



# LOWER COLORADO RIVER Multi-Species Conservation Program

## Final Programmatic Environmental Impact Statement/ Environmental Impact Report

### Volume I



U.S. Department of the Interior  
Bureau of Reclamation and U.S. Fish and Wildlife Service  
The Metropolitan Water District of Southern California

December 17, 2004



1 **FINAL PROGRAMMATIC EIS/EIR**  
2 **LOWER COLORADO RIVER MULTI-SPECIES CONSERVATION PROGRAM**  
3 **VOLUME I**

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11 Prepared by:  
12 U.S. Department of the Interior  
13 Bureau of Reclamation (Reclamation) and Fish and Wildlife Service (Service)  
14 The Metropolitan Water District of Southern California (Metropolitan)  
15

16 This Environmental Impact Statement/Environmental Impact Report (EIS/EIR) evaluates the impacts of  
17 implementing the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) Conservation  
18 Plan and issuing a section 10(a)(1)(B) (incidental take) permit based on this plan. The planning area  
19 extends from the full pool elevation of Lake Mead to the Southerly International Boundary with Mexico.  
20 The Conservation Plan is habitat-based and is intended to both promote the recovery of species listed as  
21 threatened or endangered under the Endangered Species Act of 1973, as amended, and reduce the  
22 possibility that other selected species may become listed along the LCR. The EIS/EIR has been prepared  
23 in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended; the Council on  
24 Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA; Reclamation's  
25 Draft National Environmental Policy Handbook; the California Environmental Quality Act (CEQA) of  
26 1970, as amended; and the State CEQA Guidelines, as amended. Reclamation and the Service are the lead  
27 agencies for compliance with NEPA, and Metropolitan is the lead agency for compliance with CEQA.

28 This joint EIS/EIR is a programmatic document intended to identify to agency decisionmakers and the  
29 public the potential range of impacts associated with the implementation of the proposed action,  
30 including significant and beneficial environmental effects. Additionally, the EIS/EIR will serve as the  
31 basis for future project-specific NEPA and CEQA compliance documents that will be required once  
32 individual conservation projects under the LCR MSCP are more fully defined. The proposed action does  
33 not revisit the authorization of any ongoing covered activity. This EIS/EIR analyzes the impacts of the  
34 proposed action and three additional alternatives, including no action, development of a conservation  
35 plan that addresses Federally listed species only, and off-site conservation. It also evaluates the  
36 cumulative impacts of the proposed action in combination with other projects.

37 Approximately 360 copies of the Draft EIS/EIR were distributed to agencies, public libraries, Indian  
38 tribes, organizations, and individuals for review during a 60-day period ending on August 18, 2004.  
39 Comment letters and verbal comments provided during three public hearings held in Henderson,  
40 Nevada; Blythe, California; and Phoenix, Arizona are included in LCR MSCP Volume V, along with  
41 responses to comments. Volume I, the Final EIS/EIR, incorporates changes to the Draft EIS/EIR made in  
42 response to comments and text clarifications. Volume II is the Final LCR MSCP Habitat Conservation  
43 Plan, Volume III is the Final Biological Assessment, and Volume IV contains appendices to these four  
44 volumes. For further information regarding this EIS/EIR, contact:

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# TABLE OF CONTENTS

|  |      |
|--|------|
| EXECUTIVE SUMMARY .....  | ES-1 |
| 1.0 INTRODUCTION .....   | 1-1  |
| 1.1 Background .....   | 1-1  |
| 1.1.1 Development of the LCR MSCP .....  | 1-1  |
| 1.1.2 ESA Provisions .....   | 1-2  |
| 1.1.3 Overview of the Proposed Action .....  | 1-2  |
| 1.1.4 Use of the EIS/EIR .....   | 1-5  |
| 1.1.4.1 U.S. Fish and Wildlife Service .....   | 1-5  |
| 1.1.4.2 U.S. Bureau of Reclamation .....   | 1-5  |
| 1.1.4.3 The Metropolitan Water District of<br>Southern California .....  | 1-5  |
| 1.2 Purpose of and Need for the Proposed Action .....  | 1-6  |
| 1.2.1 Need for the Proposed Action .....   | 1-6  |
| 1.2.2 Actions for Which ESA Coverage is Requested .....  | 1-7  |
| 1.2.2.1 Federal Ongoing and Future Flow-Related and<br>Non-Flow-Related Actions .....  | 1-8  |
| 1.2.2.2 Non-Federal Ongoing and Future Flow-Related<br>and Non-Flow-Related Actions .....  | 1-12 |
| 1.2.3 Purpose of the EIS/EIR .....   | 1-16 |
| 1.2.4 Scope of the EIS/EIR .....   | 1-17 |
| 1.3 Relationship to other LCR Documents Prepared Pursuant to the<br>Endangered Species Act .....   | 1-18 |
| 1.4 Required Actions and Permits .....   | 1-19 |
| 1.4.1 Actions Supported by this EIS/EIR .....  | 1-19 |
| 1.4.1.1 Federal Actions .....  | 1-19 |
| 1.4.1.2 Non-Federal Actions .....  | 1-20 |
| 1.4.1.3 Cooperating, Responsible, and Trustee<br>Agency Actions .....  | 1-20 |
| 1.4.2 Future Permits and Approvals Required to Implement<br>Specific LCR MSCP Projects .....   | 1-20 |
| 1.5 Scoping and Public Involvement .....   | 1-21 |
| 1.6 Document Organization .....  | 1-22 |
| 2.0 ALTERNATIVES .....   | 2-1  |
| 2.1 Alternatives Carried forward for Detailed Analysis .....   | 2-3  |
| 2.1.1 Alternative 1: Implementation of Proposed Conservation<br>Plan and Issuance of Section 10(a)(1)(B) Permit<br>(Conservation Plan) ..... | 2-3  |
| 2.1.1.1 Overview .....   | 2-3  |
| 2.1.1.2 Geographic Scope of the Project .....  | 2-38 |
| 2.1.1.3 Conservation Concepts .....  | 2-40 |
| 2.1.1.4 Conservation Area Site Selection, Design, and<br>Management .....  | 2-66 |

*Table of Contents*

---

|         |  |       |
|---------|--|-------|
| 2.1.1.5 | General Species Conservation Measures.....   | 2-79  |
| 2.1.1.6 | Timing of the Implementation of Conservation<br>Measures .....   | 2-92  |
| 2.1.1.7 | Monitoring and Research.....   | 2-94  |
| 2.1.1.8 | Adaptive Management .....  | 2-97  |
| 2.1.1.9 | Conceptual Habitat Conservation Actions.....   | 2-99  |
| 2.1.2   | Alternative 2: No Action Alternative .....   | 2-101 |
| 2.1.3   | Alternative 3: Implementation of a Conservation Plan<br>Addressing ESA-Listed Species Only and Issuance of a<br>Section 10(a)(1)(B) Permit (ESA-Listed Species Only) ..... | 2-102 |
| 2.1.4   | Alternative 4: Off-Site Conservation and Issuance of a Section<br>10(a)(1)(B) Permit (Off-Site Conservation) .....   | 2-103 |
| 2.1.4.1 | Lower Muddy and Virgin Rivers .....  | 2-111 |
| 2.1.4.2 | Lower Bill Williams River.....   | 2-113 |
| 2.1.4.3 | Lower Gila River .....   | 2-114 |
| 2.2     | Alternatives Considered but Eliminated from Detailed Analysis .....  | 2-115 |
| 2.2.1   | Operational or Structural Changes to the<br>Lower Colorado River .....   | 2-115 |
| 2.2.1.1 | Alternative A: Re-Operation of the Lower<br>Colorado River without Modifications to<br>Existing Structures.....  | 2-115 |
| 2.2.1.2 | Alternative B: Dam Removal.....  | 2-119 |
| 2.2.1.3 | Alternative C: Removal of Banklines, Levees, and<br>other Modifications to the Lower Colorado River .....  | 2-120 |
| 2.2.1.4 | Alternative D: Use of Conserved Water for<br>Environmental Uses on the Lower Colorado River .....  | 2-122 |
| 2.2.2   | Alternative Conservation Plans .....   | 2-122 |
| 2.2.2.1 | Alternative E: Larger-Scale Conservation Plan .....  | 2-122 |
| 2.2.2.2 | Alternative F: Shorter or Longer Permit Duration.....  | 2-123 |
| 3.0     | AFFECTED ENVIRONMENT AND<br>ENVIRONMENTAL CONSEQUENCES .....   | 3.0-1 |
| 3.1     | Aesthetics .....   | 3.1-1 |
| 3.1.1   | Affected Environment .....   | 3.1-1 |
| 3.1.1.1 | Lower Colorado River .....   | 3.1-1 |
| 3.1.1.2 | Muddy River/Moapa Valley and Virgin River.....   | 3.1-3 |
| 3.1.1.3 | Bill Williams River .....  | 3.1-3 |
| 3.1.1.4 | Lower Gila River .....   | 3.1-3 |
| 3.1.2   | Environmental Consequences.....  | 3.1-3 |
| 3.1.2.1 | Alternative 1: Proposed Conservation Plan.....   | 3.1-4 |
| 3.1.2.2 | Alternative 2: No Action Alternative .....   | 3.1-5 |
| 3.1.2.3 | Alternative 3: Listed Species Only.....  | 3.1-6 |
| 3.1.2.4 | Alternative 4: Off-Site Conservation .....   | 3.1-6 |
| 3.2     | Agricultural Resources .....   | 3.2-1 |
| 3.2.1   | Affected Environment .....   | 3.2-1 |
| 3.2.1.1 | Lower Colorado River .....   | 3.2-1 |
| 3.2.1.2 | Muddy River/Moapa Valley and Virgin River.....   | 3.2-7 |

|         |   |        |
|---------|---|--------|
| 3.2.1.3 | Bill Williams River .....                       | 3.2-7  |
| 3.2.1.4 | Lower Gila River .....                          | 3.2-8  |
| 3.2.2   | Environmental Consequences .....                | 3.2-8  |
| 3.2.2.1 | Alternative 1: Proposed Conservation Plan ..... | 3.2-9  |
| 3.2.2.2 | Alternative 2: No Action Alternative .....      | 3.2-11 |
| 3.2.2.3 | Alternative 3: Listed Species Only .....        | 3.2-12 |
| 3.2.2.4 | Alternative 4: Off-Site Conservation .....      | 3.2-12 |
| 3.3     | Air Quality .....                               | 3.3-1  |
| 3.3.1   | Affected Environment .....                      | 3.3-1  |
| 3.3.2   | Environmental Consequences .....                | 3.3-4  |
| 3.3.2.1 | Alternative 1: Proposed Conservation Plan ..... | 3.3-4  |
| 3.3.2.2 | Alternative 2: No Action Alternative .....      | 3.3-8  |
| 3.3.2.3 | Alternative 3: Listed Species Only .....        | 3.3-9  |
| 3.3.2.4 | Alternative 4: Off-Site Conservation .....      | 3.3-10 |
| 3.4     | Biological Resources .....                      | 3.4-1  |
| 3.4.1   | Affected Environment .....                      | 3.4-1  |
| 3.4.1.1 | Lower Colorado River .....                      | 3.4-1  |
| 3.4.1.2 | Muddy River/Moapa Valley and Virgin River ..... | 3.4-16 |
| 3.4.1.3 | Bill Williams River .....                       | 3.4-28 |
| 3.4.1.4 | Lower Gila River .....                          | 3.4-29 |
| 3.4.2   | Environmental Consequences .....                | 3.4-30 |
| 3.4.2.1 | Alternative 1: Proposed Conservation Plan ..... | 3.4-31 |
| 3.4.2.2 | Alternative 2: No Action Alternative .....      | 3.4-44 |
| 3.4.2.3 | Alternative 3: Listed Species Only .....        | 3.4-46 |
| 3.4.2.4 | Alternative 4: Off-Site Conservation .....      | 3.4-46 |
| 3.5     | Cultural Resources .....                        | 3.5-1  |
| 3.5.1   | Affected Environment .....                      | 3.5-5  |
| 3.5.1.1 | Lower Colorado River .....                      | 3.5-7  |
| 3.5.1.2 | Muddy River/Moapa Valley and Virgin River ..... | 3.5-15 |
| 3.5.1.3 | Bill Williams River .....                       | 3.5-15 |
| 3.5.1.4 | Lower Gila River .....                          | 3.5-16 |
| 3.5.2   | Environmental Consequences .....                | 3.5-16 |
| 3.5.2.1 | Alternative 1: Proposed Conservation Plan ..... | 3.5-16 |
| 3.5.2.2 | Alternative 2: No Action Alternative .....      | 3.5-19 |
| 3.5.2.3 | Alternative 3: Listed Species Only .....        | 3.5-19 |
| 3.5.2.4 | Alternative 4: Off-Site Conservation .....      | 3.5-19 |
| 3.6     | Energy and Depletable Resources .....           | 3.6-1  |
| 3.7     | Environmental Justice .....                     | 3.7-1  |
| 3.7.1   | Affected Environment .....                      | 3.7-1  |
| 3.7.1.1 | Lower Colorado River .....                      | 3.7-3  |
| 3.7.1.2 | Muddy River/Moapa Valley and Virgin River ..... | 3.7-3  |
| 3.7.1.3 | Bill Williams River .....                       | 3.7-3  |
| 3.7.1.4 | Lower Gila River .....                          | 3.7-3  |
| 3.7.2   | Environmental Consequences .....                | 3.7-3  |
| 3.7.2.1 | Alternative 1: Proposed Conservation Plan ..... | 3.7-4  |
| 3.7.2.2 | Alternative 2: No Action Alternative .....      | 3.7-6  |

*Table of Contents*

---

|      |          |  |        |
|------|----------|--|--------|
|      | 3.7.2.3  | Alternative 3: Listed Species Only.....        | 3.7-8  |
|      | 3.7.2.4  | Alternative 4: Off-Site Conservation.....      | 3.7-9  |
| 3.8  |          | Hazards and Hazardous Materials.....           | 3.8-1  |
|      | 3.8.1    | Affected Environment.....                      | 3.8-1  |
|      | 3.8.1.1  | Lower Colorado River.....                      | 3.8-1  |
|      | 3.8.1.2  | Muddy River/Moapa Valley and Virgin River..... | 3.8-4  |
|      | 3.8.1.3  | Bill Williams River.....                       | 3.8-4  |
|      | 3.8.1.4  | Lower Gila River.....                          | 3.8-4  |
|      | 3.8.2    | Environmental Consequences.....                | 3.8-4  |
|      | 3.8.2.1  | Alternative 1: Proposed Conservation Plan..... | 3.8-5  |
|      | 3.8.2.2  | Alternative 2: No Action Alternative.....      | 3.8-6  |
|      | 3.8.2.3  | Alternative 3: Listed Species Only.....        | 3.8-8  |
|      | 3.8.2.4  | Alternative 4: Off-Site Conservation.....      | 3.8-8  |
| 3.9  |          | Hydrology and Water Quality.....               | 3.9-1  |
|      | 3.9.1    | Affected Environment.....                      | 3.9-1  |
|      | 3.9.1.1  | Lower Colorado River.....                      | 3.9-1  |
|      | 3.9.1.2  | Muddy River/Moapa Valley and Virgin River..... | 3.9-11 |
|      | 3.9.1.3  | Bill Williams River.....                       | 3.9-13 |
|      | 3.9.1.4  | Lower Gila River.....                          | 3.9-14 |
|      | 3.9.2    | Environmental Consequences.....                | 3.9-15 |
|      | 3.9.2.1  | Alternative 1: Proposed Conservation Plan..... | 3.9-16 |
|      | 3.9.2.2  | Alternative 2: No Action Alternative.....      | 3.9-18 |
|      | 3.9.2.3  | Alternative 3: Listed Species Only.....        | 3.9-19 |
|      | 3.9.2.4  | Alternative 4: Off-Site Conservation.....      | 3.9-20 |
| 3.10 |          | Indian Trust Assets.....                       | 3.10-1 |
|      | 3.10.1   | Affected Environment.....                      | 3.10-1 |
|      | 3.10.1.1 | Lower Colorado River.....                      | 3.10-1 |
|      | 3.10.1.2 | Muddy River/Moapa Valley and Virgin River..... | 3.10-3 |
|      | 3.10.1.3 | Bill Williams River.....                       | 3.10-4 |
|      | 3.10.1.4 | Lower Gila River.....                          | 3.10-4 |
|      | 3.10.2   | Environmental Consequences.....                | 3.10-4 |
|      | 3.10.2.1 | Alternative 1: Proposed Conservation Plan..... | 3.10-4 |
|      | 3.10.2.2 | Alternative 2: No Action Alternative.....      | 3.10-5 |
|      | 3.10.2.3 | Alternative 3: Listed Species Only.....        | 3.10-6 |
|      | 3.10.2.4 | Alternative 4: Off-Site Conservation.....      | 3.10-6 |
| 3.11 |          | Land Use.....                                  | 3.11-1 |
|      | 3.11.1   | Affected Environment.....                      | 3.11-1 |
|      | 3.11.1.1 | Existing Land Uses.....                        | 3.11-1 |
|      | 3.11.1.2 | Zoning and Land Use Designations.....          | 3.11-3 |
|      | 3.11.1.3 | General and Comprehensive Plans.....           | 3.11-3 |
|      | 3.11.1.4 | Other Conservation Plans.....                  | 3.11-4 |
|      | 3.11.2   | Environmental Consequences.....                | 3.11-4 |
|      | 3.11.2.1 | Alternative 1: Proposed Conservation Plan..... | 3.11-5 |
|      | 3.11.2.2 | Alternative 2: No Action Alternative.....      | 3.11-6 |
|      | 3.11.2.3 | Alternative 3: Listed Species Only.....        | 3.11-7 |
|      | 3.11.2.4 | Alternative 4: Off-Site Conservation.....      | 3.11-7 |

|          |   |         |
|----------|---|---------|
| 3.12     | Noise .....   | 3.12-1  |
| 3.12.1   | Affected Environment .....                              | 3.12-4  |
| 3.12.1.1 | Lower Colorado River .....                              | 3.12-5  |
| 3.12.1.2 | Muddy River/Moapa Valley and Virgin River .....         | 3.12-6  |
| 3.12.1.3 | Bill Williams River .....                               | 3.12-6  |
| 3.12.1.4 | Lower Gila River .....                                  | 3.12-6  |
| 3.12.2   | Environmental Consequences .....                        | 3.12-7  |
| 3.12.2.1 | Alternative 1: Proposed Conservation Plan .....         | 3.12-7  |
| 3.12.2.2 | Alternative 2: No Action Alternative .....              | 3.12-9  |
| 3.12.2.3 | Alternative 3: Listed Species Only .....                | 3.12-10 |
| 3.12.2.4 | Alternative 4: Off-Site Conservation .....              | 3.12-10 |
| 3.13     | Population and Housing .....                            | 3.13-1  |
| 3.14     | Public Utilities and Services .....                     | 3.14-1  |
| 3.15     | Recreation .....  | 3.15-1  |
| 3.15.1   | Affected Environment .....                              | 3.15-1  |
| 3.15.1.1 | Lower Colorado River .....                              | 3.15-1  |
| 3.15.1.2 | Muddy River/Moapa Valley and Virgin River .....         | 3.15-5  |
| 3.15.1.3 | Bill Williams River .....                               | 3.15-5  |
| 3.15.1.4 | Lower Gila River .....                                  | 3.15-5  |
| 3.15.2   | Environmental Consequences .....                        | 3.15-5  |
| 3.15.2.1 | Alternative 1: Proposed Conservation Plan .....         | 3.15-5  |
| 3.15.2.2 | Alternative 2: No Action Alternative .....              | 3.15-7  |
| 3.15.2.3 | Alternative 3: Listed Species Only .....                | 3.15-7  |
| 3.15.2.4 | Alternative 4: Off-Site Conservation .....              | 3.15-7  |
| 3.16     | Socioeconomics .....                                    | 3.16-1  |
| 3.16.1   | Affected Environment .....                              | 3.16-1  |
| 3.16.1.1 | Economic Activity .....                                 | 3.16-2  |
| 3.16.2   | Environmental Consequences .....                        | 3.16-5  |
| 3.16.2.1 | Alternative 1: Proposed Conservation Plan .....         | 3.16-6  |
| 3.16.2.2 | Alternative 2: No Action Alternative .....              | 3.16-12 |
| 3.16.2.3 | Alternative 3: Listed Species Only .....                | 3.16-12 |
| 3.16.2.4 | Alternative 4: Off-Site Conservation .....              | 3.16-13 |
| 3.17     | Topography, Geology, Soils, and Mineral Resources ..... | 3.17-1  |
| 3.17.1   | Affected Environment .....                              | 3.17-1  |
| 3.17.1.1 | Lower Colorado River .....                              | 3.17-1  |
| 3.17.1.2 | Muddy River/Moapa Valley and Virgin River .....         | 3.17-2  |
| 3.17.1.3 | Bill Williams River .....                               | 3.17-2  |
| 3.17.1.4 | Lower Gila River .....                                  | 3.17-2  |
| 3.17.2   | Environmental Consequences .....                        | 3.17-3  |
| 3.17.2.1 | Alternative 1: Proposed Conservation Plan .....         | 3.17-3  |
| 3.17.2.2 | Alternative 2: No Action Alternative .....              | 3.17-3  |
| 3.17.2.3 | Alternative 3: Listed Species Only .....                | 3.17-4  |
| 3.17.2.4 | Alternative 4: Off-Site Conservation .....              | 3.17-4  |
| 3.18     | Transboundary Impacts .....                             | 3.18-1  |
| 3.18.1   | Affected Environment .....                              | 3.18-1  |
| 3.18.1.1 | Environmental Resources .....                           | 3.18-1  |

*Table of Contents*

---

|          |  |        |
|----------|--|--------|
| 3.18.1.2 | United States' 1944 Water Treaty Obligation.....                     | 3.18-3 |
| 3.18.2   | Environmental Consequences.....                                      | 3.18-4 |
| 3.18.2.1 | Alternative 1: Proposed Conservation Plan.....                       | 3.18-5 |
| 3.18.2.2 | Alternative 2: No Action Alternative.....                            | 3.18-6 |
| 3.18.2.3 | Alternative 3: Listed Species Only.....                              | 3.18-7 |
| 3.18.2.4 | Alternative 4: Off-Site Conservation.....                            | 3.18-7 |
| 3.19     | Transportation.....  | 3.19-1 |
| 4.0      | CUMULATIVE IMPACTS.....  | 4-1    |
| 4.1      | Cumulative Impact Methodology.....                                   | 4-1    |
| 4.2      | Analysis of Cumulative Impacts.....                                  | 4-2    |
| 4.2.1    | Future Covered Activities.....                                       | 4-2    |
| 4.2.2    | Urban Development Projects.....                                      | 4-8    |
| 4.2.3    | Habitat Enhancement Projects.....                                    | 4-20   |
| 4.2.4    | Other Conservation and Restoration Projects.....                     | 4-25   |
| 4.2.5    | Other Projects.....  | 4-26   |
| 4.3      | Impacts by Resource.....   | 4-31   |
| 4.3.1    | Aesthetics.....  | 4-31   |
| 4.3.2    | Agricultural Resources.....  | 4-32   |
| 4.3.3    | Air Quality.....   | 4-32   |
| 4.3.4    | Biological Resources.....  | 4-33   |
| 4.3.5    | Cultural and Historic Resources.....                                 | 4-34   |
| 4.3.6    | Energy and Depletable Resources.....                                 | 4-35   |
| 4.3.7    | Environmental Justice.....   | 4-35   |
| 4.3.8    | Hazards and Hazardous Materials.....                                 | 4-37   |
| 4.3.9    | Hydrology and Water Quality.....                                     | 4-37   |
| 4.3.10   | Indian Trust Assets.....   | 4-37   |
| 4.3.11   | Land Use.....  | 4-37   |
| 4.3.12   | Noise.....   | 4-37   |
| 4.3.13   | Population and Housing.....  | 4-37   |
| 4.3.14   | Public Utilities and Services.....                                   | 4-37   |
| 4.3.15   | Recreation.....  | 4-38   |
| 4.3.16   | Socioeconomics.....  | 4-38   |
| 4.3.17   | Topography, Geology, Soils, and Mineral Resources.....               | 4-38   |
| 4.3.18   | Transboundary Impacts.....   | 4-38   |
| 4.3.19   | Transportation.....  | 4-39   |
| 5.0      | SUMMARY COMPARISON OF ALTERNATIVES.....                              | 5-1    |
| 5.1      | Comparative Description of Alternatives and Effects.....             | 5-1    |
| 5.2      | Comparison of the No Action Alternative and Action Alternatives..... | 5-3    |
| 5.3      | Environmentally Preferred Alternative.....                           | 5-5    |
| 6.0      | OTHER SECTIONS REQUIRED BY NEPA AND/OR CEQA.....                     | 6-1    |
| 6.1      | Growth-Inducing Impacts.....   | 6-1    |
| 6.2      | Relationship Between Short-Term Uses and Long-Term Productivity..... | 6-2    |
| 6.3      | Irreversible and Irretrievable Commitments of Resources.....         | 6-3    |
| 6.4      | Unavoidable Adverse Impacts.....                                     | 6-3    |

|       |  |      |
|-------|--|------|
| 7.0   | COMPLIANCE, CONSULTATION, AND COORDINATION .....                       | 7-1  |
| 7.1   | Regulatory Compliance.....   | 7-1  |
| 7.1.1 | Federal Laws, Regulations, and Executive Orders.....                   | 7-1  |
| 7.1.2 | State of Arizona Laws and Regulations .....                            | 7-9  |
| 7.1.3 | State of California Laws and Regulations.....                          | 7-10 |
| 7.1.4 | State of Nevada Laws and Regulations .....                             | 7-12 |
| 7.1.5 | Tribal Laws and Regulations.....                                       | 7-12 |
| 7.2   | Consultation and Coordination .....                                    | 7-13 |
| 7.2.1 | Public Involvement.....  | 7-13 |
| 7.2.2 | Federal, State, and Local Agency Consultation and<br>Coordination..... | 7-14 |
| 7.2.3 | Tribal Consultation and Coordination.....                              | 7-15 |
| 8.0   | REFERENCES .....   | 8-1  |
| 9.0   | PERSONS AND AGENCIES CONTACTED .....                                   | 9-1  |
| 10.0  | ACRONYMS & GLOSSARY OF TERMS .....                                     | 10-1 |
| 10.1  | Acronyms .....   | 10-1 |
| 10.2  | Glossary of Terms .....  | 10-9 |
| 11.0  | LIST OF PREPARERS .....  | 11-1 |
| 12.0  | INDEX.....   | 12-1 |

OTHER VOLUMES:

- II Lower Colorado River Multi-Species Conservation Program  
Final Habitat Conservation Plan
- III Lower Colorado River Multi-Species Conservation Program  
Final Biological Assessment
- IV Lower Colorado River Multi-Species Conservation Program, Volume IV:  
Final Appendices to Volumes I-III and V
- V Responses to Comments on Lower Colorado River Multi-Species Conservation Program  
Volumes I-IV

**LIST OF TABLES**

ES-1 Summary of Impacts and Mitigation Measures..... ES-16

2.1-1 Proposed Covered and Evaluation Species and Their Status  
Under the Conservation Plan ..... 2-4

2.1-2 Comparison of Species-Specific Habitat Impacts to Created  
LCR MSCP Habitat (in Acres) ..... 2-7

2.1-3 Summary of Impacts on Covered and Evaluation Species and  
Estimated Level of Take Associated with Implementation of Flow- and  
Non-Flow-Related Covered Activities and the Conservation Plan ..... 2-9

2.1-4 Land Ownership in the Planning Area ..... 2-39

2.1-5 Extent of Covered Species Habitat That Would Be Provided with  
the Establishment of Land Cover Types ..... 2-57

2.1-6 Summary of Initially Identified Conservation Areas..... 2-68

2.1-7 Agricultural Land by River Reach and Landowner Category..... 2-71

2.1-8a Anticipated Schedule for Establishment of Cottonwood/Willow..... 2-93

2.1-8b Anticipated Schedule for Establishment of Honey Mesquite ..... 2-94

2.1-8c Anticipated Schedule for Establishment of Marsh..... 2-94

2.1-8d Anticipated Schedule for Establishment of Backwaters ..... 2-94

2.1-9 Key Elements of Habitat Establishment and Maintenance Concepts..... 2-100

2.1-10 Land Ownership in the Off-Site Conservation Areas (Acres) ..... 2-111

2.1-11 Species for which Habitat Establishment or Maintenance Could Occur  
in Each of the Off-Site Conservation Areas ..... 112

3.2-1 General Definitions of Categories Used in Important Farmland Maps ..... 3.2-2

3.2-2 Agricultural Land by River Reach (2003) ..... 3.2-3

3.2-3 Known Important Farmland within the Planning Area (acres) ..... 3.2-3

3.2-4 Agricultural Land Conversion Between 1993 and 2003 in the Planning Area ..... 3.2-4

3.2-5 Agricultural Land in the Off-Site Conservation Areas ..... 3.2-8

3.4-1 Land Cover Type Classification ..... 3.4-2

3.4-2 Amount (Acres) of Each Land Cover Type By Reach..... 3.4-3

3.4-3 Covered and Evaluation Species for the Conservation Plan ..... 3.4-8

3.4-4 Other Sensitive Species that Could Be Present in the Planning Area..... 3.4-11

3.4-5 Sensitive Species that Could Be Present in the Off-Site Conservation Areas ..... 3.4-19

3.5-1 Concordance Between Potential Conservation Areas within the  
LCR MSCP Planning Area and Off-Site Areas..... 3.5-6

3.5-2 Summary of Previously Recorded Sites and GLO Resources Within the  
Potential Conservation Areas within the Planning Area and Off-Site Areas..... 3.5-9

3.5-3 Historic Properties Listed on the NRHP that Fall Within or  
Immediately Adjacent to the Planning Area..... 3.5-11

3.7-1 Total Population, Minority Population and Population Living Below  
Poverty in the Affected Counties, 2000..... 3.7-2

3.7-2 Total Population, Minority Population and Population Living Below  
the Poverty Level in the LCR Planning Area and Off-Site Locations, 2000..... 3.7-2

3.9-1 Impaired Water Bodies in the Project Area ..... 3.9-12

3.12-1 Typical Sound Levels Measured in the Environment and Industry..... 3.12-2

3.12-2 Construction Noise Regulations ..... 3.12-3

3.12-3 Long-Term Noise Compatibility Thresholds ..... 3.12-4

|        |  |         |
|--------|--|---------|
| 3.12-4 | Maximum Noise Levels (Ldn) with No Noise Reduction Measures in Place .....                             | 3.12-8  |
| 3.16-1 | Agricultural Data by County (1997) .....   | 3.16-2  |
| 3.16-2 | Employment by Industry (number of jobs).....   | 3.16-3  |
| 3.16-3 | Farm Income and Expenses (thousands of dollars) .....  | 3.16-7  |
| 3.16-4 | Impacts, by Size of Agricultural Conversion, to Employment and<br>the Value of Agricultural Sales..... | 3.16-10 |
| 5.1-1  | Comparison of Impacts of Project Alternatives .....  | 5-7     |
| 5.2-1  | Comparison of Project Alternatives to No Action.....   | 5-13    |
| 6.4-1  | Summary of Impacts and Mitigation Measures.....  | 6-4     |

## LIST OF FIGURES

|        |  |        |
|--------|--|--------|
| 1.1-1  | LCR MSCP Planning Area and River Reaches.....  | 1-3    |
| 2.1-1  | LCR Planning Area, Reach 1.....  | 2-41   |
| 2.1-2  | LCR Planning Area, Reach 2.....  | 2-43   |
| 2.1-3  | LCR Planning Area, Reach 3.....  | 2-45   |
| 2.1-4  | LCR Planning Area, Reach 4.....  | 2-47   |
| 2.1-5  | LCR Planning Area, Reach 5.....  | 2-49   |
| 2.1-6  | LCR Planning Area, Reach 6.....  | 2-51   |
| 2.1-7  | LCR Planning Area, Reach 7.....  | 2-53   |
| 2.1-8  | Hypothetical Distribution of Established Cottonwood-Willow Creation<br>that Would Meet Habitat Requirements for All Covered Species<br>Associated with Cottonwood-Willow ..... | 2-60   |
| 2.1-9  | Proportion of Created Cottonwood-Willow and Marsh that Will<br>Provide Habitat for Selected Covered Species .....  | 2-61   |
| 2.1-10 | LCR MSCP Initially Identified Conservation Areas.....  | 2-69   |
| 2.1-11 | Adaptive Management Process.....   | 2-98   |
| 2.1-12 | Muddy and Virgin Rivers Off-Site Conservation Area .....   | 2-105  |
| 2.1-13 | Bill Williams River Off-Site Conservation Area .....   | 2-107  |
| 2.1-14 | Lower Gila River Off-Site Conservation Area .....  | 2-109  |
| 2.2-1  | Average Monthly Colorado River Flows below Hoover Dam<br>from January 1906 to January 1935.....  | 2-116  |
| 3.9-1  | Natural Flows at Lees Ferry.....   | 3.9-2  |
| 3.9-2  | Upper and Lower Basins of the Colorado River.....  | 3.9-3  |
| 3.18-1 | Colorado River Location within Mexico.....   | 3.18-2 |
| 3.18-2 | Monthly Average Colorado River Flows at the NIB and SIB .....  | 3.18-3 |

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# EXECUTIVE SUMMARY

## INTRODUCTION

This Environmental Impact Statement/Environmental Impact Report (EIS/EIR) evaluates the impacts of implementing the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) Conservation Plan (Conservation Plan) and issuing a section 10(a)(1)(B) (incidental take) permit based on this plan. The habitat-based Conservation Plan is intended to avoid, minimize, and fully mitigate the incidental take of the covered species from the implementation of the covered activities to the maximum extent practicable. The Conservation Plan also is intended to contribute to the recovery of species listed as threatened or endangered under the Endangered Species Act of 1973, as amended (ESA) (16 United States Code [U.S.C.] 1531-1544), and reduce the likelihood for future listing of unlisted covered species along the LCR. The EIS/EIR has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.); the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [C.F.R.] Parts 1500-1508); the U.S. Bureau of Reclamation's (Reclamation) Draft National Environmental Policy Handbook (U.S. Bureau of Reclamation [USBR] 2000a); the California Environmental Quality Act (CEQA) of 1970, as amended (Public Resources Code [P.R.C.] 21000 et seq.); and the State CEQA Guidelines, as amended (California Code of Regulations [C.C.R.], Title 14, Division 6, 15000 et seq.). Reclamation and the U.S. Fish and Wildlife Service (Service) are the lead agencies for compliance with NEPA, and The Metropolitan Water District of Southern California (Metropolitan) is the lead agency for compliance with CEQA. Together, these agencies have the responsibility for the scope, content, and legal adequacy of the document. Because the terminology and specific needs of NEPA and CEQA do not entirely overlap, explanatory text is provided where needed in the document to account for these differences. For example, CEQA uses the term "proposed project" to refer to the subject of the document, whereas NEPA uses the term "proposed action." In this EIS/EIR, the term used is "proposed action."

This joint EIS/EIR is a programmatic document intended to identify to agency decision makers and the public the potential range of impacts associated with the implementation of the proposed action, including significant and beneficial environmental effects. Additionally, the EIS/EIR will serve as the basis for future project-specific NEPA and CEQA compliance documents that will be required once individual conservation projects under the LCR MSCP are more fully defined. The proposed action does not revisit the authorization of any ongoing covered activity. Future covered activities for which incidental take authorization is being sought under the LCR MSCP may require project-specific NEPA/CEQA compliance prior to implementation.

## PURPOSE AND NEED

### Need for the Proposed Action

The ESA directs Federal agencies to support the conservation of listed species and ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. Additionally, no taking of listed species by non-Federal agencies is allowed without a permit

1 from the Service. Federal and non-Federal actions related to the ongoing and future operations  
2 of the LCR water delivery and power systems may be affecting listed species, critical habitat,  
3 and may contribute to future listing of additional species. To address the needs of the species  
4 and the need to comply with the ESA, this Conservation Plan is proposed with the purpose of  
5 avoiding jeopardy, supporting the conservation of listed species, and reducing any contribution  
6 ongoing or future operations may make to new listings. Additionally, the Service will use this  
7 analysis to support its decision concerning an incidental take permit for covered non-Federal  
8 activities.

9 As noted, the Federal participants in the LCR MSCP (Reclamation, the U.S. National Park  
10 Service [NPS], U.S. Bureau of Indian Affairs [BIA], U.S. Bureau of Land Management [BLM], the  
11 Service, and the Western Area Power Administration [Western]), acting within the scope of  
12 their legal authority and obligations, currently undertake or may undertake activities along the  
13 LCR that have the potential to affect and result in the incidental take of species that are listed  
14 under the ESA, or that may be listed in the future. Ongoing and future Federal actions that are  
15 covered by the proposed Conservation Plan are outlined in section 1.2.2.1 of this EIS/EIR and  
16 more fully described in Chapter 2 of the *Lower Colorado River Multi-Species Conservation Program*  
17 *Biological Assessment* (LCR MSCP BA)<sup>1</sup>, which comprises Volume III. Federal agencies are  
18 required under section 7(a)(2) of the ESA to ensure that their actions are not likely to jeopardize  
19 the continued existence of a listed species or to destroy or adversely modify designated critical  
20 habitat. Under section 9 of the ESA, Federal agencies also may not “take” listed species without  
21 authorization provided by the Service in the incidental take statement contained in its Biological  
22 Opinion (BO) issued pursuant to section 7(b).

23 The actions that the non-Federal participants in the LCR MSCP are engaged in or may become  
24 engaged in along the LCR that have the potential to affect and result in the incidental take of  
25 species that are listed under the ESA, or that may be listed in the future, are outlined in section  
26 1.2.2.2 of this EIS/EIR and more fully described in Chapter 2 of the LCR MSCP Habitat  
27 Conservation Plan (HCP) (Volume II). Under section 9 of the ESA, non-Federal entities may not  
28 “take” listed species without authorization. In order to comply with section 9, the non-Federal  
29 participants are requesting such authorization based on the implementation of the proposed  
30 Conservation Plan.

31 The Conservation Plan, as outlined in the LCR MSCP HCP, documents the extent of the  
32 incidental take for which authorization is being requested under ESA sections 7 and 10(a)(1)(B),  
33 and includes measures to avoid, minimize, and mitigate the effect of that level of take to the  
34 maximum extent practicable. The Conservation Plan covers both Federal and non-Federal  
35 actions over a 50-year period. The Federal participants will submit the Conservation Plan as  
36 part of their proposed action for consideration under section 7 consultation. The non-Federal  
37 participants will submit the Conservation Plan with their application for a section 10(a)(1)(B)  
38 permit to the Service. The Service will use the Conservation Plan as part of its determinations  
39 under sections 7 and 10 on issuing an incidental take statement and incidental take permit.

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1 To facilitate compliance with section 7(a)(2), Federal agencies may prepare a BA, pursuant to section 7(c)(1) that identifies the likely effects of the Federal action on threatened and endangered species.

1 The implementation of the Conservation Plan would provide the mechanism to meet the needs  
2 of the Service, the Federal participants, and the non-Federal participants for incidental take  
3 authorization under the ESA for ongoing and future actions on the LCR.

#### 4 **Purpose of the EIS/EIR**

5 The purpose of the EIS/EIR is to analyze the environmental effects of implementing the LCR  
6 MSCP Conservation Plan by both the Federal and non-Federal participants for a 50-year period,  
7 as well as analyze the impacts of the incidental take from the covered activities that would be  
8 authorized by the section 10(a)(1)(B) permit. There is no parallel requirement to evaluate the  
9 environmental effects of authorizing incidental take through an incidental take statement under  
10 section 7, although the analysis of incidental take of covered species in this EIS/EIR includes the  
11 effects caused by both the Federal and non-Federal actions.

12 This EIS/EIR and the accompanying BA and HCP contain descriptions of the ongoing and  
13 future activities for which incidental take coverage is sought under the ESA by the Federal and  
14 non-Federal participants. Except for the effect of the authorized incidental take of covered  
15 species, which is part of the proposed action, this EIS/EIR does not evaluate the environmental  
16 effects of the covered activities and does not revisit NEPA or CEQA authorizations for ongoing  
17 activities or provide NEPA or CEQA authorization for future activities. Implementation of the  
18 Conservation Plan would not be contingent on actually undertaking any of the future covered  
19 activities, but would proceed pursuant to the schedule outlined in the proposed Conservation  
20 Plan as provided in Tables 2.1-8a-d (included in section 2.1.1.6 as part of the description of the  
21 proposed action).

#### 22 **Scope of the EIS/EIR**

23 This EIS/EIR evaluates only the impacts of implementing the Conservation Plan and issuance  
24 of a section 10(a)(1)(B) permit by the Service based on this plan since these are the two  
25 components of the proposed action. The ongoing covered activities have obtained NEPA  
26 and/or CEQA authorizations to the extent required by laws in effect at the time they were  
27 approved, and future covered activities will be required to obtain the appropriate  
28 authorizations. Although specific regions of influence have been developed for individual  
29 resources (e.g., socioeconomic and air quality impacts could affect a larger area than noise  
30 impacts or impacts to cultural resources, which are site-specific and highly localized), impacts  
31 generally would occur in the vicinity of the historic floodplain of the LCR or its tributaries, in  
32 proximity to the sites that would be used for conservation area establishment. Implementation  
33 of the Conservation Plan and issuance of the section 10(a)(1)(B) permit would not change the  
34 amount of water available to the LCR MSCP participants, the amount of water used by these  
35 participants, or otherwise result in changes to environmental conditions beyond those analyzed  
36 in Chapter 3 of this EIS/EIR.

37 The Conservation Plan includes measures that would contribute to maintaining existing  
38 desirable habitat within the planning area. The LCR MSCP participants would establish a fund  
39 early in the term of the program to be expended on assessing and implementing projects for  
40 maintaining existing native habitat that could occur anywhere within the planning area. The  
41 types of activities that could be conducted include construction of infrastructure for water  
42 delivery or movement; maintenance of marsh vegetation by burning, water delivery, dredging,

1 and other means; maintenance of moist soil conditions in riparian land cover types (e.g.,  
2 cottonwood-willow); dredging activities to establish backwaters or backwater connection with  
3 the main river channel; removal or control of undesirable vegetation such as saltcedar and  
4 *Arundo*; and other appropriate means to maintain existing desirable habitat. Specific projects  
5 and locations have not been identified (some of the projects are ongoing while others are only  
6 proposed), but these maintenance activities would involve actions that are similar to the  
7 proposed action and it is reasonable to assume that they would result in impacts that are similar  
8 to those described in Chapter 3 of this EIS/EIR. Analyzing the environmental impacts of these  
9 measures is beyond the scope of this EIS/EIR, and their implementation would not be  
10 authorized by decisions based on this report.

### 11 **Goals and Objectives for the LCR MSCP Conservation Plan**

12 In developing the LCR MSCP Conservation Plan, the participants identified a set of goals and  
13 objectives that they expect to achieve through its implementation. The goals and objectives are  
14 as follows:

- 15 1. Conserve habitat that may be impacted by the covered activities that the LCR MSCP  
16 participants would implement or perform on the LCR;
- 17 2. Reduce the likelihood of additional species listings on the LCR under the ESA;
- 18 3. Contribute to recovery of listed species on the LCR;
- 19 4. Accommodate current water diversions and power production on the LCR;
- 20 5. Optimize opportunities for future water and power development on the LCR;
- 21 6. Provide the basis for take authorizations for Federal and non-Federal covered  
22 activities on the LCR pursuant to the ESA;
- 23 7. Provide the basis for assurances for the non-Federal parties pursuant to the ESA  
24 against requirements for increased conservation and mitigation measures in the event  
25 of changed circumstances or unforeseen circumstances to the maximum extent  
26 permitted by law;
- 27 8. Comply with the Law of the River;
- 28 9. Identify and implement feasible conservation and mitigation measures for the  
29 program based on specific economic, social, legal, and technical considerations,  
30 including:
  - 31 a. Whether an alternative's costs would be prohibitively or substantially greater than  
32 other alternatives.
  - 33 b. Whether the alternative is technically feasible based on current science or  
34 technology, proximity to existing populations of the species, the presence or absence  
35 of infrastructure necessary to implement the measures, and the ability to integrate  
36 established native land cover types with existing native land cover types.

37 The Conservation Plan must also meet the criteria for issuance of a section 10(a)(1)(B) permit by  
38 the Service:

- 1 1. The taking will be incidental to an otherwise lawful activity;
- 2 2. The applicant will, to the maximum extent practicable, minimize and mitigate the
- 3 impacts of such taking;
- 4 3. The applicant will develop an HCP and ensure that adequate funding for the HCP will
- 5 be provided;
- 6 4. The taking will not appreciably reduce the likelihood of the survival and recovery of the
- 7 species in the wild; and
- 8 5. The applicant agrees to implement other measures the Service may require as being
- 9 necessary or appropriate for the purpose of the HCP.

## 10 **ALTERNATIVES**

11 A number of project alternatives were considered but eliminated from detailed analysis. The  
12 action alternatives that were carried forward are considered feasible and meet most or all of the  
13 goals and objectives outlined above.

### 14 **Alternative 1: Implementation of the Proposed Conservation Plan and Issuance of Section** 15 **10(a)(1)(B) Permit (Conservation Plan)**

16 Alternative 1 is the proposed action and includes two primary components:

- 17 1) Implementation of a regional Conservation Plan by Federal and non-Federal
- 18 participants that would meet the LCR MSCP goals and objectives.
- 19 2) Issuance of an ESA section 10(a)(1)(B) permit by the Service based on the proposed HCP
- 20 for non-Federal covered activities.

21 Species proposed for coverage are those that meet one of the following selection criteria:

- 22 • Species that are listed or that are proposed or candidates for listing under the ESA or
- 23 species that are protected under Arizona, California, or Nevada law that could be
- 24 affected by covered activities and would require take authorization; or
- 25 • Species that could become listed during the term of the LCR MSCP Conservation Plan
- 26 under the ESA or species that could become protected under Arizona, California, or
- 27 Nevada law that could be affected by covered activities and could require future take
- 28 authorization.

29 The Conservation Plan includes a full range of conservation measures for all covered species.  
30 Based on application of the selection criteria, 27 of the species considered are proposed for  
31 coverage under the ESA section 10(a)(1)(B) permit. The LCR MSCP HCP also includes four  
32 "evaluation species." Evaluation species are species that could become listed in future years  
33 and that could be added to the covered species list during the term of the LCR MSCP, but for  
34 which sufficient information is not available at this time to determine their status in the  
35 planning area, the potential effects of covered activities, or to develop specific conservation  
36 measures for the species. The Conservation Plan includes research studies and pilot  
37 management studies for the evaluation species to determine their status in the planning area

1 and to determine appropriate conservation measures. None of the four evaluation species are  
2 presently protected under the ESA.

3 The Conservation Plan includes the following types of conservation measures that, in  
4 combination, would achieve program objectives for regulatory compliance and contribute to  
5 species' recovery:

- 6 • Establishment of a \$25 million fund to support projects implemented by land use  
7 managers in the planning area that maintain existing habitat for listed species that  
8 would be covered by the Conservation Plan under this alternative;
- 9 • Creation of native land cover types (5,940 acres of cottonwood-willow, 1,320 acres of  
10 honey mesquite type III, 512 acres of marsh, and 360 acres of backwaters) to provide  
11 covered species habitats;
- 12 • Avoidance and minimization of impacts on covered species and their habitat resulting  
13 from covered activities and Conservation Plan implementation;
- 14 • Population enhancement measures that directly or indirectly increase abundance of  
15 covered species;
- 16 • Monitoring and research necessary to assess and improve conservation measure  
17 effectiveness and adaptively manage implementation of the Conservation Plan over  
18 time; and
- 19 • Other conservation measures relating to the covered species and the strategies for  
20 implementing them.

21 The Conservation Plan is designed to fully mitigate adverse effects on all covered species  
22 resulting from covered activities and to meet the ESA section 10 standard to minimize and  
23 mitigate the impacts of the covered activities on covered species to the maximum extent  
24 practicable [50 C.F.R. 17.22(b)(2)(B)].

25 This alternative would be implemented in the planning area, which is the historic floodplain of  
26 the LCR, from Lake Mead to the SIB between the United States and Mexico and areas with  
27 elevations up to and including the full pool elevations of Lake Mead, Lake Mohave, and Lake  
28 Havasu.

### 29 **Alternative 2: No-Action Alternative**

30 The no action alternative describes a reasonable assumption of the expected future situation  
31 that would result if the Conservation Plan were not implemented as proposed and the section  
32 10(a)(1)(B) permit were not issued. This alternative is based on the following assumptions  
33 regarding the actions that would be taken in the absence of the LCR MSCP.

#### 34 *Assumptions*

- 35 • A comprehensive, regional multi-species conservation plan would not be implemented  
36 by non-Federal and Federal entities.

- 
- 1       • The Service would not issue a comprehensive section 10(a)(1)(B) permit to the states of  
2       Arizona, California, and Nevada for incidental take resulting from the covered activities.
- 3       • The covered activities described in the LCR MSCP BA and LCR MSCP HCP would  
4       likely be implemented, but regulatory compliance would be required and applied on a  
5       case-by-case basis as each activity is considered and approved. The types of  
6       conservation measures and strategies described for the proposed Conservation Plan  
7       would likely be adopted to offset the impacts of each of the activities, but would be  
8       planned and implemented independently for each activity. Conservation could occur in  
9       the planning area as well as in the off-site conservation areas described below under  
10      Alternative 4. These include the lower reaches of the Virgin and Muddy rivers, Bill  
11      Williams River, and Gila River. In the absence of a comprehensive, coordinated  
12      conservation program, the following would be expected:
- 13      – It is unlikely that funding would be provided to maintain existing habitat that is not  
14      impacted by the individual projects.
- 15      – The individual project mitigation programs likely would not provide the regional  
16      wildfire suppression and law enforcement funding proposed in the Conservation  
17      Plan.
- 18      – Coordinated monitoring and adaptive management programs would not be  
19      implemented.
- 20      – Since each individual project would establish its own mitigation sites, it is likely that  
21      more maintenance and storage facilities would be required.
- 22      – More, smaller mitigation sites would be established, requiring more infrastructure  
23      (access roads and irrigation pipelines/canals and pump facilities).
- 24      – To the extent that the agencies undertaking the covered activities proceed with ESA  
25      compliance, there may be a reduced number of covered species because unlisted  
26      species likely would not be included. This would result in a reduction in the amount  
27      of conservation area required.

#### 28 ***Federal Regulatory Compliance Actions***

- 29       • All Reasonable Prudent Measures (RPMs) and Reasonable Prudent Alternatives (RPAs)  
30       for the 1997 and 2002 BOs must be completed by April 30, 2005, when the current BO  
31       expires. Reclamation would need to reinitiate consultation with the Service on LCR  
32       operations and maintenance activities, and the Service would issue a new BO, which  
33       may contain conservation measures or requirements not in the original 1997 BO or the  
34       2002 extension. It is likely that Reclamation's consultation with the Service regarding  
35       ongoing operations and maintenance activities would incorporate the future actions for  
36       which coverage is provided by the proposed Conservation Plan.
- 37       • The provisions of the 2001 BO regarding the change in point of diversion of up to 400  
38       kaf from Imperial Dam to Lake Havasu would remain in effect, assuming that the  
39       exchange is accomplished, until the time limits set in the BO expire.

- 1 • Future Federal actions would be required to comply with NEPA, the ESA, and other  
2 laws and regulations; compliance and permit requirements would be implemented on a  
3 case-by-case basis.
- 4 • It is likely that conservation measures similar to those of the proposed action would be  
5 implemented to comply with regulatory requirements, with the exceptions described  
6 above under “Assumptions.”

7 *Non-Federal Regulatory Compliance Actions*

- 8 • Ongoing and future actions in Arizona, California, and Nevada would be required to  
9 comply with permit requirements, where appropriate, and all applicable laws and  
10 regulations. There is a reasonable possibility that potential non-Federal permittees  
11 would conclude that they do not require a section 10(a)(1)(B) permit for their activities,  
12 either because they choose not to implement those activities or they determine that their  
13 activities do not cause incidental take of protected species.

14 *Ongoing Conservation Actions*

- 15 • Conservation actions by Federal agencies that are tied to section 7 consultations under  
16 section 7(a)(2) would continue to be implemented as part of that proposed action or  
17 under the requirements of the BO. Implementation would cease only under the terms of  
18 the BO.
- 19 • Voluntary conservation actions initiated by Federal agencies under section 7(a)(1) would  
20 continue to be implemented at the discretion of the Federal agency.
- 21 • Voluntary conservation actions initiated by state agencies, tribes, or private groups  
22 would continue to be implemented at the discretion of the funding entity.
- 23 • Implementation of existing recovery plans for listed species would continue as Federal  
24 and non-Federal partners provide funding for specific projects relevant to the planning  
25 area.

26 **Alternative 3: Implementation of a Conservation Plan Addressing ESA-Listed Species Only**  
27 **and Issuance of a Section 10(a)(1)(B) Permit (ESA-Listed Species Only)**

28 This alternative would provide coverage only for those species listed under the ESA, and it  
29 would result in the issuance of a section 10(a)(1)(B) permit by the Service. Covered species  
30 would be the Yuma clapper rail, southwestern willow flycatcher, desert tortoise, bonytail,  
31 humpback chub, and razorback sucker. The amount of take authorized would be as shown on  
32 Tables 2.1-2 and 2.1-3 for these species. This alternative would differ from the proposed action  
33 primarily in that no honey mesquite and less cottonwood-willow and marsh land cover would  
34 need to be established. Additionally, no take permit would be issued for unlisted species, and  
35 specific benefits for those species would not occur. Under this alternative, the Conservation  
36 Plan would be implemented in the same geographic area as the proposed action and would  
37 include the following:

- 1 • Establishment of a \$25 million fund to support projects implemented by land use  
2 managers in the planning area that maintain existing habitat for listed species that  
3 would be covered by the Conservation Plan under this alternative;
- 4 • Creation of native habitat in the planning area (4,050 acres of cottonwood-willow, 382  
5 acres of marsh, and 360 acres of backwaters);
- 6 • Long-term management of established habitat to maintain and preserve ecological  
7 functions;
- 8 • Avoidance and minimization of impacts resulting from covered activities and  
9 Conservation Plan implementation on listed species and their habitat;
- 10 • Population enhancement measures intended to directly or indirectly increase abundance  
11 of listed species; and
- 12 • Adaptive management measures, including monitoring and research necessary to assess  
13 and improve conservation measure effectiveness.
- 14 • Other conservation measures relating to the listed species and the strategies for  
15 implementing them.

16 **Alternative 4: Off-Site Conservation and Issuance of a Section 10(a)(1)(B) Permit (Off-Site**  
17 **Conservation)**

18 The off-site conservation alternative would involve the application for and issuance of a section  
19 10(a)(1)(B) permit for the same covered activities and covered species as the proposed action.  
20 The level of impacts to covered species, including the amount of authorized take that is  
21 requested, is the same for this alternative as for the proposed action, and therefore, the same  
22 level of conservation measures would be proposed to mitigate the impacts, including:

- 23 • Establishment of a \$25 million fund to support projects implemented by land use  
24 managers in the planning area that maintain existing covered species habitat;
- 25 • Creation of native habitat (5,940 acres of cottonwood-willow, 1,320 acres of honey  
26 mesquite type III, 512 acres of marsh, and 360 acres of backwaters);
- 27 • Long-term management of created habitat to maintain and preserve ecological  
28 functions;
- 29 • Avoidance and minimization of impacts resulting from covered activities and  
30 Conservation Plan implementation on covered species and their habitat;
- 31 • Population enhancement measures intended to directly or indirectly increase abundance  
32 of covered species;
- 33 • Adaptive management measures, including monitoring and research necessary to assess  
34 and improve conservation measure effectiveness; and
- 35 • Other conservation measures relating to the covered species and the strategies for  
36 implementing them.

37 The only difference between this alternative and the proposed action is that habitat generally  
38 would be created along tributaries to the LCR. Fish conservation, including the creation of 360

1 acres of backwaters and fish augmentation strategies, would continue to take place in the  
2 mainstem, reservoirs, and backwaters of the LCR. For purposes of analysis, it is assumed that  
3 created habitat would be equally distributed between the three off-site conservation areas.

4 Potential off-site locations for implementing the Conservation Plan elements are (1) the lower  
5 reaches of the Muddy River/Moapa Valley and Virgin River, proceeding upstream from the  
6 confluences with Lake Mead and overlapping the NDOW's Overton Wildlife Management  
7 Area; (2) the lower reach of the Bill Williams River, proceeding upstream from the confluence  
8 with the LCR and overlapping the Bill Williams NWR, to Alamo Dam; and/or (3) lower Gila  
9 River Valley, proceeding upstream from the LCR planning area and extending approximately  
10 ten miles east of Mohawk Valley.

## 11 SCOPING AND PUBLIC INVOLVEMENT

12 Public scoping was conducted to help identify areas of concern and specific issues that should  
13 be addressed in the EIS/EIR. Notices that a combined EIS/EIR was being prepared were  
14 published in 1999 and 2000. Subsequent notices were made in October 2003. The first Notice of  
15 Intent (NOI)/Notice of Preparation (NOP) was published in the *Federal Register* (Volume 64,  
16 Number 95, pages 27000-27002) on May 18, 1999. A supplemental NOI/NOP was published in  
17 the *Federal Register* (Volume 65, Number 134, pages 43031-43034) on July 12, 2000. These two  
18 NOI/NOPs are included in Appendix B. A Revised NOP of a Draft EIR was issued by  
19 Metropolitan on July 25, 2000 and also is included in Appendix B, as is the NOP issued on  
20 October 17, 2003. Three public scoping meetings held in 2000 were supplemental to the original  
21 scoping meetings in 1999 and involved a formal presentation on planning progress and  
22 conceptual preliminary alternatives. Four additional public information meetings were held in  
23 November 2003 in Arizona, California, and Nevada to present information regarding the  
24 alternatives being evaluated in this EIS/EIR and to obtain public comments regarding issues to  
25 be addressed in this document. Scoping summary reports documenting the issues raised at  
26 these meetings are included in Appendix C.

27 Approximately 360 copies of the Draft EIS/EIR were distributed to agencies, public libraries,  
28 Indian tribes, organizations, and individuals for review during a 60-day period ending on  
29 August 18, 2004. Additionally, three public hearings were held in Henderson, Nevada; Blythe,  
30 California; and Phoenix, Arizona on July 20-22, 2004 in order to receive public comments on the  
31 Draft EIS/EIR. Additional information regarding the public involvement program is included  
32 in section 7.2.1.

## 33 SUMMARY OF IMPACTS

### 34 Comparative Description of Alternatives and Effects

35 The proposed action (Alternative 1) has the potential to cause impacts to environmental  
36 resources, as described in Chapter 3. Many of these potential impacts would be caused by  
37 construction activities, such as grading required to establish the proper topography for growing  
38 riparian vegetation to provide habitat for covered species or to develop backwaters and marsh  
39 land cover. Once the habitat has been established, ongoing maintenance activities would not  
40 significantly impact most resources. Potential construction-related temporary and less than  
41 significant impacts have been identified for aesthetics, biological resources, hazards and

1 hazardous materials, hydrology, geology, and transportation. Construction also could result in  
2 significant impacts to agricultural resources, air quality, biological resources (associated with  
3 backwater creation), cultural resources, and noise. Additionally, construction would result in  
4 temporary environmental justice impacts (associated with air quality and noise) and  
5 transboundary impacts (associated with air quality). It also could result in long-term changes to  
6 Indian Trust Assets (ITAs). Mitigation measures have been identified that would reduce most  
7 of the potential significant impacts to a less than significant level. (Impacts to aesthetics,  
8 hazards and hazardous materials, hydrology, ITAs, geology, transboundary impacts, and  
9 transportation do not require mitigation, nor do some impacts to air quality and biological  
10 resources.) Depending on the characteristics of specific conservation sites and construction  
11 methods implemented, there may be significant temporary impacts to air quality and associated  
12 impacts to environmental justice that cannot be avoided.

13 Potential impacts that may result from the maintenance and monitoring of the conservation  
14 sites after construction is completed and from implementing other conservation measures are  
15 either less than significant or can be mitigated to be less than significant, with the exception of  
16 air quality impacts from the largest prescribed burns and associated environmental justice  
17 impacts.

18 No significant long-term operational impacts have been identified for the proposed action with  
19 the exception of potential noise impacts from pump operation and associated environmental  
20 justice impacts. The potential long-term effects to agricultural resources, land use,  
21 environmental justice, and socioeconomics would be less than significant. Furthermore, the  
22 proposed action would result in long-term beneficial impacts on biological resources, aesthetics,  
23 and water quality.

24 The no action alternative (Alternative 2) is assumed to include many of the same conservation  
25 measures as the proposed action. These measures would be implemented on a case-by-case  
26 basis as required to mitigate the effects of covered actions that are undertaken by the various  
27 agencies. Although the construction, maintenance, and operation of these individual  
28 conservation projects have the potential to cause impacts that are similar to those of the  
29 proposed action, there would be differences in the scope of those impacts. In the absence of a  
30 coordinated conservation program, the individual conservation projects are likely to be smaller  
31 and more widely scattered. It also is likely that conservation would focus only on listed species,  
32 thus reducing the total amount of conservation area that would be created.

33 These factors may reduce the effects on agricultural resources, land use, environmental justice  
34 (loss of agricultural jobs), and socioeconomics below those caused by the proposed action.  
35 However, there would likely be similar levels of impacts to aesthetics, air quality, cultural  
36 resources, and transportation. The potential for significant air quality and associated  
37 environmental justice impacts would still exist, even with adoption of mitigation measures,  
38 depending on the location and size of the conservation projects. Although less than significant,  
39 impacts would likely be greater than those caused by the proposed action for hazards and  
40 hazardous materials and noise because of the increased number of individual projects involved  
41 and the greater likelihood that the conservation sites would be located closer to developed areas  
42 near existing facilities used in implementing the covered actions. The no action alternative  
43 could include conservation in the off-site conservation areas. To the extent that this occurred,

1 short-term impacts on environmental justice associated with air quality and noise, ITAs, and  
2 transboundary impacts would be reduced because these impacts would not occur in the off-site  
3 areas.

4 More importantly, the no action alternative would provide fewer benefits to biological  
5 resources, along with reduced benefits to aesthetics and water quality. In the absence of a  
6 coordinated program with the capacity to develop large blocks of conservation area, the  
7 multiple individual mitigation sites that would be developed under this alternative would be  
8 smaller, with greater edge areas proportionate to their size, and are less likely to be located in  
9 proximity to existing occupied habitat. These factors would reduce the effectiveness of the  
10 mitigation sites as compared to the conservation measures in the proposed action.  
11 Furthermore, the absence of a coordinated monitoring and adaptive management program for  
12 the individual projects would reduce their likelihood of success in providing the benefits for the  
13 biological resources that would result from the program proposed for the LCR MSCP. Impacts  
14 to native fish species along the Virgin and Muddy rivers also could occur under this alternative,  
15 however, which would represent a greater impact to biological resources than identified for the  
16 proposed action.

17 Overall, under the no action alternative, the short-term, construction-related impacts are  
18 potentially greater, while the permanent agricultural and associated environmental justice  
19 impacts and biological, aesthetic, and water quality benefits are potentially less than those of the  
20 proposed action.

21 The listed species only alternative (Alternative 3) would require the construction of a smaller  
22 amount of conservation area, reducing the short-term, construction-related impacts from the  
23 levels that would be caused by the proposed action. Unlike the no action alternative, the  
24 construction of the conservation projects would still be a coordinated effort, focusing on  
25 creating large size patches of integrated mosaics of vegetation. This approach would likely  
26 involve fewer construction sites than would be required under the proposed action, but there  
27 would still be the potential for significant unmitigable impacts to air quality and related  
28 environmental justice impacts, depending on the location and size of the sites. Other  
29 construction-related, short-term impacts would likely be less than those identified for the  
30 proposed action. Effects on agricultural resources, land use, environmental justice (from noise  
31 and loss of agricultural jobs), and socioeconomics would also likely be less since fewer acres of  
32 existing agricultural land would be subject to conversion for conservation area use. As with the  
33 proposed action, these effects would be less than significant. However, this alternative would  
34 not provide the same level of long-term, beneficial impacts to biological and aesthetic resources  
35 and water quality that are provided by the proposed action.

36 The off-site conservation alternative (Alternative 4) differs from the proposed action in the  
37 location, but not the quantity, of the riparian and mesquite land cover types that would be  
38 created. As a result, the scope of short-term, construction-related impacts would be similar to  
39 those identified for the proposed action, although transboundary and ITA impacts would not  
40 occur, and the potential for short-term environmental justice impacts associated with air quality  
41 and noise and long-term impacts associated with noise would be greatly lessened. The  
42 potential for significant, unmitigable impacts to air quality remains, although the California air  
43 quality standards would not be applicable to this alternative since none of the conservation

1 areas would be created in California. The environmental justice impacts associated with noise  
2 and air quality would not occur in the off-site conservation areas since the percentage of low-  
3 income and minority populations in these locations is less than in the larger community of  
4 comparison; they would be associated only with the creation of 360 acres of backwaters. Effects  
5 to agricultural resources, land use, environmental justice (loss of agricultural jobs), and  
6 socioeconomics would be similar to the proposed action, and less than significant. Potential  
7 impacts to ITAs would be greatly lessened under this alternative because they are not present in  
8 the off-site conservation areas, and impacts would occur only in the areas where the 360 acres of  
9 backwaters would be created.

10 This alternative would provide the same long-term benefits to biological resources, aesthetic  
11 resources, and water quality as the proposed action, but it has the potential to cause significant  
12 unavoidable short- and long-term impacts to biological resources that are present at off-site  
13 conservation areas (native common and sensitive fish inhabiting the Virgin and Muddy rivers)  
14 that are not present in the planning area. These potential short- and long-term impacts to  
15 biological resources offset the difference between this alternative and the proposed action with  
16 respect to short-term air quality and associated environmental justice impacts, as well as  
17 environmental impacts associated with noise since this impact would be feasibly mitigable.  
18 Alternative 4 would not result in transboundary impacts, but these are impacts that would  
19 occur in a different location than those of the proposed action; they are not different types of  
20 impacts. Alternative 4 also would not result in impacts to ITAs (with the exception of potential  
21 impacts from backwater creation), but these, too, are feasibly mitigable.

## 22 **Comparison of the No Action Alternative and Action Alternatives**

23 Under the no action alternative (Alternative 2), the covered activities described in the LCR  
24 MSCP BA and LCR MSCP HCP would likely be implemented, but regulatory compliance  
25 would be required and applied on a case-by-case basis as each action is considered and  
26 approved. In the absence of a comprehensive, coordinated conservation program, the following  
27 would be expected:

- 28 • It is unlikely that funding would be provided to maintain existing habitat that is not  
29 impacted by the individual projects.
- 30 • The individual project mitigation programs likely would not provide the regional  
31 wildfire suppression and law enforcement funding proposed in the Conservation Plan.
- 32 • Coordinated monitoring and adaptive management programs would not be  
33 implemented.
- 34 • Since each individual project would establish its own mitigation sites, it is likely that  
35 more maintenance and storage facilities would be required.
- 36 • More, smaller mitigation sites would be established, requiring more infrastructure  
37 (access roads and irrigation pipelines/canals and pump facilities).
- 38 • To the extent that the agencies undertaking the covered activities proceed with ESA  
39 compliance, there may be a reduced number of covered species because unlisted species  
40 likely would not be included.

1 Thus, the no action alternative would not result in a continuation of existing conditions. Its  
2 impacts generally would be similar to those of the action alternatives because similar  
3 conservation measures likely would be implemented, and differences in impacts typically  
4 would be a matter of degree rather than kind. In general, the impacts that are directly  
5 associated with the amount of conservation area established (including beneficial impacts)  
6 would be comparable to those of Alternative 3 and less than those of Alternatives 1 and 4.

7 The no action alternative would result in similar types of construction-related impacts as the  
8 action alternatives. In some cases, the intensity of the impact would be comparable to  
9 Alternative 3 and less than under Alternatives 1 and 4 (e.g., short-term aesthetic impacts to  
10 conservation area establishment sites; impacts from erosion). In other cases (e.g., air quality,  
11 noise), short-term impacts would be greater because the lack of a comprehensive, coordinated  
12 effort could result in more, smaller projects, and the need to develop more infrastructure and  
13 support facilities. As noted above, this may reduce the effects to agricultural resources, land  
14 use, environmental justice (loss of agricultural jobs) and socioeconomics below those caused by  
15 the proposed action and Alternative 4 (off-site conservation).

16 Beneficial impacts to aesthetic resources and water quality would be less than under  
17 Alternatives 1 and 4 because a smaller amount of conservation area would be created and  
18 comparable to those of Alternative 3 because similar amounts of conservation area would be  
19 created. Beneficial impacts to biological resources that are directly linked to the amount of  
20 conservation area created would be less than under Alternatives 1 and 4 and comparable to  
21 Alternative 3. Beneficial impacts of all action alternatives to biological resources would be  
22 reduced under the no action alternative because funding would not be provided to maintain  
23 existing habitat that is not impacted by the individual projects, regional wildfire suppression  
24 and law enforcement funding likely would not be provided, and coordinated monitoring and  
25 adaptive management programs would not be implemented.

26 Long-term noise from pump operation could be slightly greater than under the proposed action  
27 and Alternative 4 because conservation measures would be more likely to be implemented  
28 closer to developed areas and approximately equal to those of Alternative 3.

29 The no action alternative could include conservation in the off-site conservation areas. To the  
30 extent that this occurred, short-term impacts on environmental justice associated with air  
31 quality and noise, ITAs, and transboundary impacts identified for Alternatives 1 and 3 would  
32 be reduced because these impacts would not occur in the off-site areas. Impacts to native fish  
33 species along the Virgin and Muddy rivers could occur under this alternative, as is the case for  
34 Alternative 4. This would represent a greater impact to biological resources than identified for  
35 Alternatives 2 or 3.

### 36 **Environmentally Preferred Alternative**

37 As discussed above, each of the alternatives would have the potential to cause short-term,  
38 construction-related impacts to many of the resources analyzed in this EIS/EIR. Although these  
39 potential impacts may be less for Alternatives 2 (no action), and 3 (listed species only), they can  
40 be mitigated to less than significant levels for all of the alternatives, except for the potential  
41 impacts to air quality and associated environmental justice impacts. Some impacts would not  
42 occur or would be reduced under Alternatives 2 and 4 because ITAs are not present in the off-

1 site conservation areas, and transboundary impacts and environmental justice impacts  
2 associated with noise and air quality would not occur as a result of construction in these off-site  
3 areas. These impacts would all be feasibly mitigable with the exception of air quality-related  
4 impacts, as noted above. Depending on the location and size of conservation project sites, there  
5 may be significant air quality impacts that cannot be mitigated to a less than significant level,  
6 and this potential exists for each alternative, although the associated environmental justice  
7 impacts would be greatly reduced under Alternative 4, and the transboundary impacts would  
8 be avoided. To the extent that conservation occurred in the off-site conservation areas as part of  
9 Alternative 2, these impacts would be reduced or avoided as well.

10 Similarly, each of the alternatives could cause long-term impacts through ongoing maintenance  
11 of created habitat. These impacts would be less than significant for each alternative, with the  
12 exception of air quality impacts from prescribed burns, which could be unavoidable for the  
13 largest burns. The effects to agricultural resources, land use, environmental justice, and  
14 socioeconomics would be less for Alternatives 2 and 3, although environmental justice impacts  
15 associated with noise and air quality could be lessened under Alternative 2 to the extent that  
16 conservation occurred in the off-site conservation areas. Alternatives 2 and 3, however, would  
17 not provide the same level of long-term biological, aesthetic, or water quality benefits as the  
18 proposed action or Alternative 4 (off-site conservation). These long-term benefits would offset  
19 the less than significant short-term effects to other resources. Alternative 4, like Alternative 2,  
20 would potentially cause greater biological impacts than the proposed action, which would  
21 offset the equal benefit that it would provide to these resources. These long-term biological  
22 beneficial impacts would outweigh the short-term air quality and environmental justice impacts  
23 and the feasibly mitigable environmental justice impact associated with noise from pumps that  
24 would be avoided under Alternative 4.

25 Overall, most of the short-term, construction-related impacts that would potentially occur  
26 under each alternative can be mitigated to less than significant levels. The potentially  
27 significant air quality impacts would exist for all the alternatives and do not provide a basis for  
28 distinguishing between them, although short-term air quality impacts associated with  
29 environmental justice would be lessened under Alternative 4, and transboundary impacts,  
30 which are not considered substantial impacts, would not occur. The long-term impacts, with  
31 the implementation of the mitigation measures identified in this EIS/EIR, would similarly be  
32 less than significant for all the alternatives. The primary difference between the alternatives lies  
33 with the level of benefit that is provided to the biological resources. Both Alternatives 1 and 4  
34 provide the same level of benefit, but Alternative 4 poses the potential for short- and long-term  
35 impacts to endangered fish species that inhabit the Virgin and Muddy rivers where the off-site  
36 conservation projects would be sited. Therefore, Alternative 1 is the environmentally preferred  
37 alternative.

38 A summary of the potential impacts and proposed mitigation measures identified for  
39 Alternatives 1, 2, 3, and 4 is provided in Table ES-1.

Table ES-1. Summary of Impacts and Mitigation Measures

| Impact  | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure <sup>3</sup>  |
|---|--------------------------------|-------------------------|---|-------------------------------|--|
|   | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |  |
| AESTHETICS  |                                |                         |   |                               |  |
| AESTH-1: Construction/maintenance activities would temporarily lessen the visual quality of the conservation area establishment sites located on or near visually sensitive resources ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required  |
| AESTH-2: The construction of field facilities and fish-rearing facilities could be required, which could alter the visual quality of the selected sites ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required  |
| AESTH-3: Conservation area establishment would return sites to a more natural appearance ( <i>beneficial impact</i> ).  | X                              | X                       | X   | X                             | None required  |
| AGRICULTURAL RESOURCES  |                                |                         |   |                               |  |
| AG-1: Important Farmland could be converted to a nonagricultural use ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required  |
| AG-2: Waterfowl attracted to established backwaters and marshes could destroy crops grown on adjacent farmland ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required  |
| AG-3: Runoff from established conservation areas could alter the slopes of adjoining laser-leveled fields ( <i>significant impact</i> ).  | X                              | X                       | X   | X                             | AG-1: Develop grading plans for newly established conservation areas that direct runoff away from adjacent agricultural lands to ensure that flow rates from the conservation area do not exceed existing discharge rates. |
| AG-4: Covered species attracted to established conservation areas could disperse to other lands within the planning area ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required  |
| AIR QUALITY   |                                |                         |   |                               |  |
| AQ-1: The use of fossil fuel-fired construction equipment during construction, maintenance, and operational activities would result in intermittent combustive emissions that would not violate any air quality standard or contribute substantially to an existing or projected air quality violation ( <i>less than significant impact</i> ). | X                              | X                       | X   | X                             | None required  |

Table ES-1. Summary of Impacts and Mitigation Measures (continued)

| Impact  | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure  |
|---|--------------------------------|-------------------------|---|-------------------------------|---|
|   | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |   |
| AIR QUALITY   |                                |                         |   |                               |   |
| AQ-2: The development of the largest projects would produce fugitive dust emissions that could exceed an ambient 24-hour PM10 standard ( <i>significant impact</i> ).   | X                              | X                       | X   | X                             | AQ-1: Implement standard operating practices to minimize fugitive dust (PM10) emissions during construction activities. |
| AQ-3: Emissions from the largest prescribed burns during terrestrial vegetation establishment or maintenance activities would produce emissions that could contribute to an exceedance of an ambient 24-hour PM10 standard ( <i>significant impact</i> ).   | X                              | X                       | X   | X                             | AQ-2: Implement a smoke management plan for all construction and maintenance activities involving the use of fire.      |
| AQ-4: Air emissions from proposed conservation area establishment activities and facility construction could exceed the MDAQMD daily NO <sub>x</sub> or PM10 emission significance thresholds, which would result in a cumulatively considerable net increase of a nonattainment pollutant ( <i>significant impact</i> ). | X                              | X                       | X   |                               | See Mitigation Measure AQ-1.  |
| AQ-5: Air emissions from the proposed conservation area establishment activities would not expose sensitive receptors to substantial pollutant concentrations ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required   |
| AQ-6: Air emissions from the proposed conservation area establishment activities would not create objectionable odors that affect a substantial number of people ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required   |
| BIOLOGICAL RESOURCES  |                                |                         |   |                               |   |
| BIO-1: Issuance of the section 10(a)(1)(B) permit would authorize the incidental take of up to 27 covered species from implementation of both the covered activities and the Conservation Plan ( <i>less than significant impact</i> ).   |                                | X                       | X   | X                             | None required   |

**Table ES-1. Summary of Impacts and Mitigation Measures (continued)**

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure |
|--|--------------------------------|-------------------------|---|-------------------------------|--------------------|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |                    |
| BIOLOGICAL RESOURCES   |                                |                         |   |                               |                    |
| BIO-2: The establishment of 7,260 acres of cottonwood-willow and honey mesquite land cover would increase the extent of cottonwood-willow riparian forest and mesquite woodland sensitive communities ( <i>beneficial</i> ).   | X                              | X                       | X <sup>4</sup>                              | X                             | None required      |
| BIO-3: Clearing, grading, planting, and site maintenance during conversion of agricultural lands to cottonwood-willow and/or honey mesquite land cover types would result in the elimination of existing low value habitat used by resident and migratory wildlife, removal of weedy vegetation and crops, alteration of habitat characteristics through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ). | X                              | X                       | X   | X                             | None required      |
| BIO-4: Clearing, grading, planting, and site maintenance during conversion of undeveloped lands (primarily saltcedar) to cottonwood-willow and/or honey mesquite land cover types would result in the elimination of existing non-native vegetation and the habitat it provides for wildlife, short-term effects on habitat characteristics from alteration of local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).      | X                              | X                       | X   | X                             | None required      |
| BIO-5: Clearing, grading, planting, and site maintenance during establishment of marsh would result in the long-term elimination of existing vegetation and the habitat it provides for wildlife, alteration of habitat conditions through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).   | X                              | X                       | X   | X                             | None required      |

Table ES-1. Summary of Impacts and Mitigation Measures (continued)

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure   |
|--|--------------------------------|-------------------------|---|-------------------------------|--|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |  |
| BIOLOGICAL RESOURCES   |                                |                         |   |                               |  |
| BIO-6: Clearing, grading, and site maintenance during establishment of backwaters would result in the long-term elimination of existing vegetation and the habitat it provides for wildlife, alteration of habitat conditions through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant or significant short-term impacts; beneficial long-term impacts</i> ). | X                              | X                       | X   | X                             | BIO-1: Conduct site-specific surveys for non-covered sensitive species during selection of habitat establishment or enhancement (e.g., existing backwaters) areas and, if any are found, then implement measures appropriate for the specific site and species to avoid or minimize impacts to the extent feasible without causing impacts on covered species. These may include measures specified in the Conservation Plan to avoid or minimize potential effects on covered species (e.g., scheduling to avoid breeding times). |
| BIO-7: Maintenance of established habitats would result in the removal of invasive non-native vegetation, alteration of habitat characteristics through changes in local hydrology, and short-term elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; less than significant or beneficial long-term impacts</i> ).  | X                              | X                       | X   | X                             | None required  |
| BIO-8: Population enhancement activities for covered fish and bird species could adversely affect existing individuals or populations of covered or sensitive species ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).   | X                              | X                       | X   | X                             | None required  |
| BIO-9: Native land cover type establishment and maintenance could temporarily affect wetlands and waters of the U.S ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).   | X                              | X                       | X   | X                             | None required  |
| BIO-10: Land cover type establishment and maintenance activities could result in periodic short-term impacts on sensitive and common native fishes inhabiting the Virgin and Muddy rivers ( <i>less than significant impact</i> ).   | X                              |                         |   | X                             | None required  |

**Table ES-1. Summary of Impacts and Mitigation Measures (continued)**

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure  |
|--|--------------------------------|-------------------------|---|-------------------------------|---|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |   |
| BIOLOGICAL RESOURCES   |                                |                         |   |                               |   |
| BIO-11: Construction to establish/enhance native land cover types could result in the long-term loss or degradation of sensitive native fish habitats in the Virgin and Muddy rivers ( <i>significant impact</i> ).                      | X <sup>5</sup>                 |                         |   | X                             | BIO-2: Design site-specific habitat establishment plans to avoid and minimize potential effects on sensitive native fish habitats along the Virgin and Muddy rivers. Preparation of the design plans shall be coordinated with and approved by the Service as part of section 7 consultation. If appropriate, design plans shall include measures to rehabilitate any affected habitat.   |
| CULTURAL AND HISTORIC RESOURCES  |                                |                         |   |                               |   |
| CULT-1: Disturbance of the ground surface could directly or indirectly disturb or destroy significant archaeological or historical resources, particularly in undeveloped or previously undisturbed areas ( <i>significant impact</i> ). | X                              | X                       | X   | X                             | CULT-1: Consult with the appropriate SHPO(s), tribes, and other interested parties, perform archival research, interview informants, and conduct cultural resource inventories; evaluate all identified cultural resources for potential listing on the National Register of Historic Places or state or local registers; modify project design, when feasible, to avoid cultural resources eligible for listing; develop and implement a pre-construction Testing and Evaluation Plan, pre-construction Data Recovery Plan, and Cultural Resources Construction Monitoring Plan as appropriate; re-direct construction as needed if new cultural resources sites are found, document new discoveries, and avoid sites or implement a data recovery program; initiate consultation with any known lineal descendants and relevant Indian tribes as per NAGPRA or follow state and local laws as appropriate; incorporate these procedures into all archaeological testing and/or data recovery plans and the Cultural Resources Construction Monitoring Plan. |

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Table ES-1. Summary of Impacts and Mitigation Measures (continued)

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure   |
|--|--------------------------------|-------------------------|---|-------------------------------|--|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |  |
| CULTURAL AND HISTORIC RESOURCES  |                                |                         |   |                               |  |
| CULT-2: Cultural resources may be affected by unauthorized artifact collection during construction or by a lack of awareness of cultural resource mitigation measures on the part of construction personnel ( <i>significant impact</i> ). | X                              | X                       | X   | X                             | See Mitigation Measure CULT-1  |
| ENERGY AND DEPLETABLE RESOURCES  |                                |                         |   |                               |  |
| Minor impact associated with use of diesel fuel and electrical power during construction and operations.<br>Negligible impact to hydropower production due to consumptive use of water for conservation areas.                             | X                              | X                       | X   | X                             | None required  |
| ENVIRONMENTAL JUSTICE  |                                |                         |   |                               |  |
| EJ-1. Significant, short-term air quality impacts from construction activities and prescribed burns in or near agricultural areas could result in disproportionate impacts to minority and low-income populations.                         | X <sup>6</sup>                 | X                       | X   | X <sup>6</sup>                | Implement Mitigation Measures AQ-1 and AQ-2  |
| EJ-2. Noise from construction and pumps that exceeded local standards could disproportionately affect minority and low-income populations.   | X <sup>6</sup>                 | X                       | X   | X <sup>6</sup>                | Implement Mitigation Measures NOI-1 and NOI-2  |
| EJ-3: If agricultural land were converted to conservation areas, the loss of agricultural jobs would disproportionately affect minority and low-income populations.  | X                              | X                       | X   | X                             | EJ-1: Reclamation shall work with local jurisdictions and/or growers to ensure that agricultural workers are notified as soon as possible of the potential for a loss of jobs once specific project locations have been identified. Reclamation will encourage the local jurisdictions and/or growers to provide timely information and assistance to agricultural workers regarding the availability of alternative employment. |

**Table ES-1. Summary of Impacts and Mitigation Measures (continued)**

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure |
|--|--------------------------------|-------------------------|---|-------------------------------|--------------------|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |                    |
| HAZARDS AND HAZARDOUS MATERIALS  |                                |                         |   |                               |                    |
| HAZ-1: The use of pesticides, lubricants, fuels, and other hazardous materials during construction, operations, and maintenance could result in localized spills, which could create a hazard to the environment ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required      |
| HAZ-2: The increase in riparian and backwater areas could result in an increase in vectors ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required      |
| HAZ-3: Construction activities could cause wildfires ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required      |
| HAZ-4: Fire used as a construction and maintenance tool could escape control and become a wildland fire ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required      |
| HAZ-5: Conservation area establishment actions implemented within an Accident Potential Zone of an airport or near a private airstrip could cause a comparatively minor increase in bird populations ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required      |
| HYDROLOGY AND WATER QUALITY  |                                |                         |   |                               |                    |
| HYDRO-1: Habitat establishment activities could result in erosion-induced siltation ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required      |
| HYDRO-2: Habitat establishment could have a short-term adverse effect to water quality if irrigation mobilized (released) pesticides, salts, or other contaminants ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required      |
| HYDROLOGY AND WATER QUALITY  |                                |                         |   |                               |                    |
| HYDRO-3: Water quality in created or restored backwaters and marshes could be affected by increasing concentrations of various naturally occurring and man-made chemicals (both in the soil and the water column) that result from evaporation of water ( <i>less than significant impact</i> ). | X                              | X                       | X   | X                             | None required      |

Table ES-1. Summary of Impacts and Mitigation Measures (continued)

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure  |
|--|--------------------------------|-------------------------|---|-------------------------------|---|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |   |
| HYDRO-4: Conservation area establishment would result in a long-term improvement to water quality if agricultural land were used ( <i>beneficial impact</i> ).   | X                              | X                       | X   | X                             | None required   |
| INDIAN TRUST ASSETS  |                                |                         |   |                               |   |
| ITA-1: Implementing conservation measures on tribal land could result in changes to all classes of ITAs.   | X <sup>7</sup>                 | X                       | X   | X <sup>7</sup>                | None required.  |
| LAND USE   |                                |                         |   |                               |   |
| No significant impacts specific to land use were identified, although significant land use conflicts were identified in the agricultural resources and noise analyses (Impacts AG-3, AG-4, NOI-1, and NOI-2).                            | X                              | X                       | X   | X                             | Implement Mitigation Measures AG-1, NOI-1, and NOI-2.   |
| NOISE  |                                |                         |   |                               |   |
| NOI-1: Construction activities could cause a temporary, substantial increase in ambient noise levels that could exceed local standards if construction occurred in proximity to noise-sensitive receptors ( <i>significant impact</i> ). | X                              | X                       | X   | X                             | NOI-1: As needed, select quieter equipment; use noise control devices on equipment, locate equipment away from sensitive receptors; notify nearby neighbors prior to work; minimize idling, use noise barriers; and where possible, limit construction to non-mating, non-nesting seasons of noise-sensitive species. |
| NOI-2: Pumps located near noise-sensitive receptors could cause a substantial increase in ambient noise levels or exceed regulatory thresholds ( <i>significant impact</i> ).  | X                              | X                       | X   | X                             | NOI-2: If pumps cannot be located at sufficient distances from sensitive receptors to avoid the exceedance of a local noise standard or a substantial increase in the ambient noise level at the sensitive receptors, construct barriers or enclosures to ensure adherence to local standards.                        |
| POPULATION AND HOUSING   |                                |                         |   |                               |   |
| No impact on population or housing.  | X                              | X                       | X   | X                             | None required   |
| PUBLIC SERVICES AND UTILITIES  |                                |                         |   |                               |   |
| Minimal impacts to water treatment, storm drainage, and water supply from the potential construction and operation of two field facilities. Minor impacts to landfill capacity from construction and operations.                         | X                              | X                       | X   | X                             | None required   |

**Table ES-1. Summary of Impacts and Mitigation Measures (continued)**

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure |
|--|--------------------------------|-------------------------|---|-------------------------------|--------------------|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |                    |
| RECREATION   |                                |                         |   |                               |                    |
| REC-1: The implementation of certain conservation measures could result in the loss of recreational opportunities ( <i>less than significant impact</i> ).                 | X                              | X                       | X   | X                             | None required      |
| SOCIOECONOMICS   |                                |                         |   |                               |                    |
| SOC-1: Agricultural jobs would be lost if agricultural land were converted to conservation areas.  | X                              | X                       | X   | X                             | None required      |
| SOC-2: Agricultural-related revenue would be lost if agricultural land were converted to conservation areas.   | X                              | X                       | X   | X                             | None required      |
| SOC-3: Local property tax revenues could be reduced if privately owned land were leased or acquired by the Federal or state participants in the LCR MSCP.                  | X                              | X                       | X   | X                             | None required      |
| SOCIOECONOMICS   |                                |                         |   |                               |                    |
| SOC-4: Local sales tax from the purchase of products related to agricultural uses would be reduced if privately owned agricultural land was placed in public ownership.    | X                              | X                       | X   | X                             | None required      |
| TOPOGRAPHY, GEOLOGY, SOILS, AND MINERAL RESOURCES  |                                |                         |   |                               |                    |
| GEO-1: Activities associated with conservation area establishment could result in erosion-induced siltation of the Colorado River ( <i>less than significant impact</i> ). | X                              | X                       | X   | X                             | None required      |
| TRANSBOUNDARY IMPACTS  |                                |                         |   |                               |                    |
| TRANS-1: PM <sub>10</sub> and combusive emissions from the construction and maintenance of created conservation areas in Reach 7 could disperse to Mexico.                 | X <sup>8</sup>                 | X                       | X   |                               | None required      |

**Table ES-1. Summary of Impacts and Mitigation Measures (continued)**

| <i>Impact</i>                           | <i>APPLICABLE ALTERNATIVE</i>   |                                  |  |  | <i>Mitigation Measure</i> |
|---|---|----------------------------------|--|--|---------------------------|
|   | <i>2<br/>No<br/>Action<sup>1</sup></i>  | <i>1<br/>Proposed<br/>Action</i> | <i>3<br/>Listed<br/>Species<br/>Only<sup>2</sup></i> | <i>4<br/>Off-Site<br/>Conservation</i> |                           |
| TRANSPORTATION                          |   |                                  |  |  |                           |
| Minor impact from construction traffic. | X   | X                                | X  | X                                      | None required             |
| 1                                       | The no action alternative would result in similar types of impacts as the proposed action since similar conservation measures likely would be implemented. It is likely, however, that a smaller amount of conservation area would be established or maintained, thus reducing the intensity or magnitude of the impacts, including beneficial impacts. Some conservation could occur in the off-site conservation areas, and impacts could occur in these areas as well as in the planning area. |                                  |  |  |                           |
| 2                                       | The listed species only alternative would result in the establishment of a smaller amount of conservation area than the proposed action. The same types of impacts would occur, but the intensity, or magnitude, would be reduced, including that of beneficial impacts.  |                                  |  |  |                           |
| 3                                       | The development and implementation of mitigation measures for the no action alternative is outside the authority of the lead agencies for this EIS/EIR. The mitigation measures included in this table are examples of measures that could be implemented to reduce impacts associated with the no action alternative.  |                                  |  |  |                           |
| 4                                       | Less cottonwood-willow habitat and no honey mesquite habitat would be established under this alternative.   |                                  |  |  |                           |
| 5                                       | These impacts could occur under the no action alternative to the extent that conservation area creation occurred in the off-site conservation areas.  |                                  |  |  |                           |
| 6                                       | Under Alternative 2, these impacts would not occur to the extent that conservation areas were created in the off-site conservation areas. Air quality and noise impacts would not disproportionately affect minority and low-income populations in the off-site conservation areas. Under Alternative 4, impacts would be associated only with the creation of 360 acres of backwaters along the LCR.   |                                  |  |  |                           |
| 7                                       | Under Alternative 2, these impacts would not occur to the extent that conservation areas were created in the off-site conservation areas. Under Alternative 4, impacts would be associated only with the creation of 360 acres of backwaters along the LCR. No tribal lands or ITAS are present in any of the off-site conservation areas.  |                                  |  |  |                           |
| 8                                       | Transboundary impacts would not occur if conservation occurred only in the off-site conservation areas or in Reaches 1-6.   |                                  |  |  |                           |

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## 1.0 INTRODUCTION

This Environmental Impact Statement/Environmental Impact Report (EIS/EIR) evaluates the impacts of implementing the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) Conservation Plan (Conservation Plan) and issuing a section 10(a)(1)(B) (incidental take) permit based on this plan. The habitat-based Conservation Plan is intended to avoid, minimize, and fully mitigate the incidental take of the covered species from the implementation of the covered activities to the maximum extent practicable. The Conservation Plan also is intended to contribute to the recovery of species listed as threatened or endangered under the Endangered Species Act of 1973, as amended (ESA) (16 United States Code [U.S.C.] 1531-1544), and reduce the likelihood for future listing of unlisted covered species along the LCR. The EIS/EIR has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.); the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [C.F.R.] Parts 1500-1508); the U.S. Bureau of Reclamation's (Reclamation) Draft National Environmental Policy Handbook (U.S. Bureau of Reclamation [USBR] 2000a); the California Environmental Quality Act (CEQA) of 1970, as amended (Public Resources Code [P.R.C.] 21000 et seq.); and the State CEQA Guidelines, as amended (California Code of Regulations [C.C.R.], Title 14, Division 6, 15000 et seq.). Reclamation and the U.S. Fish and Wildlife Service (Service) are the lead agencies for compliance with NEPA, and The Metropolitan Water District of Southern California (Metropolitan) is the lead agency for compliance with CEQA. Together, these agencies have the responsibility for the scope, content, and legal adequacy of the document. Because the terminology and specific needs of NEPA and CEQA do not entirely overlap, explanatory text is provided where needed in the document to account for these differences. For example, CEQA uses the term "proposed project" to refer to the subject of the document, whereas NEPA uses the term "proposed action." In this EIS/EIR, the term used is "proposed action."

### 1.1 BACKGROUND

#### 1.1.1 Development of the LCR MSCP

The LCR MSCP<sup>1</sup> is proposed to serve as a coordinated, comprehensive conservation approach for the LCR basin for a period of 50 years. The program has been developed and would be implemented and funded by a partnership of state, Federal, and other public and private stakeholders in Arizona, California, and Nevada with interests in managing the water and related resources of the LCR. The LCR MSCP planning area (planning area) extends from the full pool elevation of Lake Mead to the Southerly International Boundary (SIB) with Mexico (Figure 1.1-1). The impetus for the creation of the LCR MSCP was the recognition by the Federal and non-Federal participants of the potential for their activities to affect species listed as threatened or endangered under the ESA, as well as designated critical habitat along the LCR. The participants agreed to form a partnership to develop and implement a long-term

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<sup>1</sup> In this EIS/EIR, the term "LCR MSCP" is used to describe the broad program and its participants. The term "Conservation Plan" is used to describe the proposed conservation measures included in Chapter 5 of the LCR MSCP Habitat Conservation Plan (HCP) (Volume II) and described in Chapter 2 of this EIS/EIR.

1 endangered species compliance and management program for the historic floodplain of the  
2 LCR.

3 **1.1.2 ESA Provisions**

4 Section 9 of the ESA provides for the prohibition of “take” of any fish or wildlife species listed  
5 as threatened or endangered under the ESA unless specifically authorized by regulation. Take,  
6 as defined by the ESA, means to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture  
7 or collect, or attempt to engage in such conduct” (16 U.S.C. section 1531[18]). “Harm” is further  
8 defined to include significant habitat modifications or degradation that actually kill or injure  
9 wildlife by significantly impairing behavioral patterns such as breeding, feeding, and sheltering  
10 (50 C.F.R. section 17.3). “Harass” is further defined to include intentional or negligent acts or  
11 omissions that create the likelihood of significant injury to wildlife through disruption of  
12 normal behavior patterns, including breeding, feeding, or sheltering (50 C.F.R. section 17.3).  
13 “Incidental take” is defined by the ESA as take that is “incidental to, and not the purpose of, the  
14 carrying out of an otherwise lawful activity” (50 C.F.R. section 17.22 and 17.32).

15 The Service, under the provisions of sections 7 and 10 of the ESA, must provide for the  
16 authorization of incidental take where such authorization is not likely to jeopardize the  
17 continued existence of a listed species or to destroy or adversely modify designated critical  
18 habitat.

19 **1.1.3 Overview of the Proposed Action**

20 The proposed action includes two primary components:

- 21 1. Implementation of a Conservation Plan by Federal and non-Federal participants that  
22 would meet the LCR MSCP goals and objectives, described in Chapter 2.
- 23 2. Issuance of an ESA section 10(a)(1)(B) permit by the Service based on the proposed  
24 Conservation Plan for non-Federal covered activities described in section 1.2.2 below.

25 The Conservation Plan is a comprehensive, habitat-based approach developed to provide ESA  
26 compliance for a suite of species that are currently listed under the ESA or that may become  
27 listed in the future. It was designed to meet ESA requirements for the issuance of a permit  
28 under section 10(a)(1)(B), and it includes specific conservation measures for species and  
29 habitats<sup>2</sup> that would avoid, minimize, and fully mitigate the incidental take of the covered  
30 species to the maximum extent practicable and contribute to the listed species’ recovery. It also  
31 would reduce the likelihood for future listing of unlisted covered species. Because the LCR  
32 MSCP is seeking compliance for a 50-year period, the Conservation Plan includes minimization  
33 and mitigation measures for species not currently listed under the ESA that may become listed  
34 within the term of the permit. The Conservation Plan was developed in accordance with the  
35 laws and regulations that govern the operation of the LCR. Collectively, these are referred to as

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2 For purposes of the Conservation Plan, habitat is defined as the specific places where the environmental conditions (i.e., physical and biological conditions) are present that are required to support occupancy by individuals or populations of a given species. For further detail, refer to Appendix W in Volume IV.

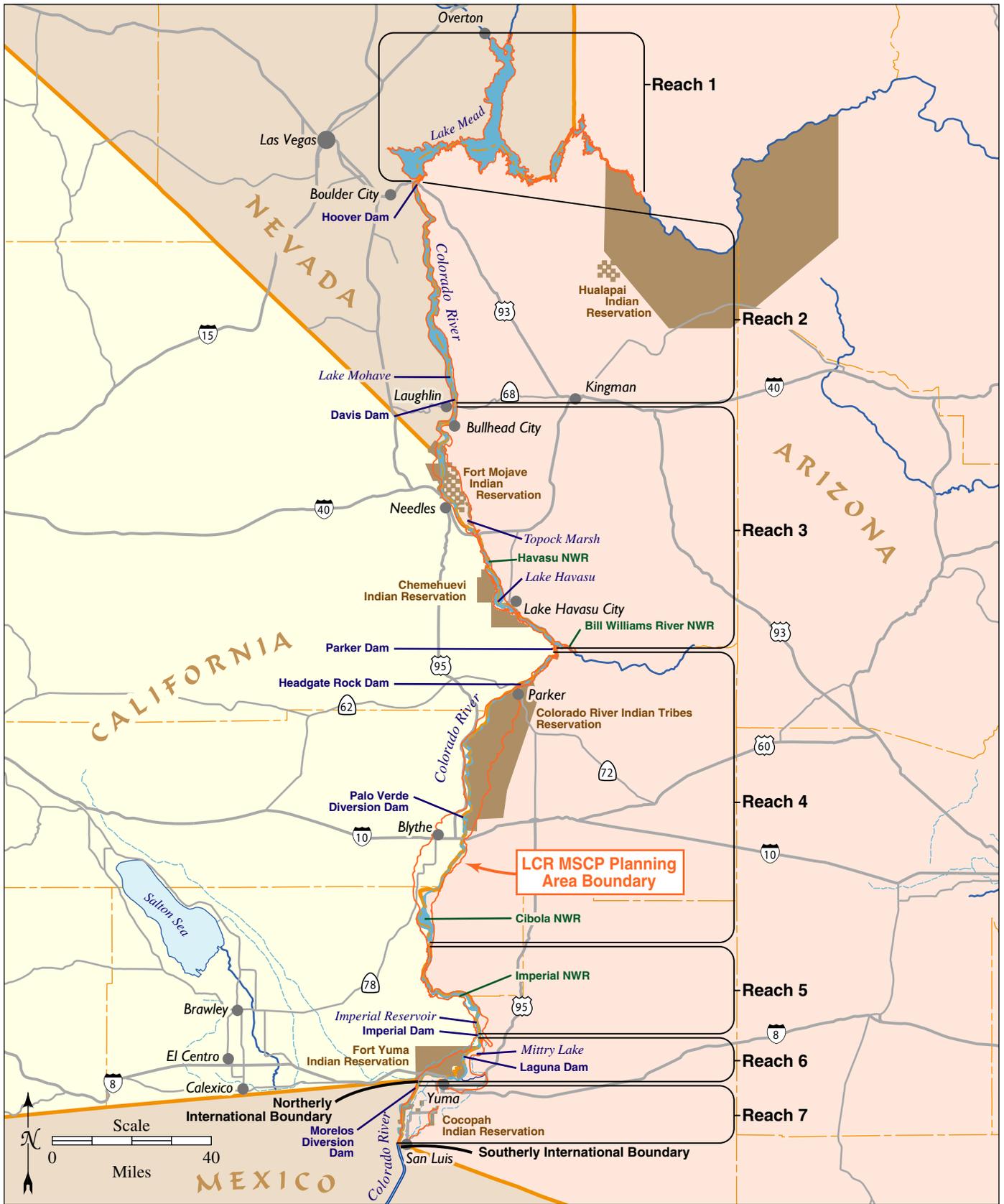


Figure 1.1-1. LCR MSCP Planning Area and River Reaches

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1 the “Law of the River” and include, but are not limited to, Federal and state laws, interstate  
2 compacts, an international treaty, court decisions, Federal contracts, Federal and state  
3 regulations, and multi-party agreements. Selected documents that comprise the Law of the  
4 River are summarized in Appendix A.

#### 5 **1.1.4 Use of the EIS/EIR**

6 This joint EIS/EIR is a programmatic document intended to identify to agency decision makers  
7 and the public the potential range of impacts associated with the implementation of the  
8 proposed action, including significant and beneficial environmental effects. As described below  
9 and in section 1.4, each of the three lead agencies has independent regulatory compliance needs  
10 that are served by this EIS/EIR. Additionally, the EIS/EIR will serve as the basis for future  
11 project-specific NEPA and CEQA compliance documents that will be required once individual  
12 conservation projects under the LCR MSCP are more fully defined. The proposed action does  
13 not revisit the authorization of any ongoing covered activity. Future covered activities  
14 described in section 1.2.2 for which incidental take authorization is being sought under the LCR  
15 MSCP may require project-specific NEPA/CEQA compliance prior to implementation.

##### 16 **1.1.4.1 U.S. Fish and Wildlife Service**

17 Issuance of a section 10(a)(1)(B) permit by the Service is an action subject to NEPA compliance.  
18 This EIS/EIR addresses the impacts to the environment, including the effects of the incidental  
19 take that would be permitted, if the Service were to issue a section 10(a)(1)(B) permit based on  
20 the implementation of the proposed action or alternatives.

##### 21 **1.1.4.2 U.S. Bureau of Reclamation**

22 The implementation and funding of the Conservation Plan by Reclamation is an action that is  
23 subject to NEPA compliance, even though it would be implemented for beneficial  
24 environmental purposes. This EIS/EIR addresses the potential environmental effects that may  
25 result from implementing the proposed action and alternatives, including the implementation  
26 of a Conservation Plan.

##### 27 **1.1.4.3 The Metropolitan Water District of Southern California**

28 The implementation and funding of the Conservation Plan is a project that is subject to CEQA  
29 compliance. The California participants are requesting a section 10(a)(1)(B) incidental take  
30 permit for their covered activities on the basis of their participation in the implementation and  
31 funding of the LCR MSCP Habitat Conservation Plan (HCP), of which the Conservation Plan is  
32 a part. (A non-Federal entity is required to develop an HCP in order to be granted an incidental  
33 take permit under section 10(a)(1)(B) of the ESA. The entire LCR MSCP HCP is included in  
34 Volume II. In addition to the Conservation Plan, which is included in Chapter 5, the HCP  
35 contains a number of required sections, such as descriptions of covered activities, impacts on  
36 covered species expected to result from the covered activities, LCR MSCP governance structure,  
37 and implementation costs, that would not result in impacts to the environment and thus are not  
38 specifically addressed in this EIS/EIR.) Additionally, the LCR MSCP EIS/EIR and HCP may be  
39 used in support of a section 2081 permit from the California Department of Fish and Game  
40 (CDFG) for incidental take of species by California’s covered activities in compliance with the

1 California Endangered Species Act (CESA). This EIS/EIR addresses the potential  
2 environmental effects that may result from implementing the proposed action and alternatives,  
3 including the impact of the authorized incidental take of covered species that is being requested  
4 by the California participants and the impacts of implementing a Conservation Plan.

5 **1.2 PURPOSE OF AND NEED FOR THE PROPOSED ACTION**

6 **1.2.1 Need for the Proposed Action**

7 The ESA directs Federal agencies to support the conservation of listed species and ensure that  
8 their actions do not jeopardize listed species or critical habitat. Additionally, no taking of listed  
9 species by non-Federal agencies is allowed without a permit from the Service. Federal and non-  
10 Federal actions related to the ongoing and future operations of the LCR water delivery and  
11 power systems are affecting listed species and critical habitat, and may contribute to future  
12 listing of additional species. To address the needs of the species and the need to comply with  
13 the ESA, this Conservation Plan is proposed with the purpose of avoiding jeopardy, supporting  
14 the conservation of listed species, and reducing any contribution that ongoing or future  
15 operations may make to new listings. Additionally, the Service will use this analysis to support  
16 its decision concerning an incidental take permit for covered non-Federal activities.

17 As noted, the Federal participants in the LCR MSCP (Reclamation, the U.S. National Park  
18 Service [NPS], U.S. Bureau of Indian Affairs [BIA], U.S. Bureau of Land Management [BLM], the  
19 Service, and the Western Area Power Administration [Western]), acting within the scope of  
20 their legal authority and obligations, currently undertake or may undertake activities along the  
21 LCR that have the potential to affect and result in the incidental take of species that are listed  
22 under the ESA, or that may be listed in the future. Ongoing and future Federal actions that are  
23 covered by the proposed Conservation Plan are outlined in section 1.2.2 of this EIS/EIR and  
24 more fully described in Chapter 2 of the *Lower Colorado River Multi-Species Conservation Program*  
25 *Biological Assessment* (LCR MSCP BA) <sup>3</sup>, which comprises Volume III. Federal agencies are  
26 required under section 7(a)(2) of the ESA to ensure that their actions are not likely to jeopardize  
27 the continued existence of a listed species or to destroy or adversely modify designated critical  
28 habitat. Under section 9 of the ESA, Federal agencies also may not “take” listed species without  
29 authorization provided by the Service in the incidental take statement contained in its Biological  
30 Opinion (BO) issued pursuant to section 7(b).

31 The actions that the non-Federal participants in the LCR MSCP are engaged in or may become  
32 engaged in along the LCR that have the potential to affect and result in the incidental take of  
33 species that are listed under the ESA, or that may be listed in the future, are outlined in section  
34 1.2.2 of this EIS/EIR and more fully described in Chapter 2 of the LCR MSCP HCP. Under  
35 section 9 of the ESA, non-Federal entities may not “take” listed species without authorization.  
36 In order to comply with section 9, the non-Federal participants are requesting such  
37 authorization based on the implementation of the LCR MSCP HCP, which includes the  
38 proposed Conservation Plan.

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3 To facilitate compliance with section 7(a)(2), Federal agencies may prepare a BA, pursuant to section 7(c)(1) that identifies the likely effects of the Federal action on threatened and endangered species.

1 The Conservation Plan, as outlined in the LCR MSCP HCP, documents the extent of the  
2 incidental take for which authorization is being requested under ESA sections 7 and 10(a)(1)(B),  
3 and includes measures to avoid, minimize, and mitigate the effect of that level of take to the  
4 maximum extent practicable. The Conservation Plan covers both Federal and non-Federal  
5 actions over a 50-year period. The Federal participants will submit the Conservation Plan as  
6 part of their proposed action for consideration under section 7 consultation. The non-Federal  
7 participants will submit the Conservation Plan with their application for a section 10(a)(1)(B)  
8 permit to the Service. The Service will use the Conservation Plan as part of its determination  
9 under sections 7 and 10 on issuing an incidental take statement and incidental take permit.

10 The implementation of the Conservation Plan would provide the mechanism to meet the needs  
11 of the Service, the Federal participants, and the non-Federal participants for incidental take  
12 authorization under the ESA for ongoing and future actions on the LCR. Implementation of the  
13 Conservation Plan would not be contingent on actually undertaking any of the future covered  
14 activities, but would proceed pursuant to the schedule outlined in the proposed Conservation  
15 Plan as provided in Tables 2.1-8a-d (included in section 2.1.1.6 as part of the description of the  
16 proposed action).

### 17 **1.2.2 Actions for Which ESA Coverage is Requested**

18 The proposed action is the implementation of a regional Conservation Plan and issuance of  
19 incidental take authorizations for the covered activities over the 50-year term of the LCR MSCP.  
20 In order to obtain comprehensive ESA coverage for the covered activities, the Federal and non-  
21 Federal participants have included future flow- and non-flow related activities that are  
22 reasonably expected to be implemented or undertaken during the term of the LCR MSCP.  
23 Examples of such future activities include the development of additional tribal lands for  
24 agriculture by BIA and the change in point of diversion of water on the LCR by non-Federal  
25 participants. These future activities are not part of the proposed action and are not part of the  
26 actions analyzed in this EIS/EIR. The potential environmental effects of conducting these  
27 future activities in combination with those of the proposed action are considered in the  
28 cumulative impact analysis set out in Chapter 4.

29 The following describes the ongoing and future Federal and non-Federal projects, actions, and  
30 activities (i.e., covered activities) for which ESA coverage is being sought. The environmental  
31 impacts of these activities are not being evaluated in this EIS/EIR, with the exception of those  
32 impacts to covered species as a result of incidental take authorization. Four categories of  
33 covered activities are included:

- 34 • ongoing flow-related activities;
- 35 • future flow-related activities;
- 36 • ongoing non-flow-related activities; and
- 37 • future non-flow-related activities.

38 Certain ongoing activities have been subject to previous NEPA and/or CEQA compliance  
39 actions; others pre-date these laws. This EIS/EIR does not revisit the authorization of any  
40 ongoing covered activity; rather, it is limited to assessing the impacts of the ESA take

1 authorization being requested for the covered activities and the impacts of the Conservation  
2 Plan that is the basis for the incidental take permit.

3 ESA coverage also is being sought for incidental take of covered species that would occur as a  
4 result of actions required to implement the Conservation Plan. All of the covered activities  
5 would be implemented within the LCR MSCP planning area.

6 **1.2.2.1 Federal Ongoing and Future Flow-Related and Non-Flow-Related Actions<sup>4</sup>**

7 Federal ongoing and future covered activities for which incidental take authorizations are being  
8 sought under the ESA are as follows:

9 *Reclamation*

10 Ongoing flow-related river management operations for which incidental take authorization is  
11 being sought under the ESA include the following:

- 12 • Flood control releases from dams along the LCR and management of flood control space  
13 and target elevations of reservoirs.
- 14 • Delivery of Colorado River water to Arizona, California, and Nevada within each state's  
15 apportionment to individual entitlement holders in that state pursuant to water delivery  
16 contracts or other delivery obligations; the cumulative water apportionment for these  
17 three states is 7.5 million acre-feet (maf) for normal water years.
- 18 • Annual operation of the Colorado River in accordance with the Long-Range Operating  
19 Criteria.
- 20 • Daily operation of the Colorado River below Hoover, Davis, and Parker dams and at  
21 Senator Wash, Imperial, and Laguna dams.
- 22 • Electric power generation at Hoover, Davis, and Parker powerplants.
- 23 • Preparation and maintenance of Decree Accounting reports (reports of the diversion and  
24 use of Colorado River water, as well as some other operational parameters).
- 25 • Delivery of Mexico's basic apportionment as provided by the *Utilization of Waters of the*  
26 *Colorado and Tijuana Rivers and of the Rio Grande – Treaty Between the United States of*  
27 *America and Mexico*, dated February 3, 1944 (1944 Water Treaty) (annual delivery of 1.36  
28 maf of water from the Colorado River at the Northerly International Boundary [NIB]  
29 with Mexico and up to 140,000 acre-feet [af] at the SIB).
- 30 • Temporary emergency delivery of a portion of the 1944 Water Treaty waters in the  
31 vicinity of the City of Tijuana, Mexico, resulting in a temporary change in point of  
32 diversion and delivery of these waters from the NIB to Lake Havasu.
- 33 • Execution and administration of individual Water Supply Project contracts under the  
34 Lower Colorado River Water Supply Act, allowing water to be diverted for Water

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4 Federal actions are described in detail in Chapter 2 of the LCR MSCP BA.

1 Supply Project purposes by users at any approved location along the California border  
2 adjoining the Colorado River once a contract is executed.

3 Future flow-related actions for which incidental take authorization is being sought under the  
4 ESA include the following:

- 5 • Application of specific surplus and shortage guidelines that would allow for the release  
6 of water (excluding 1944 Water Treaty water) in excess of the 7.5 maf of entitlement  
7 waters in surplus years or less than the 7.5 maf in shortage years.
- 8 • U.S. entitlement holders may be permitted to divert and beneficially use water released  
9 for flood control purposes in excess of downstream demand. Total diversions by U.S.  
10 entitlement holders would be limited to the maximum amount of, and only for the  
11 duration of, the specific flood control release.
- 12 • Specific administrative actions related to the delivery and use of Colorado River water in  
13 the Lower Division States (Arizona, Nevada, and California).

14 Ongoing non-flow-related river management operations for which incidental take authorization  
15 is being sought under the ESA include the following:

- 16 • Channel maintenance from Davis Dam to the SIB, including (a) wash fan removal, (b)  
17 maintenance and care of unprotected banklines, (c) levee location and maintenance, (d)  
18 dredging of settling basins, (e) maintenance of jetties and training structures, (f)  
19 stockpile replenishment, and (g) riprap placement and haul roads.
- 20 • Operation and maintenance of major Federal facilities (e.g., the Central Arizona Project  
21 at Lake Havasu; Palo Verde Diversion Dam; and Imperial, Laguna, and Senator Wash  
22 dams) and miscellaneous features, (e.g., drains, wasteways, weirs, siphons, boat ramps,  
23 gauges, survey markers, and drainage and groundwater monitoring wells); maintenance  
24 activities at the SIB.
- 25 • Maintenance of backwater areas created by various features associated with river  
26 management.
- 27 • Maintenance in the Limitrophe Division of the Colorado River, which extends from the  
28 NIB to the SIB. Actions include maintaining the bankline road, the levee, various  
29 wasteways and drains flowing to the river, and the Bypass Drain that carries  
30 agricultural drainage water to the Cienega de Santa Clara in Mexico.

31 Future non-flow-related actions for which incidental take authorization is being sought under  
32 the ESA include the following:

- 33 • Operation and maintenance of dikes and outlet works at Topock Marsh. Future  
34 restoration and habitat improvement at the marsh may be necessary and would be  
35 coordinated between the Service and Reclamation.
- 36 • Implementation of the Laguna Reservoir Restoration and Enhancement Project, which  
37 includes creation of incremental storage capacity by excavating a large channel that  
38 extends upstream from the pool near the face of Laguna Dam; potential habitat  
39 restoration; and construction of a small inlet canal.

## 1.0 Introduction

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- 1 • Stabilization and maintenance of unprotected banklines.
- 2 • Construction of up to 41 jetties.
- 3 • Establishment of new stockpiles (e.g., riprap, gravel), including access roads.

### 4 *Western Area Power Administration*

5 Incidental take authorization is being sought under the ESA for the continuation of current  
6 contract conditions and practices related to the release of LCR water for the operation of  
7 hydroelectrical power generating facilities throughout the 50-year term of the LCR MSCP. It is  
8 assumed that power generated at Hoover Dam will continue to be marketed pursuant to the  
9 1928 Boulder Canyon Project Act and other relevant authorities. Hydropower availability will  
10 continue to be subject to water schedules and interagency coordination will continue pursuant  
11 to Reclamation and Western's Joint Operating Agreement.

### 12 *National Park Service*

13 Three broad categories of non-flow-related projects in the Lake Mead National Recreation Area  
14 (NRA) for which incidental take authorization is being sought under the ESA include the  
15 following:

- 16 • Riparian habitat restoration by replacing non-native species with native vegetation,  
17 including potential projects on both Lake Mead and Lake Mohave.
- 18 • Fishery management, including both native fish propagation and the enhancement of  
19 sportfishing opportunities in Lake Mead and Lake Mohave.
- 20 • Boating access improvements, including maintenance of existing boating access and the  
21 potential for enhancement of existing ramps at Lake Mead and Lake Mohave.

22 Additionally, incidental take authorization is being sought under the ESA for the following  
23 flow-related actions:

- 24 • In managing the Lake Mead NRA, the NPS makes decisions regarding the temporal and  
25 spatial diversion (i.e., whether to divert surface flows or pump) of its Colorado River  
26 water rights and, in some situations, return flows to the river.

### 27 *Bureau of Indian Affairs*

28 Ongoing activities for which incidental take authorization is being sought under the ESA  
29 include the following:

- 30 • Irrigation system operation and maintenance.
- 31 • Water conservation practices intended to make the most efficient use on the tribal lands  
32 of the water diverted to the irrigation systems.
- 33 • Riparian habitat rehabilitation and restoration.
- 34 • Wildland fire suppression activities, including fuel hazard reduction around dwellings  
35 (e.g., tree and brush trimming or removal as appropriate).

- Woodland and shoreline maintenance project on the Chemehuevi Indian Reservation.
- Tribal decisions regarding the temporal and spatial diversion (i.e., whether to divert surface flows or pump) of their Colorado River water rights and, in some situations, return flows to the river.

Future activities for which incidental take authorization is being sought under the ESA include the following:

- Patching or re-lining canals that are currently lined, or lining un-lined stretches of canal.
- Continuing ongoing water conservation practices into the future and possibly intensifying these practices. Other options include storage of water and increased reuse of irrigation and other reclaimed water.
- Farmland development, including construction of irrigation systems.
- Riparian habitat rehabilitation and restoration.
- Headgate Rock Dam water and power operations and maintenance.
- Wildland fire management, including the management of fuels/hazardous vegetation through the use of, or combination of, mechanical treatments, prescribed fire, wildland fire use, and chemical treatments as approved by the local tribal leadership.

#### *U.S. Fish and Wildlife Service*

The Service is not requesting ESA coverage for any of its activities on National Wildlife Refuges (NWR) or National Fish Hatcheries in the planning area. The Service does have LCR water allocations and information on these is provided below. These allocations are included within the 7.5 maf of diversions for which the LCR MSCP participants are requesting coverage.

In managing the four NWRs along the LCR, the Service would continue to make decisions regarding the temporal and spatial diversion (diverting surface flows or pumping) of its Colorado River water rights and, in some situations, return flows to the river. Specifically:

- Havasu NWR has an entitlement in annual quantities reasonably necessary to fulfill the purposes of the refuge, not to exceed 41,839 af of water diverted from the Colorado River mainstem or 37,339 af of consumptive use of mainstem water, whichever is less. Bill Williams River NWR withdraws less than 2 af of Colorado River water from its headquarter's pump under Havasu's water rights.
- Cibola NWR has an entitlement for the diversion of 27,000 af annually (afy) from the mainstem or the consumptive use of 16,793 afy from the mainstem, whichever is less, with a priority date of August 21, 1964. Additionally, Cibola has a diversionary right for 7,500 afy, for the purpose of circulation through Cibola Lake.
- Imperial NWR has an entitlement in annual quantities reasonably necessary to fulfill the purposes of the refuge, not to exceed 28,000 af of water diverted from the mainstem or 23,000 af consumptive use of mainstem water, whichever is less.

1 *Bureau of Land Management*

2 BLM makes decisions regarding the temporal and spatial diversion (i.e., whether to divert  
3 surface flows or pump) of its Colorado River water rights and, in some situations, return flows  
4 to the river. BLM is not seeking coverage for any additional actions. It completed a previous  
5 section 7 consultation on its discretionary actions along the LCR. Lands managed by BLM may  
6 be selected, through cooperative planning between the LCR MSCP Executive Director and BLM,  
7 for the use in implementation of LCR MSCP-sponsored conservation projects along the LCR.

8 **1.2.2.2 *Non-Federal Ongoing and Future Flow-Related and Non-Flow-Related Actions***<sup>5</sup>

9 Non-Federal ongoing covered activities for which incidental take authorizations are being  
10 sought under the ESA are as follows:

11 *Arizona*

12 Arizona's ongoing flow-related projects for which incidental take authorization is being sought  
13 include the following:

- 14 • Diversion of up to 2.8 maf of Arizona's full annual entitlement, plus surplus, plus  
15 Arizona's share of any unused apportionment, plus the volume of return-flow as  
16 applicable.
- 17 • Operation, maintenance, and replacement of existing water diversion and conveyance  
18 facilities and electrical generation and transmission facilities within the planning area.
- 19 • The continued contracting for, ordering of, and scheduling of Federal hydroelectric  
20 power by purchasers in Arizona to maximize the economic value of such power  
21 generation within the constraints of the water release schedule(s).

22 Future flow-related projects for which incidental take authorization is being sought under the  
23 ESA include the following:

- 24 • Colorado River water contracts for the approximately 20,000 af of unallocated Arizona  
25 Colorado River water.
- 26 • Diversions, discharges, and return flows through existing facilities on the LCR.
- 27 • Permanent transfers of entitlement and change in points of diversion of up to 200,000  
28 afy.
- 29 • Full use of Colorado River entitlements (change in point of diversion) by existing  
30 contractors and decreed water right holders, including but not limited to the City of  
31 Kingman and the City of Quartzite.

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5 Non-Federal actions are described in detail in Chapter 2 of the LCR MSCP HCP.

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- 1 • Temporary and intermittent water exchanges, forbearances, and associated changes in  
2 points of diversion for Arizona water banking activities or short-term (i.e., less than 5  
3 years) leasing.
- 4 • Execution, administration, and operation of extended, renewed, new, or additional  
5 contracts for hydroelectric power from hydroelectric facilities at Hoover Dam, Davis  
6 Dam, Parker Dam, Headgate Rock Dam, Siphon Drop, and Pilot Knob Power Plant by  
7 power users in Arizona.

8 Ongoing non-flow-related projects:

- 9 • Operation, maintenance, and replacement of existing water diversion and conveyance  
10 facilities and electrical generation and transmission facilities within the planning area.

11 Ongoing non-flow-related Arizona Game and Fish Department (AGFD) programs and activities  
12 for which incidental take authorization is being sought under the ESA include the following:

- 13 • Vegetation and habitat management programs.
- 14 • Fish surveys (surveys are not for threatened or endangered species) and fish stocking  
15 activities.
- 16 • Maintenance of aids to navigation and boating access.
- 17 • Law enforcement patrol activities.

18 Future non-flow-related projects for which incidental take authorization is being sought under  
19 the ESA include the following:

- 20 • Maintenance and replacement of existing water diversion and conveyance facilities and  
21 electrical generation and transmission facilities within the planning area.
- 22 • AGFD programs and activities described above and AGFD projects related to  
23 implementation of the Conservation Plan.

24 *California*

25 Ongoing flow-related projects for which incidental take authorization is being sought under the  
26 ESA include the following:

- 27 • Diversion of up to 4.4 maf of California's full annual entitlement (consistent with the  
28 Quantification Settlement Agreement [QSA]<sup>6</sup> executed among three California water

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<sup>6</sup> The QSA would implement major components of California's Draft Colorado River Water Use Plan (California Plan) and provide part of the mechanism for California to reduce its diversions of Colorado River water to the state's normal year apportionment of 4.4 maf. The QSA components would provide a framework for conservation measures and water transfers for a period of up to 75 years. The Coachella Valley Water District, Imperial Irrigation District, and Metropolitan are signatory to the QSA.

1 agencies on October 10, 2003), plus California's share of any unused apportionment and  
2 designated surpluses, plus return flows as applicable.

- 3 • All operation, maintenance, and replacement activities associated with existing water  
4 diversion and conveyance facilities, and electrical power generation and transmission  
5 facilities within the planning area.
- 6 • Contracting for, ordering of, and scheduling of Federal hydroelectric power by  
7 purchasers in California to maximize the economic value of such power generation  
8 within the constraints of the water release schedule(s).

9 Future flow-related projects for which incidental take authorization is being sought under the  
10 ESA include the following:

- 11 • Diversions, discharges, and return flows of mainstem Colorado River water through  
12 existing facilities on the LCR.
- 13 • Change of up to 800,000 afy of diversions, discharges, and return flows by  
14 administrative actions, which may include changes to points of diversion (e.g.,  
15 associated with the LCR Water Supply Project), interstate water banking, forbearance,  
16 inadvertent overruns, water marketing, and water transfers, or any other actions as  
17 made possible from any future agreements and/or measures taken by the Colorado  
18 River Board of California or contract holder(s). Included within the 800,000 afy change  
19 in point of diversion are: (1) the change in point of diversion of up to 200,000 afy from  
20 Imperial Dam to Lake Havasu pursuant to the Agreement for Transfer of Conserved  
21 Water by and between the Imperial Irrigation District and the San Diego County Water  
22 Authority, dated April 29, 1998, as amended; and (2) the change in point of diversion of  
23 up to 77,700 afy from Imperial Dam to Lake Havasu transferred to the San Diego County  
24 Water Authority, as described in the Allocation Agreement among the United States of  
25 America, the Metropolitan Water District of Southern California, Coachella Valley Water  
26 District, Imperial Irrigation District, San Diego County Water Authority, the La Jolla,  
27 Pauma, Pala, Rincon, and San Pasqual Bands of Mission Indians, the San Luis Rey River  
28 Indian Water Authority, the City of Escondido, and Vista Irrigation District, dated  
29 October 10, 2003. Future changes in points of diversion within the 800,000 afy are  
30 projects that would be implemented in accordance with the QSA or contemplated in the  
31 Draft California Colorado River Water Use Plan.
- 32 • Execution, administration, and operation of extended, renewed, new, or additional  
33 contracts for hydroelectric power from hydroelectric facilities at Hoover Dam, Davis  
34 Dam, Parker Dam, and Headgate Rock Dam, Palo Verde Diversion Dam, Siphon Drop  
35 Power Plant and Pilot Knob Power Plant by power users in California.

36 Ongoing non-flow-related projects for which incidental take authorization is being sought  
37 under the ESA include the following:

- 38 • Operation, maintenance and replacement of existing water diversion and conveyance  
39 facilities, and electrical generation and transmission facilities within the planning area.

1 Future non-flow-related projects for which incidental take authorization is being sought under  
2 the ESA include the following:

- 3 • Operation, maintenance and replacement of existing water diversion and conveyance  
4 facilities, and electrical generation and transmission facilities within the planning area.

5 *Nevada*

6 Ongoing flow-related projects for which incidental take authorization is being sought under the  
7 ESA include the following:

- 8 • Diversion of up to 0.3 maf of Nevada's full annual entitlement, plus surplus flows, plus  
9 Nevada's share of any unused apportionment, plus volume of return flows as  
10 applicable.
- 11 • All operation, maintenance, and replacement of existing water diversion and  
12 conveyance facilities and electrical generation and transmission facilities within the  
13 planning area.
- 14 • Contracting for, ordering of, and scheduling of Federal hydroelectric power by  
15 purchasers in Nevada to maximize the economic value of such power generation within  
16 the constraints of the water release schedule(s).

17 Future flow-related projects for which incidental take authorization is being sought under the  
18 ESA include the following:

- 19 • Change of future volumes of diversions, discharges, and return by administrative  
20 actions, which may include changes to points of diversion, new points of diversion,  
21 interstate water banking, water marketing, and water transfers, or any other actions as  
22 made possible from any future agreements and/or measures taken by the Colorado  
23 River Commission of Nevada or contract holder(s). The potential changes in flows from  
24 future projects by Nevada are not expected to exceed 233,000 af of consumptive use.  
25 Consumptive use includes return flows from activities on the LCR.
- 26 • Potential changes to existing flows into Lake Mead from the Muddy and Virgin rivers  
27 (i.e., inflows discharging within the high pool elevation of Lake Mead), which may affect  
28 lake levels. Flows from the Muddy and Virgin rivers pass into Lake Mead and could be  
29 increased by augmentation from potential future projects implemented outside of the  
30 LCR MSCP planning area along the Muddy and Virgin rivers (e.g., actions such as  
31 purchasing irrigation water shares), or decreased by construction of upstream water  
32 diversion and conveyance facilities. Those activities that would be implemented outside  
33 of the planning area and that could affect lake levels, however, are not covered under  
34 the Conservation Plan, including effects of these actions on the Muddy and Virgin  
35 rivers.
- 36 • Temporary water exchanges, forbearances, and associated changes in points of diversion  
37 for water banking activities or short-term leasing.

- Execution, administration, and operation of extended, renewed, new, or additional contracts for hydroelectric power from hydroelectric facilities at Hoover, Davis, Parker, and Headgate Rock dams by power users in Nevada.

Ongoing non-flow-related projects for which incidental take authorization is being sought under the ESA include the following:

- Operation, maintenance and replacement of existing water diversion and conveyance facilities and electrical generation and transmission facilities within the planning area.

Ongoing non-flow-related Nevada Department of Wildlife (NDOW) programs and activities for which incidental take authorization is being sought under the ESA include the following:

- Fish surveys using electrofishing, netting, and angling (these surveys are not for threatened or endangered species).
- Sport Fish Restoration Act-funded sport fish enhancement projects.
- Wildlife surveys (these surveys are not for threatened or endangered species).
- Aquatic, wetland, and riparian habitat maintenance and restoration activities, including installation of artificial fishery habitat enhancement at Lake Mead and Lake Mohave.
- Revegetation activities for aquatic, wetland, and riparian enhancement.
- Maintenance of aids to navigation and boating access along the LCR and in Lake Mead and Lake Mohave.
- Law enforcement patrol activities, including boating safety programs in both the mainstem of the LCR and mainstem reservoirs and lakes.

Future non-flow-related projects for which incidental take authorization is being sought under the ESA include the following:

- Operation, maintenance and replacement of existing water diversion and conveyance facilities and electrical generation and transmission facilities within the planning area.
- NDOW programs and activities described above.

### 1.2.3 Purpose of the EIS/EIR

The purpose of the EIS/EIR is to analyze the environmental effects of implementing the Conservation Plan by both the Federal and non-Federal participants for a 50-year period, as well as analyze the impacts of the incidental take from the covered activities that would be authorized by the section 10(a)(1)(B) permit. There is no parallel requirement to evaluate the environmental effects of authorizing incidental take through an incidental take statement under section 7, although the analysis of incidental take of covered species in this EIS/EIR includes the effects caused by both the Federal and non-Federal actions.

1 This EIS/EIR and the accompanying HCP and BA contain descriptions of the ongoing and  
2 future activities for which incidental take coverage is sought under the ESA by the Federal and  
3 non-Federal participants. Except for the effect of the authorized incidental take of covered  
4 species, which is part of the proposed action, this EIS/EIR does not evaluate the environmental  
5 effects of the covered activities and does not revisit NEPA or CEQA authorizations for ongoing  
6 activities or provide NEPA or CEQA authorization for future activities.

#### 7 **1.2.4 Scope of the EIS/EIR**

8 This EIS/EIR evaluates only the impacts of implementing the Conservation Plan and issuance  
9 of a section 10(a)(1)(B) permit by the Service based on this plan because these are the two  
10 components of the proposed action. The ongoing covered activities have obtained NEPA  
11 and/or CEQA authorizations to the extent required by laws in effect at the time they were  
12 approved, and future covered activities will be required to obtain the appropriate  
13 authorizations. Although specific regions of influence have been developed for individual  
14 resources (e.g., socioeconomic and air quality impacts could affect a larger area than noise  
15 impacts or impacts to cultural resources, which are site-specific and highly localized), impacts  
16 generally would occur in the vicinity of the historic floodplain of the LCR or its tributaries, in  
17 proximity to the sites that would be used for habitat establishment. Implementation of the  
18 Conservation Plan and issuance of the section 10(a)(1)(B) permit would not change the amount  
19 of water available to the LCR MSCP participants, the amount of water used by these  
20 participants, or otherwise result in changes to environmental conditions beyond those analyzed  
21 in Chapter 3 of this EIS/EIR.

22 As described in section 2.1.1.3, the Conservation Plan includes measures that would contribute  
23 to maintaining existing desirable habitat areas within the planning area. The LCR MSCP  
24 participants would establish a fund early in the term of the program to be expended on  
25 assessing and implementing projects for maintaining existing native habitat that could occur  
26 anywhere within the planning area. The types of activities that could be conducted include  
27 construction of infrastructure for water delivery or movement; maintenance of marsh  
28 vegetation by burning, water delivery, dredging, and other means; maintenance of moist soil  
29 conditions in riparian land cover types<sup>7</sup> (e.g., cottonwood-willow); dredging activities to  
30 establish backwaters or backwater connection with the main river channel; removal or control  
31 of undesirable vegetation such as saltcedar and *Arundo*; and other appropriate means to  
32 maintain existing desirable habitat. Specific projects and locations have not been identified  
33 (some of the projects are ongoing while others are only proposed), but these maintenance  
34 activities would involve actions that are similar to the proposed action and it is reasonable to  
35 assume that they would result in impacts that are similar to those described in Chapter 3 of this  
36 EIS/EIR. Analyzing the environmental impacts of these measures is beyond the scope of this  
37 EIS/EIR, and their implementation would not be authorized by decisions based on this report.

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7 The term "land cover type" is used to describe the dominant feature of the land surface discernible from aerial photographs, defined by vegetation, water, or human uses.

1 **1.3 RELATIONSHIP TO OTHER LCR DOCUMENTS PREPARED PURSUANT**  
2 **TO THE ENDANGERED SPECIES ACT**

3 Reclamation, pursuant to the ESA, issued a BA for LCR operations and maintenance from Lake  
4 Mead to the SIB in August 1996 (USBR 1996). That BA served two purposes: (1) as initial  
5 documentation for the ESA section 7 consultation between Reclamation and the Service for  
6 discretionary operations of the LCR, and (2) as an initial reference for development and  
7 implementation of the proposed Conservation Plan by LCR stakeholders pursuant to ESA  
8 section 7 (for Federal actions) and ESA section 10 (for non-Federal actions). On April 30, 1997,  
9 the Service issued its BO (U. S. Fish and Wildlife Service [USFWS] 1997). The 1997 BO identified  
10 Reclamation's participation in developing the proposed Conservation Plan as the long-term  
11 strategy to address the environmental impacts of Reclamation's continued operation and  
12 maintenance activities on the LCR. Consultation on the 1997 BO was reinitiated at  
13 Reclamation's request in March 2002, and another BO was issued by the Service in April 2002  
14 (USBR 2002, USFWS 2002e). This BO identified minor modifications to the provisions of its  
15 1997 BO and extended coverage for Reclamation's discretionary actions on the LCR for 3 years  
16 to April 30, 2005.

17 With the approval of the LCR MSCP and issuance of the section 10(a)(1)(B) permit and section 7  
18 BO in response to the LCR MSCP HCP and LCR MSCP BA, these new authorizations would  
19 supersede the 1997 BO, as amended by the 2002 BO. When the new BO on the LCR MSCP took  
20 effect, the following obligations of Reclamation under the 1997 BO and 2002 BO would be  
21 replaced with its obligations under the new BO.

- 22 • If any of the 1,400 acres of southwestern willow flycatcher habitat acquired and  
23 protected under the provisions of the 1997 BO Reasonable and Prudent Alternative  
24 (RPA) 5 should lose its protected status in the future, the affected habitat acreage will be  
25 replaced by southwestern willow flycatcher habitat created under the LCR MSCP.
- 26 • Ongoing physical maintenance of native fish impoundments constructed by  
27 Reclamation as a condition of the 1997 BO RPA 3, as amended by the 2002 BO, will be  
28 included under the LCR MSCP.

29 Additionally, the Service issued a BO in January 2001 in response to Reclamation's August 2000  
30 *Biological Assessment for Proposed Interim Surplus Criteria, Secretarial Implementation Agreements for*  
31 *California Water Plan Components and Conservation Measures on the Lower Colorado River (Lake Mead*  
32 *to the Southerly International Boundary)* (ISC/SIA BO). This BO analyzed the effects of the change  
33 in point of diversion of 400,000 af of Colorado River water on four ESA-listed species (Yuma  
34 clapper rail, southwestern willow flycatcher, bonytail, and razorback sucker). The LCR MSCP  
35 BA includes the same action for purposes of assessing and mitigating the impacts to the 23  
36 covered and evaluation species not covered by the 2001 BO. The LCR MSCP HCP includes this  
37 action as part of the total 1.574 mafy in changes to point of diversion to obtain incidental take  
38 authorization for the non-Federal participants as to all 27 covered and evaluation species,  
39 including the four 2001 BO species. The Conservation Plan provides measures that overlap and  
40 duplicate the conservation measures provided to the four species that are benefited by the 2001  
41 BO conservation measures. Despite the overlap in the impacts and mitigation measures, there  
42 are differences between the scopes of the 2001 BO and the Conservation Plan (e.g., the terms are  
43 different) that preclude the Conservation Plan from superseding that BO. Reclamation, with

1 support of funding from California agencies, would implement the conservation and mitigation  
2 measures identified in the 2001 BO in coordination with the implementation of the  
3 Conservation Plan. Where 2001 BO conservation measures are implemented in accordance with  
4 the Conservation Plan, these measures shall be considered as implementing those same  
5 conservation and mitigation measures in the Conservation Plan.

6 The following conservation measures identified in the 2001 BO, would be credited against the  
7 LCR MSCP conservation measure requirements:

- 8 • funding and support for razorback sucker studies at Lake Mead beyond 2005;
- 9 • rearing and stocking of 20,000 razorback suckers between Parker and Imperial Dams  
10 (Reaches 4 and 5);
- 11 • restoration or creation of 44 acres of backwaters as habitat for native fish;
- 12 • \$50,000 in funding to provide for the capture of wild-born bonytail from Lake Mohave;
- 13 • monitoring of 372 acres of existing occupied southwestern willow flycatcher habitat; and
- 14 • restoration and maintenance of 372 acres of southwestern willow flycatcher habitat.

## 15 **1.4 REQUIRED ACTIONS AND PERMITS**

16 The following sections identify the Federal and non-Federal actions and permits supported by  
17 this EIS/EIR, as well as future actions and permits that may be required to implement  
18 individual LCR MSCP projects.

### 19 **1.4.1 Actions Supported by this EIS/EIR**

#### 20 **1.4.1.1 Federal Actions**

##### 21 *U.S. Fish and Wildlife Service*

22 The Service, under the provisions of ESA section 10 and its internal consultation under section  
23 7, must evaluate the section 10(a)(1)(B) permit application to be able to authorize the incidental  
24 take of listed species and provide a means to authorize the incidental take of non-listed species  
25 should such species become listed in the future. Pursuant to sections 7 (b)(4) and (o)(2) of the  
26 ESA, the authorization by the Service is to be based on a determination whether the Federal  
27 action of issuing a section 10(a)(1)(B) permit is likely to jeopardize the continued existence of  
28 any endangered or threatened species or destroy or adversely modify critical habitat. The  
29 Service may choose to (1) issue a permit conditioned on implementation of the LCR MSCP HCP  
30 as submitted, (2) issue a permit conditioned on implementation of the LCR MSCP HCP as  
31 supplemented with other measures specified by the Service, or (3) to deny the permit. The  
32 Service will sign the Record of Decision (ROD) regarding the adoption or rejection of the  
33 proposed action presented in this EIS/EIR.

##### 34 *U.S. Bureau of Reclamation*

35 Reclamation would implement the Conservation Plan for the LCR MSCP Steering Committee if  
36 the section 10(a)(1)(B) permit were issued by the Service. In addition, Reclamation would

1 initiate a section 7 consultation on ongoing and future covered activities upon completion of the  
2 BA. Reclamation must formally accept or reject the terms and conditions of the Service's BO  
3 and will sign the ROD regarding the adoption or rejection of the proposed action presented in  
4 this EIS/EIR.

5 *Other Federal Agencies*

6 Other Federal participants in the LCR MSCP may contribute funding for implementing the  
7 Conservation Plan.

8 **1.4.1.2 Non-Federal Actions**

9 Each non-Federal participant must independently evaluate the LCR MSCP HCP and determine  
10 whether to execute the agreements required to participate in the implementation of the  
11 Conservation Plan. As the lead agency under CEQA, Metropolitan will independently evaluate  
12 and, if appropriate, certify this EIR and make CEQA findings. Non-Federal participants in  
13 Arizona, California, and Nevada would contribute funding for implementing the Conservation  
14 Plan.

15 **1.4.1.3 Cooperating, Responsible, and Trustee Agency Actions**

16 Under NEPA, cooperating agencies are agencies other than the lead agency that have  
17 discretionary authority over the proposed action, jurisdiction by law, or special expertise with  
18 respect to the environmental impacts expected to result from an action. The Hualapai Tribe has  
19 been identified as cooperating agency based on the technical expertise of its members and its  
20 jurisdiction over land that might be used for conservation. Other California agencies that are  
21 requesting incidental take authorizations for their covered actions are responsible agencies  
22 under CEQA. They will consider the EIR prepared by Metropolitan and reach their own  
23 conclusions regarding whether and how to approve the proposed action. CDFG, a trustee  
24 agency under CEQA for fish and wildlife resources, reviewed and provided comments on the  
25 Draft EIR.

26 **1.4.2 Future Permits and Approvals Required to Implement Specific LCR MSCP**  
27 **Projects**

28 Permits and approvals that may be required prior to the implementation of future, site-specific  
29 LCR MSCP conservation projects include the following:

- 30 • U.S. Army Corps of Engineers (Corps) permits for dredging and fill activities;
- 31 • Rivers and Harbors Act section 10 permit;
- 32 • BIA approval of leases for conservation actions on tribal lands;
- 33 • Approvals by tribal governments for conservation actions on tribal lands;
- 34 • Section 106 consultation with State Historic Preservation Office (SHPO) for Federal  
35 projects;
- 36 • Clean Air Act conformity determinations for Federal projects;

- 1 • Air quality permits from the relevant air quality management or air pollution control  
2 districts for construction activities and some maintenance activities, such as the use of  
3 prescribed burns for marsh restoration;
- 4 • AGFD permits to stock or take fish and wildlife;
- 5 • NDOW clearance for activities potentially affecting state-listed species;
- 6 • National Pollutant Discharge Elimination System (NPDES) permits from the California  
7 Regional Water Quality Control Boards (RWQCB) or Nevada Bureau of Water Pollution  
8 Control (NBWPC); Arizona Pollutant Discharge Elimination System permits from the  
9 Arizona Department of Environmental Quality (ADEQ);
- 10 • Section 401, Clean Water Act (CWA), Water Quality Certifications from ADEQ,  
11 RWQCBs, or NBWPC. Section 401 certification on tribal lands is handled by the U.S.  
12 Environmental Protection Agency (EPA) if the tribes do not have primacy or by the  
13 individual tribes if they do; and
- 14 • Collecting permits, section 10(a)(1)(A) permits, and migratory bird permits from the  
15 Service.

16 Additionally, the NPS, BLM, BIA, and the Service's NWRs may modify their land management  
17 plans to be consistent with the Conservation Plan and may make decisions regarding whether  
18 to integrate this plan with other conservation actions on the LCR.

## 19 1.5 SCOPING AND PUBLIC INVOLVEMENT

20 Public scoping was conducted to help identify areas of concern and specific issues that should  
21 be addressed in the EIS/EIR. Notices that a combined EIS/EIR was being prepared were  
22 published in 1999 and 2000. Subsequent notices were made in October 2003. The first Notice of  
23 Intent (NOI)/Notice of Preparation (NOP) was published in the *Federal Register* (Volume 64,  
24 Number 95, pages 27000-27002) on May 18, 1999. A supplemental NOI/NOP was published in  
25 the *Federal Register* (Volume 65, Number 134, pages 43031-43034) on July 12, 2000. These two  
26 NOI/NOPs are included in Appendix B. A Revised NOP of a Draft EIR was issued by  
27 Metropolitan on July 25, 2000 and also is included in Appendix B, as is the NOP issued on  
28 October 17, 2003. Three public scoping meetings held in 2000 were supplemental to the original  
29 scoping meetings in 1999 and involved a formal presentation on planning progress and  
30 conceptual preliminary alternatives. Four additional public information meetings were held in  
31 November 2003 in Arizona, California, and Nevada to present information regarding the  
32 alternatives being evaluated in this EIS/EIR and to obtain public comments regarding issues to  
33 be addressed in this document. Scoping summary reports documenting the issues raised at  
34 these meetings are included in Appendix C.

35 Approximately 360 copies of the Draft EIS/EIR were distributed to agencies, public libraries,  
36 Indian tribes, organizations, and individuals for review during a 60-day period ending on  
37 August 18, 2004. Additionally, three public hearings were held in Henderson, Nevada; Blythe,  
38 California; and Phoenix, Arizona on July 20-22, 2004 in order to receive public comments on the  
39 Draft EIS/EIR. Additional information regarding the public involvement program is included  
40 in section 7.2.1.

1 **1.6 DOCUMENT ORGANIZATION**

2 Volume I is the Final EIS/EIR, and it incorporates minor text changes made in response to  
3 comments on the Draft EIS/EIR and text clarifications. The LCR MSCP Final HCP is Volume II,  
4 and the accompanying Final BA is Volume III. Comment letters received during the 60-day  
5 public review period for the Draft EIS/EIR and verbal comments provided during three public  
6 hearings held during this period are included in LCR MSCP Volume V, along with responses to  
7 the comments. All appendices for these documents are included in Volume IV. Together, these  
8 documents comprise the NEPA, CEQA, and ESA documentation required to implement the  
9 proposed action. The EIS/EIR is organized as follows:

- 10 • The proposed action and alternatives are described in detail in Chapter 2 of this  
11 EIS/EIR;
- 12 • The affected environment, environmental consequences of these actions, and mitigation  
13 measures for significant impacts are described in Chapter 3 for each resource  
14 considered;
- 15 • Chapter 4 addresses cumulative impacts;
- 16 • Chapter 5 provides a comparison of the action and no action alternatives;
- 17 • Chapter 6 includes other NEPA and CEQA considerations, such as growth-inducing  
18 impacts, the relationship between short-term uses of the environment and long-term  
19 productivity, and irreversible and irretrievable commitments of resources; and
- 20 • Chapter 7 includes a discussion of regulatory compliance, consultation, and  
21 coordination.
- 22 • The remaining sections include a list of references and persons/agencies consulted; a  
23 glossary of technical terms; definitions of acronyms; and a list of preparers.

## 2.0 ALTERNATIVES

### NEPA AND CEQA REQUIREMENTS REGARDING ALTERNATIVES

NEPA and CEQA require that an EIS or EIR, respectively, analyze the impacts of a proposed action and alternatives to the action. NEPA's requirements for an alternatives analysis are found in the CEQ NEPA Regulations (40 C.F.R. 1502.14) and CEQA's are found in section 15126.6 of the State CEQA Guidelines. NEPA requires an EIS to rigorously explore and objectively evaluate all reasonable alternatives that meet the proposed action's purpose and need, including those that are not within the jurisdiction of the lead agency. Reasonable alternatives are those that can be carried out based on technical, economic, and environmental factors, as well as common sense (40 C.F.R. 1502.14; Forty Most Asked Questions Concerning CEQ's NEPA Regulations No. 2a). The CEQ Regulations also indicate that a potential conflict with local or Federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered (40 C.F.R. 1506.2[d]; Forty Questions No. 2b). The EIS must also briefly explain the reasons for eliminating alternatives from detailed study.

Reclamation's Draft NEPA Handbook (2000a) references the CEQ Regulations and indicates that alternatives should take distinctly different approaches and may emphasize the achievement of some objectives at the expense of others. Any reasonable alternative with anticipated environmental consequences that differ significantly from the preferred alternative should be considered a major alternative and analyzed fully.

CEQA requires that EIRs examine a reasonable range of alternatives to the project or to the location of the project that would feasibly obtain most of the basic project objectives, but would avoid or substantially lessen one or more of the significant environmental impacts of the project. Project alternatives must be feasible based on specific economic, social, legal, and technical considerations. The EIR must explain the rationale for selecting the alternatives to be discussed, identify those that were eliminated as infeasible, and briefly explain why they were eliminated. The range of alternatives required in an EIR is governed by a "rule of reason," which requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the project objectives (State CEQA Guidelines section 15126.6[f]). An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative (State CEQA Guidelines section 15126.6[f][3]).

Both NEPA (C.F.R. 1502.14[d]) and CEQA (State CEQA Guidelines section 15126.6[e]) require that the no action alternative be analyzed in order to provide a comparison of the conditions that would occur with and without the implementation of the proposed action or other alternatives. Reclamation's NEPA Handbook defines "no action" as the projection of current conditions to the most reasonable future responses or conditions that could occur during the life of the project without the proposed action or other proposed action alternatives being implemented. The State CEQA Guidelines (section 15126.6[e][1]) indicate that the no action alternative is not the baseline for determining whether the proposed action's environmental impacts may be significant unless it is identical to the existing environmental setting. The State CEQA Guidelines (section 15126.6[3][2]) further indicate that the no action analysis shall discuss the existing conditions at the time the NOP is published, as well as what would be reasonably

1 expected to occur in the foreseeable future if the action were not approved, based on current  
2 plans and consistent with available infrastructure and community services.

### 3 **GOALS AND OBJECTIVES FOR THE CONSERVATION PLAN**

4 In developing the Conservation Plan, the LCR MSCP participants identified a set of goals and  
5 objectives that they expect to achieve through its implementation. The goals and objectives are  
6 as follows:

- 7 1. Conserve habitat that may be impacted by the covered activities that the LCR MSCP  
8 participants would implement or perform on the LCR;
- 9 2. Reduce the likelihood of additional species listings on the LCR under the ESA;
- 10 3. Contribute to recovery of listed species on the LCR;
- 11 4. Accommodate current water diversions and power production on the LCR;
- 12 5. Optimize opportunities for future water and power development on the LCR;
- 13 6. Provide the basis for take authorizations for Federal and non-Federal covered activities  
14 on the LCR pursuant to the ESA;
- 15 7. Provide the basis for assurances for the non-Federal parties pursuant to the ESA against  
16 requirements for increased conservation and mitigation measures in the event of  
17 changed circumstances or unforeseen circumstances to the maximum extent permitted  
18 by law;
- 19 8. Comply with the Law of the River;
- 20 9. Identify and implement feasible conservation and mitigation measures for the program  
21 based on specific economic, social, legal, and technical considerations, including:
  - 22 a. Whether an alternative's costs would be prohibitively or substantially greater than  
23 other alternatives.
  - 24 b. Whether the alternative is technically feasible based on current science or  
25 technology, proximity to existing populations of the species, the presence or absence  
26 of infrastructure necessary to implement the measures, and the ability to integrate  
27 created habitat with existing habitat.

28 The Conservation Plan must also meet the criteria for issuance of a section 10(a)(1)(B) permit by  
29 the Service:

- 30 1. The taking will be incidental to an otherwise lawful activity;
- 31 2. The applicant will, to the maximum extent practicable, minimize and mitigate the  
32 impacts of such taking;
- 33 3. The applicant will develop an HCP and ensure that adequate funding for the HCP will  
34 be provided;
- 35 4. The taking will not appreciably reduce the likelihood of the survival and recovery of the  
36 species in the wild; and

5. The applicant agrees to implement other measures the Service may require as being necessary or appropriate for the purpose of the HCP.

### SCREENING CRITERIA

Criteria to screen project alternatives were established based on the State CEQA Guidelines and CEQ NEPA Regulations. To be considered in detail, alternatives should:

- Meet most project goals and objectives;
- Reduce or avoid the significant effects of the proposed action; and
- Minimize the creation of new, significant environmental effects.

The following sections describe both the alternatives that have been carried forward for detailed analysis, as well as those that were eliminated.

## 2.1 ALTERNATIVES CARRIED FORWARD FOR DETAILED ANALYSIS

### 2.1.1 Alternative 1: Implementation of Proposed Conservation Plan and Issuance of Section 10(a)(1)(B) Permit (Conservation Plan)

#### 2.1.1.1 Overview

##### *Proposed Action*

Alternative 1 is the proposed action and includes two primary components:

1. Implementation of a regional Conservation Plan by Federal and non-Federal participants that would meet the LCR MSCP goals and objectives.
2. Issuance of an ESA section 10(a)(1)(B) permit by the Service based on the proposed HCP for non-Federal covered activities described in section 1.2.2.2.

##### *Covered and Evaluation Species*

Species proposed for coverage are those that meet one of the following selection criteria:

- Species that are listed or that are proposed or candidates for listing under the ESA or species that are protected under Arizona, California, or Nevada law that could be affected by covered activities and would require take authorization.
- Species that could become listed during the term of the LCR MSCP Conservation Plan under the ESA or species that could become protected under Arizona, California, or Nevada law that could be affected by covered activities and could require future take authorization.

The Conservation Plan includes a full range of conservation measures for all covered species. Based on application of the selection criteria, 27 of the species considered are proposed for coverage under the ESA section 10(a)(1)(B) permit (Table 2.1-1). The LCR MSCP HCP also includes four "evaluation species." Evaluation species are species that could become listed in

**Table 2.1-1. Proposed Covered and Evaluation Species and Their Status Under the Conservation Plan (page 1 of 2)**

| Common and Scientific Name  | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | California Status <sup>3</sup> | Nevada Status <sup>4</sup> | Selection Criteria <sup>5</sup> |
|---|-----------------------------|-----------------------------|--------------------------------|----------------------------|---------------------------------|
| THREATENED AND ENDANGERED SPECIES                                   |                             |                             |                                |                            |                                 |
| Yuma clapper rail<br><i>Rallus longirostris yumanensis</i>          | FE                          | ASC                         | CT/FP                          | -                          | 1                               |
| Southwestern willow flycatcher<br><i>Empidonax trailii extimus</i>  | FE                          | ASC                         | CE                             | -                          | 1                               |
| Desert tortoise (Mojave population)<br><i>Gopherus agassizii</i>    | FT                          | ASC                         | CT                             | NT                         | 1                               |
| Bonytail<br><i>Gila elegans</i>                                     | FE                          | ASC                         | CE                             | NE                         | 1                               |
| Humpback chub<br><i>Gila cypha</i>                                  | FE                          | ASC                         | -                              | -                          | 1                               |
| Razorback sucker<br><i>Xyrauchen texanus</i>                        | FE                          | ASC                         | CE/FP                          | NE                         | 1                               |
| OTHER COVERED SPECIES   |                             |                             |                                |                            |                                 |
| Western red bat<br><i>Lasiurus blossevillii</i>                     | -                           | ASC                         | -                              | -                          | 2                               |
| Western yellow bat<br><i>Lasiurus xanthinus</i>                     | -                           | ASC                         | -                              | -                          | 2                               |
| Desert pocket mouse<br><i>Chaetodipus penicillatus sobrinus</i>     | -                           | -                           | -                              | -                          | 2                               |
| Colorado River cotton rat<br><i>Sigmodon arizonae plenus</i>        | -                           | -                           | CSC                            | -                          | 2                               |
| Yuma hispid cotton rat<br><i>Sigmodon hispidus eremicus</i>         | -                           | -                           | CSC                            | -                          | 2                               |
| Western least bittern<br><i>Ixobrychus exilis hesperis</i>          | -                           | ASC                         | CSC                            | -                          | 2                               |
| California black rail<br><i>Laterallus jamaicensis coturniculus</i> | -                           | ASC                         | CT/FP                          | -                          | 1                               |
| Yellow-billed cuckoo<br><i>Coccyzus americanus occidentalis</i>     | FC                          | ASC                         | CE                             | -                          | 1                               |
| Elf owl<br><i>Micrathene whitneyi</i>                               | -                           | -                           | CE                             | NP                         | 1                               |
| Gilded flicker<br><i>Colaptes chrysoides</i>                        | -                           | -                           | CE                             | -                          | 1                               |
| Gila woodpecker<br><i>Melanerpes uropygialis</i>                    | -                           | -                           | CE                             | -                          | 1                               |
| Vermilion flycatcher<br><i>Pyrocephalus rubinus</i>                 | -                           | -                           | CSC                            | -                          | 2                               |
| Arizona Bell's vireo<br><i>Vireo bellii arizonae</i>                | -                           | -                           | CE                             | -                          | 1                               |
| Sonoran yellow warbler<br><i>Dendroica petechia sonorana</i>        | -                           | -                           | CSC                            | -                          | 2                               |
| Summer tanager<br><i>Piranga rubra</i>                              | -                           | -                           | CSC                            | -                          | 2                               |

**Table 2.1-1. Proposed Covered and Evaluation Species and their Status Under the Conservation Plan (page 2 of 2)**

| Common and Scientific Name  | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | California Status <sup>3</sup> | Nevada Status <sup>4</sup> | Selection Criteria <sup>5</sup> |
|---|-----------------------------|-----------------------------|--------------------------------|----------------------------|---------------------------------|
| Flat-tailed horned lizard<br><i>Phrynosoma mcalli</i>   | -                           | ASC                         | CSC                            | -                          | 2                               |
| Relict leopard frog<br><i>Rana onca</i>   | FC                          | ASC                         | -                              | NP                         | 1                               |
| Flannelmouth sucker<br><i>Catostomus latipinnis</i>   | -                           | ASC                         | -                              | -                          | 2                               |
| MacNeill's sootywing skipper<br><i>Pholisora graciellae</i>   | -                           | -                           | -                              | -                          | 2                               |
| Sticky buckwheat<br><i>Eriogonum viscidulum</i>   | -                           | -                           | -                              | NEP                        | 1                               |
| Threecorner milkvetch<br><i>Astragalus geyeri</i> var. <i>triquetrus</i>  | -                           | -                           | -                              | NEP                        | 1                               |
| EVALUATION SPECIES  |                             |                             |                                |                            |                                 |
| California leaf-nosed bat<br><i>Macrotus californicus</i>   | -                           | ASC                         | CSC                            | -                          | N/A                             |
| Pale Townsend's big-eared bat<br><i>Corynorhinus townsendii pallescens</i>  | -                           | -                           | CSC                            | -                          | N/A                             |
| Colorado River toad<br><i>Bufo alvarius</i>   | -                           | -                           | CSC                            | -                          | N/A                             |
| Lowland leopard frog<br><i>Rana yavapaiensis</i>  | -                           | ASC                         | CSC                            | -                          | N/A                             |
| <p>1 Federal Status<br/> FE = Listed as endangered under the Federal ESA.<br/> FT = Listed as threatened under the ESA.<br/> FC = Candidate for listing under the ESA.</p> <p>2 Arizona Status<br/> ASC = Arizona wildlife of special concern.</p> <p>3 California Status<br/> CE = Listed as endangered under CESA<br/> CT = Listed as threatened under CESA.<br/> FP = Fully protected under the California Fish and Game Code.<br/> CSC = California species of special concern.</p> <p>4 Nevada Status<br/> NE = Nevada endangered<br/> NT = Nevada threatened.<br/> NEP = Nevada critically endangered plant.<br/> NP = Nevada protected.</p> <p>5 Selection Criteria<br/> 1. Species that are listed or that are proposed or candidates for listing under the ESA or species that are protected under Arizona, California, or Nevada law that could be affected by covered activities and would require take authorization;<br/> 2. Species that could become listed during the term of the LCR MSCP under the ESA or species that could become protected under Arizona, California, or Nevada law that could be affected by covered activities and could require future take authorization. Factors considered to determine potential for future listing during the term of the LCR MSCP are:</p> <ul style="list-style-type: none"> <li>• ongoing or likely future destruction, modification, or curtailment of a species' habitat or range of sufficient magnitude that could warrant future listing;</li> <li>• the inadequacy of existing regulatory mechanisms to protect a species from ongoing decline of sufficient magnitude that could warrant future listing; or</li> <li>• other natural or artificial factors that may affect a species' continued existence.</li> </ul> <p>N/A = Not applicable.</p> |                             |                             |                                |                            |                                 |

future years and that could be added to the covered species list during the term of the LCR MSCP, but for which sufficient information is not available at this time to determine their status in the planning area, the potential effects of covered activities, or to develop specific conservation measures for the species. The Conservation Plan includes research studies and pilot management studies for the evaluation species to determine their status in the planning

1 area and to determine appropriate conservation measures. None of the four evaluation species  
2 are presently protected under the ESA.

### 3 *Covered Activities*

4 The covered activities for which the LCR MSCP participants are requesting incidental take  
5 authorizations and permits are briefly described in section 1.2.2, and are described more fully in  
6 Chapters 2 of the LCR MSCP BA and LCR MSCP HCP. The impacts to covered species' habitat  
7 that are likely to result from the covered activities and the implementation of the proposed  
8 Conservation Plan are shown in Table 2.1-2. Table 2.1-3 summarizes all impacts on covered and  
9 evaluation species and the expected level of take associated with implementing covered  
10 activities and the Conservation Plan.

### 11 *Conservation Measures*

12 The Conservation Plan includes the following types of conservation measures that, in  
13 combination, would achieve program objectives for regulatory compliance and contribute to  
14 species' recovery:

- 15 • Establishment of a \$25 million fund to support projects implemented by land use  
16 managers in the planning area that maintain existing habitat for listed species that  
17 would be covered by the Conservation Plan under this alternative;
- 18 • Creation of native land cover types (5,940 acres of cottonwood-willow, 1,320 acres of  
19 honey mesquite type III, 512 acres of marsh, and 360 acres of backwaters) to provide  
20 covered species habitats;
- 21 • Avoidance and minimization of impacts on covered species and their habitat resulting  
22 from covered activities and Conservation Plan implementation;
- 23 • Population enhancement measures that directly or indirectly increase abundance of  
24 covered species;
- 25 • Monitoring and research necessary to assess and improve conservation measure  
26 effectiveness and adaptively manage implementation of the Conservation Plan over  
27 time; and
- 28 • Other conservation measures relating to the covered species and the strategies for  
29 implementing them.

30 The Conservation Plan is designed to fully mitigate adverse effects on all covered species  
31 resulting from covered activities described in section 1.2.2 and to meet the ESA section 10  
32 standard to minimize and mitigate the impacts of the covered activities on covered species to  
33 the maximum extent practicable [50 C.F.R. 17.22(b)(2)(B)]. Specific conservation measures are  
34 listed in Table 2.1-3 and described more fully later in section 2.1.1.5.

### 35 *Science Strategy*

36 The LCR MSCP is a multi-faceted, long-range program to conserve covered species that are  
37 dependent on the aquatic, wetland, and riparian environments present within the LCR  
38 floodplain. In general, these species are rare, their habits and habitats are not well known, and  
39 experience in development and creation of their habitats and management of their populations

1 is limited. The LCR MSCP has used the best available scientific information to develop the  
 2 Conservation Plan and would use sound scientific principles and standards to implement the  
 3 conservation measures.

4 **Table 2.1-2. Comparison of Species-Specific Habitat Impacts to Created**  
 5 **LCR MSCP Habitat (in Acres) (Page 1 of 2)**

| <i>Covered Species</i>                           | <i>Impacts of Federal and Non-Federal Flow-Related Covered Activities<sup>a</sup></i> | <i>Impacts of Federal and Non-Federal Non-Flow-Related Covered Activities<sup>a</sup></i> | <i>Total Impacts</i> | <i>LCR MSCP Created Habitat</i> |
|--|---|---|----------------------|---------------------------------|
| <b>THREATENED AND ENDANGERED SPECIES</b>         |   |   |                      |                                 |
| Yuma clapper rail                                | 133   | 110   | 243                  | 512                             |
| Southwestern willow flycatcher                   | 1,784   | 69  | 1,853                | 4,050                           |
| Desert tortoise (Mojave population)              | 0   | 192   | 192                  | 0 <sup>b</sup>                  |
| Bonytail   | 399   | 0   | 399                  | 360 <sup>c</sup>                |
| Humpback chub                                    | ND <sup>d</sup>   | 0   | ND <sup>d</sup>      | ND <sup>d</sup>                 |
| Razorback sucker                                 | 399   | 0   | 399                  | 360 <sup>c</sup>                |
| <b>OTHER COVERED SPECIES</b>                     |   |   |                      |                                 |
| Western red bat (roosting habitat)               | 161   | 604   | 765                  | 765                             |
| Western yellow bat (roosting habitat)            | 161   | 604   | 765                  | 765                             |
| Desert pocket mouse                              | 0   | 0   | 0                    | 0                               |
| Colorado River cotton rat                        | 59  | 8   | 67                   | 125                             |
| Yuma hispid cotton rat                           | 0   | 71  | 71                   | 76                              |
| Western least bittern                            | 133   | 110   | 243                  | 512                             |
| California black rail                            | 37  | 66  | 103                  | 130                             |
| Yellow-billed cuckoo                             | 1,425   | 109   | 1,534                | 4,050                           |
| Elf owl  | 161   | 590   | 751                  | 1,784                           |
| Gilded flicker                                   | 1,425   | 109   | 1,534                | 4,050                           |
| Gila woodpecker                                  | 819   | 36  | 855                  | 1,702                           |
| Vermilion flycatcher                             | 1,890   | 724   | 2,614                | 5,208                           |
| Arizona Bell's vireo                             | 1,654   | 1,329 <sup>e</sup>  | 2,983 <sup>e</sup>   | 2,983                           |
| Sonoran yellow warbler                           | 2,929   | 193   | 3,122                | 4,050                           |
| Summer tanager                                   | 161   | 14  | 175                  | 602                             |
| Flat-tailed horned lizard                        | 0   | 128   | 128                  | 0 <sup>f</sup>                  |
| Relict leopard frog                              | 0 <sup>g</sup>  | 0 <sup>g</sup>  | 0 <sup>g</sup>       | 0                               |
| Flannelmouth sucker                              | 85  | 0   | 85                   | 85                              |
| MacNeill's sootywing skipper                     | 172   | 50  | 222                  | 222                             |
| Sticky buckwheat                                 | ND <sup>h</sup>   | 0   | ND <sup>h</sup>      | ND <sup>h</sup>                 |
| Threecorner milkvetch                            | ND <sup>h</sup>   | 0   | ND <sup>h</sup>      | ND <sup>h</sup>                 |
| <b>EVALUATION SPECIES</b>                        |   |   |                      |                                 |
| California leaf-nosed bat (roosting habitat)     | 0   | 0   | 0                    | 0                               |
| Pale Townsend's big-eared bat (roosting habitat) | 0   | 0   | 0                    | 0                               |
| Colorado River toad                              | 0   | 0   | 0                    | 0                               |
| Lowland leopard frog                             | 0   | 0   | 0                    | 0                               |

1  
2

**Table 2.1-2. Comparison of Species-Specific Habitat Impacts to Created LCR MSCP Habitat (in Acres) (Page 2 of 2)**

Note: LCR MSCP conservation measures to create habitat for covered species would avoid removal of cottonwood-willow, honey mesquite, marsh, and backwater land cover types that provide habitat for covered species, and, therefore, impacts of implementing the LCR MSCP conservation measures are not shown in this table. The LCR MSCP currently estimates that about two-thirds of LCR MSCP created habitat would be created on agricultural lands (5,045 acres), including associated infrastructure (estimated to be 1percent of all habitat created, or 81 acres). Agricultural lands provide little or no habitat value for covered and evaluation species.

The LCR MSCP impact assessment also assumes that up to 512 acres of existing degraded or former marsh that may provide low-value habitat could be converted to create fully functioning marsh that provides high-value Yuma clapper rail, western least bittern, California black rail, and Colorado River cotton rat habitat. Up to 360 acres of existing degraded or former backwaters could also be converted to create fully functioning backwaters that provides high-value habitat for the bonytail, razorback sucker, and flannelmouth sucker. Conversion of existing degraded or former marsh and backwaters to create habitat for these species, however, would not result in a loss of existing habitat.

The remainder of LCR MSCP habitat (currently estimated to be 2,377 acres) would be created on lands that currently support low-value habitats (e.g., saltcedar and saltcedar-dominated land cover types) for one or more covered species. These low-value habitats would be lost and replaced with habitats designed to be of higher value for the covered species. With implementation of the avoidance and minimization measures described in section 2.1.1.5, "Avoidance and Minimization Measures," removal of these low-quality habitats, however, is not expected to result in harm (i.e., injury or mortality of individuals) and, therefore, is not expected to result in take of covered or evaluation species.

- <sup>a</sup> The estimated effects on covered species habitats that will result from implementation of the Federal non-flow-related covered activities are addressed in the LCR MSCP BA. The amount of land cover types to be created or protected to provide covered species habitats described in Table 2.1-5 includes the creation or protection of sufficient land cover to provide covered species habitat to mitigate the impacts of implementing all of the LCR MSCP covered activities, including the Federal non-flow-related activities, on covered species habitats.
- <sup>b</sup> Net loss in habitat is fully mitigated by protecting 230 acres of desert tortoise habitat in accordance with mitigation requirements in the document entitled "Compensation for Desert Tortoise" (Desert Tortoise Compensation Team 1991).
- <sup>c</sup> The effects of the loss of 399 acres of backwater on this species would be fully mitigated by both creating 360 acres of backwater that would be managed to provide greater habitat values for this species and by stocking juvenile fish to substantially augment the existing population over the term of the LCR MSCP (see discussion of bonytail and razorback sucker in section 2.1.1.5, General Species Conservation Measures).
- <sup>d</sup> ND = Not determined. Acres of potentially affected habitat are not calculated. Changes in reservoir elevations associated with implementation of flow-related covered activities, however, could result in the establishment of up to 62 miles of transitory Colorado River channel when the reservoir pool is maintained at lower elevations that could be occupied by humpback chub and subsequently lost when reservoir elevations rise.
- <sup>e</sup> Includes 610 acres of honey mesquite IV that provides Arizona Bell's vireo habitat that could be converted to agricultural uses and that are covered under the LCR MSCP. Up to an additional 3,832 acres of honey mesquite IV that provides habitat could be removed by Federal non-flow-related activities; however, these activities and resultant impacts are not covered under the LCR MSCP.
- <sup>f</sup> Net loss in habitat is fully mitigated by protecting 230 acres of flat-tailed horned lizard habitat in accordance with mitigation requirements in the Flat-Tailed Horned Lizard Rangelwide Management Strategy (Flat-tailed Horned Lizard Interagency Coordinating Committee 2003).
- <sup>g</sup> Implementation of covered activities will not result in removal of this species' habitat but could result in temporary disturbance of habitat or affect movement of individuals.
- <sup>h</sup> ND = Not determined. Acres of potentially affected habitat are not calculated. Changes in Lake Mead reservoir elevations associated with implementation of flow-related covered activities, however, would result in periodic loss of habitat that is exposed along the Lake Mead shoreline when reservoir elevations are low and then is subsequently inundated when reservoir elevations rise.

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>                           | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>  |
|--|---|---|--|
| <b>THREATENED AND ENDANGERED SPECIES</b> |   |   |  |
| Yuma clapper rail                        | <ul style="list-style-type: none"> <li>▪ Loss of up to 133 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic establishment and loss of habitat within the full pool elevation of Lake Mead as a result of fluctuations in reservoir elevation</li> <li>▪ Loss of up to 70 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for loss of up to 10 acres of degraded, low-value habitat associated with non-Federal, non-flow-related, habitat restoration and habitat management activities</li> <li>▪ Potential periodic removal of up to 30 acres of emergent vegetation that could provide habitat along 244 miles of drains</li> <li>▪ Potential for disturbance of up to 512 acres of existing degraded or former marsh that may provide low habitat value associated with converting it to fully functioning marsh that provides high value habitat</li> <li>▪ Potential for removal of some limited</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM2 – Avoid impacts of flow-related covered activities on covered species habitats at Topock Marsh</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM5 – Monitor selenium levels in created backwater and marsh land cover types, and study the effect of selenium released as a result of dredging activities</p> <p>CLRA1 – Create 512 acres of Yuma clapper rail habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goals to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the Yuma clapper rail, and to contribute to its recovery. Implementation of these measures would contribute to recovery by increasing the amount of new nesting habitat by 269 acres over the number of impacted acres.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>                         | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>  |
|--|---|--|--|
|  | <p>and low value habitat (e.g., dry patches of herbaceous vegetation near marsh edges) as a result of creating covered species habitats with implementation of the LCR MSCP Conservation Plan<sup>b</sup></p> <ul style="list-style-type: none"> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of a small number of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul> | <p>CLRA2 – Maintain existing important Yuma clapper rail habitat areas</p>   |  |
| <p>South-western willow flycatcher</p> | <ul style="list-style-type: none"> <li>▪ Loss of up to 1,784 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic establishment and loss of habitat within the full pool elevation of Lake Mead as a result of fluctuations in reservoir elevation</li> <li>▪ Loss of up to 59 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for loss of up to 10 acres of degraded, low-value habitat associated with non-Federal, non-flow-related,</li> </ul>  | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM2 – Avoid impacts of flow-related covered activities on covered species habitats at Topock Marsh</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the southwestern willow flycatcher, and contribute to its recovery. Implementation of these measures would</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>                      | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>   |
|-------------------------------------|---|---|---|
|                                     | <p>habitat restoration and habitat management activities</p> <ul style="list-style-type: none"> <li>▪ Potential for incidental take of individuals from activities that create covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> </ul> | <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM4 – Conduct research to determine and address the effects of brown-headed cowbird nest parasitism on reproduction of covered species</p> <p>WIFL1 – Create 4,050 acres of Southwestern willow flycatcher habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> <p>WIFL2 – Maintain existing important habitat areas</p> | <p>contribute to recovery by increasing the amount of new breeding habitat by 2,197 acres in addition to replacing the extent of impacted habitat. The conservation measures would also contribute to the objectives of the Southwestern Willow Flycatcher Recovery Plan (USFWS 2002b).</p> |
| Desert tortoise (Mojave population) | <ul style="list-style-type: none"> <li>▪ Loss of up to 192 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for direct mortality of individuals associated with operation of vehicles and other equipment with implementation of non-flow-related covered activities and implementation of the LCR MSCP Conservation Plan over the term of the LCR MSCP</li> </ul>   | <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>DETO1 – Acquire and protect 230 acres of existing unprotected occupied habitat</p> <p>DETO2 – Avoid impacts on individuals and their burrows</p>   | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the Mohave population of desert tortoises.</p>  |
| Bonytail                            | <ul style="list-style-type: none"> <li>▪ Loss of up to 399 acres of habitat associated with implementation of flow-related covered activities</li> </ul>  | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p>   | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize,</p>   |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i> | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>   |
|----------------|---|--|---|
|                | <ul style="list-style-type: none"> <li>▪ Potential temporary disturbance of habitat associated with the creation of habitat and habitat management activities.</li> <li>▪ Potential for entrainment of individuals at diversions over the term of the LCR MSCP</li> <li>▪ Potential for direct mortality of individuals as a result of stranding over the term of the LCR MSCP</li> </ul> | <p>AMM4 – Minimize contaminant loads in runoff and return irrigation flows from LCR MSCP created habitats to the LCR</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM5 – Monitor selenium levels in created backwater and marsh land cover types, and study the effect of selenium released as a result of dredging activities</p> <p>BONY1 – Coordinate bonytail conservation efforts with the Service and recovery programs for endangered fish species in the Lower Basin</p> <p>BONY2 – Create 360 acres of bonytail habitat</p> <p>BONY3 – Augment bonytail populations</p> <p>BONY4 – Evaluate and develop, if necessary, additional bonytail rearing capacity</p> <p>BONY5 – Conduct monitoring and research, and adaptively manage bonytail augmentations and created habitat</p> | <p>and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the bonytail, and contribute to its recovery. Implementation of these measures would contribute to attainment of the recovery goals established for the species (USFWS 2002c).</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>   | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>   |
|------------------|---|---|---|
| Humpback chub    | <ul style="list-style-type: none"> <li>▪ Periodic loss of up to 62 miles of transitory Colorado River channel habitat that may be present in Lake Mead when the reservoir is below full pool elevation and lost when reservoir elevations are raised</li> </ul>   | HUCH1 – Provide funding to support existing humpback chub conservation programs   | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the humpback chub, and contribute to its recovery.   |
| Razorback sucker | <ul style="list-style-type: none"> <li>▪ Loss of up to 399 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Potential for periodic loss of razorback sucker spawning habitat in Lake Mead (Reach 1) with implementation of flow-related covered activities</li> <li>▪ Potential temporary disturbance of habitat associated with the creation of habitat and habitat management activities.</li> <li>▪ Potential for entrainment of individuals at diversions over the term of the LCR MSCP</li> <li>▪ Potential for direct mortality of individuals as a result of stranding over the term of the LCR MSCP</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM4 – Minimize contaminant loads in runoff and return irrigation flows from LCR MSCP created habitats to the LCR</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM5 – Monitor selenium levels in created backwater and marsh land cover types, and study the effect of selenium released as a result of dredging activities</p> <p>RASU1 – Coordinate razorback sucker conservation efforts with the Service and recovery programs for endangered fish species in the Lower Basin</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the razorback sucker, and contribute to its recovery.</p> <p>Implementation of these measures would contribute to attainment of the recovery goals established for the species (USFWS 2002e).</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>                     | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>   |
|------------------------------------|---|---|---|
|                                    |   | RASU2 – Create 360 acres of razorback sucker habitat<br>RASU3 – Augment razorback populations<br>RASU4 – Develop additional razorback sucker rearing capacity<br>RASU5 – Support ongoing razorback conservation efforts at Lake Mohave<br>RASU6 – Conduct monitoring and research, and adaptively manage razorback sucker augmentations and created habitat<br>RASU7 – Provide funding and support for continuation of the Reclamation/SNWA ongoing Lake Mead razorback sucker studies<br>RASU8 – Continue razorback conservation measures identified in the ISC/SIA BO       |   |
| <b>OTHER COVERED SPECIES</b>       |   |   |   |
| Western red bat (roosting habitat) | <ul style="list-style-type: none"> <li>▪ Loss of up to 161 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic establishment and loss of habitat within the full pool elevation of Lake Mead as a result of fluctuations in reservoir elevation</li> <li>▪ Loss of up to 604 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for incidental take of</li> </ul> | AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats<br>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area<br>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities<br>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the western red bat. |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>                        | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>  |
|---------------------------------------|--|--|--|
|                                       | <p>individuals from activities that create covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></p> <ul style="list-style-type: none"> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for likely small, unmeasurable, effects on the production and abundance of insect prey associated with implementation of covered activities</li> </ul> | <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>WRBA1 – Conduct surveys to determine species distribution of the western red bat</p> <p>WRBA2 – Create 765 acres of western red bat roosting habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p>  |  |
| Western yellow bat (roosting habitat) | <ul style="list-style-type: none"> <li>▪ Loss of up to 161 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic establishment and loss of habitat within the full pool elevation of Lake Mead as a result of fluctuations in reservoir elevation</li> <li>▪ Loss of up to 604 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for incidental take of individuals from activities that create</li> </ul>  | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the western yellow bat. |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>      | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>   |
|---------------------|--|---|---|
|                     | <p>covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></p> <ul style="list-style-type: none"> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for likely small, unmeasurable, effects on the production and abundance of insect prey associated with implementation of covered activities</li> </ul> | <p>WYBA1 – Conduct surveys to determine species distribution of the western yellow bat</p> <p>WYBA2 – Avoid removal of western yellow bat roosts trees</p> <p>WYBA3 – Create 765 acres of western yellow bat roosting habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> |   |
| Desert pocket mouse | <ul style="list-style-type: none"> <li>▪ Potential temporary or permanent disturbance or loss of habitat associated with the restoration of habitat and habitat management activities</li> <li>▪ Potential temporary disturbance of habitat associated with the creation of LCR MSCP habitats and habitat management activities<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> </ul>   | <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>DPMO1 – Conduct surveys to locate desert pocket mouse habitat</p>  | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the desert pocket mouse. |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>            | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>   |
|---------------------------|---|---|---|
|                           | <ul style="list-style-type: none"> <li>▪ Potential for direct mortality of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul>   |   |   |
| Colorado River cotton rat | <ul style="list-style-type: none"> <li>▪ Loss of up to 59 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Loss of up to 3 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for loss of up to 5 acres of degraded, low-value habitat associated with non-Federal, non-flow-related, restoration of habitat and habitat management activities</li> <li>▪ Potential for disturbance of up to 125 acres of existing degraded or former marsh that may provide low habitat value associated with converting it to fully functioning marsh that provides high value habitat</li> <li>▪ Potential for removal of some limited and low value habitat (e.g., dry patches of herbaceous vegetation near marsh edges) as a result of creating covered species habitats with implementation of the LCR MSCP Conservation Plan<sup>b</sup></li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM2 – Avoid impacts of flow-related covered activities on covered species habitats at Topock Marsh</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM5 – Monitor selenium levels in created backwater and marsh land cover types, and study the effect of selenium released as a result of dredging activities</p> <p>CRCR1 – Conduct research to better define Colorado River cotton rat habitat requirements</p> <p>CRCR2 – Create 125 acres of Colorado River cotton rat habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the Colorado River cotton rat. |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>                | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>   |
|-------------------------------|--|--|---|
|                               | <ul style="list-style-type: none"> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul>  | <p>CMM2 – Replace created habitat affected by wildfire</p>   |   |
| <p>Yuma hispid cotton rat</p> | <ul style="list-style-type: none"> <li>▪ Loss of up to 71 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for loss of up to 5 acres of degraded, low-value habitat associated with non-Federal, non-flow-related, habitat restoration and habitat management activities</li> <li>▪ Potential for incidental take of individuals from activities that create covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>YHCR1 – Conduct research to better define Yuma hispid cotton rat habitat requirements</p> <p>YHCR2 – Create 76 acres of Yuma hispid cotton rat habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the Yuma hispid cotton rat.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>        | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>   |
|-----------------------|--|--|---|
|                       | <ul style="list-style-type: none"> <li>▪ Potential for direct mortality of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul>  |  |   |
| Western least bittern | <ul style="list-style-type: none"> <li>▪ Loss of up to 133 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic establishment and loss of habitat within the full pool elevation of Lake Mead as a result of fluctuations in reservoir elevation</li> <li>▪ Loss of up to 70 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for loss of up to 10 acres of degraded, low-value habitat associated with non-Federal, non-flow-related, habitat restoration and habitat management activities</li> <li>▪ Potential periodic removal of up to 30 acres of emergent vegetation that could provide habitat along 244 miles of drains</li> <li>▪ Potential for disturbance of up to 512 acres of existing degraded or former marsh that may provide low habitat</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM2 – Avoid impacts of flow-related covered activities on covered species habitats at Topock Marsh</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM5 – Monitor selenium levels in created backwater and marsh land cover types, and study the effect of selenium released as a result of dredging activities</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the western least bittern, and reduce the likelihood of future Federal listing of the species. Implementation of these measures would benefit the western least bittern by increasing the amount of new habitat in the LCR MSCP planning area by 269 acres in addition to replacing the extent of impacted habitat.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>        | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>  |
|-----------------------|--|--|--|
|                       | <p>value associated with converting it to fully functioning marsh that provides high value habitat</p> <ul style="list-style-type: none"> <li>▪ Potential for removal of some limited and low value habitat (e.g., dry patches of herbaceous vegetation near marsh edges) as a result of creating covered species habitats with implementation of the LCR MSCP Conservation Plan<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of a small number of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul> | <p>LEBI1 – Create 512 acres of western least bittern habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p>   |  |
| California black rail | <ul style="list-style-type: none"> <li>▪ Loss of up to 37 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Loss of up to 31 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for loss of up to 5 acres of degraded, low-value habitat associated with non-Federal, non-flow-related,</li> </ul>  | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM2 – Avoid impacts of flow-related covered activities on covered species habitats at Topock Marsh</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and</p> | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the California black rail, and reduce the likelihood of |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i> | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>  |
|----------------|--|--|--|
|                | <p>habitat restoration and habitat management activities</p> <ul style="list-style-type: none"> <li>▪ Potential periodic removal of up to 30 acres of emergent vegetation that could provide habitat along 244 miles of drains</li> <li>▪ Potential for disturbance of up to 130 acres of existing degraded or former marsh that may provide low habitat value associated with converting it to fully functioning marsh that provides high value habitat</li> <li>▪ Potential for removal of some limited and low value habitat (e.g., dry patches of herbaceous vegetation near marsh edges) as a result of creating covered species habitats with implementation of the LCR MSCP Conservation Plan<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of a small number of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul> | <p>replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM5 – Monitor selenium levels in created backwater and marsh land cover types, and study the effect of selenium released as a result of dredging activities</p> <p>BLRA1 – Create 130 acres of California black rail habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> <p>BLRA2 – Maintain existing important California black rail habitat areas</p> | <p>future Federal listing of the species.</p> <p>Implementation of these measures would benefit the California black rail by increasing the amount of new habitat in the LCR MSCP planning area by 27 acres in addition to replacing the extent of impacted habitat.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>       | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>   |
|----------------------|--|--|---|
| Yellow-billed cuckoo | <ul style="list-style-type: none"> <li>▪ Loss of up to 1,425 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic establishment and loss of habitat within the full pool elevation of Lake Mead as a result of fluctuations in reservoir elevation</li> <li>▪ Loss of up to 99 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for loss of up to 10 acres of degraded, low-value habitat associated with non-Federal, non-flow-related, habitat restoration and habitat management activities</li> <li>▪ Potential for incidental take of individuals from activities that create covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for mortality of a small number of individuals associated with non-flow-related covered activities over the term of the LCR MSCP</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM2 – Avoid impacts of flow-related covered activities on covered species habitats at Topock Marsh</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>YBCU1 – Create 4,050 acres of yellow-billed cuckoo habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> <p>YBCU2 – Maintain existing important yellow-billed cuckoo habitat areas</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the yellow-billed cuckoo, and reduce the likelihood of future Federal listing of the species. Implementation of these measures would benefit the yellow-billed cuckoo by increasing the amount of new habitat in the LCR MSCP planning area by 2,516 acres in addition to replacing the extent of impacted habitat.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i> | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>   |
|----------------|---|---|---|
|                | <ul style="list-style-type: none"> <li>▪ Loss of up to 161 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Loss of up to 590 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for incidental take of individuals from activities that create covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of a small number of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul> |   |   |
| Elf owl        | <ul style="list-style-type: none"> <li>▪ Loss of up to 1,425 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Loss of up to 99 acres of habitat</li> </ul>   | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM3 – To the extent practicable, avoid and minimize</p> | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i> | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>   |
|----------------|--|---|---|
|                | <p>associated with implementation of Federal non-flow-related covered activities<sup>a</sup></p> <ul style="list-style-type: none"> <li>▪ Potential for loss of up to 10 acres of degraded, low-value habitat associated with non-Federal, non-flow-related, habitat restoration and habitat management activities</li> <li>▪ Potential for incidental take of individuals from activities that create covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of a small number of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul> | <p>disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM3 – Conduct research to determine and address the effects of nest site competition with European starlings on reproduction of covered species</p> <p>ELOW1 – Create 1,784 acres of elf owl habitat</p> <p>ELOW2 – Install elf owl nest boxes</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> | <p>adverse effects of covered activities and LCR MSCP implementation on the elf owl, and reduce the likelihood of future Federal listing of the species. Implementation of these measures would benefit the elf owl by increasing the amount of new habitat in the LCR MSCP planning area by 1,033 acres in addition to replacing the extent of impacted habitat.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i> | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>  |
|----------------|--|---|--|
| Gilded flicker | <ul style="list-style-type: none"> <li>▪ Loss of up to 819 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Loss of up to 26 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for loss of up to 10 acres of degraded, low-value habitat associated with non-Federal, non-flow-related, habitat restoration and habitat management activities</li> <li>▪ Potential for incidental take of individuals from activities that create covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of a small number of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM2 – Avoid impacts of flow-related covered activities on covered species habitats at Topock Marsh</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM3 – Conduct research to determine and address the effects of nest site competition with European starlings on reproduction of covered species</p> <p>GIFL1 – Create 4,050 acres of gilded flicker habitat</p> <p>GIFL2 – Install artificial snags to provide gilded flicker nest sites</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the gilded flicker, and reduce the likelihood of future Federal listing of the species.</p> <p>Implementation of these measures would benefit the gilded flicker by increasing the amount of new habitat in the LCR MSCP planning area by 2,516 acres in addition to replacing the extent of impacted habitat.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>  | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>   |
|-----------------|---|--|---|
| Gila woodpecker | <ul style="list-style-type: none"> <li>▪ Loss of up to 1,890 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic establishment and loss of habitat within the full pool elevation of Lake Mead as a result of fluctuations in reservoir elevation</li> <li>▪ Loss of up to 714 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for loss of up to 10 acres of degraded, low-value habitat associated with non-Federal, non-flow-related, habitat restoration and habitat management activities</li> <li>▪ Potential for incidental take of individuals from activities that create covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM3 – Conduct research to determine and address the effects of nest site competition with European starlings on reproduction of covered species</p> <p>GIWO1 – Create 1,702 acres of Gila woodpecker habitat</p> <p>GIWO2 – Install artificial snags to provide Gila woodpecker nest sites</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the Gila woodpecker, and reduce the likelihood of future Federal listing of the species.</p> <p>Implementation of these measures would benefit the gilded flicker by increasing the amount of new habitat in the LCR MSCP planning area by 847 acres in addition to replacing the extent of impacted habitat.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>       | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>   |
|----------------------|---|---|---|
|                      | <ul style="list-style-type: none"> <li>▪ Potential for direct mortality of a small number of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul>   |   |   |
| Vermilion flycatcher | <ul style="list-style-type: none"> <li>▪ Loss of up to 1,654 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic establishment and loss of habitat within the full pool elevation of Lake Mead as a result of fluctuations in reservoir elevation</li> <li>▪ Loss of up to 1,309 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a,c</sup></li> <li>▪ Potential for loss of up to 20 acres of degraded, low-value habitat associated with non-Federal, non-flow-related, habitat restoration and habitat management activities</li> <li>▪ Potential for incidental take of individuals from activities that create covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM2 – Avoid impacts of flow-related covered activities on covered species habitats at Topock Marsh</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM4 – Conduct research to determine and address the effects of brown-headed cowbird nest parasitism on reproduction of covered species</p> <p>VEFL1 – Create 5,208 acres of vermilion flycatcher habitat</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the vermilion flycatcher, and reduce the likelihood of future Federal listing of the species. Implementation of these measures would benefit the vermilion flycatcher by increasing the amount of new habitat in the LCR MSCP planning area by 2,594 acres in addition to replacing the extent of impacted habitat.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>       | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>  |
|----------------------|---|--|--|
|                      | <ul style="list-style-type: none"> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of a small number of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul>   | <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p>  |  |
| Arizona Bell’s vireo | <ul style="list-style-type: none"> <li>▪ Loss of up to 2,929 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic establishment and loss of habitat within the full pool elevation of Lake Mead as a result of fluctuations in reservoir elevation</li> <li>▪ Loss of up to 183 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for loss of up to 10 acres of degraded, low-value habitat associated with non-Federal, non-flow-related, habitat restoration and habitat management activities</li> <li>▪ Potential for incidental take of individuals from activities that create</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM2 – Avoid impacts of flow-related covered activities on covered species habitats at Topock Marsh</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the Arizona Bell’s vireo. |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i> | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i> |
|----------------|--|--|-------------------------------------|
|                | <p>covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></p> <ul style="list-style-type: none"> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul> | <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM4 – Conduct research to determine and address the effects of brown-headed cowbird nest parasitism on reproduction of covered species</p> <p>BEVI1 – Create 2,983 acres of Arizona Bell’s vireo habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> |                                     |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>         | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>   |
|------------------------|---|---|---|
| Sonoran yellow warbler | <ul style="list-style-type: none"> <li>▪ Loss of up to 161 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic establishment and loss of habitat within the full pool elevation of Lake Mead as a result of fluctuations in reservoir elevation</li> <li>▪ Loss of up to 14 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Potential for incidental take of individuals from activities that create covered species habitats in land cover types not considered to be habitat for the species, but where some transitory or minor use of the land cover type does occur<sup>b</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of a small number of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM2 – Avoid impacts of flow-related covered activities on covered species habitats at Topock Marsh</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM4 – Conduct research to determine and address the effects of brown-headed cowbird nest parasitism on reproduction of covered species</p> <p>YWAR1 – Create 4,050 acres of Sonoran yellow warbler habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the Sonoran yellow warbler, and reduce the likelihood of future Federal listing of the species. Implementation of these measures would benefit the Sonoran yellow warbler by increasing the amount of new habitat in the LCR MSCP planning area by 928 acres in addition to replacing the extent of impacted habitat.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>            | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>  |
|---------------------------|--|--|--|
| Summer tanager            | <ul style="list-style-type: none"> <li>▪ Loss of up to 128 acres of habitat associated with implementation of Federal non-flow-related covered activities<sup>a</sup></li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of individuals associated with implementation of non-flow-related covered activities and the LCR MSCP over the term of the LCR MSCP</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM3 – To the extent practicable, avoid and minimize disturbance of covered bird species during the breeding season</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM4 – Conduct research to determine and address the effects of brown-headed cowbird nest parasitism on reproduction of covered species</p> <p>SUTA1 – Create 602 acres of summer tanager habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the summer tanager, and reduce the likelihood of future Federal listing of the species.</p> <p>Implementation of these measures would benefit the summer tanager by increasing the amount of new habitat in the LCR MSCP planning area by 427 acres in addition to replacing the extent of impacted habitat.</p> |
| Flat-tailed horned lizard | <ul style="list-style-type: none"> <li>▪ Potential temporary disturbance of habitat associated with the creation of habitat and habitat management activities.</li> </ul>  | <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>FTHL1 – Acquire and protect 230 acres of existing</p>   | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize,</p>  |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>      | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>   |
|---------------------|---|--|---|
|                     | <ul style="list-style-type: none"> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul>   | unprotected occupied flat-tailed horned lizard habitat<br>FTFL2 – Implement conservation measures to avoid or minimize take of flat-tailed horned lizard | and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the flat-tailed horned lizard.  |
| Relict leopard frog | <ul style="list-style-type: none"> <li>▪ Loss of up to 85 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Periodic loss of transitory Colorado River and Virgin River channel habitat that may be present in Lake Mead when the reservoir is below full pool elevation and lost when reservoir elevations are raised</li> <li>▪ Potential temporary disturbance of habitat associated with the creation of habitat and habitat management activities</li> <li>▪ Potential for entrainment of individuals at diversions over the term of the LCR MSCP</li> <li>▪ Harassment of individuals associated with operation of equipment and other</li> </ul> | RLFR1 – Provide funding to support existing relict leopard frog conservation programs  | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the relict leopard frog, and reduce the likelihood of future Federal listing of the species. |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>      | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>  |
|---------------------|---|---|--|
|                     | <p>activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</p> <ul style="list-style-type: none"> <li>▪ Potential for direct mortality of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul>  |   |  |
| Flannelmouth sucker | <ul style="list-style-type: none"> <li>▪ Loss of up to 172 acres of habitat associated with implementation of flow-related covered activities</li> <li>▪ Loss of up to 50 acres of habitat associated with implementation of Federal non-flow-related covered activities</li> <li>▪ Potential disturbance of or loss of a small, unquantifiable amount of habitat associated with the creation of habitat and habitat management activities</li> <li>▪ Harassment of individuals associated with operation of equipment and other activities related to implementing non-flow-related covered activities and the LCR MSCP Conservation Plan</li> <li>▪ Potential for direct mortality of individuals associated with implementation of non-flow-related covered activities over the term of the LCR MSCP</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM4 – Minimize contaminant loads in runoff and return irrigation flows from LCR MSCP created habitats to the LCR</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>AMM6 – Avoid or minimize impacts on covered species habitats during dredging, bank stabilization activities and other river management activities</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MRM5 – Monitor selenium levels in created backwater and marsh land cover types, and study the effect of selenium released as a result of dredging activities</p> <p>FLSU1 – Create 85 acres of flannelmouth sucker habitat</p> <p>FLSU2 – Provide funding to support existing flannelmouth sucker conservation programs</p> <p>FLSU3 – Assess flannelmouth sucker management needs and develop management strategies</p> | <p>Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the flannelmouth sucker, and reduce the likelihood of future Federal listing of the species.</p> |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>               | <i>Impacts and Estimated Level of Take</i>  | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>  |
|------------------------------|---|---|--|
| MacNeill's sootywing skipper | <ul style="list-style-type: none"> <li>▪ Potential for direct mortality of individuals associated with implementation of flow-related covered activities over the term of the LCR MSCP</li> </ul> | <p>AMM1 – To the extent practicable, avoid and minimize impacts of implementing the LCR MSCP on existing covered species habitats</p> <p>AMM5 – Avoid impacts of operation, maintenance, and replacement of hydroelectric generation and transmission facilities on covered species in the LCR MSCP planning area</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>MNSW1 – Conduct surveys and research to locate MacNeill's sootywing skipper habitat and to better define its habitat requirements</p> <p>MNSW2 – Create at least 222 acres of MacNeill's sootywing skipper habitat</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the MacNeill's sootywing skipper.               |
| Sticky buckwheat             | <ul style="list-style-type: none"> <li>▪ Potential for direct mortality of individuals associated with implementation of flow-related covered activities over the term of the LCR MSCP</li> </ul> | STBU1 – Provide funding to support existing sticky buckwheat conservation programs  | Implementation of conservation measures achieves the goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation and reduce likelihood of future Federal listing of the species. |

▪

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>                               | <i>Impacts and Estimated Level of Take</i>   | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>  | <i>Summary of Expected Outcomes</i>   |
|--|--|--|---|
| Threecorner milkvetch                        | <ul style="list-style-type: none"> <li>▪ Potential for direct mortality of individuals associated with implementation of flow-related covered activities over the term of the LCR MSCP</li> </ul>              | THMI1 – Provide funding to support existing threecorner milkvetch conservation programs  | Implementation of the conservation measures achieves the LCR MSCP goal to avoid, minimize, and fully mitigate adverse effects of covered activities and LCR MSCP implementation on the threecorner milkvetch, and reduce the likelihood of future Federal listing of the species.   |
| <b>EVALUATION SPECIES</b>                    |  |  |   |
| California leaf-nosed bat (roosting habitat) | <ul style="list-style-type: none"> <li>▪ Potential for likely small, unmeasurable, effects on the production and abundance of insect prey associated with implementation of flow-related activities</li> </ul> | MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements<br>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats<br>CLNB1 – Conduct surveys to locate California leaf-nosed bat roost sites<br>CLNB2 – Create covered species habitat near California leaf-nosed bat roost sites<br>CMM1 – Reduce risk of loss of created habitat to wildfire<br>CMM2 – Replace created habitat affected by wildfire | Implementation of the conservation measures would fully mitigate flow-related impacts, if any, on the diversity and production of insects. In addition, implementation of survey and research conservation measures would provide important information for use in developing future conservation efforts for this species. |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>                                   | <i>Impacts and Estimated Level of Take</i>                              | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>  |
|--|---|---|--|
| Pale Townsend's big-eared bat (roosting habitat) | <ul style="list-style-type: none"> <li>▪ No impacts expected</li> </ul> | <p>MRM1 – Conduct surveys and research to better identify covered and evaluation species habitat requirements</p> <p>MRM2 – Monitor and adaptively manage created covered and evaluation species habitats</p> <p>PTBB1 – Conduct surveys to locate pale Townsend's big-eared bat roost sites</p> <p>PTBB2 – Create covered species habitat near pale Townsend's big-eared bat roost sites</p> <p>CMM1 – Reduce risk of loss of created habitat to wildfire</p> <p>CMM2 – Replace created habitat affected by wildfire</p> | Implementation of the conservation measures would fully mitigate flow-related impacts, if any, on the diversity and production of insects. In addition, implementation of survey and research conservation measures will provide important information for use in developing future conservation efforts for this species. |
| Colorado River toad                              | <ul style="list-style-type: none"> <li>▪ No impacts expected</li> </ul> | <p>CRT01 – Conduct research to better define the distribution, habitat requirements, and factors that are limiting the distribution of the Colorado River toad</p> <p>CRT02 – Protect existing unprotected occupied Colorado River toad habitat</p> <p>CRT03 – Conduct research to determine feasibility of establishing the Colorado River toad in unoccupied habitat</p>  | Implementation of the conservation measures would provide information necessary for successful management to maintain and increase the abundance of the Colorado River toad throughout its range.  |
| Lowland leopard frog                             | <ul style="list-style-type: none"> <li>▪ No impacts expected</li> </ul> | <p>LLFR1 – Conduct research to better define the distribution, habitat requirements, and factors that are limiting the distribution of the lowland leopard frog</p> <p>LLFR2 – Protect existing unprotected occupied lowland leopard frog habitat</p>   | Implementation of the conservation measures would provide information necessary for successful   |

**Table 2.1-3. Summary of Impacts on Covered and Evaluation Species and Estimated Level of Take Associated with Implementation of Flow- and Non-Flow-Related Covered Activities and the Conservation Plan**

| <i>Species</i>  | <i>Impacts and Estimated Level of Take</i> | <i>Conservation Measures to Avoid, Minimize, and Mitigate Impacts</i>   | <i>Summary of Expected Outcomes</i>  |
|---|--|---|--|
|   |  | LLFR3— Conduct research to determine feasibility of establishing the lowland leopard frog in unoccupied habitat | management to maintain and increase the abundance of lowland leopard frogs throughout its range. |
| <p>a The estimated effects on covered species habitats that would result from implementation of the Federal non-flow-related covered activities addressed in the LCR MSCP BA. The amount of land cover types to be created to provide covered species habitats described in section 2.1.1 includes the creation of sufficient land cover to provide covered species habitat to mitigate both the impacts of implementing the LCR MSCP HCP and the Federal non-flow-related activities on covered species habitats.</p> <p>b The LCR MSCP currently estimates that about two-thirds of LCR MSCP created habitat would be created on agricultural lands (5,045 acres), including associated infrastructure (estimated to be 1 percent of all habitat created, or 81 acres). Agricultural lands provide little or no habitat value for covered and evaluation species.</p> <p>The LCR MSCP impact assessment also assumes that up to 512 acres of existing degraded or former marsh that may provide low-value habitat could be converted to create fully functioning marsh that provides high-value Yuma clapper rail, western least bittern, California black rail, and Colorado River cotton rat habitat. Up to 360 acres of existing degraded or former backwaters could also be converted to create fully functioning backwaters that provide high-value habitat for the bonytail, razorback sucker, and flannelmouth sucker. Conversion of existing degraded or former marsh and backwaters to create habitat for these species, however, would not result in a loss of existing habitat.</p> <p>The remainder of LCR MSCP habitat (currently estimated to be 2,377 acres) would be created on additional lands that may support some transitory or minor level of use (e.g., saltcedar and saltcedar-dominated land cover types) by individuals of one or more covered species, but are not considered to be habitat. These land cover types would be lost and replaced with habitats designed to be of higher value for the covered species. Implementation of the avoidance and minimization measures described in section 2.1.1.5, however, would reduce the likelihood of incidental take of covered species that could be associated with removal of these land cover types.</p> <p>c Includes 610 acres of honey mesquite IV that provides Arizona Bell's vireo habitat that could be converted to agricultural uses and that are covered under the LCR MSCP. Up to an additional 3,832 acres of honey mesquite IV that provides habitat could be removed by Federal non-flow-related activities, however, these activities and resultant impacts are not covered under the LCR MSCP.</p> |  |   |  |

1 The LCR MSCP has a commitment to use scientific information, scientific methods, principles,  
2 and standards to implement the Conservation Plan throughout the term of the LCR MSCP. This  
3 science-based strategy for implementing the LCR MSCP primarily applies to four major  
4 elements of the Conservation Plan: fish augmentation, habitat creation, monitoring and  
5 research, and adaptive management. The LCR MSCP planning processes for implementing  
6 conservation measures would incorporate both internal and external science review.

7 Internal reviews would focus on cost effectiveness of techniques for implementing conservation  
8 measures, chronology of implementation, and inter-relationships of Conservation Plan  
9 components. Internal reviews would consider the following:

- 10 • The current knowledge of the ecology and life requirements of covered species;
- 11 • Knowledge gained through applied research undertaken by the LCR MSCP and others;  
12 and
- 13 • The effectiveness of conservation measures and the status of the species and their  
14 habitats, including the results and progress of concurrent research, conservation,  
15 restoration, and recovery programs for LCR MSCP covered species undertaken  
16 elsewhere in the Colorado River Basin.

17 External reviews would be conducted by recognized experts in the field of study or program  
18 under review. The need for and timing of external review of specific elements of the LCR  
19 MSCP would be determined by the Program Manager and the number of reviewers required  
20 would be determined by the complexity of the LCR MSCP element under review.

21 Baseline conditions would be assessed before implementing conservation measures that create  
22 covered species habitats, augment populations, or other species-specific conservation measures  
23 (e.g., control brown-headed cowbirds to reduce the incidence of nest parasitism). This  
24 assessment of baseline conditions would provide the basis for assessing the success of  
25 conservation measures. Methods to implement conservation measures would be developed  
26 based on the best available scientific information, the efficacy of the methods would be  
27 monitored during implementation, and the effectiveness of the conservation measures would be  
28 monitored following implementation. Ineffective measures would be evaluated and, if feasible,  
29 modified to improve their effectiveness. Where conservation measures cannot be effectively  
30 modified, replacement conservation measures would be developed and implemented.

### 31 **2.1.1.2 Geographic Scope of the Project**

32 This alternative would be implemented in the planning area, which is the historic floodplain of  
33 the LCR, from Lake Mead to the SIB between the United States and Mexico and areas with  
34 elevations up to and including the full pool elevations of Lake Mead, Lake Mohave, and Lake  
35 Havasu (Figure 1.1-1). The historic floodplain includes all lands that are or have been affected  
36 by the meandering or regulated flows of the Colorado River, which historically have been  
37 confined by the change in elevation that forms the adjoining uplands. The full pool elevation of  
38 Lake Mead is defined by water surface elevation 1,229 feet National Geodetic Vertical Datum  
39 (NGVD). The full pool elevation of Lake Mohave is defined by surface water elevation 647 feet  
40 NGVD. The full pool elevation of Lake Havasu is defined by surface water elevation 450 feet

1 NGVD. These reservoir full pool surface elevations correspond to the top of the respective  
2 spillway gates (USBR 1981).

3 The planning area is located within seven counties in the states of Arizona, California, and  
4 Nevada: La Paz, Mohave, and Yuma counties in Arizona; Imperial, Riverside and San  
5 Bernardino counties in California; and Clark County in Nevada. It comprises approximately  
6 720,000 acres, including open water, and consists of Federal, state, tribal, and privately owned  
7 lands, as shown in Table 2.1-4. This table does not include acreage for open water areas.

8 **Table 2.1-4. Land Ownership in the Planning Area**

| Land Owner                   | River Reach (acres) |        |        |         |        |        |        | TOTAL   |
|------------------------------|---------------------|--------|--------|---------|--------|--------|--------|---------|
|                              | 1                   | 2      | 3      | 4       | 5      | 6      | 7      |         |
| U.S. Bureau of Reclamation   | 0                   | 0      | 18     | 0       | 0      | 0      | 0      | 18      |
| U.S. Fish & Wildlife Service | 0                   | 0      | 20,615 | 16,672  | 10,791 | 497    | 0      | 48,575  |
| National Park Service        | 57,068              | 12,189 | 115    | 0       | 0      | 0      | 0      | 69,372  |
| Tribal Land                  | 1,775               | 0      | 29,118 | 145,901 | 0      | 11,057 | 1,704  | 189,555 |
| Bureau of Land Management    | 0                   | 0      | 7,379  | 12,959  | 2,312  | 9,118  | 911    | 32,679  |
| State                        | 0                   | 0      | 8,841  | 5,055   | 1,630  | 5,327  | 1,612  | 22,465  |
| Private                      | 148                 | 2,892  | 24,242 | 109,342 | 2,091  | 36,756 | 57,576 | 233,047 |
| <b>Total</b>                 | 58,991              | 15,081 | 90,310 | 289,929 | 16,824 | 62,755 | 61,803 | 595,693 |

Note: Acreage does not include open water.

9 For purposes of this analysis, the portion of the LCR in the planning area is divided into seven  
10 reaches. Water surface elevations and river miles (RM) used in defining these reaches are based  
11 on maps developed by Reclamation (USBR 1976)<sup>1</sup>. The reaches are shown on Figures 2.1-1 to  
12 2.1-7 and described below:

- 13 • *Reach 1:* from Separation Canyon in the lower end of the Grand Canyon to Hoover Dam,  
14 including Lake Mead up to full-pool elevation.
- 15 • *Reach 2:* from Hoover Dam to Davis Dam (RM 276), including Lake Mohave up to full-  
16 pool elevation.
- 17 • *Reach 3:* from Davis Dam (RM 276) to Parker Dam (RM 192.3), including Lake Havasu  
18 up to full-pool elevation.
- 19 • *Reach 4:* from Parker Dam (RM 192.3) to Adobe Ruin and Reclamation's Cibola Gage  
20 (RM 87.3) at the lower end of Reclamation's maintenance Cibola Division.
- 21 • *Reach 5:* from Reclamation Cibola Gage (RM 87.3) to Imperial Dam (RM 49.2).

1 River miles are numbered along the thalweg of the LCR channel south to north starting with RM 0.0 at the SIB with Mexico. Backwaters are identified by river mile by using the first letter of the state the backwater is located in (Arizona, California, or Nevada) and the river mile distance from the SIB to the point of connection between the backwater and the river (e.g., C60.7). Dam locations are noted at their respective river miles.

- 1 • *Reach 6:* from Imperial Dam (RM 49.2) to the NIB (RM 23.1) between the United States  
2 and Mexico.
- 3 • *Reach 7:* portion of the LCR from the NIB (RM 23.1) to the SIB (RM 0.0) within the  
4 United States.

5 A certain amount of conservation would be implemented within specific river reaches, as  
6 follows:

- 7 • The created backwaters would be located in Reaches 3–6; at least 90 acres would be  
8 created in Reaches 3 and 4 with water depth, vegetation, and substrate characteristics  
9 that provide bonytail habitat. At least 85 acres would be created in Reach 3 with water  
10 depth, vegetation, and substrate characteristics that provide the elements of  
11 flannelmouth sucker habitat. Additional habitat could also be provided depending on  
12 the extent of connected backwaters that are established for the razorback sucker in  
13 Reach 3.
- 14 • Within the range of the MacNeill’s sootywing skipper (Reaches 1–4), honey mesquite  
15 would be planted with quailbush to create the honey mesquite–quailbush interface that  
16 provides habitat for this species.
- 17 • The created cottonwood–willow land cover would include 76 acres in Reaches 6 and 7 to  
18 provide habitat for the Yuma hispid cotton rat; 600 acres would be created in Reaches 3–  
19 5 to provide habitat for the elf owl; 4,050 acres would be created in Reaches 3–6 to  
20 provide habitat for the gilded flicker; and 1,702 acres would be created in Reaches 3–6 to  
21 provide habitat for Gila woodpecker. Note that these acreages are not additive; created  
22 land cover types may provide habitat for more than one species.
- 23 • At least 125 acres of the created marsh would be located in Reaches 3 and 4 for the  
24 Colorado River cotton rat, and 130 acres would be created in Reaches 5 and 6 for the  
25 California black rail.

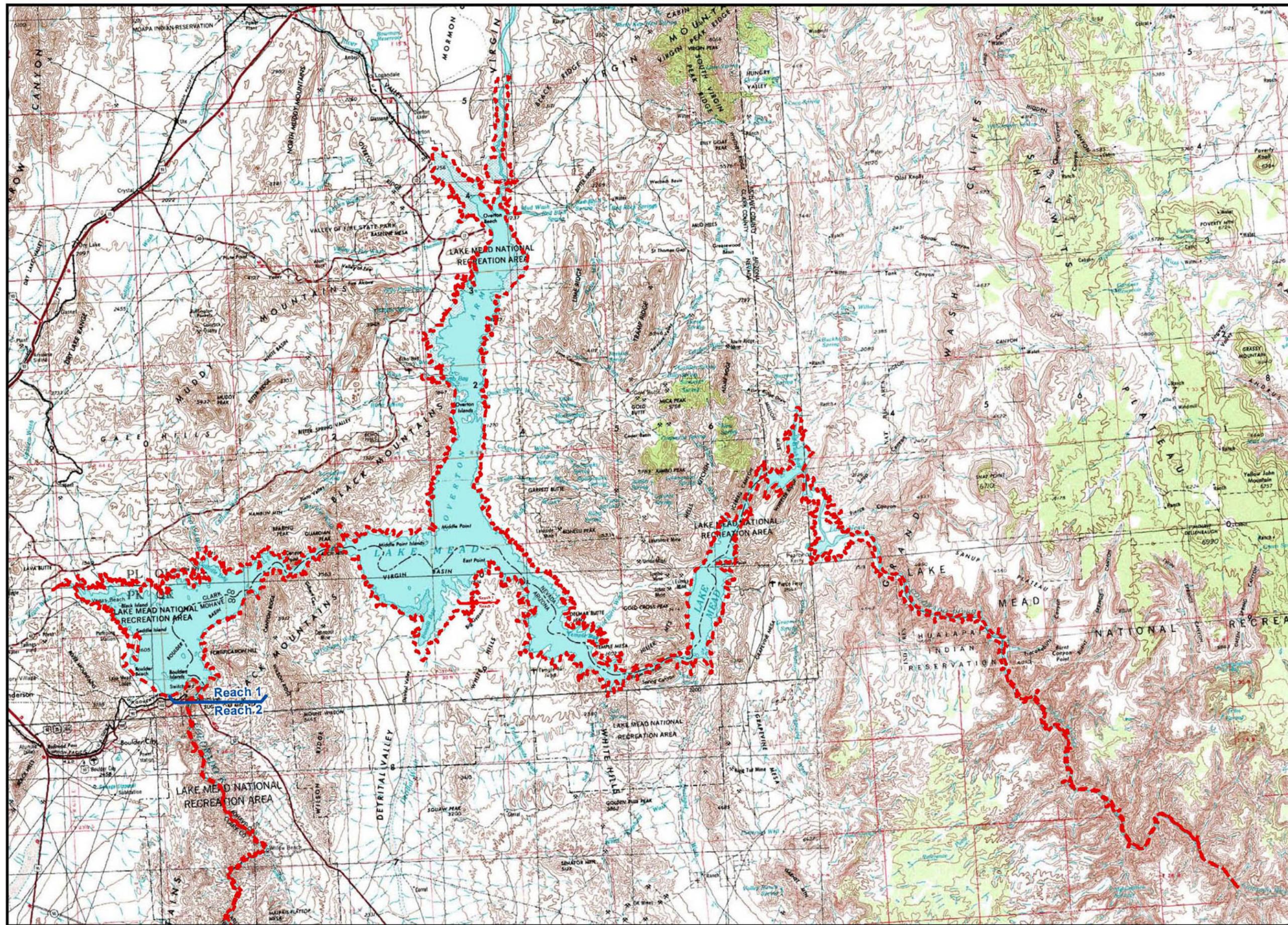
### 26 2.1.1.3 Conservation Concepts

27 The following types of conservation measures have been developed to offset take and provide  
28 benefits to covered species:

- 29 • Maintaining important existing habitat areas;
- 30 • Creating and maintaining new habitat for covered species;
- 31 • Augmenting populations of covered fish species;
- 32 • Supporting other programs to implement conservation measures to benefit covered  
33 species; and
- 34 • Timing of implementing conservation measures.

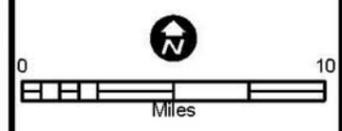
### 35 Maintenance of Existing Habitat

36 The LCR MSCP would contribute to maintaining the condition of a portion of existing habitat  
37 for southwestern willow flycatcher, yellow-billed cuckoo, Yuma clapper rail, and California



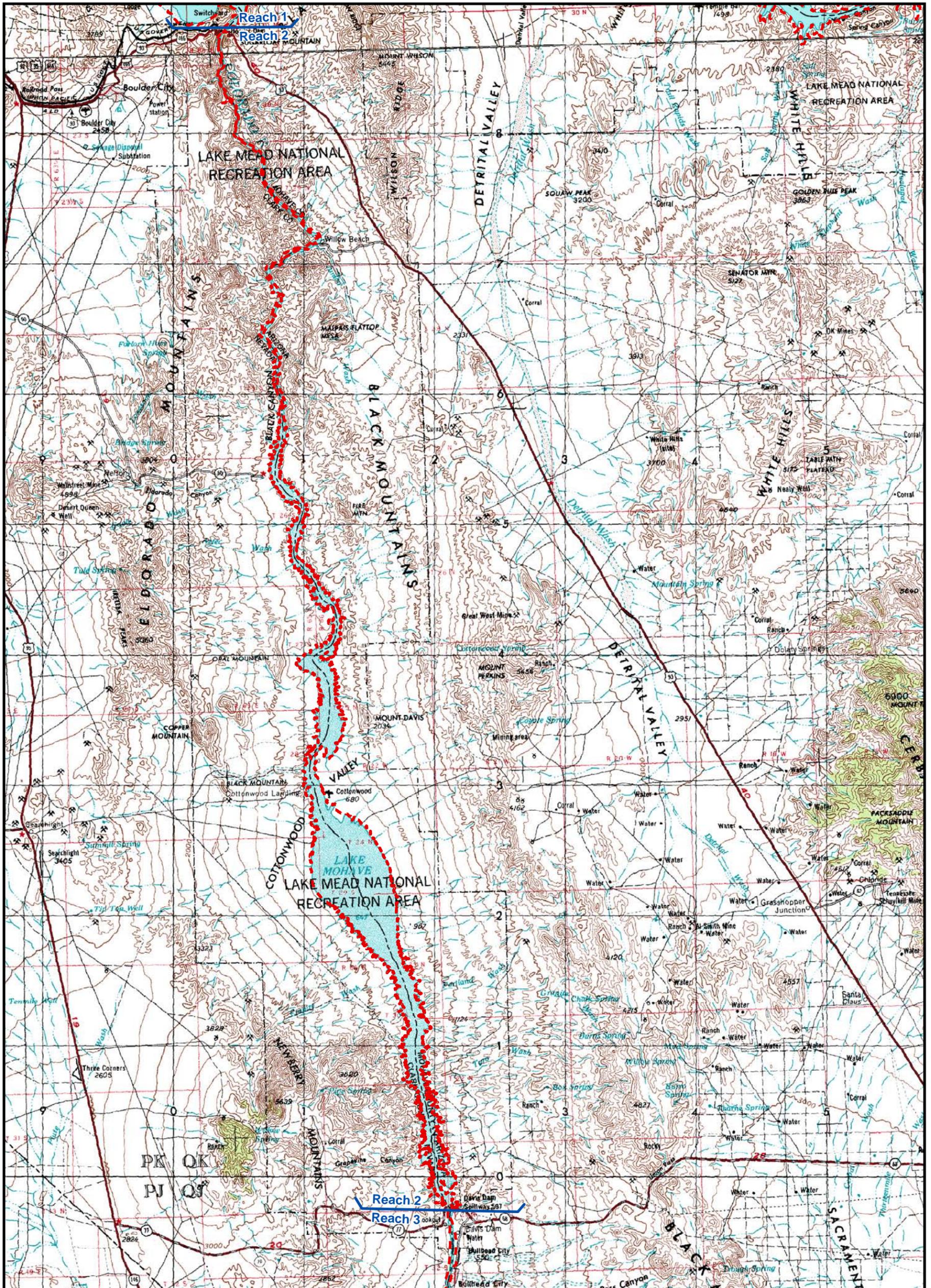
 Planning Area Boundary  
 Reach Boundary

LCR Planning Area,  
Reach 1



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LCR Planning Area, Reach 2

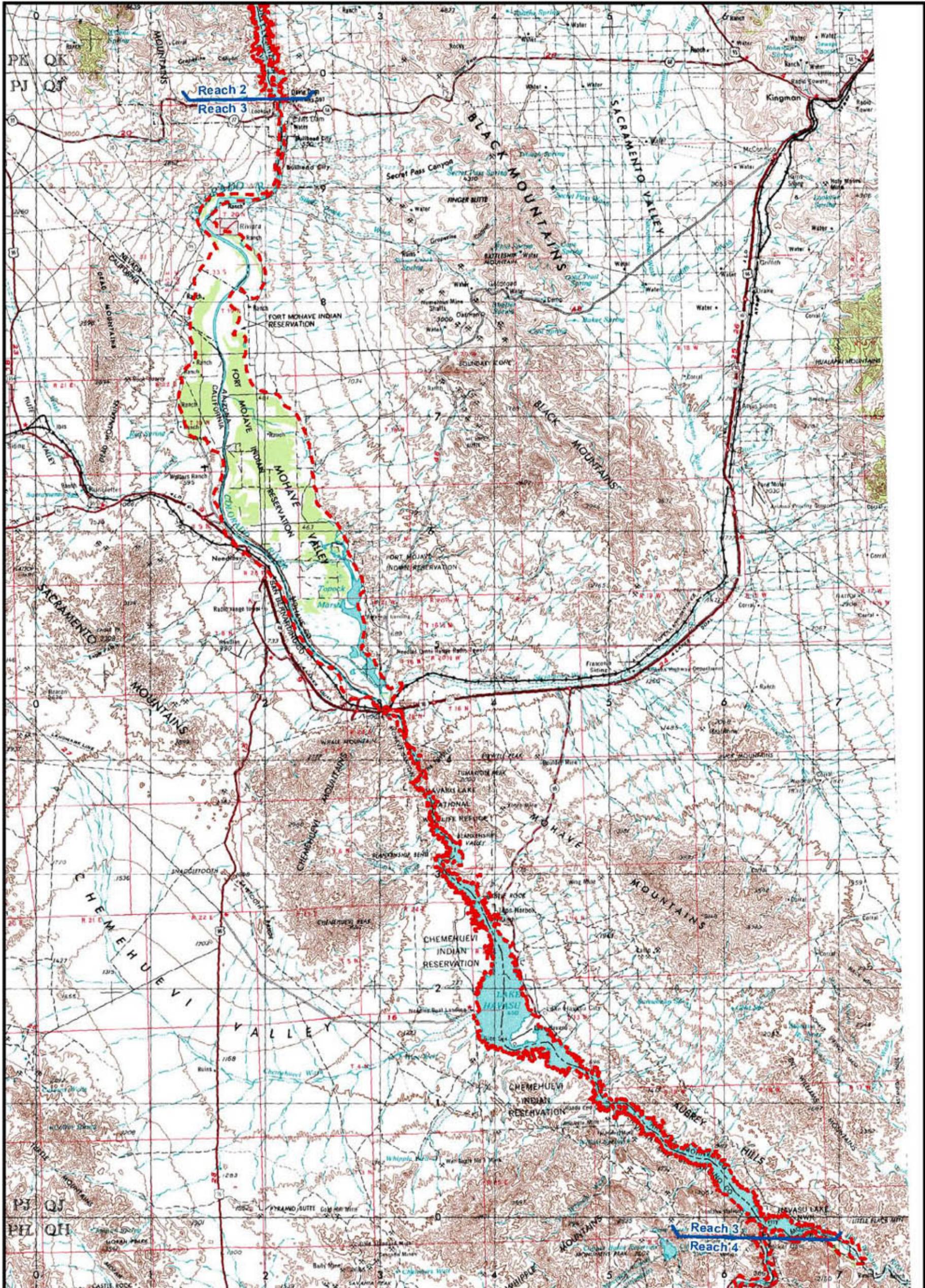
FIGURE 2.1-2

-  Planning Area Boundary
-  Reach Boundary



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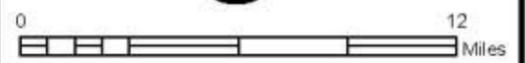
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LCR Planning Area, Reach 3

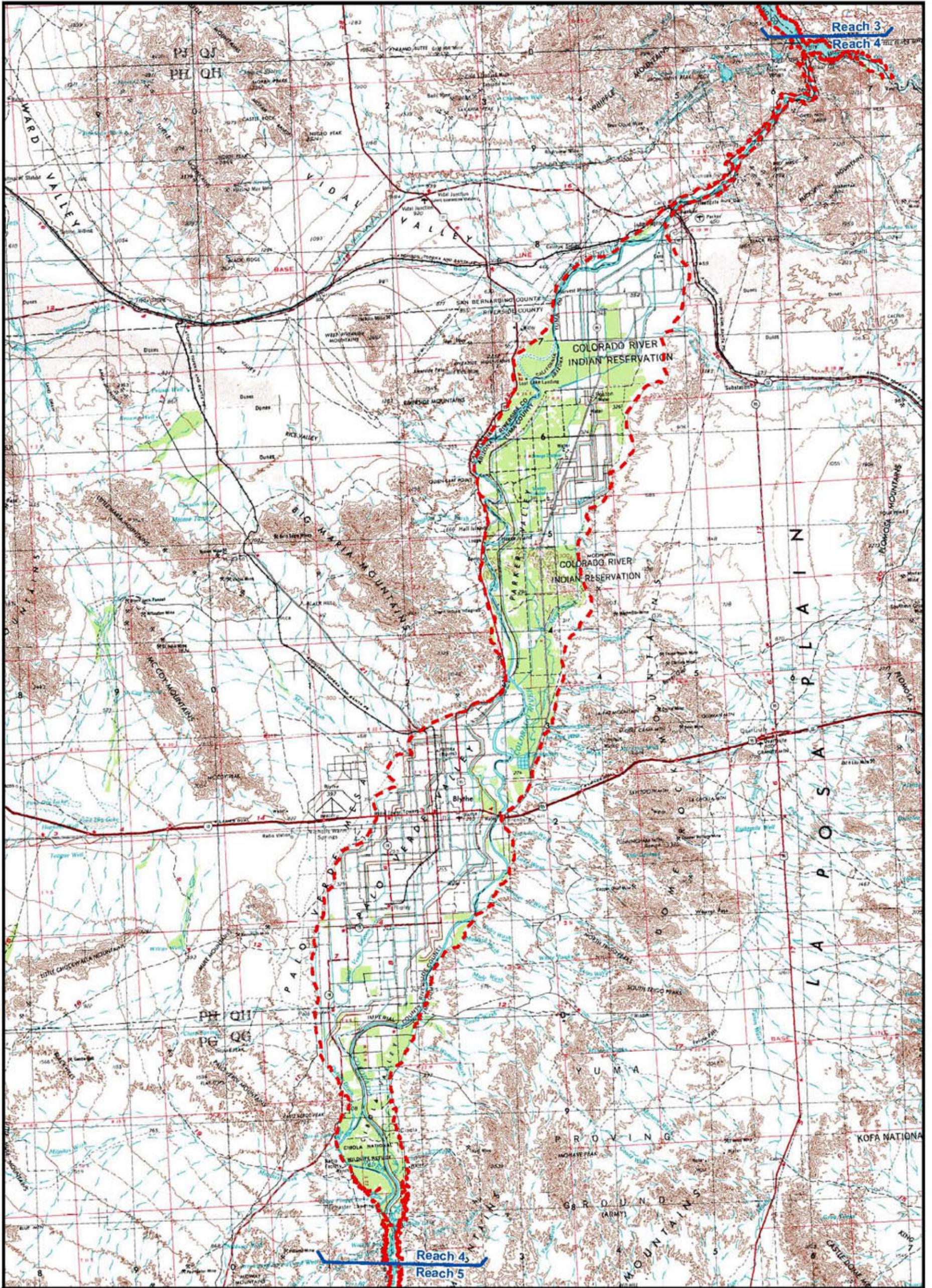
FIGURE 2.1-3

-  Planning Area Boundary
-  Reach Boundary



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LCR Planning Area, Reach 4

FIGURE

2.1-4

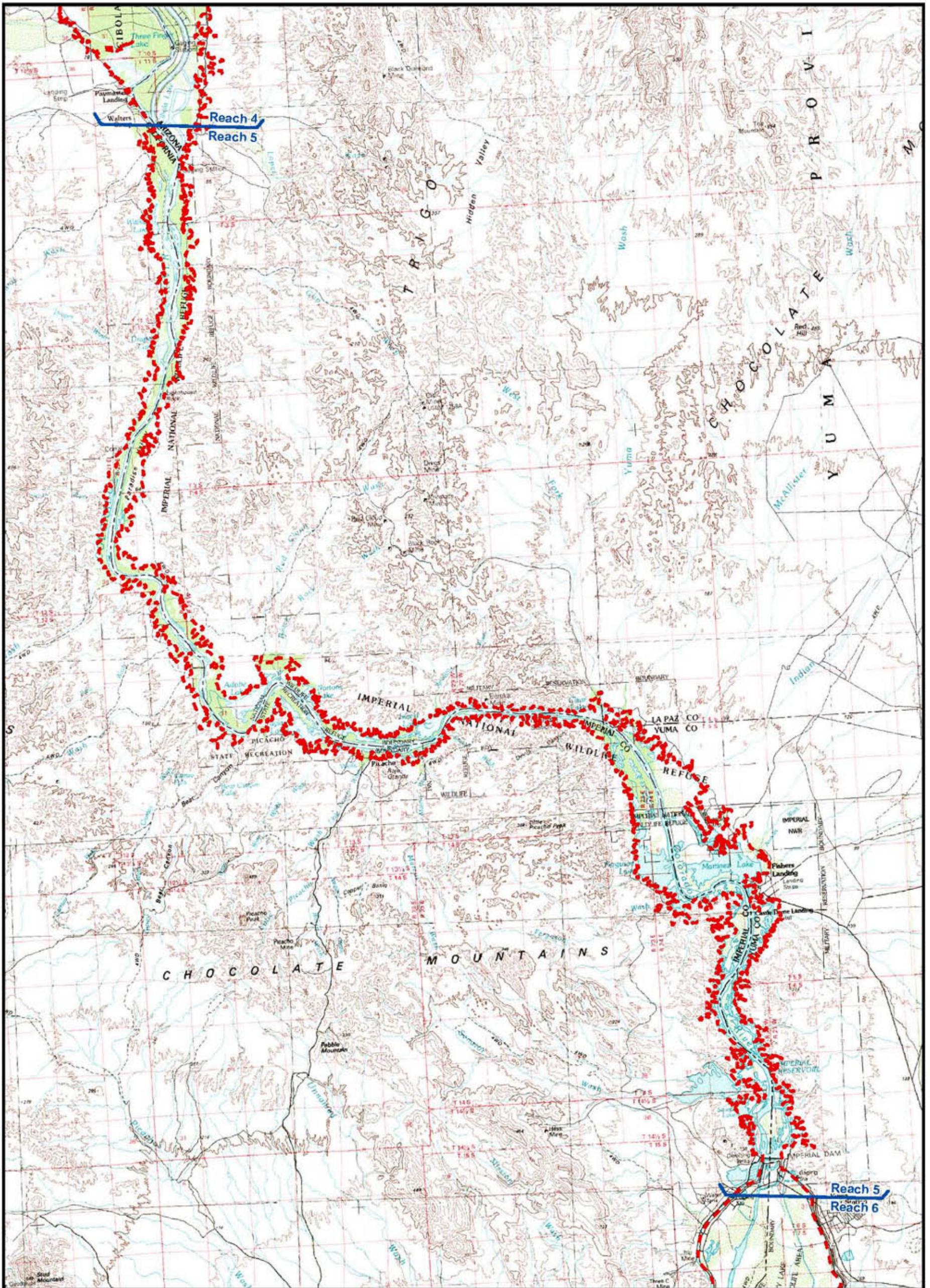
-  Planning Area Boundary
-  Reach Boundary



0 12 Miles

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LCR Planning Area, Reach 5

FIGURE

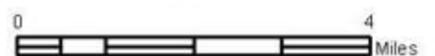
2.1-5



Planning Area Boundary



Reach Boundary



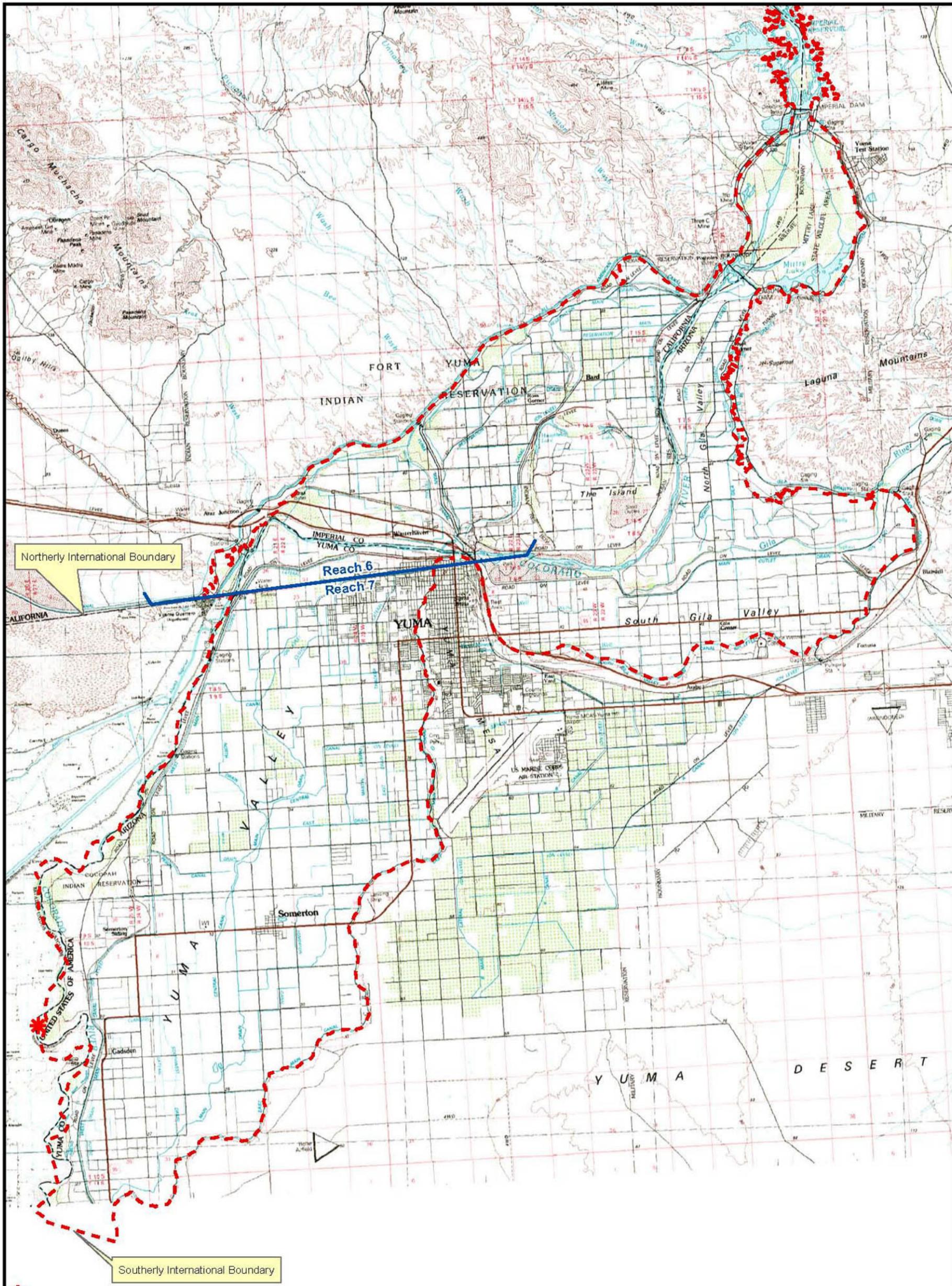
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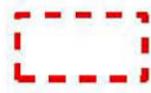


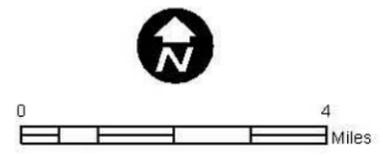
\* Note: The boundary between the United States and Mexico in Reach 7 is defined, by treaty, as the centerline of the LCR channel which varies over the planning area. The planning area boundary is based on the U.S. - Mexico boundary as it existed in 1992. The underlying topographic information depicts the boundary as it existed in 1977.



### LCR Planning Area, Reach 7

FIGURE  
**2.1-7**

-  Planning Area Boundary
-  Reach Boundary



1

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1 black rail within the planning area. The key elements of the LCR MSCP approach to maintain  
2 existing important habitat areas are described below.

- 3 • The LCR MSCP would establish a \$25 million fund contribution early in the term of the  
4 program in an interest-bearing account to be expended on assessing and implementing  
5 projects for maintaining existing habitat.
- 6 • Habitat maintenance activities could occur anywhere within the planning area and may  
7 be implemented through funding projects by any appropriate agency in the planning  
8 area.
- 9 • Habitat maintenance activities would be developed and implemented in cooperation  
10 with the managing agency for the property on which the activity would occur.
- 11 • Selection of habitat maintenance activities funded by the LCR MSCP would be  
12 determined based on a set of criteria to be developed by the LCR MSCP in conjunction  
13 with the Service. Criteria would be designed to ensure the activities are consistent with  
14 the goal of habitat maintenance, goals for covered species, and the overall goals of the  
15 Conservation Plan. General criteria that would be developed to select habitat  
16 maintenance projects to be funded under the LCR MSCP would include documented  
17 evidence that:
  - 18 – The habitat has degraded following approval of the LCR MSCP.
  - 19 – The habitat can be improved to meet the same standards as described for  
20 covered species habitats to be created under the Conservation Plan.
  - 21 – The extent of the habitat area encompassed by the project is sufficient to meet the  
22 needs of the covered species.
  - 23 – The project is economically justified.
  - 24 – Cost sharing from the applicant is sufficient.

25 Special consideration may be given to award grants for equipment and other items to  
26 support continuous maintenance programs on a broad scale.

- 27 • The habitat maintenance fund would be administered by the Program Manager,  
28 primarily through award of grants to participating agencies.
- 29 • Types of activities that could be conducted include construction of infrastructure for  
30 water delivery or movement; maintenance of marsh vegetation by burning, water  
31 delivery, and other means; maintenance of moist soil conditions in riparian land cover  
32 types (e.g., cottonwood-willow); dredging activities to create backwaters or backwater  
33 connection with the main river channel; removal or control of undesirable vegetation  
34 such as saltcedar and *Arundo*; and other appropriate means to maintain existing  
35 desirable habitat.

### 36 *Habitat Creation*

37 This section describes conservation measures for creating cottonwood-willow, honey mesquite,  
38 marsh, and backwater land cover types to provide covered species habitat. Habitat creation  
39 involves the direct construction of habitat that results in new habitat at sites that do not

1 presently support habitat (e.g., establishment of cottonwood-willow stands or marsh that  
2 provides habitat for covered species on existing agricultural lands). To the extent practicable  
3 based on site conditions, cottonwood-willow, honey mesquite, marsh, and backwaters would be  
4 created in proximity to each other to recreate integrated mosaics of habitat that approximate the  
5 relationship among aquatic and terrestrial communities historically present along the LCR  
6 floodplain.

7 The LCR MSCP would design and create the following amounts of each land cover type in a  
8 manner that would provide habitat for covered species that could be affected by covered  
9 activities and Conservation Plan implementation:

- 10 • 5,940 acres of cottonwood-willow;
- 11 • 1,320 acres of honey mesquite type III;
- 12 • 512 acres of marsh; and
- 13 • 360 acres of backwaters.

14 The extent of each created land cover type and the extent of created habitat the land cover types  
15 would provide for each covered species are summarized in Table 2.1-5. Patches of created land  
16 cover, in most instances, would be designed and managed to provide habitat for more than one  
17 covered species. Patches of land cover can support habitat for one or more covered species,  
18 although how each species may use the same patch of land cover may differ. For example,  
19 habitat for one species may be supported by the upper layers of canopy in a stand of riparian  
20 land cover, while habitat for another may be supported by the understory vegetation.  
21 Therefore, affected vegetation that provides habitat for more than one covered species can be  
22 replaced within the same footprint of created land cover, where the established land cover  
23 supports the habitat elements of each covered species. Species for which habitat can be created  
24 within the same area of land (if elements of each species' habitat are present and accessible to  
25 the species) are illustrated in Figure 2.1-8 (cottonwood-willow) and Figure 2.1-9 (cottonwood-  
26 willow and marsh land cover). Lands on which land cover types are created to provide habitat  
27 for covered species would be located within designated conservation areas under the  
28 management of the LCR MSCP Program Manager.

29 The length of time that created habitats would be maintained under the LCR MSCP is  
30 dependent on the duration of the effects of the covered activities on covered species (the  
31 covered activities include both those that would result in permanent loss of habitat and those  
32 that would not). The LCR MSCP commits to maintaining in perpetuity the habitat created to  
33 address permanent impacts of implementing the covered activities. This commitment would be  
34 accomplished through a variety of management options, including transfer of purchased  
35 mitigation land to a Federal, state, or appropriate private entity for permanent management for  
36 wildlife values, or creating habitat on existing protected lands. Agreement by the managing  
37 entity to maintain the habitat would be acquired or, if necessary, endowments for the  
38 maintenance of the properties would be provided within the LCR MSCP budget.

**Table 2.1-5. Extent of Covered Species Habitat That Would Be Provided with the Establishment of Land Cover Types  
(Page 1 of 3)**

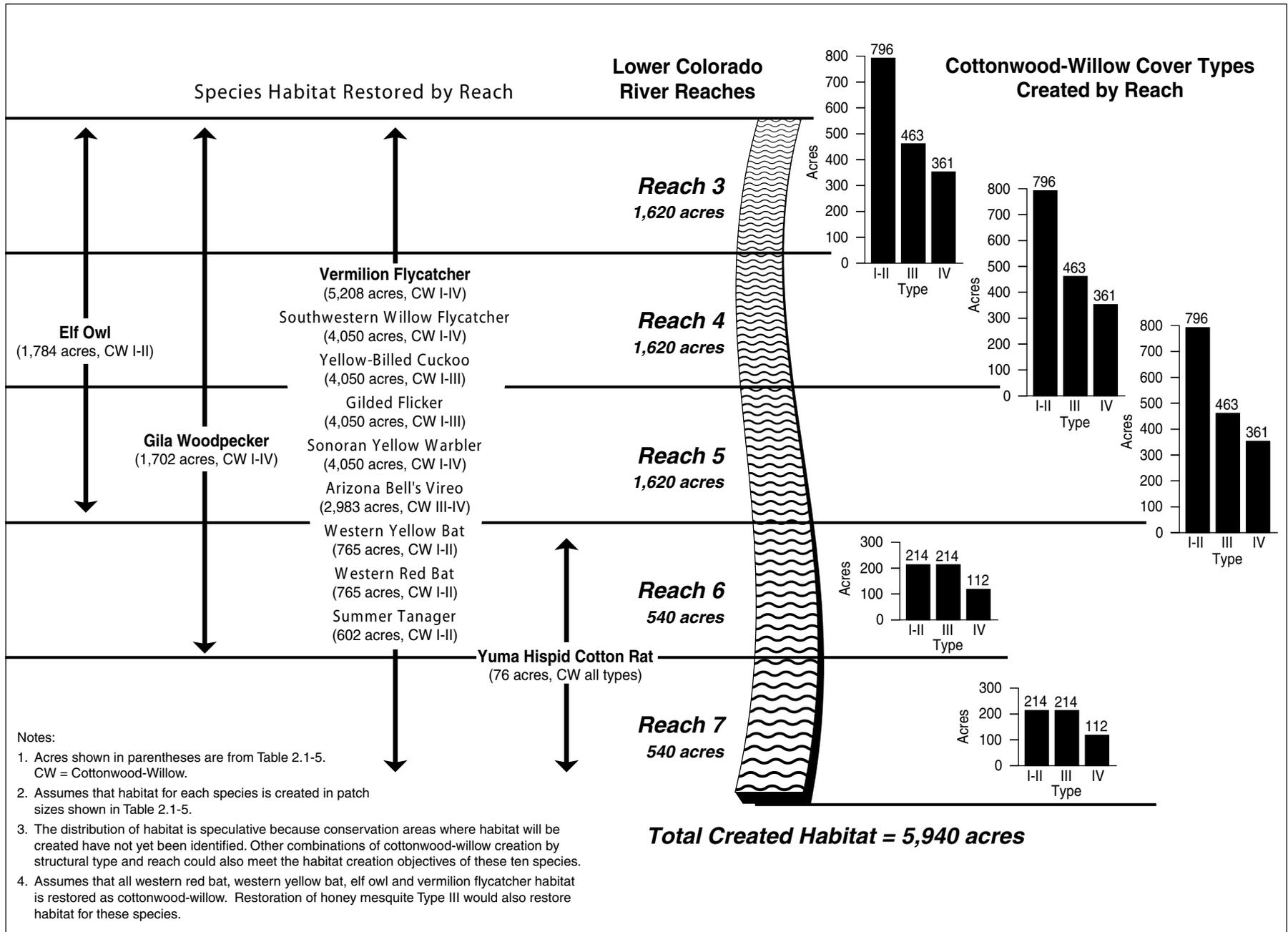
| <i>Created Land Cover Type</i>                     | <i>Species Habitat Provided by the Created Land Cover Type</i>  |
|--|---|
| Create a total of 5,940 acres of cottonwood-willow | Southwestern willow flycatcher: <ul style="list-style-type: none"> <li>• 2,700 acres would be created as cottonwood-willow types I-III with moist surface soil conditions during the breeding season</li> <li>• 1,350 acres would be created as cottonwood-willow types I-IV with moist surface soil conditions during the breeding season</li> </ul> |
|  | Western red bat: <ul style="list-style-type: none"> <li>• 175 acres would be created as cottonwood-willow types I and II to provide roosting habitat<sup>a</sup></li> </ul>   |
|  | Western yellow bat: <ul style="list-style-type: none"> <li>• 175 acres would be created as cottonwood-willow types I and II to provide roosting habitat<sup>a</sup></li> </ul>  |
|  | Yuma hispid cotton rat: <ul style="list-style-type: none"> <li>• 76 acres would be created in Reaches 6 and 7 that support a moist herbaceous understory, including openings in the canopy to allow for the establishment and growth of herbaceous vegetation</li> </ul>  |
|  | Yellow-billed cuckoo: <ul style="list-style-type: none"> <li>• 2,700 acres would be created as cottonwood-willow types I-III with moist surface soil conditions during the breeding season</li> <li>• 1,350 acres would be created as cottonwood-willow types I-III</li> </ul>  |
|  | Elf owl: <ul style="list-style-type: none"> <li>• 600 acres would be created as cottonwood-willow types I and II in Reaches 3-5<sup>b</sup></li> </ul>  |
|  | Gilded flicker: <ul style="list-style-type: none"> <li>• 4,050 acres would be created as cottonwood-willow types I-III in Reaches 3-7</li> </ul>  |
|  | Gila woodpecker: <ul style="list-style-type: none"> <li>• 1,702 acres would be created as cottonwood-willow types I-IV in Reaches 3-6</li> </ul>  |
|  | Vermilion flycatcher: <ul style="list-style-type: none"> <li>• 4,008 acres would be created as cottonwood-willow types I-IV</li> </ul>  |
|  | Arizona Bell's vireo: <ul style="list-style-type: none"> <li>• 1,763 acres would be created as cottonwood-willow types III and IV</li> </ul>  |
|  | Sonoran yellow warbler: <ul style="list-style-type: none"> <li>• 4,050 acres would be created as cottonwood-willow types I-IV</li> </ul>  |

**Table 2.1-5. Extent of Covered Species Habitat That Would Be Provided with the Establishment of Land Cover Types**  
(Page 2 of 3)

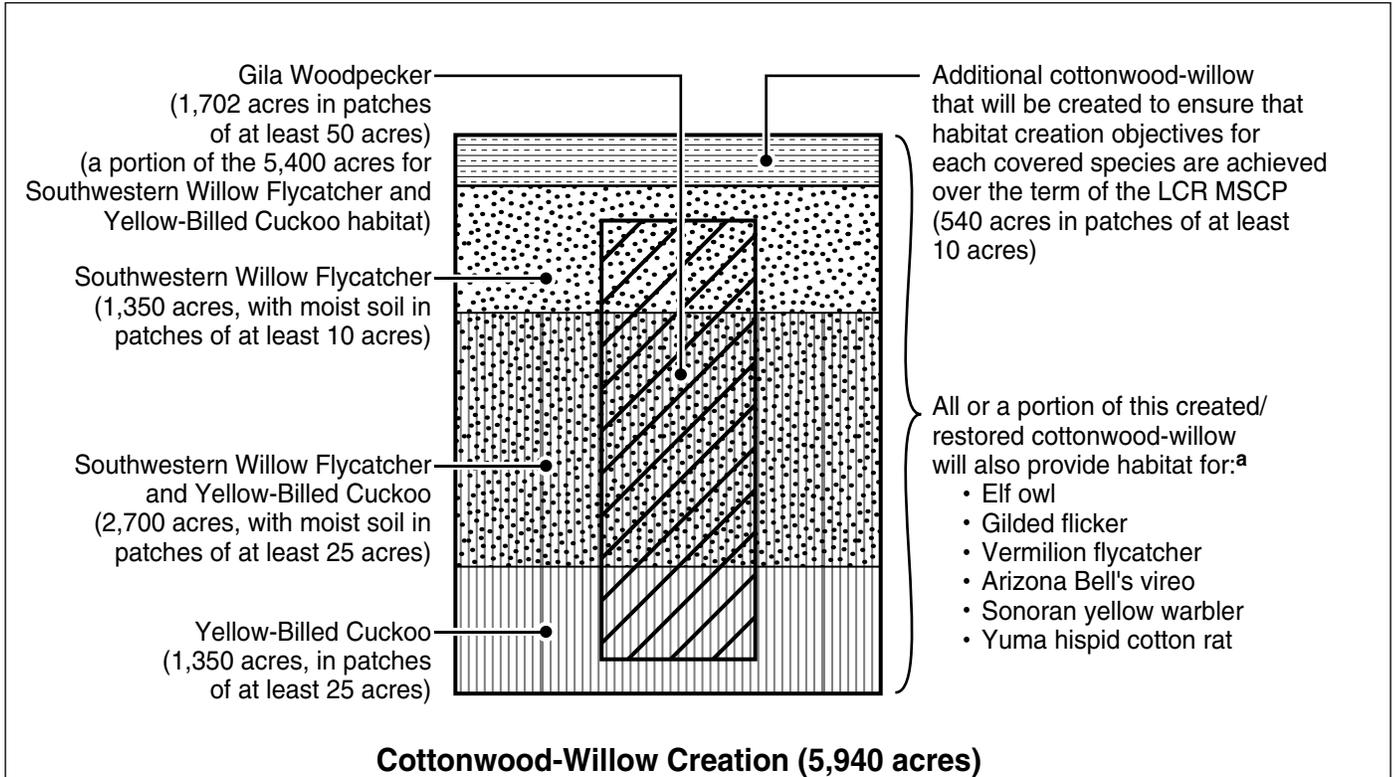
| <i>Created Land Cover Type</i>                      | <i>Species Habitat Provided by the Created Land Cover Type</i>   |
|---|--|
|   | Summer tanager: <ul style="list-style-type: none"> <li>• 602 acres would be created as cottonwood-willow types I and II</li> </ul>   |
| Create a total of 1,320 acres of honey mesquite III | Western red bat: <ul style="list-style-type: none"> <li>• 590 acres would be created to provide roosting habitat<sup>a</sup></li> </ul>  |
|   | Western yellow bat: <ul style="list-style-type: none"> <li>• 590 acres would be created to provide roosting habitat<sup>a</sup></li> </ul>   |
|   | Elf owl: <ul style="list-style-type: none"> <li>• 1,184 acres would be created in Reaches 3-5<sup>b</sup></li> </ul>   |
|   | Vermilion flycatcher: <ul style="list-style-type: none"> <li>• 1,200 acres would be created</li> </ul>   |
|   | Arizona Bell's vireo: <ul style="list-style-type: none"> <li>• 1,200 acres would be created</li> </ul>   |
|   | MacNeill's sootywing skipper: <ul style="list-style-type: none"> <li>• 222 acres would be created with quail bush to create the honey mesquite-quail bush edge required by this species near existing occupied habitat in Reaches 1-4</li> </ul> |
| Create a total of 512 acres of marsh                | Yuma clapper rail: <ul style="list-style-type: none"> <li>• 512 acres would be created with water depths no greater than 12 inches</li> </ul>  |
|   | Colorado River cotton rat: <ul style="list-style-type: none"> <li>• 120 acres would be created in Reaches 3 and 4</li> </ul>   |
|   | Western least bittern: <ul style="list-style-type: none"> <li>• 512 acres would be created with water depths no greater than 12 inches</li> </ul>  |
|   | California black rail: <ul style="list-style-type: none"> <li>• 130 acres would be created with water depths no greater than 1 inch in Reaches 5 and 6</li> </ul>  |
| Create a total of 360 acres of backwater            | Bonytail: <ul style="list-style-type: none"> <li>• 360 acres would be created in Reaches 3-6 that contain the physical, chemical, and biological conditions required to support native LCR fishes in a healthy condition</li> </ul>              |

**Table 2.1-5. Extent of Covered Species Habitat That Would Be Provided with the Establishment of Land Cover Types**  
(Page 3 of 3)

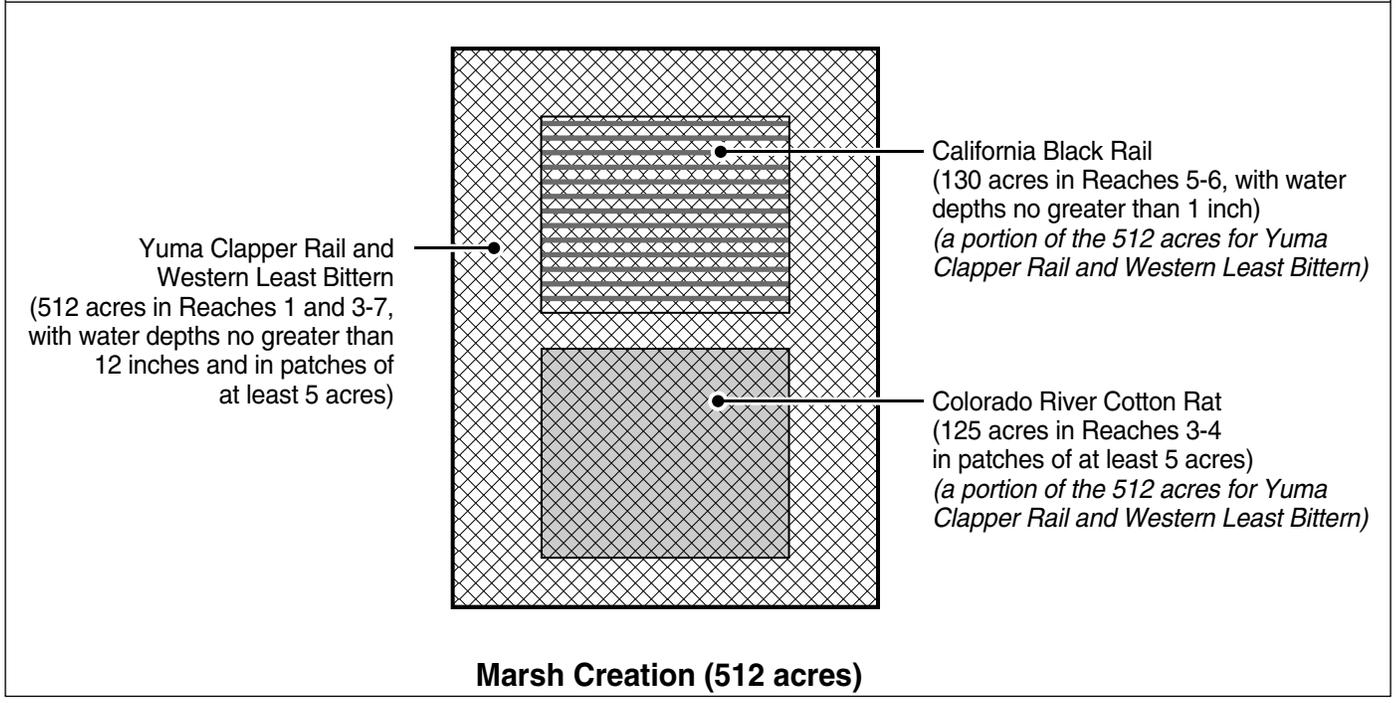
| <i>Created Land Cover Type</i>  | <i>Species Habitat Provided by the Created Land Cover Type</i>  |
|---|---|
|   | <p>Razorback sucker:</p> <ul style="list-style-type: none"> <li>• 360 acres would be created in Reaches 3–6 that contain the physical, chemical, and biological conditions required to support native LCR fishes in a healthy condition</li> </ul> <p>Flannelmouth sucker:</p> <ul style="list-style-type: none"> <li>• Up to 85 acres would be created in Reach 3 that contain the physical, chemical, and biological conditions required to support native LCR fishes in a healthy condition</li> </ul> |
| <p><i>Notes:</i></p> <p>a Cottonwood-willow types I and II and honey-mesquite type III provide roosting habitat for this species. The LCR MSCP Conservation Plan would provide a total of 765 acres of habitat for this species by creating a combination of 765 acres of cottonwood-willow types I and II and honey mesquite type III land cover type. The quantity of each created land cover type presented in this table is for illustrative purposes only – the actual amount of each land cover type that would be created to provide habitat for this species would depend on a number of factors, including site availability and conditions for creating each of the land cover types. For example, the habitat creation objective of 765 acres for this species could also be achieved by creating 100 acres of cottonwood-willow types I and II and 665 acres of honey mesquite type III.</p> <p>b Cottonwood-willow types I and II and honey-mesquite type III provide elf owl habitat. The LCR MSCP Conservation Plan would provide a total of 1,784 acres of habitat for this species by creating a combination of 1,784 acres cottonwood-willow types I and II and honey mesquite type III. The quantity of each created land cover type presented in this table is for illustrative purposes only – the actual amount of each land cover type that would be created to provide elf owl habitat would depend on a number of factors, including site availability and conditions for creating each of the land cover types. For example, the habitat creation objective of 1,784 acres for this species could also be achieved by creating 1000 acres of cottonwood-willow types I and II and 784 acres of honey mesquite type III.</p> |   |



**Figure 2.1-8. Hypothetical Distribution of Cottonwood-Willow Creation that Would Meet Habitat Requirements for all Covered Species Associated with Cottonwood-Willow**



<sup>a</sup>The portion of created cottonwood-willow that will provide habitat for these species is dependent on the structure type of cottonwood-willow required by each species and the reaches in which the species occurs or is assumed to occur (Table 2.1-5).



**Figure 2.1-9. Proportion of Created Cottonwood-Willow and Marsh that would Provide Habitat for Selected Covered Species**

1 COTTONWOOD-WILLOW

2 Cottonwood-willow land cover would be created to provide the habitat elements for the  
3 covered species that use this land cover type, as shown on Table 2.1-5. The Conservation Plan  
4 would replace 2,132 acres of cottonwood-willow that would be removed or could be degraded  
5 by non-flow and flow-related covered activities with 5,940 acres of created and actively  
6 managed cottonwood-willow of higher quality than the affected land cover.

7 Cottonwood-willow would be created in specific patches of land cover types, such as saltcedar  
8 and agricultural lands, that are not considered to support habitat for cottonwood-willow  
9 associated covered species. To the extent practicable, cottonwood-willow would be created in  
10 conjunction with honey mesquite, *Atriplex* spp., other native riparian species, and marsh and  
11 backwater vegetation to meet the habitat requirements of the covered species and to create an  
12 integrated mosaic of functional habitats. In addition, creation of large patches of habitat would  
13 reduce the likelihood for cowbird nest parasitism on several covered bird species whose  
14 populations have declined and are now being affected by nest parasitism. Creation of  
15 cottonwood-willow in patches suitable for these species would also meet the habitat patch  
16 requirements for other riparian-associated covered species.

17 Depending on site-specific conditions, creation of cottonwood-willow stands may require  
18 creating canals and seasonally wet swales, creating some topographic diversity, and planting or  
19 seeding the site with cottonwoods, willows, honey mesquite, and other native riparian species,  
20 such as quail bush and saltbush. It is anticipated that most created cottonwood-willow land  
21 cover would be flood irrigated. After planting or seeding, removal of saltcedar and  
22 management of other invasive exotic species may be required. Created cottonwood-willow  
23 designed to provide southwestern willow flycatcher habitat would be specifically managed to  
24 ensure that moist surface soil, slow-moving water, or ponded water conditions are present  
25 during the breeding season to ensure the production of the flycatcher's flying insect prey base.  
26 Once established, patches of created cottonwood-willow would be actively managed to  
27 maintain the seral stages and other patch attributes that are required habitat elements for the  
28 covered species for which each patch of created cottonwood-willow is intended to provide  
29 habitat.

30 Major design elements for creating cottonwood-willow as habitat for covered species include  
31 the following:

- 32 • creating large blocks of cottonwood-willow forest necessary to provide yellow-billed  
33 cuckoo habitat interspersed with bands of honey mesquite established at higher site  
34 elevations;
- 35 • excavating and supplying water to canals and shallow swales that dissect blocks of  
36 created forest to provide water and forest-edge conditions necessary to support  
37 southwestern willow flycatcher habitat, create the microrelief and soil moisture  
38 conditions necessary to support a diversity of understory plant species, and distribute  
39 irrigation water;
- 40 • actively managing created forest to maintain the seral stages required by covered  
41 species;

- 1 • irrigating to water and establish planted cottonwood-willow and mesquite seedlings  
2 (once stands have become established, ongoing maintenance of the native vegetation  
3 would include limiting establishment of saltcedar and other nonnative species to  
4 maintain habitat quality for associated covered species); and
- 5 • periodically irrigating, when necessary, to prevent the buildup of salts in the soil.

6 Successful creation of cottonwood-willow riparian forest requires that the physical processes  
7 that determine habitat structure and dynamics in riparian systems be mimicked as much as  
8 possible. In suitable locations, this component of the Conservation Plan would include  
9 mimicking overbank flooding by flood irrigation, in particular in the spring and early summer,  
10 but also later in the season to maintain a shallow groundwater table. Maintaining a shallow  
11 groundwater table would help maintain herbaceous understory vegetation as well as woody  
12 riparian vegetation. Creation would also include seeding of cottonwoods and willows during  
13 the natural dispersal period or allowing for self-seeding. Following the establishment of  
14 vegetation, irrigation would continue as needed to maintain moist soil conditions during the  
15 breeding season for covered bird species and to prevent the buildup of salts in the soil. In  
16 addition, stands would be managed to maintain the seral stages required by the covered species  
17 and the essential habitat parameters and minimum habitat area requirements for the  
18 southwestern willow flycatcher, western yellow-billed cuckoo, and other riparian-associated  
19 covered species. Monitoring and research through the adaptive management process would  
20 guide cottonwood-willow habitat management. (Active management may include apical  
21 pruning, bole reduction, vegetative propagation via willow limb and bole prostration in moist  
22 soil.)

#### 23 HONEY MESQUITE

24 The Conservation Plan would replace 590 acres of honey mesquite land cover type III that  
25 provide habitat for the elf owl, vermilion flycatcher, and Arizona Bell's vireo and that would be  
26 removed by non-flow-related activities with 1,320 acres of established and actively managed  
27 honey mesquite type III. The composition and structure of the established honey mesquite land  
28 cover would be consistent with Anderson and Ohmart's (1976, 1984a) vegetation classification  
29 type III. Honey mesquite would be created in conjunction with created cottonwood-willow and  
30 backwaters to create an integrated mosaic of habitats. Depending on site-specific conditions,  
31 honey mesquite may be created in small patches or as bands within created cottonwood-willow  
32 and adjacent to backwaters at suitable site elevations or as larger patches (e.g., greater than 50  
33 acres) adjoining created or existing habitats. It is anticipated that creation of large blocks of  
34 honey mesquite generally would require removing existing saltcedar-dominated stands of  
35 riparian vegetation or clearing agricultural land, planting and irrigating honey mesquite  
36 seedlings, and seeding or planting native understory vegetation. Quail bush, saltbush, and  
37 other native riparian vegetation may also be planted along the perimeter of created honey  
38 mesquite where topography and soil conditions are suitable.

#### 39 MARSH

40 The Conservation Plan would replace 243 acres of marsh that provide habitat for covered  
41 species and could be removed or degraded by covered activities with 512 acres of marsh that  
42 provide habitat for affected covered species. Replacement marsh would be designed and

1 managed to provide habitat for the Yuma clapper rail, California black rail, western least  
2 bittern, and Colorado River cotton rat. Replacement marsh would be provided by creating new  
3 marsh in locations with suitable soils and water availability. Patches of new marsh would be  
4 created, designed, and managed to provide an integrated mosaic of habitat for the Yuma  
5 clapper rail and California black rail. Creation of habitat for these species would also provide  
6 habitat for the western least bittern and Colorado River cotton rat. Habitat creation activities  
7 could include, but not be limited to the following:

- 8 • Creating moist soil units vegetated with bulrush, with infrastructure that would allow  
9 water levels to be managed to depths required by the California black rail,
- 10 • Dredging and planting emergent vegetation in newly established backwaters and marsh  
11 components of conservation areas, and
- 12 • Restoring hydrologic conditions in existing degraded, nonfunctional marsh to create  
13 marsh that functions as habitat for covered species.

14 Long-term management activities to maintain the established habitat could include burning, or  
15 applying other appropriate management measures, to remove dead mats of emergent  
16 vegetation to encourage growth of cattails and bulrush as the established marshes mature.

#### 17 BACKWATER

18 The Conservation Plan would replace 399 acres of backwaters and river channels that provide  
19 habitat for the bonytail, razorback sucker, and flannelmouth sucker that would be affected by  
20 flow-related activities, with 360 acres of created and actively managed connected and  
21 disconnected backwaters. Backwater creation would provide habitat for the razorback sucker  
22 and bonytail and provide surface and groundwater hydrology in support of existing or created  
23 habitat for southwestern willow flycatcher, western yellow-billed cuckoo, clapper rail, elf owl,  
24 and other covered species. Disconnected backwaters isolated from non-native fish communities  
25 in the river or reservoirs could provide habitat for a recruiting population of native fish,  
26 production facilities (grow-out or harvestable surplus of natural recruitment), and research  
27 facilities on habitat use and species interactions and would ultimately serve as refuges for these  
28 species. Backwaters that are disconnected from the LCR channel are of considerably higher  
29 value to bonytail and razorback sucker in the LCR and are the preferred type to achieve LCR  
30 MSCP conservation goals for these species. (Fish reared under the Conservation Plan and  
31 stocked into these backwaters would count toward total augmentation numbers for razorback  
32 sucker and bonytail, described below.) Connected backwaters would be designed to provide  
33 the environmental conditions necessary to support adult or subadult razorback sucker,  
34 bonytail, and flannelmouth sucker. Vegetation, substrate, depth, water quality, and continuity  
35 with the adjacent river or reservoir are important habitat elements for these species.

36 Where possible, backwater creation would be combined with the creation of riparian and marsh  
37 land cover types to provide a mosaic of land cover types. Backwaters would be designed to  
38 provide for the establishment of bulrush and cattail along the edges. Depending on the extent  
39 of marsh vegetation established at each site, breeding and/or dispersal habitat may be created  
40 for the Yuma clapper rail. Backwater creation within or adjacent to existing or created patches  
41 of riparian vegetation provides the two major components of southwestern willow flycatcher  
42 breeding habitat—structure for nest site placement and standing water and saturated soils for

1 production of insect prey. Backwaters, integral to flycatcher breeding habitat, would be  
2 designed and managed to maintain standing water and moist soils during the southwestern  
3 willow flycatcher breeding season. Where backwaters are created in or adjacent to extensive  
4 stands of riparian forest, they would also contribute to maintaining the humid microclimate  
5 conditions required by nesting yellow-billed cuckoos.

#### 6 *Fish Augmentation Strategies*

7 In addition to replacing covered fish species habitat affected by covered activities, the LCR  
8 MSCP would rear and stock fish to augment the existing population of razorback sucker and  
9 bonytail in the LCR. To offset any potential take of razorback sucker and bonytail, the LCR  
10 MSCP commits to providing the level of funding necessary to produce:

- 11 • up to 660,000 subadult razorback sucker (at least 300 mm [~12 inches] in length); and
- 12 • up to 620,000 bonytail (at least 300 mm [~12 inches] in length).

13 These augmentations would be structured as described below under “Species-Specific  
14 Conservation Measures for Covered Species” in section 2.1.1.5. Funds not used for production  
15 of fish would be used for other management actions that would benefit the populations of both  
16 species.

17 Existing fish rearing capacity and aquacultural techniques may initially be insufficient to meet  
18 the augmentation objectives described above. Accordingly, in the initial years of Conservation  
19 Plan implementation, the LCR MSCP would:

- 20 • Monitor the response of razorback suckers to previous augmentations and stock the  
21 numbers of razorback sucker that can be produced up to the amounts described above;
- 22 • Assess the efficacy of existing or proposed bonytail production programs and facilities  
23 and develop the methods required to produce and rear the fish;
- 24 • Increase rearing capacity, if necessary, in cooperation among AGFD, CDFG, NDOW, the  
25 Service, and other LCR MSCP participants, or fish may be acquired from other sources;
- 26 • Construct, in the context of the integrated landscape mosaic, a “pilot project” for isolated  
27 backwaters that can be used for recruiting populations, grow-out facilities, or research  
28 within the planning area.

29 The LCR MSCP would also monitor fish response to augmentations and conduct adaptive  
30 management experiments to collect information necessary to evaluate and adaptively manage  
31 implementation to better ensure program objectives are achieved.

#### 32 *Other Conservation Strategies*

##### 33 **CONTRIBUTE TO ONGOING CONSERVATION PROGRAMS**

34 The LCR MSCP would contribute up to \$1.25 million to entities charged with ongoing programs  
35 to conserve covered species within and outside of the planning area. Funding would be  
36 provided only to implement species conservation actions that have been identified to contribute

1 to the conservation of the species and for which other funding is not available. Covered species  
2 for which the LCR MSCP would fund conservation measures through other ongoing programs  
3 include the relict leopard frog, humpback chub, flannelmouth sucker, sticky buckwheat, and  
4 threecorner milkvetch.

5 COVERED SPECIES POPULATION ENHANCEMENT STRATEGIES

6 Species-specific population enhancement conservation measures are designed to address  
7 species conservation needs that cannot be addressed through maintenance of existing habitat or  
8 creation of habitat. Examples of population enhancement measures include collecting wild fish  
9 spawn, raising brood and young fish at hatcheries and rearing ponds, and releasing them into  
10 the river and backwaters; controlling piscivorous fish and nonnative amphibians in advance of  
11 releases into created backwaters; placing nest boxes in created cottonwood-willow land cover to  
12 increase nesting success for cavity-nesting species; and controlling brown-headed cowbirds to  
13 reduce adverse effects of nest parasitism on covered species. Specific descriptions of population  
14 enhancement conservation measures are presented below under “Monitoring and Research  
15 Measures” and “Species-Specific Conservation Measures for Covered Species” in section 2.1.1.5.

16 PROTECTION OF EXISTING HABITAT

17 The Conservation Plan is directed toward creating new covered species habitats to replace  
18 affected habitats and contribute to the recovery of covered species. Under specific  
19 circumstances, however, existing unprotected covered species habitats may be acquired,  
20 protected, and managed under the LCR MSCP to prevent their future loss or degradation. If  
21 existing habitat is protected under the LCR MSCP, the extent of the protected covered species  
22 habitat would be credited in lieu of an equal amount of the applicable covered species habitat to  
23 be created under the Conservation Plan (e.g., if 100 acres of existing southwestern willow  
24 flycatcher habitat are acquired and protected, 100 fewer acres would be created than is  
25 identified in the Conservation Plan). For existing unprotected habitat to be protected and  
26 managed under the LCR MSCP, the Program Manager would evaluate each identified property  
27 on a case-by-case basis.

28 AVOIDANCE AND MINIMIZATION OF IMPACTS

29 The Conservation Plan includes measures to avoid and minimize impacts of implementing  
30 covered activities and the Conservation Plan on covered and evaluation species. Examples of  
31 such measures include avoiding declines in groundwater and surface water elevations by  
32 installing infrastructure to maintain water elevations and designing LCR MSCP-created  
33 habitats to avoid removal of cottonwood-willow land cover and southwestern willow flycatcher  
34 habitat. Specific descriptions of avoidance and minimization conservation measures are  
35 presented below under “Avoidance and Minimization Measures” and “Species-Specific  
36 Conservation Measures for Covered Species” in section 2.1.1.5.

37 **2.1.1.4 Conservation Area Site Selection, Design, and Management**

38 Conservation areas are lands on which land cover types would be created to mitigate impacts of  
39 covered activities and LCR MSCP implementation on existing covered species habitat. Once

1 established, conservation areas would be maintained and managed to ensure continued habitat  
2 persistence and function.

### 3 *Conservation Area Site Selection*

4 The LCR MSCP would create 8,132 acres of habitat for covered species and would select  
5 conservation areas in which to create habitat from the following:

- 6 • among 30 potentially suitable habitat establishment sites that have been initially  
7 identified, surveyed, and evaluated by the LCR MSCP participants (Ogden  
8 Environmental and Energy Services 1999; CH2MHill 1999; SWCA Environmental  
9 Consultants 2000; Inter-Agency Team 1999, 2000a, 2000b, 2000c; SAIC/Jones & Stokes  
10 2001
- 11 • available agricultural lands; and
- 12 • other undeveloped lands.

13 Approximately 37,500 acres are present in the 30 initially identified conservation area sites  
14 (Table 2.1-6, Figure 2.1-10), and approximately 270,500 acres of agricultural lands are present in  
15 the planning area (Table 2.1-7). Consequently, sufficient suitable sites are available to the LCR  
16 MSCP to successfully create the required 8,132 acres of covered species habitat (representing  
17 approximately 3 percent of the lands identified in Tables 2.1-6 and 2.1-7).

18 The process for selecting conservation areas would involve application of site-selection criteria  
19 and require collection of sufficient information to properly evaluate the potential for the  
20 successful creation of habitat before conservation areas are acquired. It is the intent of the LCR  
21 MSCP participants to create habitats in locations and patch sizes that would best meet the  
22 conservation needs of the covered species and to manage those habitats in a manner that would  
23 meet species' seasonal habitat requirements, within the constraints associated with land  
24 availability. Conservation site-selection criteria include the following:

- 25 • presence of and proximity to existing occupied covered species habitats;
- 26 • suitability of site conditions for restoring habitat for specific species (e.g., appropriate  
27 soils, availability of water for irrigation);
- 28 • available requisite infrastructure (e.g., access roads, irrigation-related infrastructure);
- 29 • relative suitability for achieving multiple creation objectives through an integrated  
30 mosaic of habitat types;
- 31 • likelihood for mosquitoes produced on a site to become a vector control or nuisance  
32 problem based on proximity to urban areas and mosquito production potential;

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**Table 2.1-6. Summary of Initially Identified Conservation Areas**

| Potential Conservation Area                    | River Mile  | Ownership Status <sup>a</sup> | Total Area <sup>b</sup> (acres) | Cottonwood - Willow | Honey Mesquite III | Riparian <sup>c</sup> | Marsh     |
|--|-------------|-------------------------------|---------------------------------|---------------------|--------------------|-----------------------|-----------|
| Hualapai Wilderness Riparian Restoration       | GC 243-260  | T                             | 60                              | 0                   | 0                  | 60                    | 0         |
| Hualapai Lost Creek Riparian Improvement       | GC 247      | T                             | 2                               | 1                   | 0                  | 0                     | 0         |
| Lake Mead Riparian Restoration <sup>d</sup>    | 418-343     | F                             | 500                             | 0                   | 0                  | 500                   | 0         |
| Lake Mohave Riparian Restoration <sup>e</sup>  | 326-278     | F                             | 200                             | ND                  | ND                 | ND                    | ND        |
| Backwaters and Sloughs I                       | 266-264     | S                             | 450                             | 100                 | 250                | 0                     | 50        |
| Cimarron Agricultural Conversion               | 254-253.3   | T                             | 97                              | 97                  | 0                  | 0                     | 0         |
| Long Lake                                      | 254-252     | T                             | 570                             | 0                   | 0                  | 562                   | 0         |
| Pauite Wash Restoration                        | 251.5       | T                             | 630                             | 20                  | 200                | 0                     | 0         |
| Twin Lakes                                     | 251-249     | T                             | 165                             | 150                 | 0                  | 0                     | 0         |
| Section 33 Agricultural Conversion             | 250.5       | T                             | 150                             | 150                 | 0                  | 0                     | 0         |
| Section 20 Riparian and Native Fish Rest.      | 243-244     | T                             | 1,326                           | 0                   | 0                  | 1,226                 | 0         |
| Chemehuevi Rearing Pond Cove Enhance.          | 216-208.5   | T                             | 54                              | ND                  | ND                 | ND                    | ND        |
| Chemehuevi Wilderness Riparian Restoration     | 212.5-208.5 | T                             | 124                             | 124                 | 0                  | 0                     | 0         |
| Chemehuevi Agricultural Conversion             | Chem Res    | T                             | 40                              | 40                  | 0                  | 0                     | 0         |
| Chemehuevi Desert Wash Revegetation            | Chem Res    | T                             | 100                             | ND                  | ND                 | ND                    | ND        |
| 'Ahakhav Tribal Preserve                       | 175-169     | T                             | 1,010                           | 280                 | 530                | 0                     | 0         |
| Mohave and Deer Tail Backwaters                | 169-166     | T                             | 800                             | 170                 | 540                | 0                     | 0         |
| A7 Backwater                                   | 121-117     | S                             | 1,560                           | 670                 | 590                | 0                     | 0         |
| A10 Backwater                                  | 115-114     | F                             | 220                             | 110                 | 80                 | 0                     | 0         |
| Swendt Slough                                  | 111-110     | S                             | 235                             | 50                  | 160                | 0                     | 0         |
| Cibola Valley Irrigation and Drainage District | 110-107     | P                             | 1,030                           | 515                 | 515                | 0                     | 0         |
| BLM Agricultural Leases within PVID            | 107-102     | F                             | 2,200                           | 2,110               | 60                 | 0                     | 0         |
| Cibola Meander, Arizona Side                   | 104.5-101.5 | P                             | 1,040                           | 700                 | 300                | 0                     | 0         |
| Palo Verde Oxbow Enhancement                   | 102-100     | P,F                           | 1,560                           | 620                 | 20                 | 0                     | 0         |
| Sempre Property Land Acquisition               | 113-96.5    | P                             | 17,000                          | ND                  | ND                 | ND                    | 0         |
| Cibola Restoration Concepts                    | 96-88       | R,F                           | 230                             | 70                  | 110                | 0                     | 0         |
| Laguna Old Channel Restoration                 | 49-43       | S                             | 1,425                           | 770                 | 420                | 0                     | 0         |
| Yuma East Wetlands Pilot Project               | 34.2-30.8   | S,T,F,P                       | 1,305                           | 580                 | 0                  | 0                     | 0         |
| Cocopah Tribal Enhancement Proposal            | 27-9        | T                             | 1,223                           | 0                   | 0                  | 1,223                 | 0         |
| Limitrophe BLM Habitat Restoration             | 8-0         | F                             | 770                             | 740                 | 20                 | 0                     | 0         |
| <b>Acreage Totals</b>                          |             |                               | <b>37,526</b>                   | <b>7,917</b>        | <b>3,795</b>       | <b>3,571</b>          | <b>50</b> |

Notes:

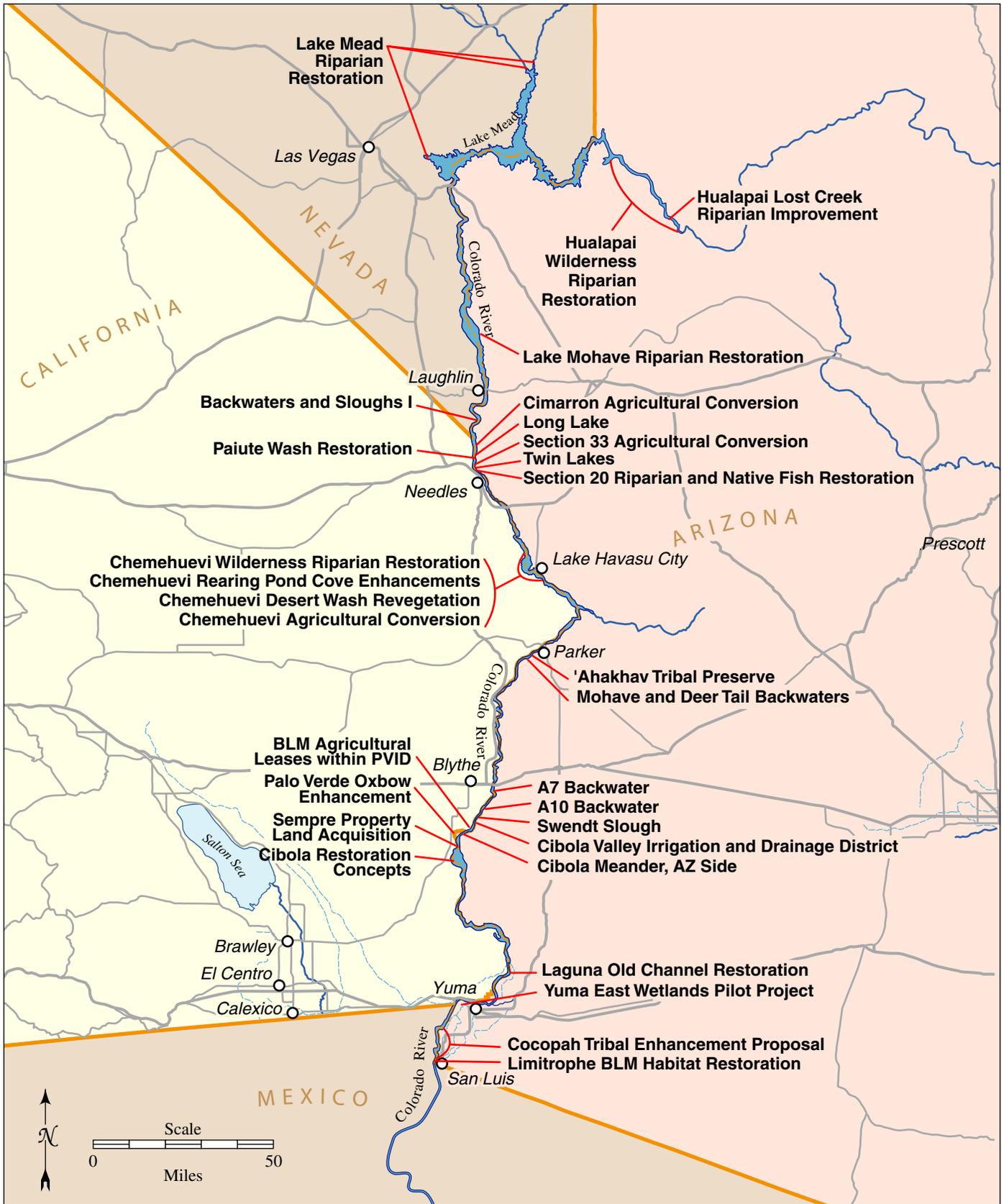
ND= no data available  
GC= Grand Canyon  
a Ownership Status Symbols:  
F = Federal (non refuge)  
R = National Wildlife Refuge  
S = State  
Chem Res = Chemehuevi Indian Reservation  
BLM = Bureau of Land Management  
T = Tribal  
P = Private

b The total extent of potential conservation areas may include land cover types (e.g., developed lands and desert scrub) that are not suitable for establishment of covered species habitat. Consequently, the total extent of established habitat may be less than the total extent of the conservation area.

c The design for the specific composition of this created riparian land cover has not yet been developed. Land cover types could include cottonwood-willow, honey mesquite, arrowweed, atriplex, and other riparian land cover types.

d Habitat created in this potential conservation area would be in addition to the Federal covered activities described in the LCR MSCP BA that will also restore habitat at Lake Mead.

e Habitat created in this potential conservation area would be in addition to the Federal covered activities described in the LCR MSCP BA that will also restore habitat at Lake Mohave.



**Figure 2.1-10. LCR MSCP Potential Conservation Areas**

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**Table 2.1-7. Agricultural Land by River Reach and Landowner Category**

| <i>River Reach</i> <sup>1</sup>  | <i>Owner Category</i>       | <i>Agricultural Land (acres)</i> |
|--|-----------------------------|----------------------------------|
| Reach 3  | Federal/state refuge        | 222                              |
|  | Tribal land                 | 11,510                           |
|  | Private                     | 5,789                            |
|  | Not identified <sup>2</sup> | 0                                |
|  | Total                       | 19,159                           |
| Reach 4  | Federal/state refuge        | 1,551                            |
|  | Other Federal/state         | 8,874                            |
|  | Tribal land                 | 78,061                           |
|  | Private                     | 81,118                           |
|  | Not identified <sup>2</sup> | 0                                |
|  | Total                       | 169,604                          |
| Reach 5  | Federal/state refuge        | 256                              |
|  | Other Federal/state         | 4                                |
|  | Total                       | 260                              |
| Reach 6  | Federal/state refuge        | 65                               |
|  | Other Federal/state         | 3,314                            |
|  | Tribal land                 | 7,292                            |
|  | Private                     | 25,207                           |
|  | Not identified <sup>2</sup> | 908                              |
|  | Total                       | 36,786                           |
| Reach 7  | Other Federal/state         | 1,847                            |
|  | Tribal land                 | 883                              |
|  | Private                     | 41,943                           |
|  | Not identified <sup>2</sup> | 32                               |
|  | Total                       | 44,705                           |
| All Reaches  | Federal/state refuge        | 2,096                            |
|  | Other Federal/state         | 15,677                           |
|  | Tribal land                 | 97,745                           |
|  | Private                     | 154,057                          |
|  | Not identified <sup>2</sup> | 940                              |
|  | Grand total                 | 270,514                          |
| <p>1 No Lower Colorado River Accounting System agricultural landowner data are available for Reaches 1 and 2. Reaches 1 and 2 do not contain agricultural land because the river in this area is generally bordered by cliffs rather than the broad plains that are conducive to such uses.</p> <p>2 No landowner data is available; however, landowners could include any of the other landowner categories.</p> <p>Sources: USBR 2003a, 2002</p> |                             |                                  |

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- 1 • cost of land acquisition (e.g., fee title, conservation easement, lease);
- 2 • timing of availability relative to the need for implementing conservation measures;
- 3 • consideration of zoning and general plan designations;
- 4 • relative cost of implementing and maintaining established habitat; and
- 5 • availability and cost of water to meet establishment and maintenance requirements.

6 *Conservation Area Design Concepts*

7 Once the location of conservation areas is determined based on the site selection criteria, a  
8 conservation area design plan would be developed specific to the conservation area to meet  
9 covered species habitat needs. The conservation area design plans would incorporate created  
10 habitat, existing habitat if present, and, if necessary, buffer areas to protect conservation area  
11 habitats from activities on adjacent lands that could degrade Conservation Plan habitats.  
12 Important conservation area design concepts that would guide implementation of the habitat  
13 creation element of the Conservation Plan are described below:

- 14 1. Habitat would be created in patches equal to or greater than the patch sizes required to  
15 support sustainable occupancy of the target-covered species.
- 16 2. Conservation areas would be designed to create an integrated mosaic of vegetation to  
17 approximate the historical juxtaposition of communities along the LCR. Examples of  
18 how this may be accomplished include the following:
  - 19 a. approximating the historical floodplain community by establishing an integrated  
20 mosaic of patches of cottonwood-willow, honey mesquite, *Atriplex* spp., other  
21 native riparian species, and backwater and emergent vegetation; and
  - 22 b. creating habitat in locations where, in combination with existing adjacent habitat,  
23 habitat mosaics are created or enhanced.
- 24 3. Created habitat for species with limited distribution along the LCR and with limited  
25 ability to move among habitat patches along the LCR would be located near known  
26 populations to facilitate future occupancy of created habitats.
- 27 4. To create large patches of habitat that would be more likely to support high numbers of  
28 associated covered species, priority would be given to creating habitat near existing  
29 habitats.
- 30 5. To the extent consistent with the conservation area site-selection criteria, preference  
31 would be accorded to locating created habitat on Federal, state, and tribal lands. If  
32 suitable public lands were not available, private land would be considered on the  
33 principle of willing seller or lessor. Preference also would be given to acquisition and  
34 design of large patches.
- 35 6. Management of conservation areas includes a commitment to:
  - 36 a. reduce the risk of the loss of created habitat to wildfire by providing resources to  
37 suppress wildfires (e.g., contributing to and integrating with local, state, and  
38 Federal agency fire management plans),

- 1           b. design conservation areas to contain wildfire and facilitate rapid response to  
2           suppress fires (e.g., fire management plans would be an element of each  
3           conservation area management plan), and
- 4           c. implement land management and habitat creation measures in conservation  
5           areas to support the re-establishment of native vegetation that is lost to wildfire  
6           or other destructive events.
- 7       7. Conservation areas would, as needed, incorporate buffer areas to minimize the potential  
8       effects of wildfire, existing land uses, and other activities that may be associated with  
9       adjacent lands that could adversely affect the ecological functions associated with  
10       established habitats. Conservation areas would be designed to minimize the need for  
11       buffers by locating, juxtaposing, and managing established habitats in a manner that  
12       would minimize the effect of activities/events that may occur on adjacent lands. The  
13       need for buffer lands would be determined based on the site-specific needs identified for  
14       each conservation area. Lands acquired and designated as buffers for conservation areas  
15       would not be lands that are established as covered species habitat. In order to avoid  
16       potential impacts to aircraft from increases in bird populations, the conservation  
17       measures would be implemented in compliance with Federal Aviation Administration  
18       (FAA) Guidelines.
- 19       8. Conservation areas would be located and designed to incorporate, to the greatest extent  
20       practicable, existing infrastructure and to minimize the need for construction of new  
21       infrastructure required for establishment and management of habitats. The extent of  
22       land required for new infrastructure to manage conservation areas would be based on  
23       site-specific needs identified for each conservation area, and lands required for new  
24       infrastructure would be in addition to lands enhanced and established as covered  
25       species habitat.
- 26       9. Design and management of conservation areas would be coordinated with appropriate  
27       local health officials to incorporate, to the extent practicable, design and management  
28       concepts to help reduce the likelihood that conservation areas do not produce  
29       mosquitoes in numbers that could cause public health or nuisance concerns. Access to  
30       conservation areas would be provided to appropriate health officials to monitor  
31       mosquito populations.

### 32   *Conservation Area Management*

33   A management plan would be developed and implemented for each conservation area. Major  
34   elements addressed by the management plans would include:

- 35       • Habitat objectives of the conservation area;
- 36       • Monitoring requirements;
- 37       • Fire management;
- 38       • Predator/competitor management;
- 39       • Vegetation management;
- 40       • Infrastructure maintenance;

- 1 • Permitted uses; and
- 2 • Water management.

3 It is anticipated that conservation area management plans would need to be periodically revised  
4 to reflect new information that is collected through monitoring and research (section 2.1.1.7).

5 *Conservation Area Mainstream Water Use and Management*

6 WATER SUPPLY

7 The diversion and consumptive use of Colorado River water is governed by the Law of the  
8 River. Key concepts are described below, and additional detail is included in Appendix A. The  
9 concepts of “apportionment” and “entitlement” are key to understanding the allocation of  
10 Colorado River water. “Apportionment” refers to the distribution of Colorado River water  
11 between the Upper and Lower Basin States as identified in the Colorado River Compact of 1922  
12 (Compact), and within the Lower Basin States as identified in the Boulder Canyon Project Act  
13 (BCPA) and the *Arizona v. California 1964 Supreme Court Decree* (Decree). The Compact  
14 apportioned Colorado River water between the Upper and Lower basins, giving in perpetuity  
15 to each basin the exclusive beneficial consumptive use of 7.5 million af per year (maf). Under  
16 the BCPA and the Decree, Colorado River water within the Lower Division States was  
17 apportioned among the states; 2.8 maf to Arizona, 4.4 maf to California, and 300 thousand af  
18 per year (kaf) to Nevada. The Decree further defined each state’s apportionment in “normal,”  
19 “surplus,” and “shortage” years<sup>2</sup>. After the water was apportioned to the Lower Division  
20 States, the states, the Decree, and the supplemental Decrees allocated the amounts among the  
21 Federal government, Indian tribes, the states themselves, and public and private entities. The  
22 right or authorization to beneficially use Colorado River water is defined as an entitlement.  
23 Entitlements are created by 1) decree of the United States Supreme Court, 2) through a contract  
24 with the Secretary under section 5 of the BCPA, and 3) Federal reservations, including those  
25 reserved by the Secretary. It is the entitlement, not the apportionment, that establishes a right to  
26 consumptively use Colorado River water.

27 Those who hold entitlements to Colorado River water are referred to as Contractors. As noted  
28 above, Contractors consist of the Federal government, states, Indian tribes, and various public  
29 and private entities that are recognized under the Decree, hold a section 5 Contract with the  
30 Secretary, or have a Secretarial reservation of water. Contractors can take delivery of Colorado  
31 River water by diversion from the river at the various dams and diversion facilities or by  
32 pumping water that is drawn from within the accounting surface of the mainstream Colorado  
33 River. Contractors have permanent water service (i.e., the Contract, Decreed right or Secretarial  
34 reservation of water remains in place indefinitely and is not lost due to non-use). The

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2 The Secretary is required to determine when “normal,” “surplus,” and “shortage” conditions occur on the LCR. These conditions are determined in the Annual Operating Plan and are referred to as “normal,” “surplus,” and “shortage” years. As generally set forth in the Decree, a “normal year” occurs if there is sufficient mainstream Colorado River water available to satisfy 7.5 maf of annual consumptive use in the Lower Division States; a “surplus year” occurs if there is sufficient mainstream water available for release to satisfy in excess of 7.5 maf of annual consumptive use in the Lower Division States; a “shortage year” occurs if there is insufficient mainstream water available for release to satisfy 7.5 maf of annual consumptive use in the Lower Division States. The Secretary makes an annual determination of the water supply conditions, in consultation with the Basin States, Indian tribes with Federal reserved rights, and other parties.

1 consumptive use of water by each Contractor is accounted for in the apportionment of the state  
2 where the water is used, so that the consumptive use of water by each Contractor within each  
3 state does not exceed the state's apportionment. This concept applies regardless of year type  
4 (i.e., normal, surplus, or shortage). There are 79 named Contractors in Arizona, 24 in California,  
5 and 15 in Nevada.

6 Colorado River water from the mainstem is anticipated to provide the necessary water supplies  
7 for establishing and maintaining the habitat created by the LCR MSCP. Implementation of the  
8 LCR MSCP would require the use of water as described below. LCR MSCP parties would  
9 obtain Colorado River water to meet these requirements from various sources in accordance  
10 with the Law of the River and in coordination with the Lower Basin State(s) whose  
11 apportionment may be affected by the use. The legal structure governing the Colorado River  
12 would ensure that these uses would not increase the amount of water used in the LCR Basin  
13 beyond existing entitlements. The geographic scope of the proposed action (section 2.1.1.2)  
14 would ensure that Colorado River water that would be used by the LCR MSCP is used within  
15 the historic floodplain and tributaries of the LCR. Sources of water supply other than the  
16 Colorado River may become available during the 50-year implementation period of the LCR  
17 MSCP. Any water source that would be required to implement the conservation measures  
18 would be analyzed during the LCR MSCP site selection process.

19 MAINSTREAM WATER USE ATTRIBUTES ASSOCIATED WITH COTTONWOOD-WILLOW AND  
20 HONEY MESQUITE LAND COVER

21 The potential water use attributes associated with the creation of cottonwood-willow and honey  
22 mesquite land cover may include site preparation, establishment irrigation, maintenance  
23 irrigation, and managed flooding. Each of these attributes is described below.

24 *Site Preparation.* After clearing and root-ripping to remove the exotic vegetation, soil  
25 conditioning or leaching of salts may be necessary. This work may require several applications  
26 of mainstream water to create appropriate soil conditions prior to revegetation with the desired  
27 native riparian plant species. Site preparation water use needs are probably not necessary, or  
28 very limited, on sites involving the conversion of lands in agricultural crop production to  
29 support stands of cottonwood-willow and honey mesquite. Depending upon the existing  
30 conditions of the soil column at the proposed habitat creation site, site preparation water use  
31 may be necessary for only one growing season.

32 *Establishment Irrigation.* Water use for establishment irrigation would be necessary to ensure  
33 that the recently planted native plant species were maintained and to promote vigorous growth.  
34 Typically, on sites with undulating or uneven topography, this could involve the application of  
35 mainstream water via sprinkler or drip irrigation systems (recognizing that most of the selected  
36 sites should be favorable for flood irrigation practices or would be graded and leveled during  
37 site preparation, but that sprinklers could be used under special or local conditions). On lands  
38 converted from agricultural crop production, the land may be level enough to facilitate flood  
39 irrigation using the existing water conveyance infrastructure. Generally, it is expected that  
40 establishment irrigation would be required at specific sites for 1 to 3 years following  
41 revegetation until the young tree root systems are able to reach the water table.

1 *Maintenance Irrigation.* Water use for maintenance irrigation may be necessary to maintain  
2 overall plant health and vigor in sites where depth to water is beyond the ability of the plant's  
3 root systems to access. The ability to access water may be more of an issue for cottonwood-  
4 willow and associated shrub and forb understory communities than for mesquite species (i.e.,  
5 mesquite has been shown to exhibit rooting depths in excess of 50 feet [Stromberg, et al. 1992]).  
6 At some sites, it may be desirable or feasible to lower the grade in order to ensure adequate  
7 depths to water for mature riparian plant species, thus limiting maintenance irrigation  
8 requirements. Depending upon specific site characteristics, maintenance irrigation may be  
9 required one or more times annually during the 50-year term of the LCR MSCP, particularly for  
10 the created patches of cottonwood-willow land cover.

11 *Managed Flooding.* Water use for managed flooding is intended to simulate pre-development  
12 hydrologic conditions along the LCR. The concept involves flooding or irrigating the  
13 established patch of riparian vegetation from late February through late March or early April,  
14 during the seed germination period for cottonwood-willow. This technique requires the  
15 presence of a number of mature cottonwood and willow seed source trees in close proximity to  
16 the habitat creation site. This managed flooding promotes recruitment of juvenile cohorts of  
17 cottonwood and willow species and maintains adequate soil conditions. Managed flooding  
18 may be desirable at some sites on an annual basis, while at other sites it may only be necessary  
19 every 2-3 years. Because of the current paucity of seed trees within the planning area, this  
20 technique may be somewhat limited during the first decade of Conservation Plan  
21 implementation until more mature trees are present in areas suitable for habitat creation.

22 Managed flooding may also be required to maintain adequate, or suitable, soil-moisture content  
23 at specific habitat creation sites. Adequate soil moisture promotes healthy macro- and micro-  
24 biotic conditions and the production of flying insects important to many of the covered species  
25 (e.g., southwestern willow flycatcher and bats). This aspect of managed flooding could be  
26 accomplished, in some cases, with the February-April flooding requirements for seed  
27 germination, but may also be required one or more times per month during the heat of the  
28 summer if the soil moisture conditions warrant.

29 A third type of managed flooding involves maintaining saturated soils or standing water in and  
30 adjacent to created stands of cottonwood-willow associated with occupied southwestern willow  
31 flycatcher habitat from May 1 through August 30. This habitat characteristic is highly desirable  
32 to promote successful breeding and recruitment of neotropical migrant bird species.  
33 Consequently, at sites currently occupied by southwestern willow flycatcher, or sites that over  
34 time become territories and nesting sites of this species, it may be necessary to include this  
35 water use, as well. It may be possible to use adjacent marsh or backwater land cover types to  
36 meet this requirement.

37 *Water Use.* Based upon the proposed creation of 5,940 acres of cottonwood-willow and 1,320  
38 acres of honey mesquite land cover types, a preliminary analysis indicates that approximately  
39 34,480 afy of mainstream water would be required to meet the consumptive use by the created  
40 habitat. This amount is based upon an average evapotranspiration (ET) rate of 4.74 afy per acre

1 for cottonwood-willow land cover and 4.79 afy per acre for the mesquite land cover.<sup>3</sup>  
2 Additionally, it has been estimated that an additional 8,600 afy may be required associated with  
3 periodic managed flooding events. This is particularly important for the created and  
4 maintained stands of cottonwood-willow because these stands must maintain certain specific  
5 macrosite and microsite characteristics in order to function as habitat for covered species.

#### 6 MARSH LAND COVER CREATION MAINSTREAM WATER USE ATTRIBUTES

7 The proposed action includes the creation and maintenance of 512 acres of marsh land cover.  
8 The potential water use attributes associated with creation of native marsh may include existing  
9 backwater enhancement and/or enlargement and new backwater and marsh creation. Each of  
10 these attributes is described below.

11 *Existing Backwater Enhancement/Enlargement.* To create functional marshes, it may be feasible  
12 and desirable to restructure existing backwater features within the planning area. This  
13 restructuring may involve the use of amphibious excavators to enlarge and reshape the  
14 interface between the backwater and the floodplain. Benches and shelves could be sculpted to  
15 create the shallow water conditions necessary to promote establishment and maintenance of  
16 marsh vegetation for both the Yuma clapper rail and California black rail. The potential  
17 mainstream water use is associated with increased open water surface area and evaporation, as  
18 well as additional consumptive use related to the ET by the marsh vegetation.

19 *New Backwater and Marsh Creation.* In conjunction with the creation of large patches of native  
20 riparian vegetation or isolated native fish refugia in the floodplain, it may be feasible and  
21 desirable to create functioning patches of marsh at the interface between the backwater and  
22 riparian vegetation. The potential mainstream water use is related to open water evaporation  
23 and the ET of the marsh vegetation.

24 *Water Use.* The proposed creation and maintenance of 512 acres of marsh land cover would  
25 require an estimated 3,000 afy of mainstream water. This amount is based on an average ET  
26 rate of 5.77 af per acre per year. Again, this average ET rate was calculated from data reported  
27 in Reclamation's calendar year (CY)-1999 LCRAS annual report for the three mainstream  
28 reaches of the Colorado River below Davis Dam.

#### 29 BACKWATER CREATION MAINSTREAM WATER USE ATTRIBUTES

30 The potential water use attributes associated with creation of the actively managed connected or  
31 disconnected backwaters may include enhancement and/or enlargement of existing connected  
32 or disconnected backwaters and new backwater and marsh creation. Each of these attributes is  
33 described below.

34 *Enhancement and/or Enlargement of Existing Connected or Disconnected Backwaters.* This habitat  
35 creation concept, like marsh habitat creation, involves enhancement or enlargement of existing  
36 backwaters and the creation of new backwaters adjacent to the mainstream or in the floodplain.

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3 The average ET rate was calculated utilizing data reported in Reclamation's CY-1990 LCRAS Annual Report; and was based upon ET rates reported for three reaches of the mainstream (i.e., Davis Dam to Parker Dam, Parker Dam to Imperial Dam, and Imperial Dam to the Southerly International Boundary).

1 Existing backwaters could be modified to provide improved water flow and water quality  
2 through the backwater (e.g., culverts, gate structures, percolation dike structures, openings  
3 directly to the mainstream). Backwaters could be divided into zones to better facilitate  
4 management of native fish and desired aquatic characteristics. The potential mainstream water  
5 use associated with enhanced or modified backwater creation activities is related to evaporation  
6 and bank storage.

7 *New Backwater and Marsh Creation.* In conjunction with the creation of large patches of  
8 cottonwood-willow, honey mesquite, and marsh land cover types, it may be desirable to  
9 construct isolated native fish refugia in the floodplain. These refugia could involve  
10 reestablishment of a hydrologic connection in a relict channel feature, remnant backwater,  
11 swale, or slough. Typically, this reestablishment involves lowering the grade of the land  
12 surface in the relict channel feature or diversion (e.g., via direct diversion from the mainstream  
13 and conveyance or supplied by groundwater pumping from wells in the floodplain) and  
14 conveyance of a water supply to the feature.

15 In the integrated mosaic concept, it is likely that functioning patches of marsh would be  
16 established around the fringe of the new backwater. The potential mainstream water use is  
17 related to open water evaporation, bank storage, and the ET of the associated marsh vegetation.

18 *Water Use.* The proposed creation and maintenance of 360 acres of backwaters would require an  
19 estimated 1,900 afy of mainstream water. This amount is based upon an average ET and  
20 evaporation rate of 5.17 af per acre per year. This average evaporation and ET rate was  
21 calculated from data reported in Reclamation's CY-1999 LCRAS annual report for the three  
22 mainstream reaches of the Colorado River below Davis Dam.

#### 23 ESTABLISHMENT AND OPERATION OF NATIVE FISH HATCHERY AND REARING FACILITIES

24 To produce sufficient numbers of native endangered fishes for reintroduction into suitable LCR  
25 mainstream habitats, it is likely that additional native fish production facilities would be  
26 required. Some of these hatchery facilities may be constructed off-stream, which is outside of  
27 the planning area. No mainstream water use would be associated with these off-stream  
28 facilities. At suitable sites within the planning area, it may make economic sense to construct  
29 the facility in the adjacent floodplain, thus reducing transport costs and the transit time  
30 associated with moving the fish from the facility to the reintroduction site.

31 Hatchery facilities would involve the construction and maintenance of raceways and grow-out  
32 ponds. Mainstream water, either directly pumped from the river or from wells in the  
33 floodplain, would provide the water supply for these activities. The potential mainstream  
34 water use attributes are generally associated with open water evaporation and bank storage in  
35 unlined earthen ponds and/or evaporation from lined ponds or raceways. The amount of  
36 water that could be required for hatchery and rearing facilities would be based on the  
37 consumptive use through evaporation.

#### 38 SUMMARY OF CONSERVATION AREA MAINSTREAM WATER USE AND MANAGEMENT NEEDS

39 As described above, the potential requirements for the use of mainstream Colorado River water  
40 include the following types of activities:

- 1 • Conservation area site preparation;
- 2 • Establishment and maintenance of riparian, marsh/wetland, and aquatic and backwater
- 3 land cover to provide habitat for covered species, as well as native fish rearing facilities;
- 4 and
- 5 • Periodic managed flooding to maintain overall plant growth and vigor and promote the
- 6 development of moist soil conditions and flying insect production.

7 These potential uses of mainstream water are anticipated to occur over the life of the 50-year  
 8 LCR MSCP. Generally, the expected mainstream water uses associated with establishment and  
 9 maintenance of conservation areas could include the use of the annual amounts shown below:

|                   |           |
|-------------------|-----------|
| Cottonwood-willow | 28,156 af |
| Honey mesquite    | 6,323 af  |
| Marsh             | 2,954 af  |
| Aquatic           | 1,861 af  |
| Total             | 39,294 af |

10 To meet the estimated consumptive use (CU) requirement associated with all of the  
 11 conservation areas, it is assumed that 6.0 afy per acre would be necessary. Consequently, to  
 12 satisfy the CU requirement of 39,294 afy, approximately 48,800 afy would need to be applied to  
 13 the conservation areas.

14 As described above, the periodic managed flooding requirement to maintain overall plant  
 15 growth and vigor and promote the development of moist soil conditions and flying insect  
 16 production is estimated to be approximately 8,600 afy of additional mainstream water. This  
 17 water is assumed to be an additional 25 percent of the annual CU of that required to meet the  
 18 conservation area site total CU needs for cottonwood-willow and mesquite land cover types.

19 In summary, the total estimated conservation area CU needs, including the managed flooding  
 20 requirements, is approximately 39,300 afy. This total results in an estimated requirement of  
 21 approximately 57,400 afy to establish and maintain the 8,132 acres of LCR MSCP conservation  
 22 areas.

### 23 **2.1.1.5 General Species Conservation Measures**

#### 24 *Avoidance and Minimization Measures*

25 This section describes the conservation measures that would be implemented to avoid and  
 26 minimize the effects of implementing the proposed action. In addition to these conservation  
 27 measures, the best management practices (BMPs) of the state in which a covered activity is  
 28 implemented would be used to control sedimentation in the vicinity of water bodies during  
 29 ground-disturbing activities.

30 **Avoidance and minimization measure (AMM)1—To the extent practicable, avoid and**  
 31 **minimize impacts of implementing the Conservation Plan on existing covered species**  
 32 **habitats.** To the extent practicable, establishment and management of created habitats would  
 33 avoid removal of existing cottonwood-willow stands, honey mesquite bosques, marsh, and  
 34 backwaters to avoid and minimize impacts on habitat they provide for covered species.

1 Temporary disturbance of covered species habitats, however, may be associated with habitat  
2 establishment and subsequent maintenance activities (e.g., controlled burning in marshes and  
3 removal of trees to maintain succession objectives). Conservation Plan measures that could  
4 result in such temporary disturbances would, to the extent practicable, be designed and  
5 implemented to avoid or minimize the potential for disturbance. In addition to implementing  
6 AMM3 and AMM4 below, these measures could include conducting pre-construction surveys  
7 to determine if covered species are present and, if present, implementing habitat establishment  
8 and management activities during periods the species would be least sensitive to the activities,  
9 or redesigning the activities to avoid the need to disturb sensitive habitat use areas; staging  
10 construction actions away from sensitive habitat use areas; and implementing BMPs to control  
11 erosion when implementing ground-disturbing activities.

12 **AMM2—Avoid impacts of flow-related covered activities on covered species habitats at**  
13 **Topock Marsh.** Impacts on groundwater levels that support covered species habitat at Topock  
14 Marsh would be avoided by maintaining water deliveries for maintenance of water levels and  
15 existing conditions. At times, flow-related activities could lower river elevations to levels that  
16 could disrupt diversion of water from the river to the marsh. Improvements to intake  
17 structures that allow water to continue to be diverted or other measures to maintain the water  
18 surface elevation would avoid effects on groundwater elevation. Avoidance of effects could be  
19 accomplished with the purchase, installation, and operation of two electric pumps sized to the  
20 current inflow at the Topock Marsh diversion inlet. The pumps would most likely need to be  
21 operated during summer to make up for the lower flow periods.

22 Implementation of this conservation measure would maintain existing habitat at Topock Marsh  
23 for the Yuma clapper rail, southwestern willow flycatcher, Colorado River cotton rat, western  
24 least bittern, California black rail, yellow-billed cuckoo, gilded flicker, vermilion flycatcher,  
25 Arizona Bell's vireo, and Sonoran yellow warbler. Maintaining water deliveries to Topock  
26 Marsh would also maintain razorback sucker and bonytail habitat associated with disconnected  
27 backwaters managed for these species.

28 **AMM3—Avoid disturbance of covered bird species during the breeding season.** To the  
29 extent practicable, to avoid and minimize potential impacts on covered bird species, vegetation  
30 management activities (e.g., periodic removal of emergent vegetation to maintain canals and  
31 drains) associated with implementation of covered activities and the Conservation Plan that  
32 could result in disturbance to covered bird species would not be implemented during the  
33 breeding season to prevent injury or mortality of eggs and young birds unable to avoid these  
34 activities.

35 **AMM4—Minimize contaminant loads in runoff and return irrigation flows from LCR**  
36 **MSCP-created habitats to the LCR.** LCR MSCP-created habitats that require irrigation to  
37 establish and maintain vegetation to provide habitat would be designed and managed to  
38 minimize contaminant loads that could return to the LCR as runoff or return-flow. Measures  
39 would include vegetation establishment methods that minimize the need for application of  
40 herbicides, pesticides, and fertilizers and designing irrigation methods and new irrigation  
41 infrastructure to reduce runoff and return-flows to the extent practicable. Use of pesticides is  
42 not a covered activity. Pesticides used to establish and maintain Conservation Plan habitats

1 would be applied in accordance with EPA restrictions and, as needed, authorization for their  
2 use would be sought under separate permits.

3 **AMM5—Avoid impacts of operation, maintenance, and replacement of hydroelectric**  
4 **generation and transmission facilities on covered species in the planning area.** To the extent  
5 practicable, before implementing activities associated with operation, maintenance, and  
6 replacement of hydroelectric generation and transmission facilities, measures would be  
7 identified and implemented that are necessary to avoid take of covered species where such  
8 activities could otherwise result in take. These measures could include conducting surveys to  
9 determine if covered species are present and, if so, deferring the implementation of activities to  
10 avoid disturbance during the breeding season; redesigning the activities to avoid the need to  
11 disturb covered species habitat use areas; staging equipment outside of covered species  
12 habitats; delineating the limits of vegetation control activities to ensure that only the vegetation  
13 that needs to be removed to maintain infrastructure is removed; stockpiling and disposing of  
14 removed vegetation in a manner that minimizes the risk of fire; and implementing BMPs to  
15 control erosion when implementing ground-disturbing activities.

16 **AMM6—Avoid or minimize impacts on covered species habitats during dredging, bank**  
17 **stabilization activities, and other river management actions.** To the extent practicable, before  
18 initiating activities involved with river maintenance projects, measures would be identified and  
19 implemented that avoid or minimize take of covered species where such activities could  
20 otherwise result in take. Such measures could include alternative methods to achieve project  
21 goals, timing of activities, pre-activity surveys, and minimizing the area of effect, including  
22 offsite direct and indirect effects (e.g., avoiding or minimizing the need to place dredge spoil  
23 and discharge lines in covered species habitats; placing dredge spoils in a manner that would  
24 not affect covered species habitats).

#### 25 *Monitoring and Research Measures*

26 This section describes the monitoring and research measures that would be implemented to  
27 help guide the design and management of established habitats over the term of the  
28 Conservation Plan.

29 **Monitoring and research measure (MRM)1—Conduct surveys and research to better identify**  
30 **covered and evaluation species habitat requirements.** Conduct surveys and research, as  
31 appropriate, to collect information necessary to better define the species habitat requirements  
32 and to design and manage fully functioning established covered and evaluation species  
33 habitats. This conservation measure applies to the following species<sup>4</sup>:

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4 MRM1 and MRM2 apply to those species for which comparable measures are not subsumed under species-specific conservation measures. They are not applicable to species for which habitat would not be established under the Conservation Plan, such as the desert tortoise, relict leopard frog, humpback chub, and threecorner milkvetch.

|                                |                       |                               |
|--------------------------------|-----------------------|-------------------------------|
| Yuma clapper rail              | California black rail | Arizona Bell's vireo          |
| Southwestern willow flycatcher | Yellow-billed cuckoo  | Sonoran yellow warbler        |
| Western red bat                | Elf owl               | Summer tanager                |
| Western yellow bat             | Gilded flicker        | California leaf-nosed bat     |
| Desert pocket mouse            | Gila woodpecker       | Pale Townsend's big-eared bat |
| Western least bittern          | Vermilion flycatcher  |                               |

1  
 2 **MRM2—Monitor and adaptively manage created habitats for covered species and evaluation**  
 3 **species.** Created species habitats would be managed to maintain their functions as species  
 4 habitat over the term of the LCR MSCP. Created habitat would be monitored and adaptively  
 5 managed over time to determine the types and frequency of management actions that may be  
 6 required to maintain created cottonwood-willow, honey mesquite, marsh, and backwater land  
 7 cover as habitat for covered species. This conservation measure applies to the following  
 8 species:

|                                |                       |                               |
|--------------------------------|-----------------------|-------------------------------|
| Yuma clapper rail              | Western least bittern | Arizona Bell's vireo          |
| Southwestern willow flycatcher | California black rail | Sonoran yellow warbler        |
| Western red bat                | Yellow-billed cuckoo  | Summer tanager                |
| Western yellow bat             | Elf owl               | Flannelmouth sucker           |
| Desert pocket mouse            | Gilded flicker        | MacNeill's sootywing skipper  |
| Colorado River cotton rat      | Gila woodpecker       | California leaf-nosed bat     |
| Yuma hispid cotton rat         | Vermilion flycatcher  | Pale Townsend's big-eared bat |

9  
 10 **MRM3—Conduct research to determine and address the effects of nest site competition with**  
 11 **European starlings on reproduction of covered species.** Research would be undertaken to  
 12 determine whether nest site competition with European starlings is a substantial factor limiting  
 13 the reproductive success of the elf owl, gilded flicker, and Gila woodpecker. If so, experimental  
 14 programs may be implemented to determine the effectiveness and practicality of controlling  
 15 starlings.

16 **MRM4—Conduct research to determine and address the effects of brown-headed cowbird**  
 17 **nest parasitism on reproduction of covered species.** Research would be undertaken to  
 18 determine whether brown-headed cowbird nest parasitism is a substantial factor limiting the  
 19 reproductive success of the southwestern willow flycatcher, vermilion flycatcher, Arizona Bell's  
 20 vireo, Sonoran yellow warbler, and summer tanager in the planning area. If so, studies would  
 21 be implemented to identify effective and practical methods for controlling brown-headed  
 22 cowbirds. If cowbirds are adversely affecting breeding success and effective control measures  
 23 are developed, a program would be implemented to monitor the effects of cowbirds on nesting  
 24 success in created habitats to determine the need for cowbird control and to implement cowbird  
 25 control measures in locations where cowbird control is needed to improve reproductive success.

26 **MRM5—Monitor selenium levels in created backwater and marsh land cover types, and**  
 27 **study the effect of selenium released as a result of dredging activities.** Conduct monitoring of  
 28 selenium levels in sediment, water, and/or biota present in LCR MSCP created backwater and  
 29 marsh land cover types. If monitoring results indicate that management of the LCR MSCP  
 30 conservation areas increases levels of selenium in created backwaters and marshes or in covered  
 31 species that use them, the LCR MSCP would undertake research to develop feasible methods to

1 manage the conservation areas in a manner that would eliminate or compensate for the effects  
2 of increased selenium levels. If feasible management methods were identified, they would be  
3 implemented. This conservation measure would include monitoring the effects of dredging  
4 and dredge spoil disposal associated with creating and maintaining backwaters and marshes. If  
5 monitoring results indicate that current or future dredging and dredge spoil disposal methods  
6 increase selenium levels, the LCR MSCP would only implement methods that will have the  
7 least effect on selenium levels. A study would also be conducted to look at the effects of  
8 potential releases of selenium from dredging in general.

#### 9 *Conservation Area Management Measures*

10 This section describes the conservation area management measures that would be implemented  
11 to maintain the intended functions and values of created covered species habitats over the term  
12 of the Conservation Plan.

13 **Conservation area management measure (CMM)1 – Reduce risk of loss of established habitat**  
14 **to wildfire.** Management of conservation areas would include contributing to and integrating  
15 with local, state, and Federal agency fire management plans. Conservation areas would be  
16 designed to contain wildfire and facilitate rapid response to suppress fires (e.g., fire  
17 management plans would be an element of each conservation area management plan).

18 **CMM2 – Replace created habitat affected by wildfire.** In the event of established habitat  
19 degradation or loss as a result of wildfire, land management and habitat establishment  
20 measures to support the reestablishment of native vegetation would be identified and  
21 implemented.

#### 22 *Species-Specific Conservation Measures for Covered Species*

23 This section describes the species-specific conservation measures, in addition to the general  
24 conservation measures described above under “Avoidance and Minimization Conservation  
25 Measures” that would be implemented to avoid, minimize, and fully mitigate the effects of  
26 implementing covered activities and contribute to the recovery of listed covered species/reduce  
27 the likelihood of future listing of unlisted covered species.

#### 28 *YUMA CLAPPER RAIL*

29 **CLRA1 – Create 512 acres of Yuma clapper rail habitat.** Create and manage 512 acres of marsh  
30 to provide Yuma clapper rail habitat. This created habitat would also provide habitat for the  
31 western least bittern and the California black rail (see conservation measures LEBI1 and  
32 BLRA1). Habitat would be created in patches as large as possible but would not be created in  
33 patches smaller than 5 acres.

34 **CLRA2 – Maintain existing important Yuma clapper rail habitat areas.** The LCR MSCP  
35 participants, under agreements with cooperating land management agencies, would provide  
36 funding to those agencies to maintain a portion of existing Yuma clapper rail habitat within the  
37 planning area.

1 SOUTHWESTERN WILLOW FLYCATCHER

2 **WIFL1—Create 4,050 acres of southwestern willow flycatcher habitat.** Of the 5,940 acres of  
3 created cottonwood-willow, at least 4,050 acres would be designed and created to provide  
4 habitat for this species. Created cottonwood-willow would be designed and managed to  
5 support cottonwood-willow types I-IV that provide breeding habitat for this species.

6 **WIFL2—Maintain existing important habitat areas.** The LCR MSCP participants, under  
7 agreements with cooperating land management agencies, would provide funding to those  
8 agencies to maintain a portion of existing southwestern willow flycatcher habitat within the  
9 planning area.

10 DESERT TORTOISE

11 **DETO1—Acquire and protect 230 acres of existing unprotected occupied habitat.** The  
12 acquired habitat would be transferred to an appropriate management agency for permanent  
13 protection of species' habitat.

14 **DETO2—Avoid impacts on individuals and their burrows.** The following measures would be  
15 implemented to avoid and minimize impacts on desert tortoise:

16 • Before implementing non-flow-related covered activities and LCR MSCP conservation  
17 measures in desert tortoise habitat, presence or absence surveys would be conducted  
18 using approved Service survey protocols to locate desert tortoises and their burrows  
19 (USFWS 1992). The number and location of all tortoises or tortoise signs (e.g., shells,  
20 bones, scutes, limbs, scats, burrows, pellets, tracks, egg shell fragments, courtship rings,  
21 drinking sites, and mineral licks) that occur within the project area and its zone of  
22 influence and whether any tortoises occur outside of the project area whose home ranges  
23 may overlap the project area or its zone of influence should be identified. The project  
24 area is defined as any area that would be cleared or partially cleared; have vehicles on or  
25 adjacent to it; be temporarily or permanently used for equipment or materials storage,  
26 loading, or unloading; or would have its soil or vegetation damaged, fragmented, or  
27 disturbed. Desert tortoise presence or absence surveys should be conducted during the  
28 typical period of activity for the tortoise (i.e., March 25 to May 31). Surveys should be  
29 conducted during daylight hours. The Service considers the results of a presence or  
30 absence survey, including the zone of influence, to be valid for no more than 1 year,  
31 although the time period may be significantly reduced, depending on project size,  
32 location, or proximity to other land disturbance.

33 • If desert tortoises are present, the covered activity or LCR MSCP activity would be  
34 modified to avoid take of individuals and their burrows. However, if impacts cannot be  
35 avoided, clearance surveys would be conducted to locate desert tortoises that would be  
36 removed and relocated to other habitat areas. Clearance surveys should be conducted to  
37 locate all desert tortoises above and below ground within the project area that would be  
38 temporarily relocated or salvaged using the Service clearance survey protocol (USFWS  
39 1992). Clearance surveys should be conducted immediately prior to surface disturbance  
40 at each site within the project area. Surveys should be conducted during daylight hours.

- If impacts cannot be avoided, desert tortoises should be removed and relocated to other habitat areas, if appropriate. The Desert Tortoise Council guidelines for determining whether tortoises should be moved, mapping tortoise burrows, determining whether burrows should be excavated, finding tortoises in burrows, excavating burrows, constructing artificial burrows, handling tortoise eggs, handling tortoises, processing tortoises, translocating tortoises, and releasing tortoises should be followed (Desert Tortoise Council 1994).

## BONYTAIL

**BONY1—Coordinate bonytail conservation efforts with the Service and recovery programs for endangered fish species in the Lower Basin..** The LCR MSCP would interact with the Service or any formal recovery program developed in the future for the Lower Basin to ensure that conservation measures included in the Conservation Plan would be implemented in support of recovery efforts to meet recovery goals for the bonytail in the Lower Basin. The LCR MSCP may also use funding programmed for bonytail augmentation (BONY3) and other bonytail conservation measures to implement other recovery activities identified by the Service or a future formal recovery program if it is determined through the adaptive management process and with concurrence of the Service that providing such funding would more effectively contribute to recovery of the bonytail.

**BONY2—Create 360 acres of bonytail habitat.** Create 360 acres of backwater with depth, vegetation, and substrate characteristics that provide the elements of bonytail habitat. This created backwater would also provide habitat for the razorback sucker. Created backwaters would be designed and managed as described in section 2.1.1.3, Conservation Concepts. At a minimum, created backwaters would contain the physical, chemical, and biological conditions suitable for the establishment and maintenance of healthy fish populations in the LCR.

**BONY3—Bonytail augmentation program.** The LCR MSCP would provide a level of funding to support implementation of a stocking/augmentation program for the bonytail providing for the stocking of up to 620,000 subadult bonytail (at least 300 mm [~ 12 inches] in length) into the designated critical habitat for the species in Reaches 2-3, and in Reaches 4 and 5 of the LCR. The figure of 620,000 fish is not a target number for the LCR but represents an assumption (see BONY1) used to define the extent of funding that would be available, with the understanding that the adaptive management process would guide the actual stocking program.

**BONY4—Evaluate and develop, if necessary, additional bonytail rearing capacity.** Additional rearing capacity, if needed, would be developed through cooperation between AGFD, CDFG, NDOW, the Service, and other LCR MSCP participants, or fish may be acquired from other sources.

**BONY5—Conduct monitoring and research, and adaptively manage bonytail augmentations and created habitat.** Monitoring and research would be conducted to gather information necessary to adaptively manage bonytail conservation, including aggressive monitoring of fish response following augmentations to gather information regarding habitat use and fish movement, to increase the success of subsequent management of the species.

1 HUMPBACK CHUB

2 **HUCH1—Provide funding to support existing humpback chub conservation programs.** The  
3 LCR MSCP would provide \$10,000 per year for 50 years (\$500,000 total) to the Glen Canyon  
4 Dam Adaptive Management Program or other entity approved by the Service to support  
5 implementation of planned, but unfunded, species conservation measures and, as appropriate,  
6 to fund species conservation measures in the lower Grand Canyon of the Colorado River  
7 upstream of Lake Mead NRA.

8 RAZORBACK SUCKER

9 **RASU1—Coordinate razorback sucker conservation efforts with the Service and recovery**  
10 **programs for endangered fish species in the Lower Basin.** The LCR MSCP would interact  
11 with the Service or any formal recovery program developed in the future for the Lower Basin to  
12 ensure that conservation measures included in the Conservation Plan would be implemented in  
13 support of recovery efforts to meet recovery goals for the razorback sucker in the Lower Basin.  
14 The LCR MSCP may also use funding programmed for razorback sucker augmentation  
15 (RASU3) and other razorback sucker conservation measures to implement other recovery  
16 activities identified by the Service or a future formal recovery program if it is determined  
17 through the adaptive management process and with concurrence of the Service that providing  
18 such funding would more effectively contribute to recovery of the razorback sucker.

19 **RASU2—Create 360 acres of razorback sucker habitat.** Create 360 acres of backwater with  
20 water depth, vegetation, and substrate characteristics that provide the elements of razorback  
21 sucker habitat. This created backwater would also provide habitat for the bonytail. Created  
22 backwaters would be designed and managed as described in section 2.1.1.3, Conservation  
23 Concepts. At a minimum, created backwaters would contain the physical, chemical, and  
24 biological conditions suitable for the establishment and maintenance of healthy fish populations  
25 in the LCR.

26 **RASU3—Razorback sucker augmentation program.** The LCR MSCP would provide a level of  
27 funding to support implementation of a stocking/augmentation program for the razorback  
28 sucker, providing for the stocking of up to 660,000 subadult razorback suckers (at least 300 mm  
29 [~12 inches] in length) into the designated critical habitat for the species in Reach 3, and in  
30 Reaches 4 and 5 of the LCR.

31 **RASU4—Develop additional razorback sucker rearing capacity.** The LCR MSCP participants,  
32 in cooperation with AGFD, CDFG, NDOW, and the Service, would develop additional  
33 razorback sucker rearing capacity or would acquire the necessary numbers of fish from other  
34 sources.

35 **RASU5—Support ongoing razorback conservation efforts at Lake Mohave.** Provide support  
36 to maintain the current Lake Mohave Program (Native Fish Work Group) goal of maintaining a  
37 population of 50,000 adult razorback sucker in Lake Mohave as a genetic refuge.

38 **RASU6—Conduct monitoring and research, and adaptively manage razorback sucker**  
39 **augmentations and created habitat.** Monitoring and research would be conducted to gather  
40 information necessary to adaptively manage razorback sucker conservation, including

1 continued monitoring of fish response to previous augmentations, aggressive monitoring of fish  
2 response following LCR MSCP augmentations to gather information regarding habitat use, and  
3 fish movement, to increase the success of subsequent management of the species.

4 **RASU7— Provide funding and support for continuation of the Reclamation/Southern Nevada**  
5 **Water Authority (SNWA) ongoing Lake Mead razorback sucker studies.** The LCR MSCP  
6 would continue to fund and support the ongoing studies of razorback suckers in Lake Mead  
7 that were implemented under the ISC/SIA BO.

8 **RASU8—Continue razorback conservation measures identified in the ISC/SIA BO.**  
9 Reclamation would continue to implement, as part of the LCR MSCP, certain conservation  
10 measures specific to razorback identified in the ISC/SIA BO.

11 WESTERN RED BAT

12 **WRBA1—Conduct surveys to determine the distribution of the western red bat.** Conduct  
13 investigations to identify the distribution of the western red bat in Reaches 3–5.

14 **WRBA2— Create 765 acres of western red bat roosting habitat.** Of the 7,260 acres of  
15 cottonwood-willow and honey mesquite to be created as covered species habitat, at least 765  
16 acres would be designed and created to provide western red bat roosting habitat.

17 WESTERN YELLOW BAT

18 **WYBA1—Conduct surveys to determine the distribution of the western yellow bat.** Conduct  
19 investigations to identify the distribution of the western yellow bat in Reaches 3–5.

20 **WYBA2— Avoid removal of western yellow bat roost trees.** To the extent practicable, avoid  
21 removal of palm trees that could serve as roosts for the western yellow bat when establishing  
22 covered species habitats.

23 **WYBA3—Create 765 acres of western yellow bat roosting habitat.** Of the 7,260 acres of  
24 cottonwood-willow and honey mesquite to be created as covered species habitat, at least 765  
25 acres would be designed and created to provide western yellow bat roosting habitat.

26 DESERT POCKET MOUSE

27 **DPMO1—Conduct surveys to locate desert pocket mouse habitat.** Conduct surveys to locate  
28 desert pocket mouse habitat that could be affected by habitat creation-related activities to  
29 determine whether the habitat is occupied. If the habitat is occupied, design habitat creation-  
30 related activities to avoid the habitat. If the habitat cannot be avoided, to the extent practicable,  
31 restore the disturbed habitat area onsite following completion of the activities and protect and  
32 incorporate the habitat into the conservation area. If the habitat cannot be restored onsite,  
33 establish amount of habitat at least equal to the extent of disturbed habitat elsewhere in the  
34 conservation area.

1 COLORADO RIVER COTTON RAT

2 **CRCR1—Conduct research to better define Colorado River cotton rat habitat requirements.**  
3 Conduct research, if needed, to better define the elements of Colorado River cotton rat habitat  
4 and provide information necessary to design and manage established habitat.

5 **CRCR2—Create 125 acres of Colorado River cotton rat habitat.** Of the 512 acres of marsh to be  
6 created to create Yuma clapper rail habitat, at least 125 acres would be designed to also provide  
7 Colorado River cotton rat habitat in Reaches 3 and 4 near occupied habitat.

8 YUMA HISPID COTTON RAT

9 **YHCR1—Conduct research to better define Yuma hispid cotton rat habitat requirements.**  
10 Conduct research, if needed, to better define the elements of Yuma hispid cotton rat habitat and  
11 provide information necessary to design and manage established habitat.

12 **YHCR2—Create 76 acres of Yuma hispid cotton rat habitat.** Of the 5,940 acres of cottonwood-  
13 willow to be created as habitat for covered species, at least 76 acres would be designed to  
14 provide habitat for the Yuma hispid cotton rat in Reaches 6 and 7 near occupied habitat.

15 WESTERN LEAST BITTERN

16 **LEBI1—Create 512 acres of western least bittern habitat.** Create and manage 512 acres of  
17 marsh to provide western least bittern habitat. This created habitat would also be habitat for  
18 the Yuma clapper rail (conservation measure CLRA1).

19 CALIFORNIA BLACK RAIL

20 **BLRA1—Create 130 acres of California black rail habitat.** Of the 512 acres of LCR MSCP-  
21 created marsh, 130 acres would be created and managed to provide California black rail habitat  
22 near occupied habitat in Reaches 5 and 6.

23 **BLRA2—Maintain existing important California black rail habitat areas.** The LCR MSCP  
24 participants, under agreements with cooperating land management agencies, would provide  
25 funding to those agencies to maintain a portion of existing California black rail habitat in the  
26 planning area.

27 YELLOW-BILLED CUCKOO

28 **YBCU1—Create 4,050 acres of yellow-billed cuckoo habitat.** Of the 5,940 acres of created  
29 cottonwood-willow, at least 4,050 acres would be designed and created to provide habitat for  
30 this species.

31 **YBCU2—Maintain existing important yellow-billed cuckoo habitat areas.** The LCR MSCP  
32 participants, under agreements with cooperating land management agencies, would provide  
33 funding to those agencies to maintain a portion of existing yellow-billed cuckoo habitat within  
34 the planning area.

## 1 ELF OWL

2 **ELOW1—Create 1,784 acres of elf owl habitat.** Of the 7,260 acres of created cottonwood-  
3 willow and honey mesquite land cover, at least 1,784 acres would be designed and created to  
4 provide elf owl habitat.

5 **ELOW2—Install elf owl nest boxes.** Until vegetation has matured sufficiently to attract  
6 woodpeckers that are needed to create nesting cavities for the elf owl, structural characteristics  
7 of nesting habitat (i.e., snags) would be artificially established.

## 8 GILDED FLICKER

9 **GIFL1—Create 4,050 acres of gilded flicker habitat.** Of the 5,940 acres of created cottonwood-  
10 willow, at least 4,050 acres would be designed and created to provide habitat for this species.

11 **GIFL2—Install artificial snags to provide gilded flicker nest sites.** Until vegetation in  
12 established patches of gilded flicker habitat has matured sufficiently to support structural  
13 characteristics of nesting habitat (i.e., snags), install artificial snags that can be used by gilded  
14 flickers to excavate nesting cavities.

## 15 GILA WOODPECKER

16 **GIWO1—Create 1,702 acres of Gila woodpecker habitat.** Of the 5,940 acres of created  
17 cottonwood-willow, at least 1,702 acres would be designed and created to provide habitat for  
18 this species in Reaches 3-6.

19 **GIWO2—Install artificial snags to provide Gila woodpecker nest sites.** Until vegetation in  
20 established patches of Gila woodpecker habitat has matured sufficiently to support structural  
21 characteristics of nesting habitat (i.e., snags), install artificial snags that can be used by Gila  
22 woodpeckers to excavate nesting cavities.

## 23 VERMILION FLYCATCHER

24 **VEFL1—Create 5,208 acres of vermilion flycatcher habitat.** Of the 7,260 acres of created  
25 cottonwood-willow and honey mesquite, at least 5,208 acres would be designed and created to  
26 provide habitat for this species.

## 27 ARIZONA BELL'S VIREO

28 **BEVI1—Create 2,983 acres of Arizona Bell's vireo habitat.** Of the 7,260 acres of created  
29 cottonwood-willow and honey mesquite, at least 2,983 acres would be designed and created to  
30 provide habitat for this species.

## 31 SONORAN YELLOW WARBLER

32 **YWAR1—Create 4,050 acres of Sonoran yellow warbler habitat.** Of the 5,940 acres of created  
33 cottonwood-willow, at least 4,050 acres would be designed and created to provide habitat for  
34 this species.

1 SUMMER TANAGER

2 **SUTA1—Create 602 acres of summer tanager habitat.** Of the 5,940 acres of created  
3 cottonwood-willow, at least 602 acres would be designed and created to provide habitat for the  
4 species.

5 FLAT-TAILED HORNED LIZARD

6 **FTHL1—Acquire and protect 230 acres of existing unprotected occupied flat-tailed horned**  
7 **lizard habitat.** The acquired habitat would be transferred to an appropriate management  
8 agency for permanent protection of habitat for the species.

9 **FTHL2—Implement conservation measures to avoid or minimize take of flat-tailed horned**  
10 **lizard.** Reclamation would continue to implement measures to avoid or minimize take of flat-  
11 tailed horned lizard. These measures would include worker education programs and other  
12 procedures as described in the 1997 BO (USFWS 1997) and are in accordance with the 2003 Flat-  
13 tailed Horned Lizard Interagency Coordinating Committee recommendations for the species.

14 RELICT LEOPARD FROG

15 **RLFR1—Provide funding to support existing relict leopard frog conservation programs.** LCR  
16 MSCP program activities would assist and contribute to existing relict leopard frog research  
17 and conservation programs where appropriate. To the extent consistent with the LCR MSCP  
18 Conservation Plan goals and objectives, implementation of this conservation measure would be  
19 coordinated with the Relict Leopard Frog Conservation Team.

20 FLANNELMOUTH SUCKER

21 **FLSU1—Create 85 acres of flannemouth sucker habitat.** Of the 360 acres of LCR MSCP-  
22 created backwaters, at least 85 acres would be created in Reach 3 with water depth, vegetation,  
23 and substrate characteristics that provide the elements of flannemouth sucker habitat.

24 **FLSU2—Provide funding to support existing flannemouth sucker conservation programs.**  
25 The LCR MSCP would provide \$80,000 per year for 5 years (\$400,000 total) to support  
26 flannemouth sucker research efforts in Reach 3 below Davis Dam to determine habitat use,  
27 habitat preferences, and recruitment and to support decisions on habitat management activities  
28 for river channel and backwater habitats in Reach 3.

29 **FLSU3—Assess flannemouth sucker management needs and develop management**  
30 **strategies.** The LCR MSCP would use results of research conducted by the LCR MSCP (see  
31 conservation measure FLSU2) and others, through the adaptive management process, to assess  
32 main channel and backwater management needs and develop management strategies to benefit  
33 the flannemouth sucker.

34 MACNEILL'S SOOTYWING SKIPPER

35 **MNSW1—Conduct surveys and research to locate MacNeill's sootywing skipper habitat and**  
36 **to better define its habitat requirements.** Conduct research to locate MacNeill's sootywing  
37 skipper populations that could be affected by covered activities and determine the macrohabitat

1 and microhabitat requirements and ecology of the species. Based on research results,  
2 implement adaptive management experiments to develop habitat establishment and  
3 management methods.

4 **MNSW2—Create at least 222 acres of MacNeill’s sootywing skipper habitat.** Based on results  
5 of research conducted under conservation measure MNSW1, at least 222 acres of MacNeill’s  
6 sootywing skipper habitat would be created in Reaches 1–4 near occupied habitat.

7 STICKY BUCKWHEAT

8 **STBU1—Provide funding to support existing sticky buckwheat conservation programs.** The  
9 LCR MSCP would provide \$10,000 per year until 2030 to the Clark County Multi-Species  
10 Habitat Conservation Plan (MSHCP) Rare Plant Workgroup to support implementation of  
11 conservation measures for the sticky buckwheat and threecorner milkvetch that are beyond the  
12 permit requirements of the Clark County MSCHP.

13 THREECORNER MILKVETCH

14 **THMI1—Provide funding to support existing threecorner milkvetch conservation programs.**  
15 The LCR MSCP would provide \$10,000 per year until 2030 to the Clark County MSHCP Rare  
16 Plant Workgroup to support implementation of conservation measures for the threecorner  
17 milkvetch and sticky buckwheat that are beyond the permit requirements of the Clark County  
18 MSCHP.

19 *Species-Specific Conservation Measures for Evaluation Species*

20 Species-specific conservation measures for evaluation species are as follows:

21 CALIFORNIA LEAF-NOSED BAT

22 **CLNB1—Conduct surveys to locate California leaf-nosed bat roost sites.** Conduct  
23 investigations to identify locations of California leaf-nosed bat roost sites within 5 miles of the  
24 planning area in Reaches 3–5.

25 **CLNB2—Create covered species habitat near California leaf-nosed bat roost sites.** The LCR  
26 MSCP process for selecting sites to establish cottonwood-willow and honey mesquite as habitat  
27 for other covered species would, based on the information collected under conservation  
28 measure CLNB1, give priority, when consistent with achieving LCR MSCP goals for other  
29 covered species, to selecting sites that are within 5 miles of California leaf-nosed bat roosts in  
30 Reaches 3–5.

31 PALE TOWNSEND’S BIG-EARED BAT

32 **PTBB1—Conduct surveys to locate pale Townsend’s big-eared bat roost sites.** Conduct  
33 investigations to identify locations of pale Townsend’s big-eared bat roost sites within 10 miles  
34 of the planning area in Reaches 3–5.

35 **PTBB2—Create covered species habitat near pale Townsend’s big-eared bat roost sites.** The  
36 LCR MSCP process for selecting sites to establish cottonwood-willow and honey mesquite as

1 habitat for other covered species would, based on the information collected under conservation  
2 measure PTBB1, give priority, when consistent with achieving LCR MSCP goals for other  
3 covered species, to selecting sites that are within 10 miles of pale Townsend's big-eared bat  
4 roosts in Reaches 3-5.

5 COLORADO RIVER TOAD

6 **CRT01—Conduct research to better define the distribution, habitat requirements, and**  
7 **factors that are limiting the distribution of the Colorado River toad.** Develop and implement  
8 a multiyear integrated research program to determine the range, status, habitat requirements,  
9 population biology, factors that currently limit Colorado River toad abundance and  
10 distribution, and factors that have contributed to the decline of the species in the planning area.

11 **CRT02—Protect existing unprotected occupied Colorado River toad habitat.** Based on results  
12 of research conducted under conservation measures CRT01 and within funding constraints of  
13 the LCR MSCP, protect existing unprotected occupied Colorado River toad habitat that is  
14 located through the research program.

15 **CRT03—Conduct research to determine feasibility of establishing the Colorado River toad**  
16 **in unoccupied habitat.** Conduct research necessary to determine the feasibility for successfully  
17 establishing the Colorado River toad in unoccupied habitat. If feasible, implement a pilot  
18 introduction into unoccupied habitat, and monitor the success of methods and establishment of  
19 the Colorado River toad in unoccupied habitat.

20 LOWLAND LEOPARD FROG

21 **LLFR1—Conduct research to better define the distribution, habitat requirements, and factors**  
22 **that are limiting the distribution of the lowland leopard frog.** Develop and implement a  
23 multiyear integrated research program to determine the range, status, habitat requirements,  
24 population biology, factors that currently limit lowland leopard frog abundance and  
25 distribution, and factors that have contributed to the decline of the species in the planning area.

26 **LLFR2—Protect existing unprotected occupied lowland leopard frog habitat.** Based on results  
27 of research conducted under conservation measures LLFRO1 and within funding constraints of  
28 the LCR MSCP, protect existing unprotected occupied lowland leopard frog habitat that is  
29 located through the research program.

30 **LLFR3—Conduct research to determine feasibility of establishing the lowland leopard frog**  
31 **in unoccupied habitat.** Conduct research necessary to determine the feasibility for successfully  
32 establishing the lowland leopard frog in unoccupied habitat. If feasible, implement a pilot  
33 introduction into unoccupied habitat, and monitor the success of methods and establishment of  
34 the lowland leopard frog in unoccupied habitat.

35 **2.1.1.6 Timing of the Implementation of Conservation Measures**

36 The conservation measures would be implemented as quickly as efficient staffing, funding, and  
37 the time required to conduct necessary research relative to creating covered species habitats and  
38 required to evaluate and acquire lands that are suitable for creating covered species habitat

1 would permit. It is not certain when future flow-related activities (i.e., changes in points of  
 2 diversion) will be implemented or whether all of these activities will be implemented. It is  
 3 anticipated, however, that changes in points of diversion will not be implemented for several  
 4 years following approval of the Conservation Plan. Because of the uncertainties surrounding  
 5 species requirements, habitat creation techniques, and the capabilities of potential habitat  
 6 creation sites to provide habitat, the LCR MSCP anticipates that the first few years of  
 7 Conservation Plan implementation would focus on conducting research and adaptive  
 8 management experiments (e.g., pilot habitat creation projects to test habitat creation techniques)  
 9 to collect information necessary to successfully implement the LCR MSCP. Following collection  
 10 of this information, implementation of the LCR MSCP is expected to rapidly accelerate, with  
 11 most or all of the habitat creation conservation component of the LCR MSCP completed within  
 12 20-30 years of LCR MSCP HCP approval.

13 The anticipated implementation strategy for establishing cottonwood-willow, honey mesquite,  
 14 and marsh land cover types to create habitats for cottonwood-willow-associated covered  
 15 species builds on information that would be gathered in the first few years of Conservation Plan  
 16 implementation. It is presumed that during implementation Years 0-5, most habitat creation  
 17 projects would be small in scale and designed to identify and verify the most cost effective  
 18 means of creating high quality habitat. Larger scale projects would be implemented in Years 6-  
 19 10 that are designed based on information gathered from previous plantings and partnerships  
 20 with willing landowners. Implementation Years 11-30 would focus on large-scale habitat  
 21 creation projects until the habitat creation objective acreage is achieved. The strategy for  
 22 creation of both connected and disconnected backwaters assumes 60 acres of backwater would  
 23 be created during each 5-year implementation period, with a goal of creating several small or  
 24 one or two larger backwaters during any single year. Performance criteria for covered species  
 25 habitats would be used to determine the extent of established cottonwood-willow, honey  
 26 mesquite, and marsh that develops as habitat for covered species.

27 Tables 2.1-8a-d describe the proposed implementation rate and interim acreage goals for  
 28 establishment of created habitats.

29

**Table 2.1-8a. Anticipated Schedule for Establishment of  
 Cottonwood/Willow**

| <i>Years</i> | <i>Acres/Year</i> | <i>5-Year Total</i> | <i>Cumulative Total</i> |
|--------------|-------------------|---------------------|-------------------------|
| 1-5          | 50                | 250                 | 250                     |
| 6-10         | 150               | 750                 | 1,000                   |
| 11-15        | 300               | 1,500               | 2,500                   |
| 16-20        | 300               | 1,500               | 4,000                   |
| 21-25        | 300               | 1,500               | 5,500                   |
| 26-30        | -                 | 440                 | 5,940                   |

30

**Table 2.1-8b. Anticipated Schedule for Establishment of Honey Mesquite**

| <i>Years</i> | <i>Acres/Year</i> | <i>5-Year Total</i> | <i>Cumulative Total</i> |
|--------------|-------------------|---------------------|-------------------------|
| 1-5          | 20                | 100                 | 100                     |
| 6-10         | 40                | 200                 | 300                     |
| 11-15        | 80                | 400                 | 700                     |
| 16-20        | 80                | 400                 | 1,100                   |
| 21-25        | -                 | 220                 | 1,320                   |
| 26-30        | -                 | -                   | 1,320                   |

**Table 2.1-8c. Anticipated Schedule for Establishment of Marsh**

| <i>Years</i> | <i>Acres/Year</i> | <i>5-Year Total</i> | <i>Cumulative Total</i> |
|--------------|-------------------|---------------------|-------------------------|
| 1-5          | 10                | 50                  | 50                      |
| 6-10         | 20                | 100                 | 150                     |
| 11-15        | 40                | 200                 | 350                     |
| 16-20        | 40                | 162                 | 512                     |
| 21-25        | -                 | -                   | -                       |
| 26-30        | -                 | -                   | -                       |

**Table 2.1-8d. Anticipated Schedule for Establishment of Backwaters**

| <i>Years</i> | <i>Acres/Year</i> | <i>4-Year Total</i> | <i>Cumulative Total</i> |
|--------------|-------------------|---------------------|-------------------------|
| 1-5          | 15                | 60                  | 60                      |
| 6-10         | 15                | 60                  | 120                     |
| 11-15        | 15                | 60                  | 180                     |
| 16-20        | 15                | 60                  | 240                     |
| 21-25        | 15                | 60                  | 300                     |
| 26-30        | 15                | 60                  | 360                     |

#### 2.1.1.7 Monitoring and Research

The elements of the monitoring and research program include system monitoring, species monitoring and research, habitat creation technology research, and post-development or post-habitat creation monitoring.

The LCR MSCP Program Manager, in cooperation with the Service, would direct development and implementation of the monitoring and research program. The LCR MSCP would maintain databases for storage and retrieval of monitoring and research data collected under the LCR MSCP and by others that are relevant to covered species and their habitats, as well as for tracking implementation and success of Conservation Plan measures. Monitoring and research would primarily be directed to fill known data and information gaps and/or those data needs identified through database review. Every attempt would be made to use and glean data from existing, ongoing programs and to direct the collection of data that would augment, not replace,

1 these programs. Monitoring protocols and research studies would be designed to avoid  
2 excessive disturbance to covered species and to ensure that monitoring and research are  
3 conducted in compliance with all permit stipulations.

4 The LCR MSCP Program Manager would maintain close coordination with other recovery  
5 implementation programs and habitat conservation programs in the Colorado River watershed,  
6 including the Upper Colorado River Endangered Fish Recovery Program, the Glen Canyon  
7 Dam Adaptive Management Program, the Clark County MSHCP and others that may develop  
8 through the life of the LCR MSCP. Additionally, communication and coordination would be  
9 maintained with other species conservation planning and habitat restoration efforts that are in  
10 place within the range of the species covered under the Conservation Plan (e.g., southwestern  
11 willow flycatcher research and habitat restoration activities along the middle Rio Grande in  
12 central New Mexico).

13 The purpose behind this close communication and coordination is to ensure and facilitate the  
14 transfer and management of data and information related to key species and the employment of  
15 state-of-the-art restoration technologies. LCR MSCP monitoring protocols would be developed  
16 in coordination with the National Fish and Wildlife Foundation's Partner's in Flight programs  
17 in Arizona, California, and Nevada to ensure that results of LCR MSCP monitoring are  
18 compatible with and can be integrated with data collected on covered species and habitat  
19 restoration efforts under these programs. This coordination would allow for comparable data  
20 to be collected that can be used to better evaluate the regional status and trends of species and  
21 to identify and direct future management efforts to benefit these species. Identification of such  
22 regional management needs based on coordinated regional monitoring efforts would not only  
23 help guide adaptive implementation of the Conservation Plan but would also provide such  
24 guidance for other species conservation programs. Additionally, monitoring protocols would  
25 be designed and developed that permit coordinated database management, as well as database  
26 compatibility with other conservation planning efforts (e.g., databases developed, maintained,  
27 and managed in the Glen Canyon Dam Adaptive Management Program, Upper Colorado River  
28 Basin Recovery Implementation Program, and Roosevelt Lake HCP).

### 29 *System Monitoring*

30 System monitoring would be conducted to collect data on existing populations and habitats of  
31 covered species to determine their status, distribution, density, migration, productivity, and  
32 other ecologically important parameters. System monitoring would be implemented annually,  
33 with decreasing intensity over the term of the LCR MSCP. Collected data would be maintained  
34 in a GIS database (e.g., distribution of habitats, species observations) and other database  
35 formats as appropriate.

36 In the early years of Conservation Plan implementation, extensive data gathering would be  
37 conducted to acquire and sort data on covered species to identify data gaps and research  
38 questions that would be addressed through the adaptive management process. At the same  
39 time, ongoing monitoring of endangered species currently performed by Reclamation would  
40 continue. Additionally, productivity and survival for other avian species would be gathered  
41 through continued monitoring at two data Monitor Avian Productivity and Survival (MAPS)  
42 stations located in patches of riparian land cover along the LCR (one on created habitat and one  
43 on existing habitat that would not be affected by covered activities). If the appropriate sites are

1 identified and become available for use, it may be feasible to establish one or more additional  
2 MAPS stations within the planning area.

3 As data gaps are identified, monitoring actions, primarily directed toward covered species for  
4 which little is known from the LCR (i.e., mammals, amphibians, insects) would be designed,  
5 scheduled, and implemented. Monitoring data would itself be reviewed to determine species-  
6 specific and habitat creation-specific research needs. For example, the status and distribution of  
7 the Colorado River cotton rat is unknown. (None have been seen or collected for a few years.)  
8 Small mammal trapping would need to be implemented in areas previously known to be  
9 occupied by this species. If the species is located, species-specific research studies would need  
10 to be undertaken to determine the relationship between the organism and its environment.  
11 Data collected through such species-specific research efforts would then be used to refine or  
12 modify Conservation Plan conservation measures to ensure the species' LCR MSCP  
13 conservation goals are achieved.

14 An important aspect of system monitoring includes the development and use of consistent  
15 monitoring and research protocols. Monitoring and research plan designs and database  
16 management techniques and methodologies should, to the maximum extent practicable,  
17 conform to protocols identified or developed in existing species recovery plans, Partner's in  
18 Flight bird conservation plans, and other species-related conservation planning efforts.

19 It is anticipated that system monitoring could decrease during the later years of LCR MSCP  
20 implementation because post-development monitoring on established sites would provide the  
21 data necessary to evaluate the overall health and well-being of these species.

### 22 *Species Research*

23 The LCR MSCP participants recognize that there are considerable data gaps for many of the  
24 covered species and that these data are needed to guide, through the adaptive management  
25 process, the design and implementation of effective conservation measures. Through the  
26 adaptive management process, LCR MSCP implementation would be informed and enhanced  
27 by the collection of basic life history data, such as food habits, migration timing, and the  
28 physical-, chemical-, and biological-limiting factors necessary to design, construct, and manage  
29 the requisite habitats necessary to ensure the continued survival of the species.

30 The LCR MSCP Program Manager would determine, in cooperation with the Service, the  
31 appropriate scope of these species-specific research programs and activities. As described for  
32 system monitoring, the LCR MSCP participants would coordinate with, participate in, and  
33 build on extant research for these species. Some of the species research items currently  
34 identified include brown-headed cowbird and starling control, bat roost and forage site  
35 identification, MacNeill's sootywing skipper habitat requirements, and flannelmouth sucker  
36 investigations below Davis Dam.

### 37 *Restoration Research*

38 Restoration technology and methodology research is a key element for successful  
39 implementation of habitat establishment through the adaptive management process. Most of  
40 the habitats to be created under the LCR MSCP involve a continuation, completion, or

1 expansion of actions currently being tested and implemented by Reclamation as part of  
2 previous BOs (e.g., some Reclamation projects, such as backwater development, have been  
3 implemented as mitigation as long as 30 years ago). Many of Reclamation's ongoing restoration  
4 projects are demonstration projects that were designed and implemented to answer some of the  
5 multitude of questions surrounding restoration of native aquatic, marsh, and riparian  
6 communities in the Colorado River floodplain. Much of this work would still be under  
7 investigation as the Conservation Plan moves into the implementation phase. In many ways,  
8 these actions are still conceptual in nature.

9 Initially, a major focus of restoration research would be to conduct site evaluations to collect the  
10 information necessary to select conservation areas based on the conservation area site-selection  
11 criteria. Substantial pre-restoration evaluation and inventory would be required to ensure that  
12 the best sites are selected.

### 13 *Post-development Monitoring*

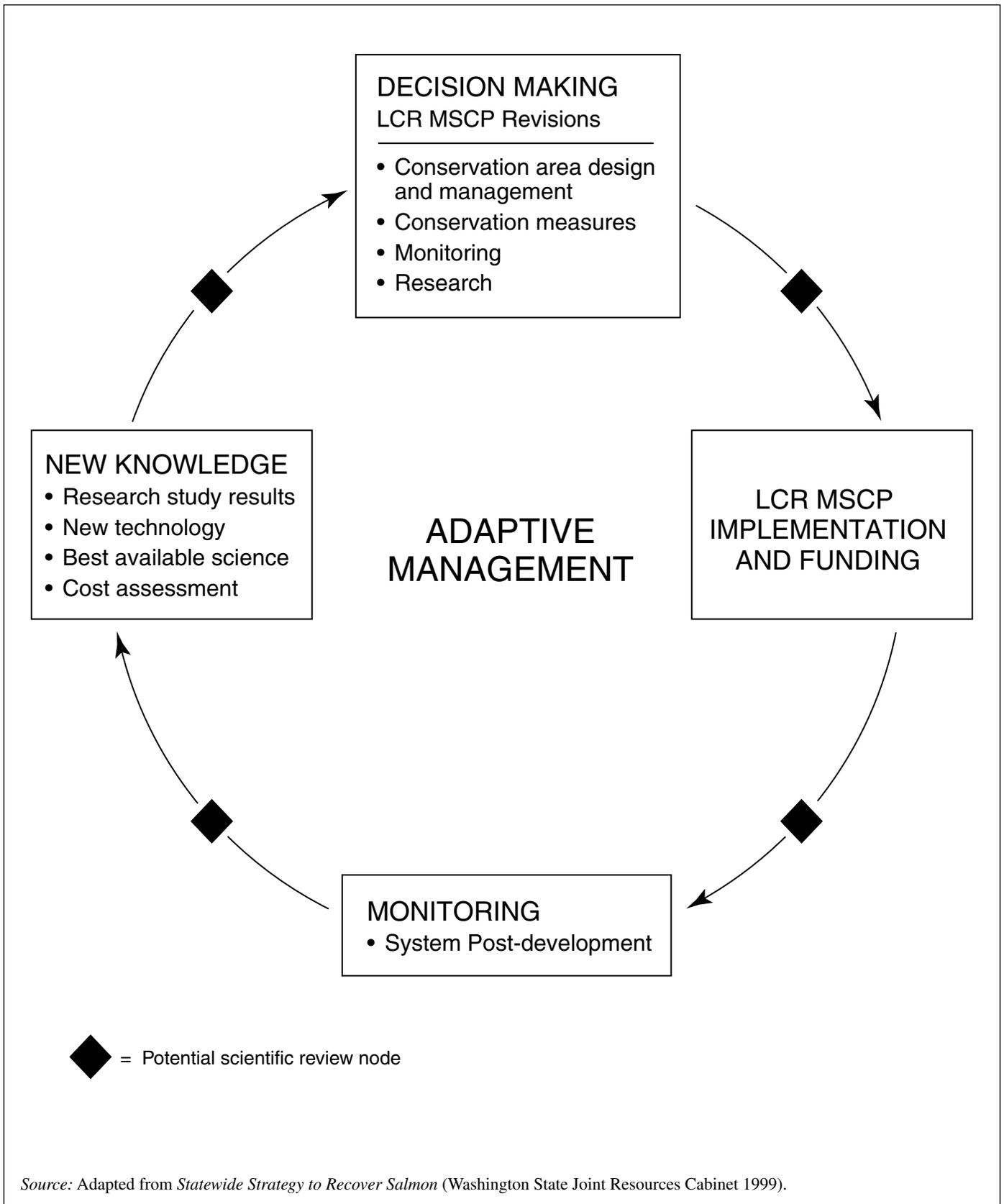
14 Following completion of habitat creation activities (e.g., site grading, plant installation) at each  
15 conservation area, post-development monitoring would be conducted to evaluate development  
16 of the site as covered species habitat (e.g., growth of vegetation, development of elements of  
17 species habitat) and use of the habitat by covered species. Data collected about how created  
18 habitat develops relative to the habitat creation techniques used to establish and maintain the  
19 habitat would be used to refine management techniques to ensure the most cost-effective  
20 approaches are used (e.g., water management). An element of post-development monitoring  
21 also includes monitoring of the parameters established for established covered species habitats  
22 to determine whether the minimum habitat requirements established for each species' habitat  
23 are being achieved.

### 24 **2.1.1.8 Adaptive Management**

25 Uncertainty is an unavoidable component of creating and managing species habitats since  
26 conditions within the planning area and the status of covered species may change during the  
27 term of the LCR MSCP. To address such uncertainties, the LCR MSCP Program Manager  
28 would implement the LCR MSCP based on the principles of adaptive management, which  
29 would allow LCR MSCP conservation measures to be adjusted over time based on results of  
30 monitoring and research.

31 The adaptive management process would be administered by the LCR MSCP Program  
32 Manager, with input from the LCR MSCP Steering Committee, and would provide the Program  
33 Manager with objective scientific data and analyses on which to base management decisions.  
34 Figure 2.1-11 conceptually illustrates the adaptive management process.

35 The LCR MSCP adaptive management process is intended to be a flexible, iterative approach to  
36 long-term habitat creation and management of biological resources and would be influenced  
37 over time by the results of ongoing monitoring, research, and other sources of information.  
38 Conservation measures, habitat creation actions, and resource management techniques would  
39 be regularly evaluated in light of monitoring and research results regarding species needs,  
40 habitat creation successes and failures, and other factors. The intent of this evaluation process is



**Figure 2.1-11. Adaptive Management Process**

1 to better achieve overall conservation and management goals as defined by measurable  
2 biological objectives.

3 The cornerstone of the adaptive management process is the LCR MSCP monitoring and  
4 research program. Information collected through monitoring and research would be used to  
5 design and manage created habitat and provide information to direct the fish augmentation  
6 element of the LCR MSCP. During the early phases of LCR MSCP implementation, monitoring  
7 and research would provide data to improve the efficacy of techniques to successfully establish  
8 habitat. As habitats are established, the adaptive management process would allow for the  
9 experience gained through early projects to shape and refine future habitat creation projects.

10 The data collected, evaluated, and managed through the monitoring and research program  
11 would provide a scientific basis for modification of existing projects or development of  
12 alternative measures that would provide greater benefits or more efficient use of LCR MSCP  
13 resources. Such modified/alternative measures would be developed as written proposals and  
14 would be presented to the LCR MSCP Steering Committee by the LCR MSCP Program  
15 Manager, together with an estimate of the costs. These proposals would be evaluated to ensure  
16 that they are consistent with the LCR MSCP goals and can be accomplished within the limits of  
17 the budget and financing assurances of the LCR MSCP participants.

18 Action plans and budgets, reflecting the implementation of conservation projects, will be  
19 presented to the Service for its review and written concurrence that they conform to the terms  
20 and conditions necessary or appropriate for purposes of the incidental take authorization.  
21 Modified/alternative conservation measures and methods that have been generated through  
22 the adaptive management process, proposed by the LCR MSCP Program Manager, reviewed by  
23 the LCR MSCP Steering Committee, and with concurrence of the Service would not require an  
24 amendment to the section 10(a)(1)(B) permit or re-initiation of the section 7 consultation.

25 Recovery plans could be developed for Federally listed species or LCR MSCP species that  
26 become listed over the 50-year life of the LCR MSCP. The LCR MSCP adaptive management  
27 process allows for revisions of objectives and conservation measures to incorporate recovery  
28 strategies identified in new or revised recovery plans.

#### 29 **2.1.1.9 Conceptual Habitat Conservation Actions**

30 Table 2.1-9 summarizes the key elements that would be involved in implementing the five  
31 habitat creation and maintenance concepts that would be incorporated into an integrated  
32 mosaic of habitats. The five concepts are:

- 33 1. Converting agricultural land to cottonwood-willow and/or mesquite habitat.
- 34 2. Converting undeveloped lands to cottonwood-willow and/or mesquite habitat.
- 35 3. Creating marsh.
- 36 4. Creating backwaters.
- 37 5. Maintaining existing habitat (this refers to the LCR MSCP's contribution to maintaining  
38 the condition of a portion of existing habitat for covered species within the planning  
39 area).

**Table 2.1-9. Key Elements of Habitat Establishment and Maintenance Concepts**

| Key Elements of Concepts   | CONCEPT <sup>1</sup> |   |   |   |   |
|--|----------------------|---|---|---|---|
|  | 1                    | 2 | 3 | 4 | 5 |
| Clearing existing vegetation.  | X                    | X | X | X |   |
| Using existing water delivery infrastructure where possible.   | X                    |   |   |   |   |
| Upgrading, augmenting, or enhancing the pumping system, canals, and drains where needed.   | X                    |   |   |   | X |
| Grading and contouring to provide distribution canals, side channels, swales, and berms to support cottonwood-willow and mesquite land cover types.  | X                    | X |   |   |   |
| Designing/constructing water infrastructure to allow for flood irrigation of cottonwood-willow and seasonal creation and maintenance of moist soils.   | X                    | X |   |   | X |
| Revegetating using methods that include but are not limited to pole planting (vertical or horizontal), planting container-grown trees and shrubs, natural seeding from early plantings, and hydroseeding   | X                    | X | X |   |   |
| Identifying potential maintenance and management measures to ensure long-term viability of the conservation site.  | X                    | X | X | X |   |
| Installing drip irrigation where needed to irrigate mesquite plantings   | X                    | X |   |   |   |
| Creating low-lying areas for water retention through dredging, surface excavation, or other means.   | X                    | X | X |   |   |
| Establishing a water inflow and outflow system to maintain water depth and extent. Establishing water inflow through the groundwater table, surface water inlet and outlet facilities, or attachment to canal distribution network.                                | X                    | X | X | X |   |
| Revegetating with shoots, seeds, or other propagules.  | X                    | X | X |   |   |
| Establishing a backwater area through dredging, surface excavation, or other means. This concept could include shallow water habitat.  |                      |   |   | X | X |
| Designing all water inflow and outflow facilities to prevent the movement of non-native aquatic species into the backwater if it is being established for native fish.   |                      |   |   | X |   |
| Maintaining marsh vegetation by burning, water delivery, and other means.  |                      |   | X |   | X |
| Removing or controlling undesirable vegetation such as saltcedar and <i>Arundo</i> ; and other appropriate means to maintain existing desirable habitat conditions.  | X                    | X | X |   | X |
| 1 Concepts are 1) converting agricultural land to cottonwood-willow and/or mesquite habitat; 2) converting undeveloped lands to cottonwood-willow and/or mesquite habitat; 3) establishing marsh; 4) establishing backwaters; and 5) maintaining existing habitat. |                      |   |   |   |   |

---

## 1 2.1.2 Alternative 2: No Action Alternative

2 The no action alternative describes a reasonable assumption of the expected future situation  
3 that would result if the Conservation Plan were not implemented as proposed and the section  
4 10(a)(1)(B) permit were not issued. This alternative is based on the following assumptions  
5 regarding the actions that would be taken in the absence of the LCR MSCP.

### 6 *Assumptions*

- 7 • A comprehensive, regional multi-species conservation plan would not be implemented  
8 by non-Federal and Federal entities.
- 9 • The Service would not issue a comprehensive section 10(a)(1)(B) permit to the states of  
10 Arizona, California, and Nevada for incidental take resulting from the covered activities.
- 11 • The covered activities described in the LCR MSCP BA and LCR MSCP HCP would  
12 likely be implemented, but regulatory compliance would be required and applied on a  
13 case-by-case basis as each activity is considered and approved. The types of  
14 conservation measures and strategies described for the proposed Conservation Plan  
15 would likely be adopted to offset the impacts of each activity, but would be planned and  
16 implemented independently for each activity. Conservation could occur in the planning  
17 area as well as in the off-site conservation areas described below under Alternative 4.  
18 These include the lower reaches of the Virgin and Muddy rivers, Bill Williams River,  
19 and Gila River. In the absence of a comprehensive, coordinated conservation program,  
20 the following would be expected:
  - 21 – It is unlikely that funding would be provided to maintain existing habitat that is not  
22 impacted by the individual projects.
  - 23 – The individual project mitigation programs likely would not provide the regional  
24 wildfire suppression and law enforcement funding proposed in the Conservation  
25 Plan.
  - 26 – Coordinated monitoring and adaptive management programs would not be  
27 implemented.
  - 28 – Since each individual project would establish its own mitigation sites, it is likely that  
29 more maintenance and storage facilities would be required.
  - 30 – More, smaller mitigation sites would be established, requiring more infrastructure  
31 (access roads and irrigation pipelines/canals and pump facilities).
  - 32 – To the extent that the agencies undertaking the covered activities proceed with ESA  
33 compliance, there may be a reduced number of covered species because unlisted  
34 species likely would not be included. This would result in a reduction in the amount  
35 of habitat required.

### 36 *Federal Regulatory Compliance Actions*

- 37 • All Reasonable Prudent Measures (RPMs) and Reasonable Prudent Alternatives (RPAs)  
38 for the 1997 and 2002 BOs must be completed by April 30, 2005, when the current BO  
39 expires. Reclamation would need to reinitiate consultation with the Service on LCR

1 operations and maintenance activities, and the Service would issue a new BO, which  
2 may contain conservation measures or requirements not in the original 1997 BO or the  
3 2002 extension. It is likely that Reclamation's consultation with the Service regarding  
4 ongoing operations and maintenance activities would incorporate the future actions for  
5 which coverage is provided by the proposed Conservation Plan.

- 6 • The provisions of the 2001 BO regarding the change in point of diversion of up to 400  
7 kaf from Imperial Dam to Lake Havasu would remain in effect, assuming that the  
8 exchange is accomplished, until the time limits set in the BO expire.
- 9 • Future Federal actions would be required to comply with NEPA, the ESA, and other  
10 laws and regulations; compliance and permit requirements would be implemented on a  
11 case-by-case basis.
- 12 • It is likely that conservation measures similar to those of the proposed action would be  
13 implemented to comply with regulatory requirements, with the exceptions described  
14 above under "Assumptions."

### 15 *Non-Federal Regulatory Compliance Actions*

- 16 • Ongoing and future actions in Arizona, California, and Nevada would be required to  
17 comply with permit requirements, where appropriate, and all applicable laws and  
18 regulations. There is a reasonable possibility that potential non-Federal permittees  
19 would conclude that they do not require a section 10(a)(1)(B) permit for their activities,  
20 either because they choose not to implement those activities or they determine that their  
21 activities do not cause incidental take of protected species.

### 22 *Ongoing Conservation Actions*

- 23 • Conservation actions by Federal agencies that are tied to section 7 consultations under  
24 section 7(a)(2) would continue to be implemented as part of that proposed action or  
25 under the requirements of the BO. Implementation would cease only under the terms of  
26 the BO.
- 27 • Voluntary conservation actions initiated by Federal agencies under section 7(a)(1) would  
28 continue to be implemented at the discretion of the Federal agency.
- 29 • Voluntary conservation actions initiated by state agencies, tribes, or private groups  
30 would continue to be implemented at the discretion of the funding entity.
- 31 • Implementation of existing recovery plans for listed species would continue as Federal  
32 and non-Federal partners provide funding for specific projects relevant to the planning  
33 area.

### 34 **2.1.3 Alternative 3: Implementation of a Conservation Plan Addressing ESA-Listed** 35 **Species Only and Issuance of a Section 10(a)(1)(B) Permit (ESA-Listed Species** 36 **Only)**

37 This alternative would provide coverage only for those species listed under the ESA, and it  
38 would result in the issuance of a section 10(a)(1)(B) permit by the Service. Covered species  
39 would be the Yuma clapper rail, southwestern willow flycatcher, desert tortoise, bonytail,

1 humpback chub, and razorback sucker. The amount of take authorized would be as shown on  
2 Tables 2.1-2 and 2.1-3 for these species. This alternative would differ from the proposed action  
3 primarily in that no honey mesquite and less cottonwood-willow and marsh land cover would  
4 need to be established. Additionally, no take permit would be issued for unlisted species, and  
5 specific benefits for those species would not occur. Under this alternative, the Conservation  
6 Plan would be implemented in the same geographic area as the proposed action and would  
7 include:

- 8 • Establishment of a \$25 million fund to support projects implemented by land use  
9 managers in the planning area that maintain existing habitat for listed species that  
10 would be covered by the Conservation Plan under this alternative;
- 11 • Creation of native habitat in the planning area (4,050 acres of cottonwood-willow, 382  
12 acres of marsh, and 360 acres of backwaters);
- 13 • Long-term management of established habitat to maintain and preserve ecological  
14 functions;
- 15 • Avoidance and minimization of impacts resulting from covered activities and  
16 Conservation Plan implementation on listed species and their habitat;
- 17 • Population enhancement measures intended to directly or indirectly increase abundance  
18 of listed species; and
- 19 • Adaptive management measures, including monitoring and research necessary to assess  
20 and improve conservation measure effectiveness.
- 21 • Other conservation measures relating to the listed species and the strategies for  
22 implementing them, as discussed in section 2.1.1.

#### 23 **2.1.4 Alternative 4: Off-Site Conservation and Issuance of a Section 10(a)(1)(B) Permit** 24 **(Off-Site Conservation)**

25 The off-site conservation alternative would involve the application for and issuance of a section  
26 10(a)(1)(B) permit for the same covered activities and covered species as the proposed action.  
27 The level of impacts to covered species, including the amount of authorized take that is  
28 requested, is the same for this alternative as for the proposed action, and therefore, the same  
29 level of conservation measures would be proposed to mitigate the impacts, including:

- 30 • Establishing a \$25 million fund to support projects implemented by land use managers  
31 in the planning area that maintain existing covered species' habitat;
- 32 • Creation of native habitat (5,940 acres of cottonwood-willow, 1,320 acres of honey  
33 mesquite type III, 512 acres of marsh, and 360 acres of backwaters);
- 34 • Long-term management of created habitat to maintain and preserve ecological  
35 functions;
- 36 • Avoidance and minimization of impacts resulting from covered activities and  
37 Conservation Plan implementation on covered species and their habitat;
- 38 • Population enhancement measures intended to directly or indirectly increase abundance  
39 of covered species;

- 1 • Adaptive management measures, including monitoring and research necessary to assess  
2 and improve conservation measure effectiveness; and
- 3 • Other conservation measures relating to the covered species and the strategies for  
4 implementing them, as discussed in section 2.1.1.

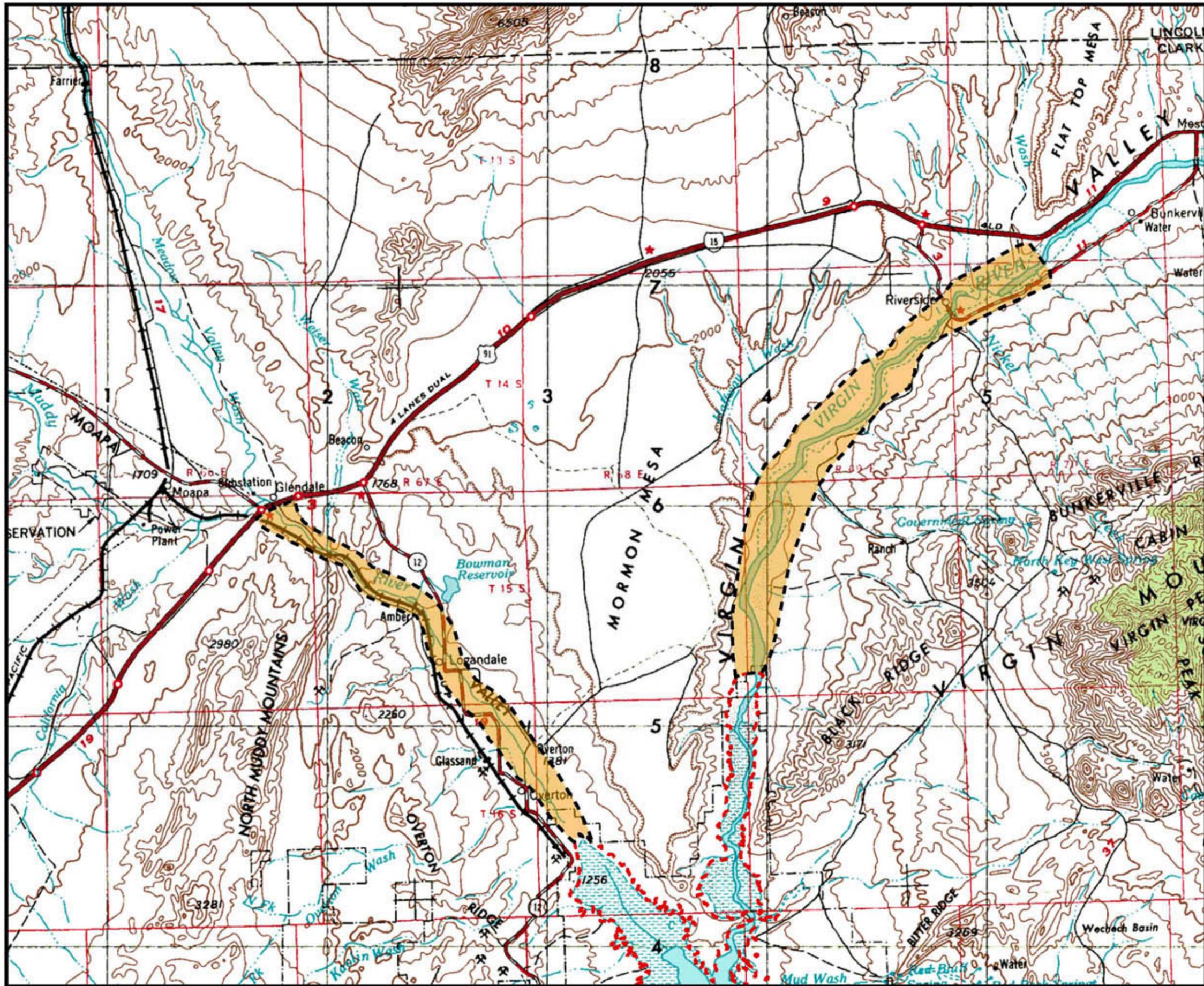
5 The only difference between this alternative and the proposed action is that habitat generally  
6 would be created along tributaries to the LCR. Fish conservation, including the creation of 360  
7 acres of backwaters and fish augmentation strategies, would continue to take place in the  
8 mainstem, reservoirs, and backwaters of the LCR. For purposes of analysis, it is assumed that  
9 created habitat would be equally distributed between the three off-site conservation areas.

10 Potential off-site locations for implementing the Conservation Plan elements are: (1) the lower  
11 reaches of the Muddy River/Moapa Valley and Virgin River, proceeding upstream from the  
12 confluences with Lake Mead and overlapping the NDOW's Overton Wildlife Management Area  
13 (Figure 2.1-12); (2) the lower reach of the Bill Williams River, proceeding upstream from the  
14 confluence with the LCR and overlapping the Bill Williams NWR, to Alamo Dam (Figure  
15 2.1-13); and/or (3) lower Gila River Valley, proceeding upstream from the LCR planning area  
16 and extending approximately ten miles east of Mohawk Valley (Figure 2.1-14). Land ownership  
17 for each of the off-site conservation areas is shown on Table 2.1-10. These locations were  
18 selected because they:

- 19 1. Provide essentially the same benefits to local-to-regional populations of covered species  
20 that would be provided by the proposed Conservation Plan. They are in close proximity  
21 to the planning area so that mitigation is effective at addressing local ecosystem  
22 concerns.
- 23 2. They would productively combine with and enhance other conservation efforts that are  
24 being and would be applied along the LCR mainstem through other initiatives.
- 25 3. They span the same range of ecological communities as the planning area, providing  
26 ecological counterparts to the upper (Reaches 1-2), middle (Reaches 3-5), and lower  
27 (Reaches 6-7) portions of the planning area.

28 In addition to the information used to develop the proposed Conservation Plan, the following  
29 key sources were consulted to identify the best locations for Alternative 4:

- 30 • *An Ecological Analysis of Conservation Priorities in the Sonoran Desert Ecoregion* (Marshall et  
31 al. 2000).
- 32 • *The Arizona Partners in Flight Bird Conservation Plan* (Latta et al. 1999).
- 33 • *The Final Recovery Plan for the Southwestern Willow Flycatcher* (USFWS 2002d).
- 34 • The Nevada Natural Heritage Program (NNHP) (2000) *Scorecard 2000: Highest Priority*  
35 *Conservation Sites*.
- 36 • The Southern Nevada Public Land Management Act's (SNPLMA 2003) website  
37 information on conservation land acquisition priorities ([http://www.nv.blm.gov/  
38 snplma/default.asp](http://www.nv.blm.gov/snplma/default.asp)).



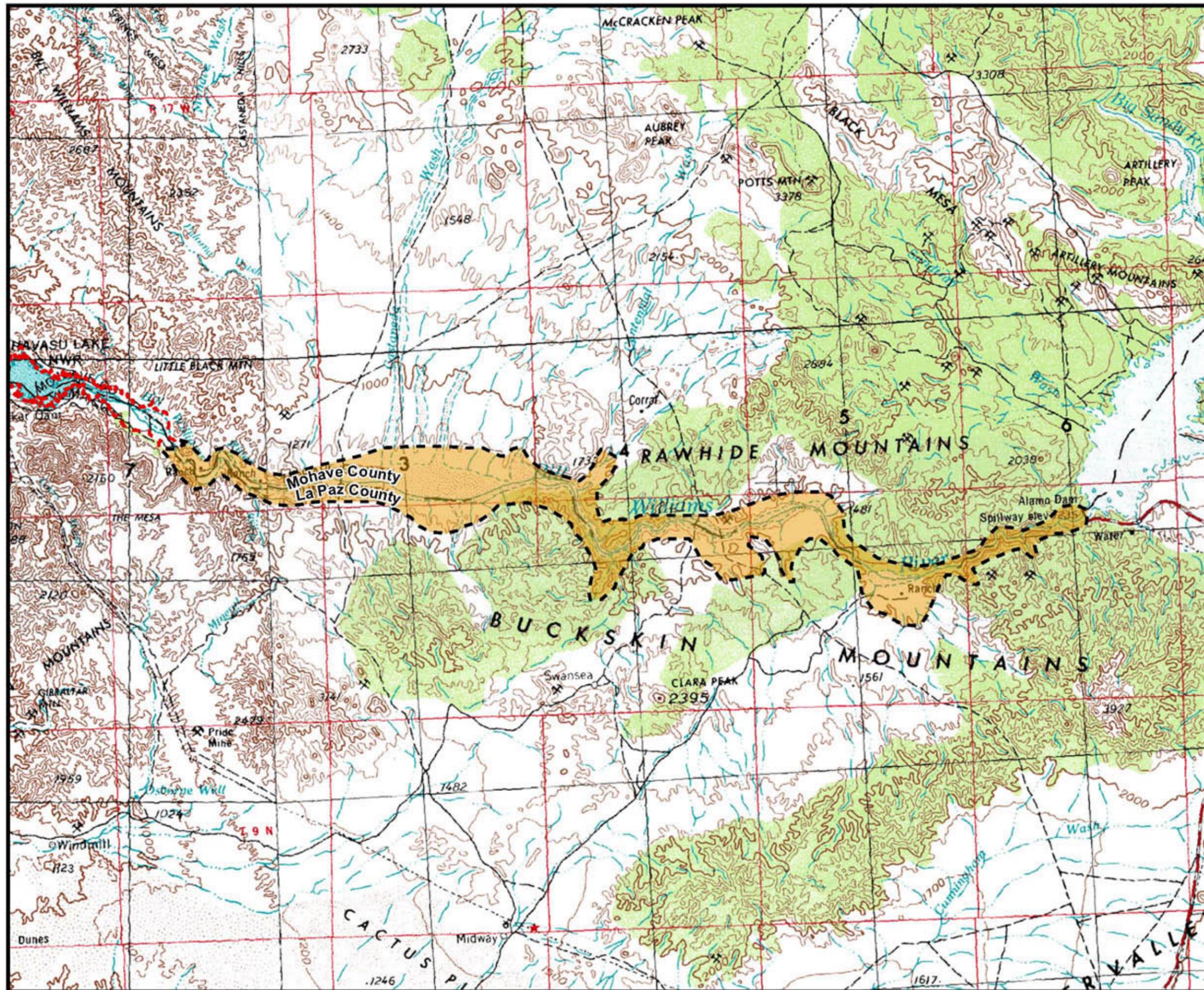
Planning Area Boundary  
 Muddy and Virgin Rivers Off-Site Conservation Areas

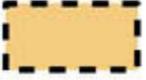
  
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**Figure 2.1-12**  
**Muddy and Virgin Rivers Off-Site Conservation Area**

1

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 Planning Area Boundary  
 Bill Williams River Off-Site Conservation Areas



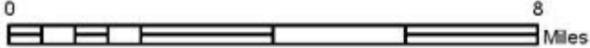


Figure 2.1-13.

**Bill Williams River  
Off-Site Conservation Area**

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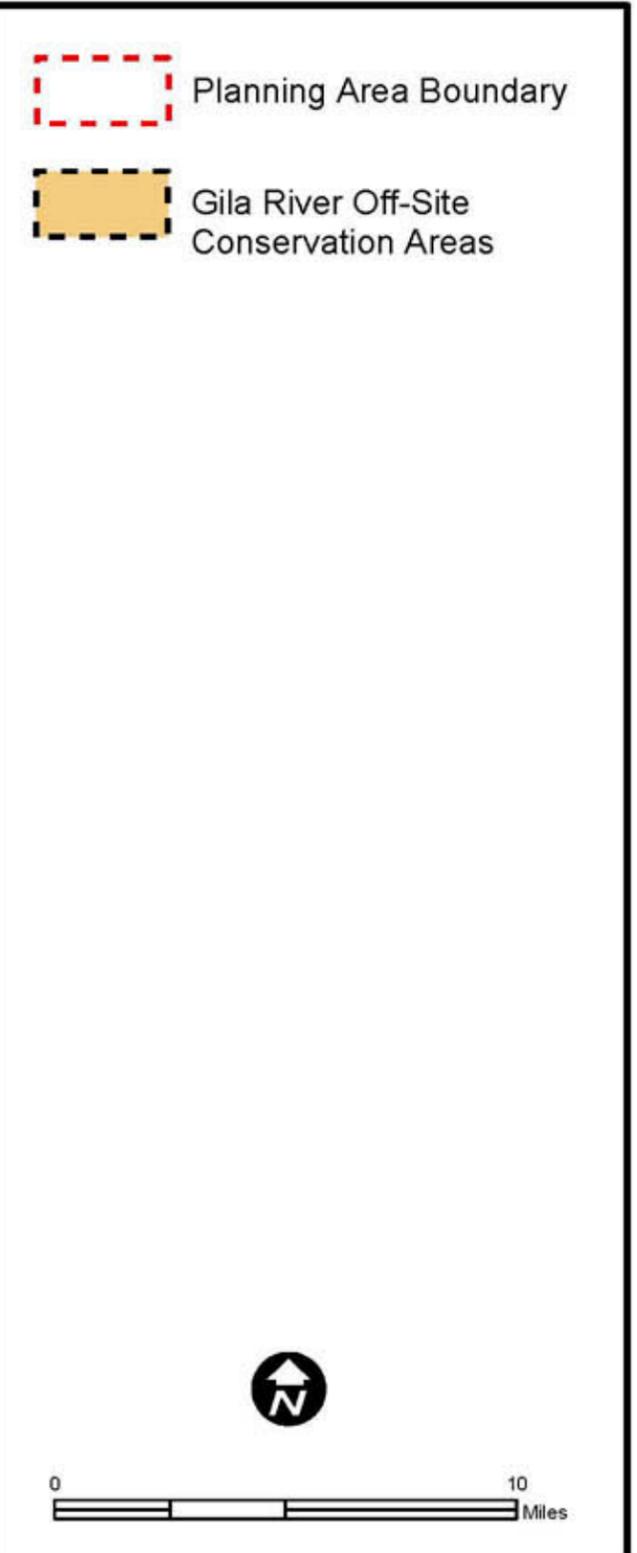
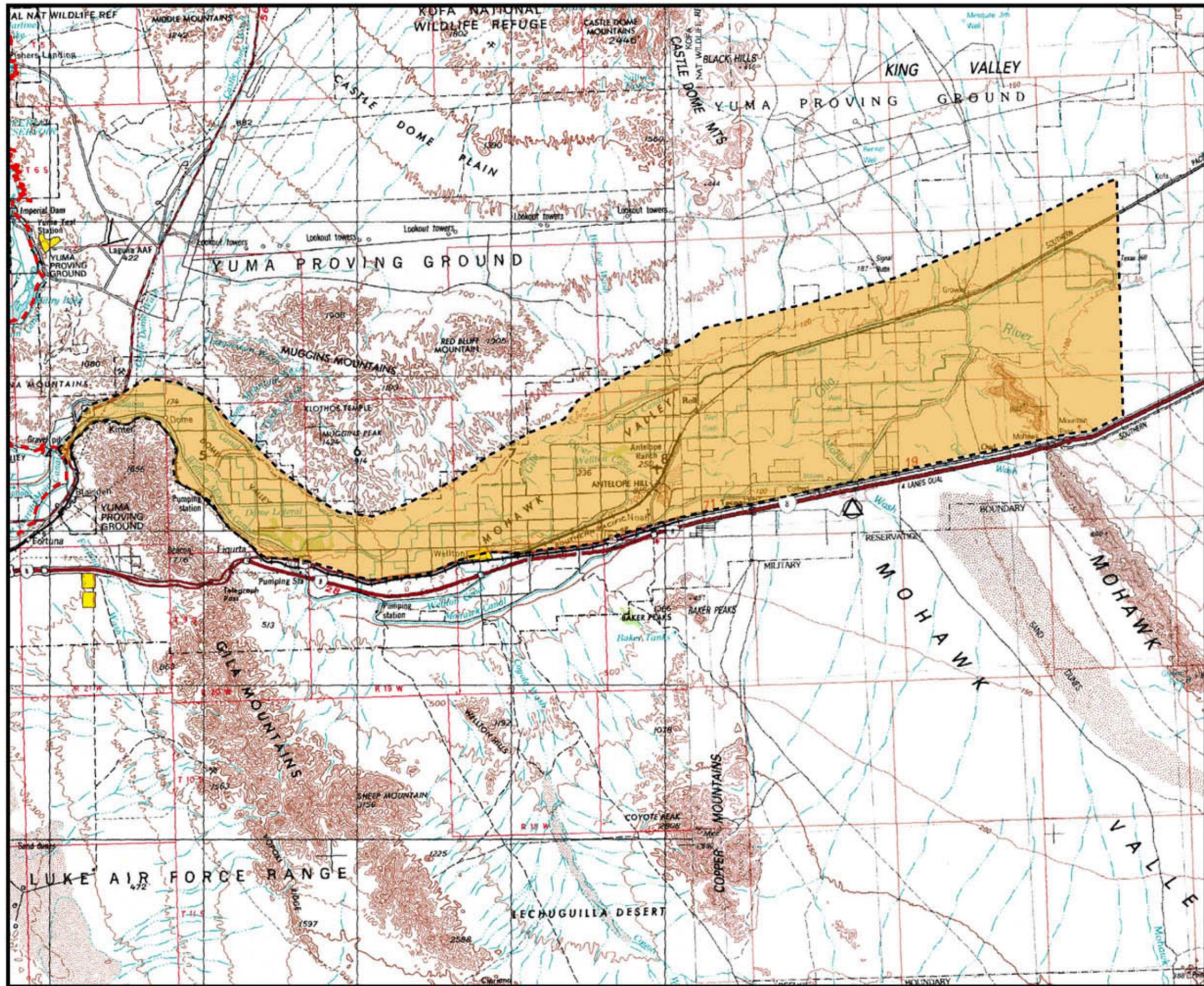


Figure 2.1-14.  
**Lower Gila River  
 Off-Site Conservation Area**

1

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1 **Table 2.1-10. Land Ownership in the Off-Site Conservation Areas (Acres)**

| <i>Land Owner</i>            | <i>Lower Muddy and Virgin Rivers</i> | <i>Lower Bill Williams River</i> | <i>Lower Gila River Valley</i> |
|------------------------------|--------------------------------------|----------------------------------|--------------------------------|
| U.S. Bureau of Reclamation   | 0                                    | 0                                | 0                              |
| U.S. Fish & Wildlife Service | 0                                    | 2,187                            | 0                              |
| Bureau of Land Management    | 7,524                                | 10,004                           | 45,003                         |
| U.S. Forest Service          | 22                                   | 0                                | 0                              |
| Department of Defense        | 0                                    | 0                                | 4,176                          |
| State                        | 2,321                                | 1,773                            | 10,230                         |
| Private                      | 7,958                                | 7,426                            | 92,716                         |
| National Park Service        | 318                                  | 0                                | 0                              |
| Unknown                      | 0                                    | 0                                | 10                             |
| <b>Acreage Totals</b>        | <b>18,142</b>                        | <b>21,390</b>                    | <b>152,135</b>                 |

- 2 • Reclamation's (USBR 1999a) *Long Term Restoration Program for the Historical Southwestern*  
3 *Willow Flycatcher (Empidonax traillii extimus) Habitat along the Lower Colorado River*  
4 *(Response to the Service pursuant to Reasonable and Prudent Alternative #11 from the*  
5 *1997 BO).*
- 6 • Other documents as cited.

#### 7 **2.1.4.1 Lower Muddy and Virgin Rivers**

8 The areas included in this off-site conservation area include large acreages of land in private  
9 ownership that surrounds riverine aquatic and riparian habitat. Within both privately and  
10 publicly held lands there are numerous areas of opportunity for creating and/or maintaining  
11 aquatic and riparian habitat. These areas include existing and potential southwestern willow  
12 flycatcher habitat that is important to the recovery of the species (USFWS 2002d). Previously

13 identified conservation opportunities include 620 acres of potential habitat for southwestern  
14 willow flycatcher on private lands along a 15-mile stretch of the Virgin River upstream from  
15 Lake Mead to the Overton Wildlife Management area (USBR 1999a). Similarly, extensive  
16 private lands exist along the lower Muddy River in Moapa Valley.

17 This off-site conservation area includes habitat conservation opportunities for a number of  
18 species that are not known to occur in the other two areas: the desert pocket mouse; the relict  
19 leopard frog; and MacNeill's sootywing skipper. Conservation actions within this area would  
20 accordingly give priority to meeting the needs of these species. This area also contains two  
21 Federal- and Nevada-listed endangered fish species that are not covered by the proposed  
22 Conservation Plan: the woundfin (*Plagopterus argentsimus*) and Virgin River chub (*Gila*  
23 *seminuda*).

24 The covered species that occur or are likely to occur in each of the off-site conservation areas  
25 and would benefit from habitat creation and maintenance efforts are shown on Table 2.1-11.

1 **Table 2.1-11. Species for which Habitat Establishment or Maintenance Could Occur**  
 2 **in Each of the Off-Site Conservation Areas**

| <i>Species Name</i>            | <i>Lower Muddy and Virgin Rivers</i> | <i>Lower Bill Williams River</i> | <i>Lower Gila River Valley</i> |
|--------------------------------|--------------------------------------|----------------------------------|--------------------------------|
| Pale Townsend’s big-eared bat  | X                                    | X                                |                                |
| Western yellow bat             | X                                    | X                                | X                              |
| Western red bat                | X                                    | X                                | X                              |
| California leaf-nosed bat      | X                                    | X                                | X                              |
| Desert pocket mouse            | X                                    |                                  |                                |
| Colorado River cotton rat      |                                      | X                                |                                |
| Yuma hispid cotton rat         |                                      |                                  | X                              |
| Western least bittern          | X                                    | X                                | X                              |
| Yuma clapper rail              | X                                    | X                                | X                              |
| California black rail          |                                      | X                                | X                              |
| Western yellow-billed cuckoo   | X                                    | X                                | X                              |
| Gilded flicker                 |                                      | X                                | X                              |
| Gila woodpecker                |                                      | X                                | X                              |
| Southwestern willow flycatcher | X                                    | X                                | X                              |
| Vermilion flycatcher           | X                                    | X                                | X                              |
| Arizona Bell’s vireo           | X                                    | X                                | X                              |
| Sonoran yellow warbler         | X                                    | X                                | X                              |
| Summer tanager                 | X                                    | X                                | X                              |
| Elf owl                        |                                      | X                                |                                |
| Relict leopard frog            | X                                    |                                  |                                |
| Lowland leopard frog           |                                      | X                                |                                |
| MacNeill’s sootywing skipper   | X                                    |                                  |                                |

*Source: NNHP 2000; Marshall et al. 2000; see also species information included in the LCR MSCP HCP*

3 *Water Supply*

4 The Law of the River enjoins the Secretary from charging water use on the tributaries against a  
 5 state’s apportionment. In the case of the Muddy and Virgin rivers, laws of the State of Nevada  
 6 govern the diversion and use of water. The doctrine of prior appropriation governs surface  
 7 water rights in Nevada. An appropriative right is the right to divert a specified quantity of  
 8 water at a specified point of diversion for reasonable and beneficial uses at a specified place of  
 9 use for a specified manner of use. Appropriative rights are generally “first-in-time, first-in-  
 10 right”; that is, one appropriative right has priority over appropriative rights established later.  
 11 Water diverted under an appropriative right may be used on lands not contiguous with the  
 12 watercourse and on lands outside of the watershed, and appropriative rights may authorize the  
 13 seasonal storage of water. Before 1905, appropriative rights could be established simply by  
 14 diverting water and applying it to the beneficial use. In 1905, the Nevada State Legislature  
 15 enacted the process for establishing appropriative rights. The Nevada State Engineer through  
 16 the Nevada Division of Water Resources (NDWR) administers all surface water rights in the

1 state. An appropriative water right granted by NDWR is required to divert and consumptively  
2 use water in the State of Nevada. Nevada has established procedures for the transfer of  
3 appropriative water rights and the transfer of a place of use for a water right (see Title 48,  
4 Chapter 533 of the Nevada Revised Statutes).

5 The NDWR had adjudicated both the Virgin and Muddy rivers. The adjudication process in  
6 Nevada focuses on verifying and quantifying pre-statutory water rights, as well as Native  
7 American Indian and Federal reserved water rights. An adjudication of surface water claims,  
8 other than claims of Native American Indian or Federal reserved rights, involves those rights  
9 established before the enactment of Nevada's statutory water law in 1905. Both the Virgin and  
10 Muddy rivers are considered "fully appropriated" or "fully designated" meaning all flows in  
11 the river have been appropriated to a water right holder and no additional water is available for  
12 a new appropriative water right.

13 LCR MSCP parties would obtain Virgin River and Muddy River waters for implementing the  
14 Conservation Plan projects from various sources in accordance with Nevada law and in  
15 coordination with the Nevada parties to the LCR MSCP whose water rights may be affected by  
16 the use. The legal structure governing water rights within Nevada would ensure that these uses  
17 would not increase the amount of Virgin River and Muddy River water used beyond existing  
18 apportionments. The geographic scope of Alternative 4 (Figure 2.1-12) would ensure that  
19 Virgin River and Muddy River water that would be used by the LCR MSCP is used within the  
20 respective historic floodplain of each river.

#### 21 **2.1.4.2 Lower Bill Williams River**

22 The area of interest includes the Bill Williams NWR, where riparian vegetation restoration and  
23 management efforts are ongoing. Planet Ranch, owned by the City of Scottsdale, includes 8,400  
24 acres, of which 2,300 acres are within the floodplain. It surrounds existing and potential  
25 riparian and aquatic habitats upstream of the refuge and includes water rights. The Bill  
26 Williams River is one of the key Management Units identified in the Service's (2002d) Recovery  
27 Plan for the southwestern willow flycatcher. Additionally, The Nature Conservancy (TNC) (in  
28 Marshall et al. 2000) identified the Bill Williams Complex, including the reach of the river under  
29 consideration here, as harboring a large number of regionally important species and habitats,  
30 making it one of the priority sites for the conservation of biodiversity. Creation of cottonwood-  
31 willow riparian habitat and honey mesquite would be given priority in this off-site conservation  
32 area.

#### 33 *Water Supply*

34 As discussed above, the Law of the River only governs the diversion and use of water on the  
35 mainstream of the Colorado River. The laws of the State of Arizona govern the diversion and  
36 use of water from the Bill Williams River. The doctrine of prior appropriation (described above)  
37 also governs surface water rights in Arizona (see Title 45, Chapter 1 of the Arizona Revised  
38 Statutes). Before June 1919, appropriative rights could be established simply by diverting water  
39 and applying it to the beneficial use, or by posting a notice and recording a water right claim  
40 with the county recorder. The Arizona State Legislature enacted the Public Water Code in 1919  
41 and established a procedure for obtaining appropriative rights under the Arizona Water Code.  
42 The Water Rights Registration Act of 1974 established a procedure for registering water rights

1 that existed prior to June 1919. Water rights may also be established pursuant to the Stockpond  
2 Registration Act of 1977, for stockponds constructed after June 12, 1919 and prior to August 27,  
3 1977. The Arizona Department of Water Resources (ADWR) now administers all surface water  
4 rights in the state. To avoid abandonment and subsequent forfeiture of an appropriative water  
5 right granted by the state the rightholder is required to beneficially use that water in the State of  
6 Arizona. Arizona has established procedures for the transfer or exchange of surface water  
7 rights and the transfer of a place of use for a water right (see Title 45, Chapters 1 and 4 of the  
8 Arizona Revised Statutes). The Bill Williams River is considered fully appropriated.

9 LCR MSCP parties would obtain Bill Williams River water for implementing the Conservation  
10 Plan projects from various sources in accordance with Arizona law and in coordination with the  
11 Arizona parties to the LCR MSCP whose water rights may be affected by the use. The legal  
12 structure governing water rights within Arizona would ensure that these uses would not  
13 increase the amount of Bill Williams River water used beyond existing apportionments. The  
14 geographic scope of Alternative 4 (Figure 2.1-13) would ensure that Bill Williams River water  
15 that would be used by the LCR MSCP is used within the historic floodplain of the river.

### 16 2.1.4.3 Lower Gila River

17 Reclamation (1999a) identified promising opportunities for riparian restoration and  
18 management to benefit willow flycatcher in newly reestablishing areas of cottonwood-willow  
19 near Wellton. Tacna Marsh is one of the priority sites identified by TNC for the conservation of  
20 biodiversity (Marshall et al. 2000) and includes extensive marshes that provide habitat for  
21 Western least bittern and Yuma clapper rail.

22 The lower Gila River Valley encompasses habitat and conservation opportunities for southern  
23 species that are not known or likely to occur at the other sites, including the Yuma hispid cotton  
24 rat, flat-tailed horned lizard, and Colorado River toad. Conservation actions in this area would  
25 give priority to the needs of these species, along with the establishment of cottonwood-willow,  
26 honey-mesquite, and marsh habitats.

### 27 Water Supply

28 Water for irrigation along the lower Gila River is Colorado River mainstem water, and the  
29 lower Gila River conveys irrigation return flows back to the Colorado River. Therefore, the use  
30 of water for LCR MSCP conservation projects in this area must comply with the Law of the  
31 River. LCR MSCP parties would obtain Colorado River water to meet these requirements from  
32 various sources in accordance with the Law of the River and in coordination with the Lower  
33 Basin State(s) whose apportionment may be affected by the use. The legal structure governing  
34 the Colorado River would ensure that these uses would not increase the amount of water used  
35 in the lower Colorado River basin beyond existing entitlements. The geographic scope of  
36 Alternative 4 (Figure 2.1-14) would ensure that Colorado River water that would be used by the  
37 LCR MSCP is used within the historic floodplain of the Gila River, a tributary of the lower  
38 Colorado River.

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## 2.2 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

During the development of the proposed Conservation Plan and the public scoping process, several concepts were proposed as potential alternatives to the proposed action. These alternatives were eliminated from detailed analysis because they did not substantially meet the goals and objectives of the LCR MSCP, did not provide a basis for issuance of incidental take authorizations pursuant to the ESA, or they resulted in potentially greater environmental consequences. The alternatives that were identified but eliminated from consideration include the following:

- Alternative A: Re-operation of the LCR without Modification of Existing Structures;
- Alternative B: Dam Removal;
- Alternative C: Removal of Banklines, Levees, and Similar Modifications;
- Alternative D: Use of Conserved Water for Environmental Purposes on the LCR;
- Alternative E: Larger-Scale Conservation Plan; and
- Alternative F: Longer or Shorter Permit Duration.

### 2.2.1 Operational or Structural Changes to the Lower Colorado River

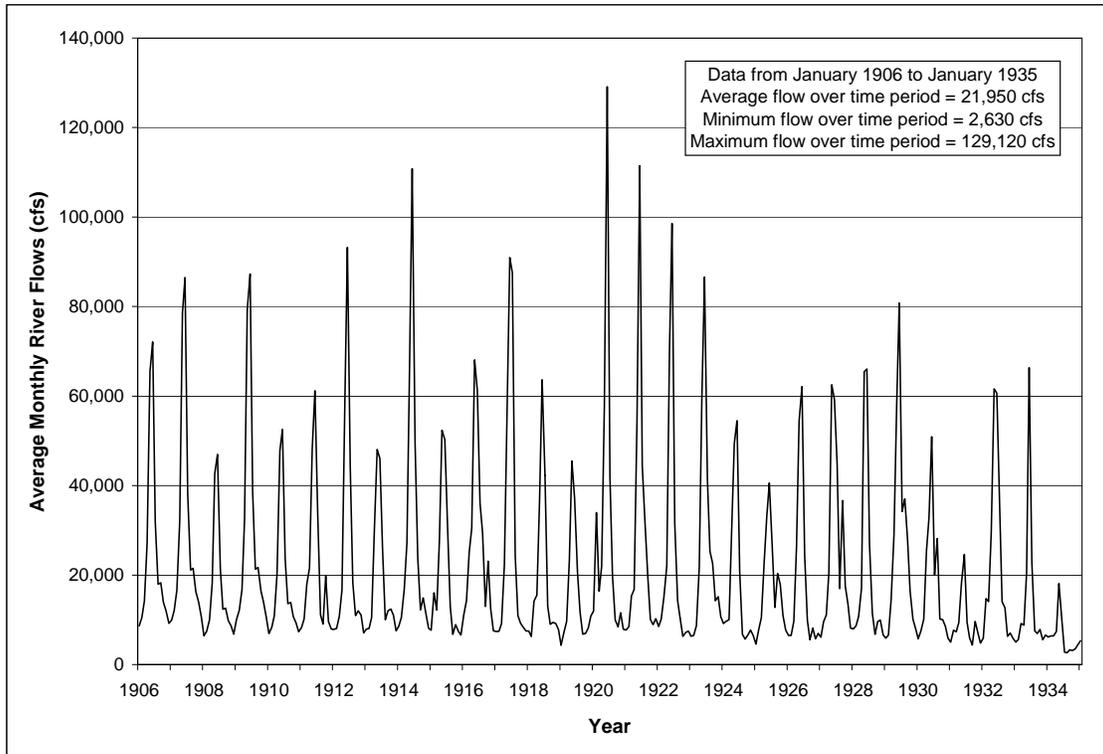
Comments provided during the 1999 and 2000 scoping sessions identified a number of measures that would result in potential changes to the current environment along the LCR intended to reduce or eliminate the impacts to sensitive species from existing structural modifications and ongoing operational practices. These are not alternatives to the proposed action (implementation of a Conservation Plan and issuance of a section 10(a)(1)(B) permit), but they have been included for discussion because they were raised during scoping. The suggested measures include re-establishing the historic hydrograph and sediment regime of the LCR; removing, relocating, or destabilizing many of the existing banklines, levees, and other structures along the river; removing one or more of the major dams on the mainstem of the river; requiring more water conservation, and developing alternative water sources in coastal Southern California in order to divert less water from the Colorado River system. These measures were combined into four alternatives: (A) re-operation of the LCR without modifications to existing structures, (B) removal of dams on the LCR, (C) removal or modification of banklines and levees on the LCR, and (D) reducing demand for Colorado River water and dedicating the conserved Colorado River water to environmental uses along the river.

#### 2.2.1.1 *Alternative A: Re-Operation of the Lower Colorado River without Modifications to Existing Structures*

This alternative would include the modification of current LCR operations from Hoover Dam to Morelos Diversion Dam for the benefit of species and habitats throughout the planning area. It would involve modifying releases of water from the dams along the LCR to better mimic the historic hydrograph. Figure 2.2-1 shows monthly average flows below Hoover Dam from January 1906 to January 1935 (prior to the beginning of storage in Lake Mead in February 1935).

1 These flows represent the historic (pre-dam) hydrograph. As shown on Figure 2.2-1, the  
2 average of all the monthly average flows over this time period was approximately 21,950 cubic  
3 feet per second (cfs), and the maximum of all the monthly average flows was approximately  
4 129,120 cfs (June 1920). Because this is based on monthly average flows, actual daily flows  
5 could be substantially higher or lower than the monthly averages; thus, 120,000 cfs is used to  
6 represent the historic peak flow below Hoover Dam.

7



8

9

10

**Figure 2.2-1. Average Monthly Colorado River Flows below Hoover Dam from January 1906 to January 1935**

11

12 The intent of this alternative would be to release water in sufficient volumes and duration to  
13 inundate key portions of the historic floodplain to induce restoration of some measure of  
14 natural riverine function to selected reaches (based upon ecological or biological criteria) during  
15 the 50-year implementation period. Modifications to or removal of existing structures located  
16 within the river would not occur.

17 Several physical and institutional issues reduce or eliminate the effectiveness and feasibility of  
18 this alternative. This alternative has been eliminated for the following reasons:

- 1 1. Controlled releases<sup>5</sup> from Hoover Dam currently are limited to approximately 73,000 cfs  
2 by the physical constraints of the dam. This is far below the historic peak river flow of  
3 approximately 120,000 cfs. To release greater than 73,000 cfs from the dam, an  
4 uncontrolled release must be made. Uncontrolled releases (releases over the spillway)  
5 can range from a small amount up to 400,000 cfs in extreme flood conditions, depending  
6 on the lake level relative to the spillway crest. To release the additional approximately  
7 50,000 cfs needed to obtain a total release of 120,000 cfs, water levels in Lake Mead must  
8 be at least 1212.5 feet above mean sea level (msl), or approximately 7.1 feet above the  
9 spillway crest (1205.4 feet above msl) [U. S. Army Corps of Engineers (USACE) 1982]. A  
10 release from the dam of 120,000 cfs is feasible, although this release can only occur under  
11 certain lake level conditions, which generally occur only after a series of wetter  
12 hydrologic years.

13 To be effective for enhancement of habitat for aquatic and floodplain associated species,  
14 the 120,000 cfs release from Hoover Dam would need to be maintained through the LCR  
15 system (i.e., a corresponding release would need to be made at Davis and Parker dams)  
16 rather than re-captured in Lake Mojave or Lake Havasu. Controlled releases from Davis  
17 Dam currently are limited to about 44,000 cfs, of which a maximum of 31,000 cfs can be  
18 released through the powerplant. Uncontrolled releases from Davis Dam via the  
19 spillway can be up to 214,000 cfs, depending on lake level (USACE 1982). Controlled  
20 releases from Parker Dam are limited to 22,600 cfs, the amount of water that can be  
21 released through the powerplant. Uncontrolled releases from Parker Dam via the  
22 spillway can be up to 400,000 cfs. Overall, it would be physically feasible to release  
23 120,000 cfs through the LCR dams; however, a release of this amount of water could  
24 result in damage to these structures (and the smaller structures such as Palo Verde  
25 Diversion Dam, Headgate Rock Dam, Imperial Dam, and others) along the LCR. It also  
26 would result in a substantial loss of revenue from power generation not realized. In  
27 addition, as discussed in number 3 below, under a release regime that would mimic the  
28 natural hydrograph of the river, a substantial amount of water could not be diverted for  
29 consumptive use since Lake Havasu is the last major reservoir in the LCR system that  
30 could re-capture all or the majority of the releases from Hoover Dam. It also should be  
31 noted that historic conditions included low flow rates, which may be insufficient to meet  
32 the requirements of the Law of the River for water delivery and power production.

- 33 2. The construction of Hoover Dam and other dams along the LCR has altered the  
34 sediment transport characteristics of the river, which has resulted in the lowering of the

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5 <sup>5</sup> Controlled releases are releases that occur through the dam structure. These releases can occur (1) by water flowing into the two southern-most intake towers, through the powerplant and discharged to the river, or bypassing the powerplant and discharged from the dam via two tunnels, one on each side of the river, that exits the canyon wall below the dam (referred to as the Canyon Wall Outlets), and (2) by water flowing into the northern-most intake towers, discharged via two tunnels, one on each side of the river, that also exists in the canyon wall below the dam (referred to as the Stoney Gates). The Stoney Gates and Canyon Wall Outlets are only used in an emergency or in flood conditions (USACE 1982). The present powerplant flow-through capacity at Hoover Dam is 49,000 cfs; releases above this amount (up to the maximum controlled release of 73,000 cfs) that are made through the Stoney Gates or Canyon Wall Outlets cannot be used to generate electricity. Hoover Dam has two spillways, one on each side of the river that spill into 50-foot diameter tunnels and eventually discharge into the river. With the spillway gates lowered and the lake at an elevation equivalent to the top of the gates in the raised position (about elevation 1221.4 feet above msl), total discharge capacity of the spillways is 184,000 cfs (USACE 1982). With the lake at the maximum design elevation 1,229 feet above msl and the gates in the lowered position, up to 400,000 cfs can be discharged (USACE 1982).

1 river bed and water surface, thereby substantially increasing the flows needed to achieve  
2 overbank flooding. This change is especially pronounced in the river reaches below  
3 Davis Dam. For example, for a few miles below both Davis and Parker dams, the  
4 sediment-deficient water released from each dam has resulted in degradation (erosion)  
5 of the channel bed, resulting in an incised and armored channel (overall lowering of the  
6 elevation of the channel and increase in the size of the bed material).

7 Hydrologic and hydraulic analyses performed by Reclamation indicate that flows of  
8 50,000 cfs would be the threshold of overbank inundation for most of the undeveloped  
9 portions of the river system (those with natural or unarmored banklines). Conversely,  
10 in other areas of the river, the change in the sediment transport characteristics of the  
11 river has resulted in aggradation of the channel with the deposition of material due to a  
12 variety of reasons including, slowed river flows at the upstream end of reservoirs. This  
13 has resulted in an overall increase in the bed and water surface elevation of the channel  
14 and a reduction in the channel capacity. In the Needles area, the design flood of the  
15 levees is 70,000 cfs; however, due to sediment aggradation, flows above 30,000 cfs cause  
16 property damage (USACE 1982).

17 Property damage and flooding are also a concern along the Parker Strip (the reach from  
18 Parker Dam to Headgate Rock Dam), where the levee design flow is 50,000 cfs, but the  
19 popularity of this reach for recreation and land use planning decisions have resulted in  
20 development that would be damaged at a flow of 19,000 to 20,000 cfs (USACE 1982). In  
21 addition, property damage occurs at flows above approximately 38,000 cfs in the Blythe  
22 area, and at about 16,000 cfs in the Yuma area where development has occurred within  
23 the levee system and a substantial amount of sediment has been deposited in the area  
24 due to the 1993 Gila River flood (USACE 1982; USBR 1997).

25 Flows above these values identified above, or above those imposed by the channel  
26 capacity (approximately 40,000 to 50,000 cfs or greater with the exception of the  
27 limitations noted above) would result in flooding and substantial property damage.  
28 Due to the depositional and erosion characteristics of the river, it is not possible to  
29 release a flow of greater than 50,000 cfs for overbank inundation without causing  
30 substantial flooding and property damage. For example, a release of 50,000 cfs from  
31 Davis Dam would likely result in overbank inundation in the Topock area (where  
32 overbank inundation has the potential to restore some of the sediment transport and  
33 fluvial processes of the river), but would result in flooding and property damage in the  
34 Needles area. Marinas and other recreational facilities along the river could be damaged  
35 by large releases. In addition, flooding in agricultural and urban areas along the river  
36 would result in property damage and increased risk of injury or loss of life. Thus, the  
37 ability of a particular water release to produce overbank flows, continuously wetted  
38 riparian lands, and other effects required to produce beneficial restoration effects is not  
39 feasible under current conditions in the absence of significant damage to the human  
40 environment. In addition, the difference between the historic river flow and current  
41 release rate would result in a substantial difference in the physical characteristics of the  
42 river, such as the amount of sediment transported and the river's ability to overflow  
43 banks (other factors would contribute to the latter, as well). In some reaches of the river,  
44 these changes would be favorable (such as flushing sediment downstream and overbank

1 scour and deposition that benefits riparian ecosystem functions), while in other areas of  
2 the river, these changes may not be desirable (such as deposition of flushed sediment  
3 that reduce existing channel capacity).

- 4 3. Due to the limited storage capacity of the reservoirs in the LCR system (with the  
5 exception of Lake Mead) and the operation of these reservoirs to limit water level  
6 fluctuations, large releases from these reservoirs likely could not be re-captured and  
7 stored in downstream reservoirs for subsequent diversion by downstream water  
8 diverters. Since the water likely could not be recaptured, it would flow over the  
9 International Boundary and would be lost to the diverters who have a legal right to the  
10 water. This would be inconsistent with the Law of the River. In addition, the loss of the  
11 water over the International Boundary would reduce the total amount of water stored in  
12 the LCR system, reducing the amount of water available (in that year and in future  
13 years) for diversion by those who have a legal right to the water<sup>6</sup>. These releases would  
14 also result in a loss of potential power generation, because a substantial amount of water  
15 released would likely have to be released through the spillways of the LCR dams and  
16 would not generate power. Depending on the amount and rate of flow over the  
17 International Boundary, flooding and property damage could occur in Mexico as a result  
18 of these releases.

#### 19 2.2.1.2 *Alternative B: Dam Removal*

20 This alternative would include the removal of the dams along the LCR for the benefit of species  
21 and as a mechanism to enhance and restore habitats throughout the planning area. The concept  
22 of removing the dams along the LCR was eliminated for a number of reasons:

23 System-wide dam removal would essentially eliminate the use of Colorado River water for  
24 municipal, agricultural use in both the United States, particularly in the major metropolitan  
25 centers of Las Vegas, Los Angeles/San Diego, Phoenix, and Tucson, and Mexico. Loss of this  
26 water and power resource would reduce the current overall capacity of these nations to  
27 produce goods and services. It also could result in the relocating of approximately 25 million  
28 residents who depend on this water supply for domestic uses, which would increase  
29 environmental impacts to other communities. Additionally, the agricultural production  
30 derived from farming enterprises in the Mohave, Parker, Palo Verde, Cibola, Yuma, Imperial,  
31 and Coachella valleys would be curtailed, if not eliminated, because of lack of reliable water  
32 supply, resulting in billions of dollars of economic impact to the local, regional, and national  
33 economies. Removing the dams also would prevent the management of water flow to generate  
34 hydroelectric power. Removal of dams would also eliminate existing reservoirs and associated  
35 water-based recreation in these reservoirs, resulting in a substantial economic loss for many  
36 communities along the river.

37 System-wide dam removal would result in the re-establishment of pre-development river flows  
38 (refer to Figure 2.2-1 for pre-development river flows). Under this alternative the ability to

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6 Under Article 10(b) of the 1944 Water Treaty, Mexico was allotted "any other quantities arriving at the Mexican points of diversion." Any mainstream Colorado River water that reaches Morelos Diversion Dam is under the jurisdiction of Mexico, and is no longer available for diversion or consumptive use by water users in the United States.

1 regulate river flows, including the reduction of peak flood flows, would be lost. Because river  
2 flows would essentially be “uncontrolled,” and because the levee system would not be able to  
3 protect existing communities and agricultural areas along the LCR (refer to number 2 of section  
4 2.2.1.1, above, for limitations of the existing levee system), substantial flooding would occur.  
5 Removing the dams would have a substantial effect on the human habitation and use of the  
6 riverine corridor along the LCR. Many communities, Indian reservations, and major  
7 agricultural districts are located within the historic floodplain of the LCR, predominately, from  
8 Davis Dam to the SIB. Removing the dams and subsequent restoration of the pre-development  
9 hydrograph would dramatically limit or eliminate all of these uses, again with severe economic  
10 consequences to the regional and national economies.

11 Substantial technological considerations such as the physical disassembling of the dam  
12 structures and power facilities, and environmental considerations such as removal of sediment  
13 trapped behind the dams and restoration of a substantial amount of area previously inundated  
14 would need to be overcome. Moreover, Alternative B would be extremely costly and would  
15 conflict with the Law of the River since it would remove dams that were authorized for a  
16 number of purposes, including river regulation, flood control and protection, improving  
17 navigation, providing for the storage and delivery of water, and for the generation of electrical  
18 energy. Dam removal would require significant new or amended legislation, modifications to  
19 the 1944 Water Treaty (which required the construction of Davis Dam), and would also require  
20 modifications to various other components of the Law of the River.

21 Dam removal would result in considerable changes to the current ecosystem, which has  
22 developed in response to the hydrologic regime imposed by the dams. Flows would become  
23 more variable and seasonal, and it is possible that large areas of existing vegetation could be  
24 eliminated by flooding. It also is possible that some currently vegetated areas that are sustained  
25 by releases from the dams would dry up. Some areas could be colonized with native species,  
26 such as cottonwood-willow; however, this probably would not prevent invasive species such as  
27 saltcedar from attaining dominance.

### 28 2.2.1.3 *Alternative C: Removal of Banklines, Levees, and other Modifications to the Lower* 29 *Colorado River*

30 Alternative C was eliminated for a number of technical, social, economic, environmental, and  
31 legal reasons. The ability or inability to remove or otherwise modify existing bankline  
32 stabilization structures to permit periodic flooding of the former river channel and floodplain  
33 terraces is constrained by numerous factors affecting the modern LCR channel. Principal  
34 among these factors is the reduction in peak discharge from historical rates caused by  
35 impoundment, which has altered the sediment transport characteristics of the river. As  
36 described under number 2 in section 2.2.1.1, this has result in degradation, incision, and  
37 armoring of the channel in some areas, and aggradation of the channel in other areas.  
38 Degradation of the channel has sharply reduced the potential for river stage to rise to an  
39 elevation sufficient to flood riparian plant communities during an appropriate season.  
40 Conversely, aggradation of the channel has increased the potential for the river stage to rise to  
41 an elevation sufficient to flood riparian plant communities during an appropriate season.

42 The areas of degradation and aggradation of the channel do not necessarily correspond with  
43 areas where overbank flooding would be desirable. Additionally, the relatively consistent

1 maximum dam releases have resulted in a well-defined river channel making overbank  
2 flooding under the normal operations of the river extremely infrequent. Under these normal  
3 operations, the removal of banklines, levees, and other channel modifications would result in a  
4 limited amount of additional overbank flooding and would have minimal benefits for riparian  
5 plant communities. However, these features were constructed to protect surrounding  
6 communities and farmlands from flooding, and under higher than normal dam releases the  
7 removal of banklines, levees, and other channel modifications would result in overbank  
8 flooding that may benefit riparian plant communities but could result in substantial property  
9 damage. If the existing bankline and levee system were removed, property damage would  
10 occur at lower river flows (since the banklines are not there to help contain and redirect flood  
11 flows) than those identified under number 2 of section 2.2.1.1. Additionally, removal of  
12 banklines, levees, and other channel modifications would not be consistent with the Law of the  
13 River, and specifically with the Colorado River Front Work and Levee System Act, which  
14 authorized the construction, repair, and preservation of public works on the Colorado river for  
15 the purposes of controlling floods, improving navigation and regulating the flow of the river.

16 Removal of bankline stabilization has shown potential as a means of river restoration for rivers  
17 with favorable hydraulic gradients. Unfortunately, those favorable hydraulic profiles do not  
18 exist on the LCR and significant uncertainty exists regarding the potential effectiveness of using  
19 this approach alone for restoration. The response of the river to stabilization after completion of  
20 Hoover, Parker, and Davis dams provides insight into the potential effectiveness or  
21 ineffectiveness of simply removing stabilization works as a means of restoring riparian habitat  
22 on the LCR. Review of a sequence of historic aerial photography of the river enables a  
23 qualitative assessment of the response of the river to the reduced flow regime with and without  
24 levee and bankline stabilization to be performed.

25 The report prepared for *RPA Provision No. 14: Synthesis of Ecological Restoration Concepts for the*  
26 *Lower Colorado River* (CH2MHill 1999), described a qualitative assessment of the potential  
27 response of the river in near Parker to the reduced flow regime resulting from the construction  
28 and operation of Hoover Dam with and without bankline stabilization. The report evaluated  
29 the ability of a non-stabilized section of the LCR to meander from 1902 to 1997; banklines in this  
30 area were not stabilized or modified until approximately 1995.

31 The analysis demonstrated the uncertainty about the effectiveness of bankline stabilization  
32 removal as a restoration technique in the LCR. A comparison between the 1902 depiction of the  
33 river and the 1942 aerial photograph clearly illustrates that high flood events in conjunction  
34 with tremendous sediment loads were fundamental to the reshaping and reconfiguration of the  
35 river. Since that time, the 1983 event was the only flood of magnitude, and the river has shown  
36 little variation in location and size. Channel widths have remained the same or are narrower,  
37 and the channel locations have not changed. The report concludes that:

38 Without the hydraulic influence of extreme floods and high sediment loads, little  
39 change in channel morphometry can be expected, and none of the fluvial  
40 processes important to natural riparian habitat dynamics can take place (e.g.,  
41 point bar and meander formation and channel erosion and aggradation). These  
42 results point to the limitations inherent to attempts to reflood the river floodplain  
43 of the LCR [lower Colorado River] under the current hydrologic regime. These

1 results can be extrapolated to other stabilized reaches of the LCR [lower  
2 Colorado River] (USBR 1999, page 2-6).

3 **2.2.1.4 Alternative D: Use of Conserved Water for Environmental Uses on the Lower**  
4 **Colorado River**

5 The key elements of this alternative include (1) the implementation of water conservation  
6 measures, (2) development of other water supplies for delivery to these districts, and (3) the  
7 dedication of the conserved Colorado River water to instream and other environmental uses.  
8 This alternative has been eliminated for the following reasons.

9 Due to competing demands for water and increasing environmental concerns, the affected  
10 water districts are already implementing a variety of water conservation measures and  
11 developing alternative water sources. Representative types of measures that are being  
12 implemented in urban areas include: water conservation, including the use of BMPs, increased  
13 storm water conservation through increased levels of groundwater replenishment; enhanced  
14 local groundwater recovery; desalination; regional surface reservoir storage; water marketing  
15 from other sources; and water recycling. Conservation measures implemented in agricultural  
16 areas include measures such as laser-leveling of fields, multi-sloping of fields, the use of drip  
17 irrigation, irrigation scheduling, water measurement, soil moisture measurements, conveyance  
18 lining, and fallowing. Even if additional conservation measures were implemented, it may not  
19 be feasible to apply additional water for habitat conservation because more Colorado River  
20 water is currently allocated than is available. Moreover, if additional conserved water were  
21 made available, it would go the next priority use and would not be available for habitat  
22 conservation.

23 Additionally, this alternative would not be consistent with the Law of the River. Under the Law  
24 of the River, and specifically, under Article II of the Decree, the Secretary is enjoined from  
25 releasing or delivering water other than to water users in the United States with valid contracts  
26 made pursuant to Section 5 of the BCPA, or to specified Secretarial reservations of water. The  
27 Law of the River requires water to be “beneficially used as reasonably required” (see 44 C.F.R.  
28 Part 417), and does not recognize instream flows a beneficial use of water. Additionally, based  
29 on the Law of the River, any water not used by one Lower Division State can be used by  
30 another Lower Division State. Likewise, within each Lower Division State, any water not used  
31 by one Colorado River Contractor can be used by another Colorado River Contractor within the  
32 state, up to the Contractor’s contracted amount, based on the specific allocation of Colorado  
33 River within that particular state. Overall, a larger amount of Colorado River water is  
34 contracted for than is available for diversion under normal years. Instream flows for  
35 environmental uses would require that all Contractors in the Lower Division States and the  
36 Lower Division States themselves forebear their right to use this water.

37 **2.2.2 Alternative Conservation Plans**

38 **2.2.2.1 Alternative E: Larger-Scale Conservation Plan**

39 This alternative was developed by the Service in the course of defining the proposed action. It  
40 would not attempt to restore the LCR to its pre-development state; rather, it would conserve  
41 lost and degraded habitat through the restoration of viable, self-sustaining populations of

1 native fish and wildlife species to the river's ecosystem. This strategy would be focused on  
2 ensuring that native species are present in the river's ecosystem in sufficient numbers to ensure  
3 that they are part of the ecosystem and are not maintained strictly as refugia populations. This  
4 strategy would construct reasonably large patches of suitable habitat for riparian, marsh, and  
5 aquatic species spread up and down the river connected by pathways for migration. A total of  
6 approximately 70,000 acres of established or protected habitat would be established for the  
7 target species. Patches could be located along the LCR or in nearby areas, such as the Bill  
8 Williams and Virgin rivers. Fish species covered by this alternative include the bonytail,  
9 razorback sucker, pikeminnow, desert pupfish, and flannelmouth sucker. This alternative also  
10 would provide conservation for the following bird species: Yuma clapper rail, southwestern  
11 willow flycatcher, yellow-billed cuckoo, and black rail.

12 This alternative was eliminated for a number of reasons. First, there is not a requirement for the  
13 LCR MSCP to provide for the recovery of listed species; therefore, this alternative provides  
14 more conservation than is needed, and the costs would be so high as to render this alternative  
15 infeasible from an economic standpoint. (Based solely on the amount of acreage involved, costs  
16 are estimated to be between eight and nine times those of the Conservation Plan.) Since  
17 substantially more conservation would be required than under the Conservation Plan, it would  
18 not reduce or eliminate the significant impacts of the proposed action to agricultural resources,  
19 air quality, biological resources, cultural resources, and noise. Rather, it would result in greater  
20 construction-related or long-term impacts on these resources, as well as on environmental  
21 justice, hazards and hazardous materials, hydrology, Indian Trust Assets (ITAs), recreational  
22 resources, socioeconomics, topography, geology, and soils, and it could have greater impacts on  
23 Mexico (transboundary impacts).

#### 24 2.2.2.2 *Alternative F: Shorter or Longer Permit Duration*

25 This alternative was eliminated because it does not meet the project goals and objectives. The  
26 Service's Five-Point Policy for HCPs (65 FR 106, June 1, 2000) identifies factors to consider when  
27 determining the duration of incidental take permits, including:

- 28 • The duration of the covered activities and effects on covered species;
- 29 • The time required to implement and acquire benefits from conservation measures; and
- 30 • The period that may be required to develop sufficient information through monitoring  
31 and research to address biological uncertainties.

32 Shortening the permit duration (e.g., to 25 or 35 years) was rejected because many of the  
33 covered activities are ongoing and continuing annually, and it takes time for replacement  
34 habitat to develop. A lesser period of time might not allow for implementation of covered  
35 activities or the successful implementation of the conservation plan. Increasing the permit  
36 duration (e.g., to 75 or 100 years) was rejected because of the uncertainties involved with  
37 implementing a conservation plan so far in the future. Fifty years was selected as a reasonable  
38 period of time for forecasting, planning, and implementing the Conservation Plan.

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## 3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

### INTRODUCTION

The following sections describe the environmental resources that could be affected by the proposed action, potential impacts to those resources, and mitigation measures that would reduce the severity of those impacts. The resources include those that are typically evaluated under both NEPA and CEQA, as well as those that are generally required for NEPA documents, such as socioeconomics, transboundary impacts, environmental justice, and energy and depletable resources. Significance criteria for evaluating impacts to resources that are considered under both NEPA and CEQA have been provided. They are based on CEQA Guidelines, Appendix G, and modified where appropriate to address impacts specific to the proposed action. NEPA does not require the use of specific significance criteria, and specifies that the description of their impacts is to be based on the context and intensity of the impacts and on the relationship between them. Thus, no significance criteria have been provided for those resources required only in an EIS.

Detailed analyses were not performed for resources for which there would be only minor impacts or no potential for environmental impacts. These include energy and depletable resources (section 3.6), population and housing (section 3.13), public utilities and services (section 3.14), and transportation (section 3.19). Each of these sections contains an explanation regarding why impacts would not occur.

Sections addressing resources that are considered in detail include a description of the affected environment and the environmental consequences of each alternative evaluated. Where appropriate, individual descriptions of the affected environment are provided for the planning area (applicable to Alternatives 1-3) and the three off-site conservation areas (applicable to Alternative 4). Impacts to some resources, such as socioeconomics and air quality, may affect a broader region than others, and the description of the affected environment for these resources is necessarily broader, as well. Environmental consequences are identified for each alternative. Each impact (i.e., less than significant, significant, and beneficial impacts) is given an alphanumeric number. These discussions are preceded, where appropriate, by a description of impacts that were considered but found to be minor. Mitigation measures also are given an alphanumeric number and are provided where necessary. The discussion of mitigation measures is followed by description of the residual impacts that would occur after the implementation of the mitigation measures.

### OVERVIEW OF THE PLANNING AREA

The planning area includes seven reaches of the LCR, extending from Lake Mead to the SIB, and includes Federal, state, tribal, and private lands. The planning area is bounded by La Paz, Mohave, and Yuma counties in Arizona; Imperial, Riverside, and San Bernardino counties in California; and Clark County, Nevada. Of the approximately 716,230 acres (1,119 square miles) in the seven reaches of the LCR planning area, approximately 22,178 acres of urban/developed land are present, primarily in incorporated cities. These cities include Bullhead City, Lake Havasu City, Parker, San Luis, Somerton, and Yuma, Arizona; Blythe, and Needles, California;

1 and Laughlin, Nevada. Several Indian reservations are located along the LCR, as well,  
2 including those of the Chemehuevi, Cocopah, Colorado River Indian Tribes (CRIT), Fort  
3 Mojave, Fort Yuma-Quechan, and the Hualapai. The total population in the LCR planning area  
4 is approximately 106,000. Agriculture is one of the primary land uses in the planning area,  
5 comprising approximately 270,000 acres. The planning area also contains considerable open  
6 space and recreational uses, including a number of state and Federal parks and wildlife refuges.

7 Present conditions in the LCR are significantly different from historical conditions. The river is  
8 no longer free flowing and does not constitute a continuous ecosystem because of the many  
9 impoundments along its length. In addition, the hydrologic regime does not support extreme  
10 fluctuations mainly because of the presence of large, mainstem dams (e.g., Hoover Dam and  
11 Glen Canyon Dam) farther upstream, resulting in reduced natural backwaters and periods of  
12 inundation in adjacent floodplain lowlands. Reach 1 is defined by the boundary of Lake Mead  
13 when its water level is at 1,229 feet msl. Lake Mead, formed by Hoover Dam, traps Colorado  
14 River sediment not trapped in Lake Powell in its upper reaches, and the river downstream of  
15 the dam is relatively clear. Reach 2 extends from Hoover Dam to Davis Dam and is defined by  
16 the boundary of Lake Mohave when its water level is at 647 feet msl. Davis Dam and Lake  
17 Mohave were created to provide part of the capacity for water delivery to Mexico and to re-  
18 regulate fluctuating discharge from Hoover Dam. Additional sediments are trapped behind  
19 Davis Dam. Reach 3 extends from Davis Dam to Parker Dam and includes channelized river, a  
20 substantial marsh area, and Lake Havasu to its 450-foot msl. Immediately below Davis Dam,  
21 the system is characterized by a riverine reach controlled by the discharge from Davis Dam.  
22 Reach 4 extends from Parker Dam to Adobe Ruin and Reclamation's Cibola Gage. This reach is  
23 channelized. Reach 5 extends from southern extent of Cibola NWR and Reclamation's Cibola  
24 Gage to Imperial Dam. Imperial Dam created Imperial Reservoir and provides water to the Gila  
25 Gravity Main Canal in Arizona and the All-American Canal in California. Generally, Imperial  
26 Reservoir is warm and shallow. Reach 6 extends from Imperial Dam to the NIB and includes  
27 Laguna Dam, Mittry Lake, and the confluence with the Gila River. The Laguna Desilting Basin,  
28 which receives sediment from upstream sources, is periodically dredged. Flows in Reach 6 are  
29 minimal since mainstem water is diverted for irrigating agricultural lands. Reach 7 extends  
30 from the NIB to the SIB and includes Morelos Diversion Dam. Flows in this reach of the river  
31 vary. At times the lower part of the reach is dry. Cohen and Henges-Jeck (2001) reported  
32 average total flows in this reach of 22,000 af in non-flood years and 2,120,000 af in flood years.  
33 These flows are the result of seepage from Morelos Diversion Dam, flow releases from Morelos  
34 Diversion Dam (flood flows and excess water Mexico does not divert), irrigation return flows  
35 from Mexico, canal wasteways on the United States side of the border, and groundwater  
36 accumulation from both the United States and Mexico.

37 The vegetation within the planning area is also significantly different from historic conditions.  
38 Approximately 126,000 acres of woody riparian vegetation are present in the LCR planning  
39 area. Most of this is saltcedar (i.e., saltcedar, saltcedar-honey mesquite, and saltcedar-  
40 screwbean mesquite land cover types). Only 23,000 acres of native vegetative communities,  
41 including cottonwood-willow, honey mesquite, arrowweed, and atriplex, remain within the  
42 planning area. The LCR supports several hundred species of wildlife (birds, mammals, fish,  
43 reptiles, and amphibians), including both resident species and migratory visitors. A number of  
44 species that are Federally listed as threatened or endangered are known to occur or have the  
45 potential to occur along the LCR. Six of these are covered in the Conservation Plan. All of these

1 species also are listed by one or more states along the river. The Conservation Plan also  
2 includes six species that are state-listed but not Federally listed, 13 species that are designated  
3 as species of special concern or protected in one or more states, and two species that have no  
4 current regulatory status but could become listed over the 50-year life of the LCR MSCP. Four  
5 other species are included in the Conservation Plan as “evaluation species” that could be  
6 proposed for coverage under the section 10(a)(1)(B) permit in the future.

## 7 **TECHNICAL ASSUMPTIONS REGARDING IMPLEMENTATION OF THE** 8 **CONSERVATION PLAN**

9 The following summarizes the technical assumptions used to assess potential impacts of  
10 implementation of the Conservation Plan. While specific conservation area establishment  
11 locations and design and construction details have yet to be developed, for purposes of  
12 assessing the proposed action’s environmental impacts, these are considered to be reasonable  
13 assumptions about the range of actions that would be required, the general types of equipment  
14 that would be used, and the implementation schedule. Actual implementation may vary.

### 15 **Location of Conservation Area Establishment Actions**

16 Conservation area establishment actions could be implemented on a combination of Federal,  
17 state, tribal, and private lands using agricultural or undeveloped lands. Since specific sites have  
18 not been selected, it is not known how much development would occur on either private,  
19 public, or tribal lands; nor it is known to what extent agricultural or undeveloped lands would  
20 be used. The impact analysis in this EIS/EIR is based on the identification of the impacts that  
21 could potentially result under reasonably foreseeable worst-case scenarios from the  
22 implementation of the Conservation Plan, as well as the mitigation measures that would avoid,  
23 minimize, restore, reduce, or compensate for the potential impacts. For example, the analysis  
24 for impacts to agricultural and socio-economic resources assumes that the established  
25 conservation areas would be constructed on lands taken out of agricultural production for that  
26 purpose, although it is probable that non-agricultural lands would be used. Most conservation  
27 opportunities have been identified in Reaches 3-5 of the LCR due to the presence of existing  
28 habitat and suitable landforms. Other reaches include constraints, such as steep canyons, which  
29 limit the feasibility of conservation area establishment.

### 30 **Construction Schedule**

31 It is estimated that sites that currently are in agriculture and require minimal grading and  
32 infrastructure can be completed within approximately 3 years. Sites that require the removal of  
33 saltcedar, grading, and the installation of irrigation and other infrastructure likely would  
34 require up to five years. These durations include planning, design, and permitting. Actual  
35 construction would take considerably less time. Construction generally would take place  
36 during daylight hours any day of the week, although dredging would probably occur 24 hours  
37 a day.

### 38 **Clearing and Grading**

39 Habitat establishment would likely require modification to existing site conditions. Clearing  
40 would involve removing existing non-native vegetation, primarily with heavy equipment, such

1 as bulldozers with root plow attachments (use of prescribed fire to clear vegetation is addressed  
2 below). Actions would include clearing, deep plowing, root-ripping, tilling, and disking.  
3 Cleared vegetation could be trucked off-site and shredded and used as mulch. (Alternatively, it  
4 could be burned, as discussed below.) Undeveloped areas can be cleared at a rate of about 1-2.5  
5 acres per day, depending on the density of existing vegetation. Agricultural lands can be  
6 cleared at a much faster rate. Hand clearing of some vegetation may occur on a limited basis  
7 using equipment such as weed-eaters. Additionally, chemical herbicides may be used to  
8 control non-native vegetation. Herbicides that are approved for use in the project area would  
9 be ordered for individual jobs and shipped to a licensed vendor, who would then apply them  
10 using accepted methods. Herbicides would be stored in accordance with appropriate standards  
11 at the field facilities described below or other existing facilities. They could be applied  
12 manually or aurally, depending on the size of the area to be cleared. Only vegetative material  
13 would be sprayed; herbicides would not be applied to open water. All state and Federal  
14 requirements to ensure public safety and environmental protection would be observed.

15 Grading would be required on both undeveloped and agricultural sites to provide suitable  
16 elevations for establishing habitat and to create access roads in some locations. Since  
17 agricultural land already is ready to plant and likely includes the necessary infrastructure, such  
18 as access roads and irrigation systems, it is assumed that agricultural sites would require  
19 approximately 1/5 of the grading of undeveloped sites (some grading would be needed to  
20 create mounds and depressions in order to provide micro-topographic diversity). Side slopes  
21 created for berms and access roads would be engineered for stability; the actual slope would  
22 depend upon the height of the slope and the composition of the graded material.

23 The BMPs of the state in which construction occurred would be used to control sedimentation  
24 in the vicinity of water bodies during ground-disturbing activities. Typical measures that could  
25 be used include the following:

- 26 • Providing for temporary pollution control measures such as dikes, basins, ditches,  
27 diversions, silt fences, and the application of straw and seed, to be functional prior to  
28 land disturbing activities;
- 29 • Minimizing the area to be cleared and graded to the extent possible;
- 30 • Constructing footings in water by the sheet pile cofferdam method and pumping water  
31 from within the dam to desilting ponds before returning it to the watercourse;
- 32 • Isolating the construction area by dikes and/or berms where necessary;
- 33 • Erecting barriers, covers, shields, and other protective devices as necessary to prevent  
34 any construction materials, equipment or contaminants/pollutants from falling or being  
35 thrown into a watercourse;
- 36 • Constructing drainage facilities with armoring when necessary to control erosion and  
37 sedimentation;
- 38 • Prohibiting the placement of oily or greasy substances originating from the contractor's  
39 operations where they would later enter a stream or watercourse;
- 40 • Storing and transporting fuel in appropriate safety containers.

- 1 • Mixing and loading hazardous materials in an accepted manner to prevent spills or  
2 leakage.
- 3 • Disposing of used containers in accordance with regulatory standards.

#### 4 **Prescribed Burns and Other Uses of Fire**

5 Prescribed burns could be used to establish marshland approximately every seven to eight  
6 years. A less likely use of fire is to clear existing vegetation or, alternatively, to burn vegetation  
7 removed by mechanical methods. Prescribed burns would be conducted by the Interagency  
8 Fire Team (IFT), which is headed by the BLM. The Service and the BIA also are members of the  
9 IFT and are responsible for conducting prescribed burns on their own lands. Certain  
10 management practices would be followed prior to initiating prescribed burns, including  
11 developing measurable objectives, an approved prescription, and an escaped fire plan to be  
12 implemented in the event that a prescribed fire exceeded the limits of an approved prescription;  
13 using qualified personnel; identifying quantified ranges of conditions under which burns  
14 would be conducted (including such factors as wind direction and speed, relative humidity,  
15 temperature, atmospheric stability, and fuel moisture content); describing actions that would be  
16 taken if those conditions were exceeded; establishing a monitoring and documentation process;  
17 and establishing a review and approval process. All Federal, state, and local requirements  
18 would be followed, including air quality regulations, and coordination with the appropriate  
19 agencies would occur prior to initiating prescribed fires. Public notification also would occur at  
20 an appropriate interval before a fire was begun. Fires likely would be conducted in the late fall  
21 through early spring to avoid the breeding season of sensitive species and to take advantage of  
22 the optimal time for burning saltcedar and marsh vegetation.

#### 23 **Dredging**

24 Hydraulic dredges would be used to establish 360 acres of backwaters. Amphibious trackhoes  
25 (excavators) would be used for clearing inlets and outlets. The exact size of backwaters would  
26 vary with site location, but for purposes of this analysis, it is assumed that individual  
27 backwaters would be a minimum of 10 acres each, and it is estimated that they would average  
28 about 6 feet in depth. Approximately 50 cubic yards (cy) per hour could be dredged. Dredged  
29 material could be disposed of onsite above the high-water mark and used for creating berms  
30 and contours or it could be sidecast into adjacent areas of the river. If dredged material were to  
31 be disposed at an upland site, it would be pumped into a bermed area, and the freshwater  
32 would be decanted and returned to the originating water body. Material discharged into the  
33 river eventually would be dredged as part of ongoing maintenance and disposed of at an  
34 upland site.

#### 35 **Field Facilities**

36 Field facilities may be required, although the LCR MSCP participants would try to share  
37 existing facilities where possible. If not, no more than two facilities would be constructed, most  
38 likely in the Mohave Valley and Blythe. They could be constructed on private or public land in  
39 an already developed area. The facilities likely would consist of a small, prefabricated steel  
40 building that would serve as an office and an equipment yard to store tractors, dredges, or other  
41 heavy equipment and approved pesticides and fuel. These facilities would not be permanently

1 staffed; rather, they would be used on an as-needed basis. Routine maintenance of the stored  
2 equipment could be performed at the facilities. These facilities would require several acres at  
3 most and would be fenced. They likely would be constructed on bare ground or at an already  
4 developed and graded site. Thus, minimal grading would be required. A concrete truck would  
5 be required to pour the building foundation, and a small crew would be needed to assemble the  
6 building. A trencher would be required to extend underground utilities such as gas and  
7 waterlines. Power lines would be placed overhead. Other equipment would likely include a  
8 road motor grader, one to two front-end loaders, one to two dump trucks, a backhoe/excavator,  
9 a crane/boom truck, and a forklift truck. Construction likely would last from 1 to 3 months,  
10 depending on the size of the site and site conditions.

### 11 **Infrastructure**

12 It is likely that electric pumps would be used where possible (e.g., where power is readily  
13 available) to provide water for irrigation. Diesel pumps could be used, as well, however, and  
14 for this analysis it is assumed that roughly half would be electric and half would be diesel.  
15 Approximately 0.09 kilowatt hours (kWh) would be required for every 1,000 gallons of pumped  
16 water, and up to approximately 6 gallons of diesel would be used for each acre-foot of water.  
17 Diesel fuel would be delivered monthly and stored on-site in 500-1,000 gallon double-walled  
18 concrete tanks with spill containment.

19 Both above- and below-ground irrigation pipelines could be used. If the water delivery system  
20 were to be a temporary feature (i.e., 1-3 years) an aboveground system likely would be used. If  
21 the site would require periodic applications of water over the lifetime of the LCR MSCP, then a  
22 more permanent, belowground water delivery system would be used. Irrigation water also  
23 could be supplied via concrete-lined canals. Heavy equipment (articulating scrapers or towed  
24 cans) would be used to build up the areas identified for concrete canal systems. Road motor  
25 graders would be used to set finish grades. Front-end loaders and end dump trucks would  
26 assist with earth moving. Concrete slip forms and concrete trucks would place and form the  
27 concrete canal lining. Backhoes/excavators and forklifts would assist where necessary.  
28 Backhoes and trenchers would be used to construct irrigation pipelines.

29 Existing access roads would be used where possible. New access roads would be surfaced with  
30 gravel and would be sufficiently wide to allow access by maintenance vehicles and fire-fighting  
31 equipment (approximately 18 feet wide). Gravel likely would be transported to the site via  
32 dump trucks that hold between 10 and 22 cy of material, although larger, off-road vehicles  
33 could be used if necessary. It is estimated that 1-2, 22 cy belly dump truck, 1 front end loader, 1  
34 water truck, and 1 road motor grader would be required to resurface 0.5 mile of road per day.  
35 It is estimated that 1 mile of roads per year would be constructed over a 20-30 year period.

### 36 **Planting Methods**

37 A variety of planting methods would be used, depending upon what was most cost-effective in  
38 a particular situation. Hydroseeding involves combining seed and mulch in a water truck with  
39 a rotating basket and physically spraying the seed on with a hose. Seed also could be placed in  
40 the water source if fields were to be flooded. Pole planting involves augering a hole and then  
41 hand or machine planting rooted stock or a cottonwood or willow pole. Another method  
42 involves attaching mechanized tree planters to a tractor that cuts a furrow, inserts a tree that has

1 been placed in a biodegradable container into the furrow, and pushes the dirt back in place.  
2 Under each method, only one piece of equipment would be required per site. The planting  
3 stock would originate from the LCR Valley, and most of it would be acquired from nurseries  
4 located in the general project area. Seeds would be collected from the local area.

#### 5 **Fish Rearing**

6 If sufficient numbers of native endangered fishes cannot be produced by existing facilities for  
7 reintroduction into suitable LCR mainstream habitats, it is possible that the expansion of  
8 existing native fish production facilities would be required. This could involve the construction  
9 and maintenance of raceways and growout ponds. If needed, the ponds would be about 5-6  
10 feet deep, lined with clay or plastic, and likely would not exceed 1 acre. The ponds likely would  
11 be dug by a crawler with dozer. All of these hatchery facilities would be constructed off-stream  
12 and it is possible that they could be above ground if pumping already were needed to provide  
13 water to the site, in which case excavation would not be required. This is not likely, however.  
14 Construction would likely last about 20-30 days. As needed, fish would be transported to the  
15 river in a hatchery truck.

#### 16 **Public Access**

17 Public access to the established conservation areas would be highly restricted in order to protect  
18 the habitats and species that use them. Access could be limited by placing a wire cable across  
19 access roads, or in some cases fencing might be required. Access would not be restricted to any  
20 other portions of the planning area.

#### 21 **Long-Term Maintenance**

22 The following measures would be implemented, as necessary.

- 23 • Dredging would be implemented if backwaters and marshes in conservation areas were  
24 lost due to flood-induced sedimentation. The description of dredging above is  
25 applicable to this measure.
- 26 • Land management and habitat establishment measures would be implemented in  
27 conservation areas to ensure the reestablishment of native vegetation through active  
28 management or natural processes in the event that terrestrial vegetation is lost to fire or  
29 other destructive event such as flooding. The types of measures that would be  
30 implemented would depend on how recovery proceeds. If the burned area revegetated  
31 with cottonwood-willow and mesquite, less active management would be needed. If  
32 saltcedar appeared, it would have to be removed, and revegetation generally would  
33 proceed as described above, although minimal dirt movement would be required and it  
34 is assumed that irrigation infrastructure still would be in place.
- 35 • Land management and habitat establishment measures would be implemented in  
36 conservation areas to ensure the establishment of the conservation area through active  
37 management or natural processes in the event of a toxic or hazardous substance spill.  
38 The specific types of measures that would be required would be dependent upon the  
39 nature of the spill. It may be necessary to remove soils, detoxify areas, and replant  
40 affected vegetation.

1 Other long-term maintenance actions may include tree trimming, non-native species control,  
2 spot replanting, diseased tree treatment, and road maintenance.

3 **Employment**

4 Construction could be performed either by Reclamation or independent contractors. Up to 30  
5 workers could be involved in the construction of individual sites, but they all would not be  
6 present at the same time since they would be involved in different phases of work. The number  
7 of construction workers required would vary according to the type of construction activity  
8 involved. For example, preparing an agricultural site that was already leveled and contained  
9 the appropriate infrastructure, would require about three construction workers. Establishing or  
10 enhancing a specific habitat at an undeveloped site could take several workers to clear the site  
11 and six to eight workers to install infrastructure. Dredges would require two personnel per  
12 shift (in the absence of restrictions, dredges may operate 24 hours a day). The number of  
13 workers required for planting depends on the methods involved. Augering holes and placing  
14 plants in each hole could require 12-24 people. Mechanized tree planting could take 10-12  
15 people.

16 Long-term maintenance and monitoring needs would require approximately 10 administrative  
17 staff; 9 planning, design, and engineering staff; and 8 conservation management and  
18 maintenance staff. Additionally, it is anticipated that one new law enforcement officer and one  
19 new wildland fire fighter would be provided, respectively, for every 5,000 and 2,500 acres of  
20 conserved land not already in public ownership. All new personnel would be stationed at  
21 existing facilities. Maintenance, law enforcement, and firefighting staff likely would be drawn  
22 from the local population. Monitoring and administrative staff would be stationed elsewhere  
23 and would make visits to the project sites as needed.

1    **3.1       AESTHETICS**

2    This section addresses the potential temporary aesthetic impacts resulting from construction  
3    and maintenance activities, as well as long-term impacts from the structures that could be  
4    constructed. Overall, impacts to visual resources would be beneficial since approximately 8,100  
5    acres of conservation area would be established and returned to a more natural appearance.

6    **3.1.1       Affected Environment**

7    Visual resources consist of the natural and manmade features that give a particular  
8    environment its aesthetic qualities. These features may be natural appearing or modified by  
9    human activities. Together, they form the overall impression of an area, referred to as its  
10   *landscape character*. Landforms, water surfaces, vegetation, and manmade features are treated as  
11   characteristic of an area if they are inherent to the formation, structure, and function of the  
12   landscape. Landscape character is evaluated to assess whether a proposed project would  
13   appear compatible with the existing setting or would contrast noticeably with the setting and  
14   appear out of place.

15   Visual resources also have a social setting, which includes public values, goals, awareness, and  
16   concern regarding visual quality. Social setting is addressed as *visual sensitivity*, or the relative  
17   degree of public interest in visual resources and concern over adverse changes in the quality of  
18   that resource. Visual sensitivity is key in assessing how important an effect on the visual  
19   resource would be and whether it represents a significant impact. Recreational uses are  
20   generally considered to have high visual sensitivity, as are views from scenic routes or  
21   corridors, or along scenic highways and wilderness areas. The primary areas of concern  
22   generally are associated with changes to prominent topographic features, changes in the  
23   character of an area with high visual sensitivity, removal of vegetation, or blockage of public  
24   views of a visually sensitive landscape.

25   **3.1.1.1    Lower Colorado River**

26    *Reach 1*

27   This reach is characterized primarily by open waters of Lake Mead, Hoover Dam, and the  
28   surrounding natural and undeveloped land. Visually sensitive resources within this reach  
29   include the Lake Mead NRA and Grand Canyon National Park. Scenic routes in the project area  
30   include the Valley of Fire State Park scenic byway, which runs south of Interstate 15 (I-15) and  
31   north of Highway 93; and Highway 93, which crosses the Colorado River just below Hoover  
32   Dam. A popular scenic drive in the Lake Mead NRA is along the North Shore Road, which  
33   offers spectacular desert vistas. Visitors to the NRA also may experience scenic vistas from  
34   park roads, the lake surface, and while taking walks. Striking backdrops include deep canyons,  
35   narrow gorges, dry washes, sheer cliffs, distant mountain ranges, the lakes, colorful soils and  
36   rock formations, and mosaics of different vegetation. Panoramic vistas of the Muddy  
37   Mountains, the red rocks of Bowl of Fire, Bitter Springs Valley, and the Virgin Basin can be seen  
38   from the Northshore Summit Trail. From the water, noted visual resources include Iceberg  
39   Canyon in Lake Mead, with its steep, narrow gorges.

1     *Reach 2*

2     This reach is generally composed of undeveloped open space and open water, although Davis  
3     Dam is a prominent visual feature. The main visually sensitive resource within this reach is  
4     Lake Mohave, a narrow, 67-mile stretch of the Colorado River that is bounded for most of its  
5     length by the steep walls of Pyramid, Painted, Eldorado, and Black canyons. This area is for a  
6     variety of recreational activities, including fishing, boating, swimming, water skiing, camping,  
7     picnicking, exploring, auto touring, photography, many of which are enhanced by its scenic  
8     atmosphere.

9     *Reach 3*

10    This reach is composed of a mix of agriculture, developed land, riparian lands, saltcedar, desert  
11    scrub, and the open waters of Lake Havasu. It also includes Parker Dam, which is a prominent  
12    feature. Visually sensitive resources include Lake Havasu State Park (including views of the  
13    London Bridge) and the Havasu NWR, which includes Topock Gorge and Topock Marsh, and  
14    Bill Williams River NWR. Lake Havasu State Park includes a number of recreational  
15    opportunities, such as wildlife photography and viewing, hiking, backpacking, and boating,  
16    many of which are enhanced by the scenic environment present at the lake and surrounding  
17    areas. Havasu NWR contains a natural cottonwood-willow forest and a series of small lakes  
18    that comprise Topock Marsh and provides habitat for resident and migratory wildlife. This  
19    area is frequented by visitors who come to view wildlife, as well as appreciate the natural  
20    beauty of Topock Gorge, which offers views of rock spires, towering cliffs, sand dunes, and the  
21    desert. The Bill Williams River NWR has a large manmade marsh, mountains, ravines, sand  
22    dunes, water areas, and hills and also attracts visitors who come to view wildlife as well as  
23    enjoy its scenic qualities.

24    *Reach 4*

25    Most of this reach is dominated by agricultural uses, although it also contains riparian lands,  
26    saltcedar, and desert scrub. Urban development is concentrated in the city of Blythe. Visually  
27    sensitive resources within this reach include Three Finger Lake, Cibola Lake, and the Cibola  
28    NWR, which are characterized by open water and native vegetation. Cibola NWR includes  
29    trails and a scenic overlook of Cibola Lake, where visitors may view a wide variety of wildlife  
30    in a relatively undisturbed setting. No scenic highways within this reach are visible from the  
31    planning area.

32    *Reach 5*

33    This reach consists of a mix of open water, saltcedar, marshland, some cotton-willow and desert  
34    scrub patches, and other riparian land. Imperial Dam is located within this reach. Visually  
35    sensitive resources along this reach include Adobe and Martinez lakes, the Picacho State  
36    Recreation Area (SRA), Imperial Reservoir, and the Imperial NWR. These areas are appreciated  
37    by visitors for both their scenic qualities as well as the opportunity to view wildlife. Imperial  
38    NWR offers views of the last non-channelized section of the LCR, which flows through the  
39    refuge and includes more than 15,000 acres of Federally designated wilderness. Wilderness  
40    areas are protected to ensure that a quiet, natural setting is maintained. Picacho SRA is more

1 developed and is popular with boaters, hikers, anglers, and campers. The park offers diverse  
2 scenery and wildlife viewing, including, wild burros, bighorn sheep, and migratory waterfowl.

### 3 *Reach 6*

4 This reach includes agricultural land and patches of desert scrub, saltcedar, cottonwood-willow,  
5 and other riparian lands. Laguna Dam is located within this reach. Visually sensitive resources  
6 within this reach include the Mittry Lake Wildlife Area, and sensitive viewpoints associated  
7 with recreational areas around Laguna Dam. Mittry Lake covers approximately 750 acres and is  
8 popular for nature study and bird watching.

### 9 *Reach 7*

10 This reach is characterized by agricultural land and areas of urban development, particularly  
11 near Yuma, Arizona. Morelos Diversion Dam also is located in this reach. Agricultural and  
12 urban areas are not highly visually sensitive.

#### 13 **3.1.1.2 Muddy River/Moapa Valley and Virgin River**

14 The Muddy River is bordered by large areas of agricultural land, desert scrub, and some  
15 riparian vegetation. Scattered towns also are present. The Virgin River is characterized  
16 primarily by desert scrub, riparian vegetation, and patches of agriculture and is generally  
17 undeveloped. Visually sensitive resources include Lake Mead NRA and the Overton Wildlife  
18 Management Area. Lake Mead NRA is described under Reach 1 in section 3.1.1.1. The Overton  
19 Wildlife Management Area provides vistas of grassy fields, canals, ponds, thickets, and other  
20 wildlife use areas.

#### 21 **3.1.1.3 Bill Williams River**

22 This area is generally undeveloped, although Alamo Dam is located at the eastern end of the  
23 potential project area. Vegetation is typically desert scrub or riparian woodland/scrub,  
24 although small portions are in agricultural use or open water. Visually sensitive resources  
25 include Lake Havasu, the Bill Williams River NWR (both of which are described in section  
26 3.1.1.1), and Alamo Lake State Park. Campgrounds at the park have excellent views of the lake  
27 and the surrounding mountains. Hiking and wildlife viewing are other activities that are  
28 enhanced by the scenic qualities of the lake and mountains.

#### 29 **3.1.1.4 Lower Gila River**

30 This area is generally in agricultural use or in open space, although urban development is  
31 concentrated in Yuma and in small towns along I-8. This area is not highly visually sensitive.

### 32 **3.1.2 Environmental Consequences**

#### 33 *Significance Criteria*

34 The project would have a significant environmental impact on aesthetic resources if it would  
35 result in any of the following:

- 1 • have a substantial adverse effect on a scenic vista;
- 2 • substantially damage scenic resources, including, but not limited to, trees, rock
- 3 outcroppings, and historic buildings within a state scenic highway;
- 4 • substantially degrade the existing visual character or quality of the site and its
- 5 surroundings; or
- 6 • create a new source of substantial light or glare that would adversely affect day or
- 7 nighttime views in the area.

8 **3.1.2.1 Alternative 1: Proposed Conservation Plan**

9 *Impacts*

10 **Impact AESTH-1: Construction/maintenance activities would temporarily lessen the visual**  
11 **quality of the conservation area establishment sites located on or near visually sensitive**  
12 **resources.** Visually sensitive resources are located in Reaches 1 through 6 where much of the  
13 conservation area would be established. Implementation of conservation measures would  
14 require actions such as clearing/burning vegetation, grading, excavating, dredging, stockpiling  
15 soil, construction/modification of supply canals, berm and swale construction, and planting.  
16 These types of activities are common in agricultural areas, where at least some conservation  
17 area establishment likely would be implemented; moreover, agricultural areas are not  
18 considered visually sensitive. Conservation area establishment actions also could be  
19 implemented on undeveloped land on or near sensitive resources, such as wildlife refuges or  
20 recreational areas. The duration of the impact would depend upon the size of the site and on  
21 whether the site previously was used for agricultural purposes or was undeveloped. It is  
22 estimated that agricultural sites would require 1/5 of the grading of undeveloped sites.  
23 Impacts from developing individual sites could last from several months to several years,  
24 although only portions of the larger sites would be under development at any one time. While  
25 the construction activities could degrade the existing visual character or quality of a site, the  
26 impact would be temporary and would not be considered a substantial degradation of the  
27 visual character or quality of the site or its surroundings. Thus, construction impacts would be  
28 *less than significant*.

29 **Impact AESTH-2: The construction of field facilities and fish-rearing facilities could be**  
30 **required, which could alter the visual quality of the selected sites.** The proposed action also  
31 could involve the construction of two field facilities and fish-rearing facilities. The field  
32 facilities probably would be located in developed areas within Blythe and the Mohave Valley,  
33 and would consist of a small, prefabricated steel building and an equipment yard. These  
34 facilities would require several acres at most and would be fenced. They probably would be  
35 constructed on bare ground or at an already developed and graded site. Thus, minimal grading  
36 would be required. The fish-rearing facilities would include raceways and growout ponds that  
37 likely would not exceed 1 acre. Along with the growout ponds, the facilities could contain other  
38 structures, such as a small office building and feed and equipment storage, to support the  
39 operation. The only potential source of light or glare would be low-level security lighting  
40 should it be required. These facilities would not be located on recreational lands or other lands  
41 that are considered visually sensitive. Impacts would be *less than significant* since their  
42 construction would not substantially damage scenic resources or the existing visual character or  
43 quality of the construction sites, nor would they create a new source of substantial light or glare.

1 **Impact AESTH-3: Conservation area establishment would return sites to a more natural**  
2 **appearance.** Overall, impacts of the proposed action to the visual resources discussed above  
3 would be *beneficial* because it would establish and maintain over 8,000 acres of land that are  
4 currently in agricultural production or undeveloped land that is characterized by invasive, non-  
5 native species. The proposed action also includes measures that would establish native  
6 vegetation in the event of wildfires. Currently, when fires occur, native vegetation is often  
7 supplanted by saltcedar, which is an invasive, introduced species.

#### 8 *Mitigation Measures*

9 No mitigation measures are required because no significant impacts would occur.

#### 10 *Residual Impacts*

11 Residual impacts are those that would occur after the implementation of mitigation measures to  
12 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

#### 13 **3.1.2.2 Alternative 2: No Action Alternative**

14 Under the no action alternative, it is likely that conservation measures similar to those included  
15 in the proposed action would likely be implemented since compliance with the ESA still would  
16 be required for the covered activities, although some conservation could occur in the off-site  
17 conservation areas (as described in section 3.1.2.4 below), as well as along the LCR. **Impacts**  
18 **AESTH-1, AESTH-2, and AESTH-3** generally apply to Alternative 2, although as noted below,  
19 **Impact AESTH-1** would not apply to conservation implemented along the lower Gila River  
20 since it is not considered a visually sensitive area. To the extent that the agencies undertaking  
21 the covered activities proceed with ESA compliance through section 7 consultations instead of  
22 the section 10 permitting process, there may be a reduced number of covered species because  
23 unlisted species would not be included. This would also likely result in less conservation area  
24 being established. Short-term construction disturbances, identified under **Impact AESTH-1**,  
25 would be somewhat lessened because smaller amounts of conservation area would be  
26 established. The establishment of a larger number of smaller-sized mitigation projects would,  
27 however, result in increased need for infrastructure (access roads and irrigation  
28 pipelines/canals and pump facilities). This would result in greater disturbance than would  
29 occur under the proposed action, and therefore incrementally greater aesthetic impacts from  
30 this component of the Conservation Plan. Overall, conservation area construction-related  
31 impacts would be comparable to the proposed action. Since each individual project would  
32 establish its own mitigation sites, it is likely that more maintenance and storage facilities would  
33 be required. Thus, impacts from this component of the Conservation Plan would be  
34 incrementally greater than described under **Impact AESTH-2** for the proposed action. The  
35 long-term beneficial impact described under **Impact AESTH-3** would be less than under the  
36 proposed action because less conservation area would be established.

#### 37 *Mitigation Measures*

38 No mitigation measures are required because no significant impacts would occur.

1 *Residual Impacts*

2 Residual impacts are those that would occur after the implementation of mitigation measures to  
3 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

4 **3.1.2.3 Alternative 3: Listed Species Only**

5 *Impacts*

6 **Impacts AESTH-1, AESTH-2, and AESTH-3** apply to Alternative 3. The magnitude of the  
7 impacts, including beneficial impacts, would be reduced since less conservation would occur.

8 *Mitigation Measures*

9 No mitigation measures are required because no significant impacts would occur.

10 *Residual Impacts*

11 Residual impacts are those that would occur after the implementation of mitigation measures to  
12 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

13 **3.1.2.4 Alternative 4: Off-Site Conservation**

14 *Impacts*

15 The potential impacts described in **Impact AESTH-1** also are applicable to visually sensitive  
16 resources located along the Muddy, Virgin, and Bill Williams rivers. They are not applicable to  
17 development on the lower Gila River since it is not considered a visually sensitive area. The  
18 scope of the activities required to establish conservation areas would be substantially the same  
19 as described in Alternative 1, but would be located in these off-site locations. Therefore, the  
20 effect of the impact described in **Impact AESTH-1** would be *less than significant* for the reasons  
21 set forth under Alternative 1. The location of backwaters, field facilities, and fish-rearing  
22 facilities would be the same under this alternative as Alternative 1, and the potential impacts  
23 from these facilities described under **Impact AESTH-2** would also be the same, i.e., *less than*  
24 *significant*. The *beneficial* impact described in **Impact AESTH-3** would also result from  
25 Alternative 4, but a portion of the benefit would be located along the Muddy, Virgin, Bill  
26 Williams and lower Gila rivers to the extent that conservation areas are located in these areas.

27 *Mitigation Measures*

28 No mitigation measures are required because no significant impacts would occur.

29 *Residual Impacts*

30 Residual impacts are those that would occur after the implementation of mitigation measures to  
31 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

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1     **3.2     AGRICULTURAL RESOURCES**

2     This section addresses the potential impacts associated with the voluntary conversion of  
3     agricultural land that is Important Farmland (defined in Table 3.2-1), zoned for agricultural use,  
4     or subject to Williamson Act contracts. It also addresses potential impacts to agriculture due to  
5     the proximity of established habitat. This analysis meets the requirements of the Farmland  
6     Protection Policy Act (7 U.S.C. 4201) on a programmatic basis. This Act is the Federal statute  
7     that provides the basis for the policy of avoiding impacts from Federal programs. The Act does  
8     not prohibit Federal agencies from undertaking actions that convert farmland to  
9     nonagricultural use, but only requires that Federal agencies “identify and take into account the  
10    adverse effects of Federal programs on the preservation of farmland; consider alternative  
11    actions, as appropriate, that could lessen such adverse effects; and assure that such Federal  
12    programs, to the extent practicable, are compatible with State (and local) programs and policies  
13    to protect farmland” (7 U.S.C. §4202[b]). The following analysis identifies and takes into  
14    account the potential effects of the proposed Conservation Plan on farmland in the whole  
15    planning area, considers alternative actions that could lessen those effects, and also assures that  
16    the Conservation Plan is compatible with state and local programs “to the extent practicable.”

17    **3.2.1     Affected Environment**

18    Individual counties and municipalities regulate agricultural land uses primarily through the  
19    adoption of land use plans, policies, and agricultural zoning that restrict the location, type, and  
20    intensity of land development and use that is allowed. The California Department of  
21    Conservation (CDOC) has the primary responsibility for regulation and reporting related to  
22    California agricultural lands. Administering agencies in Arizona and Nevada are the Arizona  
23    Department of Agriculture and the Nevada Division of Agriculture. Agricultural resources on  
24    tribal lands are governed by the tribal governments.

25    The United States Department of Agriculture (USDA), Natural Resources Conservation Service  
26    (NRCS), formerly the Soil Conservation Service (SCS), has defined Important Farmlands based  
27    upon a number of factors, including the physical and chemical characteristics of the land and  
28    the suitability of the land for producing crops (refer to Table 3.2-1 for these definitions).  
29    Important Farmlands are afforded special protection due to their importance to agricultural  
30    production.

31    **3.2.1.1    Lower Colorado River**

32    *Important Farmland*

33    The discussion of farmland present in the planning area is based on multiple sources, including  
34    Reclamation’s LCRAS, CDOC, NRCS, and Yuma County. Important Farmland has not been  
35    mapped for all of the planning area; thus, LCRAS data, which do not distinguish between  
36    Important Farmland and other farmland, are used to give an overview of lands that are  
37    classified as agricultural. LCRAS defines agricultural areas as cultivated fields or fields that will  
38    be cultivated in the future, as well as all areas that are irrigated via a canal vs. a municipal water  
39    source, which could include non-agricultural areas such as grass fields and other areas. The

3.2 Agricultural Resources

1 vast majority of the planning area that is classified as agricultural is, however, used for  
 2 agricultural purposes (personal communication, K. Zander 2003).

3

**Table 3.2-1. General Definitions of Categories Used in Important Farmland Maps<sup>1</sup>**

| <i>Farmland Category</i>                      | <i>Definition</i>   |
|---|---|
| Prime Farmland <sup>1</sup>                   | Prime Farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. In general, Prime Farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks.    |
| Unique Farmland                               | Unique Farmland is land other than Prime Farmland that is used for the production of specific high value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods.  |
| Farmland of Statewide Importance <sup>1</sup> | This is land, in addition to Prime and Unique Farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. Criteria for defining and delineating this land are to be determined by the appropriate State agency or agencies. Generally, additional farmlands of statewide importance include those that are nearly Prime Farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as Prime Farmlands if conditions are favorable.  |
| Farmland of Local Importance                  | In some local areas there is concern for certain additional farmlands for the production of food, feed, fiber, forage, and oilseed crops, even though these lands are not identified as having national or statewide importance. Where appropriate, these lands are to be identified by the local agency or agencies concerned.   |
| Grazing Land <sup>1</sup>                     | Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.  |
| Urban and Built-up Land                       | A Land Cover/Use category consisting of residential, industrial, commercial, and institutional land; construction sites; public administrative sites; railroad yards; cemeteries; airports; golf courses; sanitary landfills; sewage treatment plants; water control structures and spillways; other land used for such purposes; small parks (less than 10 acres) within urban and built-up areas; and highways, railroads, and other transportation facilities if they are surrounded by urban areas. Also included are tracts of less than 10 acres that do not meet the above definition but are completely surrounded by Urban and Built-up land. Two size categories are recognized in the National Resources Inventory (NRI): (1) areas 0.25 to 10 acres, and (2) areas greater than 10 acres. |
| Other Land                                    | Land not included in any other mapping category. Common examples include low wetland and riparian areas.  |
| Water   | A General cover category consisting of permanent water, such as a perennial stream, lake, or pond with at least 25 percent open water. If the vegetative canopy obscures more than 75 percent of the water surface from view, the area is recorded under the category appropriate for the canopy vegetation. Four types of water areas are large streams, large water bodies, small streams, and small water bodies.  |
| <i>Notes:</i>                                 | 1. The definitions for Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Urban Built-up Land were developed by the USDA-SCS as part of the nationwide Land Inventory and Monitoring (LIM) system. The LIM definitions have been modified for use in California with the most significant modification being that Prime Farmland and Farmland of Statewide Importance must be irrigated. In addition, mapping of Grazing Land as part of an Important Farmland Map is unique to California.   |
| <i>Sources:</i>                               | 7 CFR 657.5; NRI 1997; CDOC 2003; CDOC undated.   |

1 Table 3.2-2 shows the amount of agricultural land contained within each reach based on LCRAS  
 2 data. No agricultural land is mapped in Reaches 1, 2, and 5. The river in Reaches 1 and 2 is  
 3 generally bordered by cliffs, rather than the broad plains that are conducive to agricultural uses;  
 4 and Reach 5 consists primarily of publicly owned land, most of which is managed by the  
 5 Service as a wildlife refuge or by the State of California as a recreation area. The largest amount  
 6 of agricultural land is in Reach 4 (170,048 acres), followed by Reach 7 (43,965 acres), Reach 6  
 7 (36,803 acres), and Reach 3 (18,186 acres). Agricultural land comprises 38 percent of the total  
 8 land within the planning area.

**Table 3.2-2. Agricultural Land by River Reach (2003)**

| <i>River Reach</i> | <i>Agricultural Land (acres)</i> | <i>Percentage of Reach</i> |
|--------------------|----------------------------------|----------------------------|
| Reach 3            | 18,186                           | 20                         |
| Reach 4            | 170,048                          | 59                         |
| Reach 6            | 36,803                           | 56                         |
| Reach 7            | 43,965                           | 71                         |
| <b>Total</b>       | <b>269,002</b>                   | <b>—</b>                   |

Source: USBR 2003a.

9 Important Farmland has been mapped in Imperial, Riverside, and Yuma counties and is shown  
 10 by reach on Table 3.2-3. The greatest amount of Important Farmland is located in Reach 4  
 11 (113,284 acres), followed by Reach 7 (60,492 acres), Reach 6 (50,184 acres), and Reach 5 (245  
 12 acres). Since the LCRAS uses a different level of detail than the system used for mapping  
 13 Important Farmland, in some cases, general agricultural land may not have been included in the  
 14 totals for Important Farmlands and conversely, Important Farmland, such as that located in  
 15 Reach 5 may not have been included in the agricultural area totals shown on Table 3.2-2.

**Table 3.2-3. Known Important Farmland within the Planning Area (acres)**

|                                  | <i>Prime Farmland</i> | <i>Unique Farmland</i> | <i>Farmland of Statewide Importance</i> | <i>Farmland of Local Importance</i> | <i>Percentage of Reach</i> |
|----------------------------------|-----------------------|------------------------|---|-------------------------------------|----------------------------|
| Reach 4                          | 70,544                | 564                    | 36,000                                  | 6,176                               | 40                         |
| Reach 5                          | —                     | —                      | 245 <sup>1</sup>                        | —                                   | <1                         |
| Reach 6                          | 39,793                | 1,366                  | 4,619                                   | 4,406                               | 77                         |
| Reach 7                          | 55,027                | 2,875                  | 2,590                                   | 0                                   | 96                         |
| <b>Total</b>                     | <b>165,364</b>        | <b>4,805</b>           | <b>43,454</b>                           | <b>10,582</b>                       | <b>—</b>                   |
| <b>Percentage of Reaches 1-7</b> | <b>23</b>             | <b>0.67</b>            | <b>6.1</b>                              | <b>1.5</b>                          | <b>—</b>                   |

Notes: <sup>1</sup>Includes Yuma County only (Yuma County 2003).  
 Sources: CDOC, Division of Land Resource Protection 2000; NRCS 2002; Yuma County 2003.

16 The amount of land in agricultural use in the planning area has undergone only a minor overall  
 17 decline during the last 10 years. Table 3.2-4 shows the difference in the amount of agricultural  
 18 land present in those reaches containing agricultural land in 1993 and 2003. The greatest  
 19 change occurred in Reach 7, where agricultural land declined by 4.9 percent during this period  
 20 (USBR 2003a). Minor increases in agricultural land occurred in Reaches 3 and 4 during the  
 21 same period. Information regarding the conversion of Important Farmland is not available for  
 22 the planning area.

**Table 3.2-4. Agricultural Land Conversion  
Between 1993 and 2003 in the Planning Area**

| <i>River Reach</i> | <i>Agricultural Land in 1993 (acres)</i> | <i>Agricultural Land in 2003 (acres)</i> | <i>Change in Amount of Agricultural Land (acres)</i> | <i>Percent Change in Agricultural Land</i> |
|--------------------|--|--|--|--|
| Reach 3            | 18,120                                   | 18,186                                   | 66   | .36  |
| Reach 4            | 169,857                                  | 170,048                                  | 191  | .11  |
| Reach 5            | 0  | 0  | 0  | —  |
| Reach 6            | 37,500                                   | 36,803                                   | -697   | -1.9                                       |
| Reach 7            | 46,207                                   | 43,965                                   | -2242  | -4.9                                       |
| <b>Total</b>       | <b>271,684</b>                           | <b>269,002</b>                           | <b>-2682</b>   | <b>-.99</b>                                |

*Source: USBR 2003a.*

### 1 Land Zoned for Agricultural Use

2 This section identifies the portions of the planning area that contain substantial amounts of land  
3 zoned for agricultural use, as well as the generally allowed uses in these zoning districts. State  
4 and Federal agencies are not subject to local land use and zoning regulations, but they do take  
5 these into consideration and cooperate with local agencies to avoid conflicts to the extent  
6 feasible.

#### 7 REACH 1

8 Reach 1 consists primarily of lands administered by the NPS and the Hualapai Indian  
9 Reservation. The remaining portion of the reach is located within Clark County and is zoned as  
10 Rural Open Land District (R-U); however, this reach contains no agricultural land.

#### 11 REACH 2

12 Reach 2 consists primarily of lands administered by the NPS. The remaining portion of the  
13 reach is located within Clark County, and most of this land is zoned R-U; however, this reach  
14 contains no agricultural land.

#### 15 REACH 3

16 Most of the portion of Reach 3 located within Clark County is zoned R-U. The R-U district  
17 provides for appropriate uses of vast areas of rural land, which would include the proposed  
18 Conservation Plan. Fish rearing ponds normally would be allowed under a Special Use Permit  
19 (personal communication, C. Pulsipher 2003). The Mohave County portion of Reach 3 includes  
20 General Agricultural (A) and Agricultural Residential (A-R) zoning. The A zone allows for all  
21 agricultural uses, as well a variety of residential and commercial uses. The A-R zone is  
22 primarily designed for agricultural uses, but other uses, such as single-family dwellings,  
23 schools, and churches, also are allowed. Although open space/wildlife habitat areas are not  
24 expressly permitted, they would be considered compatible uses in these zones (personal  
25 communication, B. Delmar 2003).

## 1 REACH 4

2 Within the portion of this reach that is in Riverside County, the zoning is mainly Agriculture  
3 (A-1 and A-2). These zones allow single family dwellings and numerous other uses, primarily  
4 related to agricultural production, such as water works facilities for the production and  
5 distribution of water for irrigation purposes, field crops, nurseries, greenhouses, farming  
6 operations, wineries, and grazing. Any use that is not specifically listed may be considered a  
7 permitted or conditionally permitted use provided that the Planning Director finds that the  
8 proposed use is substantially the same in character and intensity as those listed. Agricultural  
9 zones permit other uses if they are found to have substantially the same character and intensity  
10 as expressly permitted uses and would allow the development of habitat for wildlife (personal  
11 communication, P. Clark 2003).

12 Zoning in the Imperial County portion of Reach 4 is primarily General Agriculture (A-2). The  
13 purpose of the A-2 zone is to designate areas that are suitable and intended primarily for  
14 agricultural uses and agricultural related compatible uses. Uses include all agricultural and  
15 grazing uses; aquaculture to allow for the growing and harvesting of algae, fish, frogs, shrimp,  
16 and similar aquatic products; and some residential development. Although habitat for wildlife  
17 (other than fish farms, which are identified as an allowable use) is not expressly permitted,  
18 conservation areas would likely be allowed in these areas if there were no anticipated conflicts  
19 with agricultural operations (Imperial County 1998).

20 In the City of Blythe, the zoning is primarily Agriculture (A), which allows for the cultivation of  
21 land and for associated uses commonly tied to agriculture, including grazing. Residential uses  
22 also are allowed. Conservation areas would likely be considered an allowable use (City of  
23 Blythe 2003).

24 La Paz County zoning maps are being revised to obtain consistency with the county's first  
25 Comprehensive Plan, which is currently being developed. Therefore, accurate zoning  
26 information for La Paz County is currently not available.

## 27 REACH 5

28 Most of the land in Reach 5 is managed by the Service and not used for agricultural purposes.  
29 Agricultural zoning is present, however, in portions of the reach located in Yuma County,  
30 which are zoned as Rural Area (this zone is the equivalent of agricultural zoning in Yuma  
31 County). This district is intended to permit uses that are compatible with the use of the land for  
32 agriculture, farming, and open space preservation. The predominantly rural character of Rural  
33 Areas is to be maintained. Permitted uses include single family residences, farms and ranches,  
34 public schools and hospitals, hunting and fishing clubs, agricultural processing, public parks or  
35 buildings, and public or private utility installations. The Rural Area district would allow for  
36 establishment of wildlife habitat, including the establishment of fish rearing ponds; however,  
37 fish ponds may not be permitted in the areas that would conflict with airport land use plans  
38 (see section 3.8.2.1) for a more detailed discussion of this issue (personal communication, G.  
39 Gallagher 2003).

1 The La Paz County zoning maps are in the process of undergoing revisions to obtain  
2 consistency with the County's first Comprehensive Plan which is currently being developed.  
3 Therefore, accurate zoning information for La Paz County is currently pending.

#### 4 REACH 6

5 Reach 6 includes lands zoned for agriculture in the city of Yuma, Imperial County, and Yuma  
6 County. The northwestern portion of the city of Yuma is zoned mainly as Agriculture (AG).  
7 The principal purpose of this district is to conserve and protect farms and other open land uses,  
8 foster orderly growth in rural and outlying areas, and prevent urban and agricultural land use  
9 conflicts. Principal permitted uses include commercial breeding, dairies, grazing, nurseries,  
10 riding stables, public utility buildings, single family residences, aviaries, and facilities necessary  
11 for service to the surrounding territory. Habitat conservation areas would be allowed in the AG  
12 district (personal communication, M. Spriggs 2003).

13 The Imperial County lands in Reach 6 are zoned as General Agriculture (A-2). (See the  
14 discussion under Reach 4 regarding uses allowed in this zone.) The Yuma County areas are  
15 zoned as Rural Area (see description of this zone under Reach 5).

#### 16 REACH 7

17 The lands within the city of Yuma in Reach 7 are predominantly zoned as Agriculture (AG) on  
18 the western periphery of the city. (See the discussion under Reach 6 regarding allowable uses  
19 in this zone.) Yuma County lands with Reach 7 are mainly zoned as Rural Area (see the  
20 description of this zone under Reach 5).

21 The City of Somerton is also located within Reach 7 and has a small land area zoned for  
22 agricultural use (AG) on the eastern side of the city. This zone conserves and protects farms  
23 and other open land uses, fosters orderly growth in rural and outlying areas, and prevents  
24 urban and agricultural land use conflicts. The primary purpose of requiring minimum lot sizes  
25 is to discourage small lot or residential subdivisions where public facilities and governmental  
26 services could not reasonably be made available in the future. Principal uses include aviaries,  
27 corrals, grazing fields, public utility buildings, and public and private wild preservation areas.  
28 The Conservation Plan would be allowed in this district (personal communication, F. Villegas  
29 2003).

#### 30 *Lands Subject to Williamson Act Contracts*

31 This discussion is applicable only to lands within California, and more specifically to Reach 4 of  
32 the LCR. Approximately 25,484 acres of land under Williamson Act contracts are located within  
33 this reach, primarily in the Palo Verde Valley. This constitutes approximately 9 percent of the  
34 total area of the reach.

35 The Williamson Act provides an incentive program for farmers to continue agricultural use on  
36 their property. The statute authorizes cities and counties to create agricultural preserves in  
37 which land uses are limited to agricultural and compatible uses. Landowners may enter  
38 contracts that limit their property to commercial agricultural use for a rolling ten-year term in  
39 exchange for reduced property taxes. The contracts must exclude "uses other than agricultural,  
40 and other than those compatible with agricultural uses" (Cal. Govt. Code §51243[a]). Since

1 agricultural uses are defined as “producing an agricultural commodity for commercial  
2 purposes” (Cal. Govt. Code §51201[b]), the acquisition of lands with Williamson Act contracts  
3 would generally be precluded for the proposed Conservation Plan, unless the contract can be  
4 terminated or the local government agency allows the use of the land for wildlife conservation  
5 as a compatible use.

6 Not all lands within an agricultural preserve created pursuant to the Williamson Act are subject  
7 to contracts. The city or county must restrict the use of such lands by zoning or other means so  
8 as not to be incompatible with the agricultural use of lands in the preserve (Cal. Govt. Code  
9 §51230). The Act contains separate provisions that discourage the locating of public  
10 improvements within an agricultural preserve (Cal. Govt. Code §51292), and provide the local  
11 government agency and State Director of Conservation with the right to sue to enforce these  
12 provisions (Cal. Govt. Code §51294). However, these provisions do not apply to the location or  
13 construction of “(p)ublic works required for fish and wildlife enhancement and preservation”  
14 (Cal. Govt. Code §51293[e][2]). Under this exception, the LCR MSCP participants would be  
15 allowed to acquire and use non-contract lands within an agricultural preserve for the purposes  
16 of establishing habitat.

### 17 **3.2.1.2 Muddy River/Moapa Valley and Virgin River**

#### 18 *Important Farmland*

19 Table 3.2-5 shows the amount of agricultural land present in the three off-site conservation  
20 areas. Most of the approximately 4,555 acres of agricultural land in this area is located in the  
21 Muddy River/Moapa Valley, rather than the Virgin River. This off-site conservation area is  
22 located within Clark County, where Important Farmland has not been mapped. The amount of  
23 land in agricultural production has not changed substantially in recent years.

#### 24 *Land Zoned for Agricultural Use*

25 This off-site alternative conservation area is located within Clark County. The zoning is  
26 predominantly R-U. See the discussion above regarding this zoning district.

### 27 **3.2.1.3 Bill Williams River**

#### 28 *Important Farmland*

29 The Bill Williams River forms the boundary between Mohave and La Paz counties. Most of the  
30 approximately 3,387 acres of agricultural land in this area is located in Mohave County, where  
31 Important Farmland has not been mapped. Much of the agricultural land in this area is located  
32 within Planet Ranch, where the amount of land in agricultural production has not changed  
33 substantially in recent years.

#### 34 *Land Zoned for Agricultural Use*

35 Mohave County areas within this off-site conservation area are zoned as Agricultural  
36 Residential (A-R) (personal communication, B. Delmar 2003). See the discussion under Reach 3  
37 of the LCR for the allowable uses in this zone.

1 The La Paz County zoning maps are in the process of undergoing revisions to obtain  
2 consistency with the County's first Comprehensive Plan, which is currently being developed.  
3 Therefore, accurate zoning information for La Paz County is currently pending.

4 **3.2.1.4 Lower Gila River**

5 *Important Farmland*

6 The lower Gila River is located within Yuma County. Approximately 82,840 acres of Important  
7 Farmland are located within this off-site conservation area, including 75,965 acres of Prime  
8 Farmland and 6,875 acres of Unique Farmland. This comprises approximately half of the total  
9 area. Approximately 79,421 acres within this off-site alternative location have been designated  
10 as general agricultural land (Ogden Environmental 1998). This information was obtained from  
11 the Gap Analysis Program (GAP) (a program that provides mapping of land cover types).  
12 Similar to the LCRAS, GAP uses different parameters for mapping general agricultural land  
13 than those used in the Important Farmland data, resulting in some discrepancies between the  
14 totals.

15 According to the Wellton-Mohawk Irrigation District, there essentially has been no change in  
16 the amount of agricultural land in this area since the mid-1990s (personal communication, W.  
17 West 2003).

18 **Table 3.2-5. Agricultural Land in the**  
19 **Off-Site Conservation Areas**

| <i>Off-Site Conservation Area</i>         | <i>Agricultural Land (acres)<sup>1</sup></i> | <i>Percentage of Total Area</i> |
|---|--|---------------------------------|
| Muddy River/Moapa Valley and Virgin River | 4,555  | 24                              |
| Bill Williams River                       | 3,387  | 16                              |
| Lower Gila River                          | 79,421                                       | 52                              |
| <b>Total</b>                              | <b>87,363</b>                                | <b>45</b>                       |

<sup>1</sup>Source: Ogden Environmental 1998 (based on GAP).

20 *Land Zoned for Agricultural Use*

21 The Yuma County zoning for the lower Gila River area is primarily Rural Area (see description  
22 of this zone under Reach 5 of the LCR). The single largest zone in the town of Wellton is  
23 Agricultural; approximately 50 percent of the incorporated area is zoned as such. Habitat  
24 conservation areas would be allowed in this zoning district.

25 **3.2.2 Environmental Consequences**

26 *Significance Criteria*

27 The proposed action would result in a significant impact if it would:

- 1 • convert a substantial portion of the available Prime Farmland, Unique Farmland, or  
2 Farmland of Statewide Importance (Important Farmland) in the project area to  
3 nonagricultural use;
- 4 • conflict with existing zoning for agricultural use, or other legal protections for  
5 agricultural use; or
- 6 • involve other changes in the existing environment, which, due to their location or  
7 nature, could individually or cumulatively result in substantial loss of Important  
8 Farmland to nonagricultural use or a loss of agricultural productivity.

### 9 3.2.2.1 *Alternative 1: Proposed Conservation Plan*

10 Conservation measures would be implemented on agricultural or undeveloped land. The most  
11 likely scenario would include a mix of such lands, but in order to ensure that the maximum  
12 potential impact is considered, the analysis assumes a worst-case scenario; i.e., that all habitat  
13 establishment would occur on agricultural land.

#### 14 *Impacts*

15 Lands subject to Williamson Act contracts would not be acquired for the Conservation Plan  
16 unless the responsible local agency agreed that the contract terms allow the establishment and  
17 maintenance of conservation areas as a compatible use, and that there is no significant adverse  
18 impact from the use of non-contract lands within an agricultural preserve because fish and  
19 wildlife enhancement and preservation is a compatible use of such lands.

20 Wildlife habitat likely would be considered a permitted use or a conditionally permitted use in  
21 the areas zoned for agricultural use potentially affected by the proposed action, as described  
22 above. Additionally, compatibility with zoning would be one of the factors considered during  
23 the site selection process. Thus, conflicts with agricultural zoning would not occur.

24 Other than those impacts described below, implementation of the proposed action would not  
25 adversely affect agricultural uses of nearby lands. Access would not be restricted to these lands,  
26 nor would they be affected by the application of pesticides on the conservation areas. Pesticides  
27 are commonly used in agricultural areas, and they would be applied in a manner that would be  
28 consistent with accepted practices and regulatory requirements.

29 **Impact AG-1: Important Farmland could be converted to a nonagricultural use.** The  
30 proposed action would establish 8,132 acres of conservation area. If the entire amount were  
31 implemented on Important Farmland, it would constitute approximately 3.6 percent of the total  
32 known to be present in Reaches 4 through 7, the only reaches where Important Farmland  
33 mapping has occurred. It also is possible that unmapped Important Farmland is present in  
34 other reaches and could be used for habitat establishment. If this were the case, it would reduce  
35 the total percentage of Important Farmland converted to habitat. The conversion of Important  
36 Farmland to nonagricultural use would be *less than significant* because a substantial amount of  
37 Important Farmland would not be converted to nonagricultural use. Additionally, during the  
38 site selection process, the amount and importance of the farmland would be considered before  
39 specific sites are selected, as required by the Farmland Protection Policy Act. The significance  
40 of this potential impact would be further minimized by the implementation of a number of

1 covered activities, described in detail in section 2.5.3.3 of the LCR MSCP BA, that would more  
2 than offset impacts of the proposed action. These include the (1) CRIT plan to bring an  
3 additional 25,000 acres into agricultural production should Congress appropriate adequate  
4 funds; (2) Fort Mojave Tribe plan to fully develop its farmland, which would increase farmed  
5 acreage by approximately 3,745 acres; (3) the Chemehuevi Tribe plan to irrigate up to 1,855  
6 acres of agricultural land; (4) Fort Yuma Agency plan to irrigate 650 acres of agricultural land;  
7 and the (5) Cocopah Tribe plan to irrigate three agricultural sites, totaling 500 acres.

8 **Impact AG-2: Waterfowl attracted to established backwaters and marshes could destroy**  
9 **crops grown on adjacent farmland.** The species for which cottonwood-willow and honey  
10 mesquite habitat is being established would not impact crops grown on adjacent farmland  
11 because they eat insects rather than grains, fruit, and other crops grown in the planning area.  
12 Waterfowl, such as ducks and geese, that are attracted to newly established aquatic or wetland  
13 areas (particularly marshes and backwaters), could, however, consume crops on adjacent  
14 farmlands. The amount of marsh and backwaters that would be established is, however, small  
15 in comparison to that which currently exists in the planning area. (The Conservation Plan  
16 would result in the establishment of 512 acres of marsh and 360 acres of backwaters. For  
17 purposes of comparison, the LCR MSCP HCP indicates that approximately 12,000 acres of  
18 marsh are present in the planning area, and a backwater study of Reaches 3, 4, 5, and part of 6  
19 identified 7,911 acres of open water [GEO/Graphics 2000]). The establishment of this  
20 comparatively small amount of marsh and backwater would not attract sufficient wildlife to  
21 result in the loss of agricultural productivity, and the impact would be *less than significant*.

22 **Impact AG-3: Runoff from established conservation areas could alter the slopes of adjoining**  
23 **laser-leveled fields.** Laser leveling is used to improve agricultural efficiency by contouring  
24 fields to allow moisture conservation and improve drainage. If the drainage from the newly  
25 established conservation areas exceeded the existing discharge rate, this could result in the  
26 alteration of slopes on adjacent laser-leveled fields. This would result in the loss of agricultural  
27 productivity on such lands, which would be a *significant impact, but mitigable to less than*  
28 *significant* through the implementation of **Mitigation Measure AG-1**.

29 **Impact AG-4: Covered species attracted to established conservation areas could disperse to**  
30 **other lands within the planning area.** The successful establishment of habitat for the covered  
31 species in the conservation areas may result in an increase in the number of individuals of those  
32 species within the planning area<sup>1</sup>. Dispersal of adults and juveniles from the conservation areas  
33 to other lands with suitable habitat within the planning area, with subsequent potential for such  
34 lands to be used as breeding, resting, or foraging habitat, is likely to occur. Agricultural lands  
35 within the planning area generally do not support habitat characteristics that would encourage  
36 covered species to become resident on these lands, however. Such lands have limited insect  
37 populations due to pesticide treatments to control crop pests, and the crops that are grown on  
38 agricultural land are unsuitable as roosting or resting habitat, which would limit the use of

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<sup>1</sup> Only increases in populations of covered species that are protected under the ESA or specific state law could potentially affect agricultural resources. Although the LCR MSCP participants are requesting incidental take coverage for a number of species not listed under the ESA, that coverage does not come into effect unless or until the species is listed. There is no requirement for coverage for incidental take for any unlisted species by any agency or individual within the planning area. Thus, use of any lands outside the conservation areas by covered, but unlisted species, would not potentially require changes to land management.

1 these lands by birds and bats. Moreover, the conservation areas are more likely to contain  
2 better foraging resources than the adjacent agricultural lands. While insectivorous birds and  
3 bats may visit adjacent farmlands for limited foraging, effects to agricultural resources would be  
4 *less than significant*.

#### 5 *Mitigation Measures*

6 **AG-1** Grading plans shall be developed for newly established conservation areas that direct  
7 runoff away from adjacent agricultural lands to ensure that flow rates from the  
8 conservation area do not exceed existing discharge rates. (*Addresses Impact AG-3*).

#### 9 *Residual Impacts*

10 Residual impacts would be *less than significant* given the implementation of **Mitigation Measure**  
11 **AG-1** because flow rates would not exceed existing discharge rates.

### 12 **3.2.2.2 Alternative 2: No Action Alternative**

#### 13 *Impacts*

14 Under the no action alternative, it is likely that conservation measures similar to those included  
15 in the proposed action would be implemented because compliance with the ESA still would be  
16 required for the covered activities, although some conservation could occur in the off-site  
17 conservation areas (as described in section 3.2.2.4 below), as well as along the LCR. **Impacts**  
18 **AG-1 through AG-4** apply to Alternative 2. The no action alternative is likely to result in the  
19 establishment and maintenance of less riparian vegetation. The same types of impacts would  
20 occur as described for the proposed action, but the overall magnitude could be lessened since a  
21 smaller amount of conservation area would be established. In addition, as described in Chapter  
22 2, the smaller size of mitigation sites required as mitigation for individual projects would result  
23 in limitations on site selection criteria and would likely cause the mitigation to be located in  
24 more developed areas where land has been subdivided. This could further reduce impacts to  
25 agricultural resources.

#### 26 *Mitigation Measures*

27 Mitigation measures would be developed as appropriate in the course of project-specific  
28 environmental reviews. If a significant impact were identified, a mitigation measure similar to  
29 that identified in this EIS/EIR (**Mitigation Measure AG-1**) could be implemented. Developing  
30 and implementing such a mitigation measure is outside the authority of the lead agencies and is  
31 beyond the scope of this EIS/EIR.

#### 32 *Residual Impacts*

33 Residual impacts would be *less than significant* because a mitigation measure is available that  
34 would reduce or avoid significant impacts to agricultural resources.

1 **3.2.2.3 Alternative 3: Listed Species Only**

2 *Impacts*

3 **Impacts AG-1 through AG-4** apply to this alternative, although since a smaller amount of  
4 conservation area would be developed than under the proposed action, the impacts to  
5 agricultural resources described in **AG-1, AG-3, and AG-4** would be even less than described  
6 for Alternative 1 because there would be reduced use of agricultural lands. The impacts to  
7 agricultural productivity from waterfowl (**AG-2**) would be substantially similar to the impact  
8 described in Alternative 1 and *less than significant* because the acreage of established backwaters  
9 would be the same.

10 *Mitigation Measures*

11 **Mitigation Measure AG-1** applies to this alternative.

12 *Residual Impacts*

13 Residual impacts would be *less than significant* given the implementation of **Mitigation Measure**  
14 **AG-1** since flow rates would not exceed existing discharge rates.

15 **3.2.2.4 Alternative 4: Off-Site Conservation**

16 *Impacts*

17 **Impacts AG-1 through AG-4** generally apply to this alternative, although impacts other than  
18 those associated with backwater establishment and other fish conservation measures would  
19 occur outside the planning area. Under this alternative, a total of 7,772 acres of conservation  
20 area would be established within the off-site conservation areas. Assuming an even  
21 distribution among the three areas, approximately 2,590 acres would be established in each.  
22 Important Farmland has been mapped only along the lower Gila River; however, as a worst-  
23 case scenario, it is assumed that all known farmland is Important Farmland. If all conservation  
24 area establishment occurred on farmland, it would represent approximately 57, 76, and 0.03  
25 percent of the total farmland within the Muddy/Virgin, Bill Williams, and lower Gila River off-  
26 site conservation areas, respectively. While this would constitute a substantial portion of the  
27 farmland present in the Muddy/Virgin River and Bill Williams River conservation areas, it  
28 would not represent a substantial portion of the farmland available in the general area (the  
29 adjacent planning area contains approximately 269,000 acres of general agricultural land and  
30 approximately 224,200 acres of Important Farmland). This impact would be *less than significant*,  
31 as described for the proposed action under **Impact AG-1**. The impacts described in **Impact AG-**  
32 **2** would be similar to those described for Alternative 1 because the marsh and backwaters  
33 would be located in the planning area.

34 *Mitigation Measures*

35 **Mitigation Measure AG-1** applies to this alternative.

- 1 *Residual Impacts*
- 2 Residual impacts would be *less than significant* given the implementation of **Mitigation Measure**
- 3 **AG-1** since flow rates would not exceed existing discharge rates.

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1    **3.3       AIR QUALITY**

2    This section addresses short-term construction and maintenance emissions, as well as long-term  
3    emissions from irrigation pumping.

4    **3.3.1      Affected Environment**

5    Air quality at a given location can be described by the concentration of various pollutants in the  
6    atmosphere. Units of concentration are expressed in parts per million (ppm) or micrograms per  
7    cubic meter. The significance of a pollutant concentration is determined by comparing its  
8    concentration to an applicable national and/or state ambient air quality standard. These  
9    standards represent the maximum allowable atmospheric concentrations that may occur and  
10   still protect public health and welfare with a reasonable margin of safety. The EPA establishes  
11   the National Ambient Air Quality Standards (NAAQS). The NAAQS generally are defined as  
12   the maximum acceptable ground-level concentrations that may not be exceeded more than once  
13   per year, except that annual standards may never be exceeded. California standards,  
14   established by the California Air Resources Board (CARB), are termed the California Ambient  
15   Air Quality Standards (CAAQS). The CAAQS are at least as restrictive as the NAAQS and  
16   include pollutants for which national standards do not exist. In the Arizona project region, the  
17   Arizona Department of Environmental Quality (ADEQ) has adopted the NAAQS to regulate  
18   sources of air pollution. In the Nevada project region, the Nevada Bureau of Air Pollution  
19   Control (NBAPC) has adopted the NAAQS and has promulgated additional state standards to  
20   regulate sources of air pollution.

21   The air pollutants of primary concern that are considered in this air quality assessment include  
22   ozone (O<sub>3</sub>), volatile organic compounds (VOCs), nitrogen oxides (NO<sub>x</sub>), and particulate matter  
23   less than 10 microns in diameter (PM<sub>10</sub>), as portions of the project region presently do not attain  
24   the national and/or California ambient air quality standards for O<sub>3</sub> and PM<sub>10</sub>. Although there  
25   are no ambient standards for VOCs or NO<sub>x</sub>, they are important as precursors to O<sub>3</sub> formation.

26   ***Existing Air Quality***

27   Identifying the region of influence (ROI) for air quality requires knowledge of the types of  
28   pollutants being emitted, emission rates of pollutant sources, and meteorological conditions.  
29   The ROI for inert pollutants (generally pollutants other than O<sub>3</sub> and its precursors) is generally  
30   limited to a few miles downwind from a source. The ROI for O<sub>3</sub> can extend much farther  
31   downwind than for inert pollutants. Ozone is a secondary pollutant formed in the atmosphere  
32   by photochemical reactions of previously emitted pollutants, or precursors. Ozone precursors  
33   are mainly the reactive portion of VOCs and NO<sub>x</sub>. In the presence of solar radiation, the  
34   maximum effect of VOCs and NO<sub>x</sub> emissions on O<sub>3</sub> levels usually occurs several hours after  
35   they are emitted and many miles from the source.

36   Ozone concentrations are highest during the warmer months and coincide with the season of  
37   maximum insolation. Inert pollutant concentrations tend to be the greatest during periods of  
38   light winds and surface-based temperature inversions. These conditions limit atmospheric  
39   dispersion. However, in the case of PM<sub>10</sub> impacts from fugitive dust episodes, maximum dust

1 impacts within the project region often occur during high wind events and in proximity to  
2 manmade ground-disturbing activities.

3 The EPA designates all areas of the United States as having air quality better (attainment) or  
4 worse (nonattainment) than the NAAQS. The criteria for nonattainment designation varies by  
5 pollutant: (1) an area is in nonattainment for O<sub>3</sub> or 24-hour PM<sub>10</sub> if its NAAQS has been  
6 exceeded more than three times in 3 years and (2) an area is in nonattainment for any other  
7 pollutant if its NAAQS has been exceeded more than once per year. Former nonattainment  
8 areas that have achieved attainment of the NAAQS are designated as maintenance areas. With  
9 regard to the NAAQS for O<sub>3</sub>, Imperial County is the only part of the project region that does not  
10 attain this standard. The portions of the project region that do not attain the NAAQS for PM<sub>10</sub>  
11 include San Bernardino County and the greater Yuma region in Arizona (roughly the Colorado  
12 River from Imperial Dam to the SIB) (EPA 2003b). The project region attains all other NAAQS.

13 The attainment status designations and new rule to implement the O<sub>3</sub> 8-hour standard became  
14 effective on 15 June 2004. The EPA designates Imperial County as a marginal nonattainment  
15 area for the 8-hour O<sub>3</sub> standard (EPA 2004a). An area will attain this standard if its three-year  
16 running average of the annual fourth-highest daily maximum 8-hour O<sub>3</sub> concentration remains  
17 below 0.084 ppm. Implementation of the 1-hour O<sub>3</sub> standard will not be revoked in a given area  
18 until that area achieves this standard.

19 The EPA is in the process of implementing the new 24-hour and annual PM<sub>2.5</sub> national ambient  
20 air quality standards. On 11 February 2004, the CARB recommended to the EPA that the  
21 Imperial, San Bernardino, and Riverside county portions of the project region be designated  
22 attainment for the PM<sub>2.5</sub> NAAQS. The EPA intends to make final attainment designations in  
23 December 2004. The EPA will finalize rule development on the implementation of the PM<sub>2.5</sub>  
24 NAAQS in early 2005 (EPA 2004b).

25 The CARB also designates areas of California as being either in attainment or nonattainment of  
26 the CAAQS. An area is in nonattainment if a CAAQS has been exceeded more than once in 3  
27 years. In regard to the CAAQS, the entire project region within California presently does not  
28 attain the O<sub>3</sub> and PM<sub>10</sub> standards (CARB 2003).

#### 29 *Regulatory Setting*

30 The Federal Clean Air Act of 1969 and its subsequent amendments (CAA) establish air quality  
31 regulations and the NAAQS and delegate the enforcement of these standards to the states. In  
32 California, Arizona, and Nevada, the CARB, ADEQ, and NBAPC, respectively, are responsible  
33 for enforcing air pollution regulations. The CARB and NBAPC have in turn delegated the  
34 responsibility of regulating stationary emission sources to local air agencies. In areas that  
35 exceed the NAAQS, the CAA requires preparation of a State Implementation Plan (SIP),  
36 detailing how the states will attain the standards within mandated time frames. The CAA  
37 identifies emission reduction goals and compliance dates based upon the severity of the  
38 ambient air quality standard violation within a region.

39 The following air pollution agencies regulate air quality within the project region:

- 40 • Imperial County Air Pollution Control District, which includes all of Imperial County;

- 1 • Mojave Desert Air Quality Management District (MDAQMD), which includes San
- 2 Bernardino and Riverside counties;
- 3 • The Air Quality Division in the State of Arizona; and
- 4 • Clark County Air Pollution Control District, which includes all of Clark County,
- 5 Nevada.

6 These regulatory agencies have developed air quality attainment plans designed to reduce  
7 emissions to a level that will bring their jurisdictions into attainment of the ambient air quality  
8 standards. Each regulatory agency has also developed rules to regulate stationary sources of air  
9 pollution within their jurisdictions. Some of these rules that may apply to proposed activities  
10 include those related to open burning and fugitive dust.

11 Section 176(c) of the CAA contains the *General Conformity Rule* (40 CFR 51.850-860 and 40 CFR  
12 93.150-160). The General Conformity Rule requires a Federal agency responsible for a proposed  
13 action in a NAAQS nonattainment or maintenance area to ensure that the action conforms to the  
14 applicable SIP. This means that Federally supported or funded activities will not (1) cause or  
15 contribute to any new air quality standard violation, (2) increase the frequency or severity of  
16 any existing standard violation, or (3) delay the timely attainment of any standard, interim  
17 emission reduction, or other milestone. Proposed attainment pollutant emissions are exempt  
18 from the General Conformity Rule. A Federal action would comply with an applicable SIP if it  
19 does not exceed identified annual emission *de minimis* thresholds, the magnitudes of which are  
20 based on the severity of the nonattainment rating of the project region. Actions that exceed  
21 these thresholds are required to conduct in depth conformity determinations. The requirements  
22 of the General Conformity Rule would apply to the portions of the project region within  
23 Imperial County (O<sub>3</sub> nonattainment area), San Bernardino County (PM<sub>10</sub> nonattainment area),  
24 and the greater Yuma area (PM<sub>10</sub> nonattainment area).

25 Reclamation has yet to identify specific locations or designs for the development of the  
26 proposed conservation measures. Therefore, it is not possible to accurately locate and quantify  
27 the emissions from the proposed action for the purpose of determining conformity since they  
28 are not deemed reasonably foreseeable. The General Conformity Rule allows a Federal agency  
29 to defer a conformity analysis for a programmatic action of this nature until project-specific  
30 information is available upon which to base the analysis (EPA 1993). As a result, the conformity  
31 analysis for the proposed action would occur at a future date in association with project-specific  
32 proposals.

### 33 *Climate and Meteorology*

34 The project region has an arid continental climate, which is characterized by hot summers, mild  
35 winters, low humidity, and large diurnal variations in temperature. The aridity of this region is  
36 due to a combination of factors, including (1) the presence of a semi-permanent atmospheric  
37 high pressure system that shields the regions from the passage of polar storm systems, (2) a cool  
38 ocean to the west that provides limited amounts of moisture, and (3) the rain shadow effects of  
39 the Coast Ranges, which blocks the flow of moisture into the region from the Pacific Ocean.  
40 This arid condition produces low soil moisture, which is responsible for one of the main air  
41 pollution problems in the region, fugitive dust (PM<sub>10</sub>).

1 **3.3.2 Environmental Consequences**

2 *Significance Criteria*

3 An impact would be significant if proposed air emissions:

- 4 • conflict with or obstruct implementation of an applicable air quality plan;
- 5 • violate any air quality standard or contribute substantially to an existing or projected air  
6 quality violation;
- 7 • result in a cumulatively considerable net increase of any criteria pollutant for which the  
8 project region is in nonattainment under an applicable Federal or state ambient air  
9 quality standard (including releasing emissions that exceed quantitative thresholds for  
10 ozone precursors);
- 11 • expose sensitive receptors to substantial pollutant concentrations; or
- 12 • create objectionable odors affecting a substantial number of people.

13 **3.3.2.1 Alternative 1: Proposed Conservation Plan**

14 Air quality impacts would result from (1) combustive emissions due to the use of fossil fuel-  
15 fired construction and maintenance equipment; (2) fugitive dust (PM<sub>10</sub>) emissions due to earth-  
16 moving activities and the use of vehicles on unpaved surfaces; (3) the use of fire to clear  
17 vegetation, burn cleared vegetation, or maintain marsh vegetation; and (4) potential odorous  
18 emissions from dredged materials. Air quality impacts would be both short-term and long-  
19 term: (1) short-term impacts would occur during the development of individual conservation  
20 area establishment projects and the construction of field and fish-rearing facilities, and (2) long-  
21 term impacts would result from the maintenance and operation of the conservation projects.  
22 Maintenance activities would produce fugitive dust emissions from the occasional use of mobile  
23 equipment on unpaved roads. These activities and sources would produce minor amounts of  
24 daily emissions.

25 *Impacts*

26 Ground-disturbing activities required for habitat establishment in conservation areas would not  
27 conflict with or obstruct implementation of an applicable air quality plan. Several air pollution  
28 agencies regulate air quality within the project region. These regulatory agencies have  
29 developed air quality plans designed to control emissions to a level that will either bring their  
30 jurisdictions into attainment of the ambient air quality standards or maintain these standards.  
31 Each agency adopts the attainment strategies into their applicable regional and state air  
32 regulations. Some of the regulations that may apply to the proposed action include those  
33 related to open burning and fugitive dust. The lead agencies would ensure that proposed  
34 habitat establishment activities would comply with these air regulations. Additionally,  
35 activities such as earth-moving and prescribed burns are common in the planning area, and  
36 such emissions are considered in the air quality attainment plans. Moreover, if agricultural  
37 land were used for LCR MSCP conservation projects, future emissions from cultivation and  
38 prescribed burns on these lands would not occur. Thus, the use of agricultural sites for LCR

1 MSCP projects would reduce the long-term potential for PM<sub>10</sub> standard exceedances to occur on  
2 these sites.

3 **Impact AQ-1: The use of fossil fuel-fired construction equipment during construction,**  
4 **maintenance, and operational activities would result in intermittent combustive emissions**  
5 **that would not violate any air quality standard or contribute substantially to an existing or**  
6 **projected air quality violation.** Due to the mobile and intermittent nature of construction  
7 sources (the proposed action would occur over a period of about 30 years at varying locations  
8 along the LCR), combustive emissions would not produce substantial impacts at any particular  
9 location and would result in *less than significant* air quality impacts. Maintenance of individual  
10 conservation projects would require the occasional use of fossil fuel-fired mobile equipment,  
11 and irrigation would require the use of water pumps, some of which would use diesel fuel.  
12 These activities and sources would produce minor amounts of daily emissions, which would be  
13 dispersed throughout the planning area. As a result, maintenance and operational emissions  
14 associated with implementation of the Conservation Plan would not produce substantial  
15 impacts at any particular location and would result in *less than significant* air quality impacts.

16 **Impact AQ-2: The development of the largest projects would produce fugitive dust**  
17 **emissions that could exceed an ambient 24-hour PM<sub>10</sub> standard.** Fugitive dust (PM<sub>10</sub>)  
18 emissions from the use of mobile equipment on bare soils would occur at a rate of about 0.5 tons  
19 per acre per day of activity (EPA 1995). The size of daily disturbances from proposed activities  
20 could range from less than 1 acre for small projects (100 acres or less) on undeveloped lands to  
21 up to 5 acres for large projects (500 to 1,000 acres) on agricultural lands. Therefore, unmitigated  
22 PM<sub>10</sub> emissions from these activities would range from less than 0.5 to 2.5 tons per day.  
23 Fugitive dust emissions currently occur within the planning area, especially from cultivation  
24 activities on agricultural lands. Development of conservation areas on agricultural lands would  
25 produce a net reduction in PM<sub>10</sub> emissions on lands periodically cultivated, since the  
26 development emissions would occur only once. Fugitive dust emissions from the development  
27 of the largest projects would be substantial enough to have the potential to contribute to an  
28 exceedance of an ambient 24-hour PM<sub>10</sub> standard. These potential exceedances would only  
29 occur in isolated locations that are immediately adjacent to the property line of each  
30 development site. If agricultural sites were used, the fugitive dust emissions from construction  
31 activities would replace some portion of the fugitive dust emissions that would occur as a result  
32 of common agricultural activities. This would minimize the potential for an increase in the  
33 number of PM<sub>10</sub> standard exceedances in the vicinity of these lands. However, to be  
34 conservative, it is determined that PM<sub>10</sub> emissions from the largest projects would produce  
35 *significant and potentially unavoidable* air quality impacts.

36 **Impact AQ-3: Emissions from the largest prescribed burns during terrestrial vegetation**  
37 **establishment or maintenance activities would produce emissions that could contribute to an**  
38 **exceedance of an ambient 24-hour PM<sub>10</sub> standard.** The use of fire represents the largest source  
39 of air emissions from the establishment of vegetation. Emissions would vary, depending on the  
40 fuel type, the mass of fuel per area, the fuel moisture content, and atmospheric conditions. For  
41 example, burns to clear vegetation on harvested agricultural lands would produce fewer  
42 emissions than those that would occur in areas with a higher fuel density, such as saltcedar  
43 stands. Prescribed burn activities currently occur within the project region, especially on  
44 agricultural lands where it is commonly used to clear vegetation. Burning agricultural lands for

1 the purpose of developing habitat could produce a net reduction in burn emissions on lands  
2 burned periodically, since this activity would occur only once. The air pollutant of most  
3 concern that occurs from prescribed burns is PM<sub>10</sub>. Emission factors for burn activities are not  
4 available for most of the vegetation types that would be affected; however, they have been  
5 established for grass (10 pounds of PM<sub>10</sub> per ton) and sagebrush (30 pounds of PM<sub>10</sub> per ton)  
6 (EPA 1996). The largest prescribed burns would produce substantial amounts of PM<sub>10</sub>  
7 emissions that could contribute to an exceedance of an ambient 24-hour PM<sub>10</sub> standard. These  
8 potential exceedances would only occur in isolated locations that are immediately adjacent to  
9 the property line of each burn area. If agricultural sites were used, the PM<sub>10</sub> emissions from  
10 construction activities would replace some portion of the PM<sub>10</sub> emissions that would occur as a  
11 result of common agricultural activities. This would minimize the potential for an increase in  
12 the number of PM<sub>10</sub> standard exceedances in the vicinity of these lands. However, to be  
13 conservative, it is determined that PM<sub>10</sub> emissions from the largest prescribed burns would  
14 produce *significant and potentially unavoidable* air quality impacts.

15 **Impact AQ-4: Air emissions from proposed conservation area establishment activities and**  
16 **facility construction could exceed the MDAQMD daily NO<sub>x</sub> or PM<sub>10</sub> emission significance**  
17 **thresholds, which would result in a cumulatively considerable net increase of a**  
18 **nonattainment pollutant.** The MDAQMD is the only air jurisdiction within the project region  
19 that uses quantitative thresholds to determine the significance of proposed emissions for CEQA  
20 or NEPA purposes. These daily thresholds are (1) 137 pounds of VOC, (2) 548 pounds of carbon  
21 monoxide, (3) 137 pounds of NO<sub>x</sub>, (4) 137 pounds of oxides of sulfur, and (5) 82 pounds of  
22 PM<sub>10</sub>. Development of the largest conservation establishment projects or prescribed burn  
23 actions could produce emissions in excess of one or more of these daily thresholds. For  
24 example, daily use of several large pieces of diesel-powered construction equipment could  
25 produce emissions in excess of the daily NO<sub>x</sub> threshold. Additionally, fugitive dust emissions  
26 from the development of the largest projects, as described under **Impact AQ-2**, could exceed the  
27 daily PM<sub>10</sub> threshold. If construction activities produced emissions that exceeded the NO<sub>x</sub> or  
28 PM<sub>10</sub> daily threshold, they would result in cumulatively considerable net increases of a  
29 nonattainment pollutant (O<sub>3</sub> or PM<sub>10</sub>).

30 If emissions exceed a significance threshold described above, further analysis of the emissions  
31 and their consequences would be performed to assess whether there was likelihood of a  
32 significant impact to air quality. The nature and extent of such analysis would depend on the  
33 specific circumstances. The analysis could range from simply a more detailed and precise  
34 examination of the likely emitting activities and equipment, to air dispersion modeling  
35 analyses. If project emissions were determined to increase ambient pollutant levels from below  
36 to above a national or state ambient air quality standard, these emissions would be *significant*.

37 **Impact AQ-5: Air emissions from the proposed conservation area establishment activities**  
38 **would not expose sensitive receptors to substantial pollutant concentrations.** Due to the rural  
39 nature of the project region, air emissions from this alternative would not occur in proximity to  
40 a substantial number of people or sensitive receptors. As a result, this alternative would not  
41 expose sensitive receptors to substantial pollutant concentrations. Therefore, the proposed  
42 action would produce *less than significant* air quality impacts to sensitive receptors.

43 **Impact AQ-6: Air emissions from the proposed conservation area establishment activities**  
44 **would not create objectionable odors that affect a substantial number of people.** Due to the

1 rural nature of the project region, air emissions from the alternative would not occur in  
2 proximity to a substantial number of people. Exposure of wet sediments to the atmosphere  
3 from dredging activities could produce offensive emissions from the decomposition of organic  
4 matter; this is unlikely, however, because such matter typically is not contained within the  
5 sandy material that is usually dredged along the LCR. Additionally, due to the intermittent  
6 nature of this emission source and low population density of the project region, odorous  
7 emissions from the proposed action would not affect a substantial number of people. As a  
8 result, odorous emissions would produce *less than significant* air quality impacts.

#### 9 *Mitigation Measures*

10 **AQ-1** One or more of the following measures shall be implemented as standard operating  
11 practices to minimize fugitive dust (PM<sub>10</sub>) emissions during construction activities.  
12 (*Addresses Impacts AQ-2 and AQ-4*)

- 13 1. Comply with applicable local and state rules that regulate proposed sources of fugitive  
14 dust.
- 15 2. Apply water or other dust palliatives to areas where vehicles and equipment perform  
16 ground-disturbing activities on dry soil. Effective application of water would reduce  
17 fugitive dust emissions by at least 50 percent from these areas.
- 18 3. Reduce dust from dirt roads used by project equipment with the use of pavement,  
19 gravel, water, or non-toxic soil stabilizers.
- 20 4. Increase water applications or reduce ground-disturbing activities as wind speeds  
21 increase. Curtail ground-disturbing activities when sustained wind speeds exceed 25  
22 miles per hour.
- 23 5. Minimize the amount of disturbed area.
- 24 6. Cover inactive soil stockpiles or treat them with soil binders, such as crusting agents or  
25 water them to keep moist.
- 26 7. Cover trucks that haul soils or fine aggregate materials.
- 27 8. Clean dirt from construction vehicle tires and undercarriages when leaving the  
28 construction site and before entering local roadways.
- 29 9. Sweep streets near the construction area at the end of the day if soil track-out occurs on  
30 these roadways.
- 31 10. Designate personnel to monitor dust control program activities to ensure that they  
32 effectively minimize fugitive dust emissions.

33 **AQ-2** A smoke management plan shall be implemented for all construction and maintenance  
34 activities involving the use of fire. (*Addresses Impact AQ-3*) This plan shall include, as a  
35 minimum, the following components:

- 36 1. Obtain local or state air permits prior to each burn event, if applicable.
- 37 2. Perform burns when conditions minimize burn emissions, such as low fuel moisture,  
38 warm temperatures, and adequate wind speeds.

- 1        3. Avoid periods of stagnant atmospheric conditions that inhibit smoke dispersion, such as  
2        early morning hours during the presence of a strong surface-based inversion.
- 3        4. Review the most recent National Weather Service weather predictions that apply during  
4        the time of the burn event as a means to estimate the direction of smoke transport  
5        during the burn period. Postpone the burn event if weather predictions show that  
6        winds would transport smoke in the direction of nearby residences or sensitive  
7        receptors.
- 8        5. Prior to each burn event, clear the burn area of any combustible non-vegetative  
9        materials, such as plastics or chemicals.
- 10       6. Do not conduct burns if a non-project burn is proposed to occur simultaneously in  
11       proximity to the project burn.
- 12       7. When feasible, do not conduct burns in proximity to residents, sensitive receptors, or  
13       gatherings of a substantial number of people.
- 14       8. Consider the use of measures to minimize burn emissions, such as forced air or air  
15       curtain ventilation techniques.
- 16       9. Direct personnel to monitor proposed burns to ensure that this plan will effectively  
17       minimize burn emissions.
- 18       10. Include burn suppression contingency strategies.

#### 19 *Residual Impacts*

20 **Mitigation Measure AQ-1** would reduce fugitive dust emissions from project activities. The  
21 exact site sizes and locations and construction methods are not known; thus, even with  
22 mitigation, the emissions from the development of the largest projects may still exceed the  
23 significance criteria considered in **Impacts AQ-2 and AQ-4**. Therefore, residual impacts of PM<sub>10</sub>  
24 emissions from the development of the largest projects would be *potentially significant*.

25 **Mitigation Measure AQ-2** would reduce combustive emissions from prescribed burns.  
26 However, mitigated burn emissions could be sufficiently substantial to contribute to an  
27 exceedance of an ambient 24-hour PM<sub>10</sub> standard. Therefore, residual impacts associated with  
28 the largest prescribed burns under **Impact AQ-3** would be *potentially significant*.

#### 29 **3.3.2.2 Alternative 2: No Action Alternative**

30 Under the no action alternative, it is likely that conservation measures similar to those included  
31 in the proposed action would be implemented since compliance with the ESA still would be  
32 required for the covered actions, although some conservation could occur in the off-site  
33 conservation areas (as described in section 3.3.2.4 below), as well as along the LCR. **Impacts**  
34 **AQ-1 through AQ-6** generally apply to Alternative 2, although none of the off-site conservation  
35 areas are located within California; therefore, **Impact AQ-4** would not apply to conservation  
36 implemented in these areas. The no action alternative is likely to result in the establishment of  
37 less riparian vegetation than the proposed action, and the projects involving maintenance of  
38 existing habitat that would be funded would not likely occur under the no action alternative.  
39 Since the no action alternative would develop fewer acres of conservation area than the  
40 proposed action, proportionately fewer air quality impacts would result from grading, clearing,

1 and other actions directly associated with the establishment of conservation areas. Since more,  
2 smaller mitigation sites would be established, however, requiring more infrastructure (access  
3 roads and irrigation pipelines/ canals and pump facilities), greater air quality impacts would be  
4 expected to result from the construction of these facilities than under the proposed action. The  
5 precise differences between this alternative and the proposed action cannot be quantified since  
6 specific projects have not been identified at this time; however, overall air quality impacts likely  
7 would be similar.

#### 8 *Mitigation Measures*

9 Mitigation measures would be developed as appropriate in the course of project-specific  
10 environmental reviews. If significant impacts were identified, mitigation measures similar to  
11 those identified in this EIS/EIR (**Mitigation Measures AQ-1** and **AQ-2**) could be implemented.  
12 Developing and implementing such mitigation measures is outside the authority of the lead  
13 agencies and is beyond the scope of this EIS/EIR.

#### 14 *Residual Impacts*

15 As described above, the exact site sizes and locations and construction methods are not known;  
16 thus, even with mitigation identified in **Mitigation Measures AQ-1** and **AQ-2**, the emissions  
17 from the development of the largest projects may still exceed the significance criteria considered  
18 in **Impacts AQ-2** and **AQ-4**. Therefore, residual impacts of PM<sub>10</sub> emissions from the  
19 development of the largest projects would be *potentially significant*. Implementation of  
20 **Mitigation Measure AQ-2** would reduce combustive emissions from prescribed burns.  
21 However, mitigated burn emissions could be sufficiently substantial to contribute to an  
22 exceedance of an ambient 24-hour PM<sub>10</sub> standard. Therefore, residual impacts associated with  
23 the largest prescribed burns under **Impact AQ-3** would be *potentially significant*.

#### 24 3.3.2.3 *Alternative 3: Listed Species Only*

25 **Impacts AQ-1 through AQ-6** apply to Alternative 3. It is estimated that Alternative 3 would  
26 develop fewer acres of conservation area than the proposed action, which generally would  
27 result in proportionately fewer air quality impacts.

#### 28 *Mitigation Measures*

29 **Mitigation Measures AQ-1 and AQ-2** apply to Alternative 3.

#### 30 *Residual Impacts*

31 **Mitigation Measure AQ-1** would reduce fugitive dust emissions from project activities. The  
32 exact site sizes and locations and construction methods are not known; thus, even with  
33 mitigation, the emissions from the development of the largest projects may still exceed the  
34 significance criteria considered in **Impacts AQ-2** and **AQ-4**. Therefore, residual impacts of PM<sub>10</sub>  
35 emissions from the development of the largest projects would be *potentially significant*.

36 **Mitigation Measure AQ-2** would reduce combustive emissions from prescribed burns.  
37 However, mitigated burn emissions could be sufficiently substantial to contribute to an

1 exceedance of an ambient 24-hour PM<sub>10</sub> standard. Therefore, residual impacts associated with  
2 the largest prescribed burns under impact AQ-3 would be *potentially significant*.

#### 3 3.3.2.4 Alternative 4: Off-Site Conservation

4 **Impacts AQ-1, AQ-2, AQ-3, AQ-5 and AQ-6** apply to Alternative 4. Air emissions from the  
5 implementation of Alternative 4 would be comparable to those of the proposed action.  
6 Although activities associated with Alternative 4 would occur in slightly different locations  
7 than those proposed for Alternative 1 (with the exception of backwater establishment and other  
8 conservation measures specific to fish), the existing background pollutant levels do not differ  
9 substantially between these areas. The Muddy, Virgin, and Bill Williams rivers air shed areas  
10 all attain the ambient air quality standards, as does most of the project region under Alternative  
11 1. Additionally, the lower Gila River area is within the Yuma PM<sub>10</sub> nonattainment area, which  
12 also encompasses portions of the Alternative 1 project region along the LCR from about  
13 Imperial Dam to the SIB. None of the off-site conservation areas are located within California;  
14 therefore, the impacts identified in **Impact AQ-4** would not apply to this alternative, nor would  
15 the discussion of the CAAQS.

#### 16 *Mitigation Measures*

17 **Mitigation Measures AQ-1 and AQ-2** apply to Alternative 4.

#### 18 *Residual Impacts*

19 **Mitigation Measure AQ-1** would reduce fugitive dust emissions from project activities. The  
20 exact site sizes and locations and construction methods are not known; thus, even with  
21 mitigation, the emissions from the development of the largest projects may still exceed the  
22 significance criteria considered in **Impacts AQ-2 and AQ-4**. Therefore, residual impacts of PM<sub>10</sub>  
23 emissions from the development of the largest projects would be *potentially significant*.

24 **Mitigation Measure AQ-2** would reduce combustive emissions from prescribed burns.  
25 However, mitigated burn emissions could be sufficiently substantial to contribute to an  
26 exceedance of an ambient 24-hour PM<sub>10</sub> standard. Therefore, residual impacts associated with  
27 the largest prescribed burns under impact AQ-3 would be *potentially significant*.

1    **3.4        BIOLOGICAL RESOURCES**

2    This section addresses the impacts of the proposed action and alternatives on biological  
3    resources, including vegetation, fish and wildlife, and sensitive species, including those covered  
4    and evaluation species that are included in the proposed Conservation Plan. The proposed  
5    action is the adoption of the Conservation Plan and the issuance of incidental take  
6    authorization. Therefore, this section evaluates the effects of the incidental take of covered  
7    species resulting from the implementation of the covered activities, but does not evaluate the  
8    covered activities themselves. Impacts include short-term and long-term impacts from  
9    implementing the Conservation Plan, as well as impacts associated with the incidental take  
10   authorized by the issuance of the section 10(a)(1)(B) permit by the Service.

11   **3.4.1       Affected Environment**

12   **3.4.1.1     *Lower Colorado River***

13   The hydrologic regime and habitats of the LCR have been substantially altered by people so  
14   that the river is no longer a continuous ecosystem. The changes include loss of riparian  
15   vegetation and floodplains, altered aquatic habitat structure and function, regulated flows,  
16   altered water quality (temperature, salinity/conductivity, pollutants), discontinuity of sediment  
17   and nutrient transport, and introduction of non-native species (plants and animals).

18   The dams and their resultant reservoirs have eliminated riparian vegetation and converted  
19   large areas of riverine habitat to lacustrine (reservoir/lake) habitat. The dams also pose barriers  
20   to movement of aquatic organisms, particularly fish, and regulate flows. This change in habitat  
21   structure, along with the release of water from deep in the reservoirs, has altered water  
22   temperature, transport of nutrients and sediments, and productivity. Agricultural and  
23   urban/industrial developments along the river have altered water quality through input of  
24   pollutants and salts, as well as removed riparian vegetation through flood control activities and  
25   water diversion. Non-native fish, invertebrates, wildlife, and plants have been introduced to  
26   the area and compete with or prey upon native species.

27   *Vegetation*

28   The Conservation Plan uses a land cover type classification system to describe vegetation and  
29   other habitat types that was derived from previous classifications (Anderson and Ohmart 1984a;  
30   1984b, Younker and Anderson 1986, Salas et al. 1996, Ogden 1998). Reservoir, agriculture, and  
31   developed land cover types have been added for this Conservation Plan. The major land cover  
32   types present are woody riparian, marsh, aquatic, desert scrub, agriculture, and developed  
33   (Table 3.4-1). The woody riparian land cover type is further divided based on plant community  
34   (seven) and structural type (six), and the marsh is divided into seven types based on  
35   composition. The amount of each land cover type per reach is summarized in Table 3.4-2. The  
36   following descriptions of the vegetation within the land cover types were summarized from the  
37   LCR MSCP HCP. Some of these cover types are not carried forward into the impact analysis  
38   because little or no effect on species using them is anticipated to occur.

### 3.4 Biological Resources

#### 1 WOODY RIPARIAN

2 Currently, approximately 126,000 acres of woody riparian vegetation are present in the  
 3 planning area. Of this, only 23,000 acres are native cottonwood-willow and honey mesquite  
 4 land cover types. The remainder is dominated by the non-native saltcedar.

**Table 3.4-1. Land Cover Type Classification**

| <i>Land Cover Type</i>   | <i>Characteristics</i>   |
|--|--|
| <b>Woody Riparian</b>  |  |
| Cottonwood-willow<br>(6 structural types)  | Goodding willow & cottonwood at least 10% of total trees   |
| Saltcedar (6 structural types)   | Saltcedar species constituting 80-100% of total trees  |
| Honey mesquite (4 structural types)  | Honey mesquite constituting 90-100% of total trees   |
| Saltcedar-honey mesquite<br>(4 structural types)   | Honey mesquite at least 10% of total trees (usually <40%)  |
| Saltcedar-screwbean mesquite<br>(5 structural types)   | Screwbean mesquite at least 20% of total trees   |
| Arrowweed  | Arrowweed at least 90-100% of total vegetation   |
| Atriplex   | Saltbush species constituting 90-100% of total vegetation  |
| <b>Marsh</b> (7 compositional types)   | 1: nearly 100% cattail/bulrush; little common reed & open water<br>2: nearly 75% cattail/bulrush; many trees & grasses<br>3: about 25-50% cattail/bulrush; some common reed, open water, trees, & grasses<br>4: about 35-50% cattail/bulrush; many trees & grasses<br>5: about 50-75% cattail/bulrush; few trees & grasses<br>6: nearly 100% common reed; little open water<br>7: open marsh (75% water) adjacent to sparse marsh vegetation |
| <b>Aquatic</b>   |  |
| River  | Mainstem plus tributaries and natural/artificial channels  |
| Reservoir  | "Lakes" formed by dams with variable water levels  |
| Backwater  | Open water plus marsh, temporary to permanent  |
| <b>Desert scrub</b>  | Adjacent to riparian and aquatic land cover types  |
| <b>Agriculture</b>   | Active or fallow, adjacent to riparian and aquatic land cover types  |
| <b>Developed</b>   | Buildings, roads, campgrounds, landscaped areas  |
| Woody riparian structural types are as follows:<br>I Mature stand with distinctive overstory >15' tall; intermediate class 2-15' tall; understory 0-2' tall<br>II Overstory >15' tall and >50% of trees; little or no intermediate class<br>III Largest proportion of trees 10-20' tall; few above 20' or below 5' tall<br>IV Few trees >15'; 50% of vegetation 5-15' tall and 50% 1-2' tall<br>V 60-70% of vegetation 0-2' tall, remainder 5-15' tall<br>VI 75-100% of vegetation 0-2' tall |  |

#### 5 Cottonwood-Willow

6 The cottonwood-willow plant community is made up of winter-deciduous trees that reach  
 7 about 60 feet in height (Holland 1986; Rowlands et al. 1995). Fremont cottonwood (*Populus*  
 8 *fremontii*) and Goodding's willow (*Salix gooddingii*) are the dominant tree species, although other  
 9 species of willows may be present as well; and willows are usually more abundant than  
 10 cottonwoods. The trees form a closed to open canopy with a variable understory on deep, well-

1

Table 3.4-2. Amount (Acres) of Each Land Cover Type By Reach

| <i>Land Cover Type</i>   | <i>Reach 1</i> | <i>Reach 2</i> | <i>Reach 3</i> | <i>Reach 4</i> | <i>Reach 5</i> | <i>Reach 6</i> | <i>Reach 7</i> | <i>Total</i>   |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Woody Riparian</b>  |                |                |                |                |                |                |                |                |
| Cottonwood-willow  | 1,721          | 1              | 1,541          | 889            | 616            | 1,325          | 675            | 6,768          |
| Saltcedar  | 2,254          | 838            | 13,647         | 26,923         | 5,581          | 6,257          | 2,800          | 58,300         |
| Honey mesquite   | 0              | 4              | 627            | 6,443          | 175            | 5              | 0              | 7,253          |
| Saltcedar-honey mesquite   | 58             | 359            | 3,463          | 13,398         | 778            | 234            | 2              | 18,293         |
| Saltcedar-screwbean mesquite   | 0              | 32             | 5,058          | 4,654          | 579            | 786            | 49             | 11,159         |
| Arrowweed  | 0              | 0              | 496            | 6,541          | 48             | 1,069          | 48             | 8,201          |
| Atriplex   | 0              | 0              | 19             | 582            | 0              | 177            | 121            | 899            |
| <b>Marsh</b>   | 137            | 22             | 4,358          | 2,091          | 3,762          | 1,414          | 129            | 11,914         |
| <b>Aquatic</b>   |                |                |                |                |                |                |                |                |
| River  | 2,486          | 27,345         | 20,753         | 7,464          | 4,089          | 887            | 140            | 63,164         |
| Reservoir  | 154,091        | 13             | 2,992          | 680            | 544            | 615            | 9              | 158,944        |
| Backwater  | NA             | NA             | 7,841          | 3,427          | 4,994          | 1,510*         | NA             | 17,772         |
| <b>Desert scrub</b>  | 353            | 31             | 7,676          | 11,710         | 397            | 3,151          | 129            | 23,447         |
| <b>Agriculture</b>   | 0              | 0              | 19,166         | 169,664        | 260            | 36,799         | 44,705         | 270,594        |
| <b>Developed</b>   | 1              | 0              | 6,391          | 32,722         | 0              | 10,205         | 14,307         | 63,626         |
| <b>Other riparian**</b>  | 0              | 0              | 6,634          | 6,268          | 0              | 2,337          | 13             | 15,252         |
| <b>TOTAL</b>   | <b>161,100</b> | <b>28,645</b>  | <b>100,661</b> | <b>293,456</b> | <b>21,825</b>  | <b>66,772</b>  | <b>63,127</b>  | <b>735,586</b> |
| NA = Not Available   |                |                |                |                |                |                |                |                |
| *Not all of Reach 6 was surveyed   |                |                |                |                |                |                |                |                |
| **Riparian cover types from LCR Accounting System database that do not fit into LCR MSCP land cover types as described |                |                |                |                |                |                |                |                |

1 watered, loamy alluvial soils on floodplains of the Colorado River and its major tributaries  
2 (Holland 1986). This plant community requires periodic winter or spring flooding to create new  
3 silt beds for cottonwood and willow seed germination, and the dominant trees do not tolerate  
4 permanent inundation (Ohmart et al. 1988, Brown 1994). As a result of flow stabilization,  
5 stands of the cottonwood-willow community remaining along the Colorado River are primarily  
6 decadent and show little evidence of seedling recruitment (Brown 1994).

#### 7 Saltcedar

8 Several species of the genus *Tamarix* make up this community (*T. chinensis*, *T. parviflora*, *T.*  
9 *ramosissima*, and *T. aphylla*). All are non-native and have aggressively displaced native riparian  
10 vegetation along the river, particularly in saline areas where native vegetation has been cleared  
11 or removed by fire (Brown 1994, Turner and Karpiscak 1980, Ohmart et al. 1988). Saltcedar  
12 generally occurs as a monoculture because it promotes conditions that it tolerates better than  
13 the native species. It grows on sandy or gravelly soils and produces a large number of very  
14 small seeds, from March through October, that are dispersed long distances by wind and water  
15 (DeLoach et al. 2000, Lovich 2000). Stabilized low flows and regular summer flooding of river  
16 bars provide ideal conditions for establishment of saltcedar (Turner and Karpiscak 1980). It also  
17 takes up and excretes salts that increase soil salinity, and it increases fire frequency by  
18 producing large amounts of litter (DeLoach et al. 2000).

#### 19 Honey Mesquite

20 Honey mesquite (*Prosopis glandulosa* var. *torreyana*) often forms monotypic stands of trees less  
21 than 30 feet tall, and it also grows mixed with other shrubby species. The canopy can be open  
22 or continuous, and the understory is usually of sparse shrubs or of grasses. This species does  
23 not tolerate prolonged inundation during the growing season and historically grew on  
24 secondary and higher terraces on the floodplain. Conversion of these terraces to agriculture  
25 decimated the populations in those areas. Regulation of the river, however, allowed the species  
26 to colonize areas closer to the river where it is vulnerable to replacement by saltcedar after  
27 flooding, fire, and vegetation clearing because it does not colonize open areas as rapidly as  
28 saltcedar (Minckley and Brown 1982; Ohmart et al. 1988). Honey mesquite is a facultative  
29 wetland plant (equal chance of being in upland or wetland plant communities) and has a long  
30 taproot to reach deep water tables (Reed 1988; Ohmart et al. 1988).

#### 31 Saltcedar-Honey Mesquite

32 Honey mesquite comprises 10 to 40 percent of the trees in this community (Younker and  
33 Andersen 1986), which forms as saltcedar becomes well established in openings within a  
34 mesquite stand. Saltcedar gradually replaces honey mesquite, particularly after fires and  
35 floods, and as soil salinity increases (Ohmart et al. 1988).

#### 36 Saltcedar-Screwbean Mesquite

37 Screwbean mesquite (*Prosopis pubescens*) is always found in association with saltcedar in the  
38 planning area and reflects the expansion of saltcedar with its displacement of screwbean  
39 mesquite (Ohmart et al. 1988; DeLoach et al. 2000). Historically, this species was fairly scarce

1 along the LCR, but it increased in abundance downstream from Parker Dam after that dam was  
2 completed due to stabilized summer low flows and reduced spring flooding (Ohmart et al.  
3 1988). The subsequent expansion of agriculture on tribal lands reduced its abundance, and this  
4 decline has continued due to replacement by saltcedar.

#### 5 Arrowweed

6 Arrowweed (*Pluchea sericea*) occurs along drier portions of the river floodplain, along canyon  
7 bottoms and irrigation ditches, around springs, and in sandy or gravelly washes (Ohmart et al.  
8 1988, Holland 1986, Brown 1994, Sawyer and Keeler-Wolf 1995). It reproduces by seed and can  
9 spread vegetatively. Once established, it spreads laterally by rhizomes to form continuous  
10 stands. The species can recolonize open alluvial deposits by resprouting from roots and buried  
11 stems (Stromberg 1993). It has replaced cottonwood-willow vegetation in some areas because it  
12 tolerates higher soil salinities and can survive with greater groundwater depths (Holland 1986;  
13 Ohmart et al. 1988; Busch and Smith 1995) although it is being replaced by saltcedar in other  
14 areas (Turner and Karpiscak 1980).

#### 15 Atriplex

16 Several species of saltbush (*Atriplex lentiformis*, *A. canescens*, *A. polycarpa*) form this community  
17 that occurs in saline areas along the LCR, often between stands of cottonwood-willow or  
18 saltcedar and stands of mesquite (Ohmart et al. 1988; Brown 1994; Younker and Andersen 1986).  
19 Quailbush (*A. lentiformis*) is the primary species in the community along the river, while the  
20 other species are more commonly found in the desert scrub community.

#### 21 MARSH

22 Marshes occur in areas characterized by long-term flooding such as oxbow lakes, backwaters,  
23 and around reservoirs with minimal daily and annual fluctuations in water level (Ohmart et al.  
24 1988; Brown 1994). The dominant species are cattails (*Typha* spp.), bulrush (*Scirpus* spp.), and  
25 common reed (*Phragmites australis*) (Ohmart et al. 1988). Cattails grow in shallow water up to 3  
26 feet deep while bulrushes can grow in water to a depth of 5 feet. Common reed forms dense  
27 stands along the banks (Ohmart et al. 1988; Brown 1994). At the upper elevation limit of  
28 marshes, the plants can intergrade with riparian scrub species (Brown 1994). Marshes can  
29 include open water, as well as sandbars and mudflats when the water level is low (Salas et al.  
30 1996).

#### 31 OTHER

32 The river land cover type includes marshes in shallow waters and can include riparian  
33 vegetation when these areas are inundated by high water. Marshes can also be part of  
34 backwaters. Desert scrub comprises several plant communities that occur adjacent to the  
35 floodplain and river channel along with agriculture and development. Agricultural fields are  
36 dominated by various crops, while fallow fields support primarily weedy species. A variety of  
37 landscape species are used in developed areas.

#### 1 *Fish and Wildlife*

2 The LCR supports several hundred species of wildlife (birds, mammals, fish, reptiles, and  
3 amphibians), including both resident species and migratory visitors, that use the land cover  
4 types described above. Woody riparian vegetation and upland land cover types such as desert  
5 scrub and, to some extent, agriculture provide habitat for common mammals such as mule deer  
6 (*Odocoileus hemionus*), burro (*Equus asinus*) (a non-native mammal), coyote (*Canis latrans*), bobcat  
7 (*Felis rufus*), Audubon cottontail (*Sylvilagus audubonii*), several species of rodents and bats,  
8 striped skunk (*Mephitis mephitis*), and raccoon (*Procyon lotor*) (Anderson and Ohmart 1984b).  
9 Reptiles and amphibians are represented by several species of lizards, snakes, toads, and frogs,  
10 many of which are native to the area. Most of these use upland and riparian areas, but the  
11 amphibians require water for reproduction. The spiny soft-shelled turtle (*Trionyx spiniferus*) has  
12 also been introduced and is present in Lake Mead and Lake Mohave (Allan and Roden 1978). A  
13 variety of aquatic invertebrates inhabit the reservoirs and river. Fourteen species of  
14 zooplankton have been reported in Lake Mead and Lake Mohave as well as mollusks,  
15 crustaceans, aquatic and terrestrial insects, and a freshwater jellyfish (Allan and Roden 1978).

16 Historically, the Colorado River in the planning area was inhabited by eight native fish species.  
17 Four of these native species are marine or brackish water species that probably never got much  
18 farther upstream than the Imperial Dam area: spotted sleeper (*Eleotris picta*), machete (*Elops*  
19 *affinis*), longjaw mudsucker (*Gillichthys mirabilis*), and striped mullet (*Mugil cephalus*). Of the  
20 other four species (Colorado pikeminnow [*Ptychocheilus lucius*], razorback sucker [*Xyrauchen*  
21 *texanus*], bonytail [*Gila elegans*], and desert pupfish [*Cyprinodon macularius*]), only the bonytail  
22 and razorback sucker are still present. At least 23 non-native fish species have been introduced  
23 into the LCR in California (Moyle 2002). These include threadfin shad (*Dorosoma petenense*), five  
24 species of minnow, four species of catfish, mosquitofish (*Gambusia affinis*), striped bass (*Morone*  
25 *saxatilis*), six species of centrarchids (bass and sunfish), and four species of cichlids. Most of  
26 these species plus several species of trout and salmon have been stocked in Lake Mead and  
27 Lake Mohave (Allan and Roden 1978). The Lake Mead fish hatchery and the Willow Beach  
28 hatchery (on Lake Mohave) supply rainbow trout (*Oncorhynchus mykiss*) for stocking into the  
29 LCR.

30 The Colorado River corridor provides important habitat for migratory birds, both upland  
31 species and waterfowl, as well as habitat for resident species. Woody riparian vegetation and  
32 wetlands provide habitat for a variety of raptors that include sharp-shinned hawk (*Accipiter*  
33 *striatus*), Cooper's hawk (*Accipiter cooperii*), northern harrier (*Circus cyaneus*), red-tailed hawk  
34 (*Buteo jamaicensis*), rough-legged hawk (*Buteo lagopus johannis*), common black hawk (*Buteogallus*  
35 *anthracinus*), Harris' hawk (*Parabuteo unicinctus*), bald eagle (*Haliaeetus luecocephalus*), golden  
36 eagle (*Aquila chrysaetos*), white-tailed kite (*Elanus leucurus*), American kestrel (*Falco sparverius*),  
37 and peregrine falcon (*Falco peregrinus*). Other common birds include egrets, herons, flycatchers,  
38 and woodpeckers. Backwaters and reservoirs provide resting and foraging habitat for  
39 waterfowl and shorebirds.

#### 40 *Sensitive Species*

41 Sensitive species, for the purposes of the Conservation Plan, are defined as special-status  
42 species that meet one or more of the following criteria:

- 1 • animal species listed or proposed for listing as threatened or endangered under the ESA  
2 (50 CFR 17.11 [listed animals], and various notices in the Federal Register [proposed  
3 species]);
- 4 • animal species that are candidates for possible future listing as threatened or  
5 endangered under the ESA (61 FR 40: 7596-7613, February 28, 1996);
- 6 • wildlife species of special concern to AGFD;
- 7 • plants listed as rare under the California Native Plant Protection Act;
- 8 • plants included on California Native Plant Society (CNPS) List 1A, 1B, 2, or 3;
- 9 • animal species listed or proposed for listing by the State of California as threatened or  
10 endangered under CESA (14 CCR 670.5);
- 11 • animal species that meet the definitions of rare or endangered under CEQA (State CEQA  
12 Guidelines, section 15380);
- 13 • animal species of special concern to CDFG (Remsen 1978 [birds], Williams 1986  
14 [mammals], and Jennings and Hayes 1994 [amphibians and reptiles] );
- 15 • animals fully protected in California (California Fish and Game Code, section 3511  
16 [birds], section 4700 [mammals], section 5050 [reptiles and amphibians], and section  
17 5515 [fish]);
- 18 • animal species included in CDFG’s list of Special Animals and monitored by the  
19 California Natural Diversity Database (CNDDDB);
- 20 • animal and plant species that are protected under State of Nevada Administrative Code  
21 (503.030); and
- 22 • BLM and Service designated sensitive species.

### 23 *Covered and Evaluation Species*

24 A number of species that are Federally listed as threatened or endangered are known or have  
25 the potential to occur along the LCR, and six of these are included in the proposed Conservation  
26 Plan. All of these are also listed by one or more states along the river. In addition, the  
27 Conservation Plan includes six species that are state-listed but not Federally listed; 13 species  
28 that are designated as species of special concern in one or more states; and two species that have  
29 no current regulatory status but could become listed over the 50-year life of the Conservation  
30 Plan. Four other species are included in the Conservation Plan as “evaluation species” that  
31 could be proposed for coverage under the section 10(a)(1)(B) permit in the future. Table 3.4-3  
32 lists the species proposed for coverage in the Conservation Plan and their regulatory status with  
33 brief notes about the species. More detailed information is provided in the LCR MSCP BA and  
34 is summarized in Appendix I.

### 35 *Other Sensitive Species*

36 Additional species are considered sensitive and have special status, are known or suspected to  
37 have occurred in the planning area, and are not covered under the Conservation Plan. These  
38 species are not covered under the Conservation Plan because covered activities would not affect

Table 3.4-3. Covered and Evaluation Species for the Conservation Plan

| Common and Scientific Name   | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | California Status <sup>3</sup> | Nevada Status <sup>4</sup> | Covered Species <sup>5</sup> | Notes <sup>6</sup>  |
|--|-----------------------------|-----------------------------|--------------------------------|----------------------------|------------------------------|---|
| MAMMALS  |                             |                             |                                |                            |                              |   |
| California leaf-nosed bat<br><i>Macrotus californicus</i>                  | -                           | ASC                         | CSC                            | -                          | E                            | Roost in caves/ mines, forages near open water  |
| Pale Townsend's big-eared bat<br><i>Corynorhinus townsendii pallascens</i> | -                           | -                           | CSC                            | -                          | E                            | Roost in caves or structures, forages over desert scrub, riparian vegetation, or open water |
| Western red bat<br><i>Lasiurus blossevillii</i>                            | -                           | ASC                         | -                              | -                          | C                            | Roost in riparian trees   |
| Western yellow bat<br><i>Lasiurus xanthinus</i>                            | -                           | ASC                         | -                              | -                          | C                            | Roost in palms or riparian trees, forages over canopy                                       |
| Desert pocket mouse<br><i>Chaetodipus penicillatus sobrinus</i>            | -                           | -                           | -                              | -                          | C                            | Endemic to R1-2, sand in riparian/mixed desert scrub  |
| Colorado River cotton rat<br><i>Sigmodon arizonae plenus</i>               | -                           | -                           | CSC                            | -                          | C                            | R3-4 in mesic herbaceous vegetation   |
| Yuma hispid cotton rat<br><i>Sigmodon hispidus eremicus</i>                | -                           | -                           | CSC                            | -                          | C                            | Moist grassy areas or brushy areas along river  |
| BIRDS  |                             |                             |                                |                            |                              |   |
| Western least bittern<br><i>Ixobrychus exilis hesperis</i>                 | -                           | ASC                         | CSC                            | -                          | C                            | Cattail & bulrush marshes, summer resident & breeder  |
| Yuma clapper rail<br><i>Rallus longirostris yumanensis</i>                 | FE                          | ASC                         | CT/FP                          | -                          | C                            | R1, 3-7 in marshes with water <12"  |
| California black rail<br><i>Laterallus jamaicensis coturniculus</i>        | -                           | ASC                         | CT/FP                          | -                          | C                            | Bulrush marsh with shallow water  |
| Yellow-billed cuckoo<br><i>Coccyzus americanus</i>                         | FC                          | ASC                         | CE                             | -                          | C                            | R3-5 in mature CW forest  |
| Elf owl<br><i>Micrathene whitneyi</i>                                      | -                           | -                           | CE                             | NP                         | C                            | R3-4 in CW or mesquite with large snags   |
| Gilded flicker<br><i>Colaptes chrysoides</i>                               | -                           | -                           | CE                             | -                          | C                            | Primarily at Bill Williams Delta in CW with saguaro nearby                                  |
| Gila woodpecker<br><i>Melanerpes uropygialis</i>                           | -                           | -                           | CE                             | -                          | C                            | R3-6 in tall trees; nest in snags   |
| Southwestern willow flycatcher<br><i>Empidonax trailii extimus</i>         | FE                          | ASC                         | CE                             | -                          | C                            | Dense riparian vegetation close to ground with water or moist soil                          |
| Vermilion flycatcher<br><i>Pyrocephalus rubinus</i>                        | -                           | -                           | CSC                            | -                          | C                            | CW with mesquite, open water and pasture nearby   |

Table 3.4-3. Covered and Evaluation Species for the Conservation Plan (continued)

| Common and Scientific Name                                       | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | California Status <sup>3</sup> | Nevada Status <sup>4</sup> | Covered Species <sup>5</sup> | Notes <sup>6</sup>   |
|--|-----------------------------|-----------------------------|--------------------------------|----------------------------|------------------------------|--|
| Arizona Bell's vireo<br><i>Vireo bellii arizonae</i>             | -                           | -                           | CE                             | -                          | C                            | CW and mesquite; forage in dense riparian vegetation   |
| Sonoran yellow warbler<br><i>Dendroica petechia sonorana</i>     | -                           | -                           | CSC                            | -                          | C                            | Nest in wet deciduous thickets of saltcedar or CW  |
| Summer tanager<br><i>Piranga rubra</i>                           | -                           | -                           | CSC                            | -                          | C                            | Nest in CW or saltcedar; forage in top of trees  |
| REPTILES   |                             |                             |                                |                            |                              |  |
| Desert tortoise (Mojave population)<br><i>Gopherus agassizii</i> | FT                          | ASC                         | CT                             | NT                         | C                            | R1-6 in desert scrub with creosote bush; burrows; critical habitat in R1-4                     |
| Flat-tailed horned lizard<br><i>Phrynosoma mcalli</i>            | -                           | ASC                         | CSC                            | -                          | C                            | R6-7 in fine sand in sparse desert scrub   |
| AMPHIBIANS   |                             |                             |                                |                            |                              |  |
| Colorado River toad<br><i>Bufo alvarius</i>                      | -                           | -                           | CSC                            | -                          | E                            | Requires water for breeding; uses burrows Aug-Feb  |
| Relict leopard frog<br><i>Rana onca</i>                          | FC                          | ASC                         | -                              | NP                         | C                            | R1-2 in Lake Mead NRA; shallow water with emergent vegetation & adjacent CW with moist soil    |
| Lowland leopard frog<br><i>Rana yavapaiensis</i>                 | -                           | ASC                         | CSC                            | -                          | E                            | Bill Williams River NWR in flowing water with aquatic vegetation & adjacent CW with moist soil |
| FISH   |                             |                             |                                |                            |                              |  |
| Bonytail<br><i>Gila elegans</i>                                  | FE                          | ASC                         | CE                             | NE                         | C                            | R2-3; critical habitat in planning area; population not self-sustaining                        |
| Humpback chub<br><i>Gila cypha</i>                               | FE                          | ASC                         | -                              | -                          | C                            | Not currently in planning area   |
| Flannelmouth sucker<br><i>Catostomus latipinnis</i>              | -                           | ASC                         | -                              | -                          | C                            | R3 in main channel; juveniles use backwaters   |
| Razorback sucker<br><i>Xyrauchen texanus</i>                     | FE                          | ASC                         | CE/FP                          | NE                         | C                            | R1-5; critical habitat in planning area; population not self-sustaining                        |

**Table 3.4-3. Covered and Evaluation Species for the Conservation Plan (continued)**

| Common and Scientific Name   | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | California Status <sup>3</sup> | Nevada Status <sup>4</sup> | Covered Species <sup>5</sup> | Notes <sup>6</sup>   |
|--|-----------------------------|-----------------------------|--------------------------------|----------------------------|------------------------------|--|
| INVERTEBRATES  |                             |                             |                                |                            |                              |  |
| MacNeill's sootywing skipper<br><i>Pholisora graciellae</i>  | -                           | -                           | -                              | -                          | C                            | R1-3 & below Parker Dam in R4; interface of quailbush & honey mesquite with high groundwater |
| PLANTS   |                             |                             |                                |                            |                              |  |
| Sticky buckwheat<br><i>Eriogonum viscidulum</i>  | -                           | -                           | -                              | NEP                        | C                            | R1-2 in Mohave mixed scrub in deep sands with seasonally moist soil                          |
| Threecorner milkvetch<br><i>Astragalus geyeri</i> var. <i>triquetrus</i>   | -                           | -                           | -                              | NEP                        | C                            | R1-2 in creosote bush scrub with stabilized sandy soil                                       |
| Notes:   |                             |                             |                                |                            |                              |  |
| 1 Federal Status<br>FE = Listed as endangered under the ESA.<br>FT = Listed as threatened under ESA.<br>FC = Candidate for listing under ESA.  |                             |                             |                                |                            |                              |  |
| 2 Arizona Status<br>ASC = Arizona wildlife of special concern.   |                             |                             |                                |                            |                              |  |
| 3 California Status<br>CE = Listed as endangered under CESA.<br>CT = Listed as threatened under CESA.<br>CSC = California species of special concern.<br>FP = Fully protected under the California Fish and Game Code. |                             |                             |                                |                            |                              |  |
| 4 Nevada Status<br>NE = Nevada endangered<br>NT = Nevada threatened.<br>NEP = Nevada critically endangered plant.<br>NP = Nevada protected.  |                             |                             |                                |                            |                              |  |
| 5 C = Conservation Plan covered species.<br>E = Conservation Plan evaluation species.  |                             |                             |                                |                            |                              |  |
| 6 R = Reach.<br>CW = Cottonwood-willow.  |                             |                             |                                |                            |                              |  |

1

2 (result in take of) the Federally listed species or because the species are not anticipated to  
 3 become Federally listed over the life of the proposed action. These species, however, are  
 4 included in the impact analysis because actions that are part of the Conservation Plan could  
 5 adversely affect one or more of these species, and such impacts must be addressed under CEQA  
 6 and NEPA. The status of these sensitive species and the primary habitats or plant communities  
 7 where they generally are found are presented in Table 3.4-4, and additional information is  
 8 provided in Appendix D. These sensitive species include a number of bats, Yuma puma,  
 9 piscivorous (fish-eating) birds, wading birds, waterfowl, raptors, riparian-dependent song  
 10 birds, several bird species associated with agriculture and grasslands, other upland and water-  
 11 associated birds, two species of toad, the banded Gila monster and rosy boa, two invertebrates,  
 12 and one plant.

**Table 3.4-4. Other Sensitive Species that Could Be Present in the Planning Area**

| Common and Scientific Name  | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | California Status <sup>3</sup> | Nevada Status <sup>4</sup> | Notes <sup>5</sup>   |
|---|-----------------------------|-----------------------------|--------------------------------|----------------------------|--|
| MAMMALS   |                             |                             |                                |                            |  |
| Mexican long-tongued bat<br><i>Choeronycteris mexicana</i>          | -                           | -                           | CSC                            | -                          | Northern limit of range just over U.S./Mexico border; migratory with adult females into U.S. |
| Occult little brown bat<br><i>Myotis lucifugus occultus</i>         | -                           | -                           | CSC                            | -                          | Roost in tree cavities, under rocks/wood, or in structures; forage along shorelines          |
| Small-footed myotis<br><i>Myotis ciliolabrum</i>                    | -                           | -                           |                                | -                          | Roost in trees, bridges, rocks; occur in CW, pinyon-juniper, chaparral                       |
| Fringed myotis<br><i>Myotis thysanodes</i>                          | -                           | -                           |                                | -                          | Roost and breed in caves, mines, buildings; occur in oak woodland near water                 |
| Cave myotis<br><i>Myotis velifer</i>                                | -                           | -                           | CSC                            | -                          | Forage in linear stands of mesquite, saltcedar, or acacia along still water                  |
| Yuma myotis<br><i>Myotis yumanensis</i>                             | -                           | -                           | CSC                            | -                          | Roost in buildings; prefer cliffs/rock walls near open woodland or scrub; forage over water  |
| Spotted bat<br>( <i>Euderma maculatum</i> )                         | -                           | ASC                         | CSC                            | NT                         | In montane, riparian, & scrub vegetation; forage on moths                                    |
| Allen's big-eared bat<br><i>Indionycteris (=Plecotus) phyllotis</i> | -                           | -                           |                                | -                          | At higher elevations (e.g., Mogollon Rim); forage near water                                 |
| Pallid bat<br><i>Antrozous pallidus</i>                             | -                           | -                           | CSC                            | -                          | Primarily in desert scrub; roost in rocks, hollow trees, buildings etc.                      |
| Pocketed freetail bat<br><i>Nyctinomops femorosaccus</i>            | -                           | -                           | CSC                            | -                          | Roost in buildings, caves, crevices in semi-arid desert; forage on insects                   |
| Big freetail bat<br><i>Nyctinomops macrotis</i>                     | -                           | -                           | CSC                            | -                          | Roost in rocky areas of desert scrub; forage on insects                                      |
| Greater western mastiff bat<br><i>Eumops perotis californicus</i>   | -                           | -                           | CSC                            | -                          | Prefer rugged rocky areas in desert scrub; forage on insects & require water                 |
| Yuma puma<br><i>Felis concolor browni</i>                           | -                           | ASC                         | CSC                            | -                          | Requires open water, rocky shelters; prey on medium to large mammals                         |
| BIRDS   |                             |                             |                                |                            |  |
| Clark's grebe<br><i>Aechmophorus clarkii</i>                        | -                           | ASC                         | -                              | -                          | Common year-round; breeds in open marshes; forages/rests in open water in reservoirs         |
| California brown pelican<br><i>Pelecanus occidentalis</i>           | FE                          | -                           | CE/FP                          | NP                         | Rare late summer/fall; forages in open water in reservoirs; rests on sandbars                |
| American white pelican<br><i>Pelecanus erythrorhynchos</i>          | -                           | -                           | CSC                            | NP                         | Uncommon migrant; forages in open water in reservoirs; rests on sandbars                     |

Table 3.4-4. Other Sensitive Species that Could Be Present in the Planning Area (continued)

| Common and Scientific Name                                | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | California Status <sup>3</sup> | Nevada Status <sup>4</sup> | Notes <sup>5</sup>  |
|---|-----------------------------|-----------------------------|--------------------------------|----------------------------|---|
| Double-crested cormorant<br><i>Phalacrocorax auritus</i>  | -                           | -                           | CSC <sup>6</sup>               | -                          | Common year-round; forages in open water in reservoirs; rests on sandbars and perches in trees; breeds on large trees |
| American bittern<br><i>Botaurus lentiginosus</i>          | -                           | ASC                         | -                              | -                          | Uncommon, winter; forages in dense marshes  |
| Great blue heron<br><i>Ardea herodias</i>                 | -                           | -                           | -                              | -                          | Common year-round; forages in marshes & shallow waters, and in agricultural fields & irrigation ditches               |
| Great egret<br><i>Ardea alba</i>                          | -                           | ASC                         | -                              | -                          | Common year-round; forages in marshes & shallow waters, and in agricultural fields & irrigation ditches               |
| Snowy egret<br><i>Egretta thula</i>                       | -                           | ASC                         | -                              | -                          | Common year-round; forages in marshes & shallow waters, and in agricultural fields & irrigation ditches               |
| Black-crowned night-heron<br><i>Nycticorax nycticorax</i> | -                           | -                           | -                              | -                          | Common year-round; forages in marshes & shallow waters, and in agricultural fields & irrigation ditches               |
| White-faced ibis<br><i>Plegadis chihi</i>                 | -                           | -                           | CSC <sup>6</sup>               | NP                         | Common year-round; forages and breeds in marshes, also forages in agricultural fields                                 |
| Wood stork<br><i>Mycteria americana</i>                   | -                           | -                           | CSC                            | -                          | Casual post-breeding visitor; forages along river banks and backwaters  |
| Turkey vulture<br><i>Cathartes aura</i>                   | -                           | -                           | -                              | NP                         | Common year-round; forages throughout; nests primarily on cliff faces, and perhaps in CW                              |
| Fulvous whistling-duck<br><i>Dendrocygna bicolor</i>      | -                           | -                           | CSC                            | -                          | Casual post-breeding visitor; forages in marshes  |
| Redhead<br><i>Aythya americana</i>                        | -                           | -                           | CSC                            | -                          | Uncommon, winter; forages in marshes and open water   |
| Osprey<br><i>Pandion haliaetus</i>                        | -                           | ASC                         | -                              | NP                         | Uncommon migrant; forages in open water; roosts in tall trees   |
| Bald eagle<br><i>Haliaeetus leucocephalus</i>             | FT                          | ASC                         | CE/FP                          | NE                         | Rare, winter; forages in open water; roosts in tall trees   |
| White-tailed kite<br><i>Elanus leucurus</i>               | -                           | -                           | CSC                            | NP                         | Casual, winter; forages in agricultural fields; roosts in trees and shrubs  |
| Northern harrier<br><i>Circus cyaneus</i>                 | -                           | -                           | CSC                            | NP                         | Common, winter; forages in agricultural fields & open riparian areas  |
| Cooper's hawk<br><i>Accipiter cooperi</i>                 | -                           | -                           | CSC <sup>6</sup>               | NP                         | Common, winter; forages primarily in riparian woodlands   |
| Harris' hawk<br><i>Parabuteo unicinctus</i>               | -                           | -                           | CSC                            | NP                         | Casual, year-round; forages primarily in riparian woodlands & mesquite scrub  |

Table 3.4-4. Other Sensitive Species that Could Be Present in the Planning Area (continued)

| Common and Scientific Name  | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | California Status <sup>3</sup> | Nevada Status <sup>4</sup> | Notes <sup>5</sup>  |
|---|-----------------------------|-----------------------------|--------------------------------|----------------------------|---|
| Swainson's hawk<br><i>Buteo swainsoni</i>   | -                           | -                           | CT                             | NP                         | Uncommon migrant; forages in agricultural fields & open riparian areas                                  |
| Ferruginous hawk<br><i>Buteo regalis</i>  | -                           | ASC                         | CSC <sup>6</sup>               | NP                         | Uncommon, winter; forages in agricultural fields  |
| Golden eagle<br><i>Aquila chrysaetos</i>  | -                           | -                           | FP                             | NP                         | Rare, winter; forages in agricultural fields and open riparian areas                                    |
| American kestrel<br><i>Falco sparverius</i>   | -                           | -                           | -                              | NP                         | Common year-round; forages in agricultural fields and riparian areas; breeds in cavities in large trees |
| Merlin<br><i>Falco columbarius</i>  | -                           | -                           | CSC <sup>6</sup>               | NP                         | Uncommon, winter; forages in agricultural fields and open riparian areas; roosts in trees and on fences |
| Peregrine falcon<br><i>Falco peregrinus</i>   | -                           | ASC                         | CE/FP                          | NE                         | Rare, winter; forages in agricultural fields and water areas on waterfowl                               |
| Prairie falcon<br><i>Falco mexicanus</i>  | -                           | -                           | CSC                            | NP                         | Uncommon, winter; forages in agricultural fields & open riparian areas                                  |
| Greater sandhill crane<br><i>Grus canadensis tabida</i>                                 | -                           | -                           | CT/FP                          | -                          | Common, winter; forages in agricultural fields  |
| Western snowy plover<br>(interior population)<br><i>Charadrius alexandrinus nivosus</i> | FT                          | ASC                         | CSC                            | -                          | Rare migrant; forages in agricultural fields; also found in marshes                                     |
| Mountain plover<br><i>Charadrius montanus</i>   | -                           | -                           | CSC                            | -                          | Uncommon, winter; forages in agricultural fields  |
| Long-billed curlew<br><i>Numenius americanus</i>  | -                           | -                           | CSC <sup>6</sup>               | -                          | Common migrant; forages in agricultural fields  |
| California gull<br><i>Larus californicus</i>  | -                           | -                           | CSC <sup>6</sup>               | -                          | Common migrant; forages in agricultural fields; roosts in open water & on sandbars                      |
| Black tern<br><i>Chlidonias niger</i>   | -                           | -                           | CSC                            | -                          | Uncommon migrant; forages in open water   |
| Greater roadrunner<br><i>Geococcyx californianus</i>                                    | -                           | -                           | -                              | NP                         | Common year-round; forages and breeds in open scrub   |
| Long-eared owl<br><i>Asio otus</i>  | -                           | -                           | CSC                            | NP                         | Rare year-round; forages in agricultural fields & open riparian; breeds in dense riparian woodland      |
| Short-eared owl<br><i>Asio flammeus</i>   | -                           | -                           | CSC                            | NP                         | Rare, winter; forages in agricultural fields and open riparian  |
| Burrowing owl<br><i>Athene cunicularia</i>  | -                           | -                           | CSC                            | NP                         | Common to uncommon, year-round in open areas (grassland, agriculture, desert) with existing burrows     |
| Lesser nighthawk<br><i>Chordeiles acutipennis</i>                                       | -                           | -                           | -                              | NP                         | Common, summer; forages over open water, agricultural fields and open riparian                          |

Table 3.4-4. Other Sensitive Species that Could Be Present in the Planning Area (continued)

| Common and Scientific Name                              | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | California Status <sup>3</sup> | Nevada Status <sup>4</sup> | Notes <sup>5</sup>   |
|---|-----------------------------|-----------------------------|--------------------------------|----------------------------|--|
| Vaux's swift<br><i>Chaetura vauxi</i>                   | -                           | -                           | CSC                            | -                          | Uncommon migrant; forages over open water, agricultural fields and open riparian   |
| Belted kingfisher<br><i>Ceryle alcyon</i>               | -                           | ASC                         | -                              | NP                         | Common, winter; forages in marshes and open water plus in irrigation ditches   |
| Olive-sided flycatcher<br><i>Contopus cooperi</i>       | -                           | -                           | CSC                            | -                          | Uncommon migrant; forages in mature CW woodland, parks, suburban areas, golf courses, and sometimes in mature honey mesquite                       |
| Ash-throated flycatcher<br><i>Myiarchus cinerascens</i> | -                           | -                           | -                              | -                          | Common year-round; forages and breeds in riparian areas/desert scrub   |
| Brown-crested flycatcher<br><i>Myiarchus tyrannulus</i> | -                           | -                           | CSC <sup>6</sup>               | -                          | Rare, summer; forages and breeds in mature CW woodland, parks, suburban areas, golf courses, and sometimes in mature honey mesquite                |
| Purple martin<br><i>Progne subis</i>                    | -                           | -                           | CSC                            | -                          | Rare migrant; forages over open water, agricultural fields and open riparian   |
| Bank swallow<br><i>Riparia riparia</i>                  | -                           | -                           | CT                             | -                          | Uncommon migrant; forages over open water, agricultural fields and open riparian   |
| Swainson's thrush<br><i>Catharus ustulatus</i>          | -                           | -                           | CSC                            | -                          | Uncommon spring migrant; forages in CW woodland, parks, suburban areas, golf courses, & sometimes in honey mesquite                                |
| Bendire's thrasher<br><i>Toxostoma bendirei</i>         | -                           | -                           | CSC                            | -                          | Rare, winter; forages in riparian & upland desert scrub  |
| Crissal thrasher<br><i>Toxostoma crissale</i>           | -                           | -                           | CSC                            | -                          | Common year-round; forages and breeds in riparian scrub  |
| Loggerhead shrike<br><i>Lanius ludovicianus</i>         | -                           | -                           | CSC                            | -                          | Common year-round; forages in agricultural fields and open riparian areas; breeds in trees and shrubs in agricultural, landscape, & riparian areas |
| Lucy's warbler<br><i>Vermivora luciae</i>               | -                           | -                           | CSC                            | -                          | Common, summer; forages and breeds in mesquite & CW woodland   |
| Yellow-breasted chat<br><i>Icteria virens</i>           | -                           | -                           | CSC                            | -                          | Uncommon, summer; forages and breeds in mesquite & CW woodland   |
| Northern cardinal<br><i>Cardinalis cardinalis</i>       | -                           | -                           | CSC <sup>6</sup>               | -                          | Rare year-round; forages and breeds in riparian scrub and suburban areas   |
| Abert's towhee<br><i>Pipilo aberti</i>                  | -                           | -                           | -                              | -                          | Common year-round; forages and breeds in riparian woodland and scrub, plus edges of agricultural fields  |

Table 3.4-4. Other Sensitive Species that Could Be Present in the Planning Area (continued)

| Common and Scientific Name  | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | California Status <sup>3</sup> | Nevada Status <sup>4</sup> | Notes <sup>5</sup>  |
|---|-----------------------------|-----------------------------|--------------------------------|----------------------------|---|
| Large-billed savannah sparrow<br><i>Passerculus sandwichensis rostratus</i> | -                           | -                           | CSC                            | -                          | Rare, winter; forages in open scrub and perhaps in agricultural fields                            |
| Sage sparrow<br><i>Aimophila belli</i>                                      | -                           | -                           | CSC                            | -                          | Uncommon, winter; forages in inkweed/open mesquite scrub  |
| Grasshopper sparrow<br><i>Ammodramus savannarum</i>                         | -                           | -                           | CSC                            | -                          | Rare, winter; forages in agricultural fields  |
| Yellow-headed blackbird<br><i>Xanthocephalus xanthocephalus</i>             | -                           | -                           | CSC                            | -                          | Common year-round; breeds and forages in marshes, also forages in agricultural fields             |
| Lawrence's goldfinch<br><i>Carduelis lawrencei</i>                          | -                           | -                           | CSC                            | -                          | Variable, winter; forages in mesquite, riparian scrub, and edges of agricultural fields           |
| REPTILES  |                             |                             |                                |                            |   |
| Banded Gila monster<br><i>Heloderma suspectum cinctum</i>                   | -                           | -                           | CSC                            | NP                         | In a variety of plant communities, desert to riparian; use animal burrows or crevices for shelter |
| Desert rosy boa<br><i>Lichanura trivirgata gracia</i>                       | -                           | -                           | CSC <sup>6</sup>               | -                          | In rocky shrubland and desert; attracted to intermittent and permanent water                      |
| AMPHIBIANS  |                             |                             |                                |                            |   |
| Arizona toad<br><i>Bufo microscaphus microscaphus</i>                       | -                           | -                           | -                              | -                          | In rocky streams and washes; eggs laid in pools   |
| Couch's spadefoot toad<br><i>Scaphiopus couchii</i>                         | -                           | -                           | CSC                            | -                          | Breeds in rain pools lasting at least 7 days; dormant in burrows much of year                     |
| INVERTEBRATES   |                             |                             |                                |                            |   |
| Maricopa tiger beetle<br><i>Cicindela oregona maricopa</i>                  | -                           | -                           | -                              | -                          | Often on sandy stream banks; burrow   |
| Obsolete Viceroy butterfly<br><i>Limenitis archippus obsoleta</i>           | -                           | -                           | -                              | -                          | Willow is host plant; feed on tree sap, dung, flower nectar                                       |
| PLANTS  |                             |                             |                                |                            |   |
| Mud nama<br><i>Nama stenocarpum</i>   | -                           | -                           | -                              | -                          | Intermittent wet areas (mud flats, lake shores, river banks)                                      |

**Table 3.4-4. Other Sensitive Species that Could Be Present in the Planning Area (continued)**

| <i>Common and Scientific Name</i>  | <i>Federal Status<sup>1</sup></i> | <i>Arizona Status<sup>2</sup></i> | <i>California Status<sup>3</sup></i> | <i>Nevada Status<sup>4</sup></i> | <i>Notes<sup>5</sup></i> |
|--|-----------------------------------|-----------------------------------|--------------------------------------|----------------------------------|--------------------------|
| <i>Notes:</i>  |                                   |                                   |                                      |                                  |                          |
| 1 Federal Status   |                                   |                                   |                                      |                                  |                          |
| FE= Listed as endangered under the ESA.  |                                   |                                   |                                      |                                  |                          |
| FT= Listed as threatened under ESA.  |                                   |                                   |                                      |                                  |                          |
| FP= Proposed for listing as threatened under ESA.  |                                   |                                   |                                      |                                  |                          |
| FC= Candidate for listing under ESA.   |                                   |                                   |                                      |                                  |                          |
| 2 Arizona Status   |                                   |                                   |                                      |                                  |                          |
| ASC = Arizona wildlife of special concern.   |                                   |                                   |                                      |                                  |                          |
| 3 California Status  |                                   |                                   |                                      |                                  |                          |
| CE = Listed as endangered under CESA.  |                                   |                                   |                                      |                                  |                          |
| CT = Listed as threatened under CESA.  |                                   |                                   |                                      |                                  |                          |
| FP = Fully protected under the California Fish and Game Code.                                      |                                   |                                   |                                      |                                  |                          |
| CSC = California species of special concern.   |                                   |                                   |                                      |                                  |                          |
| 4 Nevada Status  |                                   |                                   |                                      |                                  |                          |
| NE = Nevada endangered   |                                   |                                   |                                      |                                  |                          |
| NT = Nevada threatened.  |                                   |                                   |                                      |                                  |                          |
| NEP = Nevada critically endangered plant.  |                                   |                                   |                                      |                                  |                          |
| NP = Nevada protected.   |                                   |                                   |                                      |                                  |                          |
| 5 CW = Cottonwood-willow   |                                   |                                   |                                      |                                  |                          |
| 6 Under review by CDFG for removal from the current list of California Species of Special Concern. |                                   |                                   |                                      |                                  |                          |

1 The CNDDDB identifies the following sensitive plant communities in the planning area: Sonoran  
 2 Cottonwood-Willow Riparian Forest, Mesquite Woodland, and Alkali Bulrush-Cattail Marsh  
 3 and Brackish Bulrush-Cattail Marsh.

4 **3.4.1.2 Muddy River/Moapa Valley and Virgin River**

5 Both the Muddy River and Virgin River are tributaries to Lake Mead and are not in the  
 6 planning area. The Virgin River is a perennial stream that originates in the plateaus of southern  
 7 Utah above Zion National Park. It flows through the park and southwesterly in the Virgin  
 8 River Canyon, between the Virgin and Mormon mountains. Strong seasonal flows are  
 9 associated with spring snowmelt and flash floods during summer thunderstorms (BIO/WEST  
 10 2001). Although the Virgin River upstream of Lake Mead is a largely intact riparian ecosystem,  
 11 its plant and animal communities are strongly affected by non-native invasive species.

12 The headwaters of the Muddy River are formed by the outflows of numerous hot springs that  
 13 discharge in the vicinity of Warm Springs and support a unique ecosystem that includes several  
 14 endemic species. Downstream, the Muddy River flows through agricultural lands of the Moapa  
 15 Valley and is heavily altered by flood control structures, channels, and canals.

16 *Vegetation*

17 A detailed evaluation of the lower Virgin River riparian corridor, extending upstream from  
 18 Lake Mead to about 4 miles above Littlefield, Arizona and covering 11,132 acres, completely  
 19 overlapping and extending upstream beyond the area considered as part of this alternative, was  
 20 conducted by CH2MHill for Reclamation (1999). The mapping of vegetation communities and  
 21 open water/river channel was based on 1997 surveys. Totals for the study area as a whole are  
 22 as follows:

- 1 • Saltcedar (8,612 acres), by far the dominant vegetation of this off-site conservation area,  
2 in four structural types (III-VI).
- 3 • Saltcedar-Honey Mesquite (264 acres), dominated by tamarisk but including honey  
4 mesquite.
- 5 • Arrowweed (95 acres), as mapped along the LCR and occurring throughout the riparian  
6 corridor on sandy sites or in old channels.
- 7 • Honey Mesquite (92 acres) and Screwbean Mesquite (48 acres), occurring in small  
8 pockets on the edges of the riparian corridor.
- 9 • Cottonwood-Willow (729 acres), dominated by willow and cottonwood trees in five  
10 structural types (I-V). An additional 20 acres were identified as Cottonwood  
11 Regeneration Areas based on recent recruitment and presence of young cottonwoods in  
12 otherwise open areas.
- 13 • Marsh (412 acres), dominated by herbaceous wetland plants.
- 14 • Open Water/River Channel (758 acres), consisting of the river channel, including bars  
15 and adjacent ponds and reservoirs. An additional 1,144 acres consists of unvegetated  
16 alluvium subject to heavy scouring or deposition during the study.
- 17 • Agriculture (101 acres) crops, and fallow fields.

18 Similar to the earlier, more generalized mapping done by Ohmart (USBR 1982a), the numbers  
19 indicate the riparian corridor is strongly dominated by saltcedar. This would provide the  
20 opportunity to expand native riparian vegetation acreage in this region by  
21 removing/converting saltcedar. The relatively natural floodplain of the Virgin River also  
22 provides substantial opportunity for reestablishing backwater and marsh habitats.

23 The area considered for off-site conservation along the Muddy River/Moapa Valley riparian  
24 corridor extends upstream from the Overton arm of Lake Mead to the headwaters of the Muddy  
25 River at Warm Springs, Nevada, the location of the Moapa NWR, which is part of the larger  
26 Desert NWR. The Warm Springs area is remarkable for the discharge of numerous hot springs  
27 that provide a unique and effectively isolated habitat for several species of endemic fishes (see  
28 Fish and Wildlife below). At the refuge and extending downstream, a non-native palm  
29 woodland of California fan palms (*Washingtonia filifera*) and date palms (*Phoenix dactylifera*) is  
30 prevalent alongside the stream, intermixed with marsh vegetation and pools of open water.  
31 Native mesquite and saltbush vegetation exists but is of limited extent (e.g., see  
32 <http://desertcomplex.fws.gov/>). Farther downstream, the riparian corridor is dominated by  
33 saltcedar, with surrounding lands a mix of agriculture and desert scrub vegetation (Scoppettone  
34 et al. 1998). The palms and saltcedar promote fires and encroach upon the streambed and  
35 pools, jeopardizing the native fishes (Scoppettone et al. 1998).

#### 36 *Fish and Wildlife*

37 Native fishes of the lower Virgin River downstream of the Riverside Bridge and within the off-  
38 site conservation area include the desert sucker (*Catostomus clarki*) and speckled dace  
39 (*Rhinichthys osculus*) (BIO/WEST 1999). Woundfin (*Plagopterus argentissimus*) and Virgin River  
40 chub (*Gila seminuda*) are also present (see sensitive species below), and critical habitat for both

1 of these species is present in this area. Non-native fishes inhabiting this reach of the river  
2 include red shiner (*Cyprinella lutrensis*), common carp (*Cyprinus carpio*), and mosquitofish,  
3 among others (USBR 1982a).

4 The Muddy River/Moapa Valley area provides limited woody riparian vegetation that is  
5 dominated by saltcedar. Critical aquatic habitat for endemic fishes exists in the headwaters at  
6 Warm Springs and downstream (USFWS 1995; Scoppettone et al. 1998). Native fishes of the  
7 Muddy River include the Moapa speckled dace (*Rhinichthys osculus moapae*), Moapa White River  
8 springfish (*Crenichthys baileyi moapae*), and Muddy River roundtail chub (*Gila seminuda*). A large  
9 number of non-native fish species are present, predominantly downstream of the Warm Springs  
10 area and continuing into Lake Mead (see USFWS 1995). Non-native species that co-occur with  
11 native fishes in spring-fed pools include shortfin mollies (*Poecilia mexicana*), mosquitofish, and  
12 tilapia (*Oreochromis aureus*) (Scoppettone et al. 1998).

13 As part of the BIO/WEST (2001) study, wildlife surveys were conducted over a 3-year period in  
14 all the major vegetation types. A total of 233 wildlife species were observed. The greatest  
15 number of species (140) were associated with the open water/river channel area. Although  
16 amounting to a small percentage of the total area surveyed, more than half (121) of the total  
17 number of species observed were in riparian forest, and about 18 percent (43) of the total were  
18 almost exclusively associated with that vegetation type. Emergent wetlands and springs are of  
19 very limited extent along the river but provide nesting habitat for many species. Saltcedar-  
20 dominated, mixed (saltcedar plus natives) shrublands, and willow-dominated riparian scrub all  
21 were found to support moderate wildlife diversity. A detailed breakdown of species'  
22 occurrences by vegetation type is provided by BIO/WEST (2001).

#### 23 *Sensitive Species*

24 Sensitive species, including covered and evaluation species, that are present or could be present  
25 in each of the off-site conservation areas are listed in Table 3.4-5.

#### 26 COVERED AND EVALUATION SPECIES

27 Of the 31 covered and evaluation species, 19 are present or could be present within the Virgin  
28 and Muddy rivers off-site conservation area (Table 3.4-5) and would benefit from habitat  
29 establishment and subsequent management actions on a combination of public and private  
30 lands. The Virgin River supports the largest concentration of southwestern willow flycatchers  
31 (40 known territories ) in the LCR recovery unit and is one of the key areas targeted for recovery  
32 of the species, with a goal of 100 territories (USFWS 2002d). In addition, the flannelmouth  
33 sucker occurs in the Virgin and Muddy rivers.

#### 34 OTHER SENSITIVE SPECIES

35 A total of 65 additional sensitive species that are or could be present in or near this off-site  
36 conservation area are listed in Table 3.4-5. Sensitive fish species that could be present in or  
37 adjacent to this off-site conservation area that are not present in the planning area described  
38 above are the Moapa dace (*Moapa coriacea*), Virgin river spinedace (*Lepidomeda mollispinis*),  
39 woundfin (*Plagopterus argentisimus*), and Virgin River chub (*Gila seminuda*). Other potentially

3.4 Biological Resources

Table 3.4-5. Sensitive Species that Could Be Present in the Off-Site Conservation Areas

| Common and Scientific Name  | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | Nevada Status <sup>3</sup> | POTENTIALLY PRESENT IN OFF-SITE CONSERVATION AREAS |                           |                  |
|---|-----------------------------|-----------------------------|----------------------------|--|---------------------------|------------------|
|   |                             |                             |                            | Lower Virgin and Muddy Rivers                      | Lower Bill Williams River | Lower Gila River |
| MAMMALS   |                             |                             |                            |  |                           |                  |
| California leaf-nosed bat <sup>4</sup><br><i>Macrotus californicus</i>                  | -                           | ASC                         | -                          | X  | X                         | X                |
| Pale Townsend's big-eared bat <sup>4</sup><br><i>Corynorhinus townsendii pallescens</i> | -                           | -                           | -                          | X  | X                         | X                |
| Western red bat <sup>5</sup><br><i>Lasiurus blossevillii</i>                            | -                           | ASC                         | -                          | X  | X                         | X                |
| Western yellow bat <sup>5</sup><br><i>Lasiurus xanthinus</i>                            | -                           | ASC                         | -                          | X  | X                         | X                |
| Mexican long-tongued bat<br><i>Choeronycteris mexicana</i>                              | -                           | -                           | -                          |  | X                         | X                |
| Occult little brown bat<br><i>Myotis lucifugus occultus</i>                             | -                           | -                           | -                          | X  | X                         | X                |
| Small-footed myotis<br><i>Myotis ciliolabrum</i>  | -                           | -                           | -                          | X  | X                         | X                |
| Fringed myotis<br><i>Myotis thysanodes</i>  | -                           | -                           | -                          | X  | X                         | X                |
| Cave myotis<br><i>Myotis velifer</i>  | -                           | -                           | -                          | X  | X                         | X                |
| Yuma myotis<br><i>Myotis yumanensis</i>   | -                           | -                           | -                          | X  | X                         | X                |
| Spotted bat<br><i>Euderma maculatum</i>   | -                           | ASC                         | NT                         | X  | X                         | X                |
| Allen's big-eared bat<br><i>Indionycteris (=Plecotus) phyllotis</i>                     | -                           | -                           | -                          | X  | X                         | X                |
| Pallid bat<br><i>Antrozous pallidus</i>   | -                           | -                           | -                          | X  | X                         | X                |
| Pocketed freetail bat<br><i>Nyctinomops femorosaccus</i>                                | -                           | -                           | -                          |  | X                         | X                |

1

Table 3.4-5. Sensitive Species that Could Be Present in the Off-Site Conservation Areas (continued)

| Common and Scientific Name   | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | Nevada Status <sup>3</sup> | POTENTIALLY PRESENT IN OFF-SITE CONSERVATION AREAS |                           |                  |
|--|-----------------------------|-----------------------------|----------------------------|--|---------------------------|------------------|
|  |                             |                             |                            | Lower Virgin and Muddy Rivers                      | Lower Bill Williams River | Lower Gila River |
| MAMMALS  |                             |                             |                            |  |                           |                  |
| Big freetail bat<br><i>Nyctinomops macrotis</i>                              | -                           | -                           | -                          | X  | X                         | X                |
| Greater western mastiff bat<br><i>Eumops perotis californicus</i>            | -                           | -                           | -                          | X  | X                         | X                |
| Desert pocket mouse <sup>5</sup><br><i>Chaetodipus penicillatus sobrinus</i> | -                           | -                           | -                          | X  |                           |                  |
| Yuma hispid cotton rat <sup>5</sup><br><i>Sigmodon hispidus eremicus</i>     | -                           | -                           | -                          |  |                           | X                |
| Yuma puma<br><i>Felis concolor browni</i>                                    | -                           | ASC                         | -                          |  | X                         | X                |
| BIRDS  |                             |                             |                            |  |                           |                  |
| Double-crested cormorant<br><i>Phalacrocorax auritus</i>                     | -                           | -                           | -                          |  | X                         |                  |
| American bittern<br><i>Botaurus lentiginosus</i>                             | -                           | ASC                         | -                          |  | X                         |                  |
| Western least bittern <sup>5</sup><br><i>Ixobrychus exilis hesperis</i>      | -                           | ASC                         | -                          | X  | X                         | X                |
| Great blue heron<br><i>Ardea herodias</i>                                    | -                           | -                           | -                          | X  | X                         | X                |
| Great egret<br><i>Ardea alba</i>   | -                           | ASC                         | -                          | X  | X                         | X                |
| Snowy egret<br><i>Egretta thula</i>  | -                           | ASC                         | -                          | X  | X                         | X                |
| Black-crowned night-heron<br><i>Nycticorax nycticorax</i>                    | -                           | -                           | -                          | X  | X                         | X                |
| White-faced ibis<br><i>Plegadis chihi</i>                                    | -                           | -                           | NP                         |  | X                         |                  |

Table 3.4-5. Sensitive Species that Could Be Present in the Off-Site Conservation Areas (continued)

| Common and Scientific Name                                 | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | Nevada Status <sup>3</sup> | POTENTIALLY PRESENT IN OFF-SITE CONSERVATION AREAS |                           |                  |
|--|-----------------------------|-----------------------------|----------------------------|--|---------------------------|------------------|
|  |                             |                             |                            | Lower Virgin and Muddy Rivers                      | Lower Bill Williams River | Lower Gila River |
| BIRDS  |                             |                             |                            |  |                           |                  |
| Turkey vulture<br><i>Cathartes aura</i>                    | -                           | -                           | NP                         | X  | X                         | X                |
| Osprey<br><i>Pandion haliaetus</i>                         | -                           | ASC                         | NP                         | X  | X                         | X                |
| Bald eagle<br><i>Haliaeetus leucocephalus</i>              | FT                          | ASC                         | NE                         | X  | X                         | X                |
| White-tailed kite<br><i>Elanus leucurus</i>                | -                           | -                           | NP                         | X  | X                         | X                |
| Northern harrier<br><i>Circus cyaneus</i>                  | -                           | -                           | NP                         | X  | X                         | X                |
| Cooper's hawk<br><i>Accipiter cooperi</i>                  | -                           | -                           | NP                         | X  | X                         | X                |
| Harris' hawk<br><i>Laterallus jamaicensis coturniculus</i> | -                           | -                           | NP                         | X  | X                         | X                |
| Swainson's hawk<br><i>Buteo swainsoni</i>                  | -                           | -                           | NP                         | X  | X                         | X                |
| Ferruginous hawk<br><i>Buteo regalis</i>                   | -                           | ASC                         | NP                         | X  | X                         | X                |
| Golden eagle<br><i>Aquila chrysaetos</i>                   | -                           | -                           | NP                         | X  | X                         | X                |
| American kestrel<br><i>Falco sparverius</i>                | -                           | -                           | NP                         | X  | X                         | X                |
| Merlin<br><i>Falco columbarius</i>                         | -                           | -                           | NP                         | X  | X                         | X                |
| Peregrine falcon<br><i>Falco peregrinus</i>                | -                           | ASC                         | NE                         | X  | X                         | X                |
| Prairie falcon<br><i>Falco mexicanus</i>                   | -                           | -                           | NP                         | X  | X                         | X                |

Table 3.4-5. Sensitive Species that Could Be Present in the Off-Site Conservation Areas (continued)

| Common and Scientific Name   | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | Nevada Status <sup>3</sup> | POTENTIALLY PRESENT IN OFF-SITE CONSERVATION AREAS |                           |                  |
|--|-----------------------------|-----------------------------|----------------------------|--|---------------------------|------------------|
|  |                             |                             |                            | Lower Virgin and Muddy Rivers                      | Lower Bill Williams River | Lower Gila River |
| BIRDS  |                             |                             |                            |  |                           |                  |
| Yuma clapper rail <sup>5</sup><br><i>Rallus longirostris yumanensis</i>          | FE                          | ASC                         | -                          | X  | X                         | X                |
| California black rail <sup>5</sup><br><i>Laterallus jamaicensis coturniculus</i> | -                           | ASC                         | -                          |  | X                         | X                |
| Black tern<br><i>Chlidonias niger</i>  | -                           | -                           | -                          | X  | X                         |                  |
| Yellow-billed cuckoo <sup>5</sup><br><i>Coccyzus americanus</i>                  | FC                          | ASC                         | -                          | X  | X                         | X                |
| Greater roadrunner<br><i>Geococcyx californianus</i>                             | -                           | -                           | NP                         | X  | X                         | X                |
| Long-eared owl<br><i>Asio otus</i>   | -                           | -                           | NP                         | X  | X                         | X                |
| Short-eared owl<br><i>Asio flammeus</i>  | -                           | -                           | NP                         | X  | X                         | X                |
| Burrowing owl<br><i>Athene cunicularia</i>                                       | -                           | -                           | NP                         | X  | X                         | X                |
| Elf owl <sup>5</sup><br><i>Micrathene whitneyi</i>                               | -                           | -                           | NP                         |  | X                         | X                |
| Lesser nighthawk<br><i>Chordeiles acutipennis</i>                                | -                           | -                           | NP                         | X  | X                         | X                |
| Vaux's swift<br><i>Chaetura vauxi</i>  | -                           | -                           | -                          | X  | X                         | X                |
| Belted kingfisher<br><i>Ceryle alcyon</i>  | -                           | ASC                         | NP                         | X  | X                         | X                |
| Gilded flicker <sup>5</sup><br><i>Colaptes chrysoides</i>                        | -                           | -                           | -                          |  | X                         | X                |
| Gila woodpecker <sup>5</sup><br><i>Melanerpes uropygialis</i>                    | -                           | -                           | -                          |  | X                         | X                |

Table 3.4-5. Sensitive Species that Could Be Present in the Off-Site Conservation Areas (continued)

| Common and Scientific Name  | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | Nevada Status <sup>3</sup> | POTENTIALLY PRESENT IN OFF-SITE CONSERVATION AREAS |                           |                  |
|---|-----------------------------|-----------------------------|----------------------------|--|---------------------------|------------------|
|   |                             |                             |                            | Lower Virgin and Muddy Rivers                      | Lower Bill Williams River | Lower Gila River |
| BIRDS   |                             |                             |                            |  |                           |                  |
| Olive-sided flycatcher<br><i>Contopus cooperi</i>                               | -                           | -                           | -                          | X  | X                         | X                |
| Southwestern willow flycatcher <sup>5</sup><br><i>Empidonax trailii extimus</i> | FE                          | ASC                         | -                          | X  | X                         | X                |
| Ash-throated flycatcher<br><i>Myiarchus cinerascens</i>                         | -                           | -                           | -                          | X  | X                         | X                |
| Brown-crested flycatcher<br><i>Myiarchus tyrannulus</i>                         | -                           | -                           | -                          | X  | X                         | X                |
| Vermilion flycatcher <sup>5</sup><br><i>Pyrocephalus rubinus</i>                | -                           | -                           | -                          | X  | X                         | X                |
| Arizona Bell's vireo <sup>5</sup><br><i>Vireo bellii arizonae</i>               | -                           | -                           | -                          | X  | X                         | X                |
| Purple martin<br><i>Progne subis</i>  | -                           | -                           | -                          | X  | X                         | X                |
| Bank swallow<br><i>Riparia riparia</i>  | -                           | -                           | -                          | X  | X                         | X                |
| Swainson's thrush<br><i>Catharus ustulatus</i>                                  | -                           | -                           | -                          | X  | X                         | X                |
| Bendire's thrasher<br><i>Toxostoma bendirei</i>                                 | -                           | -                           | -                          | X  | X                         | X                |
| Crissal thrasher<br><i>Toxostoma crissale</i>                                   | -                           | -                           | -                          | X  | X                         | X                |
| Loggerhead shrike<br><i>Lanius ludovicianus</i>                                 | -                           | -                           | -                          | X  | X                         | X                |
| Lucy's warbler<br><i>Vermivora luciae</i>                                       | -                           | -                           | -                          | X  | X                         | X                |
| Sonoran yellow warbler <sup>5</sup><br><i>Dendroica petechia sonorana</i>       | -                           | -                           | -                          | X  | X                         | X                |

Table 3.4-5. Sensitive Species that Could Be Present in the Off-Site Conservation Areas (continued)

| Common and Scientific Name  | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | Nevada Status <sup>3</sup> | POTENTIALLY PRESENT IN OFF-SITE CONSERVATION AREAS |                           |                  |
|---|-----------------------------|-----------------------------|----------------------------|--|---------------------------|------------------|
|   |                             |                             |                            | Lower Virgin and Muddy Rivers                      | Lower Bill Williams River | Lower Gila River |
| BIRDS   |                             |                             |                            |  |                           |                  |
| Yellow-breasted chat<br><i>Icteria virens</i>                                 | -                           | -                           | -                          | X  | X                         | X                |
| Summer tanager <sup>5</sup><br><i>Piranga rubra</i>                           | -                           | -                           | -                          | X  | X                         | X                |
| Northern cardinal<br><i>Cardinalis cardinalis</i>                             | -                           | -                           | -                          | X  | X                         | X                |
| Abert's towhee<br><i>Pipilo aberti</i>  | -                           | -                           | -                          | X  | X                         | X                |
| Large-billed savannah sparrow<br><i>Passerculus sandwichensis rostratus</i>   | -                           | -                           | -                          | X  | X                         | X                |
| Sage sparrow<br><i>Aimophila belli</i>  | -                           | -                           | -                          | X  | X                         | X                |
| Grasshopper sparrow<br><i>Ammodramus savannarum</i>                           | -                           | -                           | -                          | X  | X                         |                  |
| Yellow-headed blackbird<br><i>Xanthocephalus xanthocephalus</i>               | -                           | -                           | -                          | X  | X                         | X                |
| Lawrence's goldfinch<br><i>Carduelis lawrencei</i>                            | -                           | -                           | -                          | X  | X                         | X                |
| REPTILES  |                             |                             |                            |  |                           |                  |
| Desert tortoise (Mojave population) <sup>5</sup><br><i>Gopherus agassizii</i> | FT                          | ASC                         | NT                         | X  |                           |                  |
| Desert tortoise (Sonoran population)<br><i>Gopherus agassizii</i>             | --                          | ASC                         | --                         |  | X                         | X                |
| Banded Gila monster<br><i>Heloderma suspectum cinctum</i>                     | -                           | -                           | NP                         | X  | X                         | X                |

Table 3.4-5. Sensitive Species that Could Be Present in the Off-Site Conservation Areas (continued)

| Common and Scientific Name  | Federal Status <sup>1</sup> | Arizona Status <sup>2</sup> | Nevada Status <sup>3</sup> | POTENTIALLY PRESENT IN OFF-SITE CONSERVATION AREAS |                           |                  |
|---|-----------------------------|-----------------------------|----------------------------|--|---------------------------|------------------|
|   |                             |                             |                            | Lower Virgin and Muddy Rivers                      | Lower Bill Williams River | Lower Gila River |
| REPTILES  |                             |                             |                            |  |                           |                  |
| Flat-tailed horned lizard <sup>5</sup><br><i>Phrynosoma mcalli</i>  | -                           | ASC                         | -                          |  |                           | X                |
| Desert rosy boa<br><i>Lichanura trivirgata gracia</i>               | -                           | -                           | -                          | X  | X                         | X                |
| AMPHIBIANS  |                             |                             |                            |  |                           |                  |
| Arizona toad<br><i>Bufo microscaphus microscaphus</i>               | -                           | -                           | -                          | X  | X                         |                  |
| Couch's spadefoot toad<br><i>Scaphiopus couchii</i>                 | -                           | -                           | -                          |  | X                         | X                |
| Relict leopard frog <sup>5</sup><br><i>Rana onca</i>                | FC                          | ASC                         | NP                         | X  |                           |                  |
| Lowland leopard frog <sup>4</sup><br><i>Rana yavapaiensis</i>       | -                           | ASC                         | -                          |  | X                         |                  |
| FISH  |                             |                             |                            |  |                           |                  |
| Moapa dace<br><i>Moapa coriacea</i>                                 | FE                          | -                           | NE                         | X  |                           |                  |
| Virgin River spinedace<br><i>Lepidomeda mollispinis mollispinis</i> | -                           | -                           | NP                         | X  |                           |                  |
| Woundfin<br><i>Plagopterus argentissimus</i>                        | FE                          | -                           | NE                         | X  |                           |                  |
| Virgin River chub<br><i>Gila seminuda</i>                           | FE                          | -                           | NE (NS) <sup>6</sup>       | X  |                           |                  |
| Flannelmouth sucker <sup>5</sup><br><i>Catostomus latipinnis</i>    | -                           | ASC                         | -                          | X  |                           |                  |
| INVERTEBRATES   |                             |                             |                            |  |                           |                  |
| Aegialian scarab beetle<br><i>Aegialia knighti</i>                  | -                           | -                           | -                          | X  |                           |                  |

**Table 3.4-5. Sensitive Species that Could Be Present in the Off-Site Conservation Areas (continued)**

| Common and Scientific Name   | Federal Status <sup>1</sup>                        | Arizona Status <sup>2</sup> | Nevada Status <sup>3</sup> | POTENTIALLY PRESENT IN OFF-SITE CONSERVATION AREAS |                           |                  |
|--|--|-----------------------------|----------------------------|--|---------------------------|------------------|
|  |  |                             |                            | Lower Virgin and Muddy Rivers                      | Lower Bill Williams River | Lower Gila River |
| INVERTEBRATES  |  |                             |                            |  |                           |                  |
| MacNeill's sootywing skipper <sup>5</sup><br><i>Pholisora graciela</i>                   | -  | -                           | -                          | X  |                           |                  |
| Maricopa tiger beetle<br><i>Cicindela oregona maricopa</i>                               | -  | -                           | -                          |  | X                         |                  |
| Obsolete Viceroy Butterfly<br><i>Limenitis archippus obsoleta</i>                        | -  | -                           | -                          | X  | X                         | X                |
| PLANTS   |  |                             |                            |  |                           |                  |
| Sticky buckwheat <sup>5</sup><br><i>Eriogonum viscidulum</i>                             | -  | -                           | NEP                        | X  |                           |                  |
| Threecorner milkvetch <sup>5</sup><br><i>Astragalus geyeri</i> var.<br><i>triquetrus</i> | -  | -                           | NEP                        | X  |                           |                  |
| Las Vegas bearpoppy<br><i>Arctomecon californica</i>                                     | -  | -                           | NEP                        | X  |                           |                  |
| Virgin River thistle<br><i>Cirsium virginensis</i>                                       | -  | -                           | -                          | X  |                           |                  |
| Notes:   |  |                             |                            |  |                           |                  |
| 1  | Federal Status                                     |                             | 3                          | Nevada Status                                      |                           |                  |
|  | FE = Listed as endangered under the ESA.           |                             |                            | NE = Nevada endangered                             |                           |                  |
|  | FT = Listed as threatened under ESA.               |                             |                            | NT = Nevada threatened.                            |                           |                  |
|  | FP = Proposed for listing as threatened under ESA. |                             |                            | NEP = Nevada critically endangered plant.          |                           |                  |
|  | FC = Candidate for listing under ESA.              |                             |                            | NP = Nevada protected.                             |                           |                  |
| 2  | Arizona Status                                     |                             |                            | NS = Nevada sensitive.                             |                           |                  |
|  | ASC = Arizona wildlife of special concern.         |                             | 4                          | Conservation Plan evaluation species.              |                           |                  |
|  |  |                             | 5                          | Conservation Plan covered species.                 |                           |                  |
|  |  |                             | 6                          | Muddy River population only.                       |                           |                  |

1 present sensitive species include the Aegialian scarab beetle, Las Vegas bearpoppy, and Virgin  
2 River thistle.

3 **3.4.1.3 Bill Williams River**

4 *Vegetation*

5 Vegetation downstream of Alamo Dam within the riparian corridor has been characterized by  
6 the Corps (1999), using categories consistent with those used along the LCR. Amounts of these  
7 vegetation categories in the Bill Williams River NWR and on Planet Ranch were provided by  
8 the NWR (personal communication, K. Blair 2003). Vegetation types and acreages are as  
9 follows:

- 10 • Cottonwood-Willow (2,168 acres), occurring along the active channel and including  
11 substantial areas where saltcedar is the dominant understory;
- 12 • Mesquite (742 acres), dominated by honey mesquite, but also including *Atriplex* spp. and  
13 screwbean mesquite;
- 14 • Mesquite-Saltcedar (161 acres), a mixture of mesquite and saltcedar, often including  
15 *Atriplex* spp. and arrowweed;
- 16 • Saltcedar (56 acres), including other species, but with more than 50 percent coverage of  
17 saltcedar;
- 18 • Open Water-Freshwater Marsh (498 acres), mostly equivalent to the Marsh category in  
19 the LCR, but including seedlings of woody riparian species; and
- 20 • Barren-Open Space/Herbaceous (1,477 acres), consisting of sparsely vegetated areas.

21 Surrounding areas consist of upland desert scrub.

22 *Fish and Wildlife*

23 The lower Bill Williams River riparian corridor is contiguous with the central part of the LCR  
24 planning area, and most of the fish and wildlife species that occur along the mainstem are also  
25 reported as occurring here. Wildlife diversity is relatively high, and wildlife includes many of  
26 the covered and evaluation species because of the excellent condition of riparian vegetation  
27 along the lower Bill Williams River (USACE 1999).

28 *Sensitive Species*

29 COVERED AND EVALUATION SPECIES

30 Of the 31 covered and evaluation species, 16 are present or could be present within the lower  
31 Bill Williams River off-site conservation area (Table 3.4-5) and would benefit from habitat  
32 establishment and subsequent management actions on a combination of public and private  
33 lands. The Bill Williams River as a whole (including upstream of Alamo Dam) supports a  
34 relatively large breeding population of southwestern willow flycatchers (32 known territories)  
35 and is another of the key areas targeted for recovery of the species, with a goal of 100 territories

1 (USFWS 2002d). Four nests were documented along the lower Bill Williams River during 2001  
2 (McKernan and Braden 2002).

3 OTHER SENSITIVE SPECIES

4 A total of 68 additional sensitive species that are present or could be present in the lower Bill  
5 Williams River off-site conservation area are listed in Table 3.4-5. Habitat requirements and  
6 status of these species are described above for the planning area.

7 **3.4.1.4 Lower Gila River**

8 *Vegetation*

9 Vegetation along the lower Gila River has been mapped by HEG as part of a Corps  
10 Reconnaissance Report (USACE 1995). Vegetation was classified according to Brown et al.  
11 (1979) and Ohmart et al. (1988) in a manner generally consistent with what has been done for  
12 the LCR. From the Wellton-Mohawk area downstream to the confluence with the Colorado  
13 River north of Yuma, in addition to agricultural lands, which occupy much of the floodplain,  
14 there are five distinct vegetation communities or series:

- 15 • Cottonwood-Willow (2,080 acres), forming a riparian forest that is similar to that  
16 described for the LCR and dominated by native Fremont cottonwoods and willows;
- 17 • Saltcedar Disclimax (3,687 acres), essentially riparian scrub vegetation, dominated by  
18 *Tamarix* spp. but including thickets of other riparian shrubs such as arrowweed;
- 19 • Leguminous Short Tree Species (11,959 acres), this community type represents the  
20 intermingling of honey mesquite and desert scrub vegetation as the two types are  
21 described along the LCR;
- 22 • Cattail Series (400 acres), equivalent to the Marsh-Wetlands category mapped along the  
23 LCR; and
- 24 • Sparsely vegetated open areas (16,102 acres).

25 These communities occur under conditions similar to those described above for the LCR. As a  
26 result of massive floods along the lower Gila River in 1993, many areas were denuded, but  
27 subsequently recolonized by cottonwoods and willows, creating opportunities for habitat  
28 establishment by taking actions to foster the reestablishment of native riparian vegetation  
29 (USACE 1995; personal communication, B. Werner 2003).

30 *Fish and Wildlife*

31 Fish that are present along the lower Gila River are limited almost entirely to non-native, warm-  
32 water species that occur in areas of permanent water sustained by return flows from agriculture  
33 (USFWS 1994). Wildlife along the lower Gila River is similar to that described previously for  
34 the LCR, although dominated by Sonoran Desert species. Riparian forest supports a rich  
35 variety of neotropical migrant species, including several species covered by the Conservation  
36 Plan. Marshes along the lower Gila River are structurally and functionally similar to those  
37 along the LCR and support the same species.

1 *Sensitive Species*

## 2 COVERED AND EVALUATION SPECIES

3 Of the 31 covered and evaluation species, 17 are present or could be present within the lower  
4 Gila River off-site conservation area (Table 3.4-5) and would benefit from habitat establishment  
5 and subsequent management actions on a combination of public and private lands. The lower  
6 Gila River is included as part of the LCR region as one of the targeted areas for recovery of the  
7 southwestern willow flycatcher.

## 8 OTHER SENSITIVE SPECIES

9 A total of 61 additional sensitive species that are present or could be present in the lower Gila  
10 River off-site conservation area are listed in Table 3.4-5. Habitat requirements and status of  
11 these species are described above for the planning area.

12 **3.4.2 Environmental Consequences**13 *Significance Criteria*

14 The proposed action would result in a significant impact if it would result in any of the  
15 following:

- 16 • have a substantial adverse effect on any sensitive natural vegetation community  
17 identified for special status under local, state, tribal or Federal laws, regulations, or  
18 policies;
- 19 • have a substantial direct or indirect effect on sensitive wildlife species identified for  
20 special status under local, state, tribal, or Federal laws, regulations, or policies ;
- 21 • have a substantial adverse effect on any riparian vegetation or other sensitive natural  
22 community identified in local or regional planning documents, policies, and regulations  
23 of the CDFG, AGFD, NDOW, BLM, Reclamation, BIA, Service, and county and tribal  
24 governments;
- 25 • have a substantial adverse effect on wetlands and waters of the U.S. as covered by  
26 section 404 of the CWA;
- 27 • have a substantial adverse effect on native resident or migratory wildlife corridors,  
28 breeding or spawning habitats, and nursery habitats;
- 29 • conflict with any local policies or ordinances protecting biological resources, such as a  
30 tree preservation policy or ordinance (discussed in section 3.11); or
- 31 • conflict with provisions of an approved local, state, tribal, or Federal habitat or species  
32 conservation plan (discussed in section 3.11).

1 3.4.2.1 *Alternative 1: Proposed Conservation Plan*

2 *Impacts*

3 The following analysis describes the impacts of (1) issuing the section 10(a)(1)(B) permit, which  
4 would authorize the incidental take of up to 27 covered species from implementation of both  
5 the covered activities and the Conservation Plan, and (2) implementing the Conservation Plan,  
6 which could have short-term and long-term impacts not only on covered species' habitats, but  
7 on habitat for non-covered common and sensitive species as well. The covered activities are not  
8 part of the proposed action, and their impacts are not analyzed in this EIS/EIR, with the  
9 exception of the incidental take that would be allowed as a result of the issuance of the section  
10 10(a)(1)(B) permit.

11 IMPACTS OF ISSUING THE SECTION 10(A)(1)(B) PERMIT

12 **Impact BIO-1: Issuance of the section 10(a)(1)(B) permit would authorize the incidental take**  
13 **of up to 27 covered species from implementation of both the covered activities and the**  
14 **Conservation Plan.** The description of the estimated level of incidental take associated with  
15 implementing the covered activities and the Conservation Plan is summarized for each covered  
16 and evaluation species in Table 2.1-3. A detailed description of the impact analysis methods  
17 and results is provided in the LCR MSCP HCP. The impacts of issuance of the section  
18 10(a)(1)(B) permit on each species are also summarized in Table 2.1-3 (see column entitled  
19 "Summary of Expected Outcomes").

20 Impacts to covered species resulting from the incidental take caused by the covered activities  
21 includes loss of habitats for covered species. Flow-related covered activities are estimated to  
22 affect 2,540 acres of land cover types that provide covered species habitat (2,008 acres of  
23 cottonwood-willow, 133 acres of marsh, and 399 acres of river and backwaters), while non-flow-  
24 related covered activities would affect 1,454 acres of land cover types that provide covered  
25 species habitat (134 acres of cottonwood-willow, 110 acres of marsh, 590 acres of honey  
26 mesquite III, and 620 acres of honey mesquite IV). Degradation or loss of land cover types that  
27 provide habitat for wildlife species would occur linearly along the LCR corridor over the term  
28 of the LCR MSCP. Impacts to covered species would also result from harassment and  
29 entrapment.

30 The effects of the incidental take to biological resources cannot be evaluated independently of  
31 the Conservation Plan. As shown in Table 2.1-3, the Conservation Plan would effectively offset  
32 and compensate for the effects of the incidental take that would result from both the covered  
33 activities and the implementation of the Conservation Plan. Thus, implementation of the  
34 covered activities and the Conservation Plan are not likely to negatively affect the overall  
35 populations of covered species within the LCR MSCP planning area or regionally. Therefore,  
36 impacts of issuing the section 10(a)(1)(B) permit would be *less than significant*.

37 IMPACTS OF IMPLEMENTING THE CONSERVATION PLAN

38 The Conservation Plan would establish 8,132 acres of land cover types supporting habitat for  
39 covered species, including 5,940 acres of cottonwood-willow, 1,320 acres of honey mesquite  
40 type III, 512 acres of marsh, and 360 acres of backwaters. Habitat would be established

1 primarily on agricultural lands and saltcedar areas, some of which are mixed with honey  
2 mesquite and screwbean mesquite. Impacts on covered and evaluation species from the  
3 implementation of covered activities and the Conservation Plan would be avoided, minimized,  
4 or fully mitigated by conservation measures that would maintain existing habitat, establish new  
5 habitat or enhance existing habitat, and enhance the populations of some species. Impacts on  
6 other special-status species would also be avoided or minimized to the extent practicable  
7 through the measures to protect the covered species.

8 The actions necessary to establish the desired habitats for covered species could have short-term  
9 and/or long-term effects not only on the covered species (i.e., take), but also on other sensitive  
10 or special status species; riparian vegetation, wetlands, or other sensitive natural communities;  
11 and resident or migratory fish or wildlife species. Short-term effects (e.g., physical  
12 disturbances, biological disturbances, and altered irrigation drainage) would result from  
13 construction activities, while long-term effects would result from the conversion of one land  
14 cover type to another. In general, habitat establishment actions are intended to provide long-  
15 term beneficial impacts that would offset any short-term losses. No woody riparian, marsh, or  
16 aquatic land cover types that support covered, evaluation, and other special-status species  
17 would be removed as part of habitat establishment activities. The Conservation Plan includes  
18 monitoring and evaluation to determine if the goals and objectives of the plan are being met as  
19 well as an adaptive management strategy to address any problems or failure to meet those goals  
20 and objectives.

21 The four habitat establishment concepts described in Chapter 2 would involve the conversion of  
22 agricultural lands, saltcedar, desert scrub, or other land cover type to cottonwood-willow or  
23 mesquite land cover types; the establishment of backwaters; and the establishment of marshes  
24 by providing a water source to existing topographically low areas (e.g., old river oxbows) or  
25 newly excavated areas. The impacts of these activities on biological resources and of take for  
26 covered species are addressed below, as are impacts from population enhancement measures  
27 and maintenance activities.

#### 28 IMPACTS OF CREATING HABITAT FOR COTTONWOOD-WILLOW AND HONEY MESQUITE-ASSOCIATED COVERED 29 SPECIES

30 **Impact BIO-2: The establishment of 7,260 acres of cottonwood-willow and honey mesquite**  
31 **land cover would increase the extent of cottonwood-willow riparian forest and mesquite**  
32 **woodland sensitive communities.** As described above, covered activities would remove or  
33 degrade an estimated 3,352 acres of cottonwood-willow and honey mesquite land cover types.  
34 Loss of this native vegetation, along with associated individuals of common and sensitive  
35 wildlife species and covered species, as a result of covered activities would be more than offset  
36 by creation of 7,260 acres of the same type of habitats through implementation of the  
37 Conservation Plan. This represents a *beneficial* impact for vegetation as well as for the covered  
38 and non-covered wildlife species using these habitat types. Expansion of these native plant  
39 communities would provide habitat for native species, including species whose populations  
40 have declined due to loss or degradation of habitat, and help to restore the natural ecosystems  
41 that these communities can support.

1 IMPACTS FROM CONVERSION OF AGRICULTURAL LAND TO HABITAT

2 **Impact BIO-3: Clearing, grading, planting, and site maintenance during conversion of**  
3 **agricultural lands to cottonwood-willow and/or honey mesquite land cover types would**  
4 **result in the elimination of existing low value habitat used by resident and migratory**  
5 **wildlife, removal of weedy vegetation and crops, alteration of habitat characteristics through**  
6 **changes in local hydrology and exposure of soil to erosion, and elimination or displacement**  
7 **of resident wildlife.** Establishing cottonwood-willow and honey mesquite (Type III) land  
8 cover types to compensate for losses of those types from covered activities (3,352 acres) and  
9 implementing the Conservation Plan would result in short-term (less than 1 to 5 years)  
10 disturbances and long-term alteration of vegetation and wildlife habitat. The cottonwood-  
11 willow and honey mesquite vegetation would be established in an integrated mosaic with  
12 marshes and backwaters. Short-term disturbances associated with converting agricultural land  
13 to these habitats include grading to provide topographic diversity where needed and seeding of  
14 native species. Soil disturbances would increase the potential for erosion and sediment runoff.  
15 These disturbances would occur for a period of days to months, usually within a single year.  
16 Recovery of the disturbed area (primarily vegetation) would progress over 3 or more years,  
17 depending on the land cover type and factors such as weather patterns during that time.  
18 Irrigation to establish the new plants could result in short-term alteration in site hydrology and  
19 soil moisture regimes. Impacts associated with converting agricultural land to backwaters or  
20 marshes are discussed below under **Impacts BIO-5 and BIO-6**, respectively. Long-term effects  
21 of maintenance are discussed under **Impact BIO-7**.

22 *Vegetation.* Conversion of agricultural lands to cottonwood-willow and honey mesquite plant  
23 communities would have a *less than significant impact* on existing vegetation because the plants  
24 that would be replaced are primarily non-native species (i.e., crops and weeds along farm roads  
25 and ditches). Furthermore, the amount of agricultural land to be affected represents a small  
26 amount (less than 2 percent) of that present in the planning area. Irrigation would continue, but  
27 the timing and amounts would be changed to benefit the native species being restored. Soil  
28 disturbance resulting from the vegetation restoration efforts initially would favor growth of  
29 weeds from seed present prior to the conversion. Soils would stabilize over time, thus making  
30 the disturbed area less suitable for weeds and reducing the potential for erosion and sediment  
31 transport. Weed control would be implemented as part of the Conservation Plan to reduce the  
32 seed source and competition with native species.

33 Several *beneficial impacts* on vegetation would result from the proposed action. The amount of  
34 native riparian plant communities in the planning area would be increased as described in  
35 **Impact BIO-2**. In addition, airborne dust produced by agricultural grading would be reduced,  
36 reducing the effects of dust (physical damage and reduced photosynthesis) on adjacent riparian  
37 vegetation.

38 *Common Wildlife.* Converting agricultural land to native riparian vegetation along the LCR  
39 would have short-term, *less than significant impacts* on a number of common wildlife species  
40 through temporary disturbances. Individuals of less mobile species, such as lizards, snakes,  
41 and small mammals (e.g., mice), would be lost, but the newly established plant community  
42 would be colonized by these and other common riparian species from nearby areas. More  
43 mobile species such as striped skunk, raccoon, Audubon cottontail, and coyote would move out  
44 of the disturbance area. The change in land cover type would alter the species composition and

1 abundance of individuals within a species to favor a greater diversity and a lower abundance  
2 for species adapted to human disturbance. The establishment of additional native vegetation  
3 would allow population expansion for these species, a *beneficial impact*. The level of disturbance  
4 to wildlife by agricultural workers and machinery would be reduced. In addition, the  
5 conversion of agricultural land to riparian vegetation would lessen the input of sediment, salts,  
6 nutrients, and agricultural chemicals to the river, improving water quality and aquatic habitat  
7 conditions. The establishment of riparian vegetation along an expanded portion of the river  
8 would provide increased shading, water filtration, and nutrient and pollutant uptake,  
9 improving water quality and aquatic habitat conditions downstream. Establishing native plant  
10 communities would aid in soil stabilization, a benefit for micro-organisms and invertebrates  
11 that live in the soil as well as vertebrates that burrow in the ground. Irrigation that mimics  
12 natural hydrologic regimes would also benefit native ground-dwelling species adapted to those  
13 conditions.

14 *Non-Covered Sensitive Species.* Conversion of agricultural lands to cottonwood-willow and  
15 honey mesquite land cover types could affect 31 species of non-covered sensitive bird species,  
16 (see Table 3.4-4), that use agricultural lands and irrigation ditches for foraging habitat. In  
17 addition, the burrowing owl will also use field berms and embankments as nesting habitat.  
18 Implementation of the Conservation Plan could affect burrowing owls by:

- 19 • Removing nesting habitat provided by berms, earthen embankments, and other such  
20 features that are associated with agricultural-related infrastructure that could support  
21 burrowing owl nesting burrows as a result of conversion to native habitats; and
- 22 • Disturbing nesting burrows as a result of maintaining roads, ditches, and other  
23 infrastructure in LCR MSCP conservation areas that could support nesting burrows.

24 Other sensitive mammal, reptile, amphibian, invertebrate, and plant species are not expected to  
25 use agricultural fields and would not be adversely affected by conversion of this land use to  
26 natural plant communities.

27 Conversion of agricultural lands associated with implementation of the Conservation Plan  
28 would have a *less than significant impacts* on all non-covered sensitive species. The creation of  
29 8,132 acres of covered species habitat proposed under the LCR MSCP would occur within the  
30 participating states of Arizona, Nevada, and California. Assuming that all conservation areas  
31 would be established on agricultural land, this would comprise only a small percentage, less  
32 than 2 percent of agricultural lands in the planning area would be converted in the process.  
33 Thus, individuals displaced during the conversion would have abundant suitable habitat in the  
34 vicinity.

35 In addition, the establishment of marshes and backwaters, which would be included in the  
36 integrated mosaics to be developed, would provide higher value habitat for non-covered  
37 sensitive water-associated birds (e.g., great blue heron, great egret, snowy egret, black-crowned  
38 night heron, and Clark's grebe) than that present in irrigated fields. Soil disturbance and  
39 irrigation resulting from activities to establish the new plant communities would cause short-  
40 term disturbances that would be *less than significant* and offset by the increase in native  
41 vegetation. These impacts would be *beneficial* to native species in the long term as described  
42 above for vegetation and wildlife.

1 *Covered Species.* Covered species are not expected to be present in agricultural areas and, thus,  
2 would not be affected by land cover type conversion activities.

3 *Summary.* Overall, the short-term impacts of the native vegetation establishment would be *less*  
4 *than significant* because the actions taken would not have substantial adverse effects on sensitive  
5 species, communities, or habitats due to implementation of measures to avoid or minimize  
6 effects on covered species in the Conservation Plan. These measures would also protect non-  
7 covered sensitive species, as well as common native species present in the agricultural areas to  
8 be used. In addition, voluntary "Implementation Measures," discussed below, would be used  
9 to further reduce potential, less than significant impacts to non-covered sensitive species. Long-  
10 term impacts would be *beneficial* to vegetation and both covered and non-covered sensitive  
11 species, as well as common wildlife, that use cottonwood-willow and mesquite land cover types  
12 by reestablishing a more natural ecosystem.

13 IMPACTS FROM CONVERSION OF UNDEVELOPED LAND TO HABITAT

14 **Impact BIO-4: Clearing, grading, planting, and site maintenance during conversion of**  
15 **undeveloped lands (primarily saltcedar) to cottonwood-willow and/or honey mesquite land**  
16 **cover types would result in the elimination of existing non-native vegetation and the habitat**  
17 **it provides for wildlife, short-term effects on habitat characteristics from alteration of local**  
18 **hydrology and exposure of soil to erosion, and elimination or displacement of resident**  
19 **wildlife.** As described under **Impact BIO-3**, establishing native riparian vegetation to  
20 compensate for losses of that land cover type from covered activities (3,352 acres) and  
21 implementing the Conservation Plan would result in short-term disturbances and long-term  
22 alteration of vegetation and wildlife habitat as a result of grading, removal of saltcedar, and  
23 seeding of native species as well as maintenance (e.g., irrigation) activities. Impacts associated  
24 with converting undeveloped land to backwaters or marshes are discussed below under  
25 **Impacts BIO-5 and BIO-6**, respectively. Long-term effects of maintenance are discussed under  
26 **Impact BIO-7.**

27 *Vegetation.* Conversion of saltcedar-dominated land cover to establish cottonwood-willow and  
28 honey mesquite land cover types would have *beneficial impacts* on vegetation because saltcedar  
29 is a non-native, invasive species. The conversion would only affect a relatively small proportion  
30 (less than 3 percent) of the saltcedar present in the planning area. Irrigation would occur to  
31 help establish the native species being restored. Habitat creation efforts temporarily would  
32 disturb soils, which would favor growth of weeds from seed present prior to the conversion.  
33 Soils would stabilize over time, thus making the area less suitable for weeds and reducing the  
34 potential for erosion and sediment transport. Weed control would be implemented as part of  
35 the Conservation Plan to reduce the source of seeds and competition with native species.

36 The amount of native riparian plant communities in the planning area would be increased as  
37 described in **Impact BIO-2**. Furthermore, the removal of saltcedar and its replacement by  
38 native riparian vegetation would reduce the incidence of fires and their adverse effects on  
39 native vegetation (e.g., preventing natural cycles in regeneration and increasing the potential for  
40 proliferation of weedy species), a *beneficial impact*.

41 *Common Wildlife.* Individuals of common species using the saltcedar would be displaced or lost  
42 during the conversion process, and those in adjacent areas would be disturbed by the

1 vegetation establishment activities (e.g., noise and human presence). Impacts would be *less than*  
2 *significant* because work would be scheduled, when feasible, to avoid the nesting season of  
3 covered species that may use adjacent riparian areas. This would avoid the nesting season of  
4 most, if not all, common birds as well. It is anticipated that most of the work would be  
5 scheduled outside of the breeding season. Relatively small areas of saltcedar (estimated to be  
6 less than 380 acres per year) would be removed over 25 to 30 years during the term of the LCR  
7 MSCP and would not be concentrated in one portion of the planning area, thereby minimizing  
8 the amount of habitat for common species that would be affected at any particular location and  
9 time. Soil disturbance during the conversion process would have short-term effects on micro-  
10 organisms and invertebrates that live in the soil as well as vertebrates that burrow in the ground  
11 (e.g., small mammals) or are associated with ground cover (e.g., lizards and snakes). These  
12 impacts would be *less than significant* because measures in the Conservation Plan would be  
13 implemented to rapidly stabilize soils and allow colonization by native species. Irrigation to aid  
14 in establishment of the new plant communities would have *less than significant* effects on  
15 ground-dwelling animals. The change in moisture regime would be short-term, located in  
16 relatively small areas at a time, and the locations phased over 25 to 30 years. Individuals of  
17 common wildlife species in those areas would avoid or adapt to the changed conditions. The  
18 newly established habitat would be colonized by common riparian species from nearby areas,  
19 and the establishment of additional native vegetation would likely allow population expansion  
20 for these species, a *beneficial impact* (i.e., an expansion of native species that add to the  
21 complexity and function of the ecosystem).

22 *Non-Covered Sensitive Species.* Several sensitive bird species may nest in saltcedar or saltcedar-  
23 dominated land cover types, and a few reptiles and amphibians are likely to be present. Loss of  
24 saltcedar-dominated land cover types through conversion to cottonwood-willow or honey  
25 mesquite would affect individuals of species using those areas by causing them leave the  
26 disturbance area, to at least temporarily, and by causing mortality (directly or indirectly).  
27 Short-lived sensitive species generally have high reproductive and colonization potentials that  
28 would aid in rapid recovery from soil and vegetation disturbance impacts. Impacts on non-  
29 covered sensitive species would be *less than significant* for the following reasons. The total  
30 amount of the saltcedar-dominated land cover types in the planning area is large relative to the  
31 amount potentially lost (about 3 percent) so that other similar habitat would be available. The  
32 Conservation Plan would be phased in over 25 to 30 years and would not be concentrated in  
33 one portion of the planning area. The maximum amount of habitat to be developed per year is  
34 estimated to be 300 acres for cottonwood-willow and 80 acres per year for honey mesquite (see  
35 Tables 2.1-6a and b). Implementation of Conservation Plan measures to minimize the amount  
36 of construction work for site conversion during the breeding season of most birds also reduces  
37 the potential for impacts. This combination of factors minimizes the potential for adverse  
38 effects of the conversion on non-covered sensitive species.

39 Short-term effects of soil disturbance and irrigation resulting from activities to establish the new  
40 plant communities would be *less than significant* and, in the long-term, *beneficial* to native  
41 sensitive species as described above for vegetation and common wildlife.

42 *Covered Species.* Cottonwood-willow and honey mesquite (Type III) would be established in an  
43 integrated mosaic with backwaters and marshes where undeveloped lands are converted to  
44 cottonwood-willow habitat or within existing degraded riparian areas. Riparian woodland

1 establishment activities involving removal of saltcedar and planting of mesquite and  
2 understory species would cause short-term disturbances in the new habitat as well as in the  
3 adjacent areas, with soil disturbance only in the new areas. Two covered bird species, Sonoran  
4 yellow warbler and summer tanager, are known to nest in saltcedar. Both species are  
5 uncommon in the planning area, making the probability of any being present at the specific  
6 locations being converted unlikely. Impacts on covered species would be *less than significant*  
7 due to the implementation of measures to avoid and minimize effects on these species as  
8 described in the Conservation Plan. For example, existing native riparian trees would be  
9 avoided, only a portion of the saltcedar would be removed from the planning area, and BMPs  
10 would be used to prevent erosion and sediment runoff from disturbed soils. In addition,  
11 phasing of the proposed action as described above under non-covered sensitive species, would  
12 minimize the potential for effects on covered species. Irrigation to establish the new plants and  
13 to mimic hydrologic conditions that support this habitat type would not affect covered species  
14 in the short term because none would be present as the vegetation is being established. Impacts  
15 in the long-term would be *beneficial* to covered species by helping to establish and maintain the  
16 native habitat.

17 *Summary.* Overall, impacts on vegetation, wildlife, non-covered sensitive species, and covered  
18 species from construction activities would be *less than significant*. Nonetheless, voluntary  
19 Implementation Measures, discussed below, would be used to reduce potential, less than  
20 significant impacts to non-covered sensitive species. Long-term impacts from establishing  
21 native riparian plant communities would be *beneficial* to vegetation (see **Impact BIO-2**) and  
22 many wildlife species, including both covered and non-covered sensitive species, that use  
23 saltcedar but whose native habitat is provided by cottonwood-willow and/or honey mesquite.

24 IMPACTS ASSOCIATED WITH ESTABLISHMENT OF MARSHES

25 **Impact BIO-5: Clearing, grading, planting, and site maintenance during establishment of**  
26 **marsh would result in the long-term elimination of existing vegetation and the habitat it**  
27 **provides for wildlife, alteration of habitat conditions through changes in local hydrology and**  
28 **exposure of soil to erosion, and elimination or displacement of resident wildlife.** Covered  
29 activities would affect 243 acres of marsh along with its associated wildlife. Implementing the  
30 Conservation Plan would result in establishing 512 acres of new marsh, which would involve  
31 excavation of uplands, such as agricultural lands and saltcedar, and providing a water source,  
32 followed by planting of emergent vegetation; or providing a water source to an existing  
33 topographically low area, such as an old river oxbow, and planting emergent vegetation.  
34 Construction of new marshes is more likely to occur than restoration of existing marshes, and  
35 both would likely involve major reconstruction activities. At some locations, such work could  
36 occur immediately adjacent to existing marshes in order to expand their size. The establishment  
37 activities would occur in the same land cover types (agricultural fields or saltcedar stands)  
38 discussed in **Impact BIO-3** and **BIO-4**, but much smaller areas would be affected at any one  
39 time (20 to 40 acres per year). Soil disturbance associated with clearing and grading would be  
40 in topographically low areas, and erosion and sediment runoff would not affect adjacent areas.  
41 Impacts on vegetation, wildlife, non-covered sensitive species, and covered species would be  
42 similar to those described in the above impact analyses. The new marsh would be colonized by  
43 wildlife species adapted to that land cover type. Loss of upland land cover types would be  
44 permanent but a *less than significant impact* because the habitat value for the area lost would be

1 low and the size affected would be small. No loss of sensitive vegetation would occur. Where  
2 establishing new marsh occurs adjacent to an existing marsh, impacts on residents of the  
3 existing marsh would be minimized through measures in the Conservation Plan implemented  
4 to minimize effects on covered species. These measures would also reduce the potential for  
5 impacts on vegetation and non-covered species. The value of the habitat created would be  
6 equal to or greater than the value of that lost, resulting in replacement or a net gain in habitat  
7 value, which would be a *beneficial impact*, and mitigation for impacts of covered activities would  
8 be provided as planned.

9 *Summary.* The overall impacts on vegetation, wildlife, non-covered sensitive species, and  
10 covered species would be *less than significant* in the short term and *beneficial* in the long term by  
11 providing marshes mixed within native riparian land cover types (i.e., more vegetation and  
12 habitat complexity to support a diversity of native animal species, including sensitive species).  
13 Nonetheless, voluntary Implementation Measures, discussed below, would be used to reduce  
14 potential, less than significant impacts to non-covered sensitive species.

#### 15 IMPACTS ASSOCIATED WITH THE ESTABLISHMENT OF BACKWATERS

16 **Impact BIO-6: Clearing, grading, and site maintenance during establishment of backwaters**  
17 **would result in the long-term elimination of existing vegetation and the habitat it provides**  
18 **for wildlife, alteration of habitat conditions through changes in local hydrology and**  
19 **exposure of soil to erosion, and elimination or displacement of resident wildlife.** Covered  
20 activities would affect 399 acres of backwater and river land cover types. Backwaters (360 acres)  
21 connected to and disconnected from the river or reservoir would be established to provide  
22 locations for release of reared covered fish species as part of the Conservation Plan. The  
23 backwaters not connected to the river or reservoirs would also be isolated from the non-native  
24 fish populations in the river and reservoirs. Water levels would be maintained, and vegetation  
25 would be controlled through design (depth) and other means. In some cases, the possibility  
26 exists for establishment activities to occur in existing backwaters in order to enlarge the area  
27 and increase its habitat values. All such activities would be undertaken using avoidance and  
28 minimization measures in the Conservation Plan.

29 *Vegetation.* Conversion of agricultural land or saltcedar-dominated areas to backwaters would  
30 have *less than significant impacts* on vegetation as described in **Impacts BIO-3 and BIO-4**.  
31 Because soil disturbance associated with clearing and grading would be in topographically low  
32 areas, erosion and sediment runoff would not affect plants in adjacent areas. The temporary  
33 loss or disturbance of riparian or marsh vegetation associated with existing backwaters,  
34 however, would represent a short-term, *less than significant impact* to wetlands that is addressed  
35 under **Impact BIO-9**. This impact would be more than offset by the increase in habitat value  
36 resulting from the creation of backwaters and would require no mitigation. Providing water for  
37 maintenance of the backwaters would ensure the continued presence of high value habitat for  
38 the aquatic species associated with backwaters.

39 *Common Wildlife.* Excavation, vegetation planting, and other establishment activities in areas  
40 that were previously agricultural lands or saltcedar-dominated areas would have short-term  
41 effects on common wildlife populations currently present that would be *less than significant* as  
42 described in **Impacts BIO-3 and BIO-4**. Loss of upland vegetation in areas excavated would be  
43 permanent but would result in a *less than significant impact* because the habitat value for the area

1 lost would be low and the size affected at any one location would be small. Disturbance of  
2 existing backwaters during enlargement activities would cause temporary impacts on animal  
3 species present. The value of the habitat created would be equal to or greater than the value of  
4 that lost, resulting in replacement or a net gain in habitat value, and mitigation for impacts of  
5 covered activities would be provided as planned. Creation of backwaters would be a *beneficial*  
6 *impact* for common wildlife that use such areas.

7 *Non-Covered Sensitive Species.* Impacts on non-covered sensitive species would generally be *less*  
8 *than significant*, as described under **Impact BIO-3** and **BIO-4** for backwater establishment in  
9 agricultural lands or saltcedar-dominated areas, although due to the much smaller size of  
10 backwaters to be established, impacts would be lessened. The new backwaters would have  
11 *beneficial impacts* as described above for common wildlife. Temporary disturbances to non-  
12 covered sensitive species during enlargement of existing backwaters would have the potential  
13 for *significant impacts that are mitigable to less than significant* through the implementation of  
14 **Mitigation Measure BIO-1**, particularly for birds that require backwater-type habitats, if a  
15 substantial number of individuals or breeding were affected. Measures to protect covered  
16 species would avoid or minimize impacts on non-covered species in most, but not all,  
17 situations. For example, breeding or aggregations of some species may not be avoided if they  
18 are not known to be present. The potential for significant impacts would be site-specific and  
19 depend on the timing of the work.

20 *Covered Species.* Impacts on any covered species present at the backwater establishment sites  
21 would be temporary and *less than significant* due to implementation of measures to minimize  
22 effects on these species as described in the Conservation Plan. However, if the breeding season  
23 or nursery areas of some species, such as fish, cannot be avoided, impacts could be *significant*  
24 but offset by the amount of backwater area established so that additional mitigation would not  
25 be required. Providing water for the created or enhanced backwater sites would result in a  
26 *beneficial impact* to covered species by maintaining the availability of this habitat.

27 *Summary.* Overall, long-term impacts on vegetation, common wildlife, non-covered sensitive  
28 species, and covered species would be *beneficial* due to implementation of protection measures  
29 described in the Conservation Plan and development of habitat diversity (i.e., backwaters  
30 within native riparian land cover types). In the short term, impacts of establishing backwaters  
31 where small backwaters already exist would have the potential to have *less than significant* or  
32 *significant but mitigable to less than significant* impacts on non-covered sensitive species.  
33 Voluntary Implementation Measures, discussed below, would be used to reduce potential, less  
34 than significant impacts to non-covered sensitive species.

#### 35 IMPACTS OF MAINTENANCE ACTIVITIES

36 **Impact BIO-7: Maintenance of established habitats would result in the removal of invasive**  
37 **non-native vegetation, alteration of habitat characteristics through changes in local**  
38 **hydrology, and short-term elimination or displacement of resident wildlife.** A number of  
39 maintenance activities would be necessary to ensure that the established habitats retain their  
40 value to covered species. These include irrigation of some cottonwood-willow and honey  
41 mesquite habitats, burning in marshes, and removal of saltcedar and giant cane (*Arundo donax*)  
42 that invade these areas. Maintenance of infrastructure in converted agricultural lands would  
43 also affect species using these areas.

1 *Vegetation.* Periodic removal of saltcedar and giant cane as well as burning in marshes would  
2 cause temporary loss or disturbance to vegetation in small areas where such activities occur.  
3 Removal of non-native invasive species such as saltcedar and giant cane as they colonize the  
4 established habitat areas would be *beneficial* to vegetation of the area by helping to maintain the  
5 native species composition of the plant community. Flood irrigation of cottonwood-willow  
6 areas in spring, early summer, and later in the season, as well as irrigation to maintain moist  
7 soil during the southwestern willow flycatcher breeding season (in habitat for that species)  
8 could result in long-term alteration in site hydrology. Irrigation to maintain honey mesquite  
9 could also cause long-term alteration of the site hydrology. Changes in hydrology would affect  
10 plant growth for target species as well as all other species, including non-native weedy species.  
11 Irrigation could result in a more dense understory of grasses, herbs, and shrubs depending on  
12 the amount and timing of the irrigation as well as the duration and extent of moisture near the  
13 soil surface. Impacts on vegetation other than the target tree species could range from *less than*  
14 *significant* to *beneficial*. The irrigation would be *beneficial* for the target species by assisting their  
15 growth. Seral stage management for specific plant species and community structure (e.g.,  
16 burning in marshes and tree trimming or minor amounts of clearing in riparian woodlands)  
17 would also cause disturbances at intervals over the long term. These disturbances would be *less*  
18 *than significant* for target plant communities because the disturbances necessary to maintain the  
19 seral stage would be of short duration and at intervals with no loss of native plant community.  
20 Periodic burning and other management methods to maintain marshes would have  
21 intermittent, short-term (generally less than 1 year) *less than significant* impacts on marsh  
22 vegetation. These measures would control marsh vegetative growth but would not eliminate it.  
23 Vegetation would begin to grow again within one year but would not reach densities that  
24 require repeated maintenance for several years.

25 *Common Wildlife.* Maintenance activities would result in temporary and intermittent  
26 disturbances to wildlife in and adjacent to the areas where such activities occur. Removal of  
27 saltcedar and giant cane as well as burning of marsh vegetation would introduce noise and  
28 human presence during the removal process. Burning of marsh vegetation would also cause a  
29 temporary alteration of the habitat characteristics resulting in more open water and less dense  
30 vegetation until the vegetation grows back. Marsh residents (primarily birds) that require  
31 dense vegetation cover would be displaced to areas with such cover, while species that use  
32 open water would return after the maintenance activities were complete. Some individuals of  
33 wildlife species could be lost as a result of maintenance activities, but most would be expected  
34 to leave the marsh when it is burned or otherwise manipulated. Irrigation would affect wildlife,  
35 particularly reptiles, amphibians, and invertebrates, by altering habitat characteristics to be  
36 more favorable for species preferring higher moisture and less favorable for those preferring  
37 drier habitats. Changes in understory vegetation could also influence the abundance and  
38 species composition of common wildlife species. Maintenance of earthen berms associated with  
39 roads, canals, or other infrastructure would periodically disturb these areas and the organisms  
40 residing there. Impacts of maintenance activities on common wildlife would generally be *less*  
41 *than significant* in the short term and *beneficial* in the long term, assuming that maintenance  
42 activities such as burning would not occur every year. The disturbances associated with  
43 maintenance activities would occur in relatively small areas and be of short duration so that few  
44 individuals of common species would be affected at any one time. Timing of these activities to  
45 minimize impacts on covered species, including breeding, would also minimize effects on

1 common species. Maintenance would ensure that high value habitat remains for use by a  
2 variety of wildlife species.

3 *Non-Covered Sensitive Species.* Effects of management activities on non-covered sensitive species  
4 would be similar to those described for common wildlife. In addition, marsh management  
5 actions implemented in conservation areas within California would be designed to avoid  
6 mortality of fully protected species. Impacts of maintenance activities on non-covered sensitive  
7 species would be *less than significant* because measures to minimize effects on covered species  
8 that could be in the same area would also protect the non-covered species.

9 *Covered Species.* Removal of saltcedar and giant cane would have the potential to disturb  
10 covered species through noise and human presence as described for wildlife. Periodic burning  
11 and other management methods to maintain the marsh would have intermittent, short-term  
12 (less than 1 year) impacts on covered species and would maintain habitat preferred by these  
13 species. Maintenance activities, other than water level control, would have intermittent effects  
14 on species using backwaters. Maintenance activities would have *less than significant impacts* on  
15 covered species because all such activities would be planned and timed to avoid or minimize  
16 impacts on covered species. This includes avoiding the breeding season for covered species,  
17 such as the Yuma clapper rail, to the maximum extent feasible. Managing water levels in  
18 marshes for selected species (e.g., Yuma clapper rail and California black rail) would have  
19 *beneficial* impacts on those species, as well as other marsh species of plants and animals.  
20 Managing water levels would result in little habitat disturbance and would help maintain  
21 marsh vegetation and preferred habitat conditions, such as water depth, for covered species.

22 *Summary.* Overall, the long-term impacts of maintenance activities would be *less than significant*  
23 or *beneficial* for biological resources. Short-term impacts of maintenance activities would be *less*  
24 *than significant* because the actions taken would not have substantial adverse effects on covered  
25 species or their habitats due to implementation of measures to minimize or avoid such effects.  
26 Take of covered species would be evaluated through monitoring and analysis of the data  
27 collected as described in the Conservation Plan. The frequency and extent of maintenance  
28 activities would be regulated through adaptive management so that take levels established in  
29 the 10(a)(1)(B) permit are not exceeded. These measures would also minimize impacts on other  
30 species present. In addition, voluntary Implementation Measures, discussed below, would be  
31 used to further reduce potential, less than significant impacts to non-covered sensitive species.

#### 32 IMPACTS OF POPULATION ENHANCEMENT MEASURES

33 **Impact BIO-8: Population enhancement activities for covered fish and bird species could**  
34 **adversely affect existing individuals or populations of covered or sensitive species.**  
35 Population enhancement activities include rearing and release of covered fish (bonytail and  
36 razorback sucker) and control of predatory non-native aquatic species (primarily fish) before  
37 their release. Population enhancement activities for covered birds include installation of nest  
38 boxes for cavity nesting birds (e.g., elf owl, gilded flicker, and Gila woodpecker) and control of  
39 brown-head cowbird nest parasitism.

40 *Vegetation.* Population enhancement for covered fish and bird species would have essentially  
41 no impacts on vegetation.

1 *Common Wildlife.* Release of covered fish species raised in a hatchery to habitats established for  
2 rearing them would alter the ecology of the aquatic habitat through the foraging activities of  
3 these fish as well as provide prey for predatory fish, reptiles, and amphibians. The bonytail  
4 feeds primarily on insects, while the razorback sucker feeds on the bottom eating vegetation  
5 and bottom ooze. Consequently, foraging by the stocked covered fish primarily would affect  
6 lower trophic levels. This would cause some competition with the non-native and non-covered  
7 native fish that feed on these same resources but would have essentially no effect on the  
8 populations of either type of fish through direct predation by the covered species. Terrestrial  
9 ecology would also be affected to the extent that the stocked covered fish provide prey for  
10 piscivorous (fish-eating) birds. How much benefit the birds receive would depend on the  
11 number of fish stocked as well as their susceptibility to predation at each life stage by birds.  
12 The benefits are likely to be minor. Establishment of more natural aquatic community  
13 interactions would also benefit other native aquatic species (both invertebrates and vertebrates).  
14 Removal of non-native piscivorous fish and non-native amphibians before release of the  
15 covered fish has the potential to incidentally and adversely affect native (non-covered) aquatic  
16 invertebrates, reptiles, amphibians, and fish that are also present in the treatment areas through  
17 habitat disturbances, stress, or direct mortality during the non-native removal process. BMPs  
18 and all applicable permits would be followed for predator control to minimize such effects,  
19 resulting in *less than significant* impacts.

20 Installation of nest boxes and control of brown-headed cowbird nest parasitism for covered bird  
21 species would result in temporary and localized disturbances in wildlife habitat. These  
22 disturbances would have *less than significant* impacts on common wildlife due to their  
23 intermittent occurrence, limited area of disturbance, and implementation of measures to  
24 minimize impacts on covered species that would also protect common wildlife.

25 *Non-Covered Sensitive Species.* Several non-covered sensitive bird species prey upon fish and  
26 could potentially benefit from foraging on the stocked covered fish species. Those piscivorous  
27 bird species that are uncommon to rare visitors would receive negligible benefits while common  
28 species (e.g., double-crested cormorant, belted kingfisher) could receive minor benefits.  
29 Installation of nest boxes and control of brown-headed cowbird nest parasitism for covered  
30 species would cause a temporary disturbance in the habitat. Impacts on non-covered sensitive  
31 species would be *less than significant* because the measures to reduce impacts on covered species  
32 would also protect non-covered species and the area of disturbance would be small and of short  
33 duration.

34 *Covered Species.* Establishment of more natural aquatic community interactions would be  
35 *beneficial* to the covered species by providing habitat more like that in which they evolved.  
36 Although non-native predatory species removal would occur before the covered fish species are  
37 stocked, such efforts are unlikely to eradicate all of the non-natives, particularly in riverine or  
38 reservoir habitats where isolation of an area for covered species is not feasible. Loss of some  
39 stocked covered fish due to predation by non-native species would at least partially reduce the  
40 benefits of the stocking. Incidental capture of some individuals of the stocked fish by fishermen  
41 angling for non-native game fish would also be an adverse effect on the stocked fish  
42 populations. Although loss of stocked covered species to predation by non-natives and to  
43 fishermen would have an adverse effect on the stocked fish populations, this would not be an  
44 impact of the proposed action. In the most likely case, predator removal prior to stocking

1 should reduce predation losses, and fishermen are not likely to target these species, which are  
2 not prized game fish. Overall, the stocking is expected to *benefit* the covered fish species.  
3 Installation of nesting boxes in riparian woodlands and cowbird control activities would result  
4 in a temporary disturbance in the habitat due to human presence and noise associated with the  
5 activity. Use of avoidance and minimization measures in the Conservation Plan would result in  
6 *less than significant* impacts on covered species. These actions would *benefit* the bird species in  
7 the long term by increasing nesting habitat and reproductive success.

8 *Summary.* Overall, long-term impacts on covered species would be *beneficial*, while short-term  
9 impacts resulting from disturbances due to enhancement activities would be *less than significant*.  
10 Nonetheless, voluntary Implementation Measures, discussed below, would be used to reduce  
11 potential, less than significant impacts to non-covered sensitive species.

12 IMPACTS ON WETLANDS AND WATERS OF THE U.S.

13 **Impact BIO-9: Native land cover type establishment and maintenance could temporarily**  
14 **affect wetlands and waters of the U.S.** To establish habitat mosaics, marsh, backwaters,  
15 cottonwood-willow, and honey mesquite land cover may be established or enhanced  
16 immediately adjacent to existing wetlands and waters protected under section 404 of the CWA.  
17 Enhancement of existing backwaters would require activities within wetlands and waters of the  
18 U.S., while expansion of marshes by excavation of immediately adjacent uplands would place  
19 activities next to wetlands or waters of the U.S. Consequently, land cover type establishment-  
20 related activities (e.g., grading) could result in temporary disturbances to adjacent wetlands and  
21 waters and to their associated vegetation and wildlife. Enhancement/enlargement activities in  
22 existing backwaters would temporarily disturb wetlands and waters of the U.S. and their  
23 associated vegetation and wildlife (see **Impact BIO-6**). Future actions to maintain established  
24 marshes and backwaters (e.g., dredging, burning) could have similar impacts on wetlands and  
25 waters at intervals (see **Impact BIO-7**). Any activities in wetlands and waters of the U.S. would  
26 be conducted in accordance with all applicable permits for such activities on a site-specific  
27 basis. Therefore, the temporary impacts associated with backwater enhancement would be *less*  
28 *than significant*.

29 *Summary.* Overall, long-term *beneficial impacts* would offset the temporary, *less than significant*  
30 *impacts*.

31 *Implementation Measures*

32 The following Implementation Measures would, to the extent practicable, be employed to avoid  
33 and minimize potential impacts on non-covered sensitive species that could be associated with  
34 implementation of the LCR MSCP conservation measures. While not required to mitigate any  
35 identified significant impacts, these measures would be implemented on a voluntary basis to  
36 reduce potentially adverse impacts to non-covered sensitive species resulting from  
37 implementation of the Conservation Plan.

38 **IM-1: To the extent practicable, avoid and minimize impacts of implementing the LCR**  
39 **MSCP Conservation Plan on non-covered sensitive species.** To the extent practicable,  
40 establishment and management of LCR MSCP-created habitats would avoid removal of existing  
41 cottonwood-willow stands, honey mesquite bosques, marsh, and backwaters to avoid and

1 minimize impacts on habitat they provide for sensitive species. Temporary disturbance of  
2 sensitive species habitats, however, may be associated with habitat creation and subsequent  
3 maintenance activities (e.g., controlled burning in marshes and removal of trees to maintain  
4 succession objectives). LCR MSCP conservation measures that could result in such temporary  
5 disturbances would, to the extent practicable, be designed and implemented to avoid or  
6 minimize the potential for disturbance.

7 **IM-2: To the extent practicable, avoid disturbance to non-covered sensitive species'**  
8 **important habitat areas.** Lands under consideration for acquisition as conservation areas  
9 would be surveyed to determine if sensitive species habitats (e.g., high density use areas) are  
10 present. If present, important habitat areas would be delineated and, to the extent practicable  
11 and consistent with LCR MSCP biological goals and objectives, LCR MSCP conservation areas  
12 would be designed to avoid removal of the important habitats.

13 **IM-3: To the extent practicable, avoid and minimize disturbance of non-covered sensitive**  
14 **species during the breeding season.** To the extent practicable, activities associated with  
15 establishment and management of conservation areas would not be implemented during the  
16 breeding season of sensitive species that are present in conservation areas to prevent injury or  
17 mortality of eggs and young birds unable to avoid these activities.

#### 18 *Mitigation Measures*

19 **BIO-1** Conduct site-specific surveys for non-covered sensitive species during selection of land  
20 cover type establishment or enhancement (e.g., existing backwaters) areas and, if any are  
21 found, then implement measures appropriate for the specific site and species to avoid or  
22 minimize impacts to the extent feasible without causing impacts on covered species.  
23 These may include measures specified in the Conservation Plan to avoid or minimize  
24 potential effects on covered species (e.g., scheduling to avoid breeding times). (*Addresses*  
25 *Impact BIO-6*)

#### 26 *Residual Impacts*

27 Residual impacts of **Impact BIO-6** would be *less than significant* with implementation of  
28 **Mitigation Measure BIO-1** since the Conservation Plan contains adequate measures to avoid or  
29 minimize impacts on non-covered sensitive species, as well as covered species.

#### 30 **3.4.2.2 Alternative 2: No Action Alternative**

31 Under the no action alternative, it is likely that conservation measures similar to those included  
32 in the proposed action would be implemented because compliance with the ESA still would be  
33 required for the covered activities, although some conservation could occur in the off-site  
34 conservation areas (as described in section 3.4.2.4 below), as well as along the LCR. **Impacts**  
35 **BIO-2 through BIO-9** generally apply to this alternative since it is likely that conservation  
36 measures similar to those included in the proposed action would be implemented. **Impacts**  
37 **BIO-10 and BIO-11**, discussed in section 3.4.2.4, also would apply because some conservation  
38 could occur along the Virgin and Muddy rivers and could affect native fish species. Under this  
39 alternative, compliance and permit requirements would be implemented on a case-by-case  
40 basis, unlike the proposed action. The expected differences between this alternative and the

1 proposed action, in addition to those impacts related to native fish along the Virgin and Muddy  
2 rivers, are as follows:

- 3 • The fund for projects to protect and maintain existing native habitat would not be  
4 provided; thus, there likely would be a reduction in the overall availability of habitat for  
5 all sensitive species along the LCR due to a loss of habitat that would have been  
6 preventable through the funding of pending projects.
- 7 • Implementing individual project mitigation programs would not be likely to provide the  
8 regional wildfire suppression and law enforcement funding proposed in the  
9 Conservation Plan, which would result in less protection for habitat for all sensitive  
10 species.
- 11 • The absence of coordinated monitoring and adaptive management among individual  
12 mitigation programs would create more uncertainty in the success of habitat  
13 establishment and maintenance, which would likely reduce the benefits to covered  
14 species.
- 15 • The increased number and reduced size of mitigation sites that would result from  
16 individual projects would have reduced benefits for species due to limitations on site  
17 design criteria, such as inadequate patch sizes to meet territorial needs of species,  
18 increased edge effects, and inability to develop integrated mosaics of habitat to provide  
19 all of the constituent elements of each species' habitat. This primarily would reduce the  
20 benefits to the bird species that use the cottonwood-willow and honey mesquite habitat  
21 types, but also could affect marsh birds.
- 22 • The smaller size of mitigation sites required as mitigation for individual projects would  
23 result in limitations on site selection criteria and would likely cause the mitigation to be  
24 located in more developed areas where land has been subdivided. Site selection would  
25 be focused more on the proximity to the implementing entities' facilities and less on  
26 proximity to existing land cover types that provide habitat for covered species or other  
27 mitigation sites. This would reduce the benefits provided to the covered species,  
28 particularly bird species.
- 29 • The establishment of a larger number of smaller-sized mitigation projects would result  
30 in increased need for infrastructure (access roads and irrigation pipelines/canals and  
31 pump facilities), which would likely cause additional air quality and noise impacts from  
32 maintenance and operations, as well as physical disturbances to species from these  
33 activities. This would increase adverse impacts on all terrestrial sensitive species.

#### 34 *Mitigation Measures*

35 Mitigation measures would be developed as appropriate in the course of project-specific  
36 environmental reviews. If significant impacts are identified, mitigation measures similar to  
37 those identified in this EIS/EIR (**Mitigation Measures BIO-1 and BIO-2**) could be  
38 implemented. Developing and implementing such mitigation measures is outside the authority  
39 of the lead agencies and is beyond the scope of this EIS/EIR.

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1 *Residual Impacts*

2 Residual impacts would be *less than significant* because mitigation measures are available that  
3 would reduce or avoid significant impacts to biological resources.

4 **3.4.2.3 Alternative 3: Listed Species Only**

5 **Impacts BIO-2 through BIO-9** apply to this alternative. This alternative would provide  
6 coverage only for those species listed under the ESA, and would differ from the proposed  
7 action in that no honey mesquite and less acreage of cottonwood-willow (4,455 acres) and  
8 marsh (382 acres) land cover would need to be established to provide covered species habitat.  
9 The ecosystem-wide benefits of establishing these habitats would be incrementally less than  
10 those of the proposed Conservation Plan, although still they would still occur. All impact  
11 avoidance and minimization measures that are part of the Conservation Plan would apply to  
12 this alternative.

13 *Mitigation Measures*

14 **Mitigation Measure BIO-1** applies to this alternative.

15 *Residual Impacts*

16 Residual impacts would be *less than significant* since the Conservation Plan contains adequate  
17 measures to avoid or minimize impacts on non-covered species, as well as covered species,  
18 impacts on native species would be minimized and populations would be retained in the  
19 backwaters, and the wetlands disturbed or lost would be replaced at a ratio that offsets the  
20 temporal loss.

21 **3.4.2.4 Alternative 4: Off-Site Conservation**

22 As noted in section 3.9, Hydrology, a hydraulic connection exists between flow in the Bill  
23 Williams River and groundwater in the alluvium along the river. The establishment of land  
24 cover types that provide new habitat for covered species along the Bill Williams River on  
25 existing agricultural lands may result in a change in groundwater flow availability for existing  
26 land cover types downstream. The extent of change in groundwater flow would be dependent  
27 on the amount of water used to establish the new vegetation versus what is currently used for  
28 the agricultural operations. As described in section 2.1.4.2, the use of existing appropriative  
29 water rights for LCR MSCP conservation projects ensures that the water use is in compliance  
30 with Arizona law, under which the Bill Williams River is fully appropriated. Through the use  
31 of water from these sources, implementation of the Conservation Plan would not increase the  
32 amount of water used from the Bill Williams River. Irrigating newly developed land cover  
33 types to provide habitat for covered species in this off-site conservation area could, however,  
34 result in a continuation of unquantified adverse impacts on groundwater flow to the existing  
35 habitats on the Bill Williams River NWR resulting from the ongoing agricultural operations if  
36 the new habitat require a similar amount of water as the ongoing operations.

37 **Impacts BIO-2 through BIO-9** would generally apply to Alternative 4, although the locations of  
38 most beneficial and adverse effects would differ. As described in section 2.1.4, Alternative 4

1 includes the same measures that are part of the proposed action, although habitat establishment  
2 and enhancement measures (with the exception of those relating to fish) would occur at  
3 locations to be determined along the lower Virgin and Muddy, lower Bill Williams, and lower  
4 Gila rivers. These measures would be undertaken in areas that are of low biological value and  
5 not likely to be currently occupied by covered species as described in the Conservation Plan.  
6 The impacts of implementing components of the Conservation Plan at these locations would be  
7 similar to those of the proposed action but may be lower in cases where covered species are not  
8 present. Impacts on non-covered sensitive species, however, would likely be similar. Habitat  
9 maintenance and certain types of conservation actions would continue along the LCR mainstem  
10 as identified in the Conservation Plan.

11 **Impact BIO-10: Land cover type establishment and maintenance activities could result in**  
12 **periodic short-term impacts on sensitive and common native fishes inhabiting the Virgin**  
13 **and Muddy rivers.** Land cover type establishment/enhancement- and maintenance-related  
14 activities would likely involve operation of equipment in or near channels occupied by sensitive  
15 and common native fish. These activities would result in short-term harassment of individuals  
16 present in or near construction areas. Operation of equipment to install or improve irrigation-  
17 related infrastructure in or near channels could also affect individuals by releasing sediments,  
18 temporarily reducing water quality and increasing turbidity. Impacts on non-covered sensitive  
19 species, such as the Virgin River spinedace, would depend on the specific location and type of  
20 activities conducted for vegetation establishment. These impacts would be *less than significant*  
21 because they would be of short duration, would occur infrequently over the term of the LCR  
22 MSCP, and would be minimized through implementation of BMPs to minimize effects on water  
23 quality and turbidity. In addition, since the Federally listed as endangered Moapa dace,  
24 woundfin, and the Virgin River population of the Virgin River chub are not addressed in the  
25 LCR MSCP HCP, implementation of conservation measures that could affect these species  
26 would require additional ESA compliance. Impacts on those three species would be ensured to  
27 remain *less than significant* as a result of the terms and conditions that would be part of the BO(s)  
28 issued by the Service.

29 **Impact BIO-11: Construction to establish/enhance native land cover types could result in the**  
30 **long-term loss or degradation of sensitive native fish habitats in the Virgin and Muddy**  
31 **rivers.** Sensitive native fish habitats could be lost or degraded if the establishment of land cover  
32 types and associated infrastructure results in long-term modification of river channels or flow  
33 conditions. If this were to occur, the effects on fish habitat would be a *significant impact but*  
34 *mitigable* through the implementation of **Mitigation Measure BIO-2**, because restoration  
35 activities would be sited to avoid impacts to covered species and impacts of restoration  
36 activities would not increase impacts of existing baseline conditions (e.g., water diversions).  
37 Because the Federally listed as endangered Moapa dace, woundfin, and the Virgin River  
38 population of the Virgin River chub are not addressed in the Conservation Plan,  
39 implementation of proposed conservation measures that could affect these species would  
40 require additional ESA compliance before the actions could be implemented.

41 *Mitigation Measures*

42 **Mitigation Measure BIO-1** applies to this alternative.

1 **BIO-2** Design site-specific land cover type establishment plans to avoid and minimize potential  
2 effects on sensitive native fish habitats along the Virgin and Muddy rivers. Preparation  
3 of the design plans shall be coordinated with and approved by the Service as part of  
4 section 7 consultation. If appropriate, design plans shall include measures to rehabilitate  
5 any affected habitat. (*Addresses Impact BIO-10*)

6 *Residual Impacts*

7 Residual impacts from **Impact BIO-6** after the implementation of **Mitigation Measure BIO-1**  
8 would be *less than significant* since the Conservation Plan contains adequate measures to avoid  
9 or minimize impacts on non-covered species, as well as covered species; impacts on native  
10 species would be minimized and populations would be retained in the backwaters; and the  
11 wetlands disturbed or lost would be replaced at a ratio that offsets the temporal loss.  
12 **Mitigation Measure BIO-2** would reduce **Impact BIO-11** so that residual impacts would be *less*  
13 *than significant* because avoidance/minimization measures and rehabilitation of habitat would  
14 be part of the ESA consultation, which would ensure that restoration activities would be sited to  
15 avoid impacts to covered species and that impacts of restoration activities would not increase  
16 impacts of existing baseline conditions (e.g., water diversions).

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1    **3.5        CULTURAL RESOURCES**

2    This section addresses potential impacts to cultural resources from implementation of the  
3    proposed Conservation Plan and alternatives. Cultural resources include, but are not limited to,  
4    prehistoric and historic sites, districts, buildings, structures, objects, etc., of importance to the  
5    study or appreciation of history, archaeology, architecture, other scientific disciplines, and/or  
6    that are valued by a cultural group or community.

7    Impacts may be direct or indirect. Direct impacts are those ground-disturbing activities that are  
8    directly associated with the implementation of the proposed action, including vegetation  
9    removal, revegetation, and periodic vegetation control, grading and contouring, trenching,  
10   dredging, and other land modifications associated with conservation area establishment,  
11   upgrading of existing infrastructure, and construction and maintenance of new infrastructure  
12   such as above-ground distribution canals, side channels, swales, berms, irrigation systems, and  
13   fish production and field facilities. Other elements that can directly affect cultural resources  
14   include, for example, construction and use of staging areas, access roads, borrow pits, dredge  
15   disposal sites, and installation of barriers, covers, shields and other devices to control erosion  
16   and ensure that construction materials, equipment, and contaminants/pollutants do not enter  
17   watercourses. Indirect impacts are here defined as bank erosion and other natural land-  
18   disturbing processes that may inadvertently result from the functioning of the new and  
19   improved conservation areas.

20   **Federal Regulations**

21   Passage of the National Historic Preservation Act (NHPA) in 1966 established the Federal  
22   historic preservation program and made it the policy of the Federal government, in partnership  
23   with the states, local governments, Indian tribes, and private organizations and individuals, to  
24   preserve, protect, and manage cultural resources for “the inspiration and benefit of present and  
25   future generations” (16 U.S.C. 470-1, section 2[3]).

26   Section 106 of the NHPA directs Federal agencies to take into account the effects of their actions  
27   on historic properties and to afford the Advisory Council on Historic Preservation an  
28   opportunity to comment with respect to the effects of the undertaking. Implementing  
29   regulations for section 106 are found at 36 CFR 800, and establish the procedures Federal  
30   agencies must follow when assessing the effects of a proposed action on historic properties. The  
31   term “historic properties” is defined at 36 CFR 800.16(l)(1) as “....any prehistoric or historic  
32   district, site, building, structure, or object included in, or eligible for inclusion in the National  
33   Register of Historic Places [NRHP]...[and] includes properties of traditional religious  
34   importance to an Indian tribe or Native Hawaiian organization that meet the National Register  
35   criteria.”

36   To be eligible for listing on the NRHP, a cultural resource must be at least 50 years old  
37   (although there are exceptions) and must meet one or more of the eligibility criteria set forth at  
38   36 CFR 60.4 which state:

39        The quality of significance in American history, architecture, archaeology,  
40        engineering and culture is present in districts, sites, buildings, structures, and

1 objects that possess integrity of location, design, setting, materials, workmanship,  
2 feeling, and association and (a) that are associated with events that have made a  
3 significant contribution to the broad patterns of our history; or (b) that are  
4 associated with the lives of persons that are significant in our past; or (c) that  
5 embody the distinctive characteristics of a type, period, or method of  
6 construction, or that represent the work of a master, or that possess high artistic  
7 value, or that represent a significant and distinguishable entity whose  
8 components may lack individual distinction; or (d) that have yielded, or may  
9 likely yield, information important in prehistory or history.

10 Cultural resources are evaluated for potential listing on the NRHP with reference to an historic  
11 context and associated research questions, in consultation with the SHPO and/or Tribal  
12 Historic Preservation Officer, tribes, and other interested organizations and individuals.

13 Pursuant to Executive Order (EO) 13007 agencies must also consider the effects of their actions  
14 on the physical integrity of sacred sites, and access to and ceremonial use of such sites by Indian  
15 religious practitioners. EO 13007 defines a “sacred site” as:

16 ...any specific, discrete, narrowly delineated location on Federal land that is  
17 identified by an Indian tribe, or Indian individual determined to be an  
18 appropriately authoritative representative of an Indian religion, as sacred by  
19 virtue of its established religious significance to, or ceremonial use by, an Indian  
20 religion; provided that the tribe or appropriately authoritative representative of  
21 an Indian religion has informed the agency of the existence of such a site.

22 EO 13007 directs Federal agencies “...to the extent practicable, permitted by law, and not clearly  
23 inconsistent with essential agency functions,” to accommodate access to and use of such sites by  
24 Native American traditional religious practitioners, and to avoid affecting their physical  
25 integrity.

### 26 **Arizona Regulations**

27 Chapter 4.2 of the Arizona Revised Statutes addresses historic preservation issues. While a  
28 specific historic preservation compliance process is not identified, the preamble to Article 1  
29 states:

- 30 B. It is the intent of the legislature that this state, in cooperation with the political  
31 subdivisions of this state, Federal agencies, Indian tribes, and other persons....
- 32 2. Provide leadership in the identification and preservation of the prehistoric and historic  
33 resources of this state.
- 34 3. Administer state owned, administered or controlled prehistoric and historic resources  
35 in a spirit of stewardship for the inspiration and benefit of present and future  
36 generations.

37 Chapter 4.2, Article 1 goes on to assign responsibility for preservation of historic properties  
38 owned and controlled by the agency, to the chief administrator of each agency (section 41-861).

1 All state agencies are directed to cooperate with the SHPO in developing a program to locate,  
2 inventory, and nominate to the Arizona Register of Historic Places all properties under the  
3 agency's ownership or control that appear to meet the criteria for inclusion on the register  
4 (section 41-862). In the event a direct action or one assisted by a state agency will result in  
5 substantial alteration to or destruction of an historic property, state agencies are directed to  
6 initiate measures to document the property to the standards established by the state historic  
7 preservation officer (section 41-863). And lastly, section 41-864 accords the SHPO 30 days:

8 ...to review and comment on any plans of a state agency which involve property  
9 which is included on or may qualify for inclusion on the Arizona register of  
10 historic places, including any construction project, sale, lease, or acquisition of  
11 historic properties, to ensure that the prehistorical, historical, architectural or  
12 culturally significant values will be preserved or enhanced.

### 13 California

14 Section 15064.5 of the State CEQA Guidelines provides that a project may have a significant  
15 environmental effect if it causes "substantial adverse change" in the significance of an historical  
16 resource or a unique archaeological resource. Historical resources are defined in State CEQA  
17 Guidelines section 15064.5 as any of the following:

- 18 (1) A resource listed in, or determined to be eligible by the State Historical Resources  
19 Commission for listing in the California Register of Historical Resources (Pub. Res.  
20 Code §5024.1, Title 14 CCR, section 4850 et seq.).
- 21 (2) A resource included in a local register of historical resources, as defined in section  
22 5020.1(k) of the PRC or identified as significant in an historical resource survey  
23 meeting the requirements of section 5024.1(g) of the PRC, shall be presumed to be  
24 historically or culturally significant. Public agencies must treat any such resource as  
25 significant unless the preponderance of evidence demonstrates that it is not  
26 historically or culturally significant.
- 27 (3) Any object, building, structure, site, area, place, record, or manuscript that a lead  
28 agency determines to be historically significant or significant in the architectural,  
29 engineering, scientific, economic, agricultural, educational, social, political, military,  
30 or cultural annals of California may be considered to be an historical resource,  
31 provided the lead agency's determination is supported by substantial evidence in  
32 light of the whole record. Generally, a resource shall be considered by the lead  
33 agency to be "historically significant" if the resource meets the criteria for listing on  
34 the California Register of Historical Resources (Pub. Res. Code §5024.1, Title 14 CCR,  
35 section 4852), including the following:
  - 36 (A) is associated with events that have made a significant contribution to the  
37 broad patterns of California's history and cultural heritage;
  - 38 (B) is associated with the lives of persons important in our past;

1 (C) embodies the distinctive characteristics of a type, period, region, or method  
2 of construction, or represents the work of an important creative individual, or  
3 possesses high artistic values; or

4 (D) has yielded, or may be likely to yield, information important in prehistory or  
5 history.

6 The guidelines specify that a lead agency shall identify potentially feasible measures to mitigate  
7 significant adverse changes in the significance of an historical resource. The lead agency shall  
8 ensure that any adopted measures to mitigate or avoid significant adverse changes are fully  
9 enforceable through permit conditions, agreements, or other measures.

10 The guidelines specify that if an archaeological site does not meet the criteria for being  
11 designated a historical resource, but does meet the definition of a unique archeological resource  
12 in section 21083.2 of the PRC, impacts to the site shall also shall be treated or mitigated.

13 If an archaeological resource is neither a unique archaeological nor an historical resource, the  
14 guidelines indicate that effects of the project on those resources shall not be considered a  
15 significant effect on the environment. It shall be sufficient that both the resource and the effect  
16 on it are noted in the Initial Study or EIR, if one is prepared to address impacts on other  
17 resources, but they need not be considered further in the CEQA process.

18 **Nevada**

19 Nevada Revised Statutes (NRS) Chapter 383 addresses historic preservation and archaeology.  
20 NRS 383.021 provided for the establishment of the Office of Historic Preservation (OHP). A  
21 specific historic preservation compliance process is not identified. However, NRS 383.121  
22 states:

23 1. All departments, commissions, boards, and other agencies of the state and its political  
24 subdivisions shall cooperate with the office [i.e., OHP] in order to salvage or preserve  
25 historic, prehistoric, or paleoenvironmental evidence located on property owned or  
26 controlled by the United States, the State of Nevada or its political subdivisions.

27 2. When any agency of the state or its political subdivisions is preparing or has contracted  
28 to excavate or perform work of any kind on property owned or controlled by the United  
29 States, the State of Nevada or its political subdivisions which may endanger historic,  
30 prehistoric or paleoenvironmental evidence found on the property, or when any artifact,  
31 site or other historic or prehistoric evidence is discovered during the course of such  
32 excavation or work, the agency or the contractor hired by the agency shall notify the  
33 office and cooperate with the office to the fullest extent practicable, within the  
34 appropriations available to the agency or political subdivision for that purpose, to  
35 preserve or permit study of such evidence before its destruction, displacement, or  
36 removal.

### 3.5.1 Affected Environment

The “area of potential effects” (APE) of an undertaking is defined at 36 CFR 800.16(d) as “the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist.” This section goes on to state “the [APE] is influenced by the scale of the undertaking and may be different for different kinds of effects cause [sic] by the undertaking.” The APE considered in this EIS/EIR includes the planning area, which extends from the full pool elevation of Lake Mead to the SIB (applicable to Alternatives 1-3), as well as the lower reaches of the Virgin, Muddy, Bill Williams, and Gila rivers, which are addressed as part of Alternative 4. For the purposes of the cultural resources identification and effects evaluation process, three buffer areas were defined around the lakes that extend for a distance of 1 mile to the landward side of the high surface elevation of Lake Mead, along with 0.25-mile buffers extending to the landward side of the high surface water elevation contours of Lakes Mohave and Havasu.

The following discusses the nature and range of cultural resources recorded within the planning area and off-site conservation areas. Areas chosen for conservation area establishment would be selected from one or more of the following categories:

- Up to 30 potentially suitable conservation area sites that have been identified, surveyed, and evaluated by the LCR MSCP. These include 36,500 acres of land initially believed to have potential for successful implementation of conservation measures. These sites encompass lands situated on the historic floodplain of the Colorado River below the first river terrace/scarp;
- Potential off-site conservation areas along the lower reaches of the Virgin, Muddy, Bill Williams, and Gila rivers;
- Available agricultural lands; and
- Other undeveloped areas.

Although any or all of these area types may be selected for Conservation Plan implementation, the following discussion focuses on known and predicted resources within the 30 potential conservation areas because (1) they are located in all reaches of the LCR (Figure 2.1-10 and Table 3.5-1) and thus for programmatic purposes can be considered generally representative of the geographic distribution and range of cultural resource types that may occur within the planning area, and (2) Reclamation has initiated a comprehensive Class I inventory report to characterize these 30 areas in terms of known cultural resources and the nature, location and adequacy of previous cultural resource studies. The focus on gathering and analyzing existing data, as opposed to conducting more intensive Class II (sample) or Class III (100 percent) field surveys, is appropriate given that the locations of specific areas where the conservation measures may be implemented, and the specific details of each project/action that might be undertaken, are not yet known. Given the programmatic character of the LCR MSCP and the fact the LCR MSCP participants will be required to comply with environmental and historic preservation laws and regulations in effect at the time specific projects are planned and implemented, the Class I inventory was determined to be the appropriate study for present needs. The Class I inventory study was initiated in 2000 and is still in draft form and unavailable for public distribution at this time, although the final Class I inventory report will

3.5 Cultural Resources

1 be submitted to the Arizona, California, and Nevada SHPOs, tribes, and other interested parties  
 2 for their information and comment.

3 **Table 3.5-1. Concordance Between Potential Conservation Areas**  
 4 **within the LCR MSCP Planning Area and Off-Site Areas**

| <i>Reach Number</i> | <i>Description</i>   | <i>Conservation Opportunity Areas (COAs) Covered</i>   |
|---------------------|--|--|
| 1                   | Lake Mead full pool surface elevation of 1229' to Separation Canyon                  | Upper Lake Mead<br>Lake Mead<br>Lake Mead 1 Mile Buffer  |
| 2                   | Hoover Dam to Davis Dam including Lake Mohave to full pool surface elevation of 647' | Lake Mohave<br>Lake Mohave 0.25 Mile Buffer  |
| 3                   | Davis Dam to Parker Dam including Lake Havasu to full pool surface elevation of 450' | Fort Mojave<br>Topock<br>Lake Havasu<br>Lake Havasu 0.25 Mile Buffer   |
| 4                   | Parker Dam to Adobe Ruin & USBR's Cibola Gauging Station at RM 87.3                  | North CRIT<br>East CRIT<br>East-Central CRIT<br>West CRIT<br>South CRIT<br>Big Hole<br>North Palo Verde<br>South Palo Verde<br>Cibola Valley Irrigation & Drainage District<br>Palo Verde Oxbow<br>Cibola (northern 75%) |
| 5                   | USBR's Cibola Gauging Station at RM 87.3 to Imperial Dam                             | Cibola (southern 25%)<br>North Imperial<br>South Imperial  |
| 6                   | Imperial Dam to the Northerly International Boundary at RM 32.1                      | Laguna<br>Yuma   |
| 7                   | NIB to SIB   | Limitrophe   |
| n/a                 | Lower Virgin River   | Virgin River   |
| n/a                 | Lower Bill Williams River to Alamo Dam   | Bill Williams<br>Planet Ranch  |
| n/a                 | Lower Gila River   | Lower Gila River   |

5 Preliminary results of the Class I inventory, however, do allow broad conclusions consistent  
 6 with the programmatic data needs of this impact assessment. That is, the available data are  
 7 sufficient to identify the broad range and general location of resources that occur within the  
 8 planning area and are sufficient to programmatically determine whether the implementation  
 9 project could have a significant impact on cultural resources that meet criteria for listing on the  
 10 NRHP, the Arizona Register of Historic Places, the California Register of Historic Places, the  
 11 Nevada Register of Historic Places, or are otherwise considered unique, important, or  
 12 significant by other Federal, state or local criteria.

1 Further details regarding the Class I inventory, its data sources and other background  
2 information are provided in Appendix E. Information provided in the draft Class I inventory  
3 report serves as the basis of the following discussion.

#### 4 **3.5.1.1 Lower Colorado River**

##### 5 *Cultural/Historical Setting*

6 The LCR is now, as it was in the past, a reliable water source capable of supporting lush stands  
7 of vegetation and a wide variety of fish, birds, and other wildlife. Valleys and canyons along  
8 the course of the river and its tributaries are oases in an otherwise harsh desert, and there is  
9 little doubt they have been inhabited since Late Pleistocene times. Generally speaking,  
10 archaeological research along the River and its tributaries has been hampered by a lack of  
11 stratified sites and sites containing datable materials, and as a result, much of what is known of  
12 the sequence and character of the cultural groups that occupied the region during the  
13 prehistoric period has been extrapolated from surrounding or more distant areas whose culture  
14 histories are better known. Definitive evidence for continuous occupation of the floodplain and  
15 rocky canyons along the Colorado River since the Late Pleistocene is lacking, however. Notable  
16 exceptions to this general rule include the excavations conducted by Schroeder and others at  
17 Willow Beach below Hoover Dam (Baldwin 1948; Harrington 1937; Schroeder 1961), Harrington  
18 and Wheeler's work at sites the Muddy and Virgin River valleys prior to their submersion  
19 beneath the waters of Lake Mead (as summarized in Shutler 1961), and Lyneis' later work in the  
20 same area (e.g., Lyneis 1992). Current understanding of the prehistoric occupation along the  
21 LCR and its tributaries is summarized in a number of overviews and project specific reports  
22 including Altschul et al. (1994, 2002), Cordell (1984), Ezzo (1994a and b), Ezzo and Altschul  
23 (1993), Hoffman (1984), Huber and Ezzo (1995), McGuire and Schiffer (1982), Sterner and  
24 Bischoff (1997), Stone (1991), Swartout (1981a and b), Swartout and Drover (1981).

25 General summaries concerning historic period exploration and settlement of the area include  
26 Hague (1978), Schneider and Altschul (2000), Sterner and Bischoff (1997), Stone (1991), and  
27 Warren et al. (1981). Tribes with traditional and historical ties to the lower Colorado River and  
28 its tributaries under consideration here include: the Southern Paiute, Hualapai, Mohave,  
29 Colorado River Indian Tribes, Chemehuevi, Yavapai, Quechan, Cocopah, Hopi, Zuni, and  
30 Navajo tribes. Summaries of ethnographic information concerning these and other  
31 Southwestern and Great Basin tribes can be found in Ortiz (1983) and D'Azevado (1986),  
32 respectively.

##### 33 *Previous Cultural Resource Inventories within the LCR MSCP Planning Area*

34 Examination of the 80+ 7.5' U.S. Geological Survey (USGS) quadrangles covering lands  
35 encompassed by the 30 potential conservation areas indicates numerous cultural resource  
36 inventories have been conducted around Lakes Mead, Mohave, and Havasu, and along the  
37 corridor of the LCR. For the most part, these inventories have been performed in support of the  
38 section 106 compliance process and are limited in scope, covering only a small percentage of the  
39 total land area encompassed by the potential conservation areas. Survey coverage is generally  
40 spotty, with a tendency for recent inventories to be concentrated in the vicinity of developed  
41 recreation areas and other facilities around the lakes, and in areas around developed population

1 centers and recreation areas along the river corridor, with little inventory occurring on the  
2 floodplain in intervening areas. While numerous inventories have been conducted in upland  
3 areas along the river corridor, Class III (100 percent) inventory of locations on the historic  
4 floodplain itself has been extremely limited. Class III inventories in upland areas bordering the  
5 historic floodplain of the Colorado River have resulted in the identification of numerous  
6 prehistoric sites. In contrast, Class III inventories performed on the historic floodplain seem  
7 rarely to result in the identification of prehistoric or historic cultural resources. More detail  
8 regarding this issue is provided in the *Previously Recorded Sites Within and Adjacent to the*  
9 *Planning Area* discussion below.

#### 10 *Government Land Office Resources within the Planning Area*

11 The Class I records search included Government Land Office (GLO) township survey plats on  
12 file at BLM offices in Arizona, California, and Nevada. GLO township survey plats and  
13 surveyors notes frequently make reference to various cultural features present in an area at the  
14 time the township was being platted or re-surveyed (some townships in areas along the lower  
15 Colorado River were first platted over 100 years ago). GLO township survey plats can thus be a  
16 good source of information regarding the kinds of historic period cultural resources that might  
17 be present in an area. In some cases, GLO surveyors also noted the presence of prehistoric  
18 cultural resources including ruins, petroglyph sites, and "Indian trails."

19 In excess of 566 GLO resources were identified during the examination of the GLO township  
20 survey plat maps. Table 3.5-2 lists the number of GLO resources identified in each of the  
21 potential conservation areas. In some cases roads and fences occurred with such high frequency  
22 it would have been prohibitively time consuming to individually number and describe them. In  
23 these cases researchers assigned a single number to roads or fences that were relatively short in  
24 length. In other cases, one or more cultural features on an old township plat was labeled as a  
25 cluster or group of houses or other types of structures, making it impossible to derive a count of  
26 the specific kinds of resources present at that particular location. As a result of these factors, the  
27 GLO resource counts provided in Table 3.5-2 should be taken to reflect the minimum number of  
28 GLO resources present within a particular area.

29 A wide variety of historic features were identified on GLO township plat maps within areas  
30 covered by the planning area. Roads/highways (n=198+) are the most frequently noted historic  
31 features on the GLO plat maps. Structures used for habitation (shacks, cabins, houses, ranches,  
32 camps) occur with the next highest frequency (n=77+), followed by fences (n=59+),  
33 fields/cultivated fields/fenced fields and lots (n=46+), mining claims and physical features  
34 associated with mining (e.g., mills, shafts, etc.; total n=44+) other types of structures (including  
35 sheds, a "pumping pump," wells, windmills, monuments, a pumping plant, a barn, a pipeline,  
36 and a bridge; n=29), desert land claims and a forest lien claim (n=25), and ditches (n=21). Other  
37 GLO resources noted as occurring within the potential conservation areas include trails (n=17,  
38 including 3 noted as "Indian trail"), railroads (n=8, with the Southern Pacific Railroad occurring  
39 in at least 3 potential conservation areas thus reducing the actual number of railroads to 5),  
40 canals (n=8), corrals (n=7), townsites and resorts (n=6, including St. Thomas, Callville, El  
41 Dorado, Doudville, Norton's Landing, and La Paz), telephone and telegraph lines (n=5),  
42 military and hay and wood reservations (n=5; actual count is 3 owing to the occurrence of Fort  
43 Mohave and its hay and wood reservation in 2 Potential conservation areas; the other military

1 **Table 3.5-2. Summary of Previously Recorded Sites and GLO Resources Within the Potential**  
 2 **Conservation Areas within the Planning Area and Off-Site Areas**

| <i>Reach No.</i> | <i>COA Name</i>                              | <i>Number of GLO Resources Identified</i> | <i>Number of Previously Recorded Sites</i> |
|------------------|--|---|--|
| 1                | Upper Lake Mead                              | 0   | 22   |
|                  | Lake Mead (inundated)                        | 58  | 93   |
|                  | Lake Mead 1 Mile Buffer                      | 31  | 245  |
| 2                | Lake Mohave (inundated)                      | 35  | 128 (47)*                                  |
|                  | Lake Mohave 0.25 Mile Buffer                 | 7   | 89   |
| 3                | Fort Mojave                                  | 8   | 34   |
|                  | Topock                                       | 98  | 18   |
|                  | Lake Havasu (inundated)                      | 30  | 7  |
|                  | Lake Havasu 0.25 Mile Buffer                 | 4   | 20   |
| 4                | North CRIT                                   | 3   | 0  |
|                  | East-Central CRIT                            | 24  | 5  |
|                  | West CRIT                                    | 17  | 4  |
|                  | East CRIT                                    | 55  | 4  |
|                  | South CRIT                                   | 6   | 0  |
|                  | Big Hole                                     | 1   | 0  |
|                  | North Palo Verde                             | 1   | 7  |
|                  | South Palo Verde                             | 4   | 0  |
|                  | Cibola Valley Irrigation & Drainage District | 19  | 1  |
|                  | Palo Verde Oxbow                             | 2   | 6 (0)**                                    |
|                  | Cibola                                       | 57  | 17 (5)**                                   |
| 5                | North Imperial                               | 15  | 21 (4)**                                   |
|                  | South Imperial                               | 5   | 20 (1)**                                   |
| 6                | Laguna                                       | 0   | 24 (18)**                                  |
|                  | Yuma   | 9   | 17 (11)**                                  |
| 7                | Limitrophe                                   | 1   | 6 (5)**                                    |
| n/a              | Lower Virgin River                           | 4   | 26   |
| n/a              | Bill Williams                                | 22  | 2  |
|                  | Planet Ranch                                 | 47  | 4  |
| n/a              | Lower Gila River                             | 3   | 2  |
| <b>All</b>       | <b>Totals for LCR MSCP APE</b>               | <b>566</b>                                | <b>822 (674)</b>                           |

\*Number in parentheses represents the number of sites that would be present were features within sites assigned separate site status by Baldwin to be grouped into single sites.

\*\*Number in parentheses represents the number of sites within a particular COA following elimination of sites for which no information is available, and Imperial County GLO point plots, which are better treated as GLO resources, not known site locations.

1 feature is Old Fort Callville, now submerged beneath the waters of Lake Mead), ferries (n=3,  
2 including Gregg's and Bonelli's and one unnamed), salt mines (n=2), a cemetery (at El Dorado  
3 which was moved to Nelson's Landing prior to the inundation of El Dorado by the rising  
4 waters of Lake Mohave); and 6 natural features (including a named rock/outcrop, seeps,  
5 springs, and hot springs).

6 *Sites Listed on the NRHP Within or in Close Proximity to the Planning Area*

7 During the course of the Class I records search the National Register Information System was  
8 queried to determine if any sites listed on the NRHP fall within or in close proximity to the  
9 planning area. A total of eight sites were found listed on the register (see Table 3.5-3). Two of  
10 these, Pueblo Grande de Nevada (26CK7; better known as "Lost City") and Hoover Dam (which  
11 has been designated a National Historic Landmark), fall within the Lake Mead and Lake Mead  
12 1 Mile Buffer Potential conservation areas. Lost City is located on lands managed by  
13 Reclamation and the NPS, while Hoover Dam is operated and maintained by Reclamation.  
14 Two other sites, the Willow Beach Gaging Station and the Homestake Mine (26CK3126) are  
15 located in the Lake Mojave 0.25 Mile Buffer conservation opportunity area on lands managed  
16 by the NPS. The Ripley Intaglios are located on the east side of the Colorado River about 10  
17 miles south of Blythe (Holmlund 1993). The site is located on the first terrace overlooking the  
18 historic floodplain of the Colorado River, so is situated adjacent to but not within the APE of the  
19 Conservation Plan. The Ripley Intaglios are individually listed, but also contribute to a larger  
20 thematic nomination encompassing many of the ground figure groups located along the lower  
21 reaches of the Colorado and Gila rivers. The Ripley Intaglios themselves are located on  
22 Reclamation withdrawn lands and lands administered by the BLM Yuma Field Office  
23 (BLMYFO). The Martinez Lake/Fisher Landing Site (AZ X:3:13) is a large prehistoric site  
24 located in an elevated position on a knoll near the eastern bank of the Colorado River. The land  
25 on which the site is located is administered by the BLMYFO. The Ocean to Ocean Bridge was  
26 the first highway bridge constructed across the Colorado River. Constructed in 1915 by the  
27 Office of Indian Affairs, the bridge served as the river crossing for Highway 80 in Yuma,  
28 Arizona. The area surrounding Yuma Crossing and Associated Sites has been designated a  
29 National Historic Landmark. The Landmark boundaries straddle the Colorado River taking in  
30 the area surrounding the Quartermaster Depot and the Yuma Territorial Prison on the south,  
31 and the St. Thomas Yuma Indian Mission on the north. Lands within the Landmark boundaries  
32 south of the river are administered by Arizona State Parks and the City of Yuma, while lands to  
33 the north of the river are managed by the Fort Yuma Quechan Tribe.

34 *Previously Recorded Sites Within and Adjacent to the Planning Area*

35 A majority of the site data received from the various repositories contacted during the records  
36 search is best considered "legacy data." Legacy data is here defined as information collected by  
37 professionals and amateurs that, in general, do not meet current Federal, state, or professional  
38 standards for site recording. As a result, many site forms lack basic descriptive data, and most  
39 do not have accurate data regarding the NRHP eligibility of the resource. Even in those cases  
40 where the recorder included an eligibility recommendation on the site form or in the body of  
41 the report, there is no indication in repository records whether or not the Federal agency, and  
42

**Table 3.5-3. Historic Properties Listed on the NRHP that Fall Within or Immediately Adjacent to the Planning Area**

| <i>State</i> | <i>County</i> | <i>COA Name</i>              | <i>USGS Quad</i>                            | <i>Property Name</i>  | <i>Managing Agency</i>                              |
|--------------|---------------|------------------------------|---|---|---|
| NV           | Clark         | Lake Mead & Lake Mead Buffer | Overton, Overton Beach, Valley of Fire East | Pueblo Grande de Nevada/Lost City/26CK7                     | NPS/ Reclamation                                    |
| AZ/NV        | Mohave/Clark  | Lake Mead Buffer             | Hoover Dam                                  | Hoover Dam National Historic Landmark                       | Reclamation   |
| AZ           | Mohave        | Lake Mohave Buffer           | Willow Beach                                | Willow Beach Gaging Station                                 | NPS   |
| NV           | Clark         | Lake Mohave Buffer           | Davis Dam                                   | Homestake Mine/26CK3126                                     | NPS   |
| AZ           | La Paz/Yuma   | South CRIT & Big Hole        | Mule Wash                                   | Ripley Intaglios  | BLMYFO  |
| AZ           | Yuma          | South Imperial               | Imperial Reservoir                          | Martinez Lake/Fisher Landing/AZ X:3:13                      | BLMYFO  |
| AZ/CA        | Yuma/Imperial | Yuma                         | Yuma East                                   | Ocean to Ocean Bridge                                       | NRHP states "Local"                                 |
| AZ/CA        | Yuma/Imperial | Yuma                         | Yuma East                                   | Yuma Crossing & Associated Sites National Historic Landmark | AZ State Parks/City of Yuma/Fort Yuma Quechan Tribe |

subsequently the SHPO or the Keeper of the Register, concurred with the recommendation. As a result, there is no way to state with any certainty how many sites located within or in proximity to the planning area have been found eligible or potentially eligible for listing on the NRHP.

The criteria used to define what is and what is not a site have changed through time. In the early days of section 106 compliance surveys, scatters of 2-3 artifacts were often recorded as sites and assigned permanent state site numbers. Today, such scatters would be considered isolated occurrences and would not be entered into repository records with permanent site numbers. To determine how many sites listed in the LCR MSCP database might actually be isolated artifacts or isolated occurrences would be prohibitively time consuming, thus for the purpose of this analysis it is assumed all resources listed in the database represent sites, with the exceptions described in the following paragraph. Southeast Information Center records for Imperial County contain numerous site forms for linear features that appear in the surveyors' notes accompanying the original GLO township plat maps. These linear "sites" are commonly plotted as a point along a township grid line and are only cursorily described on the site form with a phrase from the surveyor's notes (e.g., "cross trail bearing north and south"). Since there is nothing in the Imperial County site records indicating any field reconnaissance has ever been performed to confirm the presence of physical remains of cultural features at the plotted

1 locations, these “sites,” like the GLO resources discussed above, are best viewed as being  
2 suggestive of the kinds of historic features that might be present in the planning area.

3 A total of 822 previously recorded sites appear in the LCR MSCP site database (Table 3.5-2). If  
4 sites for which no data is available and Imperial County GLO point plot data are eliminated, the  
5 total number of sites falls to 755. The actual number of sites present is even somewhat lower  
6 than this. Many of the sites in the Lake Mohave and Lake Mohave 0.25 Mile Buffer potential  
7 conservation opportunity areas were recorded by Baldwin (1943, 1948) prior to construction of  
8 Davis Dam. Field observations made by Reclamation and NPS cultural program staff regarding  
9 several sites recorded by Baldwin indicate he assigned separate site status to individual features  
10 within larger sites. If one treats Baldwin’s site clusters as single sites, rather than several  
11 individual sites as they appear in the record, the number of sites in the Lake Mohave 0.25 Mile  
12 Buffer conservation opportunity area is reduced from 128 to 47, thus decreasing the total  
13 number of sites in the Conservation Plan APE as a whole to 674.

14 Some general observations can be made with respect to the kinds of sites located within or  
15 adjacent to the potential conservation areas, and how these are distributed across the landscape.  
16 Lithic scatters, and lithic and ceramic scatters, have been recorded in virtually all the  
17 conservation areas. Large concentrations of heat-altered rock believed to represent  
18 mesal/agave roasting features appear in the records for only the Upper Lake Mead, Virgin  
19 River, and Lake Mead One Mile Buffer potential conservation areas. Rock rings, rock  
20 alignments, cleared circles and trails are common features in many of the potential conservation  
21 areas and are found in isolation or as features within larger sites. Rock shelters exhibiting  
22 evidence of human occupation have been recorded in the Upper Lake Mead, Virgin River, Lake  
23 Mead and Lake Mead One Mile Buffer, and Lake Mohave and Lake Mohave 0.25 Mile Buffer  
24 potential conservation areas where there are rock formations conducive to shelter formation.  
25 Petroglyph sites have been recorded in the Lake Mohave, Topock, Lake Havasu, and Planet  
26 Ranch potential conservation areas; sites with pictographs occur only in the Upper Lake Mead  
27 area. Ground stone quarrying and manufacturing sites occur only in the records for the Fort  
28 Mojave area. Sites containing intaglios (also called geoglyphs, ground figures, and gravel  
29 features in the records) have been recorded in proximity to the Fort Mojave, Topock, Lake  
30 Havasu 0.25 Mile Buffer, and Cibola potential conservation areas.

31 Historic site types recorded within and in proximity to the potential conservation areas include  
32 ruins of adobe and wood houses, rock cabins, tent pads, survey markers, mineral prospects,  
33 claim cairns, a mill, railroad grades, wagon roads, and trash dumps. Numerous historic period  
34 sites occur in the vicinity of Hoover Dam that are associated with the construction and  
35 operation of the dam. The vast majority of the historic period sites recorded in the South  
36 Imperial, Laguna, Yuma, Limitrophe, and lower Gila River potential conservation areas are  
37 irrigation facilities associated with the historic Yuma Irrigation Project and the Gila Project  
38 irrigation systems. Overall, historic period site distribution is relatively random, with sites  
39 appearing in a variety of environmental and geomorphological contexts.

40 As noted above, LCR MSCP project and site data are still in the process of being evaluated. As  
41 a result, it is not possible at this time to provide generalized statements concerning the  
42 distribution of sites in the vicinity of Lakes Mead, Mohave, and Havasu. The following  
43 discussion thus focuses on general observations concerning the distribution of prehistoric sites

1 along the Colorado River corridor. Careful examination of site location maps accompanying the  
2 LCR MSCP Class I draft report indicates while a significant number of prehistoric sites have  
3 been recorded on terraces and ridges in upland areas immediately adjacent to and overlooking  
4 the historic floodplain, very few prehistoric sites have been recorded on the historic floodplain  
5 proper. Where prehistoric sites have been documented on the floodplain they are described as  
6 occurring on geomorphological features such as sand dunes, ridges of very low relief, and low  
7 knolls, that are slightly elevated above floodplain sediments.

8 Lack of extensive Class III inventory coverage on areas of the historic floodplain of the Colorado  
9 River is a likely explanation for the low numbers of documented prehistoric and historic sites  
10 on the historic floodplain. However, the results of recent research done in the vicinity of Yuma,  
11 Arizona, suggest an alternative explanation that is worthy of further testing in other areas along  
12 the river. Examination of historic maps during archival work conducted in association with a  
13 series of cultural resource inventories near Yuma (i.e., Bischoff et al. 1998; Huber et al. 1998a  
14 and 1998b; Sterner and Bischoff 1998), indicated the river altered its course several times  
15 between the 1840s and 1950s, in one case meandering 2 miles across its floodplain. Evaluation  
16 of geomorphological test trenches placed on the floodplain in areas behind the modern levees  
17 consistently revealed the presence of sedimentary deposits characteristic of a high energy  
18 fluvial environment (Sterner and Bischoff 1998; Huber et al. 1998a and 1998b). Sediments laid  
19 down under high energy fluvial conditions are extremely unlikely to contain in situ cultural  
20 remains. Inventory of several parcels on the historic floodplain of the Colorado River was also  
21 revealing. Only recent trash was found on parcels located inside the levee system, while the  
22 earliest cultural materials identified on parcels outside but in close proximity to the levees, post-  
23 dated levee construction. Prehistoric cultural remains recorded during the inventories were  
24 confined to elevations on the first terrace above the historic floodplain. The results of these  
25 inventories suggest there should be few prehistoric or historic sites on the historic floodplain of  
26 the Colorado River that will pre-date the construction of Hoover, Davis, and Parker Dams,  
27 and/or local levee systems. The applicability of the results of the Yuma inventories to other  
28 areas along the river remains to be tested.

29 Various authors (e.g., Stone 1991) have suggested the low frequency of occurrence of sites on  
30 the historic floodplain of the Colorado River might also be explainable by their burial. Recent  
31 monitoring of trenching operations associated with construction of the North Baja Pipeline  
32 across the river and downstream from Ehrenberg, Arizona, resulted in the discovery of a  
33 number of subsurface lenses of charcoal and ash associated with lithic and ceramic artifacts.  
34 Preliminary examination of these deposits by a geomorphologist suggests they are associated  
35 with surfaces representing the first terrace above the historic floodplain that have been buried  
36 as a result of colluvial and sedimentary depositional processes (personal communication, R. M.  
37 Apple 2002).

38 It is also possible many sites that may have been located on the historic floodplain of the  
39 Colorado River have been destroyed by historic period development. Descriptions of the few  
40 prehistoric sites that have been recorded on the historic floodplain suggest such sites are  
41 relatively small, artifact densities are low, and cultural remains are restricted to surface  
42 contexts, thus they would be extremely susceptible to destruction by activities associated with  
43 urban development and intensive agriculture.

1 In summary, the draft Class I inventory suggests the following:

- 2 • Most areas have not been completely surveyed according to modern standards.
- 3 • Nonetheless, a wide range of prehistoric and historic resources are known or predicted  
4 to occur within the planning area. Many site types are non-randomly distributed,  
5 reflecting geographic variations in settlement and subsistence patterns.
- 6 • Many sites are poorly documented because they were recorded before modern  
7 standards were the norm or because they were recorded from archival (GLO) sources  
8 and their existence has not been verified by field surveys.
- 9 • The GLO data, therefore, are best considered as suggestive of the types of historic  
10 resources that might be present within the planning area.
- 11 • Most intensive inventories have been conducted in upland areas adjacent to the  
12 potential conservation areas located in the historic floodplain. These inventories have  
13 located numerous prehistoric sites, particularly on terraces adjacent to but above the  
14 floodplain.
- 15 • In contrast, few intensive inventories have been conducted on the historic floodplain  
16 and these have located few prehistoric or historic cultural resources.
- 17 • Existing data indicate that the low frequency of cultural resources found on the historic  
18 floodplain within the potential conservations areas is probably due to multiple factors:
  - 19 – In some places natural movements of the river channels probably have destroyed  
20 most resources that predate the early to mid-twentieth-Century construction of the  
21 Hoover, Davis, and Parker Dams and/or local levee systems.
  - 22 – In some areas geomorphic processes have buried first terraces and the archaeological  
23 sites located on them.
  - 24 – In some places, sites have been destroyed by historic and modern period  
25 development.

#### 26 *Traditional Cultural Property Identification: Consultations with Tribes*

27 As the lead Federal agency for environmental compliance activities associated with this action,  
28 Reclamation initiated government-to-government consultation with tribes early in the planning  
29 process. Letters were sent to tribal leaders, and tribal natural resource and cultural resource  
30 specialists explaining the Conservation Plan. The purpose of the Conservation Plan was  
31 explained, and the tribes on whose reservations activities might be implemented (i.e. the  
32 Hualapai, Fort Mojave Indian Tribe, CRIT, the Chemehuevi Tribe, the Fort Yuma Quechan  
33 Tribe, and the Cocopah Indian Community) were invited to become partners in the effort.  
34 Several meetings were later held with leaders of these tribes during which tribal representatives  
35 were able to express their general concerns and interests in the project. In November 2000,  
36 Reclamation sent a certified letter to tribal leaders and tribal cultural resource specialists  
37 requesting information concerning traditional cultural properties (TCPs) that might be present  
38 in the potential conservation areas. This letter was sent to the following tribes and  
39 communities:

---

|   |                                       |                        |
|---|---------------------------------------|------------------------|
| 1 | Chemehuevi Tribe                      | Hualapai Tribe         |
| 2 | Cocopah Indian Community              | Kaibab Paiute Tribe    |
| 3 | Colorado River Indian Tribes          | Las Vegas Paiute Tribe |
| 4 | Fort McDowell Mohave-Apache Community | Moapa Paiute Tribe     |
| 5 | Fort Mojave Indian Tribe              | Navajo Nation          |
| 6 | Fort Yuma Quechan Tribe               | Paiute Tribe of Utah   |
| 7 | Gila River Indian Community           | Pueblo of Zuni         |
| 8 | Havasupai Tribe                       | Yavapai Tribe          |
| 9 | Hopi Tribe                            |                        |

10 Reclamation also sent the same letter to several interested parties including the Las Vegas  
 11 Indian Center, the Pahrump Paiute Tribe, the Shivwits Band of Paiute, and the Southern Paiute  
 12 Consortium. Reclamation and representatives from Archaeological Consulting Services Ltd.  
 13 followed up the November 2000 letter with phone calls to tribal leaders and tribal cultural  
 14 resource specialists. All tribal representatives declined to provide information concerning TCPs  
 15 and sacred sites that might be located within the Potential conservation areas, indicating  
 16 whether or not to disclose such information was better considered when more was known  
 17 concerning where specific projects would be located and what the potential impacts might be.

18 As part of the background research for the North Baja Pipeline Project Kirkish et al. (2000)  
 19 prepared a general overview of the kinds of cultural resources typically of general concern to  
 20 tribes in southern California. Such resources include: geoglyphs, trails, white quartz, "vision  
 21 quest" and "prayer circles," rock art (petroglyphs and pictographs), cleared circles, "spirit  
 22 breaks" and "deflectors," and cairns or shrines. For more information concerning the  
 23 importance of these kinds of resources the reader is referred to Ezzo and Altschul (1993),  
 24 Kirkish et al. (2000), and Schnieder and Altschul (2000).

### 25 **3.5.1.2 Muddy River/Moapa Valley and Virgin River**

26 These river valleys are generally known to be sensitive for cultural resources. Table 3.5-2  
 27 indicates that four GLO resources have been documented from archival sources and 26 sites  
 28 have been recorded in the off-site conservation area.

### 29 **3.5.1.3 Bill Williams River**

30 This river valley is likely sensitive for cultural resources, although few resources have been  
 31 actually recorded so far. Table 3.5-2 indicates that 69 GLO resources have been documented in  
 32 the Bill Williams/Planet Ranch areas from archival sources, while field survey has resulted in  
 33 the recordation of six sites within the off-site conservation areas. The low numbers of recorded  
 34 sites could reflect the lack of intensive survey or specific characteristics of the off-site  
 35 conservation areas.

1 **3.5.1.4 Lower Gila River**

2 The Gila River is generally considered sensitive for cultural resources, although few resources  
3 have been documented in the specific location selected for off-site conservation. Table 3.5-2  
4 indicates that three GLO resources have been documented from archival sources and field  
5 surveys have recorded two sites in the off-site conservation area.

6 **3.5.2 Environmental Consequences**

7 ***Significance Criteria***

8 In accordance with 36 CFR 800 (a)(1), an adverse effect to a historic property eligible for  
9 inclusion in the NRHP is found when "...an undertaking may alter, directly or indirectly, any of  
10 the characteristics of a historic property that qualify that property for inclusion in the NRHP in  
11 a manner that would diminish the integrity of the property's location, design, setting, materials,  
12 workmanship, feeling or association." In accordance with CEQA, an impact on cultural  
13 resources would be considered significant if it adversely affects a resource listed in or eligible  
14 for listing in the NRHP, state registers, or is otherwise considered a unique, important or  
15 significant resource under relevant cultural resource laws, guidelines, and regulations. In  
16 general, a project may have an adverse effect on a cultural resource if the resource would be  
17 physically damaged or altered, would be isolated from the context considered significant, or  
18 would be affected by project elements that would be out of character with the significant  
19 property or its setting.

20 The American Indian Religious Freedom Act of 1978 establishes that it is the policy of the  
21 Federal government to "protect and preserve for American Indians their inherent right of  
22 freedom to believe, express, and exercise the(ir) traditional religions..." EO 13007 elaborates  
23 and strengthens the Act and directs Federal agencies to avoid adversely affecting "sacred sites."  
24 Title 36 CFR 800 addresses the consideration of Native Americans and other interested parties  
25 in the process of evaluating impacts on cultural resources. Specific impacts that would be  
26 considered adverse and significant are determined in consultation with such parties. For  
27 present purposes, any action that could disturb or destroy archaeological sites, biological  
28 habitats, topographic features or other properties associated with Native American religious  
29 ceremonies would be considered adverse and significant.

30 **3.5.2.1 Alternative 1: Proposed Conservation Plan**

31 ***Impacts***

32 Prior to implementing specific projects, LCR MSCP participants would be required to comply  
33 with the environmental compliance and historic preservation laws and regulations in effect at  
34 the time. Current laws and regulations require agencies to identify cultural resources and to  
35 evaluate these for potential listing on Federal and state registers in consultation with the  
36 SHPOs, tribes, and other interested organizations and individuals. Agencies are further  
37 required to assess the effects of an undertaking on those properties found eligible for listing on  
38 the NRHP, and to mitigate, in so far as is possible, adverse effects to those properties if they can  
39 not be avoided through project redesign or by other means.

1 **Impact CULT-1: Disturbance of the ground surface could directly or indirectly disturb or**  
2 **destroy significant archaeological or historical resources, particularly in undeveloped or**  
3 **previously undisturbed areas.** A number of the activities proposed for implementation in the  
4 Conservation Plan could result in adverse effects to historic properties if such are present in the  
5 area of a planned conservation project. Controlled burns to remove undesirable vegetation can  
6 result in the destruction of perishable items (e.g., basketry, arrow and dart shafts, textiles,  
7 historic wooden structures, corrals, fences, etc.) that might be preserved in sites, and can cause  
8 lithics, ceramics, and the faces of rock art panels to spall. Burning can also result in physical  
9 and chemical changes in some classes of artifacts that could prevent the use of some analytical  
10 techniques, such as thermoluminescence to date ceramics. Vegetation removal using  
11 mechanical means can result in the destruction of the integrity of both surface and subsurface  
12 cultural deposits. Dredging areas that have not been previously dredged could result in the  
13 destruction of buried cultural deposits, if such exist, and/or burial of sites at dredge spoil  
14 disposal locations. Ground disturbing activities such as excavation of new channels, ditches,  
15 and shallow swales, creation of terraces and benches, and contouring and leveling areas for  
16 plantings, construction of water control structures, development of new access roads, etc., all  
17 have the potential to destroy surface and subsurface cultural deposits if any exist in the area of a  
18 project. Construction and use of access roads, staging areas, and other ancillary facilities  
19 associated with construction and operations can also affect cultural resources in potential  
20 conservation areas and other project areas.

21 The potential for cultural resource impacts in agricultural areas would be similar to those in  
22 undeveloped areas, although the number of significant sites that might be affected might be  
23 lower due to prior disturbance from plowing, contouring, disking, and other agricultural  
24 practices that disturb the ground surface. Such disturbances can destroy or reduce the integrity  
25 and information potential of some (but not all) types of sites.

26 This impact would be *significant but mitigable to less than significant* with implementation of  
27 **Mitigation Measure CULT-1.**

28 **Impact CULT-2: Cultural resources may be affected by unauthorized artifact collection**  
29 **during construction or by a lack of awareness of cultural resource mitigation measures on the**  
30 **part of construction personnel.** Construction workers may collect artifacts or unintentionally  
31 damage or destroy cultural resources unless they have a working knowledge of the nature and  
32 importance of cultural resources, laws preventing vandalism and artifact theft. This impact  
33 would be *significant but mitigable to less than significant* with implementation of **Mitigation**  
34 **Measure CULT-1.**

### 35 *Mitigation Measures*

36 **CULT-1:** One or more of the following mitigation measures shall be implemented (*Addresses*  
37 *Impacts Cult-1 and Cult-2*)

- 38 1. Consult with the appropriate SHPO(s), tribes, and other interested parties, perform  
39 archival research, interview informants, and conduct cultural resource inventories  
40 during site-specific environmental review to identify any cultural resources that may be  
41 affected. Consult with geologists, geomorphologists, and/or geophysicists to determine  
42 if there are areas that may contain buried cultural deposits and to determine the

- 1 appropriate methods/techniques for locating these. Implement subsurface exploration  
2 activities as a part of the inventory and identification program.
- 3 2. Evaluate all identified cultural resources for potential listing on the NRHP or state or  
4 local registers with respect to applicable criteria and appropriate historic themes,  
5 research questions, and data requirements as identified in regional, local, and/or project  
6 specific historic contexts.
- 7 3. Modify project design, if feasible, to avoid cultural resources found eligible for listing on  
8 the national, state, or local registers.
- 9 4. When required (i.e., in California), consult with the SHPO, tribes, and other interested  
10 parties to develop and implement, prior to construction, a "Testing and Evaluation  
11 Plan" if "potentially significant" archaeological sites cannot be avoided through project  
12 redesign.
- 13 5. If an archaeological site eligible for listing on the national, state, or local registers of  
14 historic places cannot be avoided through project redesign, in consultation with the  
15 appropriate SHPO, tribes, and other interested parties, develop and implement a Data  
16 Recovery Plan. If the eligible property is a building or structure, consult with the  
17 appropriate SHPO and other interested parties, and document the resource to the agreed  
18 to standards.
- 19 6. Develop a Cultural Resources Construction Monitoring Plan prior to construction if  
20 ground disturbance would occur within any areas of potential archaeological sensitivity.
- 21 7. In the event of an unanticipated cultural resource discovery during construction, re-  
22 direct construction to other areas until the discovery has been documented by a  
23 qualified archaeologist and its potential significance evaluated in terms of applicable  
24 criteria. Resources considered significant would be avoided or subject to a testing and  
25 evaluation program and/or a data recovery program as described above.
- 26 8. If the project has the potential to discover or otherwise result in the excavation of Native  
27 American cultural items on Federal or tribal lands, then the appropriate Federal agency  
28 or agencies will initiate consultation with any known lineal descendants and relevant  
29 Indian tribes as per the Native American Graves Protection and Repatriation Act  
30 (NAGPRA). Consultation would identify, among other things, procedures that would  
31 be followed in the event that project-related activities resulted in the excavation or  
32 discovery of Native American human remains on Federal or tribal lands. If cultural  
33 resources or human remains were discovered on non-Federal or non-tribal lands, state  
34 and local laws would be followed.
- 35 9. Procedures that would be identified under item 8, above, would be incorporated into all  
36 archaeological testing and data recovery plans and the Cultural Resources Construction  
37 Monitoring Plan as appropriate.

38 *Residual Impacts*

39 Residual impacts would be *less than significant* because implementation of the mitigation  
40 measures noted above would ensure compliance with all regulatory requirements and the  
41 avoidance or recovery of significant cultural resources.

---

### 1 3.5.2.2 *Alternative 2: No Action Alternative*

2 Under the no action alternative, it is likely that conservation measures similar to those included  
3 in the proposed action would be implemented because compliance with the ESA still would be  
4 required for the covered actions, although some conservation could occur in the off-site  
5 conservation areas (as described in section 3.5.2.4 below), as well as along the LCR. **Impacts**  
6 **CULT-1 and CULT-2** apply to this alternative, although the smaller size of the floodplains on  
7 the tributaries could limit the potential for agencies to redesign projects to avoid impacts to  
8 historic properties; thus the probability that such properties might be affected could potentially  
9 increase to the extent that conservation were implemented in the off-site conservation areas. It  
10 is estimated that the no action alternative would develop fewer acres of conservation area than  
11 the proposed action, which would result in proportionately fewer cultural resource impacts.  
12 However, since the no action alternative would result in increased need for infrastructure,  
13 additional impacts to cultural impacts would result from the construction of these facilities.  
14 Thus, overall cultural resource impacts would be similar to those under the proposed action.

#### 15 *Mitigation Measures*

16 Mitigation measures would be developed as appropriate in the course of project-specific  
17 environmental reviews. If significant impacts are identified, mitigation measures similar to  
18 those identified in this EIS/EIR (**Mitigation Measure Cult-1**) could be implemented.  
19 Developing and implementing such mitigation measures is outside the authority of the lead  
20 agencies and is beyond the scope of this EIS/EIR.

#### 21 *Residual Impacts*

22 Residual impacts would be *less than significant* because mitigation measures are available that  
23 would reduce or avoid significant impacts to cultural resources.

### 24 3.5.2.3 *Alternative 3: Listed Species Only*

25 **Impacts CULT-1 and CULT-2** apply to this alternative. The same types of impacts would occur  
26 as described for the proposed action, but the overall magnitude would be lessened since a  
27 smaller amount of conservation area would be established.

#### 28 *Mitigation Measures*

29 **Mitigation Measure CULT-1** applies to this alternative.

#### 30 *Residual Impacts*

31 Residual impacts would be *less than significant* because implementation of the mitigation  
32 measures noted above would ensure compliance with all regulatory requirement and the  
33 avoidance or recovery of significant cultural resources.

### 34 3.5.2.4 *Alternative 4: Off-Site Conservation*

35 **Impacts CULT-1 and CULT-2** apply to this alternative. This alternative would contain the  
36 same elements as the proposed action (i.e., the number of acres subject to ground disturbing

1 activities is the same), except that establishment of upland land cover types and the  
2 establishment of marsh would be focused on the lower reaches of the Virgin, Muddy, Bill  
3 Williams, and Gila rivers. The 360 acres of backwater establishment would still occur within  
4 the planning area. Impacts of implementing this alternative generally would be similar to those  
5 of the proposed Conservation Plan, although the smaller size of the floodplains on the  
6 tributaries could limit the potential for agencies to redesign projects to avoid impacts to historic  
7 properties; thus the probability that such properties might be affected could potentially increase  
8 under this alternative.

#### 9 *Mitigation Measures*

10 **Mitigation Measure CULT-1** applies to this alternative.

#### 11 *Residual Impacts*

12 Residual impacts would be *less than significant* because implementation of the mitigation  
13 measures noted above would ensure compliance with all regulatory requirements and the  
14 avoidance or recovery of significant cultural resources.

1    **3.6           ENERGY AND DEPLETABLE RESOURCES**

2    A detailed analysis of energy and depletable resources was not performed because the  
3    proposed action and alternatives would have minimal impacts on these resources. Diesel fuel  
4    would be required during construction and to operate some of the water pumps used for  
5    irrigation. Electrical power would be required at the two potential field facilities and to operate  
6    other irrigation pumps. The amounts of diesel fuel and electricity that would be required  
7    would be minor and not require an expansion of existing supplies.

8    Hydroelectric power would not be adversely affected by the proposed action and alternatives  
9    because irrigation water for those sites that use Colorado River water would be released  
10   seasonally, as it is for agricultural uses. Because it is likely that a number of the conservation  
11   area establishment sites would be located on agricultural land using the agricultural land's  
12   water entitlement, it is likely that the timing and magnitude of water releases would be similar  
13   to those that currently exist. Moreover, only a small amount of water would be required for  
14   irrigation of the conservation area establishment sites in relation to the total amount of water  
15   released for consumptive use on the LCR (about 48,800 af compared to the 7.5 maf total annual  
16   release). (The actual release of water from Lake Mead in a given year is approximately 9.2 maf  
17   because of water delivered to Mexico). Most hydroelectric power is produced at Hoover,  
18   Parker, and Davis dams, and even if no agricultural land were used, this amount would  
19   represent a negligible change to the dams' operations. The 2003 Annual Operating Plan signed  
20   by the Secretary of the Interior, for example, shows an annual release of between 9,575,000 af  
21   and 9,305,000 af from Hoover Dam during calendar year 2003, depending on whether a Full  
22   Domestic Surplus or Normal determination is made. This would result in the production of  
23   4.136 million kWh. The proposed action and alternatives, even under worst-case conditions,  
24   would result in a less than 0.5 percent reduction in the amount of water released through  
25   Hoover Dam to generate hydroelectric power.

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1    **3.7           ENVIRONMENTAL JUSTICE**

2    This section addresses the potential for the proposed action and alternatives to create  
3    disproportionate impacts on minority and low-income populations. The Public Involvement  
4    Program (PIP) for the LCR MSCP provides opportunities for members of the low-income and  
5    minority communities that could be affected by the proposed action to participate in the LCR  
6    MSCP planning efforts. These efforts are described in section 7.2.

7    In 1994, the president issued Executive Order (EO) 12898, Federal Actions to Address  
8    Environmental Justice in Minority and Low-income Populations. The objectives of the EO  
9    include developing Federal agency implementation strategies, identifying minority and low-  
10   income populations where proposed Federal actions could have disproportionately high and  
11   adverse human health and environmental impacts, and encouraging the participation of  
12   minority and low-income populations in the NEPA process.

13   Minority populations include all persons identified by the Census of Population and Housing to  
14   be of Hispanic or Latino origin, regardless of race, as well as non-Hispanic persons who are  
15   Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian and  
16   Other Pacific Islander.

17   Low-income populations are those that fall within the annual statistical poverty thresholds from  
18   the Bureau of the Census “Current Population Reports, Series P-60 on Income and Poverty.” For  
19   the purposes of this analysis, low-income populations are defined as persons living below the  
20   poverty level (\$17,463 for a family of four with two children in 2000, adjusted based on  
21   household size and number of children), as reported by the Census (2000). The Census Bureau  
22   uses a set of money income thresholds that vary by family size and composition to detect who is  
23   poor. If the total income for a family or unrelated individual falls below the relevant poverty  
24   threshold, then the family or unrelated individual is classified as being “below the poverty  
25   level.” The percentage of low-income persons is calculated as the percentage of all persons for  
26   whom the Bureau of the Census determines poverty status, which is generally a slightly lower  
27   number than the total population since it excludes institutionalized persons, persons in military  
28   group quarters and in college dormitories, and unrelated individuals under 15 years old.

29   **3.7.1        Affected Environment**

30   The planning area and the off-site locations are located within a large geographic region  
31   encompassing all or portions of seven counties, including portions of three California counties,  
32   portions of three counties in Arizona, and a portion of Clark County, Nevada. Two types of  
33   data must be reviewed to evaluate environmental justice effects: minority populations and  
34   income levels. Information on population, demographic characteristics, and income for the  
35   seven counties in 2000 is provided in Table 3.7-1 below.

36   Of the seven counties, Imperial County has the largest percentage of minority residents and the  
37   highest percentage of the population living below the poverty level, at approximately 80  
38   percent and 23 percent, respectively. Mohave County has the lowest percentage of minority  
39   residents and the smallest percentage of the population living below the poverty level, at

1 approximately 16 percent and 14 percent respectively. The other four counties have minority  
 2 and poverty populations falling within the range identified for these two counties.

3 **Table 3.7-1. Total Population, Minority Population and Population**  
 4 **Living Below Poverty in the Affected Counties, 2000**

| <i>County</i>      | <i>Total Population</i> | <i>Minority Population</i> | <i>Percent Minority</i> | <i>Population Living Below Poverty Level</i> | <i>Percent of Population Living Below Poverty Level</i> |
|--------------------|-------------------------|----------------------------|-------------------------|--|---|
| La Paz, AZ         | 19,715                  | 7,154                      | 36.3                    | 3,798  | 19.6  |
| Mohave, AZ         | 155,032                 | 24,745                     | 16.0                    | 21,252                                       | 13.9  |
| Yuma, AZ           | 160,026                 | 88,896                     | 55.6                    | 29,670                                       | 19.2  |
| Imperial, CA       | 142,361                 | 113,872                    | 80.0                    | 29,681                                       | 22.6  |
| Riverside, CA      | 1,545,387               | 758,069                    | 49.1                    | 214,084                                      | 14.2  |
| San Bernardino, CA | 1,709,434               | 960,210                    | 56.2                    | 263,412                                      | 15.8  |
| Clark, NV          | 1,375,765               | 548,423                    | 39.9                    | 145,855                                      | 10.8  |
| <b>Total</b>       | <b>5,107,720</b>        | <b>2,501,369</b>           | <b>49.0</b>             | <b>707,752</b>                               | <b>13.9</b>   |

5 Portions of the area potentially affected by the proposed action and alternatives also consist of  
 6 tribal lands associated with the Fort Mojave Indian Reservation; CRIT; and the Chemehuevi,  
 7 Quechan (Fort Yuma Indian Reservation), Hualapai, Havasupai, and Cocopah Indian Tribes.  
 8 Figure 1.1-1 identifies the locations of tribal lands.

9 Population and income data also were collected for the four specific areas within the counties  
 10 that could be directly affected by construction related to the project: the LCR planning area,  
 11 and the three off-site conservation areas located along the Muddy and Virgin rivers, Bill  
 12 Williams River, and lower Gila River (see Table 3.7-2).

13 **Table 3.7-2. Total Population, Minority Population and Population Living Below the Poverty**  
 14 **Level in the LCR Planning Area and Off-Site Locations, 2000**

| <i>Affected Environment</i> | <i>Counties Included</i>   | <i>Total Population</i> | <i>Minority Population</i> | <i>Percent Minority</i> | <i>Population Living Below Poverty Level</i> | <i>Percent Population Living Below Poverty Level</i> |
|-----------------------------|--|-------------------------|----------------------------|-------------------------|--|--|
| Planning Area               | La Paz, Mohave, Yuma, Imperial, Riverside, San Bernardino, Clark | 105,756                 | 60,491                     | 57.2                    | 22,330                                       | 21.1   |
| Muddy and Virgin Rivers     | Clark  | 4,656                   | 567                        | 12.2                    | 353  | 7.6  |
| Bill Williams River         | La Paz, Mohave   | 713                     | 86                         | 12.1                    | 77   | 10.8   |
| Lower Gila River            | Yuma   | 2,576                   | 1,108                      | 43.0                    | 464  | 18.1   |

Source: U.S. Department of Commerce, Census Bureau 2000.

1 Based on a GIS analysis of the census block groups within each of these four areas, and  
2 assuming that populations are equally distributed within a particular census block group,  
3 populations were prorated for subsections within block groups. The total population, minority  
4 population, and persons living below poverty level were then estimated for each area. It is  
5 noted that communities located in proximity to these four areas (e.g., Blythe, Bullhead City,  
6 Parker, Needles, and Wellton) could also be affected by the proposed action; however, it would  
7 be speculative in this programmatic analysis to attempt to identify which specific locations  
8 would be affected. Additional evaluation would be performed once specific projects were  
9 identified. Projects located on tribal lands also might require additional analysis. In addition,  
10 because workers may travel some distance to agricultural sites for work, the demographic and  
11 economic characteristics of the four areas discussed below are provided as general indicators  
12 only and are not intended to suggest that persons residing outside of these areas could not be  
13 affected.

#### 14 **3.7.1.1 Lower Colorado River**

15 The planning area is the largest and most populated of the four areas considered, with a year  
16 2000 population of approximately 105,756. Of this total, approximately 57 percent of the  
17 population is minority, and approximately 21 percent of the population lives below the poverty  
18 level. Compared to the three off-site locations, this area has a substantially higher percentage of  
19 both minorities and persons living below the poverty level.

#### 20 **3.7.1.2 Muddy River/Moapa Valley and Virgin River**

21 The Muddy River/Moapa Valley and Virgin River off-site conservation area is located entirely  
22 within Clark County. The year 2000 population was approximately 4,656. Of this total,  
23 approximately 12 percent of the population is minority, and approximately 8 percent of the  
24 population lives below the poverty level.

#### 25 **3.7.1.3 Bill Williams River**

26 The Bill Williams River off-site conservation area is located within La Paz and Mohave counties.  
27 The year 2000 population was approximately 713. Of this total, approximately 12 percent of the  
28 population is minority, and approximately 11 percent of the population lives below the poverty  
29 level.

#### 30 **3.7.1.4 Lower Gila River**

31 The lower Gila River off-site conservation area is located entirely within Yuma County. It had a  
32 year 2000 population of approximately 2,576. Of this total, approximately 43 percent of the  
33 population is minority, and approximately 18 percent of the population lives below the poverty  
34 level.

### 35 **3.7.2 Environmental Consequences**

#### 36 **Significance Criteria**

37 The analysis of environmental justice impacts is required by EO 12898 and must be evaluated in  
38 NEPA documents. NEPA does not require the use of significance criteria. This analysis

1 considers whether the impacts of the proposed action and alternatives would dispropor-  
2 tionately affect minority or low-income populations.

3 **3.7.2.1 Alternative 1: Proposed Conservation Plan**

4 *Methodology*

5 The air quality, hazards (increased vectors), noise, and socioeconomic analyses in Chapter 3  
6 were reviewed to determine whether they identified impacts to human populations and are  
7 used as the basis for the environmental justice analysis. To provide data for a determination of  
8 disproportionate impacts, the demographics of the planning area were compared to the  
9 combined demographics of the seven counties containing the planning area, referred to as the  
10 Community of Comparison (or COC) (see Tables 3.7-1 and 3.7-2). Likewise, the demographics  
11 of each of the three off-site areas were compared to the county or counties (the COC) containing  
12 each off-site area. The likelihood of agricultural jobs to be held by minority and low income  
13 workers also was considered.

14 *Impacts*

15 The increase in riparian and backwater areas could result in an increase in vectors. Vectors,  
16 such as mosquitoes, are attracted to pools of water, such as ponds and backwaters, as well as  
17 riparian vegetation. The amount of conservation area containing these land cover types that  
18 would be established, however, is small in relation to the overall size of the planning area.  
19 Moreover, the siting criteria for conservation sites include consideration of the likelihood for  
20 mosquitoes produced on a site to become a vector control or nuisance problem based on  
21 proximity to urban areas and mosquito production potential. The Conservation Plan includes  
22 other measures to minimize potential impacts from vectors, including coordinating the design  
23 and management of conservation areas with local appropriate health officials; incorporating, to  
24 the extent practicable, design, and management concepts to help reduce the likelihood that  
25 conservation areas do not produce mosquitoes in numbers that could cause public health or  
26 nuisance concerns; and providing conservation area access to mosquito abatement district  
27 officials to monitor mosquito populations. The proposed action also would result in an increase  
28 in fish and bird populations that eat insects. Given the measures included in the Conservation  
29 Plan to minimize impacts from vectors, an increase in vectors would not create disproportionate  
30 impacts to minority and low-income populations.

31 **Impact EJ-1. Significant, short-term air quality impacts from construction activities and**  
32 **prescribed burns in or near agricultural areas could result in disproportionate impacts to**  
33 **minority and low-income populations.** Construction and prescribed burn activities would  
34 result in emissions that could significantly affect air quality (i.e., the development of the largest  
35 projects and prescribed burns would produce fugitive dust emissions that could exceed an  
36 ambient 24-hour PM<sub>10</sub> standard, and air emissions from proposed conservation area  
37 establishment activities and facility construction could exceed the MDAQMD daily NO<sub>x</sub> or  
38 PM<sub>10</sub> emission significance thresholds; refer to **Impacts AQ-2, AQ-3, and AQ-4** for additional  
39 detail). Construction activities would be temporary and would take place in agricultural or  
40 undeveloped areas that are not densely populated (urban areas would be avoided as part of the  
41 vector control management for the proposed action). Air emissions disperse, however, and it is

1 possible that construction and burn-related emissions could have the potential to have an  
2 impact on isolated residences and workers that are close to the affected area.

3 The population in the planning area is 57.2 percent minority, compared to 49.0 percent minority  
4 in the COC. Also, the population in the planning area is 21.1 percent low-income compared to  
5 13.9 percent low-income in the COC. Based on these two comparisons and because the  
6 percentage of minority and low-income populations is meaningfully higher in the planning area  
7 than the COC, there is the potential for disproportionate impacts to minority and low-income  
8 populations from significant, short-term air emissions.

9 **Impact EJ-2. Noise from construction and pumps that exceeded local standards could**  
10 **disproportionately affect minority and low-income populations.** As noted above,  
11 construction activities would take place in agricultural or undeveloped areas that are not  
12 densely populated. However, in some areas, construction-related noise would have the  
13 potential to have an adverse effect on isolated residences or populations that are close to the  
14 construction area, disproportionately affecting minority populations and low-income  
15 populations (refer to **Impact NOI-1** for additional detail). Additionally, as described under  
16 **Impact NOI-2**, pumps located near noise-sensitive receptors could cause a substantial increase  
17 in ambient noise levels or exceed regulatory thresholds. Because the percentage of minority  
18 and low-income populations is meaningfully higher in the planning area than the COC, there is  
19 the potential for disproportionate impacts to minority and low-income populations from  
20 significant short-term and long-term noise.

21 **Impact EJ-3: If agricultural land were converted to conservation areas, the loss of agricultural**  
22 **jobs would disproportionately affect minority and low-income populations.** The potential  
23 conversion of agricultural land to conservation areas under the proposed Conservation Plan  
24 would result in the loss of agricultural jobs. It is estimated that, on average, there would be a  
25 reduction of just under 30 workers for every 1,000 acres of farmland that is taken out of  
26 agricultural use. If, as a worst-case scenario, all 8,132 acres of conservation area established  
27 under the proposed action were from conversion of actively farmed agricultural land, an  
28 average of approximately 244 agricultural jobs could be lost. Although losses of this magnitude  
29 represent extremely small shares (less than 1 percent) of the total employment in individual  
30 counties, they would represent a larger share of agricultural employment and could  
31 substantially affect individual communities. Agricultural jobs typically are held by a higher  
32 percentage of minority and low-income individuals than are represented by the county  
33 populations as a whole; moreover the population in the planning area consists of a higher  
34 percentage of minority and low-income individuals than the COC. Thus, the loss of agricultural  
35 jobs would have a disproportionate effect on minority and low-income populations.

### 36 *Mitigation Measures*

37 Implement **Mitigation Measures AQ-1** and **AQ-2**. (*Addresses Impact EJ-1*)

38 Implement **Mitigation Measures NOI-1** and **NOI-2**. (*Addresses Impact EJ-2*)

39 **EJ-1** Reclamation shall work with local jurisdictions and/or growers to ensure that  
40 agricultural workers are notified as soon as possible of the potential for a loss of jobs  
41 once specific project locations have been identified. Reclamation will encourage the

1 local jurisdictions and/or growers to provide timely information and assistance to  
2 agricultural workers regarding the availability of alternative employment. (*Addresses*  
3 *Impact EJ-3*)

4 *Residual Impacts*

5 The implementation of **Mitigation Measure AQ-1** would reduce fugitive dust emissions from  
6 project activities. The exact site sizes, locations, and construction methods are not known; thus,  
7 even with mitigation, the emissions from the development of the largest projects may still  
8 exceed the significance criteria considered in **Impacts AQ-2** and **AQ-4**. Therefore, residual  
9 impacts of PM<sub>10</sub> emissions from the development of the largest projects would be *potentially*  
10 *significant* and would have a potentially disproportionate impact on minority and low-income  
11 populations as described under **Impact EJ-1**. The implementation of **Mitigation Measure AQ-2**  
12 would reduce combustive emissions from prescribed burns; however, mitigated burn emissions  
13 could be sufficiently substantial to contribute to an exceedance of an ambient 24-hour PM<sub>10</sub>  
14 standard. Therefore, residual impacts associated with the largest prescribed burns under  
15 **Impact AQ-3** would be *potentially significant* and would have potentially disproportionate  
16 impacts on minority populations and low-income populations as described under **Impact EJ-1**.  
17 No additional mitigation measures were identified for these residual disproportionate impacts;  
18 however, it is noted that once specific project locations are known, the demographics of  
19 potentially affected populations may differ from those of the planning area as a whole.

20 The implementation of **Mitigation Measures NOI-1 and NOI-2** would mitigate  
21 disproportionate noise impacts identified under **Impact EJ-2** since noise levels would be  
22 reduced to meet regulatory standards or to avoid substantially increasing the ambient noise  
23 levels.

24 The implementation of **Mitigation Measure EJ-1** would minimize potential environmental  
25 justice impacts by providing advance notice of the loss of agricultural jobs to affected workers  
26 and by encouraging local jurisdictions and/or growers to provide timely information and  
27 assistance to agricultural workers regarding the availability of alternative employment.

28 **3.7.2.2 Alternative 2: No Action Alternative**

29 *Impacts*

30 Under the no action alternative, it is likely that conservation measures similar to those included  
31 in the proposed action would be implemented because compliance with the ESA still would be  
32 required for the covered actions, although some conservation could occur in the off-site  
33 conservation areas (as described in section 3.7.2.4 below), as well as along the LCR. **Impacts EJ-**  
34 **1, EJ-2, and EJ-3** apply to this alternative, although **Impacts EJ-1** and **EJ-2** apply only to  
35 conservation in the planning area, along the LCR. Air quality and noise impacts in the off-site  
36 conservation areas would not have disproportionate effects on minority or low-income  
37 populations because the percentages of these populations are lower in the affected areas than in  
38 the general population represented by the COC for each location. To the extent that the  
39 agencies undertaking the covered actions proceed with ESA compliance through section 7  
40 consultations instead of the section 10 permitting process, there may be a reduced number of  
41 covered species because unlisted species would not be included. This would likely result in the

1 establishment of less conservation area than under the proposed action. Proportionately fewer  
2 environmental justice impacts would occur since less agricultural land would be converted to  
3 other land cover types and therefore fewer jobs would be lost (assuming a worst-case scenario  
4 that all conservation areas would be established on agricultural land). The same types of  
5 impacts would occur as described for the proposed action, but the overall magnitude could be  
6 lessened because a smaller amount of conservation area would be established.

#### 7 *Mitigation Measures*

8 Mitigation measures would be developed as appropriate in the course of project-specific  
9 environmental reviews. If significant impacts were identified, mitigation measure similar to  
10 those identified in this EIS/EIR (**Mitigation Measures AQ-1 and AQ-2, NOI-1 and NOI-2, and**  
11 **EJ-1**) could be implemented. Developing and implementing such mitigation measures is  
12 outside the authority of the lead agencies and is beyond the scope of this EIS/EIR.

#### 13 *Residual Impacts*

14 As described above, the exact site sizes and locations and construction methods are not known;  
15 thus, even with mitigation identified in **Mitigation Measures AQ-1 and AQ-2**, the emissions  
16 from the development of the largest projects may still exceed the significance criteria considered  
17 in **Impacts AQ-2 and AQ-4**. Therefore, residual impacts of PM<sub>10</sub> emissions from the  
18 development of the largest projects would be *potentially significant* and would have potentially  
19 disproportionate impacts on minority populations and low-income populations as described  
20 under **Impact EJ-1**. The implementation of **Mitigation Measure AQ-2** would reduce  
21 combustive emissions from prescribed burns; however, mitigated burn emissions could be  
22 sufficiently substantial to contribute to an exceedance of an ambient 24-hour PM<sub>10</sub> standard.  
23 Therefore, residual impacts associated with the largest prescribed burns under **Impact AQ-3**  
24 would be *potentially significant* and would have potentially disproportionate impacts on  
25 minority populations and low-income populations as described under **Impact EJ-1**. No  
26 additional mitigation measures were identified for these residual disproportionate impacts;  
27 however, it is noted that once specific project locations are known, the demographics of  
28 potentially affected populations may differ from those of the planning area as a whole.

29 The implementation of **Mitigation Measures NOI-1 and NOI-2** would mitigate  
30 disproportionate noise impacts identified under **Impact EJ-2** since noise levels would be  
31 reduced to meet regulatory standards or to avoid substantially increasing the ambient noise  
32 levels.

33 The implementation of **Mitigation Measure EJ-1** would minimize potential environmental  
34 justice impacts by providing advance notice of the loss of agricultural jobs to affected workers  
35 and by encouraging local jurisdictions and/or growers to provide timely information and  
36 assistance to agricultural workers regarding the availability of alternative employment.

1 3.7.2.3 *Alternative 3: Listed Species Only*

2 *Impacts*

3 **Impacts EJ-1, EJ-2, and EJ-3** apply to this alternative, although a smaller amount of  
4 conservation area would be developed than under the proposed action. Proportionately fewer  
5 environmental justice impacts would occur since less agricultural land would be converted to  
6 other land cover types and therefore fewer jobs would be lost (assuming a worst-case scenario  
7 that all conservation areas would be established on agricultural land). The same types of  
8 impacts would occur as described for the proposed action, but the overall magnitude could be  
9 lessened because a smaller amount of conservation area would be established.

10 *Mitigation Measures*

11 **Mitigation Measures AQ-1, AQ-2, NOI-1, NOI-2, and EJ-1** apply to this alternative.

12 *Residual Impacts*

13 The implementation of **Mitigation Measure AQ-1** would reduce fugitive dust emissions from  
14 project activities. The exact site sizes, locations, and construction methods are not known; thus,  
15 even with mitigation, the emissions from the development of the largest projects may still  
16 exceed the significance criteria considered in **Impacts AQ-2** and **AQ-4**. Therefore, residual  
17 impacts of PM<sub>10</sub> emissions from the development of the largest projects would be *potentially*  
18 *significant* and would have a potentially disproportionate impact on minority and low-income  
19 populations as described under **Impact EJ-1**. The implementation of **Mitigation Measure AQ-2**  
20 would reduce combustive emissions from prescribed burns; however, mitigated burn emissions  
21 could be sufficiently substantial to contribute to an exceedance of an ambient 24-hour PM<sub>10</sub>  
22 standard. Therefore, residual impacts associated with the largest prescribed burns under  
23 **Impact AQ-3** would be *potentially significant* and would have potentially disproportionate  
24 impacts on minority populations and low-income populations as described under **Impact EJ-1**.  
25 No additional mitigation measures were identified for these residual disproportionate impacts;  
26 however, it is noted that once specific project locations are known, the demographics of  
27 potentially affected populations may differ from those of the planning area as a whole.

28 The implementation of **Mitigation Measures NOI-1** and **NOI-2** would mitigate  
29 disproportionate noise impacts identified under **Impact EJ-2** because noise levels would be  
30 reduced to meet regulatory standards or to avoid substantially increasing the ambient noise  
31 levels.

32 The implementation of **Mitigation Measure EJ-1** would minimize potential environmental  
33 justice impacts by providing advance notice of the loss of agricultural jobs to affected workers  
34 and by encouraging local jurisdictions and/or growers to provide timely information and  
35 assistance to agricultural workers regarding the availability of alternative employment.

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#### 1 3.7.2.4 Alternative 4: Off-Site Conservation

##### 2 *Impacts*

3 Air quality and noise impacts in the off-site conservation areas would not have  
4 disproportionate effects on minority or low-income populations because the percentages of  
5 these populations are lower in the affected areas than in the general population represented by  
6 the COC for each location. The estimated population in the Muddy and Virgin rivers off-site  
7 location is 12.2 percent minority and 7.6 percent low-income, compared to 39.2 percent minority  
8 and 10.8 percent low-income in Clark County, the COC. The estimated population in the Bill  
9 Williams River off-site location is 12.1 percent minority and 10.8 percent low-income, compared  
10 to 18.3 percent minority and 14.3 percent low-income in La Paz and Mohave counties, the COC.  
11 The estimated population in the Lower Gila River off-site location is 43 percent minority and  
12 18.1 percent low-income, compared to 55.6 percent minority and 19.2 percent low-income in  
13 Clark County, the COC.

14 **Impacts EJ-1 and EJ-2** apply to this alternative but only in relation to the 360 acres of  
15 backwaters that would be established along the LCR. Thus, the potential for these impacts  
16 would be greatly reduced in comparison to the proposed action.

17 **Impact EJ-3** applies to this alternative. As noted in section 3.2, Agricultural Resources, all of the  
18 off-site locations contain agricultural land. Since the same amount of conservation area would  
19 be established under this alternative, overall impacts would be as characterized for the  
20 proposed action. Backwaters would continue to be established in the planning area; thus,  
21 impacts associated with this component of the Conservation Plan would be identical to those of  
22 the proposed action. Other impacts associated with the loss of agricultural jobs from  
23 conservation area establishment would occur in slightly different areas than under the  
24 proposed action.

##### 25 *Mitigation Measures*

26 **Mitigation Measure EJ-1** applies to this alternative.

##### 27 *Residual Impacts*

28 The implementation of **Mitigation Measure EJ-1** would minimize potential environmental  
29 justice impacts by providing advance notice of the loss of agricultural jobs to affected workers  
30 and by encouraging local jurisdictions and/or growers to provide timely information and  
31 assistance to agricultural workers regarding the availability of alternative employment.

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1    **3.8    HAZARDS AND HAZARDOUS MATERIALS**

2    This section addresses hazardous materials, vectors, wildland fires, and the potential for bird-  
3    aircraft strikes.

4    **3.8.1    Affected Environment**

5    **3.8.1.1    Lower Colorado River**

6    *Hazardous Materials*

7    A material is considered hazardous if it appears on a list of hazardous materials prepared by a  
8    Federal, state, or local agency, and/or if it has characteristics defined as hazardous by such an  
9    agency. Chemical and physical properties cause a substance to be considered hazardous,  
10   including the properties of toxicity, ignitability, corrosivity, and reactivity. These properties are  
11   defined in CCR, Title 22, sections 66261.20-66261.24.

12   A variety of hazardous materials potentially are present throughout the project area. Industries  
13   and other entities use many types of hazardous materials, such as fuels and solvents.  
14   Numerous fuels, chemicals, and other hazardous materials are also transported via roadways  
15   and railways. At typical construction sites, materials that could be considered hazardous  
16   include fuels, motor oil, grease, various lubricants, solvents, soldering equipment, and glues.  
17   Additionally, excavation may expose buried hazardous materials resulting from prior use of the  
18   site or adjacent property. A substantial portion of the area affected by the proposed project is  
19   used for agricultural purposes (refer to section 3.2, Agricultural Resources, for additional  
20   detail). Above-ground petroleum storage tanks and pesticide storage facilities are present in  
21   many locations and increase the risk of human exposure to potentially hazardous substances.  
22   Additionally, storage tanks may leak petroleum products into the soil, where they could  
23   migrate to water supplies. Pesticides and fertilizers used for agricultural operations may  
24   accumulate in the soil and may over time contaminate surface water and groundwater supplies.

25   *Vectors*

26   This section discusses the prevalence and distribution of vector populations in the project area.  
27   The term “vector” is used to denote a carrier of disease organisms. The vector may be purely  
28   mechanical, as exemplified by houseflies spreading enteric organisms, or biological, wherein  
29   the disease organism multiplies or undergoes change within the vector, as exemplified by the  
30   development of encephalitic viruses in mosquitoes. Nuisance organisms are also addressed  
31   with the understanding that they are not generally considered disease carriers but do present  
32   nuisance effects to humans and domestic animal populations.

33   Mosquitoes are the primary vectors of concern because they are not only annoying pests, but  
34   some are known carriers of human and animal diseases. The presence of standing water  
35   provides an ideal breeding environment for mosquitoes. Most adults remain close to their point  
36   of origin, but their traveling ability is heavily dependent on physical phenomena such as wind.  
37   Some mosquitoes feed on mammalian and other animal hosts, while others feed on fruits and  
38   plant nectars. Within the LCR region, encephalitic viruses such as the West Nile virus (WNV),  
39   Western equine encephalitis (WEE), and St. Louis encephalitis (SLE), spread by the mosquito

1 vector *Culex tarsalis* are the most important arboviruses of concern, although dengue fever also  
2 may be present.

3 Mosquitoes become infected with WNV when they feed on infected birds that have high levels  
4 of the virus in their blood. WNV was first detected in the United States in the fall of 1999 in  
5 New York City. Since 1999, more than 4,000 cases of infection with WNV have been detected in  
6 44 states, including California. Numerous local agencies throughout California routinely  
7 conduct surveillance and control of mosquitoes and the diseases they transmit. In 2000, the  
8 statewide surveillance program added WNV to the list of diseases monitored. In 2002, WNV  
9 was detected for the first time in California in a single human case in Los Angeles (California  
10 Department of Health Services [CADHS] 2002). A second human case was discovered in  
11 California in October 2003, in Imperial County (University of California at Davis 2003).  
12 Evidence of WNV activity has been found in almost all the counties in Arizona (Arizona  
13 Department of Health Services [ADHS] 2003a). As of October 2003, two human cases of WNV  
14 were discovered in both Arizona (Graham and Pima counties) and in Nevada (Washoe and Nye  
15 counties) (Centers for Disease Control [CDC] 2003a and USGS 2003e).

16 WEE is an important cause of encephalitis in horses and humans, mainly in western parts of the  
17 United States and Canada. WEE is carried principally by the *Culex tarsalis* species of mosquito  
18 that is associated with irrigated agriculture and stream drainages. Surveillance efforts in  
19 Arizona in 2002 detected the WEE virus in 14 out of 28 mosquito tested pools (Yuma County-10,  
20 Pinal County-2, Maricopa County-1, and Mohave County-1) (ADHS 2003). As of April 2003, no  
21 cases of WEE have otherwise been detected in Arizona. No human cases of WEE have been  
22 detected in Nevada (CDC 2001a). Two human cases of WEE were found in California in 1986  
23 and none since then (CDC 2001a).

24 In the United States, the leading cause of epidemic flaviviral encephalitis is SLE virus. SLE is  
25 the most common mosquito-transmitted human pathogen in the United States, and is  
26 distributed throughout the lower 48 states. During the summer season, SLE virus is maintained  
27 in a mosquito-bird-mosquito cycle. In the western United States, *Culex tarsalis* and *Culex pipiens*  
28 are the principal vectors. Surveillance efforts in Arizona in 2002 detected the SLE virus in 14  
29 out of 28 mosquito tested pools (Yuma County-9, Maricopa County-2, Pima County-2, and Pinal  
30 County-1) (ADHS 2003). Two human cases of SLE were reported in Maricopa County in 2002  
31 (ADHS 2003). One human case of SLE was reported in California in 1995 (CDC 2001b), and no  
32 other cases have been reported to date (CADHS 2003). In 2003, one human case of SLE has been  
33 detected in Clark County, Nevada (Clark County Health District 2003). There has never been a  
34 human outbreak of SLE in Utah (Utah County Online 2002).

35 Since 2001, five human cases of dengue fever have been detected in California. Two of those  
36 were detected in 2003, one in Alameda County and one in Riverside County (CADHS 2003).  
37 Two cases of dengue fever (one confirmed and one presumptive) were reported in 2002 in  
38 Coconino County, Arizona (ADHS 2003).

### 39 *Wildfires*

40 On average, at least one fire occurs every three years that will burn at least 1,000 acres along the  
41 LCR, and approximately 95 percent of all wildfires in this area are caused by humans (personal  
42 communication, J. Swett 2003). The risk from wildfires along the LCR has increased since the

1 completion of Hoover Dam in 1935 because suppression of annual flood events has limited the  
2 ability of native plant communities to regenerate and has created a system where wildfire has  
3 become the major disturbance influencing riparian stand development along the river.

4 Fire management along the LCR primarily is the responsibility of three Department of Interior  
5 agencies: the BLM, BIA, and the Service. In 1989, the Colorado River Zone (CRZ) was  
6 established as an interagency dispatch in order to facilitate fire suppression activities along the  
7 LCR using the closest resources available. The CRZ enabled these three agencies to eliminate  
8 duplication of personnel and equipment needed to support relatively small programs.  
9 Additionally, these agencies signed an interagency agreement forming the Lower Colorado  
10 River Wildland Fire Management Group (LCR Fire Management Group) in January 1999. This  
11 group has entered into agreements with the State of Arizona and San Bernardino, Imperial, and  
12 Riverside counties to mutually provide wildland fire fighting resources to assist in both initial  
13 attack and extended attack situations along the river. State and local fire offices can be staffed  
14 up or additional equipment can be supplied to the local entities. Currently, local fire  
15 organizations do not participate in fire suppression along the LCR.

16 Prescribed burns, which are intentionally set fires, may be used to suppress active fires, to  
17 reduce fuel loads, clear vegetation, or to establish or enhance habitat. Prescribed burns have  
18 been used by the LCR Fire Management Group as a fire suppression technology along the LCR  
19 (personal communication, J. Swett 2003) and have been used by the Service to establish suitable  
20 habitat conditions for particular species. Five such prescribed burns took place along the LCR  
21 from 2000 to 2003, at Lake Havasu NWR, Mittry Lake, and Imperial NWR (personal  
22 communication, D. Repass 2003). Prescribed burns also are commonly used by farmers to clear  
23 fields. For example, approximately 11,490 acres of agricultural land were burned within the  
24 MDAQMD<sup>1</sup> in 2002 (MDAQMD 2002). Of those acres, approximately 7,000 were burned by the  
25 California Department of Forestry and Fire Protection personnel within the city of Blythe in  
26 Riverside County (MDAQMD 2002).

### 27 *Bird-Aircraft Strike Hazards*

28 Bird-Aircraft Strike Hazards (BASH) can result in damage to aircraft and potentially the loss of  
29 human life. Approximately 95 percent of BASH incidents occur below 2,000 feet above ground  
30 level (AGL); 70 percent of these occur below 500 feet AGL (Murton and Wright 1968). More  
31 recent unpublished studies confirm these findings (U.S. Navy 1999). The species involved in  
32 BASH incidents are generally the common species that occur near airfields. Large, slow-flying  
33 birds such as raptors (hawks and owls); large wading birds (herons, egrets, and ibis); gulls; and  
34 waterfowl (ducks and geese) are more likely to be hit, and also are more likely to do substantial  
35 damage to aircraft due to their mass.

36 Waterfowl often congregate at or near ponds and other water bodies. Smaller birds that often  
37 form large flocks (for example, European starling, blackbirds, and some shorebirds) can pose a  
38 threat to aircraft and aircrews. Even a single small bird can cause significant damage to an  
39 airplane; a flock makes collisions more likely and damage more severe. Resident adult birds

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1 The MDAQMD encompasses the desert portion of northern San Bernardino County, as well as the Palo Verde Valley in Riverside County.

1 may learn to avoid planes, but young birds and migrants may be more prone to collision  
2 (Blokpoel 1976).

3 The joint-use airfield shared by the Marine Corps Air Station and Yuma International Airport  
4 (MCAS Yuma/YIA) is the one most likely to be affected by the proposed action because its  
5 Accident Potential Zone extends over the lower Gila River near its confluence with the LCR,  
6 which is in the planning area.

### 7 **3.8.1.2 Muddy River/Moapa Valley and Virgin River**

8 The discussions of hazardous materials, vectors, and wildfires in section 3.8.1.1 are generally  
9 applicable to this off-site location. No airports are located in the immediate vicinity of these  
10 rivers. Reclamation and the Las Vegas BLM field office are responsible for fire suppression  
11 efforts along the Virgin and Muddy rivers.

### 12 **3.8.1.3 Bill Williams River**

13 The discussions of hazardous materials, vectors, and wildfires in section 3.8.1.1 are generally  
14 applicable to this off-site location. No airports are located in the immediate vicinity of these  
15 rivers. Fire management practices for the Bill Williams River region are as described for the  
16 LCR, and are the responsibility of the LCR Fire Management Group.

### 17 **3.8.1.4 Lower Gila River**

18 The discussions of hazardous materials, vectors, and wildfires in section 3.8.1.1 are generally  
19 applicable to this off-site location. The Accident Potential Zone for the MCAS Yuma/YIA is not  
20 within the boundary of this conservation area, nor are any other airports. The Arizona State  
21 Land Department and BLM share primary responsibility for fire management on the lower Gila  
22 River, with the exception of the small municipalities located along the river.

## 23 **3.8.2 Environmental Consequences**

### 24 **Significance Criteria**

25 The proposed action would result in significant impacts if it would result in any of the  
26 following:

- 27 • create a significant hazard to the public or the environment through reasonably  
28 foreseeable upset and accident conditions associated with operations and/or  
29 maintenance;
- 30 • result in conditions that would lead to a substantially increased population of disease or  
31 nuisance vectors;
- 32 • result in a substantially increased risk of wildland fires; or
- 33 • be located within an airport land use plan or, where such a plan has not been adopted,  
34 within 2 miles of a public airport or public use airport or a private airstrip, and result in  
35 a safety hazard.

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### 3.8.2.1 *Alternative 1: Proposed Conservation Plan*

#### *Hazardous Materials*

**Impact HAZ-1: The use of pesticides, lubricants, fuels, and other hazardous materials during construction, operations, and maintenance could result in localized spills, which could create a hazard to the environment.** During construction and some maintenance activities, heavy equipment and vehicles would be present in the project area. Most of this equipment requires a number of petroleum products such as fuel, hydraulic fluids, and lubricants for effective operation. Fuel replenishment would be required daily for most of the heavy equipment. Lubricant and hydraulic fluid changes and replenishment would be required less frequently. Typically, service trucks would deliver these types of fluids on site and perform the necessary fuel and oil transfers. Diesel fuel also would be used to operate some irrigation pumps, and refueling would be required periodically. The risk of small fuel or oil spills is considered likely. Accidental spills would result in a *less than significant* impact to public health and the environment because the spills would be small and localized, most construction would be located in unpopulated areas, and BMPs would be implemented to minimize the potential for accidents to occur (refer to section 3.0 for examples of typical BMPs). All spills would be cleaned up in accordance with permit conditions.

#### *Vectors*

**Impact HAZ-2: The increase in riparian and backwater areas could result in an increase in vectors.** Vectors, such as mosquitoes, are attracted to pools of water, such as ponds and backwaters, as well as riparian vegetation. The amount of aquatic land cover type that would be established and that would be suitable as vector habitat, however, is small in relation to the overall size of the planning area. The Conservation Plan would result in the establishment of 5,940 acres of cottonwood-willow, 1,320 acres of honey mesquite, 512 acres of marsh, and 360 acres of backwaters. For purposes of comparison, the LCR MSCP HCP indicates that approximately 126,000 acres of woody riparian vegetation and 12,000 acres of marsh are present in the planning area, and a backwater study of Reaches 3, 4, 5, and part of 6 identified 461 backwaters, with 7,911 acres of open water [GEO/Graphics 2000]. Moreover, the siting criteria for conservation sites include consideration of the likelihood for mosquitoes on a site to become a vector control or nuisance problem based on proximity to urban areas and mosquito production potential. The Conservation Plan includes an integrated pest management approach that would minimize potential impacts from vectors, including coordinating the design and management of conservation areas with appropriate health officials; incorporating, to the extent practicable, design, and management concepts to help reduce the likelihood that conservation areas do not produce mosquitoes in numbers that could cause public health or nuisance concerns; and providing access to conservation areas to appropriate health officials to monitor mosquito populations. The proposed action also would result in an increase in fish and bird populations that eat insects. Impacts would be *less than significant* because the proposed action would not lead to a substantially increased population of disease or nuisance vectors.

#### *Wildfires*

**Impact HAZ-3: Construction activities could cause wildfires.** The fuel tanks on board some of the equipment used for construction activities contain fuel volumes ranging from 100 to 500

1 gallons. Accidental ignition could result in a fire, which, depending on the location, could  
2 spread. All such equipment is required to have fire suppression equipment on board or at the  
3 work site. The risk of a vehicle fire is considered unlikely, and the impact would be *less than*  
4 *significant* because it would not result in a substantially increased risk of wildfire.

5 **Impact HAZ-4: Fire used as a construction and maintenance tool could escape control and**  
6 **become a wildland fire.** Prescribed burns could be used to establish marshland approximately  
7 every 7-8 years. A less likely use of fire is to clear existing vegetation or, alternatively, to burn  
8 vegetation removed by mechanical methods. The impact would be *less than significant* because  
9 fires would be conducted by experienced personnel in accordance with established practices;  
10 therefore, the risk of wildland fires would not be substantially increased.

11 *Bird-Aircraft Strike Hazards*

12 **Impact HAZ-5: Conservation area establishment actions implemented within an Accident**  
13 **Potential Zone of an airport or near a private airstrip could cause a comparatively minor**  
14 **increase in bird populations.** Conservation actions could either increase or decrease local  
15 concentrations of birds, depending on initial site conditions and the type of land cover type  
16 establishment that would be implemented. For example, agricultural fields can attract large  
17 flocks of starlings, and in such cases, conversion to cottonwood-willow may actually reduce the  
18 number of birds in the air where they could pose a risk to aircraft. Conversely, the  
19 establishment of marsh or open-water areas in existing desert scrub would probably increase  
20 the numbers of certain types of birds, especially waterfowl, relative to existing agricultural  
21 conditions. Within an Accident Potential Zone of an airport or near a private landing strip, an  
22 increase in the overall number of birds would be a *less than significant impact* to bird-airstrike  
23 hazards since construction associated with the Conservation Plan would comply with FAA  
24 guidelines, only a small amount of terrestrial land cover types and backwaters would be  
25 established in comparison with that which already exists (refer to the discussion under Impact  
26 **HAZ-2** above), and it would not be concentrated in one location. In particular, the MCAS  
27 Yuma/YIA already is adjacent to the lower Gila River, which contains riparian forest and  
28 marshes that already supports a variety of bird species, and the establishment of a portion of  
29 the backwaters in this area would not appreciably increase the risk of bird-airstrikes.

30 *Mitigation Measures*

31 No mitigation measures are required because no significant impacts would occur.

32 *Residual Impacts*

33 Residual impacts are those that would occur after the implementation of mitigation measures to  
34 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

35 **3.8.2.2 Alternative 2: No Action Alternative**

36 Under the no action alternative, it is likely that conservation measures similar to those included  
37 in the proposed action would be implemented since compliance with the ESA still would be  
38 required for the covered actions, although some conservation could occur in the off-site  
39 conservation areas (as described in section 3.8.2.4 below), as well as along the LCR. **Impacts**

1 **HAZ-1 through HAZ-5** apply to this alternative, although **Impact HAZ-5** would not apply to  
2 conservation implemented in the off-site conservation areas since none of these areas are  
3 located within the Accident Potential Zone of an airport or near private airstrips. To the extent  
4 that the agencies undertaking the covered actions proceed with ESA compliance through  
5 section 7 consultations instead of the section 10 permitting process, there may be a reduced  
6 number of covered species because unlisted species will not be included. This would also likely  
7 result in a smaller amount of conservation area being established. The same types of impacts  
8 would occur as described for the proposed action, but the magnitude of some impacts would  
9 differ.

10 A smaller amount of conservation area would be established under this alternative than under  
11 the proposed action, but more, smaller mitigation sites would be developed, requiring more  
12 infrastructure (access roads and irrigation pipelines/canals and pump facilities). Additionally,  
13 since each individual project would establish its own mitigation sites, it is likely that more  
14 maintenance and storage facilities would be required. Thus, the chance of hazardous releases  
15 could increase in comparison to the proposed action. There also is a greater likelihood that the  
16 conservation sites would be located close to developed areas, increasing risks to the public from  
17 accidental releases of hazardous materials. The impacts generally would be as described under  
18 **Impact HAZ-1**, but the potential for the impacts to occur would be slightly greater than under  
19 the proposed action.

20 As described above under **Impact HAZ-2**, aquatic land cover type establishment could result in  
21 an increase in vectors. A smaller amount of conservation area would be created, resulting in  
22 less potential for such an increase to occur. There is a greater likelihood that the conservation  
23 sites would be located close to developed areas, however, increasing risks to the public from  
24 vector. Additionally, in the absence of a comprehensive Conservation Plan, it is not known  
25 whether an integrated pest management plan would be implemented. Impacts associated with  
26 vectors could be greater than for the proposed action.

27 The no action alternative would not include the unified approach to wildfire suppression that  
28 would occur under the proposed action. Thus, impacts associated with **Impact HAZ-3** would  
29 be considered greater under this alternative.

30 **Impacts HAZ-4 and HAZ-5** would be similar to the proposed action, although since a smaller  
31 amount of conservation area would be created, the risks would decrease proportionately.

#### 32 *Mitigation Measures*

33 No mitigation measures are required because no significant impacts would occur.

#### 34 *Residual Impacts*

35 Residual impacts are those that would occur after the implementation of mitigation measures to  
36 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

1 **3.8.2.3 Alternative 3: Listed Species Only**

2 *Impacts*

3 **Impacts HAZ-1 through HAZ-5** apply to this alternative. The same types of impacts would  
4 occur as described for the proposed action, but the overall magnitude would be lessened since a  
5 smaller amount of conservation area establishment would occur.

6 *Mitigation Measures*

7 No mitigation measures are required because no significant impacts would occur.

8 *Residual Impacts*

9 Residual impacts are those that would occur after the implementation of mitigation measures to  
10 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

11 **3.8.2.4 Alternative 4: Off-Site Conservation**

12 *Impacts*

13 **Impacts HAZ-1 through HAZ-4** apply to this alternative. The key difference between this  
14 alternative and the proposed action is that the conservation measures would be implemented at  
15 different locations, with the exception of conservation measures directly related to fish  
16 including backwater creation, which would be implemented in the planning area, as described  
17 for the proposed action. **Impact HAZ-5** would not apply to this alternative since none of the  
18 off-site conservation areas are located within the Accident Potential Zone of an airport or near  
19 private airstrips.

20 *Mitigation Measures*

21 No mitigation measures are required because no significant impacts would occur.

22 *Residual Impacts*

23 Residual impacts are those that would occur after the implementation of mitigation measures to  
24 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

1    **3.9           HYDROLOGY AND WATER QUALITY**

2    This section addresses potential changes to surface water, groundwater, and water quality from  
3    construction and operations.

4    **3.9.1        Affected Environment**

5    **3.9.1.1     Lower Colorado River**

6    *Surface Water*

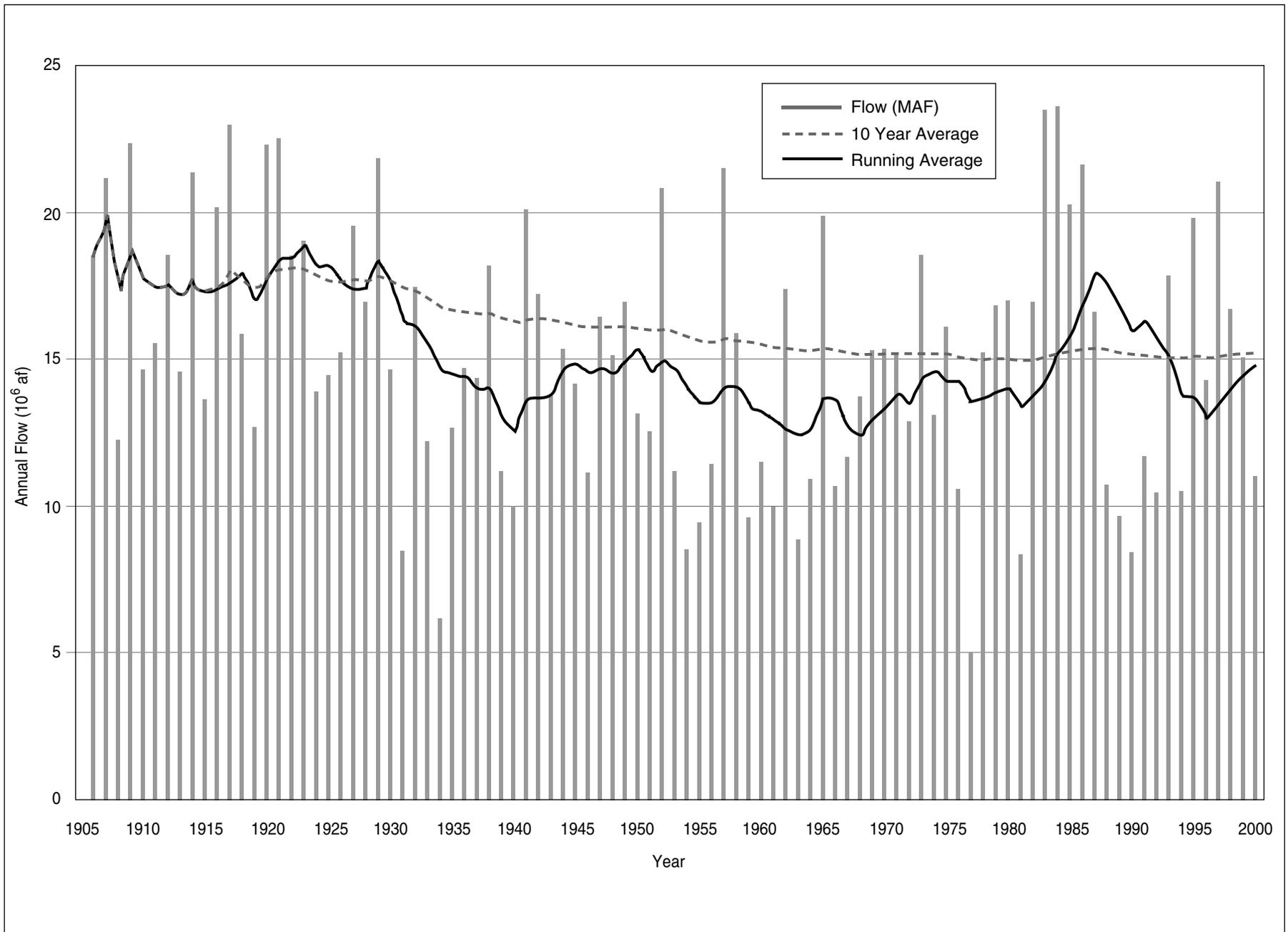
7    The LCR has a wide variation in annual inflows of source waters, which is typical of river  
8    systems within semi-arid and arid climate zones. Historically, this natural variation resulted in  
9    wide variations in annual river flows. However, the development of dams and other facilities  
10   significantly modified this natural variation by storing water for controlled releases. Facilities  
11   on the river are operated primarily for flood control, water supply, and hydropower  
12   production. Agricultural, urban, and power generation demands and the associated dam  
13   releases to meet these demands lead to daily and monthly variations in flows. The volume and  
14   flow in the river affects water levels (stage), surface area, and salinity levels (USBR 2000b).

15   The Colorado River in its entirety is approximately 1,400 miles long. The proposed action has  
16   the potential to affect the hydrology from the full pool elevation of Lake Mead (approximately  
17   at Separation Canyon [RM 450] to the SIB [RM 0]). The river flow is highly variable from year  
18   to year. For example, the natural flow at the Lees Ferry gaging station has varied annually from  
19   5 maf to 24 maf (USBR 2000b) (Figure 3.9-1). These flows show significant annual variability;  
20   however, the average trend over the past 40 years closely approximates the 15 maf total  
21   apportionment for the Upper and Lower Basin states. The Upper and Lower basins of the  
22   Colorado River are shown on Figure 3.9-2.

23   The size of the watershed and variability of the natural hydrologic system make managing the  
24   Colorado River a challenge. To better control and utilize waters of the Colorado River multiple  
25   dams, power plants, and diversion structures have been constructed, some dating as far back as  
26   1860. Currently, the overall system has ten major reservoirs that provide an aggregate of  
27   approximately 60 maf of active storage.

28   Dams in the Lower Basin include Hoover, Davis, Parker, Headgate Rock, Palo Verde Diversion  
29   Dam, Imperial, and Laguna. Morelos Diversion Dam, located just below the NIB is the last dam  
30   on the Colorado River. It is the operation of these dams and reservoirs, particularly Hoover  
31   Dam and Lake Mead, that determines the existing hydrology in the Lower Basin.

32   River stage (water levels) depends on the volume of water moving through the river at any  
33   particular location and point in time. Dam releases are made by Reclamation according to  
34   operational policies. In addition to the daily variations in river stage, there are seasonal and  
35   annual variations due to rainfall and reservoir releases. For example, the difference between  
36   maximum and minimum monthly stage for an individual month from October 1988 to  
37   September 1999 ranged from 0.11 to 7.09 feet. Monthly flows throughout the same time period  
38   varied from 100 kaf to 1 maf. The comparison of water levels to daily or annual water volumes  
39   indicates that volumes may vary widely.



**Figure 3.9-1. Natural Flows at Lees Ferry**



**Figure 3.9-2. Upper and Lower Basins of the Colorado River**

1 There are a few lakes off the mainstem of the Colorado River that are affected by flow and  
2 surface elevations of the river. Cibola Lake, which is part of the Cibola NWR, has inlet and  
3 outlet control structures to maintain desired lake levels. Three Fingers Lake also has inlet and  
4 outlet control structures. Topock Marsh is also a regulated lake. Other lakes such as Adobe,  
5 Martinez, and Ferguson Lakes have no flow control structures, and water levels are dependent  
6 on levels of the river or reservoirs on the river.

7 Flooding on the LCR generally consists of two types of floods: large regional floods and  
8 localized floods. Large regional floods generally result from unusually high levels of snowmelt  
9 in the Upper Basin or in the Gila River watershed, resulting in basin-wide or regional increases  
10 in runoff. Localized floods result from localized, short-term flow increases from rainfall,  
11 including short-term winter rains, and summer thunderstorms, which can be intense over short  
12 periods. Operation of the facilities along the river is designed to maximize the storage of water  
13 for irrigation and water supply uses, and to provide flood control protection of downstream  
14 areas. Therefore, flood flows, which potentially “waste” water beyond the ability of local users  
15 to beneficially use it, are minimized. However, the ability to capture large flows downstream of  
16 Hoover Dam is limited due to the operation of Lake Mead and Lake Mohave and the limited  
17 storage capacity of other downstream reservoirs.

18 REACH 1

19 Glen Canyon Dam, which creates Lake Powell, is operated to make a minimum release of 8.23  
20 maf annually, although releases can be greater.

21 Hoover Dam and Lake Mead are operated with the following three main priorities: (1) river  
22 regulation, improvement of navigation, and flood control; (2) irrigation and domestic uses,  
23 including the satisfaction of Present Perfected Rights (PPRs); and (3) electrical power  
24 production. The regulations set forth two primary flood control operations: (1) reserved  
25 floodwater space within Lake Mead, and (2) releases based on forecasted runoff. Lake Mead’s  
26 uppermost 1.5 maf of storage capacity, between elevations 1219.6 and 1229 feet above msl, is  
27 allocated exclusively to control floods. Additional flood control space is required through the  
28 period August 1 through January 1. Normal space-building releases to create and maintain  
29 flood control space from August 1 to January 1 are limited to a maximum of 28,000 cfs. Between  
30 January 1 and July 31 flood control releases are based on forecasted inflow and can exceed  
31 28,000 cfs.

32 Lake Mead provides the majority of the storage capacity for the Lower Basin. From 1980 to  
33 2000 annual Lake Mead elevation ranged from 1,170 to 1,220 feet msl, a variation of 50 feet. The  
34 average annual elevation from 1990 to 1999 was 1,191 feet msl. Over a period of 3 years, from  
35 2000 to 2003, Lake Mead elevations dropped more than 60 feet as a result of sustained drought  
36 in the western United States (NASA Earth Observatory 2003). In addition to flood control  
37 space, flood control releases are required when forecasted inflow exceeds probable available  
38 storage space at Lake Mead and Lake Powell, and allowable space in other Upper Basin  
39 reservoirs. This includes accounting for projected bank storage and evaporation losses at both  
40 lakes, plus net withdrawals from Lake Mead by water users. Releases are made in steps meant  
41 to retain power generation capacity and to protect the downstream river area.

1 Unless flood control releases are necessary, Hoover Dam is operated to meet downstream water  
2 demands, including the release of water for consumptive use by the Lower Division States plus  
3 the United States' obligation under the 1944 Water Treaty. Within these operations, Hoover  
4 Dam releases are managed on an hourly basis to maximize the value of generated power by  
5 providing peaking during high-demand periods. This results in fluctuating flows through  
6 Hoover Dam that can range from 1,000 cfs to 49,000 cfs. The upper value is the maximum flow-  
7 through capacity through the power plant at Hoover Dam (49,000 cfs). However, because these  
8 flows enter Lake Mohave downstream, the affected zone of fluctuation is only a few miles.

9 The close proximity of Lake Mohave to Hoover Dam effectively dampens the short-term  
10 fluctuations below Hoover Dam. Since 1980, annual releases from Lake Mead have varied from  
11 a low of 7.4 maf to a high of 21.4 maf. Daily releases can vary by more than 22,000 cfs. Since  
12 1980, within any given non-flood year, flows through Hoover Dam have ranged from 750 cfs to  
13 27,000 cfs.

14 Lake Mead is the primary water supply diversion point for the State of Nevada. About 90  
15 percent of the state's 0.3 maf apportionment is diverted 5 miles northwest of Hoover Dam at  
16 SNWA's Saddle Island facilities. The minimum Lake Mead water level necessary to operate the  
17 pumping units at SNWA's original intake facility is 1,050 feet msl. SNWA recently constructed  
18 a second pumping plant and the minimum Lake Mead water level required to operate this unit  
19 is 1,000 feet msl. The new SNWA intake provides only a portion of the capacity required by  
20 SNWA to meet its Colorado River water supply needs. Therefore, the intake elevation of  
21 SNWA's original pumping plant is critical to its ability to divert its full Colorado River water  
22 entitlement.

23 In addition to SNWA's diversion, Basic Water Company also diverts water from Lake Mead at  
24 Saddle Island for use in the Henderson, Nevada area for industrial and domestic purposes.

25 Related to power generation and water supply, there are several "key" Lake Mead water  
26 surface elevations. The first elevation is 1,083 feet msl, the minimum elevation for the effective  
27 generation of power. The second elevation is 1,050 feet msl, the minimum elevation required  
28 for the operation of SNWA's original intake facility. The final elevation is 1,000 feet msl, the  
29 elevation required for operation of SNWA's second intake. Historic Lake Mead low water  
30 levels have dropped to the minimum rated power elevation of 1,083 feet msl during two  
31 periods (1954 to 1957 and 1965 to 1966). The highest historical Lake Mead water surface  
32 elevation of approximately 1,225.6 feet msl occurred once, in 1983.

33 REACHES 2 AND 3

34 Reach 2 of the planning area encompasses the land and waters within the historic floodplain  
35 between Hoover Dam and Davis Dam. Reach 3 extends from Davis Dam to Parker Dam. Major  
36 features between Hoover Dam and Parker Dam include Davis Dam, Havasu NWR and the Bill  
37 Williams River. Immediately downstream of Hoover Dam, river flows consist almost entirely  
38 of water released from Lake Mead. Between Davis and Parker dams minor gains in the river  
39 come from tributaries such as the Bill Williams River, groundwater discharge, and return flows  
40 from agriculture.

1 Daily and hourly releases from Hoover Dam reflect the short-term demands of Colorado River  
2 water users having diversions located downstream, storage management in Lake Mohave and  
3 Lake Havasu, and power production at Hoover, Davis, and Parker dams. Reclamation  
4 combines the total estimated water releases of Davis Dam and the target Lake Mohave elevation  
5 to determine the monthly amount of water required downstream of Hoover Dam. This  
6 monthly release is formulated into a monthly energy figure for Hoover Dam. The monthly  
7 energy figure is used by the Western Area Power Administration to meet the daily energy  
8 requirements of the electric service customers.

9 The primary purpose of Davis Dam is to re-regulate Hoover Dam releases to meet downstream  
10 needs and aid the annual delivery of 1.5 maf to Mexico. Releases at Davis Dam are scheduled  
11 on a daily basis to meet the water demands downstream and Lake Havasu storage  
12 management. The hourly release profile is determined by the electric service customer  
13 requirements, the current downstream river needs, and upstream Lake Mohave requirements.  
14 Since 1980, annual release from Davis Dam has varied from a low of 7.3 maf to a high of 21.7  
15 maf (USBR 2000d).

16 Parker Dam's primary purpose is to provide reservoir storage from which water can be  
17 diverted into the Colorado River Aqueduct (CRA) and the Central Arizona Project (CAP)  
18 Aqueduct. The CRA delivers water to metropolitan Los Angeles and San Diego areas. The  
19 CAP delivers water to cities, industries, Indian communities, and agricultural areas in central  
20 and southern Arizona, including the Phoenix and Tucson areas. Parker Dam also has a power  
21 plant function and may provide a minimal amount of flood control, capturing and delaying  
22 flash floods into the river from tributaries below Davis Dam. Parker also re-regulates water  
23 released from the Hoover and Davis power plants, thus regulating river flow for downstream  
24 irrigators. Releases at Parker Dam are scheduled on a daily basis to meet the short-term  
25 demands of Colorado River water users located downstream. The hourly release profile is  
26 determined by the electric service customer requirements.

27 REACHES 4 AND 5

28 Major features between Parker and Imperial dams include Headgate Rock Dam and CRIT  
29 Diversion, Palo Verde Diversion Dam, and Cibola and Imperial NWRs. This stretch of the river  
30 is designated as Reaches 4 and 5. Reach 4 extends from below Parker Dam to the Cibola Gage;  
31 Reach 5 extends from the Cibola Gage to Imperial Dam.

32 Flows between Parker Dam and Palo Verde Diversion Dam result primarily from releases from  
33 Parker Dam. Since 1980, annual releases from Parker Dam have ranged from a low of 5.5 maf to  
34 a high of 20.5 maf. These releases are adjusted daily to meet the water demands of downstream  
35 users unless flood control releases are being made. These releases are further regulated within  
36 the day to maximize power generation. Within a given month, daily releases can vary by more  
37 than 11,000 cfs. Since 1980, within any given non-flood year, flows through Parker Dam on a  
38 daily basis have ranged from approximately 1,500 cfs (with a minimum of 30 cfs during an  
39 emergency situation) to approximately 19,500 cfs.

40 Annual surface water flow in the river, measured just downstream from Parker Dam, averaged  
41 approximately 9.0 maf for the period from 1935 to 1999, but varied from a maximum of  
42 approximately 20.5 maf to a minimum of approximately 5.5 maf (USGS 2003d). Annual median

1 flow in the river over this same time period was approximately 7.3 maf (USGS 2003d). From  
2 1990 to 1999, annual flow averaged 7.4 maf downstream from Parker Dam, and annual medial  
3 flow was 7.2 maf (USGS 2003d). The overall effect of diversions, local surface inflows,  
4 evapotranspiration, and groundwater recharge, is a decrease in flow between Parker and  
5 Imperial dams. Long-term average annual flow just upstream of Imperial Dam from 1935 to  
6 1999 was approximately 8.1 maf (USGS 2003d). From 1990 to 1999, the average annual flow just  
7 upstream of Imperial Dam was 6.2 maf (USGS 2003d).

8 Palo Verde Diversion Dam is the intake for California's PVID. Flows between Palo Verde  
9 Diversion Dam and Imperial Dam are set by downstream demands and required deliveries to  
10 Mexico. Imperial Dam is the diversion point for the All American Canal (AAC), Yuma Main  
11 Canal, and the Gila Gravity Main Canal. The AAC delivers to California's Yuma Project  
12 Reservation Division, the Imperial Irrigation District (IID), and the Coachella Valley Water  
13 District. The Yuma Main Canal delivers to Arizona's Yuma Project, while the Gila Gravity  
14 Main Canal delivers to Arizona's Gila and Wellton-Mohawk projects.

15 The surface water levels in the Parker to Imperial dams reach of the Colorado River have daily  
16 variations, with a higher volume usually released from the reservoirs during the day. Just  
17 downstream of Parker Dam, the typical daily variation is about 5 feet in the summer when  
18 irrigation demand is high. In winter the daily variation in surface water levels is reduced to  
19 about 2.5 feet due to lower irrigation demand and a more consistent demand in general. By the  
20 time water reaches Imperial Dam, fluctuation is dampened to approximately 0.5 feet by the  
21 channel storage and daily variations in river surface water levels (USBR and IID 1994).

22 REACH 6

23 Reach 6 extends from Imperial Dam to the NIB. The major feature from Imperial Dam to the  
24 NIB is Laguna Dam. The Gila River enters the Colorado River system in this reach.

25 REACH 7

26 Reach 7 of the LCR extends from the NIB to the SIB, a distance of 23.1 miles that forms the  
27 boundary between Arizona (United States) and Baja California (Mexico). The major feature in  
28 this reach is Morelos Diversion Dam, located just downstream of the NIB. Mexico diverts the  
29 majority of its Colorado River water supply at Morelos Diversion Dam. Flows in this reach of  
30 the river vary. At times the lower part of this reach is dry. Cohen and Henges-Jeck (2000)  
31 reported average total flows in this reach of 22,000 af in non-flood years and 2,120,000 af in  
32 flood years. These flows are the result of seepage from Morelos Diversion Dam, flow releases  
33 from Morelos Diversion Dam (flood flows and excess water not diverted by Mexico), irrigation  
34 return flows from Mexico, canal wasteways in the United States, and groundwater  
35 accumulation from both the United States and Mexico.

36 THE REPUBLIC OF MEXICO

37 The 1944 Water Treaty provides Mexico with a right to receive 1.5 mafy plus 0.2 maf of surplus  
38 water, when available. Mexico received 1.7 maf in compliance with the treaty in both 1999 and  
39 2000 (USBR 1999). The two governments through the International Boundary and Water  
40 Commission (IBWC) jointly administer the terms of the 1944 Water Treaty relating to the  
41 Colorado River. The operations are performed in collaboration with Reclamation. The

1 deliveries to Mexico are jointly monitored by the IBWC to ensure compliance with the treaty  
2 allotment and schedules.

#### 3 *Groundwater*

4 The Colorado River is in hydraulic connection with the groundwater in the underlying  
5 alluvium. Depending on river stage and groundwater elevations, the river can receive inflows  
6 from the aquifer, or it can provide recharge to the aquifer. The hydraulic connection results in  
7 groundwater levels that, at least in part, reflect the stage of the Colorado River.

8 Groundwater pumped from the underlying alluvium is considered Colorado River water and is  
9 accounted for under each states' apportionment. This includes groundwater pumped from the  
10 LCR floodplain and from certain wells on the alluvial slopes outside the floodplain.  
11 Reclamation, in association with the U.S. Geological Survey (USGS), has developed a method to  
12 identify wells outside of the floodplain that yield water that would be replaced by water from  
13 the Colorado River. This method has resulted in the development of an "accounting surface,"  
14 or area where groundwater extractions are considered Colorado River water.

15 Studies using near-river (within 400 feet) observation wells in the Yuma area that were  
16 conducted in the 1970s showed the influence of river surface water levels on near-river  
17 groundwater elevations in an area irrigated with surface-diverted Colorado River water. The  
18 Yuma area near-river groundwater level changes in response to river level changes are  
19 considered to be representative of the groundwater response in the valleys below Parker Dam  
20 because of similar geohydrology. It is estimated that for every unit drop in river surface water  
21 levels, groundwater under irrigated fields closest to the river will drop by half a unit. In a non-  
22 irrigated reach, groundwater elevation drop is assumed to be equal to the river drop (USBR  
23 2000d). Near-river groundwater elevations above Parker Dam may show differing responses to  
24 changes in river surface water levels.

#### 25 NEVADA

26 Groundwater basins proximal to the river and within the accounting surface include those in  
27 the Las Vegas Wash Valley, other small drainages adjacent to Lake Mead, the smaller washes  
28 and drainages adjacent to Lake Mohave, and those in the areas of Laughlin and the Fort Mojave  
29 Indian Reservation. These basins are generally small in size and are bounded by zones of non-  
30 water bearing rock.

#### 31 CALIFORNIA

32 Groundwater basins proximal to the river and within the accounting surface include portions of  
33 the Needles Valley, the Chemehuevi Valley, the Arch Creek and Vidal Wash area, the Big Wash  
34 and Slaughter Wash areas just north of the Palo Verde Valley, the Palo Verde Valley,  
35 Chuckwalla Valley, the Cibola Valley, Senator Wash, and the Yuma Valley. With the exception  
36 of the Yuma Valley, these basins are generally small in size and are bounded by zones of non-  
37 water bearing rock. For most of the basins, designated beneficial uses include municipal,  
38 industrial, and agricultural uses.

1 ARIZONA

2 Groundwater basins proximal to the river and within the accounting surface include the smaller  
3 washes and drainages adjacent to Lake Mead and Lake Mohave, portions of the Mohave Valley  
4 and Sacramento Wash, the smaller washes and drainages adjacent to Lake Havasu, portions of  
5 the Cactus Plain and the area around Parker, the Parker Valley, the Palo Verde Valley, Cibola  
6 Valley, the Yuma Valley, and the South Gila Valley. With the exception of the Yuma Valley,  
7 these basins are generally small in size and are bounded by zones of non-water bearing rock.

8 *Water Quality*

9 SURFACE AND GROUNDWATER CONSTITUENTS OF CONCERN

10 **Salinity.** The main water quality concerns for the lower portion of the Colorado River are  
11 associated with salinity and total dissolved solids (TDS)<sup>1</sup>. Factors influencing salinity levels  
12 include regional geology, salinity levels in tributaries and other inflow sources, drainage from  
13 irrigation system return flows, municipal discharge, and concentration of salts due to  
14 evaporation and other losses. Approximately 47 percent of the salinity in the Colorado River  
15 System is from natural sources (U.S. Department of the Interior [DOI] 1999). The remaining 53  
16 percent is due to human activities including agricultural runoff, as well as industrial and  
17 municipal sources. The river increases in salinity from its headwaters to its mouth.

18 In 1974, the Colorado River Basin Salinity Control Act was enacted with the purposes of (1)  
19 resolving salinity issues associated with 1944 Water Treaty deliveries; and (2) creating a salinity  
20 control program within the United States portion of the Colorado River Basin to meet objectives  
21 and standards set by the CWA. The Federal/state salinity control program under Title II of the  
22 Salinity Control Act is designed to maintain flow-weighted average annual salinity at or below  
23 the adopted numeric criteria. The program is not intended to counteract short-term salinity  
24 variations due to the highly variable flows caused by natural factors (DOI 2001).

25 The Colorado River Basin Salinity Control Forum reviews the water quality standards for the  
26 Colorado River every three years and makes revisions to accommodate changes occurring in the  
27 Basin. The most recent review was in 2002. At each triennial review, the current and future  
28 water uses are analyzed for their impact on the salinity of the Colorado River. An  
29 implementation plan is developed, which includes adequate salinity control projects to assure  
30 compliance with the numeric criteria. In selecting a project, considerable weight is given to the  
31 relative cost-effectiveness of the project. Environmental feasibility is also considered.

32 Salinity is a Federal issue below Imperial Dam. Per United States Section, IBWC (USIBWC)  
33 Minute 242 of the 1944 Water Treaty, the United States must deliver water to Mexico at the NIB  
34 with an average annual salinity concentration no greater than 115 parts per million (ppm)  
35 (equivalent to 115 milligrams per liter [mg/L]) +/- 30 ppm (30 mg/L) over the average annual  
36 salinity concentration of the river at Imperial Dam.

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1 TDS is a measure of the total amount of minerals, organic matter, and nutrients that are dissolved in water. The dissolved solids concentration commonly is called the water's salinity and is classified as follows: fresh, 0-1,000 milligrams/Liter (mg/L); slightly saline, 1,000-3,000 mg/L; moderately saline, 3,000-10,000 mg/L; very saline, 10,000-35,000 mg/L; and briny, more than 35,000 mg/L.

1 **Selenium.** Selenium in the Colorado River naturally originates from shale sediment deposits  
2 along river tributaries. Within the river system, Lake Powell has the highest annual loading of  
3 dissolved selenium, and the majority of selenium is thought to come from above Lake Powell.  
4 Selenium loads drop within Lake Powell and drop again as the Colorado River passes through  
5 downstream reservoirs. Due to this decline, it does not appear that selenium is added to the  
6 system in the Lower Basin (DOI 1999). Research indicates that there are no local sources of  
7 selenium within the LCR basin, and, unlike in the Upper Basin, use of water for agricultural  
8 purposes along the LCR does not contribute to selenium increases (Radtke, et al. 1988).  
9 Selenium levels in biota of the Lower Basin have been found to equal or exceed the guideline for  
10 reproductive impairment of biota (Radtke, et al. 1988). Based on a recent study, selenium  
11 appears to be a constituent of concern in the LCR aquatic system, and continued selenium  
12 loading to the LCR could severely affect important components of the ecosystem (Radtke, et al.  
13 1988).

14 **Perchlorate.** Ammonium perchlorate, the most common form of perchlorate contamination, is  
15 manufactured for use as an oxygen-adding component in solid propellant for rockets, missiles,  
16 and fireworks (EPA 1999, 2001). Perchlorate contamination in surface waters has been given  
17 increasing scrutiny due to potential health effects on human thyroid function (EPA 1999, 2001).  
18 There is currently no Federal National Primary Drinking Water Regulation for perchlorate.  
19 Perchlorate is on the EPA's Safe Drinking Water Act's Contaminant Candidate List as of 1998  
20 (EPA 1999, 2001) and the EPA has established 1 part per billion (ppb) as the provisional  
21 reference dose for adults (EPA 1999, 2001; CADHS 2001).

22 Perchlorate has been detected in the water of the Colorado River and Lake Mead. Perchlorate  
23 concentrations have ranged from less than 4 ppb to 17 ppb at the SNWA's water intake at Lake  
24 Mead (EPA 1999, SNWA 2003b). The EPA identified two facilities in Henderson, Nevada that  
25 manufactured ammonium perchlorate and were found to have released perchlorate to  
26 groundwater. Kerr-McGee Chemical Company, the Nevada Department of Environmental  
27 Protection (NDEP) and Reclamation are working together to intercept a major surface flow of  
28 perchlorate-laden water along Las Vegas Wash. This program is ongoing and has significantly  
29 reduced the amount of perchlorate entering the Las Vegas Wash, Lake Mead, and the Colorado  
30 River. This remediation program will continue into the future and will continue to reduce  
31 perchlorate contamination in groundwater and in Colorado River water in Lake Mead and  
32 downstream (USBR 2000b).

33 **Chromium 6.** A plume of the chemical chromium-6 in groundwater near Needles, thought to  
34 be related to Pacific Gas and Electric operations in the area, has been observed moving toward  
35 the Colorado River (Coachella Valley Desert Sun 2003). Affected parties and the Colorado River  
36 RWQCB are currently exploring containment and cleanup options.

37 DESIGNATED IMPAIRED RIVER SEGMENTS AND WATER BODIES

38 Under section 303(d) of the CWA, the states and EPA identify "impaired" stream segments and  
39 water bodies where constituent concentrations impair the designated beneficial uses of the  
40 water body. Additional human activities within the segments, or that may directly or indirectly  
41 affect these segments, may result in further impairment. The states and EPA work together to  
42 develop a Total Maximum Daily Load (TMDL) for the segment, and set up a timeframe for

1 reducing concentrations of the constituents and bringing the impaired water body back to  
2 attainment.

3 Several stream segments within the project area are currently impaired for some beneficial uses  
4 as a result of elevated constituent concentrations, including the following:

- 5 • The Las Vegas Wash, which is tributary to Lake Mead and carries the drainage for all of  
6 the Las Vegas metropolitan area to Lake Mead. The wash is currently impaired as a  
7 result of high ammonia and phosphorus concentrations, and iron and total suspended  
8 solids (TSS) are also being investigated as impairments to beneficial uses.
- 9 • The Colorado River between Hoover Dam and Lake Mohave, which has elevated pH  
10 levels. However, since the adoption of the 2002 303(d) List, the State of Nevada has  
11 updated its pH criteria and these areas are meeting the revised criteria (personal  
12 communication, R. Paul 2003). It is anticipated that these area will be reevaluated and  
13 removed from the 303(d) List as part of the 2004 303(d) List revisions (EPA 2003a).
- 14 • The Palo Verde Outfall Drain, which carries runoff from PVID to the Colorado River.  
15 Pathogenic bacteria from natural background sources and dysfunctional septic systems  
16 have resulted in the loss of beneficial uses of this water body (CRWQCB 2003).

17 The complete listing of impaired stream segments is presented in Table 3.9-1. Information  
18 included in this table provides a complete overview of constituents of concern in the potentially  
19 affected water bodies. However, the concentration and total load of these constituents of  
20 concern would not be affected by the Conservation Plan because the constituents of concern are  
21 primarily a result of urban, agricultural, and mining activities. The Conservation Plan would  
22 not increase or otherwise affect urban, agricultural, and mining activities in the planning area.

### 23 3.9.1.2 Muddy River/Moapa Valley and Virgin River

#### 24 *Surface Water*

25 The Muddy River is a perennial river fed by the Muddy Springs in southern Nevada and flows  
26 into Lake Mead. The majority of the flow currently is used for agriculture and power  
27 generation (SNWA 2003a). The drainage area of the river is large, but due to soil conditions and  
28 rainfall patterns, only a small portion of the overall basin contributes directly to surface runoff  
29 (USGS 2003a). Near Moapa, the Muddy River recently exhibited a daily average flow of 30 cfs,  
30 part of a long-term downward trend from an average of 50 cfs in 1950 (USGS; period 1950-  
31 2000). Peak flows reached great than 1,000 cfs, while minimum flows were near 20 cfs.

32 The Virgin River originates in southwestern Utah, flows through the northwestern corner of  
33 Arizona and into Nevada where it joins the Colorado River at Lake Mead. Virgin River water is  
34 used for both domestic and agricultural uses. Stream flows in the lower Virgin River are  
35 frequently at or near zero, with an upper range of greater than 7,000 cfs occasionally exhibited.  
36 The normal range of measured flows tops out near 2,000 cfs, however.

1

**Table 3.9-1. Impaired Water Bodies in the Project Area**

| <i>Water Body</i>   | <i>Constituent(s) of Concern</i>  | <i>Source</i>                               | <i>Proposed TMDL Completion</i>                              |
|---|---|---|--|
| CALIFORNIA  |   |   |  |
| Palo Verde Outfall Drain  | Pathogens   | Unknown                                     | 2003   |
| ARIZONA <sup>1</sup>  |   |   |  |
| Virgin River  | Fecal coliform and turbidity  | Not identified                              | Not developed  |
| Alamo Lake  | Sulfide, pH, DO, and mercury  | Assumed to be mining wastes                 | Not developed  |
| Painted Rock Lake (Borrow Pit)  | Fecal coliform, DO, and pesticides  | Not identified                              | Not developed  |
| NEVADA  |   |   |  |
| Las Vegas Wash – Telephone Line Road to Lake Mead   | Total ammonia, total phosphorus, total iron, total suspended solids         | Effluent discharges, nonpoint source runoff | TMDLs exist for ammonia and phosphorus; others not developed |
| Colorado River – Lake Mohave inlet to California state line   | pH  | Not identified                              | Not developed  |
| Colorado River – Hoover Dam to Lake Mohave inlet  | pH  | Not identified                              | Not developed  |
| Muddy River – Source to Glendale <sup>2</sup>   | Total iron, total phosphorus, and temperature                               | Not identified                              | Not developed  |
| Muddy River – Glendale to Lake Mead   | Total boron, total iron, and temperature                                    | Not identified                              | Not developed  |
| Virgin River – Mesquite to Lake Mead  | Total boron, total iron, total phosphorus, and temperature                  | Not identified                              | Draft in review – date uncertain                             |
| Virgin River – Stateline to Mesquite <sup>2</sup>   | Total boron, total iron, total phosphorus, total nitrogen, and temperature, | Not identified                              | Not developed  |
| <p><i>Sources:</i> State Water Resources Control Board (SWRCB) 2003, ADEQ 2002, Colorado RWQCB 2003, NDEP 2003</p> <p>1 Impaired segments in Arizona are identified in the Lake Mead watershed, Bill Williams River watershed and the lower Gila River watershed, upstream from areas being evaluated as alternatives to the proposed action, that do not directly affect the mainstem Colorado River or occur within the riverine segments being evaluated as alternative conservation area establishment sites.</p> <p>2 Some impaired segments in Nevada are identified in the Lake Mead watershed upstream from areas being evaluated as alternatives to the proposed action, that do not directly affect the mainstem Colorado River or occur within the riverine segments being evaluated as alternative conservation area establishment sites.</p> |   |   |  |

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### 1 Groundwater

2 The surface water and groundwater basins designated along the Muddy and Virgin rivers in  
3 Nevada are part of Nevada's Hydrographic Region 13 (the Colorado River Basin hydrographic  
4 region). Both the Muddy River Springs/lower Moapa Valley and Virgin River Valley basins are  
5 classified as "designated" for depleted groundwater conditions.

### 6 Water Quality

7 The Muddy River is designated as impaired under section 303(d) of the CWA over its entire  
8 length (see Table 3.9-1). The river is designated from its source to Glendale (13.63 miles) as  
9 impaired for iron (total), temperature, and total phosphorous. The TMDLs identified for this  
10 portion of the river have a priority of 3 (lowest). From Glendale to Lake Mead (25.07 miles) the  
11 river is listed for boron (total), iron (total), and temperature; iron and temperature were added  
12 in 2002. The TMDLs identified for this portion of the river have a priority of 3.

13 The reach of the Virgin River in Nevada from Mesquite to Lake Mead (25.75 miles) is  
14 designated as impaired under section 303(d) of the CWA for boron (total), iron (total),  
15 temperature, and total phosphorous; iron and temperature were added in 2002 (see Table 3.9-1).  
16 The TMDLs identified for this portion of the river have a priority of 3, with the exception of the  
17 boron, which has a priority of 1 (highest). From the Stateline to Mesquite (4.5 miles) the river is  
18 listed for boron (total), iron (total), temperature, and total nitrogen. The TMDLs identified for  
19 this portion of the river have a priority of 3, with the exception of the boron, which has a  
20 priority of 1. A Draft TMDL has been developed for boron (NDEP 2003a).

21 A portion of the Virgin River in Arizona is designated as impaired under section 303(d) of the  
22 CWA for turbidity and fecal coliform (see Table 3.9-1).

### 23 3.9.1.3 Bill Williams River

#### 24 Surface Water

25 The Bill Williams basin consists of approximately 3,200 square miles. The Bill Williams River  
26 was historically a perennial stream, but flows in the river are now primarily dependent on the  
27 operation of Alamo Dam or on local precipitation. The Bill Williams River watershed area  
28 below Alamo Dam consists primarily of BLM and State of Arizona-owned lands, with a small  
29 percentage of private ownership. Many historic mining discharge permits have been granted in  
30 this watershed area.

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2 "Designated" groundwater basins are basins where permitted ground water rights approach or exceed the estimated average annual recharge and the water resources are being depleted or require additional administration. Under such conditions, a state's water officials will so designate a groundwater basin and, in the interest of public welfare, declare preferred uses (e.g., municipal and industrial, domestic, agriculture, etc.). For Nevada, in the interest of public welfare, the Nevada State Engineer, Division of Water Resources, Department of Conservation and Natural Resources, is authorized by statute (Nevada Revised Statute 534.120) and directed to designate a groundwater basin and declare preferred uses within such designated basin. The State Engineer has additional authority in the administration of the water resources within a designated groundwater basin.

1 Flows in the Bill Williams River are controlled primarily by releases from Alamo Dam. From  
2 1988 to September 2002, the timeframe of daily stream flow data, flows were most frequently  
3 measured as zero (USGS 2003b). Some periodic daily average flows greater than 6,000 cfs were  
4 observed (USGS 2003b), probably as a result of local rainfall.

5 *Groundwater*

6 A hydraulic connection exists between flow in the Bill Williams River and groundwater in the  
7 alluvium along the river (ADWR 2003a). Short-term water level rises and declines of as much  
8 as 30 feet have been reported by well owners along the river. These fluctuations correlate with  
9 water releases at Alamo Dam.

10 Groundwater in the Bill Williams basin occurs in younger alluvial deposits, in basin-fill, and in  
11 fractured and porous volcanic rocks. The amount of water stored and extracted in each of these  
12 units varies, but the basin-fill contains the largest volume of stored water and is the primary  
13 water-bearing unit (ADWR 2003a). Recharge to the basin-fill results from stream flow  
14 infiltration and precipitation along the mountain fronts (ADWR 2003a).

15 *Water Quality*

16 There are no waters in the watershed below Alamo Dam that are listed on the section 303(d)  
17 CWA list. Alamo Lake, the source water for the Bill Williams River behind Alamo Dam, is  
18 currently under investigation for pH, DO, sulfide, and mercury. The impairment from mercury  
19 is possibly from mining activities in the watershed, and an investigation is in progress with  
20 ongoing sampling. There are no approved listings or implementation plans for this water body  
21 (ADEQ 2002). There are several riverine segments in the watershed above the lake that are  
22 impaired for various water quality attributes.

23 Water quality within the basin-fill is generally suitable for irrigation uses (ADWR 2003a).

24 **3.9.1.4 Lower Gila River**

25 *Surface Water*

26 The lower Gila River is ephemeral and flows only in response to precipitation events or water  
27 releases from upstream dams (ADWR 2003c). Prior to the construction of the Coolidge Dam,  
28 natural or unimpaired flow in the lower portion of the Gila River was intermittent (i.e., the river  
29 flowed for a few months or more, but did not flow year-round) (ADWR 2003c). Painted Rock  
30 Dam provides flood control on the lower Gila River. However, due the limited storage capacity  
31 on the river, this facility is not able to capture and or significantly moderate the large flood flow  
32 events (such as in the 1993 floods). Irrigation return flow from the Wellton-Mohawk Irrigation  
33 and Drainage District seeps into the Gila River channel near Dome, Arizona. This influx of  
34 water supports flow from Dome to the confluence with the Colorado River (ADWR 2003c).

35 Upstream of Dome, the river exhibits essentially no flow. Localized rainfall accounts for  
36 periodic daily average flows of up to 1,000 cfs. The area experienced significant flooding in  
37 1993 following unusually prolonged rainfall. At the USGS gage near Dome, recorded daily

1 mean flows exceeded 10,000 cfs on 83 days throughout the year, and exceeded 20,000 cfs on 27  
2 days throughout the year (USGS 2003c). Peak flows in 1993 exceeded 28,000 cfs (USGS 2003c).

### 3 *Groundwater*

4 Groundwater in the lower Gila basin occurs in both the floodplain alluvium and the basin-fill.  
5 In the western part of the lower Gila basin (from approximately Dateland to Dome),  
6 groundwater development has occurred predominately in the streambed alluvium in the Gila  
7 River floodplain aquifer (ADWR 2003b). The primary water-bearing areas of the floodplain  
8 aquifer are the upper sandy unit and the lower gravel unit (ADWR 2003b). Groundwater in the  
9 floodplain aquifer is at a shallow depth and is unconfined. Groundwater development outside  
10 the Gila River floodplain is minimal and most of the wells outside the floodplain have low  
11 yields (ADWR 2003b).

12 Due to excessive recharge that resulted from the application of imported Colorado River water,  
13 a network of wells began pumping excess groundwater into drainage canals to lower shallow  
14 groundwater levels in the early 1960s (ADWR 2003b). These drainage canals discharge into the  
15 Colorado River at various points, or into Mexico. Since the early 1960s, groundwater pumpage  
16 in the western part of the basin has been primarily for drainage of excess irrigation water.

### 17 *Water Quality*

18 Painted Rock Lake (Borrow Pit) is designated as impaired under the section 303(d) of the CWA  
19 for DO, fecal coliform, and pesticides (see Table 3.9-1). Groundwater quality can vary  
20 substantially depending on the location within the basin, but in general, groundwater quality is  
21 poor in the Gila River floodplain due to high TDS concentrations (ADWR 2003b). Groundwater  
22 quality in the valleys and plains away from the Gila River floodplain is marginal to suitable,  
23 and TDS concentrations are generally lower than those observed in the floodplain.

## 24 **3.9.2 Environmental Consequences**

### 25 *Significance Criteria*

26 The proposed action would have a significant impact to water resources if it would:

- 27 • violate (or cause the violation of) any water quality standards or waste discharge  
28 requirement;
- 29 • substantially deplete groundwater supplies or interfere substantially with groundwater  
30 recharge or flow to the extent that it would not support existing land uses that rely on  
31 groundwater or planned uses for which permits have been granted;
- 32 • substantially alter the existing drainage pattern of the site or area, including the  
33 alteration of the course of a stream or river, in a manner which would result in  
34 substantial erosion or siltation on- or off-site;
- 35 • substantially alter the existing drainage pattern of the site or area, including through the  
36 alteration of the course of a stream or river, or substantially increase the rate or amount  
37 of surface runoff in a manner which would result in flooding on- or off-site; or

- 1       • place within a 100-year flood hazard area structures which would impede or redirect  
2 flood flows.

3 **3.9.2.1 Alternative 1: Proposed Conservation Plan**

4 *Impacts*

5 The proposed action would require a water supply of approximately 57,400 af of water per year,  
6 or approximately 0.7 percent of the average annual water use within the Lower Basin from 1990  
7 to 2001. As noted, in section 2.1.1.4, the legal structure governing the Colorado River would  
8 ensure that the proposed action would not increase the amount of water used in the Lower  
9 Basin beyond existing entitlements. The geographic scope of the proposed action would ensure  
10 that Colorado River water used as part of its implementation would be used within the historic  
11 floodplain of the LCR. The use of this water would not affect the water surface elevation of the  
12 LCR because it would be water that otherwise would be used for another purpose and would  
13 be diverted from the same general location. Moreover, the amount of water used would be  
14 small in comparison with the amount of water used within the Lower Basin and thus would not  
15 appreciably alter the water surface elevation even if it were not already being used for other  
16 purposes.

17 Conservation area establishment activities may require the construction of two field facilities,  
18 which would consist of a small, prefabricated steel building that would serve as an office and an  
19 equipment yard. They likely would be constructed on bare ground or at an already developed  
20 and graded site, and would require several acres at most. Fish rearing facilities also could be  
21 required. These structures would not be placed in areas where flood flows would be impeded  
22 or interrupted.

23 Conservation area establishment activities would require grading of both undeveloped and  
24 agricultural sites to provide suitable elevations for establishing habitat and to create access  
25 roads in some locations. Mounds and depressions would be created in order to provide micro-  
26 topographic diversity and simulate historic conditions. Backwaters also would be established  
27 and could result in the alteration of streams or rivers. None of these actions would substantially  
28 increase the rate or amount of surface runoff in a manner that would result in flooding on- or  
29 off-site.

30 The application of Colorado River water to conservation areas would not adversely affect local  
31 or regional groundwater levels or groundwater quality. Local groundwater levels may rise as a  
32 result of the periodic application of surface water to develop or maintain habitat, but the  
33 increase would be minor and temporary. The use of groundwater for irrigation purposes  
34 would be based on compliance with legal requirements for this use, so that there would be no  
35 adverse effect to groundwater resources. Moreover, water would not be applied to patches of  
36 established habitat in sufficient quantities to increase regional groundwater levels, particularly  
37 since they would be established in dispersed locations along the river, and irrigation would be  
38 required only at certain times of the year. Herbicides and pesticides would be applied  
39 periodically, but this would not affect groundwater quality since they would be applied in  
40 accordance with established requirements in the same manner as existing agricultural uses and  
41 would not be extensively used; it is likely that they would be applied in lesser quantities than  
42 used at existing agricultural sites that could be converted to other land cover types.

1 The use of Colorado River water as part of the proposed action would not adversely affect  
2 water quality except as discussed under **Impacts HYDRO-2** and **HYDRO-3** below. The  
3 potential for accidental releases of hazardous materials, which could have a minor, short-term,  
4 and localized effect on water quality, are addressed in section 3.8, Hazards and Hazardous  
5 Materials.

6 **Impact HYDRO-1: Habitat establishment activities could result in erosion-induced siltation.**  
7 Construction activities would include such actions as clearing vegetation, grading, excavating,  
8 dredging, stockpiling soil, construction/modification of supply canals, berm construction, and  
9 swale construction. Each of these activities could result in increased localized soil erosion and  
10 associated sedimentation of the Colorado River or backwaters. Less clearing and grading  
11 would be required if agricultural land were used instead of undeveloped land; erosion-induced  
12 siltation could occur, however, just to a lesser extent. The use of standard BMPs has been  
13 included as part of the proposed action (refer to section 3.0 for examples of typical BMPs), and  
14 could include constructing temporary pollution control measures such as silt fences and the  
15 application of straw and seed, minimizing the area to be cleared and graded to the extent  
16 possible, and installing barriers around stockpiled soil. Thus, with implementation of these  
17 BMPs, construction would not substantially alter the existing drainage pattern of the site in a  
18 manner that would result in substantial erosion or siltation on- or off-site. Impacts would be  
19 *less than significant*.

20 **Impact HYDRO-2: Habitat establishment could have a short-term, adverse effect to water**  
21 **quality if irrigation resulted in the release of pesticides, salts, or other contaminants.** This  
22 impact could occur if sites selected for the establishment of conservation areas contained  
23 contaminated soils. The release of herbicides and pesticides would be most likely to occur on  
24 sites that were previously used for agricultural activities. Increases in selenium levels in the  
25 LCR are not likely to be affected by irrigation of restoration sites due to the low levels of  
26 selenium in the soils. The release of other contaminants could occur on both undeveloped and  
27 developed sites. This, however, is highly dependent on the specific past history and other  
28 characteristics of the site and the type of conservation action implemented. In particular, the  
29 potency of many pesticides could have been reduced by naturally occurring physical and  
30 biological processes prior to their release by conservation actions. A number of other factors  
31 would further reduce the severity of potential impacts. Releases would be distributed  
32 throughout the planning area over the 20- to 30-year construction period. Further, once in the  
33 Colorado River, such releases would be diluted by the substantial flows ranging from more  
34 than 8 mafy in Reach 2 to 1.5 mafy in Reach 6. Impacts would be *less than significant*.

35 Salt leaching may be required on some sites prior to revegetation (primarily those sites that are  
36 not located on existing agricultural lands). This may require several applications of water  
37 throughout one or more growing seasons in order to create appropriate soil conditions.  
38 Because salt leaching would be a temporary activity and the amount of additional salts added  
39 to the Colorado River from this activity would be minor, impacts would be *less than significant*.

40 **Impact HYDRO-3: Water quality in created or restored backwaters and marshes could be**  
41 **affected by increasing concentrations of various naturally occurring and man-made**  
42 **chemicals, including perchlorate, selenium, Chromium 6, and other dissolved salts (both in**  
43 **the soil and the water column) that result from evaporation of water.** The proposed action  
44 includes the establishment of 360 acres of backwaters and 512 acres of marsh. The degree of

1 connectivity to groundwater or the river would influence the extent to which salt or selenium  
2 concentrations increase. Marshes and backwaters with direct connection to the river do not  
3 tend to concentrate salts because the water flows through these systems, while those isolated  
4 from the river are more prone to salt concentrations due to high evaporation rates. High  
5 salinities reduce the water quality for both aquatic animals and plants and affect the  
6 composition of the community. The concentration of salts in water from isolated marshes and  
7 backwaters would not be not likely to reach the river unless water from these areas were  
8 pumped out as part of a “freshening” action. The amount of water returned to the river in this  
9 way would be small relative to the total flow, and the affected water would be diluted. Impacts  
10 to water quality would be *less than significant*.

11 Marshes and backwaters with direct connection to the river tend to have higher selenium levels  
12 than isolated marshes and backwaters. This is likely due to the inflow of selenium-bearing  
13 water to these areas, where it is available for capture in the organic sediments to move into the  
14 food chain. Isolated marshes and backwaters receive their water filtered through the ground,  
15 and it is believed this filtration removes selenium before the water reaches the marsh or  
16 backwater. Further investigations on this phenomenon are ongoing. High selenium levels have  
17 been implicated in reproductive failure in birds and fish, and these effects may be more likely to  
18 appear in connected marshes and backwaters than those isolated from the river. New, isolated  
19 marshes and backwaters are not likely to experience significant increases in selenium over time,  
20 or be a source of selenium concentration in the river. Impacts to water quality would be *less*  
21 *than significant*.

22 **Impact HYDRO-4: Conservation area establishment would result in a long-term**  
23 **improvement to water quality if agricultural land were used.** The conversion of agricultural  
24 land to riparian land cover types would lessen the input of nutrients and agricultural chemicals  
25 to the river, improving water quality and aquatic habitat conditions. The establishment of  
26 riparian vegetation along an expanded portion of the river would provide increased shading,  
27 water filtration, and nutrient and pollutant uptake, improving water quality and aquatic habitat  
28 conditions downstream. This impact would be *beneficial*.

29 *Mitigation Measures*

30 No mitigation measures are required because no significant impacts would occur.

31 *Residual Impacts*

32 Residual impacts are those that would occur after the implementation of mitigation measures to  
33 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

34 **3.9.2.2 Alternative 2: No Action Alternative**

35 Under the no action alternative, it is likely that conservation measures similar to those included  
36 in the proposed action would be implemented since compliance with the ESA still would be  
37 required for the covered activities, although some conservation could occur in the off-site  
38 conservation areas (as described in section 3.9.2.4 below), as well as along the LCR. **Impacts**  
39 **HYDRO-1** through **HYDRO-4** apply to Alternative 2, as does the discussion of water surface  
40 elevation, flooding, groundwater, and water quality impacts from accidental spills in section

1 3.9.2.1. Water quality impacts associated with marsh creation along the lower Virgin, Muddy,  
2 and Bill Williams rivers would differ somewhat from those of the proposed action because  
3 different constituents of concern are present. Impacts would be *less than significant*, though, as  
4 described under **Impact HYDRO-3**. To the extent that the agencies undertaking the covered  
5 activities proceed with ESA compliance through section 7 consultations instead of the section 10  
6 permitting process, there may be a reduced number of covered species because unlisted species  
7 would not be included. This would likely result in a smaller amount of conservation area being  
8 established and proportionately lessened impacts related to erosion-induced siltation and water  
9 quality from irrigation (**Impacts HYDRO-1 and HYDRO-2**). It is likely that the amount of  
10 backwaters created would be similar to the proposed action since they provide habitat for listed  
11 species; thus, impacts associated with their creation would be as described for the proposed  
12 action (**Impact HYDRO-3**). The long-term improvement to water quality (**Impact HYDRO-4**)  
13 would be somewhat lessened under this alternative since less agricultural land would be  
14 converted to conservation areas under the worst-case scenario.

15 *Mitigation Measures*

16 No mitigation measures are required because no significant impacts would occur.

17 *Residual Impacts*

18 Residual impacts are those that would occur after the implementation of mitigation measures to  
19 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

20 **3.9.2.3 Alternative 3: Listed Species Only**

21 **Impacts HYDRO-1 through HYDRO-4** generally apply to Alternative 3, as does the discussion  
22 of water surface elevation, flooding, groundwater, and water quality impacts from accidental  
23 spills in section 3.9.2.1. This alternative would result in a smaller amount of conservation area  
24 being established and proportionately lessened impacts related to erosion-induced siltation and  
25 water quality from irrigation (**Impacts HYDRO-1 and HYDRO-2**). The amount of backwaters  
26 created would be as described for the proposed action; thus, impacts associated with their  
27 creation would be as described for the proposed action (**Impact HYDRO-3**). The long-term  
28 improvement to water quality (**Impact HYDRO-4**) would be somewhat lessened under this  
29 alternative since less agricultural land would be converted to conservation areas under the  
30 worst-case scenario.

31 *Mitigation Measures*

32 No mitigation measures are required because no significant impacts would occur.

33 *Residual Impacts*

34 Residual impacts are those that would occur after the implementation of mitigation measures to  
35 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

1 **3.9.2.4 Alternative 4: Off-Site Conservation**

2 As noted above, a hydraulic connection exists between flow in the Bill Williams River and  
3 groundwater in the alluvium along the river. The establishment of new habitat along the Bill  
4 Williams River on existing agricultural lands may result in an unquantified change in  
5 groundwater flow and availability for existing habitats downstream. The extent of change in  
6 groundwater flow would be dependent on the amount of water used to establish the new  
7 vegetation versus what is currently used for the agricultural operations. As described in section  
8 2.1.4.2, LCR MSCP parties would obtain Bill Williams River water for implementing the  
9 Conservation Plan projects from various sources in accordance with Arizona law and in  
10 coordination with the Arizona parties to the LCR MSCP whose water rights may be affected by  
11 the use. The legal structure governing water rights within Arizona would ensure that the use of  
12 water under the proposed action would not increase the amount of Bill Williams River water  
13 used beyond existing apportionments. Through the use of water from these sources,  
14 implementation of the Conservation Plan would not increase the amount of water used from  
15 the Bill Williams River. Irrigating new habitat in this off-site conservation area could, however,  
16 result in a continuation of unquantified adverse impacts to groundwater flow to the existing  
17 habitats on Bill Williams River NWR resulting from the ongoing agricultural operations if the  
18 new habitat requires a similar amount of water as the ongoing operations. This would not  
19 result in an adverse impact to groundwater resources.

20 **Impacts HYDRO-1, HYDRO-2, and HYDRO-4** generally apply to this alternative, as does the  
21 discussion of water surface elevation, flooding, groundwater, and water quality impacts from  
22 accidental spills in section 3.9.2.1. These impacts would be the same as described for the  
23 proposed action (*less than significant* or *beneficial*) since the same overall amount of conservation  
24 area would be established. Impacts from the establishment of cottonwood-willow, honey  
25 mesquite, and marsh would occur along the Muddy/Virgin, Bill Williams, and lower Gila  
26 rivers. **Impact HYDRO-3** also generally applies to this alternative. Water quality impacts  
27 associated with backwater development would be as described under **Impact HYDRO-3**  
28 because backwaters would continue to be established in the planning area. Water quality  
29 impacts associated with marsh establishment would be similar to those described under **Impact**  
30 **HYDRO-3**, although different constituents of concern are present along the Virgin, Muddy, and  
31 Bill Williams rivers (e.g., boron, iron, phosphorous, total nitrogen, and possibly mercury). As  
32 described under **Impact HYDRO-3**, for connected marshes, the extent of concentration of  
33 chemicals relative to the flow of the river is not likely to be significant. For isolated marshes,  
34 salts and selenium in those areas would not reach the river unless water from the area was  
35 pumped out as part of a “freshening” action. The amount of water involved relative to the flow  
36 of the river is small and the affected water would be diluted. Impacts to water quality would be  
37 *less than significant*.

38 Conservation area establishment would not affect the specific water quality parameters  
39 identified as impairing the use of the Muddy and Virgin rivers or Alamo Lake (refer to Table  
40 3.9-1); thus, no additional water quality impacts would occur in these areas.

41 Along the lower Gila River, the proposed action could use groundwater as a water supply, but  
42 because the amount of water required is small, it would result in very minor, localized increases  
43 in the salinity of irrigation return water infiltrating to the local groundwater. Historic high

1 groundwater levels have led to the installation of extensive dewatering networks in the region,  
2 and groundwater levels are closely controlled so that agriculture is not affected. The  
3 establishment of conservation areas along the lower Gila River would not exacerbate these high  
4 groundwater levels because the amount of water required would be small, and thus, water  
5 would not be applied to patches of established vegetation in sufficient quantities to increase  
6 regional groundwater levels. Additionally, conservation sites would be established in different  
7 locations along the river and irrigation would be required only at certain times of the year.

8 *Mitigation Measures*

9 No mitigation measures are required because no significant impacts would occur.

10 *Residual Impacts*

11 Residual impacts are those that would occur after the implementation of mitigation measures to  
12 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

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1    **3.10       INDIAN TRUST ASSETS**

2    Implementation of the proposed action and alternatives has the potential to create both direct  
3    and indirect impacts to ITAs. ITAs are "...'legal interests' in 'assets' held in 'trust' by the  
4    Federal government for Federally recognized Indian tribes or individual Indians" (USBR 1994).  
5    All Federal bureaus and agencies are responsible for protecting ITAs from adverse impacts  
6    resulting from their programs and activities. Each Federal bureau or agency, in cooperation  
7    with potentially affected tribe(s), must inventory and evaluate assets, and then mitigate or  
8    compensate for adverse impacts to the asset. While most ITAs are located on reservation lands,  
9    they can also be located off-reservation. Examples of ITAs include, but are not limited to, land;  
10   minerals; rights to hunt, fish, and gather; and water rights (USBR 2000d). The following section  
11   describes ITAs that might potentially be impacted by actions taken by Federal agencies as a  
12   result of implementing the proposed action and alternatives.

13   **3.10.1     Affected Environment**

14   **3.10.1.1   Lower Colorado River**

15   *Land*

16   The Phoenix Area Office of the BIA was contacted in June 2000 to determine the types of ITAs  
17   that might be affected by actions associated with implementation of the Conservation Plan. Six  
18   Indian reservations are located within or immediately adjacent to the planning area. The six  
19   reservations are the Hualapai Indian Reservation, the Fort Mojave Indian Reservation, the  
20   Colorado River Indian Reservation, the Chemehuevi Indian Reservation, the Fort Yuma Indian  
21   Reservation, and the Cocopah Indian Reservation.

22   Reservation lands are not the only lands held in trust for tribes and individual Indians. Small  
23   areas of land known as "allotments" were granted to individual Indians in the period after 1887  
24   following passage of the Dawes Act. Allotments were granted to individual Indians living both  
25   on and off Indian reservations and ranged in size from a few to several hundreds of acres. The  
26   size of the allotment varied from reservation to reservation according to the date the allotments  
27   were patented. On many reservations in the United States, after the Indian population had been  
28   allotted land, the land that was not allotted was sold to non-Indians. This was not the case on  
29   reservations located in the Southwest. In some parts of the United States, Indians were  
30   accorded the right to sell their allotments after a prescribed period of time, usually 20+ years,  
31   but again, this generally did not occur for members of tribes in the Southwest (Weiss and Maas  
32   1992).

33   Allotments were granted to individual tribal members on the Colorado River Indian  
34   Reservation and the Fort Yuma Indian Reservation. On the Colorado River Indian Reservation,  
35   allotments were granted to individual tribal members between 1904 and 1940. The first  
36   allotments on this reservation were limited to 5-acre parcels. Later allotments were 10 acres in  
37   size and even later, tribal members could receive up to 80 acres (Tiller 1996). Allotted lands on  
38   the Colorado River Indian Reservation are located near Parker, Arizona, and in areas to the  
39   southwest.

1 On the Fort Yuma Indian Reservation, 10-acre allotments were granted to individual tribal  
2 members in 1912, and the trust patents were approved in 1914 (Bee 1981). There are numerous  
3 (over 100) allotments in the southeastern portion of the Fort Yuma Indian Reservation,  
4 beginning at a point just north of the Colorado River and extending northward for some  
5 distance. Allotments in this area vary from 3-4 contiguous parcels, up to a maximum of 7  
6 contiguous parcels.

7 Ownership of allotments on the Colorado River Indian Reservation and the Fort Yuma Indian  
8 Reservation has passed to the heirs of the original allottees, with as many as 20-30 individuals  
9 having heirship rights to each allotment. If an activity associated with the Conservation Plan  
10 were to be planned for an area on either of these reservations where an allotment was present,  
11 the Federal agency, in cooperation with the tribe, would need to identify, notify, and obtain  
12 permission to use the land from each of the allotment heirs, and provide appropriate  
13 compensation for that use to the heirs and the tribe.

14 Tribes have the right to assign land on their reservations for farming, grazing, home sites, tribal  
15 economic developments, business ventures, cemeteries, and other purposes. Lands can be  
16 assigned or leased to tribal members and non-tribal members. Records of these assignments  
17 and/or leases are maintained by the issuing tribe.

#### 18 *Water Rights*

19 Tribal rights to Colorado River water are, at least partially, based on the 1908 *Winters v. United*  
20 *States* decision and have been further specified in the 1964 United States Supreme Court Decree  
21 in *Arizona v. California* and supplemental Decrees issued by the Court in 1979 and 1984. Five of  
22 the six tribes with reservation lands located within or bordering the planning area possess  
23 present perfected Federal reserved rights to Colorado River water. These tribes are the Fort  
24 Mojave Indian Tribe, the Chemehuevi Tribe, the CRIT, the Fort Yuma Quechan Tribe, and the  
25 Cocopah Indian Tribe. Taken together, these five tribes have present perfected Federal reserved  
26 rights to 920,718 AFY of Colorado River water.

27 The Fort Mojave Indian Reservation is located on the Colorado River near the point where the  
28 boundaries of Arizona, California, and Nevada meet. The tribe has reservation land in, and  
29 possesses present perfected Federal reserved water rights to Colorado River water in all three  
30 states, as specified in the Decree in *Arizona v. California* and the supplemental Decrees of 1979  
31 and 1984. The tribe has rights to 129,767 AFY of Colorado River water, including 103,535 AFY  
32 in Arizona, 13,698 AFY in California, and 12,534 AFY in Nevada (USBR 2000d).

33 The Chemehuevi Indian Reservation is located in southern California on plateau lands near the  
34 western shoreline of Lake Havasu. Pursuant to the Decree in *Arizona v. California* and the  
35 supplemental Decrees of 1979 and 1984, the tribe possesses present perfected Federal reserved  
36 water rights to 11,340 AFY of Colorado River water (USBR 2000d).

37 The CRIT Reservation is located in southwestern Arizona and southeastern California, south of  
38 Parker, Arizona. In accordance with the Decree in *Arizona v. California* and the supplemental  
39 Decrees of 1979 and 1984, the CRIT possess present perfected Federal reserved water rights to  
40 717,148 AFY of Colorado River water, including 662,402 AFY in Arizona and 54,746 AFY in  
41 California (USBR 2000d).

1 The Fort Yuma Indian Reservation is located in southwestern Arizona and southeastern  
2 California north and west of Yuma, Arizona. Water for the tribe is diverted from the Colorado  
3 River at Imperial Dam and is delivered through the Yuma Project Reservation Division-Indian  
4 Unit. The tribe also has small uses at homestead sites south of Yuma. Pursuant to the Decree in  
5 *Arizona v. California* and the supplemental Decrees of 1979 and 1984, the Fort Yuma Quechan  
6 Tribe possesses present perfected Federal reserved water rights to 51,616 AFY of Colorado River  
7 water (USBR 2000d).

8 The Cocopah Indian Reservation is located in southwestern Arizona, south of Yuma. The  
9 Cocopah Indian Tribe possesses present perfected Federal reserved water rights to 10,847 AFY  
10 of Colorado River water. The AFY figure cited here includes only that water diverted directly  
11 from the Colorado River at Imperial Dam. In addition to these rights, the tribe has numerous  
12 well permits that allow the tribe to pump groundwater from aquifers that may be connected to  
13 the Colorado River within the boundaries of the United States (USBR 2000d).

#### 14 *Hydroelectric Power Generation and Distribution*

15 Headgate Rock Dam and Powerplant is owned and operated by the BIA. BIA supplies energy  
16 generated at the Headgate Rock Powerplant to the CRIT and other Indian tribes. WAPA  
17 markets any excess power produced at Headgate Rock on the open market (USBR 2002).

#### 18 *Cultural Resources*

19 Tribes with traditional ties to lands included within the planning area include the Southern  
20 Paiute, Hualapai, Mohave, Chemehuevi, CRIT, Yavapai, Quechan, Cocopah, Hopi, Zuni, and  
21 Navajo tribes. As described in section 3.5, hundreds of cultural resources have been identified  
22 and documented on lands in the planning area. Many of these cultural resources sites were  
23 subsequently destroyed by dam construction and the filling of Lakes Mead, Mohave, and  
24 Havasu, and other agricultural, urban, and recreational developments. Federal agencies must  
25 treat cultural resources located on reservations as ITAs if the affected tribe requests that the  
26 resources be considered ITAs.

#### 27 *Biological Resources*

28 The planning area contains habitat for sensitive fish and wildlife species, especially in riparian  
29 woodlands, backwaters, and marshes located along the Colorado River and its tributaries. A  
30 substantial portion of this habitat is located on reservation lands along the Colorado River  
31 (USBR 2002). Some members of the Hualapai, Mohave, Chemehuevi, CRIT, Quechan, and  
32 Cocopah tribes still collect a variety of native plants, which are utilized for food, medicinal, and  
33 ceremonial purposes, and in traditional craft production (e.g., basketry). Although no  
34 traditional gathering locales have been identified to date by any of the tribes, it is likely such  
35 areas exist both on and off reservation lands in the planning area.

#### 36 **3.10.1.2 Muddy River/Moapa Valley and Virgin River**

37 No tribal lands are located in this off-site conservation area, and no ITAs are present.

1 **3.10.1.3 Bill Williams River**

2 No tribal lands are located in this off-site conservation area, and no ITAs are present.

3 **3.10.1.4 Lower Gila River**

4 No tribal lands are located in this off-site conservation area, and no ITAs are present.

5 **3.10.2 Environmental Consequences**

6 *Significance Criteria*

7 The analysis of impacts to ITAs is required by NEPA, which does not require the use of  
8 significance criteria. This analysis addresses whether the proposed action and alternatives  
9 would have the potential to create impacts to all classes of ITAs.

10 **3.10.2.1 Alternative 1: Proposed Conservation Plan**

11 *Impacts*

12 **Impact ITA-1: Implementing conservation measures on tribal land could result in changes to**  
13 **all classes of ITAs.** A number of tribes are LCR MSCP participants. Nonetheless, locating a  
14 conservation area establishment project on tribal land could result in the long-term dedication  
15 of that land for this purpose and limit other tribal uses during the span of the permit. Water  
16 would be needed for a variety of activities identified in the Conservation Plan. If tribal water  
17 rights were developed in support of planned conservation activities, this could result in the  
18 long-term dedication/lease of those rights for maintenance of those conservation projects,  
19 rather than for some other purpose that might be of economic and social benefit to the tribe.  
20 The United States, as trustee for tribal water rights, is committed to protecting these rights. Any  
21 action taken to implement the LCR MSCP Conservation Plan would not and cannot modify  
22 these decreed water rights in any manner.

23 Some conservation projects would require electricity to power pumps. If these projects were to  
24 be located in an area where it was possible to draw power from the Headgate Rock Powerplant,  
25 it is possible less power from this facility would be available to tribes for other purposes. As  
26 noted in section 3.5, implementation of the Conservation Plan could result in adverse effects to  
27 historic properties (ITAs) if they are present in the area of a proposed conservation project.  
28 Potential impacts to cultural resources would be addressed in accordance with historic  
29 preservation laws and regulations in effect at the time a project was being planned. Some  
30 activities associated with implementing the Conservation Plan would result in the re-  
31 establishment of native vegetation, which would be considered a beneficial effect. These same  
32 activities could, however, impact locations where other native plants are growing that are used  
33 for food, ceremonial, and medicinal purposes, and for the production of traditional craft items  
34 so careful avoidance planning would be required.

35 No activity associated with implementation of the Conservation Plan would be initiated on  
36 tribal land without the full cooperation and express permission of the tribe on whose land that  
37 activity might occur. LCR MSCP participants and the affected tribe would work cooperatively

1 to identify and resolve potential impacts to ITAs. Appropriate mitigation and/or compensation  
2 measures would be identified, negotiated, and memorialized in agreement form, thus resulting  
3 in no effect or no adverse effect to the identified ITA(s). If LCR MSCP participants and the tribe  
4 were unable to reach agreement on how best to resolve effects, the LCR MSCP activity would  
5 not be implemented on the reservation and there would be no effect to ITAs.

#### 6 *Mitigation Measures*

7 No mitigation measures are required because substantial adverse impacts would not occur.

#### 8 *Residual Impacts*

9 The Conservation Plan represents a comprehensive, coordinated program that would be  
10 implemented over the course of 50 years. Implementation of this alternative would afford LCR  
11 MSCP participants and tribes the opportunity to develop agreements for conservation area  
12 establishment on reservation lands that would be programmatic in character, which could  
13 decrease the likelihood for impacts to occur to ITAs. With programmatic, or project-specific,  
14 agreements in place, there would be no effect or no adverse effect to ITAs. If it were not  
15 possible to reach agreement on appropriate mitigation, the proposed conservation measures  
16 would not be implemented on reservation land, and there would be no effect to ITAs.

### 17 **3.10.2.2 Alternative 2: No Action Alternative**

#### 18 *Impacts*

19 Under the no action alternative, it is likely that conservation measures similar to those included  
20 in the proposed action would be implemented since compliance with the ESA still would be  
21 required for the covered activities on a case-by-case basis, although some conservation could  
22 occur in the off-site conservation areas (as described in section 3.10.2.4 below), as well as along  
23 the LCR. **Impact ITA-1** generally applies to Alternative 2, although some differences would  
24 occur. No tribal lands or ITAs are present in any of the off-site conservation areas; thus, no  
25 impacts to ITAs would occur if conservation were implemented in the off-site conservation  
26 areas. Additionally, some of the elements of the proposed action are unlikely to be  
27 implemented, including the establishment of a fund to support projects for maintaining and/or  
28 enhancing existing land cover types that provide habitat for covered species in the planning  
29 area. Under the proposed action, this money would be available to fund tribal projects that  
30 maintain/enhance these habitats on reservation lands, and the absence of the fund would  
31 remove this potential benefit to ITAs. To the extent that the agencies undertaking the covered  
32 activities proceed with ESA compliance through section 7 consultations instead of the section 10  
33 permitting process, there may be a reduced number of covered species because unlisted species  
34 would not be included. This would also likely result in a smaller amount of conservation area  
35 being established, which generally would result in proportionately fewer impacts to ITAs.

#### 36 *Mitigation Measures*

37 No mitigation measures are required because substantial adverse impacts would not occur.

1 *Residual Impacts*

2 Residual impacts are those that would occur after the implementation of mitigation measures to  
3 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

4 **3.10.2.3 Alternative 3: Listed Species Only**

5 *Impacts*

6 **Impact ITA-1** applies to Alternative 3. Alternative 3 would develop fewer acres of conservation  
7 area (41 percent less) than the proposed action, which generally would result in proportionately  
8 fewer opportunities for conservation measures to be implemented on tribal land, and lessened  
9 impacts to ITAs.

10 No activity associated with Alternative 3 would be initiated on tribal land without the full  
11 cooperation and expressed permission of the tribe on whose land that activity might occur. The  
12 LCR MSCP participants and the affected tribes would work cooperatively to identify and  
13 resolve potential impacts to ITAs. Appropriate mitigation and/or compensation measures  
14 would be identified, negotiated, and memorialized in agreement form, thus resulting in no  
15 effect or no adverse effect to the identified ITAs. If the LCR MSCP participants and the tribe  
16 were unable to reach agreement on how best to resolve effects, the conservation measures  
17 would not be implemented on the reservation and there would be no effect to ITAs.

18 *Mitigation Measures*

19 No mitigation measures are required because substantial adverse impacts would not occur.

20 *Residual Impacts*

21 The Conservation Plan that would be implemented under Alternative 3 represents a  
22 comprehensive, coordinated program that would be implemented over the course of 50 years.  
23 Implementation of this alternative would afford LCR MSCP participants and tribes the  
24 opportunity to develop agreements for conservation area development on reservation lands  
25 that would be programmatic in character, which could decrease the likelihood for impacts to  
26 occur to ITAs. With programmatic, or project-specific, agreements in place, there would be no  
27 effect or no adverse effect to ITAs. If it were not possible to reach agreement on appropriate  
28 mitigation, the conservation measures would not be implemented on reservation land, and  
29 there would be no effect to ITAs.

30 **3.10.2.4 Alternative 4: Off-Site Conservation**

31 *Impacts*

32 No tribal lands or ITAs are present in any of the off-site conservation areas; thus, no impacts  
33 would occur if this alternative were implemented, beyond those potentially occurring in the  
34 planning area if backwaters were constructed on tribal lands. The potential for impacts to ITAs  
35 would be greatly lessened under this alternative in comparison to Alternatives 1 and 3, since a  
36 maximum of 360 acres of land could be affected.

1 *Mitigation Measures*

2 No mitigation measures are required because substantial adverse impacts would not occur.

3 *Residual Impacts*

4 The Conservation Plan represents a comprehensive coordinated program that would be  
5 implemented over the course of 50 years. Implementation of this alternative would afford LCR  
6 MSCP participants and tribes the opportunity to develop agreements for conservation area  
7 development on reservation lands that would be programmatic in character, which could  
8 decrease the likelihood for impacts to occur to ITAs. With programmatic, or project-specific,  
9 agreements in place, there would be no effect or no adverse effect to ITAs. If it were not  
10 possible to reach agreement on appropriate mitigation, the LCR MSCP activity would not be  
11 implemented on reservation land and there would be no effect to ITAs.

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1    **3.11       LAND USE**

2    This section addresses land use compatibility issues, as well as potential conflicts with zoning  
3    and land use plans and policies, including other habitat conservation plans. State and Federal  
4    agencies are not subject to local land use and zoning regulations, but they do take these into  
5    consideration and cooperate with local agencies to avoid conflicts to the extent feasible.  
6    Additionally, NEPA requires the discussion of possible conflicts between the proposed action  
7    and Federal, state, regional, local, or tribal land use plans, policies, or controls for the area.  
8    Approaches to resolving these conflicts also must be identified (40 CFR 1502.16[c]; Forty  
9    Questions no. 23). The State CEQA Guidelines, section 15125c, also specify that an EIR should  
10   discuss any inconsistencies between the proposed project and applicable general plans and  
11   regional plans.

12   **3.11.1      Affected Environment**

13   This section provides an overview of the existing land uses and zoning within the proposed  
14   Conservation Plan boundary and the off-site alternative conservation areas and draws on the  
15   respective General/Comprehensive plans, zoning ordinances, and zoning maps for each  
16   affected jurisdiction. Note that for planning purposes, local jurisdictions may have assigned  
17   zoning/land use designations to lands outside their direct planning authority, such as Federal  
18   or state-managed lands. A more detailed discussion of agricultural and recreational resources  
19   is included in sections 3.2 and 3.15, respectively.

20   Land uses along the LCR and the off-site alternative conservation areas are under the  
21   jurisdiction of a number of agencies, including La Paz, Mohave, and Yuma counties in Arizona;  
22   Imperial, Riverside, and San Bernardino counties in California; and Clark County, Nevada. In  
23   addition, there are a number of incorporated cities in the vicinity, including Bullhead City, Lake  
24   Havasu City, Parker, San Luis, Somerton, and Yuma, Arizona; Blythe, and Needles, California;  
25   and Laughlin, Nevada. Several Indian reservations are located along the LCR, as well,  
26   including those of the Chemehuevi, Cocopah, CRIT, Fort Mojave, Fort Yuma-Quechan, and the  
27   Hualapai. Indian tribes are sovereign nations and reservation lands are not subject to local land  
28   use controls. A number of Federal agencies manage land along the LCR, including the Service,  
29   NPS, BLM, and the Department of Defense. Other land is under the jurisdiction of individual  
30   states.

31   **3.11.1.1    Existing Land Uses**

32    *Lower Colorado River*

33    REACH 1

34    Reach 1 is predominantly composed of the Lake Mead NRA, the Hualapai Indian Reservation,  
35    and Grand Canyon National Park. The recreation areas are owned and managed by the NPS.  
36    Land use in this reach is primarily recreational.

### 3.11 Land Use

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1 REACH 2

2 Reach 2 is composed mainly of the Lake Mead NRA, including Lake Mohave. The recreation  
3 areas are owned and managed by the NPS. Land use is primarily recreational.

4 REACH 3

5 Reach 3 includes the Fort Mojave and Chemehuevi Indian reservations (approximately 29,000  
6 acres of Reach 3 are tribal land), the Havasu and Bill Williams River NWRs (approximately  
7 21,000 acres of Reach 3 are owned by the Service), and incorporated, urbanized areas, such as  
8 Bullhead City, Lake Havasu City, Laughlin, and Needles (approximately 24,000 acres are  
9 controlled by local jurisdictions). This reach also includes areas used for recreational purposes,  
10 such as hiking, hunting, off-highway vehicle (OHV) use, and rockhounding; and agricultural  
11 uses and undeveloped open space (primarily in Mohave County).

12 REACH 4

13 Reach 4 contains large quantities of agricultural land both in Riverside County and on the CRIT  
14 Reservation. Agricultural and open space areas are also present in Imperial County and  
15 surrounding the city of Blythe. Additionally, the Cibola NWR and Parker Strip Recreation Area  
16 are within this reach. Urbanized areas include the city of Blythe and the Town of Parker. The  
17 majority of Reach 4 is tribal land (approximately 146,000 acres) and by local jurisdictions  
18 (approximately 109,000 acres).

19 REACH 5

20 This reach includes the Imperial NWR, Picacho SRA, and Martinez Lake. Limited agricultural  
21 uses presently exist to the west of Martinez Lake. The majority of the land in Reach 5 is  
22 managed by the Service (approximately 11,000 acres).

23 REACH 6

24 Reach 6 is predominantly agricultural, with scattered areas of urban and developed areas,  
25 particularly concentrated around the Yuma area. The Fort Yuma-Quechan Reservation is  
26 located within Reach 6 and is largely an agricultural community. The Mittry Lake Wildlife Area  
27 is also located in Reach 6. The majority of the land within this reach is tribal land  
28 (approximately 11,000 acres), local jurisdictions (approximately 37,000 acres), and the BLM  
29 (approximately 9,000 acres).

30 REACH 7

31 The predominant land use in Reach 7 is agricultural, with pockets of urban and developed  
32 areas, particularly in the northern portion near Yuma. The Cocopah Indian Reservation is  
33 located within this reach. Some undeveloped riparian areas border the LCR. The majority of  
34 the land in Reach 7 is governed by local jurisdictions (approximately 58,000 acres).

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1 *Muddy River/Moapa Valley and Virgin River*

2 Land uses within the Muddy River/Moapa Valley and Virgin River area include agricultural  
3 and generally undeveloped rural areas. Additionally, the NDOW's Overton Wildlife  
4 Management Area is located within this off-site conservation area and allows for a variety of  
5 recreational uses.

6 *Bill Williams River*

7 Land uses within the Bill Williams River off-site conservation area includes the Bill Williams  
8 River NWR, agricultural uses, and a portion of Alamo Lake State Park and Alamo Wildlife  
9 Area. Most of this area is undeveloped.

10 *Lower Gila River*

11 Agricultural land uses, BLM lands, and Department of Defense lands are in the lower Gila River  
12 area. Additionally, the lower Gila River area contains recreational land uses in the Mohawk  
13 Valley and Tacna Marsh areas. Scattered towns are present in this area, but urban development  
14 is limited.

15 **3.11.1.2 Zoning and Land Use Designations**

16 The agricultural and undeveloped areas along the LCR are zoned for a variety of uses by their  
17 respective jurisdictions, although most are zoned for some type of agricultural, low-  
18 density/rural residential, open space, or resource conservation use. Areas zoned for  
19 commercial, industrial, and more intensive residential uses are generally concentrated near  
20 developed areas.<sup>1</sup>

21 Along the Muddy River/Moapa Valley and Virgin River, lands are zoned primarily for open  
22 space, rural residential, and agricultural uses. The Bill Williams River off-site conservation area  
23 primarily is zoned agricultural residential and recreational residential uses. The lower Gila  
24 River is zoned for rural uses, including agriculture and open space preservation.

25 **3.11.1.3 General and Comprehensive Plans**

26 Each local jurisdiction in the planning area has prepared a general or comprehensive plan to  
27 guide development. Each includes policies intended to minimize impacts of development on a  
28 variety of environmental resources. Elements typically include land use, housing, circulation/  
29 transportation, open space, conservation, recreation, noise, and safety. Additionally,  
30 management plans may be developed for tribal, state, and Federal lands.

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<sup>1</sup> La Paz County zoning maps are being revised to obtain consistency with the County's first Comprehensive Plan, which is currently being developed. Therefore, land use designations and accurate zoning information for La Paz County are pending at this time and are not included in the generalized discussion above.

1 **3.11.1.4 Other Conservation Plans**

2 *Clark County Multiple Species Habitat Conservation Plan*

3 Clark County, Nevada, has prepared an MSHCP to conserve a wide variety of species and their  
4 habitats throughout the county. The area included in the Clark County MSHCP overlaps with  
5 that of the proposed Conservation Plan in the portions of Reaches 1 through 3 located in Clark  
6 County. The Service has issued a 30-year permit authorizing the incidental take of the listed  
7 species covered by the plan. The MSHCP identifies those actions necessary to maintain the  
8 viability of natural habitats in the county for approximately 232 species residing in those  
9 habitats. While the MSHCP addresses all 232 species, it proposes that 79 of the species that are  
10 currently listed be covered by a section 10(a)(1)(B) permit and that prelisting agreements be  
11 developed for those species that are not listed. Another 103 species are identified as evaluation  
12 species. Among the 79 covered species are the southwestern willow flycatcher (*Empidonax*  
13 *traillii extimus*), Mojave desert tortoise (*Gopherus agassizii*), and blue diamond cholla (*Opuntia*  
14 *whipplei* var. *multigeniculata*).

15 *Northern and Eastern Colorado Desert Coordinated Management Plan*

16 The planning area for the BLM's Northern and Eastern Colorado Desert Coordinated  
17 Management Plan (NECO) covers 5.5 million acres in the southeastern California Desert  
18 (including lands in San Bernardino, Riverside, and Imperial counties). The northeastern  
19 boundary of the planning area is near Needles and travels south just west of the LCR area  
20 through Blythe down to the NIB. The western planning area boundary extends to Indio,  
21 California. The plan primarily covers lands adjacent to the LCR planning area; however,  
22 portions are within the LCR planning area, e.g., near Needles in Reach 3 and in the southern  
23 portion of Reach 4. The goal of the plan is to manage species and their habitats on Federal lands  
24 administered by the BLM, Joshua Tree National Park, and the U.S. Marine Corps Chocolate  
25 Mountains Aerial Gunnery Range. Specific goals include recovery of the desert tortoise, a listed  
26 threatened species under both the ESA and the CESA, and conservation of a variety of other  
27 species and their habitats.

28 **3.11.2 Environmental Consequences**

29 *Significance Criteria*

30 The proposed action would have a significant environmental impact if it would result in any of  
31 the following:

- 32 • physically divide an established community;
- 33 • conflict with existing land uses;
- 34 • conflict with any applicable land use plan, policy, or regulation of any agency with  
35 jurisdiction over the project adopted for the purpose of avoiding or mitigating an  
36 environmental effect; or
- 37 • conflict with any applicable habitat conservation plan or natural community  
38 conservation plan.

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### 1 3.11.2.1 *Alternative 1: Proposed Conservation Plan*

#### 2 *Impacts*

3 The proposed Conservation Plan would not physically divide an established community  
4 because conservation area establishment would be implemented on undeveloped or  
5 agricultural land and directed away from populated, developed areas. The proposed action  
6 would not impede the implementation of the other conservation plans in the general planning  
7 area, and it would directly support the Clark County MSHCP by providing \$10,000 per year  
8 until 2030 to its Rare Plant Workgroup to support implementation of planned, but unfunded,  
9 species conservation measures for the threecorner milkvetch and sticky buckwheat.

10 The implementation of conservation measures on Federal or state lands would not conflict with  
11 any management plans because they would occur only in cooperation with the managing  
12 agency and its goals and objectives. Conversations with local planners and review of local land  
13 use ordinances indicated that conservation area establishment generally would be considered a  
14 permitted use in the undeveloped and agricultural areas where it would occur (personal  
15 communications, C. Pulsipher, T. Anthony, S. Mayes-Atkinson, P. Clark, D. Petritz, G.  
16 Gallagher, M. Spriggs, F. Villegas, J. Heuberger, and S. Martinez 2003; Imperial County 1998).  
17 However, the zoning of each potential conservation project site would be reviewed to minimize  
18 any potential conflicts with the plans and policies of local jurisdictions prior to site selection.  
19 Additionally, implementation of the mitigation measures identified in this EIS/EIR would  
20 minimize the potential for conflicts with policies of local jurisdictions adopted for the purpose  
21 of avoiding or mitigating an environmental effect.

22 Undeveloped lands within the planning area that provide suitable components of habitat for  
23 covered species may experience an increase in the population of covered species as a result of  
24 dispersal from the conservation areas. Limited areas with suitable habitat in the planning area  
25 are available, however, and it is likely that covered species already are present in such areas.  
26 Therefore, an increase in the population of covered species would not require changes to land  
27 management activities. It is important to note that only increases in populations of covered  
28 species that are protected under the ESA or specific state law could affect land management  
29 activities. Although the LCR MSCP participants are requesting incidental take coverage for a  
30 number of species not listed under the ESA, that coverage does not come into effect unless or  
31 until the species is listed. There is no requirement for coverage for incidental take for any  
32 unlisted species by any agency or individual within the planning area. Thus, use of any lands  
33 outside the conservation areas by covered, but unlisted species, would not require management  
34 changes.

35 Conservation areas would, as needed, incorporate buffer areas to minimize the potential effects  
36 of existing land uses and other activities that may be associated with adjacent lands that could  
37 adversely affect the ecological functions associated with established land cover types.  
38 Moreover, they would be designed to minimize the need for buffers by locating, juxtaposing,  
39 and managing established habitats in a manner that would minimize the effect of  
40 activities/events that may occur on adjacent lands. The need for buffer lands would be  
41 determined based on the site-specific needs identified for each conservation area. Nonetheless,  
42 specific, potential conflicts with existing adjacent land uses have been identified in the

1 agricultural resources and noise analyses (sections 3.2 and 3.12, respectively). These impacts are  
2 identified below.

- 3 • **Impact AG-3: Runoff from established conservation areas could alter the slopes of**  
4 **adjoining laser-leveled fields.** This impact would be *significant but mitigable to less than*  
5 *significant* through the implementation of **Mitigation Measure AG-1.**
- 6 • **Impact AG-4: Covered species attracted to established conservation areas could**  
7 **disperse to other lands within the planning area.** Impacts would be *less than significant.*
- 8 • **Impact NOI-1: Construction activities could cause a temporary, substantial increase**  
9 **in ambient noise levels that could exceed local standards if construction occurred in**  
10 **proximity to noise-sensitive receptors.** This impact would be *significant but mitigable to*  
11 *less than significant* through the implementation of **Mitigation Measure NOI-1.**
- 12 • **Impact NOI-2: Pumps located near noise-sensitive receptors could cause a substantial**  
13 **increase in ambient noise levels or exceed regulatory thresholds.** This impact would  
14 be *significant but mitigable to less than significant* through the implementation of  
15 **Mitigation Measure NOI-2.**

16 *Mitigation Measures*

17 No mitigation measures specific to land use are required. The implementation of **Mitigation**  
18 **Measures AG-1, NOI-1, and NOI-2** would minimize potential conflicts with nearby land uses.

19 *Residual Impacts*

20 Residual impacts would be *less than significant* because mitigation measures are available that  
21 would reduce or avoid significant impacts to agricultural resources and noise.

22 **3.11.2.2 Alternative 2: No Action Alternative**

23 *Impacts*

24 Under the no action alternative, it is likely that conservation measures similar to those included  
25 in the proposed action would be implemented since compliance with the ESA still would be  
26 required for the covered activities, although some conservation could occur in the off-site  
27 conservation areas (as described in section 3.11.2.4 below), as well as along the LCR. The  
28 discussion of the proposed action's impacts generally applies to Alternative 2. It is not known,  
29 however, if buffer zones would be established or if conservation areas would be sited or  
30 managed in a manner that would minimize the effect of implementing the conservation  
31 measures on adjacent lands. To the extent that the agencies undertaking the covered activities  
32 proceed with ESA compliance through section 7 consultations instead of the section 10  
33 permitting process, there may be a reduced number of covered species because unlisted species  
34 would not be included. This would also likely result in a smaller amount of conservation area  
35 being established. The same types of impacts would occur as described for the proposed action,  
36 but the overall magnitude would be lessened since a smaller amount of conservation area  
37 establishment would occur.

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1 *Mitigation Measures*

2 No mitigation measures specific to land use impacts are required. Mitigation measures would  
3 be developed as appropriate in the course of project-specific environmental reviews. The  
4 implementation of measures such as **Mitigation Measures AG-1, NOI-1, and NOI-2** would  
5 minimize potential conflicts with nearby land uses. Developing and implementing such  
6 mitigation measures is outside the authority of the lead agencies and is beyond the scope of this  
7 EIS/EIR.

8 *Residual Impacts*

9 Residual impacts would be *less than significant* because mitigation measures are available that  
10 would reduce or avoid significant land use impacts.

11 **3.11.2.3 Alternative 3: Listed Species Only**

12 *Impacts*

13 The discussion of the proposed action's impacts applies to Alternative 3. The same types of  
14 impacts would occur as described for the proposed action, but the overall magnitude would be  
15 lessened since a smaller amount of conservation area establishment would occur.

16 *Mitigation Measures*

17 No mitigation measures specific to land use are required. The implementation of **Mitigation**  
18 **Measures AG-1, NOI-1, and NOI-2** would minimize potential conflicts with nearby land uses.

19 *Residual Impacts*

20 Residual impacts would be *less than significant* because mitigation measures are available that  
21 would reduce or avoid significant land use impacts.

22 **3.11.2.4 Alternative 4: Off-Site Conservation**

23 *Impacts*

24 The discussion of the proposed action's impacts applies to Alternative 4. The only difference  
25 between this alternative and the proposed action is that the conservation measures would be  
26 implemented at different locations (the Muddy/Virgin, Bill Williams, and lower Gila rivers),  
27 with the exception of conservation measures directly related to fish, including backwater  
28 creation, which would be implemented in the planning area. Conversations with local planners  
29 indicated that conservation area establishment generally would be considered a permitted use  
30 in the undeveloped and agricultural areas where it would occur (personal communications, C.  
31 Pulsipher, B. Delmar, B. Hopkins, and G. Gallagher 2003).

32 *Mitigation Measures*

33 No mitigation measures specific to land use are required. The implementation of **Mitigation**  
34 **Measures AG-1, NOI-1, and NOI-2** would minimize potential conflicts with nearby land uses.

### 3.11 Land Use

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- 1 *Residual Impacts*
- 2 Residual impacts would be *less than significant* because mitigation measures are available that
- 3 would reduce or avoid significant land use impacts.

1    **3.12     NOISE**

2    This section addresses noise from potential sources related to the implementation of the  
3    Conservation Plan, including noise impacts from construction activities and long-term  
4    operational noise from pumps.

5    Noise may be defined as unwanted sound. Noise is usually objectionable because it is  
6    disturbing or annoying. Several noise measurement scales are used to describe noise in a  
7    particular location. A decibel (dB) is a unit of measurement that indicates the relative  
8    amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the  
9    healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a  
10   logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while  
11   20 dB is 100 times more intense, 30 dB is 1,000 times more intense, etc. There is a relationship  
12   between the subjective noisiness or loudness of a sound and its intensity. Each 10-dB increase  
13   in sound level is perceived as approximately a doubling of loudness over a fairly wide range of  
14   intensities.

15   There are several methods of characterizing sound. The most common is the A-weighted sound  
16   level, or dBA. This scale gives greater weight to the frequencies of sound to which the human  
17   ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown  
18   in Table 3.12-1. Because sound levels can vary markedly over a short period of time, a method  
19   for describing either the average character of the sound or the statistical behavior of the  
20   variations must be utilized. Most commonly, sounds are described in terms of an average level  
21   that has the same acoustical energy as the summation of all the time-varying events. This  
22   energy-equivalent sound/noise descriptor is called  $L_{eq}$ . The most common averaging period is  
23   hourly, but  $L_{eq}$  can describe any series of noise events of arbitrary duration.

24   Because the sensitivity to noise increases during the evening and at night—excessive noise  
25   interferes with the ability to sleep—24-hour descriptors have been developed that incorporate  
26   artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent  
27   Level (CNEL) is a measure of the cumulative noise exposure in a community, with a 5-dB  
28   penalty added to evening (7:00 P.M. to 10:00 P.M.) and a 10-dB addition to nocturnal (10:00 P.M.  
29   to 7:00 A.M.) noise levels. The Day/Night Average Sound Level ( $L_{dn}$ ) is essentially the same as  
30   CNEL, with the exception that the evening time period is dropped and all occurrences during  
31   this 3-hour period are grouped into the daytime period.

32    **Noise Regulations**

33    Land use compatibility with differing noise levels is regulated at the local level, although the  
34    Federal government has established suggested land use compatibility criteria for different noise  
35    zones (Federal Interagency Committee on Urban Noise, 1980). Residential areas and schools are  
36    considered compatible where the  $L_{dn}$  is up to 65 dBA; outdoor recreational activities such as  
37    fishing, golfing and horseback riding are compatible when noise exceeds 75 dBA; and parks are  
38    compatible with noise levels up to 75 dBA.

**Table 3.12-1. Typical Sound Levels  
Measured in the Environment and Industry**

| <i>At a Given Distance From Noise Source</i> | <i>A-Weighted Sound Level in Decibels</i> | <i>Noise Environments</i>                | <i>Subjective Impression</i> |
|--|---|--|------------------------------|
|  | 140                                       |  |                              |
| Civil Defense Siren (100')                   | 130                                       |  |                              |
| Jet Takeoff (200')                           | 120                                       |  | Pain Threshold               |
|  | 110                                       | Rock Music Concert                       |                              |
| Diesel Pile Driver (100')                    | 100                                       |  | Very Loud                    |
|  | 90  | Boiler Room<br>Printing Press Plant      |                              |
| Freight Cars (50')                           | 80  |  |                              |
| Pneumatic Drill (50')                        |   |  |                              |
| Freeway (100')                               |   | In Kitchen with Garbage Disposal Running |                              |
| Vacuum Cleaner (10')                         | 70  |  | Moderately Loud              |
|  | 60  | Data Processing Center                   |                              |
|  |   | Department Store                         |                              |
| Light Traffic (100')                         | 50  |  |                              |
| Large Transformer (200')                     |   |  |                              |
|  | 40  | Private Business Office                  | Quiet                        |
| Soft Whisper (5')                            | 30  | Quiet Bedroom                            |                              |
|  | 20  | Recording Studio                         |                              |
|  | 10  |  | Threshold of Hearing         |
|  | 0   |  |                              |

*Source:* U.S. Department of Housing and Urban Development. 1985

2 Neither Arizona, California, nor Nevada has adopted any quantitative noise regulations that are  
3 applicable to the proposed action, although the CADHS, Environmental Health Division has  
4 established guidelines regarding land use compatibility.

5 Noise regulations established by local jurisdictions that govern stationary noise sources are  
6 typically included in noise ordinances, although policies that limit public exposure to noise may  
7 be included in the general or community plans of individual cities or counties. Some  
8 jurisdictions also have specific provisions addressing construction noise impacts that often limit

1 the hours and days of construction and may establish noise thresholds that may not be  
 2 exceeded at specific locations, such as the property line of the site that is under construction.  
 3 Tables 3.12-2 and 3.12-3 provide summaries of the regulations governing noise from  
 4 construction and long-term operations, respectively.

**Table 3.12-2. Construction Noise Regulations**

| <i>County/State</i>       | <i>LDN OR CNEL (dB)</i>  |
|---------------------------|--|
| La Paz County, AZ         | None   |
| Mohave County, AZ         | 65 dBA at property line.   |
| Yuma County, AZ           | None   |
| Imperial County, CA       | 75 dBA Leq when averaged over an 8-hour period and measured at the nearest sensitive receptor (e.g., residences, schools, hospitals, parks, office buildings, and certain non-human species, including riparian bird species).   |
| Riverside County, CA      | Riverside County Code does not provide construction noise limits; however, it does restrict construction activities within ¼ mile of an occupied residence(s) to the hours of 6 A.M. to 6 P.M. during the months of June through September, and between 7 A.M. to 6 P.M. during the other months.  |
| San Bernardino County, CA | For large projects, such as subdivision construction adjacent to developed/occupied noise sensitive land uses, a construction related noise mitigation plan is required prior to issuance of a grading permit.   |
| Clark County, NV          | None   |
| <i>City/ State</i>        | <i>LDN OR CNEL (dB)</i>  |
| Parker, AZ                | None   |
| Quartzsite, AZ            | None   |
| Bullhead City, AZ         | None   |
| Lake Havasu City, AZ      | None   |
| City of San Luis, AZ      | None   |
| City of Somerton, AZ      | Construction is not allowed, other than between the hours of 7:00 A.M. and 7:00 P.M. on weekdays, except in case of urgent necessity in the interest of public health and safety and then only with a permit which may be granted for a period not to exceed 30 days, while the emergency continues.                                     |
| Yuma, AZ                  | Construction is not allowed in any residential district or section, other than between the hours of 6:00 A.M. and 7:00 P.M. from the first day of May to and including the 30th day of September and between the hours of 7:00 A.M. and 7:00 P.M. beginning the first day of October to and including the 30th day of April on weekdays. |
| Blythe, CA                | None   |
| Needles, CA               | None   |
| Laughlin, NV              | None   |
| Boulder City, NV          | None   |
| Henderson, NV             | None   |
| Wellton, NV               | None   |

5

1

**Table 3.12-3. Long-Term Noise Compatibility Thresholds**

| County/<br>State   | Noise<br>Ordinance/<br>Controls?<br>Yes/No | LDN OR CNEL (dBA)  |   |                                      |                                      |
|--|--|--|---|--------------------------------------|--------------------------------------|
|  |  | Residential  | Commercial                              | Industrial                           | Recreational                         |
| La Paz County, AZ  | Yes<br>(nuisance ordinance)                | Not specified  | Not specified                           | Not specified                        | Not specified                        |
| Mohave County, AZ  | Yes  | 50-60 dBA  | 50-70 dBA                               | 50-75 dBA                            | 50-75 dBA                            |
| Yuma County, AZ  | No   | NA   | NA                                      | NA                                   | NA                                   |
| Imperial County, CA  | Yes  | Daytime [50-55dB] Nighttime [45-50 dB]   | Daytime [60dB] Nighttime [55 dB]        | Anytime [70-75dB]                    | Not specified                        |
| Riverside County, CA   | Yes  | Daytime [65dB 10-min. Leq] <sup>2</sup> Nighttime [45 dB 10-min. Leq] <sup>2</sup> | 50-65 dBA                               | 50-70 dBA                            | 50-65 dBA                            |
| San Bernardino County, CA  | Yes  | Interior [45 dB] Exterior [60 dB]  | Interior [45-50 dB] Exterior [60-65 dB] | Not specified                        | Interior [NA] Exterior [65 dB]       |
| Clark County, NV   | Yes  | Daytime [56dB] Nighttime [46 dB]   | Daytime [65dB] Nighttime [61 dB]        | Daytime [65dB] Nighttime [61 dB]     | Not specified                        |
| <i>City/ State</i>   |  |  |   |                                      |                                      |
| Parker, AZ   | No   | NA   | NA                                      | NA                                   | NA                                   |
| Quartzsite, AZ   | No   | NA   | NA                                      | NA                                   | NA                                   |
| Bullhead City, AZ  | Yes  | Not specified  | Not specified                           | Not specified                        | Not specified                        |
| Lake Havasu City, AZ   | Yes  | Daytime [50-68 dB] Nighttime [45 dB]   | Daytime [50-68 dB] Nighttime [45 dB]    | Daytime [50-68 dB] Nighttime [45 dB] | Daytime [50-68 dB] Nighttime [45 dB] |
| City of San Luis, AZ   | No   | NA   | NA                                      | NA                                   | NA                                   |
| City of Somerton, AZ   | Yes  | Not specified  | 50 dB                                   | Not specified                        | Not specified                        |
| Yuma, AZ   | Yes  | Not specified  | 70 dB                                   | Not specified                        | Not specified                        |
| Blythe, CA   | Yes  | 50-60 dB   | 50-65 dB                                | 50-75 dB                             | 50-55 dB                             |
| Needles, CA  | Yes  | 45-65 dB   | Not specified                           | Not specified                        | Not specified                        |
| Laughlin, NV   | Yes  | Daytime [56dB] Nighttime [46 dB]   | Daytime [65dB] Nighttime [61 dB]        | Daytime [65dB] Nighttime [61 dB]     | Not specified                        |
| Boulder City, NV   | Yes  | Not specified  | Not specified                           | Not specified                        | Not specified                        |
| Henderson, NV  | Yes  | 32-72 dB <sup>3</sup>  | 32-72 dB <sup>3</sup>                   | 32-72 dB <sup>3</sup>                | 32-72 dB <sup>3</sup>                |
| Wellton, NV  | No   | NA   | NA                                      | NA                                   | NA                                   |
| <p>1. Daytime is typically 7:00 A.M. to 10:00 P.M. and nighttime is typically 10:00 P.M. to 7:00 A.M.</p> <p>2. Leq (Equivalent Energy Level) - The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically 18 or 24 hours.</p> <p>3. Henderson generally regulates all uses and activities noise levels by the maximum sound pressure level radiated by any use or facility. These sound pressure levels vary depending on the octave-band range in cycles per second.</p> <p>4. NA</p> |  |  |   |                                      |                                      |

### 2 3.12.1 Affected Environment

3 The following discussion describes the existing manmade noise sources for each reach of the  
4 LCR, as well as the off-site conservation areas. Noise sensitive receptors are also identified,  
5 including those in those in urban areas, although the proposed conservation measures likely  
6 would not be located in proximity to such areas.

---

### 1 3.12.1.1 Lower Colorado River

#### 2 Reach 1

3 Reach 1 is bordered by Clark County, Nevada and Mohave County, Arizona. The primary  
4 noise sources are related to recreational activities such as camping and boating on Lake Mead.  
5 Noise generated by the operation of Hoover Dam may also contribute to the noise environment  
6 within this reach. The main noise-sensitive receptors in this region are the Lake Mead NRA and  
7 Grand Canyon National Park. Here, campgrounds and other recreation areas where quiet is an  
8 essential part of the recreational experience are considered noise sensitive uses. The Hualapai  
9 Indian Reservation is also located in this reach.

#### 10 Reach 2

11 Reach 2 is located within Clark County and Mohave County. The primary noise sources are  
12 related to recreational activities such as camping and boating on Lake Mohave. Noise  
13 generated by the operation of Davis Dam may also contribute to the noise environment within  
14 this reach. Because U.S. Highway 93 and Highway 68 cross the LCR perpendicularly, they are a  
15 noise source only in the vicinity of the point at which they cross the planning area. The main  
16 noise-sensitive receptors in this region are the Lake Mead Recreation Area, which extends from  
17 Reach 1, and residential uses in the communities that border this region.

#### 18 Reach 3

19 Reach 3 is bounded mainly by Mohave County on the east and San Bernardino County on the  
20 west, although a small portion of the northern portion of the reach is located in Clark County.  
21 The main noise sources in this reach are recreational activities on Lake Havasu and below Davis  
22 Dam, vehicular traffic (particularly along Interstate 40), agricultural uses, and aircraft from the  
23 Lake Havasu City Airport. Operational noise from Parker Dam also contributes to the noise  
24 environment within this reach. The main noise-sensitive receptors in this region are the Lake  
25 Havasu and Bill Williams River NWRs and residential uses in the communities that border this  
26 region, including the Fort Mojave and Chemehuevi Indian reservations. Bullhead City, Lake  
27 Havasu City, and the City of Needles are also located in this reach, and contain noise-sensitive  
28 receptors such as schools, hospitals, and residences. Urban areas are also sources of noise.

#### 29 Reach 4

30 Reach 4 is bordered by La Paz County on the east and is largely located within Riverside  
31 County on the west, although the northern portion of the reach is located in San Bernardino  
32 County and the southern portion is within Imperial County. The main noise sources within this  
33 reach are vehicular traffic (particularly along Interstate 10 and Highway 95), recreational  
34 boating, agricultural uses, and operational noise from Headgate Rock Dam and Palo Verde  
35 Diversion Dam. The main noise-sensitive receptors in this region are the Cibola NWR and  
36 residential uses in the communities that border this region, including the Colorado River Indian  
37 Tribes Reservation. The Town of Parker and City of Blythe are also located in this reach, and  
38 contain noise-sensitive receptors such as schools, hospitals, and residences. Urban areas are  
39 also sources of noise.

1 *Reach 5*

2 Reach 5 is bounded by La Paz and Yuma counties on the east and Imperial County on the west.  
3 The main noise sources within this reach are related to recreational activities such as camping  
4 and boating on Cibola, Adobe, or Martinez lakes. Limited agricultural uses also may contribute  
5 to the noise environment. The main noise-sensitive receptors in this reach are the Imperial  
6 NWR and the Picacho SRA.

7 *Reach 6*

8 Reach 6 is bordered by Yuma County on the east and Imperial County on the west. The main  
9 sources of noise within this reach are recreational activities on Mittry Lake. Traffic noise also  
10 contributes to the noise environment within this reach, as do agricultural uses and the operation  
11 of Imperial Dam. Noise-sensitive receptors in Reach 6 include the Mittry Lake State Wildlife  
12 Area, and residential uses in the communities that border this region, including the Fort Yuma  
13 Indian Reservation.

14 *Reach 7*

15 Reach 7 is located within Yuma County. The main sources of noise within this reach are traffic  
16 noise (primarily from Interstate 8), operational noise from Morelos Diversion Dam, and  
17 agricultural uses. The main noise-sensitive receptors in Reach 7 include the Cocopah Indian  
18 Reservation and associated residential uses. The City of San Luis and Yuma are also located in  
19 this reach, and contain noise-sensitive receptors such as schools, hospitals, and residences.  
20 Urban areas are also sources of noise.

21 **3.12.1.2 *Muddy River/Moapa Valley and Virgin River***

22 These rivers are located in Clark County, Nevada, and the Muddy River also passes through the  
23 towns of Logandale and Overton. The main sources of noise are related to recreational  
24 activities such as camping and boating on upper Lake Mead, as well as agricultural uses in the  
25 Muddy River/Moapa Valley. Traffic noise from Interstate 15 contributes to the noise  
26 environment where it intersects the Muddy River. Noise-sensitive receptors in the Muddy  
27 River/Moapa Valley and Virgin River region include the Lake Mead National Recreation Area,  
28 and schools, hospitals, and residences that are associated with the towns of Logandale or  
29 Overton. Urban areas are also sources of noise.

30 **3.12.1.3 *Bill Williams River***

31 The Bill Williams River borders both Mohave and La Paz counties. Agricultural activities are  
32 the main source of noise, and the primary noise-sensitive receptor in this region is the Bill  
33 Williams River NWR.

34 **3.12.1.4 *Lower Gila River***

35 The lower Gila River is located in Yuma County. The main sources of noise are traffic  
36 (primarily Interstate 8) aircraft associated with the Marine Corps Air Station and Yuma

1 International Airport, which lie just south of the lower Gila River, and agricultural uses. Noise  
2 sensitive receptors include scattered residences and farmhouses.

### 3 **3.12.2 Environmental Consequences**

#### 4 *Significance Criteria*

5 Impacts would be significant if the project would result in the following:

- 6 • exposure of persons to or generation of noise levels in excess of standards established in  
7 the local General Plan or Noise Ordinance, or applicable standards of other agencies;
- 8 • exposure of persons to or generation of excessive groundborne vibration or  
9 groundborne noise levels;
- 10 • a substantial permanent increase in ambient noise levels in the project vicinity above  
11 levels existing without the project; or
- 12 • a substantial temporary or periodic increase in ambient noise levels in the project  
13 vicinity above levels existing without the project.

#### 14 **3.12.2.1 Alternative 1: Proposed Conservation Plan**

##### 15 *Impacts*

16 The proposed action would require standard construction activities, including clearing,  
17 grading, dredging, and construction of infrastructure. Long-term noise would result from the  
18 operation of diesel or electric pumps. No elements of the project would result in excessive  
19 groundborne vibration or groundborne noise levels.

##### 20 CONSTRUCTION NOISE

21 **Impact NOI-1: Construction activities could cause a temporary, substantial increase in**  
22 **ambient noise levels that could exceed local standards if construction occurred in proximity**  
23 **to noise-sensitive receptors.** The proposed action would require a number of actions that  
24 would generate noise, including clearing, grading, dredging, and construction of infrastructure.  
25 The amount of noise generated by each of these key actions at varying distances from the source  
26 is shown on Table 3.12-4. The duration of construction would vary, depending on the type of  
27 site and the nature of the construction activity. Field facilities, for example, could be  
28 constructed in 1 to 3 months, whereas habitat establishment could take considerably longer,  
29 depending on the size and other characteristics of the site (e.g., agricultural land can be  
30 converted to habitat much more rapidly than undeveloped land). Construction generally  
31 would occur in agricultural or undeveloped areas. Thus, noise would be unlikely to affect  
32 concentrations of residences, churches, schools, or other sensitive receptors found in more  
33 heavily populated areas. Average ambient noise levels likely are low in the areas where  
34 construction would occur (about 45 dBA). Nonetheless, construction, particularly on the  
35 periphery of the sites, could potentially occur in proximity to individual rural residences. Some  
36 of the local jurisdictions in the planning area regulate construction noise, as indicated in Table  
37 3.12-2. If construction activities generated noise levels that violated local standards or caused a  
38 substantial increase in areas containing noise-sensitive receptors, this impact would be

1 *significant but mitigable to less than significant* through the implementation of **Mitigation Measure**  
2 **NOI-1.**

3 OPERATIONAL NOISE

4 **Impact NOI-2: Pumps located near noise-sensitive receptors could cause a substantial**  
5 **increase in ambient noise levels or exceed regulatory thresholds.** The primary source of  
6 operational noise would be the use of electric or diesel pumps. It is assumed that pumps would  
7 generate approximately 85 dBA at 50 feet. Noise attenuation would be as shown for clearing  
8 and grading on Table 3.12-4. As described under construction, the established conservation  
9 area would be located in agricultural or undeveloped areas, and it is unlikely that pumps  
10 would be located in the vicinity of noise-sensitive receptors. As noted in section 2.1.1.4,  
11 conservation areas would be designed to minimize the effect of activities/events that may occur  
12 on adjacent lands. Thus, pumps generally would be sited to avoid exceeding local regulatory  
13 noise thresholds or causing a substantial permanent increase in ambient noise levels in the  
14 project vicinity if noise-sensitive receptors are present. However, if there were no flexibility in  
15 their placement, impacts could be *significant but mitigable to less than significant* through the  
16 implementation of **Mitigation Measure NOI-2.**

**Table 3.12-4. Maximum Noise Levels (L<sub>dn</sub>) with  
No Noise Reduction Measures in Place**

| <i>Feet</i> | <i>Clearing</i> | <i>Grading</i> | <i>Dredging</i> | <i>Irrigation</i> |
|-------------|-----------------|----------------|-----------------|-------------------|
| 50          | 85              | 85             | 93              | 93                |
| 100         | 79              | 79             | 87              | 87                |
| 200         | 73              | 73             | 81              | 81                |
| 300         | 69              | 70             | 77              | 77                |
| 400         | 67              | 67             | 75              | 75                |
| 500         | 65              | 65             | 73              | 73                |
| 600         | 64              | 64             | 71              | 71                |
| 700         | 62              | 63             | 70              | 70                |
| 800         | 61              | 61             | 69              | 69                |
| 900         | 60              | 60             | 68              | 68                |
| 1,000       | 59              | 60             | 67              | 67                |
| 1,200       | 58              | 58             | 65              | 65                |
| 1,400       | 56              | 57             | 64              | 64                |
| 1,600       | 55              | 56             | 63              | 63                |
| 1,800       | 54              | 55             | 62              | 62                |
| 2,000       | 54              | 54             | 61              | 61                |
| 2,500       | 52              | 52             | 59              | 59                |

Note: Background Noise Level (dBA) = 45

17 *Mitigation Measures*

18 **NOI-1** When construction occurs sufficiently close to noise-sensitive receptors so that noise  
19 from construction activities exceeds local regulatory standards or causes a substantial

1 increase in ambient noise levels, one or more of the following measures shall be  
2 implemented. This list does not preclude the use of additional mitigation measures if  
3 appropriate (*Addresses Impact NOI-1*).

- 4 • Use hydraulically or electrically powered impact tools when possible. If the use of  
5 pneumatically powered tools is unavoidable, use an exhaust muffler on the  
6 compressed air exhaust.
- 7 • Install manufacturer's standard noise control devices, such as mufflers, on  
8 construction equipment.
- 9 • Locate stationary equipment as far as possible from noise-sensitive receptors.
- 10 • Notify nearby property users whenever extremely noisy work might occur.
- 11 • Use stockpiles as noise barriers when feasible.
- 12 • Keep idling of construction equipment to a minimum (no more than 30 minutes)  
13 when not in use.
- 14 • Install temporary or portable acoustic barriers around stationary construction  
15 noise sources.
- 16 • As appropriate, modify noise enclosures with acoustical louvers, baffle walls,  
17 and/or acoustical panels.
- 18 • Whenever possible, limit construction activities to non-mating, non-nesting  
19 seasons of noise-sensitive species.

20 **NOI-2** If pumps cannot be located at sufficient distances from sensitive receptors to avoid the  
21 exceedance of a local noise standard or a substantial increase in the ambient noise level  
22 at the sensitive receptors, then barriers or enclosures shall be constructed to ensure  
23 adherence to local standards. (*Addresses Impact NOI-2*)

#### 24 *Residual Impacts*

25 Residual impacts would be *less than significant* since noise impacts would be reduced to meet  
26 regulatory standards or to avoid substantially increasing the ambient noise levels.

#### 27 **3.12.2.2 Alternative 2: No Action Alternative**

28 Under the no action alternative, it is likely that conservation measures similar to those included  
29 in the proposed action would be implemented since compliance with the ESA still would be  
30 required for the covered activities, although some conservation could occur in the off-site  
31 conservation areas (as described in section 3.12.2.4 below), as well as along the LCR. **Impacts**  
32 **NOI-1 and NOI-2** apply to this alternative. To the extent that the agencies undertaking the  
33 covered activities proceed with ESA compliance through section 7 consultations instead of the  
34 section 10 permitting process, there may be a reduced number of covered species because  
35 unlisted species would not be included. This would also likely result in a smaller amount of  
36 conservation area being established, which would result in proportionately fewer noise impacts.  
37 However, due to the increased number of individual projects associated with the no action

1 alternative, and the greater likelihood that the conservation sites would be located closer to  
2 developed areas, noise impacts could be somewhat greater than under the proposed action.

3 *Mitigation Measures*

4 Mitigation measures would be developed as appropriate in the course of project-specific  
5 environmental reviews. If significant impacts are identified, mitigation measures similar to  
6 those identified in this EIS/EIR (**Mitigation Measures NOI-1 and NOI-2**) could be  
7 implemented. Developing and implementing such mitigation measures is outside the authority  
8 of the lead agencies and is beyond the scope of this EIS/EIR.

9 *Residual Impacts*

10 Residual impacts would be *less than significant* because mitigation measures are available that  
11 would reduce or avoid significant noise impacts.

12 **3.12.2.3 Alternative 3: Listed Species Only**

13 **Impacts NOI-1 and NOI-2** apply to this alternative. The same types of *significant but mitigable to*  
14 *less than significant* impacts would occur as described for the proposed action, but the overall  
15 magnitude would be lessened since a smaller amount of conservation area establishment would  
16 occur.

17 *Mitigation Measures*

18 **Mitigation Measures NOI-1 and NOI-2** are applicable to this alternative.

19 *Residual Impacts*

20 Residual impacts would be *less than significant* because mitigation measures are available that  
21 would reduce or avoid significant noise impacts.

22 **3.12.2.4 Alternative 4: Off-Site Conservation**

23 **Impacts NOI-1 and NOI-2** apply to this alternative. The difference between this alternative and  
24 the proposed action is that most conservation measures would be implemented at different  
25 locations (along the Muddy/Virgin, Bill Williams, and lower Gila rivers). The conservation  
26 measures directly related to fish, including backwater creation, would be implemented in the  
27 planning area, as described for the proposed action. Impacts would be *significant but mitigable to*  
28 *less than significant* through the implementation of **Mitigation Measures NOI-1 and NOI-2**.

29 *Mitigation Measures*

30 **Mitigation Measures NOI-1 and NOI-2** are applicable to this alternative.

31 *Residual Impacts*

32 Residual impacts would be *less than significant* because mitigation measures are available that  
33 would reduce or avoid significant noise impacts.

1    **3.13       POPULATION AND HOUSING**

2    A detailed analysis of these resources was not performed because the proposed action and  
3    alternatives would not affect population or housing. Implementation of the proposed action  
4    would not generate any significant number of job opportunities that would cause an increase in  
5    population in the planning area. Conservation area establishment would be implemented on  
6    agricultural or undeveloped land in areas well removed from population centers. No  
7    residences would be proposed as part of the proposed action or alternatives, nor would roads  
8    or infrastructure be extended into areas that could serve new development. New access roads  
9    and irrigation infrastructure could be required in some areas, but they would be sized and  
10   positioned to serve only the conservation areas. Since agricultural or undeveloped land would  
11   be used for conservation area establishment, the proposed action and alternatives would not  
12   displace substantial numbers of existing houses or people, necessitating the construction of  
13   replacement housing elsewhere.

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1   **3.14       PUBLIC UTILITIES AND SERVICES**

2   A detailed analysis of public utilities and services was not performed because the proposed  
3   action and alternatives would have minimal impacts on these resources, as described below.

4       • *Wastewater treatment.* The proposed action and alternatives would not generate  
5       wastewater except at the two potential field facilities, which would generate only  
6       minimal amounts. Thus, no impacts to existing wastewater conveyance and treatment  
7       facilities would occur.

8       • *Water treatment.* Water use of the proposed action and alternatives would be associated  
9       primarily with irrigation. Colorado River water would be used and would not require  
10      treatment. The two potential field facilities would require only minimal potable water  
11      use, and therefore would not require the construction of new water treatment facilities  
12      or the expansion of existing facilities.

13      • *Water supply.* Water used in habitat establishment would be obtained from the Colorado  
14      River through legal means and would not affect the water supply or distribution  
15      systems of water purveyors. Only minimal amounts of potable water would be required  
16      to serve the two field facilities should they be constructed; thus, adequate water supply  
17      would be available to serve these facilities from existing entitlements.

18      • *Storm water drainage.* Minimal storm water drainage would be required for the two  
19      potential field facilities, which would not require or result in the construction of new  
20      storm water drainage facilities or the expansion of existing facilities.

21      • *Landfill capacity.* Minimal amounts of solid waste requiring disposal would be generated  
22      during construction and operations. Cleared vegetation would either be burned or  
23      shredded and used as mulch. Thus, landfill capacity would not be exceeded.

24      • *Need for new or physically altered facilities.* The proposed action and alternatives would  
25      not add population, and thus would not affect schools or parks. It is anticipated that  
26      one new law enforcement officer and one new wildland fire fighter would be provided,  
27      respectively, for every 5,000 and 2,500 acres of conserved land not already in public  
28      ownership. All new personnel would be stationed at existing facilities. Additionally,  
29      the Conservation Plan includes a number of provisions that would minimize the  
30      potential impacts from wildland fires and thus would not require the expansion of fire  
31      protection services by other agencies.

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1 **3.15 RECREATION**

2 This section addresses the potential for the use of recreational facilities to increase as a result of  
3 implementing the proposed Conservation Plan, leading to their deterioration, as well as the  
4 potential for decreased recreational opportunities.

5 **3.15.1 Affected Environment**

6 **3.15.1.1 Lower Colorado River**

7 Key recreational resources are identified by river reach, although much of the river system,  
8 including undeveloped land, is used for a variety of recreational purposes, including camping,  
9 fishing, boating, canoeing, hunting, and water-skiing.

10 *Reach 1*

11 GRAND CANYON NATIONAL PARK

12 Grand Canyon National Park is located in northern Arizona. Created as a national park in 1919,  
13 it was designated as a World Heritage Site in 1979. The park encompasses 277 miles of the  
14 Colorado River and adjacent uplands and contains 1.28 million acres. The park had more than  
15 4.4 million recreation visits in 2001 (NPS 2002).

16 HUALAPAI INDIAN RESERVATION

17 The Hualapai Reservation offers camping, fishing, hiking, and big game hunting. A tribal  
18 enterprise operates a river rafting company that offers rafting trips on the Colorado River.

19 LAKE MEAD NATIONAL RECREATION AREA

20 Lake Mead NRA extends along the LCR from the western border of Grand Canyon National  
21 Park to Davis Dam. The Lake Mead portion is 110 miles long, with a surface area of 274 square  
22 miles and more than 500 miles of shore. The lakes within the NRA provide boating, canoeing,  
23 kayaking, sport fishing, swimming, and water skiing opportunities; while its desert offers  
24 impressive scenery enjoyed by hikers and wildlife photographers. Three of America's four  
25 desert ecosystems; i.e., the Great Basin, the Mojave, and the Sonoran deserts, converge in the  
26 Lake Mead NRA. As a result, this seemingly barren area contains a large variety of plant and  
27 animal species. A number of campgrounds and picnic areas provide additional recreational  
28 opportunities and include Boulder Beach, Calville Bay, Echo Beach, Las Vegas Bay, and Temple  
29 Bar. The Lake Mead NRA has approximately 6 million visitor use days per year (NPS 2001).

30 *Reach 2*

31 LAKE MEAD NATIONAL RECREATION AREA

32 The Lake Mead NRA extends into Reach 2. Lake Mohave, which is formed by Davis Dam, is  
33 part of this NRA. Lake Mohave is a 67-mile stretch of the Colorado River north of Bullhead  
34 City, Arizona and Laughlin, Nevada. The lake is comparatively narrow, not more than 4 miles  
35 across at its widest point. It is confined for most of its length between the steep walls of Black,

### 3.15 Recreation

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1 El Dorado, Painted, and Pyramid canyons. Lake Mohave provides habitat for fish and wildlife,  
2 and the area around Lake Mohave (e.g., Cottonwood Cove and Katherine Landing) and along  
3 the Colorado River below Davis Dam provides a multitude of recreational opportunities.  
4 Activities include boating, camping, exploring, fishing, photography, picnicking, swimming,  
5 and water skiing. There are also hundreds of beaches that can only be accessed by boat. Noted  
6 fish species in the area include largemouth and rainbow trout and striped bass.

#### 7 *Reach 3*

#### 8 LAUGHLIN

9 Laughlin, Nevada is set in a rugged mountain terrain that slopes to the banks of the Colorado  
10 River. Laughlin offers an abundance of recreational water activities, as well as gambling and  
11 nightclub entertainment. Approximately 5 million visitors visit the Laughlin area each year  
12 (Laughlin, Nevada Chamber of Commerce 2003).

#### 13 BULLHEAD CITY

14 Bullhead City, which is located in Mohave County, features the Colorado River, miles of natural  
15 hiking, thousands of acres of public lands, the Lake Mead NRA, Arizona's Veteran Memorial,  
16 and the Colorado River Museum. More than 5 million people travel through Bullhead City  
17 annually (Desert USA 2003). Activities in the Bullhead City area include ghost town  
18 exploration, hiking, hunting, OHV use, rockhounding, and water sports on the Colorado River  
19 and Lake Mohave.

#### 20 DAVIS CAMP

21 Located near Bullhead City, Davis Camp, a campground and day use area, has boat launching  
22 facilities, picnic areas, numerous campsites, and RV hookups. Davis Camp offers many  
23 recreational opportunities, including fishing and water sports.

#### 24 NEEDLES

25 Needles offers a wide range of recreational opportunities, including camping, fishing, hiking,  
26 sightseeing, swimming, and other water sports.

#### 27 HAVASU NATIONAL WILDLIFE REFUGE

28 The Havasu NWR covers 30 river miles (300 miles of shoreline) from Lake Havasu City,  
29 Arizona to Needles, California and includes one of the last remaining natural stretches of the  
30 LCR, which flows through the 20-mile-long Topock Gorge (USFWS 2002f). Four endangered  
31 bird species reside here: the peregrine falcon, the southern bald eagle, the southwestern willow  
32 flycatcher, and the Yuma clapper rail (USFWS 2002f). Typical activities include canoeing,  
33 fishing, boating through the scenic Topock Gorge, and hiking in the Havasu Wilderness Area.  
34 Each year, thousands of visitors explore the 4,000-acre Topock Marsh, which offers excellent  
35 canoeing, fishing, and waterbird watching. Other activities offered by the Havasu NWR  
36 include camping and hunting.

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1 LAKE HAVASU STATE PARK

2 Lake Havasu, formed by Parker Dam, contains a number of coves and inlets, and is a popular  
3 spot for fishing. The waters of the lake also are used for canoeing, houseboating, jet-skiing,  
4 kayaking, sailing, speed-boating, swimming, and water-skiing. Camping and hiking also occur  
5 along the more than 400 miles of the lake's shoreline. Additional tourist opportunities include  
6 viewing the London Bridge.

7 BILL WILLIAMS RIVER NATIONAL WILDLIFE REFUGE

8 The Bill Williams River NWR is located along the Bill Williams River near its confluence with  
9 the LCR. The refuge offers a variety of recreational opportunities, including hiking and bird  
10 watching (as well as other wildlife viewing), with opportunities to view Yuma clapper rails and  
11 southwestern willow flycatchers, among other species. Hunting is permitted for dove,  
12 cottontail, quail, and desert bighorn sheep. Other activities include boating and fishing.

13 *Reach 4*

14 PARKER STRIP RECREATION AREA

15 The Parker Strip Recreation Area includes backcountry byways that traverse scenic corridors  
16 providing historic, natural, prehistoric, and scenic values along an 11-mile road that travels  
17 along the Colorado River. Recreational activities include boating, camping, fishing, hiking, rock  
18 hounding, swimming, and wildlife viewing.

19 PALO VERDE DIVERSION DAM

20 There are approximately 95 miles of navigable water between the Imperial Dam below Yuma  
21 and the Palo Verde Diversion Dam above Blythe. Activities include canoeing, fishing, hunting,  
22 power boating, and other water sports.

23 BLYTHE

24 Exploring ghost towns, hiking, hunting, and OHV sports are a few of the recreational activities  
25 available in the desert around Blythe. In addition, many water sports may be enjoyed along the  
26 Colorado River.

27 CIBOLA NATIONAL WILDLIFE REFUGE

28 The Cibola NWR, which includes Cibola Lake, is located about 15 miles south of Blythe. The  
29 largest concentration of Canada geese and sandhill cranes on the LCR winter at the refuge.  
30 Visitors to the refuge engage in canoeing, fishing, hiking through native cottonwood, mesquite  
31 and willow plant communities, hunting, photography, and wildlife observation. Over 288  
32 species of birds have been found in the Cibola NWR, including Gambel's quail, greater sandhill  
33 cranes, many species of migratory songbirds, mourning and white-winged doves, roadrunners,  
34 snow geese and Vermilion flycatchers (USFWS 2002a). The bald eagle, southwestern willow  
35 flycatcher, and Yuma clapper rail are among the endangered birds that use Cibola NWR. Other  
36 listed species include the bonytail, desert pupfish, desert tortoise, and razorback sucker.

### 3.15 Recreation

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1 *Reach 5*

2 PICACHO STATE RECREATION AREA

3 Picacho SRA is a popular area for camping, desert exploring, river running, and sportfishing.  
4 Picacho SRA is bordered by 8 miles of the Colorado River and is approximately 24 miles north  
5 of the U.S.-Mexico boundary. The area has a group boat-in area, three individual boat-in camp  
6 areas, and large group camping areas. Bird watching and small game hunting for doves, ducks,  
7 and quail are among other recreational opportunities.

8 IMPERIAL NATIONAL WILDLIFE REFUGE

9 Imperial NWR protects habitat for wildlife species along 30 miles of the LCR in Arizona and  
10 California, including the last unchannelized section before the river enters Mexico (USFWS  
11 2002g). The river, and its associated backwater lakes and wetlands, are a green oasis,  
12 contrasting with the surrounding desert mountains. Recreational opportunities include  
13 canoeing, fishing, and hunting. The refuge surrounds one of the few remaining "wild" places  
14 on the Colorado River and is valued by boaters for its remote scenery. In addition, scenic drives  
15 through the Sonoran Desert landscape allow access to the lookout points and the Painted Desert  
16 Trail.

17 MARTINEZ LAKE

18 Martinez Lake, which adjoins the Imperial NWR, encompasses 300 to 500 acres and is an  
19 attraction catering to anglers, birdwatchers, boaters, fishers, hunters, nature lovers, rock  
20 hounds, sightseers, and water skiers. Martinez Lake has a large variety of birds year around  
21 that can be viewed from boats on the Colorado River as well as the many side lakes along the  
22 river.

23 *Reach 6*

24 BETTY'S KITCHEN

25 Betty's Kitchen, a 10-acre wildlife interpretive area, provides birdwatching and fishing  
26 opportunities.

27 MITTRY LAKE WILDLIFE AREA

28 Mittry Lake, within the Mittry Lake Wildlife Area, covers approximately 600 acres and has  
29 undergone rehabilitation work, including fish habitat improvement, marsh dredging, and  
30 revegetation, making it an ideal location for small game hunting and sportfishing. Major  
31 species for small game hunting include doves, quail, rabbit, raccoon, and waterfowl. Major  
32 species of fish in the lake include bluegill, channel catfish, crappie, flathead catfish, and  
33 largemouth bass. There is a 3-lane boat launch ramp for motorized boating on the lake. The  
34 area is also popular for birdwatching and nature study.

1 *Reach 7*

2 YUMA

3 The City of Yuma is located on the edge of the historic floodplain to the east of the Colorado  
4 River. The area offers a number of recreational opportunities, including boating, fishing,  
5 hunting, and swimming.

6 **3.15.1.2 *Muddy River/Moapa Valley and Virgin River***

7 Recreational activities such as camping, boating, fishing, and hiking occur on upper Lake Mead,  
8 described above. The Overton Wildlife Management Area provides opportunities for wildlife  
9 viewing and photography, waterfowl and upland game bird hunting, hiking, and fishing. The  
10 Overton Wildlife Management Area has an average of 5,300 annual visitor use days (NDOW  
11 2001).

12 **3.15.1.3 *Bill Williams River***

13 The Bill Williams River NWR is located along the Bill Williams River, as described above.  
14 Alamo Lake State Park, located at the eastern end of this off-site conservation area, includes  
15 fishing, hiking, wildlife watching, and camping.

16 **3.15.1.4 *Lower Gila River***

17 The lower Gila River offers limited recreational opportunities, mostly in the form of wildlife  
18 observation and some warm-water fishing in the area with permanent water below Dome.  
19 Additionally, small game waterfowl hunting is available in the Lower Gila River area.

20 **3.15.2 *Environmental Consequences***

21 ***Significance Criteria***

22 The project would result in a significant impact if it would result in any of the following:

- 23 • increase the use of existing neighborhood and regional parks or other recreational  
24 facilities such that substantial deterioration of the facility would occur or be accelerated;  
25 or
- 26 • cause the direct loss or substantial physical degradation of either public recreation uses  
27 or public recreational facilities resulting in decreased recreational opportunities, such as  
28 sport fishing, bird watching, or waterfowl hunting.

29 **3.15.2.1 *Alternative 1: Proposed Conservation Plan***

30 ***Impacts***

31 Established conservation areas would be located on agricultural or undeveloped land owned by  
32 public agencies, Indian tribes, or private owners. Access to habitat conservation sites would be  
33 controlled in order to protect the covered species and their habitats. Developed and heavily  
34 used recreational areas would not be suitable for conservation area establishment and thus

1 would not be directly affected by the proposed action. The conversion of agricultural land to  
2 conservation areas would not adversely affect recreational resources, because this land is  
3 generally not used for recreational purposes and is not accessible to the public. Water-based  
4 recreation generally would not be affected by the proposed action. As described in section 3.9,  
5 Hydrology, the relatively minor amount of water required to irrigate vegetation in conservation  
6 areas would not lower the water surface elevation of the LCR, and thus would not affect the  
7 operation of marinas, other boating facilities, or navigation in the river. Additionally, the  
8 proposed action would not restrict use of boating areas.

9 **Impact REC-1. The implementation of certain conservation measures could result in the loss**  
10 **of recreational opportunities.** The conversion of undeveloped land to conservation areas could  
11 result in the loss of some recreational opportunities, such as camping, fishing, and access to the  
12 LCR. This impact would be *less than significant* because a relatively small area would be affected  
13 in relationship to the total area available (the planning area contains approximately 126,000  
14 acres of woody riparian vegetation and a maximum of 8,132 acres of conservation areas would  
15 be established), and the displacement of a limited amount of recreational uses to other areas  
16 would not result in the degradation of these areas. Limited fishing opportunities may be lost if  
17 backwaters were established in areas already used by the public for this purpose. Again, only a  
18 small area would be affected (360 acres out of 7,911 acres of open water [GEO/Graphics 2000]);  
19 thus, this impact would be *less than significant*.

20 The implementation of certain species-specific conservation measures also could result in the  
21 loss of access to recreational uses. Specifically, measures for the desert tortoise and flat-tailed  
22 horned lizard (DETO1 and FTHL1) include acquiring and protecting 230 acres of existing  
23 unprotected habitat, and measures for the lowland leopard frog include protecting existing  
24 unprotected habitat (LLFR2). To the extent that the protected habitat for these species was on  
25 lands used for public recreational purposes, access would be lost. Since the amount of  
26 recreational area that could be removed from public use is small in comparison to the area  
27 available (approximately 423,500 acres within the planning area are in open space or used for  
28 recreational purposes), the impact would be *less than significant*.

29 Population enhancement measures that could be implemented include controlling piscivorous  
30 fish in established backwaters prior to their use as grow-out facilities. This impact would be  
31 localized, would have a minor impact on overall fish populations, and would occur in  
32 conservation areas that would not be accessible to the public. The impact to fishing would be  
33 *less than significant*.

34 *Mitigation Measures*

35 No mitigation measures are required because no significant impacts would occur.

36 *Residual Impacts*

37 Residual impacts are those that would occur after the implementation of mitigation measures to  
38 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

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### 1 3.15.2.2 *Alternative 2: No Action Alternative*

#### 2 *Impacts*

3 Under the no action alternative, it is likely that conservation measures similar to those included  
4 in the proposed action would be implemented since compliance with the ESA still would be  
5 required for the covered actions, although some conservation could occur in the off-site  
6 conservation areas (as described in section 3.15.2.4 below), as well as along the LCR. **Impact**  
7 **REC-1** applies to this alternative. The same type of *less than significant* impacts would occur as  
8 described for the proposed action, but the overall magnitude would be lessened since a smaller  
9 amount of conservation area would be established.

#### 10 *Mitigation Measures*

11 No mitigation measures are required because no significant impacts would occur.

#### 12 *Residual Impacts*

13 Residual impacts are those that would occur after the implementation of mitigation measures to  
14 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

### 15 3.15.2.3 *Alternative 3: Listed Species Only*

#### 16 *Impacts*

17 **Impact REC-1** applies to this alternative. A smaller amount of conservation area would be  
18 developed than under the proposed action. Therefore, the same types of *less than significant*  
19 impacts would occur as described for the proposed action, but the overall magnitude would be  
20 lessened since a smaller area would be affected.

#### 21 *Mitigation Measures*

22 No mitigation measures are required because no significant impacts would occur.

#### 23 *Residual Impacts*

24 Residual impacts are those that would occur after the implementation of mitigation measures to  
25 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

### 26 3.15.2.4 *Alternative 4: Off-Site Conservation*

#### 27 *Impacts*

28 **Impact REC-1** applies to this alternative. The difference between this alternative and the  
29 proposed action is that most conservation measures would be implemented at different  
30 locations (along the Muddy/Virgin, Bill Williams, and lower Gila rivers). The conservation  
31 measures directly related to fish, including backwater creation, would be implemented in the  
32 planning area, as described for the proposed action.

### 3.15 Recreation

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1 *Mitigation Measures*

2 No mitigation measures are required because no significant impacts would occur.

3 *Residual Impacts*

4 Residual impacts are those that would occur after the implementation of mitigation measures to  
5 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

1   **3.16       SOCIOECONOMICS**

2   This section addresses the potential socioeconomic impacts associated with the voluntary  
3   conversion of agricultural land to conservation areas, focusing on (1) employment in the  
4   agricultural sector, (2) the market value of farm production, and (3) property tax and sales tax  
5   revenues. The potential loss of property taxes from the use of undeveloped or public land also  
6   is discussed. Other segments of the economy would not be substantively affected by the  
7   proposed action.

8   **3.16.1      Affected Environment**

9   The affected area is composed of the counties located within the lower basin of the Colorado  
10  River that are contained within the planning area and off-site locations, although the areas  
11  where conservation could occur comprise only a small portion of each of the counties. The  
12  affected counties include Imperial, Riverside, and San Bernardino counties in California; La Paz,  
13  Mohave, and Yuma counties in Arizona; and Clark County, Nevada. This section presents  
14  pertinent information describing selected characteristics of the above-mentioned counties,  
15  focusing on socioeconomic impacts associated with the agricultural sector of the economy since  
16  the most likely economic effect of implementing the proposed action is the conversion of  
17  agricultural lands from commercial activity to conservation areas for wildlife use. Virtually all  
18  agricultural activity in the LCR region is irrigation agriculture using water that is, for the most  
19  part diverted from the Colorado River directly or indirectly (through groundwater pumping).  
20  For each of the seven counties that are partially contained within the LCR region, the most  
21  recent data regarding farms and cropland is contained in the 1997 Census of Agriculture and  
22  2000 Census of Population and Housing.

23  Selected summary information concerning the number, value, and size of farm units in each of  
24  the seven counties and for the states of Arizona, California, and Nevada is presented in Table  
25  3.16-1. The average farm size ranges from 167 acres in Riverside County, California to 2,875  
26  acres in La Paz County, Arizona. The amount of land in farms ranges from almost 71,000 acres  
27  in Clark County, Nevada to over 997,000 acres in Mohave County, Arizona. The proportion of  
28  farmland harvested for crops (excluding grazing land) varies greatly, from a low of just over 1  
29  percent in Mohave County, Arizona to a high of 88 percent in Imperial County, California and  
30  82 percent in Yuma, Arizona. Of the harvested cropland (which excludes grazing land), a  
31  uniformly high proportion (between 63 percent and 95 percent) is irrigated.

32  An indication of the value of farmland is given by the per acre market value of land and  
33  buildings. This value ranges from over \$4,600 in Riverside County, California and almost  
34  \$4,500 in Yuma County, Arizona to almost \$700 in San Bernardino County, California and about  
35  \$250 in Mojave County, Arizona. The average market value of agricultural products sold per  
36  farm is highest in Imperial County, California (\$1.526 million) and Yuma County, Arizona  
37  (\$1.122 million) (Table 3.16-1).

1

**Table 3.16-1. Agricultural Data by County (1997)**

|   | CALIFORNIA      |                  |                       | ARIZONA       |               |             | NEVADA       |
|---|-----------------|------------------|-----------------------|---------------|---------------|-------------|--------------|
|   | <i>Imperial</i> | <i>Riverside</i> | <i>San Bernardino</i> | <i>La Paz</i> | <i>Mohave</i> | <i>Yuma</i> | <i>Clark</i> |
| Number of farms   | 557             | 3,048            | 1,455                 | 97            | 212           | 465         | 209          |
| Land in farms (acres)   | 489,726         | 509,031          | 924,015               | 278,854       | 997,171       | 237,742     | 70,741       |
| Total harvested cropland (acres)                                      | 433,119         | 245,446          | 39,543                | 100,835       | 12,060        | 195,416     | 3,406        |
| Market value of land and buildings per acre (dollars)                 | \$3,068         | \$4,618          | \$693                 | \$1,512       | \$257         | \$4,496     | \$1,610      |
| Market value of agricultural products sold (\$1000)                   | \$850,315       | \$1,047,525      | \$617,833             | \$94,665      | \$14,983      | \$522,063   | \$18,926     |
| Average market value of agricultural products sold per farm (dollars) | \$1,526,662     | \$343,676        | \$424,628             | \$975,925     | \$70,674      | \$1,122,717 | \$90,557     |

*Source:* U.S. Department of Commerce, Census Bureau, Census of Agriculture, 1997.

2

**3.16.1.1 Economic Activity**

3

*Arizona*

4 Full- and part-time employment in the three-county region composed of La Paz, Mohave, and  
5 Yuma counties increased from 110,926 to 129,492 jobs between 1995 and 2000, for a total  
6 increase of 18,566 jobs (approximately 14 percent). Employment in all sectors of the regional  
7 economy increased, with the exception of the farm and mining sectors, which declined by 30.6  
8 and 32.6 percent, respectively, in La Paz and Mohave counties combined. Farm employment in  
9 Yuma County, however, increased approximately 2.5 percent over the same time period (Table  
10 3.16-2). The numerically greatest gains were experienced in the services; retail trade; finance,  
11 insurance, and real estate; and local government sectors.

12

*California*

13 Full- and part-time employment in the three-county region composed of Imperial, Riverside,  
14 and San Bernardino counties increased from 1,168,370 jobs in 1995 to 1,447,030 jobs in 2000, an  
15 increase of 278,660 jobs (approximately 19 percent). Employment in all sectors of the regional  
16 economy increased, with the following exceptions. Agricultural services, forestry, and fishing  
17 declined by 24 percent in Imperial and Riverside counties (compared to a decrease of about 1  
18 percent in San Bernardino County), and military services declined by approximately 9 percent  
19 in Imperial and San Bernardino counties and by over 44 percent in Riverside County (Table  
20 3.16-2). The numerically greatest gains were experienced in the following sectors: construction;

Table 3.16-2. Employment by Industry (number of jobs)

|  | California |        |           |         |                |         | Arizona |       |        |        |        |        | Nevada  |         |
|--|------------|--------|-----------|---------|----------------|---------|---------|-------|--------|--------|--------|--------|---------|---------|
|  | IMPERIAL   |        | RIVERSIDE |         | SAN BERNARDINO |         | LA PAZ  |       | MOHAVE |        | YUMA   |        | CLARK   |         |
|  | 1995       | 2000   | 1995      | 2000    | 1995           | 2000    | 1995    | 2000  | 1995   | 2000   | 1995   | 2000   | 1995    | 2000    |
| Total full-time and part-time employment           | 58,946     | 61,744 | 514,523   | 662,481 | 595,171        | 722,805 | 6,704   | 7,537 | 44,320 | 54,095 | 59,902 | 67,860 | 617,216 | 866,758 |
| BY TYPE  |            |        |           |         |                |         |         |       |        |        |        |        |         |         |
| Wage and salary employment                         | 50,884     | 52,581 | 389,971   | 506,024 | 480,506        | 583,766 | 5,383   | 6,099 | 34,936 | 42,483 | 52,996 | 59,656 | 540,495 | 745,041 |
| Proprietors employment                             | 8,062      | 9,163  | 124,282   | 156,457 | 114,665        | 139,039 | 1,321   | 1,438 | 9,384  | 11,612 | 6,906  | 8,204  | 76,721  | 121,717 |
| Farm proprietors employment                        | 685        | 676    | 3,843     | 3,771   | 1,863          | 1,830   | 150     | 157   | 239    | 239    | 636    | 618    | 201     | 187     |
| Nonfarm proprietors employment                     | 7,377      | 8,487  | 120,439   | 152,686 | 112,802        | 137,209 | 1,171   | 1,281 | 9,145  | 11,373 | 6,270  | 7,586  | 76,520  | 121,530 |
| BY INDUSTRY  |            |        |           |         |                |         |         |       |        |        |        |        |         |         |
| Farm employment                                    | 5,050      | 6,180  | 12,125    | 13,909  | 5,046          | 5,577   | 667     | 389   | 382    | 339    | 3,613  | 3,705  | 304     | 339     |
| Nonfarm employment                                 | 53,896     | 55,564 | 502,128   | 648,572 | 590,125        | 717,228 | 6,037   | 7,148 | 43,938 | 53,756 | 56,289 | 64,155 | 616,912 | 866,419 |
| Private employment                                 | 40,616     | 40,722 | 422,227   | 557,854 | 485,722        | 599,648 | 5,018   | 5,983 | 37,894 | 46,971 | 43,211 | 50,142 | 554,762 | 787,517 |
| Agricultural services, forestry, fishing and other | 10,181     | 7,711  | 19,001    | 21,080  | 7,823          | 7,731   | 346     | 484   | 464    | 632    | 9,560  | 11,888 | 5,824   | 9,175   |
| Mining   | (D)        | (D)    | 1,167     | 893     | 1,228          | 894     | 41      | (D)   | 235    | 145    | 68     | (D)    | 1,389   | 1,424   |
| Construction                                       | 2,007      | 2,283  | 37,514    | 63,146  | 33,769         | 45,244  | 262     | 190   | 4,212  | 4,837  | 2,352  | 3,400  | 52,832  | 75,531  |
| Manufacturing                                      | 1,961      | 1,974  | 43,613    | 57,789  | 58,699         | 75,191  | 324     | 402   | 3,010  | 3,506  | 1,755  | 2,485  | 17,742  | 22,489  |

**Table 3.16-2. Employment by Industry (number of jobs) (Continued)**

|   | California |        |           |         |                |         | Arizona |       |        |        |        |        | Nevada  |         |
|---|------------|--------|-----------|---------|----------------|---------|---------|-------|--------|--------|--------|--------|---------|---------|
|   | IMPERIAL   |        | RIVERSIDE |         | SAN BERNARDINO |         | LA PAZ  |       | MOHAVE |        | YUMA   |        | CLARK   |         |
|   | 1995       | 2000   | 1995      | 2000    | 1995           | 2000    | 1995    | 2000  | 1995   | 2000   | 1995   | 2000   | 1995    | 2000    |
| Transportation and public utilities   | 2,668      | 2,884  | 16,428    | 20,752  | 35,890         | 45,353  | 222     | 312   | 2,046  | 2,444  | 2,158  | 1,829  | 28,724  | 43,578  |
| Wholesale trade   | 1,962      | 2,413  | 15,878    | 21,806  | 26,908         | 34,491  | 85      | (D)   | 1,182  | 1,468  | 3,587  | 2,160  | 18,945  | 24,797  |
| Retail trade  | 9,482      | 10,321 | 98,596    | 119,732 | 118,842        | 132,508 | 1,581   | 1,828 | 10,682 | 13,144 | 9,623  | 10,891 | 97,488  | 142,470 |
| Finance, insurance, and real estate   | (D)        | (D)    | 33,601    | 50,668  | 31,680         | 45,941  | 354     | 397   | 3,532  | 4,374  | 2,662  | (D)    | 46,433  | 85,685  |
| Services  | 9,897      | 10,474 | 156,429   | 201,988 | 170,883        | 212,295 | 1,803   | 2,219 | 12,531 | 16,421 | 11,446 | 14,401 | 285,385 | 382,368 |
| Government and government enterprises   | 13,280     | 14,842 | 79,901    | 90,718  | 104,403        | 117,580 | 1,019   | 1,165 | 6,44   | 6,785  | 13,078 | 14,013 | 62,150  | 78,902  |
| Federal, civilian   | 1245       | 1776   | 6297      | 6,724   | 12,209         | 11,211  | 157     | 167   | 455    | 545    | 2,245  | 2,578  | 7,855   | 9,429   |
| Military  | 578        | 523    | 5496      | 3,030   | 17,810         | 18,558  | 40      | 45    | 343    | 360    | 4,420  | 4,340  | 9,535   | 9,356   |
| State and local   | 11457      | 12543  | 68108     | 80,964  | 74,384         | 87,811  | 822     | 953   | 5,246  | 5,880  | 6,413  | 7,095  | 44,760  | 60,117  |
| State government  | 2611       | 2537   | 9886      | 11,704  | 10,182         | 10,971  | 67      | 64    | 401    | (D)    | 425    | (D)    | 9,707   | 10,940  |
| Local government  | 8846       | 10006  | 58222     | 69,260  | 64,202         | 76,840  | 755     | 889   | 4,845  | (D)    | 5,988  | (D)    | 35,053  | 49,177  |
| <i>Notes:</i> (D) Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.<br><i>Source:</i> Bureau of Economic Analysis, Regional Economic Information System, Table CA25, May 2003. |            |        |           |         |                |         |         |       |        |        |        |        |         |         |

1 finance, insurance, and real estate; and wholesale trade. Nonfarm personal income comprises  
2 over 95 percent of total income for all three counties. Agricultural services earnings as a  
3 percentage of nonfarm earnings, however, are greatest in Imperial County (about 8 percent) as  
4 compared to Riverside and San Bernardino counties where the contributions are 2 and 0.66  
5 percent, respectively.

### 6 *Nevada*

7 Full- and part-time employment in Clark County increased from 617,216 jobs in 1995 to 866,758  
8 jobs in 2000, an increase of 269,542 jobs (approximately 31 percent). Employment in all sectors  
9 of the regional economy increased, with the exception of the military sector, which declined by  
10 about 2 percent. The sectors that increased at the greatest rate were finance, insurance, and real  
11 estate, which increased by over 84 percent; agricultural services, fishing, and forestry, which  
12 increased by 57 percent; and transportation and public utilities, which increased by 51 percent.  
13 Farm employment in Clark County comprises less than 0.5 percent of total full-time and part-  
14 time employment within the county; the services industry employs almost half of the  
15 workforce. Nonfarm income comprises over 99.9 percent of the total personal income within  
16 Clark County. Earnings from agricultural services contribute less than 1 percent of the county's  
17 total nonfarm earnings. Of the total cash receipts from agricultural sales in Clark County, 66  
18 percent are attributable to livestock and products, and 34 percent are attributable to crops. This  
19 proportion is similar to the state of Nevada as a whole. Thirty percent of total farm production  
20 expenses in the county are spent on hired farm labor, and about 15 percent are used to purchase  
21 feed. Fifty percent of the total production expenses fall in the "all other" production expenses  
22 category.

## 23 **3.16.2 Environmental Consequences**

### 24 *Significance Criteria*

25 The analysis of socioeconomic impacts is required by NEPA, which does not require the use of  
26 significance criteria. This analysis addresses whether the proposed action and alternatives  
27 would have substantial adverse effects to local employment levels and agricultural productivity  
28 within the planning area and surrounding communities.

### 29 *Methodology*

30 Since specific site sizes and locations are not known, the socioeconomic analysis evaluates  
31 impacts for selected quantities of land that could be converted from irrigated agricultural use to  
32 conservation areas (100 acres, 500 acres, and 1,000 acres). The corresponding number of farm  
33 workers whose labor would no longer be required is estimated, along with the reduction in the  
34 value of agricultural products that would not be produced. Each of these effects is compared to  
35 (1) the existing level of employment (both total and farm) and (2) market value of all  
36 agricultural products sold.

37 The potential loss of employment and value of agricultural products is estimated through the  
38 use of two ratios developed from readily available information. The first indicates the  
39 relationship between the change in the value of agricultural products and loss of agricultural

1 land. The second addresses the change in farm employment associated with a reduction in  
2 harvested cropland.

3 The first ratio describes the relationship between the total number of harvested irrigated  
4 cropland acres for each county for the year 1997 (Table 3.16-1) and the market value of crops  
5 harvested in 1997 (Table 3.16-1). To estimate the loss of value of agricultural products  
6 attributable to the proposed action, the quantity of land that is converted out of irrigated  
7 farmland (in acres) is multiplied by this ratio. The resulting value is an estimate of the potential  
8 economic loss in terms of market value for each acre of cropland taken out of production.

9 The second ratio relates the change in farm labor to a change in the amount of cropland  
10 harvested. The percentage of the market value of crops that is composed of labor is determined  
11 by comparing the annual expenses of hired farm labor (Table 3.16-3) to the total cash receipts  
12 from all agricultural products sold (Table 3.16-3). This percentage is applied to the value of  
13 crops harvested per acre, resulting in an estimate of the cost of labor per acre of land harvested.  
14 This is an expression of the cost of labor not expended for each acre taken out of production.  
15 Using an average wage rate for farm workers of \$7.25/hour, the annual labor cost per worker  
16 (assuming full-time employment of 2,080 hours/year, is \$15,080/year. Dividing the cost of  
17 labor per harvested acre by the annual cost of one farm worker results in the number of farm  
18 workers required per acre of harvested land per year.

19 To estimate the potential reduction in the value of agricultural products, the value of the crops  
20 harvested per acre was used to determine the total value of agricultural crops per 100, 500, and  
21 1,000 acres. These figures were then compared to the total market value for all of the  
22 agricultural products sold in each county, resulting in the value of agricultural products as a  
23 percentage of the market value.

24 The results of the socioeconomic analysis for both the impact to employment and to the  
25 economy in terms of market values are displayed in Table 3.16-4.

26 The potential loss of property taxes was assessed qualitatively.

### 27 **3.16.2.1 Alternative 1: Proposed Conservation Plan**

#### 28 *Impacts*

29 **Impact SOC-1: Agricultural jobs would be lost if agricultural land were converted to**  
30 **conservation areas.** Table 3.16-4 presents values that represent the likely impacts (to  
31 employment) associated with the voluntary conversion of varying amounts of irrigated  
32 agricultural land. (Note that this table contains information for Clark County. No impacts  
33 would occur in this county under the proposed action since no agricultural lands are present in  
34 Reaches 1 and 2 of the LCR. Clark County information is included in this table because it is  
35 relevant to Alternative 4 since the Virgin/Muddy rivers off-site conservation area is in this  
36 county.) Depending upon the county in which the conversion takes place, the reduction in farm  
37 employment could range from a low of 18 agricultural laborers (per 1,000 acres of converted  
38 farmland) in Mojave County, Arizona to a high of 124 workers (per 1,000 acres of converted  
39 farmland) in San Bernardino County, California. The agricultural sector of the economy is most

**Table 3.16-3. Farm Income and Expenses (thousands of dollars)**

|   | California |         |           |           |                |         | Arizona |         |        |        |         |         | Nevada |        |
|---|------------|---------|-----------|-----------|----------------|---------|---------|---------|--------|--------|---------|---------|--------|--------|
|   | IMPERIAL   |         | RIVERSIDE |           | SAN BERNARDINO |         | LA PAZ  |         | MOHAVE |        | YUMA    |         | CLARK  |        |
|   | 1995       | 2000    | 1995      | 2000      | 1995           | 2000    | 1995    | 2000    | 1995   | 2000   | 1995    | 2000    | 1995   | 2000   |
| Total cash receipts from marketings                           | 1,030,857  | 894,648 | 1,179,532 | 1,078,471 | 613,739        | 614,706 | 65,451  | 101,263 | 12,624 | 13,969 | 840,564 | 780,126 | 18,886 | 20,310 |
| Cash receipts: livestock and products                         | 261,870    | 253,267 | 488,947   | 415,496   | 550,118        | 530,271 | 390     | 418     | 4,372  | 10,040 | 138,899 | 148,152 | 14,669 | 13,408 |
| Cash receipts: crops  | 768,987    | 641,381 | 690,585   | 662,975   | 63,621         | 84,433  | 65,061  | 100,845 | 8,252  | 3,929  | 701,665 | 631,974 | 4,217  | 6,902  |
| Other income  | 24,679     | 41,193  | 28,001    | 36,783    | 11,691         | 16,889  | 6,430   | 15,242  | 4,281  | 7,292  | 15,961  | 32,239  | 1,708  | 2,400  |
| Govt. payments  | 1,032      | 10,006  | 994       | 7,389     | 652            | 4,899   | 238     | 5,789   | 224    | 1,279  | 793     | 8,100   | (L)    | 66     |
| Imputed and misc. income received                             | 23,647     | 31,187  | 27,007    | 29,394    | 11,039         | 11,990  | 6,192   | 9,453   | 4,057  | 6,013  | 15,168  | 24,139  | 1,677  | 2,334  |
| Total production expenses                                     | 708,542    | 788,551 | 929,065   | 1,068,665 | 559,313        | 600,209 | 63,924  | 106,561 | 21,803 | 21,160 | 496,218 | 610,886 | 19,324 | 21,175 |
| Feed purchased  | 82,002     | 88,224  | 185,783   | 225,038   | 223,060        | 251,018 | 69      | 56      | 1,339  | 1,14   | 21,474  | 21,820  | 3,501  | 3,194  |
| Livestock purchased   | 104,567    | 102,110 | 49,641    | 40,516    | 46,135         | 39,178  | (L)     | (L)     | 303    | 1,412  | 55,994  | 87,265  | 798    | 497    |
| Seed purchased  | 19,805     | 28,646  | 16,670    | 25,324    | 3,607          | 5,803   | 1,465   | 2,526   | 223    | 259    | 15,482  | 22,732  | 104    | 133    |
| Fertilizer and lime (incl. Ag. chem.. 1078-fwd.) <sup>1</sup> | 72,514     | 74,492  | 50,599    | 52,936    | 4,099          | 4,008   | 8,411   | 12,382  | 1246   | 989    | 46,152  | 48,876  | 259    | 351    |

Table 3.16-3. Farm Income and Expenses (thousands of dollars) (Continued)

|  | California |         |           |           |                |         | Arizona |         |        |        |         |         | Nevada |        |
|--|------------|---------|-----------|-----------|----------------|---------|---------|---------|--------|--------|---------|---------|--------|--------|
|  | IMPERIAL   |         | RIVERSIDE |           | SAN BERNARDINO |         | LA PAZ  |         | MOHAVE |        | YUMA    |         | CLARK  |        |
|  | 1995       | 2000    | 1995      | 2000      | 1995           | 2000    | 1995    | 2000    | 1995   | 2000   | 1995    | 2000    | 1995   | 2000   |
| Petroleum products purchased               | 13,246     | 19,771  | 11,519    | 16,770    | 4,808          | 6,388   | 1,693   | 3,326   | 925    | 1,355  | 9,364   | 15,014  | 261    | 396    |
| Hired farm labor expenses                  | 173,465    | 205,621 | 220,362   | 270,766   | 74,096         | 93,962  | 30,964  | 54,578  | 3,947  | 3,526  | 147,200 | 179,919 | 4,525  | 6,460  |
| All other production expenses              | 242,943    | 269,687 | 394,491   | 437,315   | 203,508        | 199,852 | 21,317  | 33,689  | 13,820 | 12,405 | 200,552 | 235,260 | 9,876  | 10,144 |
| Total cash receipts and other income       | 1,055,536  | 935,841 | 1,207,533 | 1,115,254 | 625,430        | 631,595 | 71,881  | 116,505 | 16,905 | 21,261 | 856,525 | 812,365 | 20,594 | 22,710 |
| less: Total production expenses            | 708,542    | 788,551 | 929,065   | 1,068,665 | 559,313        | 600,209 | 63,924  | 106,561 | 21,803 | 21,160 | 496,218 | 610,886 | 19,324 | 21,175 |
| Realized net income                        | 346,994    | 147,290 | 278,468   | 46,589    | 66,117         | 31,386  | 7,957   | 9,944   | -4,898 | 101    | 360,307 | 201,479 | 1,270  | 1,535  |
| plus: Value of inventory change            | -778       | 874     | -2,551    | -1,337    | -2,250         | 1,514   | 2,616   | 2,512   | 480    | 520    | 1,911   | 1,879   | 78     | 56     |
| Total net income including corporate farms | 346,216    | 148,164 | 275,917   | 45,252    | 63,867         | 32,900  | 10,573  | 12,456  | -4,418 | 621    | 362,218 | 203,358 | 1,348  | 1,591  |
| less: Net income of corporate farms        | 44,534     | 80,632  | 25,491    | 15,544    | 569            | 843     | 517     | 5,705   | -1,358 | (L)    | 52,981  | 130,127 | 364    | 556    |
| plus: statistical adjustment               | (L)        | (L)     | (L)       | (L)       | 0              | (L)     | 0       | 0       | 0      | 0      | (L)     | (L)     | 0      | 0      |

Table 3.16-3. Farm Income and Expenses (thousands of dollars) (Continued)

|  | California |         |           |         |                |         | Arizona |        |        |       |         |         | Nevada |       |
|--|------------|---------|-----------|---------|----------------|---------|---------|--------|--------|-------|---------|---------|--------|-------|
|  | IMPERIAL   |         | RIVERSIDE |         | SAN BERNARDINO |         | LA PAZ  |        | MOHAVE |       | YUMA    |         | CLARK  |       |
|  | 1995       | 2000    | 1995      | 2000    | 1995           | 2000    | 1995    | 2000   | 1995   | 2000  | 1995    | 2000    | 1995   | 2000  |
| Total net farm proprietors' income   | 301,681    | 67,534  | 250,425   | 29,710  | 63,298         | 32,058  | 10,056  | 6,751  | -3,060 | 652   | 309,236 | 73,233  | 984    | 1,035 |
| plus: Farm wages and perquisites   | 72,855     | 91,526  | 134,801   | 165,979 | 62,414         | 74,880  | 15,025  | 7,720  | 3,041  | 2,822 | 61,105  | 78,210  | 2,549  | 5,199 |
| plus: Farm other labor income  | 7,452      | 8,617   | 13,900    | 15,750  | 6,080          | 6,413   | 893     | 358    | 200    | 144   | 4,072   | 4,262   | 97     | 179   |
| Total farm labor and proprietors' income   | 381,988    | 167,677 | 399,126   | 211,439 | 131,792        | 113,351 | 25,974  | 14,829 | 181    | 3,618 | 374,413 | 155,705 | 4,630  | 6,413 |
| <p>Notes: (1) Fertilizer and lime are expenditures on fertilizer and lime by all farms during a given calendar year. After 1977, this estimate includes expenditures on agricultural chemicals (pesticides), as well.</p> <p>(L) Less than \$50,000, but the estimates for this item are included in the totals.</p> <p>Source: Bureau of Economic Analysis, Regional Economic Information System, Table CA45, May 2003.</p> |            |         |           |         |                |         |         |        |        |       |         |         |        |       |

**Table 3.16-4. Impacts, by Size of Agricultural Conversion, to Employment and the Value of Agricultural Sales**

| COUNTY  | <i>La Paz,<br/>Arizona</i> | <i>Mohave,<br/>Arizona</i> | <i>Yuma,<br/>Arizona</i> | <i>Imperial,<br/>California</i> | <i>Riverside,<br/>California</i> | <i>San<br/>Bernardino,<br/>California</i> | <i>Clark,<br/>Nevada<sup>a</sup></i> |
|---|----------------------------|----------------------------|--------------------------|---------------------------------|----------------------------------|---|--------------------------------------|
| REDUCTION IN NUMBER OF FARM WORKERS   |                            |                            |                          |                                 |                                  |   |                                      |
| 100 acres   | 3.1                        | 1.8                        | 4.3                      | 2.5                             | 5.9                              | 12.4                                      | 11.1                                 |
| 500 acres   | 15.5                       | 9.0                        | 21.5                     | 12.5                            | 29.5                             | 62.0                                      | 55.5                                 |
| 1,000 acres   | 31.0                       | 18.0                       | 43                       | 25.0                            | 59.0                             | 124.0                                     | 111.0                                |
| REDUCTION IN NUMBER OF FARM WORKERS AS PERCENT OF TOTAL EMPLOYMENT  |                            |                            |                          |                                 |                                  |   |                                      |
| 100 acres   | 0.04%                      | 0.00%                      | 0.01%                    | 0.00%                           | 0.00%                            | 0.00%                                     | 0.00%                                |
| 500 acres   | 0.22%                      | 0.02%                      | 0.03%                    | 0.02%                           | 0.01%                            | 0.01%                                     | 0.01%                                |
| 1,000 acres   | 0.43%                      | 0.04%                      | 0.07%                    | 0.04%                           | 0.01%                            | 0.02%                                     | 0.02%                                |
| REDUCTION IN NUMBER OF FARM WORKERS AS PERCENT OF FARM EMPLOYMENT   |                            |                            |                          |                                 |                                  |   |                                      |
| 100 acres   | 0.68%                      | 0.51%                      | 0.13%                    | 0.06%                           | 0.05%                            | 0.26%                                     | 3.26%                                |
| 500 acres   | 3.42%                      | 2.53%                      | 0.64%                    | 0.28%                           | 0.26%                            | 1.29%                                     | 16.28%                               |
| 1,000 acres   | 6.84%                      | 5.06%                      | 1.28%                    | 0.55%                           | 0.53%                            | 2.58%                                     | 32.55%                               |
| REDUCTION IN VALUE OF AGRICULTURAL PRODUCTS SOLD  |                            |                            |                          |                                 |                                  |   |                                      |
| 1,000 acres   | \$938,810                  | \$1,242,370                | \$2,671,550              | \$1,963,240                     | \$4,267,840                      | \$15,624,330                              | \$5,556,660                          |
| REDUCTION IN VALUE OF AGRICULTURAL PRODUCTS SOLD AS PERCENT OF TOTAL MARKET VALUE   |                            |                            |                          |                                 |                                  |   |                                      |
| 1,000 acres   | 0.99%                      | 8.29%                      | 0.51%                    | 0.23%                           | 0.41%                            | 2.53%                                     | 29.36%                               |
| <i>Notes: a</i> Impacts to Clark County would not occur under the proposed action. Information is included in this table because it is relevant to Alternative 4. |                            |                            |                          |                                 |                                  |   |                                      |

3 important in La Paz, Mojave, Yuma, and Imperial counties, where the average value is just  
 4 under 30 workers per 1,000 acres of converted farmland. It is estimated that, on average, there  
 5 would be a reduction of just under 30 workers for every 1,000 acres of farmland that is taken out  
 6 of irrigated agricultural use. Losses of this magnitude represent extremely small shares (less  
 7 than 1 percent) of total employment in the respective counties. The average reduction in farm  
 8 employment in the representative counties would be 3.4 percent. Because this is a  
 9 programmatic document, impacts to specific communities are not identifiable, but they would  
 10 be considered during the site-selection process. Impacts to individual communities would be

1 minimized because of the need to disperse conservation areas along the LCR to meet the habitat  
2 needs of the covered species.

3 **Impact SOC-2: Agriculture-related revenue would be lost if agricultural land were converted**  
4 **to conservation areas.** Based on the conversion of 1,000 acres from agricultural use, it is  
5 estimated that the reduction in the value of agricultural products sold would range from just  
6 under \$940,000 to over \$15,624,000. Values for the most representative counties average about  
7 \$1.7 million. When such potential losses are compared to existing levels of total value of all  
8 agricultural products sold in each of the four representative counties (La Paz, Mojave, Yuma,  
9 and Imperial) the reduction averages 2.5 percent (Table 3.16-4). Because this is a programmatic  
10 document, impacts to specific communities are not identifiable, but they would be considered  
11 during the site-selection process. Impacts to individual communities would be minimized  
12 because of the need to disperse conservation areas along the LCR to meet the habitat needs of  
13 the covered species. Individual landowners would not experience adverse economic impacts  
14 since privately owned land used for LCR MSCP purposes would be acquired or leased only on  
15 a voluntary basis, and landowners would receive compensation.

16 **Impact SOC-3: Local property tax revenues could be reduced if privately owned land were**  
17 **leased or acquired by the Federal or state participants in the LCR MSCP.** The LCR MSCP  
18 participants would either lease tribal land, acquire or lease private land, or use public land for  
19 conservation area establishment and the construction of field facilities. If tribal land were  
20 leased, no changes in property tax liability would occur, because Indian tribes do not pay local  
21 property taxes. If private land were leased, taxes would continue to be paid by the property  
22 owner, but they could decrease if the land were reassessed at a lower value resulting from the  
23 change in use to a wildlife conservation area. The amount of land potentially involved would  
24 be relatively small compared to the total amount of harvested cropland available in the region,  
25 however, and tax revenues derived from agricultural lands are typically small compared to  
26 revenues derived from land supporting higher levels of development such as urban and  
27 community uses. Additionally, as noted under **Impacts SOC-1 and SOC-2**, conservation would  
28 not be concentrated in one area, thus diminishing impacts to any particular area. If publicly  
29 owned land were used, no changes in local property taxes would occur since government  
30 entities do not pay such taxes.

31 **Impact SOC-4: Local sales tax from the purchase of products related to agricultural uses**  
32 **would be reduced if privately owned agricultural land were placed in public ownership.**  
33 Sales tax revenues would decrease along with agricultural output if agricultural land were  
34 converted to conservation areas with other land cover types, but this decrease would be small  
35 when compared to total sales taxes in any of the counties and would not have an impact to the  
36 overall economy. Sales taxes would be reduced if the land was leased as well as purchased.

### 37 *Mitigation Measures*

38 No mitigation measures are required because substantial adverse impacts would not occur.

### 39 *Residual Impacts*

40 Residual impacts are those that would occur after the implementation of mitigation measures to  
41 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

1 **3.16.2.2 Alternative 2: No Action Alternative**

2 Under the no action alternative, it is likely that conservation measures similar to those included  
3 in the proposed action would be implemented since compliance with the ESA still would be  
4 required for the covered activities, although some conservation could occur in the off-site  
5 conservation areas (as described in section 3.16.2.4 below), as well as along the LCR. **Impacts**  
6 **SOC-1, SOC-2, SOC-3, and SOC-4** apply to this alternative. To the extent that the agencies  
7 undertaking the covered activities proceed with ESA compliance through section 7  
8 consultations instead of the section 10 permitting process, there may be a reduced number of  
9 covered species because unlisted species would not be included. This would also likely result  
10 in a smaller amount of conservation area being established. It is estimated that the no action  
11 alternative would develop fewer acres of conservation area than the proposed action, which  
12 would result in proportionately fewer socioeconomic impacts. The same types of impacts  
13 would occur as described for the proposed action, but the overall magnitude would be lessened  
14 since a smaller area would be affected.

15 *Mitigation Measures*

16 No mitigation measures are required because substantial adverse impacts would not occur.

17 *Residual Impacts*

18 Residual impacts are those that would occur after the implementation of mitigation measures to  
19 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

20 **3.16.2.3 Alternative 3: Listed Species Only**

21 *Impacts*

22 **Impacts SOC-1, SOC-2, SOC-3, and SOC-4** apply to this alternative, although a smaller amount  
23 of conservation area would be developed than under the proposed action. Under a worst-case  
24 scenario that assumes that all conservation areas would be established on agricultural land,  
25 impacts to socioeconomic resources would be less than under the proposed action, because less  
26 conversion of agricultural land would be required.

27 *Mitigation Measures*

28 No mitigation measures are required because substantial adverse impacts would not occur.

29 *Residual Impacts*

30 Residual impacts are those that would occur after the implementation of mitigation measures to  
31 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

1 **3.16.2.4 Alternative 4: Off-Site Conservation**2 *Impacts*

3 **Impacts SOC-1, SOC-2, SOC-3, and SOC-4** apply to this alternative. Under this alternative, a  
4 total of 7,772 acres of conservation area would be established within the off-site conservation  
5 areas. Assuming that the conservation area would be evenly divided among the three off-site  
6 areas, approximately 2,590 acres would be established in each. Impacts to socioeconomic  
7 resources would affect Clark County, Nevada, and Yuma and Mohave counties in Arizona,  
8 along with towns and cities located in and near the off-site conservation areas. Impacts would  
9 be reduced in proportion to the amount of agricultural land converted to conservation area.  
10 The impacts associated with the establishment of 360 acres of backwaters would be identical to  
11 those of the proposed action for this component of the Conservation Plan since they would be  
12 located within the planning area.

13 *Mitigation Measures*

14 No mitigation measures are required because substantial adverse impacts would not occur.

15 *Residual Impacts*

16 Residual impacts are those that would occur after the implementation of mitigation measures to  
17 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

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1    **3.17        TOPOGRAPHY, GEOLOGY, SOILS, AND MINERAL RESOURCES**

2    This section focuses on erosional impacts from construction of the habitat conservation  
3    measures. The conservation measures would be implemented within the historic floodplain of  
4    the LCR or its tributaries, where the topography is generally flat-lying. Project grading,  
5    excavating, and dredging would not substantially alter the topography of the floodplain  
6    because it would only be altered enough to establish land cover types in the conservation areas  
7    and build roadways. Therefore, topographic impacts are not discussed in the following section.  
8    Similarly, construction would be limited to two prefabricated field offices, fish-rearing facilities,  
9    and miscellaneous water conveyance structures (e.g., pipelines). These structures would be  
10   constructed in accordance with seismic standards established in the Uniform Building Code;  
11   thus, potentially severe earthquake-induced ground motion would have minimal impacts on  
12   these components of the project. Therefore, seismic impacts are not discussed in the following  
13   section. Impacts to mineral resources also are not discussed because implementation of the  
14   proposed action would not interfere with any existing or foreseeable mineral extraction  
15   operations. The primary mineral resource of commercial importance in the vicinity of the LCR  
16   and its tributaries is crushed stone aggregate. Sources of this mineral are typically bedrock  
17   areas of high relief and minimal floodplain development, which are unfavorable for  
18   conservation area establishment.

19   **3.17.1      Affected Environment**

20   **3.17.1.1    Lower Colorado River**

21   *Topography, Geology, and Soils*

22   The LCR area of Arizona, Nevada, and California is located in the lower portion of the Basin  
23   and Range geomorphic province, within the western Sonoran Desert. This area is characterized  
24   by numerous mountain ranges that rise abruptly from broad, plain-like valleys or basins. The  
25   basins are composed of silt-filled channels and alluvial fans, fan terraces, and floodplains,  
26   consisting of Quaternary sand, gravel, and conglomerate. Limited soil horizon development  
27   indicates young, unstable alluvial and floodplain surfaces of late Holocene age, subject to  
28   periodic flooding, sedimentation, and dynamic alteration.

29   The LCR generally consists of narrow stretches confined by resistant bedrock cliffs and bluffs  
30   and broad areas lined by low-lying alluvial floodplains. The bedrock areas generally lack  
31   organic soil development and would likely not be suitable for conservation area vegetation  
32   establishment activities. However, alluvial floodplain areas are generally mantled by soil  
33   profiles sufficient to support agricultural activities (USDA Soil Conservation Service 1974, 1986).  
34   Therefore, conservation area establishment activities would also likely be most appropriate in  
35   these areas.

36   The active floodplain is bounded by steep, active slopes (escarpments), active sand dunes, and  
37   washes (arroyos). The floodplain has low relief and includes the stream channel and associated  
38   features such as point bars and abandoned channels or meanders. Sand splays, point bars, and  
39   meander scrolls are typically underlain by coarse-grained alluvium, whereas broad shallow  
40   channels and backswamps are more clay-rich (Parsons et al. 1986).

1 The soils on the Colorado River floodplain are saline. The salinity is the result of accumulated  
2 salts from alluvial deposits and subsequent evaporation of soil moisture. The rainfall is not  
3 sufficient to leach these salts below the plant root zone; therefore, a continuing accumulation of  
4 salts occurs. These salts are primarily calcium, sodium, magnesium, chloride, and sulfate. An  
5 excessive amount of toxic salts in the soil can delay or prevent seed germination, decrease  
6 available water capacity, interfere with plant growth, and impede the movement of air and  
7 water through the soil. Intensive management is required to minimize salinity to levels that do  
8 not inhibit plant growth (USDA Soil Conservation Service 1986).

9 **3.17.1.2 Muddy River/Moapa Valley and Virgin River**

10 From the Overton Arm of Lake Mead, the Muddy River trends northwest through alternating  
11 areas of relatively flat-lying, alluvial-filled valleys and steeper topography of the North Muddy  
12 Mountains, which are underlain by sedimentary and volcanic strata (Nevada Bureau of Mines  
13 and Geology [NBMG] 1978). From the Overton Arm of Lake Mead, the Virgin River trends  
14 north-northeast through the Virgin Valley, located between the Mormon Mesa to the west and  
15 Black Ridge to the east. This valley gradually broadens toward the northeast. Sedimentary  
16 rocks underlie the Mormon Mesa and metamorphic rocks underlie the Black Ridge. Quaternary  
17 alluvium underlies the floor of the Virgin Valley, immediately adjacent to the river (NBMG  
18 1978). Soils overlying the low-lying, alluvial fans and floodplains in the Lake Mead area  
19 generally consist of deep, medium- to coarse-textured, nearly level to gently sloping soils. Soils  
20 in the steeper bedrock areas generally consist of shallow, gravelly and cobbly, moderately  
21 sloping to very steep soils (USDA Soil Conservation Service 1975).

22 **3.17.1.3 Bill Williams River**

23 Eastward from the Colorado River, the Bill Williams River traverses the Bill Williams  
24 Mountains, the southern portion of the Castaneda Basin, and then forms the boundary between  
25 the Rawhide Mountains to the north and the Buckskin Mountains to the south. Along the  
26 western stretch of the river, the Bill Williams Mountains are composed of metamorphic,  
27 sedimentary, and volcanic rocks. The Castaneda Basin is underlain by sandstone and  
28 conglomerate, which form high rounded hills and ridges. The eastern stretch of the Bill  
29 Williams River, through the Rawhide and Buckskin mountains, are similarly composed of  
30 metamorphic, sedimentary, and volcanic rocks (Arizona Geological Survey [AGS] 2000). Soils  
31 along the mountainous portions of the river consist primarily of shallow, gravelly and cobbly,  
32 moderately coarse to moderately fine-textured, gently sloping to very steep soils and rock  
33 outcrop on hills and mountains. The portion of the river that traverses the Castaneda Basin are  
34 composed of deep, medium-textured, limy and gravelly, moderately coarse- and coarse-  
35 textured, nearly level to moderately sloping soils on floodplains and dissected alluvial surfaces  
36 (USDA Soil Conservation Service 1975).

37 **3.17.1.4 Lower Gila River**

38 Eastward from the Colorado River, the lower Gila River traverses a gap through a narrow band  
39 of northwest-trending mountains, composed of the Gila Mountains to the south and the Laguna  
40 Mountains to the north, and then trends south of the Muggins Mountains, through the broad,  
41 flat-lying Dome and Mohawk valleys. The northwest trending Mohawk Mountains terminate  
42 just south of the river in the eastern Mohawk Valley. Sedimentary rocks are present along the

1 river through the short section between the Gila and Laguna mountains, as well as at the north  
2 end of the Mohawk Mountains. The portion of the river traversing the Dome and Mohawk  
3 valleys is underlain by river alluvium, consisting primarily of unconsolidated to weakly  
4 consolidated sand and gravel in river channels and sand, silt, and clay on floodplains (AGS  
5 2000). Soils along this section of the lower Gila River primarily consist of deep, stratified,  
6 coarse- to fine-textured nearly level to gently sloping soils on floodplains and lower alluvial  
7 fans (USDA Soil Conservation Service 1975).

### 8 3.17.2 Environmental Consequences

#### 9 *Significance Criteria*

10 The project would have a significant impact on geology, soils, and minerals if it would result in  
11 substantial soil erosion or the loss of topsoil.

#### 12 3.17.2.1 *Alternative 1: Proposed Conservation Plan*

##### 13 *Impacts*

14 **Impact GEO-1: Activities associated with conservation area establishment could result in**  
15 **erosion-induced siltation of the Colorado River.** Conservation area establishment would  
16 include such actions as clearing vegetation, grading, excavating, dredging, stockpiling soil,  
17 construction/modification of supply canals, berm construction, and swale construction. Each of  
18 these activities could result in increased soil erosion and associated sedimentation of the  
19 Colorado River, which in turn, would result in adverse water quality impacts. Less clearing  
20 and grading would be required if agricultural land were used instead of undeveloped land;  
21 erosion-induced siltation could occur, however, just to a lesser extent. Standard BMPs have  
22 been included as part of the proposed action (refer to section 3.0), and could include  
23 construction of silt fences, revegetation, minimization of grading (to the extent possible),  
24 construction of surface water velocity reducers, and installation of erosion control barriers  
25 around stockpiled soil. Given the implementation of these BMPs, impacts would be *less than*  
26 *significant* since substantial soil erosion and loss of topsoil would not occur.

##### 27 *Mitigation Measures*

28 No mitigation measures are required because no significant impacts would occur.

##### 29 *Residual Impacts*

30 Residual impacts are those that would occur after the implementation of mitigation measures to  
31 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

#### 32 3.17.2.2 *Alternative 2: No Action Alternative*

33 Under the no action alternative, it is likely that conservation measures similar to those included  
34 in the proposed action would be implemented since compliance with the ESA still would be  
35 required for the covered activities, although some conservation could occur in the off-site  
36 conservation areas (as described in section 3.17.2.4 below), as well as along the LCR. **Impact**  
37 **GEO-1** applies to Alternative 2. To the extent that the agencies undertaking the covered

1 activities proceed with ESA compliance through section 7 consultations instead of the section 10  
2 permitting process, there may be a reduced number of covered species because unlisted species  
3 would not be included. This would likely result in a smaller amount of conservation area being  
4 established and proportionately lessened impacts related to erosion-induced siltation.

5 *Mitigation Measures*

6 No mitigation measures are required because no significant impacts would occur.

7 *Residual Impacts*

8 Residual impacts are those that would occur after the implementation of mitigation measures to  
9 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

10 **3.17.2.3 Alternative 3: Listed Species Only**

11 *Impacts*

12 **Impact GEO-1** applies to Alternative 3. The same types of impacts would occur as described  
13 for the proposed action, but the overall magnitude would be lessened proportionately since less  
14 construction would occur.

15 *Mitigation Measures*

16 No mitigation measures are required because no significant impacts would occur.

17 *Residual Impacts*

18 Residual impacts are those that would occur after the implementation of mitigation measures to  
19 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

20 **3.17.2.4 Alternative 4: Off-Site Conservation**

21 *Impacts*

22 **Impact GEO-1** generally applies to this alternative. This impact would be substantially the  
23 same as described for the proposed action (*less than significant*) since the same overall amount of  
24 conservation area would be established. Impacts from the establishment of cottonwood-willow,  
25 honey mesquite, and marsh would occur along the Muddy/Virgin, Bill Williams, and lower  
26 Gila rivers. To the extent that impacts would result from backwater creation, they would occur  
27 in the planning area under this alternative, as well as under the proposed action.

28 *Mitigation Measures*

29 No mitigation measures are required because no significant impacts would occur.

1 *Residual Impacts*

- 2 Residual impacts are those that would occur after the implementation of mitigation measures to  
3 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

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1    **3.18       TRANSBOUNDARY IMPACTS**

2    The body of NEPA law directs Federal agencies to analyze the reasonably foreseeable  
3    consequences of proposed actions, regardless of where impacts might occur. Based on this, the  
4    CEQ, in a July 1, 1997 memorandum to heads of agencies, determined that NEPA requires  
5    agencies to include analysis of reasonably foreseeable transboundary effects in their analysis of  
6    proposed actions in the United States. The CEQ further states that such effects are best  
7    identified during the scoping stage, and should be analyzed to the best of the agency’s ability  
8    using reasonably available information. Such analysis should be included in the environmental  
9    documentation for the proposed action (CEQ 1997). The CEQ policy has been incorporated into  
10    DOI’s Environmental Statement Memorandum 97-2.

11   The transboundary impacts analysis addresses impacts to environmental resources in Mexico,  
12   as well as United States’ treaty obligations and other agreements with Mexico.

13   **3.18.1     Affected Environment**

14   As illustrated in Figure 3.18-1, from Morelos Diversion Dam (RM 22.1) at the NIB (the  
15   California-Mexico border), the Colorado River flows southwesterly, roughly paralleling the  
16   Limitrophe section of the Arizona-Mexico border. After passing the SIB (the Arizona-Mexico  
17   border), the river flows southwest and receives tributary flows from the Rio Hardy before  
18   draining into the Sea of Cortez (also called the Gulf of California).

19   **3.18.1.1   Environmental Resources**

20   Impacts from construction-related activities in Reach 7 could affect environmental resources in  
21   Mexico. Because construction impacts would be localized, only the areas immediately adjacent  
22   to Reach 7, the Mexicali Valley in Baja California and the San Luís Río Colorado Valley in  
23   Sonora, are discussed. The Mexicali and San Luís Río Colorado valleys are generally in  
24   agricultural use and contain a few scattered rural residences. No residences appear to be  
25   present in the area immediately adjacent to the LCR where conservation measures would be  
26   implemented. The only urban areas sufficiently close to be affected by construction activities  
27   are the city of Algodones, which is located adjacent to the Colorado River just south of the NIB,  
28   and the city of San Luís Río Colorado, which is located just south of the Arizona-Sonora Border,  
29   immediately east of the river.

30   Air quality within the Reach 7 area is generally good, but the Yuma area was determined to be  
31   in non-attainment of the NAAQS for PM10 in November 1990. The area has not violated the  
32   NAAQS since 1991. Contributors to PM10 include agricultural activities, prescribed burning,  
33   unpaved roads, general construction activities, and various other sources.

34   Flows in Reach 7 vary. At times the lower part of this reach is dry. Cohen and Henges-Jeck  
35   (2000) reported average total flows in this reach of 22,000 af in non-flood years and 2,120,000 af  
36   in flood years. These flows are the result of seepage from Morelos Diversion Dam, flow releases  
37   from Morelos Diversion Dam (flood flows and excess water not diverted by Mexico), irrigation  
38   return flows from Mexico, canal wasteways in the United States, and groundwater  
39   accumulation from both the United States and Mexico. Figure 3.18-2 shows monthly average

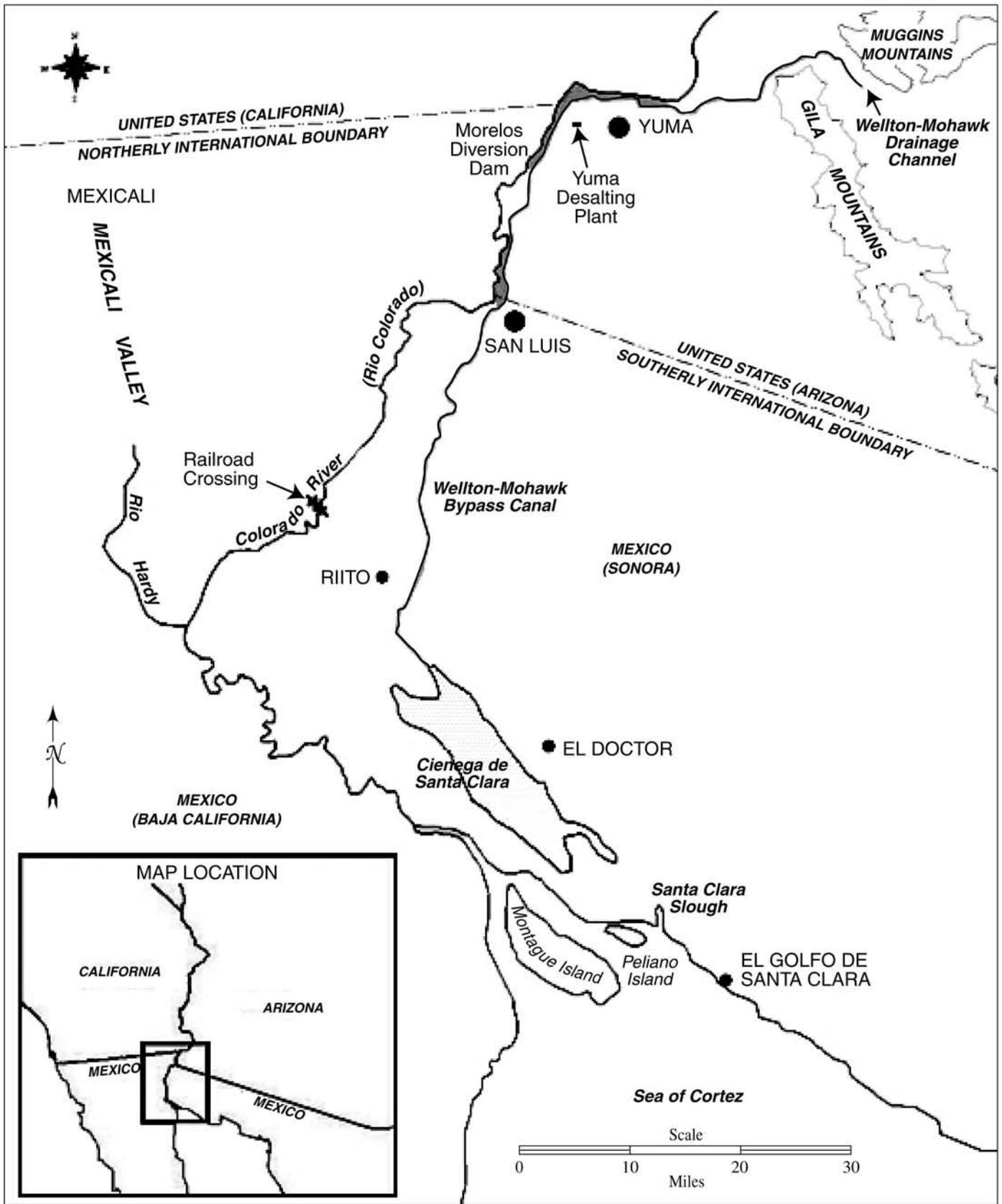
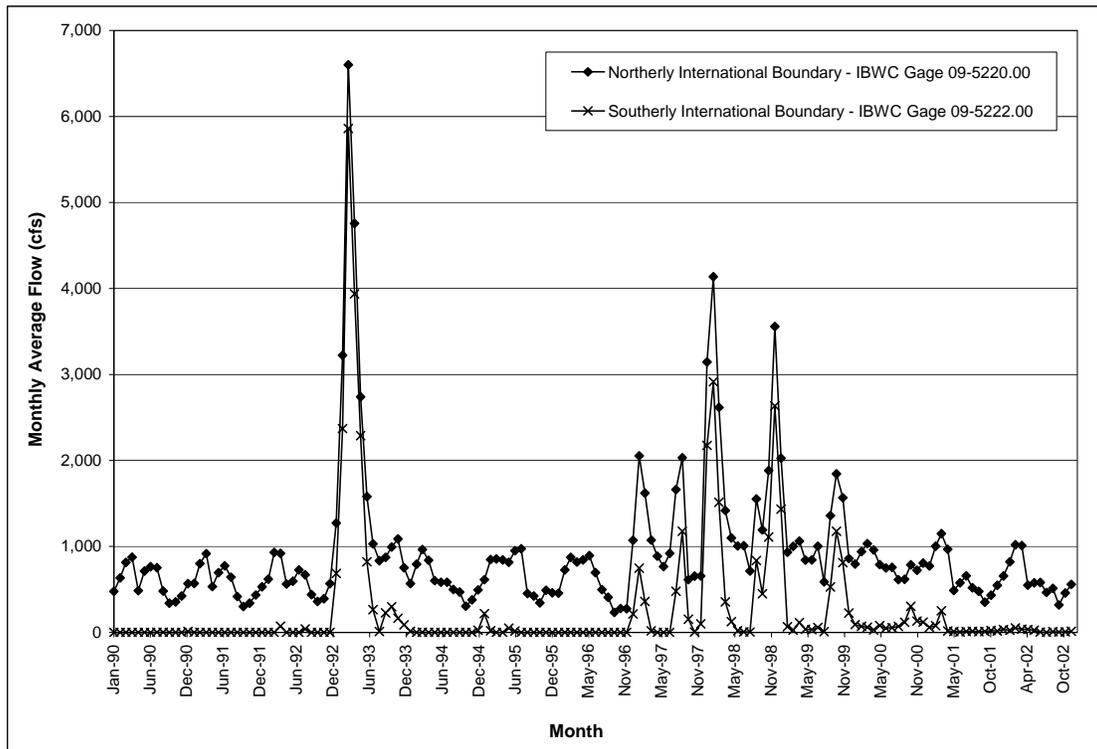


Figure 3.18-1. Colorado River Location Within Mexico

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2  
3

**Figure 3.18-2. Monthly Average Colorado River Flows at the NIB and SIB**

4 flows at the NIB and SIB from 1990 to 2002. These flows are recorded and reported by the  
 5 IBWC (2003). Water quality immediately below Morelos Diversion Dam meets the standards  
 6 required by USIBWC Minute No. 242 of the 1944 Water Treaty, and likely deteriorates to some  
 7 degree further downstream depending on flows.

8 The Comisión Nacional del Agua is the Federal agency that defines and administers water  
 9 policy in Mexico, including overseeing the operation, maintenance of delivery canals and  
 10 drainage systems and the allocation and management of all waters that belong to the nation  
 11 (Clark et. al. 2001). The Mexicali and San Luís Río Colorado valleys are within the Colorado  
 12 River Irrigation District Number 14. The irrigation district obtains its supply from the Colorado  
 13 River and groundwater. Although irrigation accounts for the majority of the water used in the  
 14 district, the district does provide water to municipal and industrial users in Mexicali, Tecate,  
 15 Tijuana, Ensenada, and San Luís Río Colorado (Clark et. al. 2001). The Colorado River  
 16 Irrigation District Number 14 contains 23 irrigation modules. The irrigation modules have the  
 17 local governing responsibility for water management along with the operation and maintenance  
 18 of distribution canals (Clark et al. 2001).

### 19 3.18.1.2 United States' 1944 Water Treaty Obligation

20 Flows in the reach of the Colorado River below Imperial Dam are primarily water to be  
 21 delivered to Mexico in accordance with the 1944 Water Treaty. Under Article 10(a) of the treaty,  
 22 Mexico is allotted a guaranteed annual amount of 1.5 maf of Colorado River water. Under

1 Article 10(b) of the treaty, Mexico may schedule up to an additional 0.2 maf when “there exists a  
2 surplus of waters of the Colorado River in excess of the amount necessary to satisfy uses in the  
3 United States.” Under current practice, this 0.2 maf is available to Mexico when flood control  
4 releases are made, and is scheduled for delivery throughout the year in accordance with Article  
5 15 of the 1944 Water Treaty. Additionally, under Article 10(b) of the treaty, Mexico was allotted  
6 “any other quantities arriving at the Mexican points of diversion.” These flows are generally  
7 referred to as “excess flows” and are over and above the 1.5 maf (or 1.7 maf) delivery to Mexico  
8 under the 1944 Water Treaty. Excess flows are primarily a result of (1) operational activities  
9 upstream (e.g., canceled water orders in the United States, maintenance activities, etc.), (2) a  
10 Gila River flood event, or (3) flood control releases along the mainstream of the Colorado River.  
11 Article 10(b) also stipulates that in the event of an extraordinary drought or serious accident to  
12 the irrigation system of the United States, water allotted to Mexico can be reduced in the same  
13 proportion as consumptive uses in the United States are reduced. The United States has met the  
14 1944 Water Treaty obligations every year.

15 Per USBWC Minute 242 of the 1944 Water Treaty, the United States must deliver water to  
16 Mexico with an average annual salinity concentration no greater than 115 ppm +/- 30 ppm over  
17 the average annual salinity concentration of the Colorado River at Imperial Dam. Thus, an  
18 increase in salinity at Imperial Dam directly translates to an allowable increase in salinity of  
19 water delivered to Mexico and an increase in salinity of water flowing past Morelos Diversion  
20 Dam. The United States has met the water quality obligations every year.

21 The waters of the Colorado River, once delivered to Mexico, are under the jurisdiction of  
22 Mexico. The 1944 Water Treaty contains no provisions requiring Mexico to provide water for  
23 environmental protection, nor any requirements relating to Mexico’s use of that water<sup>1</sup>. As  
24 flows arrive at Morelos Diversion Dam, Mexico has the discretion to divert more water than its  
25 allocation or allow all the additional flows to pass downstream of Morelos Diversion Dam. In  
26 the past, Mexico has generally chosen to increase its diversion for use in agriculture for  
27 increased crop production and soil salinity improvement, or for diluting flows delivered at the  
28 SIB, municipal industrial uses, or to recharge groundwater aquifers in the Mexicali Valley  
29 (USBR 2001a).

30 Various other agreements including, although not limited to, Minutes of the 1944 Water Treaty  
31 and other treaties with Mexico (such as the 1970 Boundary Treaty) define the United States  
32 responsibility for Colorado River water deliveries, water quality, and river and levee  
33 maintenance.

#### 34 **3.18.2 Environmental Consequences**

35 The analysis of transboundary impacts is required by NEPA, which does not require the use of  
36 significance criteria. This analysis addresses whether construction and operation of the  
37 proposed action would have substantial adverse effects on environmental resources in Mexico.

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1 In December 2000, the governments of the United States and Mexico, through Minute 306 of the 1944 Water Treaty agreed to (1) develop joint studies that include possible approaches to ensure use of water for ecological purposes on the Colorado River below the NIB; and (2) through a binational technical task force, to examine the effect of flows on the existing riparian and estuarine ecology of the Colorado River from the NIB to the delta with a focus on defining the habitat needs of fish, and marine and wildlife species of concern to each country.

1 In addition, it addresses whether the proposed action would have substantial adverse effects to  
2 the United States' treaty obligations or other agreements with Mexico where important  
3 resources in Mexico would be affected.

#### 4 **3.18.2.1 Alternative 1: Proposed Conservation Plan**

##### 5 *Impacts*

###### 6 ENVIRONMENTAL IMPACTS

7 No construction would occur in Mexico; therefore, direct impacts such as those associated with  
8 the conversion of agricultural land to conservation areas, the loss or alteration of existing  
9 habitat, and impacts to cultural resources would not occur. Substantial adverse noise impacts  
10 would not occur since the area adjacent to the LCR is used for agriculture and noise sensitive  
11 receptors are not present. Runoff from created/restored habitat would not alter the slopes of  
12 adjoining fields because the Colorado River is the low point between Arizona and Mexico, thus  
13 preventing water from flowing from conservation areas to Mexican fields. Other impacts, such  
14 as erosion-induced siltation, accidental spills, and increased risk of wildfires and vectors would  
15 be minor and localized and would not adversely affect Mexico. The water supply for the  
16 proposed action would be obtained through a contract with an existing water purveyor, or  
17 purchase or transfer from existing Colorado River water users in the United States and would  
18 not affect Mexico's Colorado River supply. Air emissions from construction activities could  
19 affect Mexico, as described below.

20 **Impact TRANS-1: PM<sub>10</sub> and combustive emissions from the construction and maintenance of**  
21 **created conservation areas in Reach 7 could disperse to Mexico.** As described in section 3.3,  
22 construction activities and periodic prescribed burns would produce temporary fugitive dust  
23 emissions and intermittent combustive emissions. These air emissions would last only for the  
24 duration of the construction or maintenance activity and would dissipate as the distance from  
25 the construction site increased. The portion of Mexico that is near Reach 7 is in agricultural use  
26 and is sparsely populated. Thus, sensitive receptors would not be adversely affected by these  
27 air emissions. Over the long-term, to the extent that agricultural land is converted to  
28 conservation areas, emissions would be reduced since fields would no longer be plowed. The  
29 proposed action would not result in substantial adverse impacts to Mexico.

##### 30 *Mitigation Measures*

31 No mitigation measures are required because substantial adverse impacts would not occur. The  
32 implementation of **Mitigation Measures AQ-1 and AQ-2** would, however, reduce air quality  
33 impacts in Mexico.

##### 34 *Residual Impacts*

35 Residual impacts are those that would occur after the implementation of mitigation measures to  
36 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

1 TREATY OBLIGATIONS

2 The proposed action would not affect the amount of water delivered to Mexico, nor would it  
3 conflict with the 1944 Water Treaty and related agreements. As described in section 3.14, water  
4 supply for the proposed action would be obtained through legal means consistent with the Law  
5 of the River. Because the supply would be obtained through a contract with an existing water  
6 purveyor, or purchase or transfer from existing Colorado River water users in the United States,  
7 and would not be an expansion of water use in the Lower Division States, excess flows and  
8 flood flows to Mexico would not be affected by the proposed action. Reclamation would  
9 continue to make deliveries to Mexico in compliance with the 1944 Water Treaty, USIBWC  
10 Minute 242 of the 1944 Water Treaty, and all other applicable agreements. The waters of the  
11 Colorado River, once delivered to Mexico, would continue to be under the jurisdiction of  
12 Mexico, and any conservation measure implemented in Reach 7 would not obligate Mexico to  
13 dedicate or deliver water for land cover type enhancement purposes, unless mutually agreed  
14 upon by both countries. Additionally, Reclamation would continue to meet the requirements of  
15 the various other agreements, treaties, and Minutes of the 1944 Water Treaty. Because the  
16 proposed action would not affect Colorado River water deliveries to Mexico, including 1944  
17 Water Treaty flows, excess flow and flood flows, and would not otherwise change the terms of  
18 the 1944 Water Treaty, USIBWC Minute 242 of the 1944 Water Treaty, or other applicable  
19 agreements, it would not have adverse effects to the United States' treaty obligations or other  
20 agreements with Mexico where important resources in Mexico would be affected.

21 **3.18.2.2 Alternative 2: No Action Alternative**

22 Under Alternative 2, it is likely that conservation measures similar to those included in the  
23 proposed action would be implemented because compliance with the ESA still would be  
24 required for the covered actions, although some conservation could occur in the off-site  
25 conservation areas (as described in section 3.18.2.4 below), as well as along the LCR. To the  
26 extent that conservation was implemented in the off-site conservation areas, transboundary  
27 impacts would not occur because these sites are not sufficiently close to Mexico. To the extent  
28 that the agencies undertaking the covered actions proceed with ESA compliance through  
29 section 7 consultations instead of the section 10 permitting process, there may be a reduced  
30 number of covered species because unlisted species will not be included. This would also likely  
31 result in a smaller amount of conservation area being established, resulting in a lower  
32 likelihood of conservation measures being implemented in Reach 7. The potential for  
33 transboundary impacts would be even less than described for the proposed action.

34 *Mitigation Measures*

35 No mitigation measures are required because substantial adverse impacts would not occur. The  
36 implementation of mitigation measures such as **Mitigation Measures AQ-1 and AQ-2** would,  
37 however, reduce air quality impacts in Mexico.

38 *Residual Impacts*

39 Residual impacts are those that would occur after the implementation of mitigation measures to  
40 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

1 **3.18.2.3 Alternative 3: Listed Species Only**

2 *Impacts*

3 **Impact TRANS-1** applies to Alternative 3. It is estimated that Alternative 3 would develop  
4 fewer acres of conservation area than the proposed action, which generally would result in  
5 proportionately fewer air quality impacts and less potential for conservation to occur in Reach  
6 7.

7 *Mitigation Measures*

8 No mitigation measures are required because substantial adverse impacts would not occur. The  
9 implementation of **Mitigation Measures AQ-1 and AQ-2** would, however, reduce air quality  
10 impacts in Mexico.

11 *Residual Impacts*

12 Residual impacts are those that would occur after the implementation of mitigation measures to  
13 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

14 **3.18.2.4 Alternative 4: Off-Site Conservation**

15 *Impacts*

16 No transboundary impacts would occur under Alternative 4. Construction activities would not  
17 occur in Reach 7 or in proximity to the Mexican border. As described for the proposed action,  
18 the water supply for the Conservation Plan would be obtained through a contract with an  
19 existing water purveyor, or purchase or transfer from existing Colorado River water users in the  
20 United States and would not affect Mexico's Colorado River water supply.

21 *Mitigation Measures*

22 No mitigation measures are required because no significant impacts would occur.

23 *Residual Impacts*

24 Residual impacts are those that would occur after the implementation of mitigation measures to  
25 reduce an impact. No mitigation measures are required; thus, no residual impacts would occur.

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1    **3.19       TRANSPORTATION**

2    The proposed action and alternatives would have only minor impacts on transportation. As  
3    described in section 3.0, only small numbers of workers would be needed to construct land  
4    cover types and related improvements (fewer than 30 at any given location). Additionally,  
5    minimal amounts of equipment would be required. Heavy equipment typically is brought to a  
6    site and remains until its task is completed. Construction would be spread out over a 20-30 year  
7    period and would occur at different locations within a large planning area. Conservation area  
8    establishment would occur in agricultural or undeveloped areas that have limited amounts of  
9    traffic. Adding the minor amounts of traffic generated by the proposed action would not affect  
10   roadway capacity, the volume-to-capacity ratio on roads, congestion at intersections, or cause  
11   inadequate emergency access.

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## 4.0 CUMULATIVE IMPACTS

Both NEPA and CEQA require that cumulative impacts of the proposed action in combination with other projects be addressed in an EIS/EIR.

### 4.1 CUMULATIVE IMPACT METHODOLOGY

This section addresses the cumulative impacts of the proposed action in combination with other projects. (The “proposed action” when used in this analysis refers to implementation of the Conservation Plan and issuance of a section 10 [a][1][B] permit by the Service.) A list approach was used to identify projects that are closely related to the proposed action (i.e., either located within or in the vicinity of the planning area and having the potential to impact common resources) that could result in cumulatively considerable impacts. Where appropriate, the analysis includes potential impacts on common resources that extend outside the planning area (e.g., transboundary impacts). Federal, state, and local agencies and tribal governments with planning and regulatory authority within or in the vicinity of the planning area were contacted to identify projects that may result in a cumulative impact. These projects then were examined for their potential to result in a cumulative impact when combined with the proposed action. In addition, future Federal and non-Federal covered activities were reviewed and included based on the criteria discussed above.

Many of the impacts of the proposed action would result from construction activities, as would many of the impacts of the other projects considered in the cumulative impact analysis. Most of the adverse construction-related impacts of the proposed action would be temporary and localized (such as impacts related to air quality, noise, erosion, and spills of hazardous materials, as well as some impacts on aesthetics, water quality, and biological resources), and individual construction sites would be dispersed over a wide geographic area. Moreover, construction would be implemented over a long period of time, as shown on Tables 2.1-8a through 2.1-8d, with relatively minor amounts of construction occurring in any given year. Thus, construction associated with the proposed action would not likely overlap in time or place with the other projects considered in the cumulative impact analysis, although this could occur.

In general, if the proposed action would result in a significant impact on a resource that also could be adversely affected by another project, the impact is considered to be a significant cumulative impact, although the potential for the combination of less than significant impacts to result in significant cumulative impacts also is considered. The proposed action would have long-term beneficial impacts on biological resources and aesthetics and thus would not contribute to a long-term cumulative adverse impact on these resources.

Section 4.2 describes the projects included in the cumulative impact analysis, the status of their environmental documentation, anticipated environmental impacts of those projects, and the potential cumulative impacts of those projects in combination with those of the proposed Conservation Plan. Section 4.3 summarizes cumulative impacts by each resource and identifies mitigation measures where appropriate. The implementation of these mitigation measures may be the responsibility of agencies other than the lead agencies for this EIS/EIR, who would adopt them as part of their own environmental review and approval processes.

1 **4.2 ANALYSIS OF CUMULATIVE IMPACTS**

2 This section provides an analysis of the potential cumulative impacts that would affect the  
3 present environment within, and in the vicinity of, the planning area. An overview of the  
4 present environment in the planning area, as well as the historical environmental changes, is  
5 provided in section 3.0. These changes have occurred primarily as a result of actions affecting  
6 the flow regime of the LCR (e.g., the construction of large, mainstem dams such as Hoover Dam  
7 and Glen Canyon Dam). The river is no longer free flowing and does not constitute a  
8 continuous ecosystem because of the many impoundments along its length and the hydrologic  
9 regime does not support extreme fluctuations. Moreover, the vegetation within the planning  
10 area has also changed over time with a general decline of native communities.

11 **4.2.1 Future Covered Activities**

12 Future Federal and non-Federal covered activities for which ESA compliance is being sought by  
13 the LCR MSCP participants (refer to section 1.2.2) were reviewed to identify those that could  
14 result in cumulative impacts; these generally were projects that would result in new  
15 construction and associated construction-related impacts, as would the proposed action, or have  
16 the potential to affect those resources that are central to the proposed action (e.g., agricultural  
17 resources and biological resources), although the change in point of diversion of up to 1.574  
18 mafy is considered, as well.

19 *Changes in Points of Diversion of up to 1.574 mafy of Colorado River Water*

20 *Project Description*

21 Covered activities include the potential changes in points of diversion of up to 1.574 mafy of  
22 Colorado River water by water contractors in Arizona, California, and Nevada. Diversion  
23 changes are expected to occur in response to shifts in water demand during the 50-year term of  
24 the Conservation Plan. Neither the source nor the recipient of water that will be diverted as a  
25 result of future projects can be determined until these projects are developed. However, the  
26 LCR MSCP participants expect that there will be shifts in demand among water users within  
27 each of the Lower Basin States and between the states. Although no additional water would be  
28 diverted in a normal water year as a result of these future projects, the points of diversion  
29 would change based on demand.

30 *Project's Environmental Analysis Status and Anticipated Impacts*

31 Specific transfers for the entire 1.574 mafy have not been identified; therefore, the impact  
32 analysis for the changes in points of diversion is programmatic. It is anticipated that a shift in  
33 water diversion from the southern reaches of the Colorado River upstream to Lake Mead and to  
34 Lake Havasu will occur. Potential impacts could include changes in water surface elevation  
35 along the LCR where points of diversion are changed, which could result in concomitant  
36 impacts on biological resources. These actions also could result in increased water conservation  
37 on agricultural lands, including lands within the planning area. This could lead to increased  
38 short-term and long-term fallowing and the construction of on-farm conservation measures,  
39 such as canal lining and irrigation system improvements. These changes could result in  
40 impacts on agricultural resources in the event that long-term fallowing were required as well as

1 associated changes to socioeconomic resources (e.g., revenue, sales tax, and employment) and  
 2 environmental justice (from the potential loss of agricultural jobs). Following also could result  
 3 in increased fugitive dust emissions. Construction of on-farm conservation measures could  
 4 result in short-term impacts on air quality, geology and soils/water quality (from erosion),  
 5 cultural resources, hazards, biological resources, and noise.

#### 6 *Cumulative Impacts with the Proposed Action*

7 The proposed action would not change the surface water elevation of the LCR; therefore, no  
 8 cumulative impacts on hydrology associated with water elevation would occur. Impacts on  
 9 biological resources resulting from the changes in surface water elevation would be mitigated  
 10 by the implementation of the proposed action, and a cumulative impact would not occur.

11 Both the proposed action and the implementation of water conservation measures, if needed,  
 12 would result in construction-related air quality impacts from increased combustive and PM<sub>10</sub>  
 13 emissions. Combustive emissions from both projects would be mobile and intermittent and  
 14 would be *cumulatively less than significant*. The proposed action would result in a significant,  
 15 potentially unavoidable, impact from increased PM<sub>10</sub> emissions, and if construction associated  
 16 with the proposed action and water conservation projects occurred at the same general time and  
 17 in the same general location, fugitive dust emissions would be cumulatively *significant*.  
 18 Following associated with the changes in points of diversion also could result in increased  
 19 fugitive dust emissions, but this could be offset by the proposed action, which would convert  
 20 some agricultural land to other land cover types, and long-term impacts would not be  
 21 cumulatively significant.

22 Both projects would have the potential for construction-related impacts on biological resources,  
 23 but these would be *cumulatively less than significant*<sup>1</sup> because the impacts of both projects would  
 24 be temporary and localized and would not cause substantial adverse changes to vegetation or  
 25 wildlife communities along the LCR. Moreover, the water conservation projects likely would  
 26 be constructed on farmland, thus minimizing the potential for impacts on biological resources.

27 Both projects would result in increased ambient noise levels during construction, but impacts  
 28 would be considered *cumulatively less than significant* because noise impacts are highly localized,  
 29 and impacts would be temporary, lasting only for the duration of the construction<sup>2</sup>. Both  
 30 projects also would have only minor, temporary, and localized construction-related impacts on  
 31 hazards, geology and soils, and water quality, and the impact on these resources would be  
 32 *cumulatively less than significant*. Cumulative impacts on cultural resources could be *cumulatively*  
 33 *significant* because construction associated with both actions could affect significant cultural  
 34 resources.

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1 The proposed action could result in a significant impact on non-covered sensitive species, particularly birds, as a result of backwater creation. The anticipated schedule includes construction of only 15 acres of backwaters per year and these would be dispersed throughout Reaches 3 through 5. This impact would not in itself trigger a cumulatively significant impact unless other projects would specifically affect the same species.

2 The proposed action could result in significant long-term noise impacts from pump operations. Pumps would be located in agricultural or undeveloped areas, and it is unlikely that they would be located in the vicinity of noise-sensitive receptors; thus, the operation of individual pumps, which would have a highly localized impact, would not contribute to a long-term cumulative noise impact in combination with the other projects considered in this analysis.

1 Since water conservation measures likely would be implemented on agricultural lands,  
2 construction would not result in aesthetic impacts since these are typical of agricultural areas.  
3 Although the proposed action could result in temporary less than significant impacts,  
4 cumulative impacts would not occur.

#### 5 *Jetty Construction*

##### 6 *Project Description*

7 In RMs A238.5-A240.0, between nine and 21 new jetties may be constructed and are currently in  
8 the pre-design phase. Along RMs 50-260, a total of one to 20 new jetties may be constructed.  
9 These may be constructed on the LCR as needed.

##### 10 *Project's Environmental Analysis Status and Anticipated Impacts*

11 The jetty projects have not yet undergone environmental review. Construction could result in  
12 temporary impacts on aesthetics, biological resources, air quality, hazards (due to the use of  
13 hazardous materials during construction), water quality (due to the use of hazardous materials  
14 during construction and turbidity resulting from construction in and near water), and geology  
15 and soils. Long-term aesthetic impacts also may occur.

##### 16 *Cumulative Impacts with the Proposed Action*

17 Both the proposed action and the construction of water conservation measures would result in  
18 construction-related air quality impacts from increased combustive and PM<sub>10</sub> emissions.  
19 Combustive emissions from both projects would be mobile and intermittent and would be  
20 *cumulatively less than significant*. The proposed action would result in a significant, potentially  
21 unavoidable, impact from increased PM<sub>10</sub> emissions, and if construction associated with the  
22 proposed action and jetty projects occurred at the same general time and in the same general  
23 location, and if the latter required earth-moving activities, fugitive dust emissions would be  
24 *cumulatively significant*.

25 Both projects would have the potential for construction-related impacts on terrestrial and  
26 aquatic biological resources, but these would be *cumulatively less than significant* because the  
27 impacts of both projects would be temporary and localized and would not cause substantial  
28 adverse changes to vegetation or wildlife communities along the LCR.

29 Both projects would result in construction-related, short-term disturbances to aesthetic  
30 resources, but these would be *cumulatively less than significant* since they would be temporary  
31 and localized. Depending on their placement, the jetties could have long-term adverse aesthetic  
32 impacts, but the proposed action would have long-term beneficial impacts on aesthetics, and  
33 would not contribute to a long-term cumulative impact in combination with the jetty  
34 construction projects. The proposed action and the jetty projects would have only minor, short-  
35 term, and localized construction-related impacts on hazards, geology and soils, and water  
36 quality, and the cumulative impact would be *less than significant*.

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## 1 *Riparian Plant Community Rehabilitation and Restoration Projects*

### 2 *Project Description*

3 Riparian plant community rehabilitation and restoration projects could be implemented on both  
4 Lake Mead and Lake Mohave. On Lake Mead, such projects would likely be restricted to the  
5 tributary confluence areas of the Virgin River, Muddy River, and Las Vegas Wash. Activities  
6 associated with these projects may include the removal of non-native saltcedar by mechanical  
7 means (e.g., chain saws or bulldozers), prescribed fire, and the use of EPA-registered herbicides.  
8 Native riparian species, including willow and cottonwood, may be planted using seed, cuttings,  
9 poles, or transplants of nursery stock. The total project area would be approximately 500 acres,  
10 and it is not anticipated that more than 20 acres would be under construction in any one year.

11 On Lake Mohave, a secondary objective of saltcedar removal and willow plantings would be  
12 the enhancement of aesthetics for recreation in selected areas through the creation of open  
13 shoreline or shade. Saltcedar removal for recreational purposes would be limited to specific  
14 areas; no more than 10 coves on Lake Mohave (potentially including Nevada Telephone Cove,  
15 North Telephone Cove, South Telephone Cove, Cabinsite Cove, and the boat-beaching area  
16 adjacent to the Arizona Hot Springs drainage) would be affected, and it is not expected that any  
17 areas where saltcedar would be cleared would exceed 2 acres. The total project area would be  
18 approximately 100 acres, and it is not anticipated that more than 5 acres would be under  
19 construction in any one year.

### 20 *Project's Environmental Analysis Status and Anticipated Impacts*

21 The riparian plant community rehabilitation and restoration projects have not yet undergone  
22 environmental review. Anticipated impacts include long-term beneficial impacts on recreation,  
23 aesthetics, and biological resources. Vegetation removal and replanting activities would likely  
24 result in similar impacts as the proposed action, including impacts on biological resources, fire  
25 hazards, air quality, hydrology, geology and soils, cultural resources, and noise.

### 26 *Cumulative Impacts with the Proposed Action*

27 Both the proposed action and the plant community rehabilitation and restoration projects  
28 would result in construction-related air quality impacts from increased combustive and PM<sub>10</sub>  
29 emissions. Combustive emissions from both projects would be mobile and intermittent and  
30 would be *cumulatively less than significant*. The proposed action would result in a significant,  
31 potentially unavoidable, impact from increased PM<sub>10</sub> emissions, and if construction and  
32 prescribed fires associated with the proposed action and rehabilitation and restoration projects  
33 occurred at the same general time and in the same general location, fugitive dust emissions  
34 would be *cumulatively significant*.

35 Both projects would have the potential for construction-related impacts on terrestrial and  
36 aquatic biological resources, but most of these would be cumulatively *less than significant*  
37 because the impacts of both projects would be temporary and localized and would not cause  
38 substantial adverse changes to vegetation or wildlife communities along the LCR. The  
39 proposed action would have less than significant or significant impacts on native common and  
40 sensitive fish species inhabiting the Virgin and Muddy rivers. Impacts on these fish could be

1 *cumulatively significant but mitigable to less than significant* if the riparian plant community  
2 rehabilitation and restoration projects were implemented along these rivers. Long-term impacts  
3 on biological resources generally would be *cumulatively beneficial* because both projects would  
4 replace non-native vegetation with native vegetation.

5 *Significant* cumulative impacts on cultural resources could occur if both projects affected  
6 significant cultural resources. All other impacts on the resources identified above would be  
7 *cumulatively less than significant* because only 25 total acres in any given year would be affected  
8 by the riparian plant community rehabilitation and restoration projects, and impacts would be  
9 localized. Long-term *cumulatively beneficial* impacts on aesthetics would occur since the  
10 proposed action would establish 8,132 acres of habitat and the Lake Mead/Lake Mohave  
11 restoration projects would restore an additional 600 total acres of vegetation.

#### 12 ***Farmland Development/Construction of Irrigation Systems***

##### 13 *Project Description*

14 A number of tribal irrigation projects are planned, including the Colorado River Indian  
15 Irrigation Project (25,000 acres of potential additional irrigated land), the Fort Mojave Irrigation  
16 Project (3,745 acres of potential additional irrigated land), the Chemehuevi Irrigation Project  
17 (1,855 acres of potential additional irrigated land), a Fort Yuma Agency irrigation project that  
18 would include 600 acres of potential additional irrigated land, and a total of 500 acres of  
19 irrigated agriculture development on three Cocopah Indian Reservation sites. The projects  
20 would include the creation of lined and unlined canals and maintained roadways.

##### 21 *Project's Environmental Analysis Status and Anticipated Impacts*

22 These projects have not yet undergone environmental review. Anticipated impacts of the  
23 planned irrigation projects include beneficial impacts on agriculture and construction-related  
24 impacts associated with the creation of canals and roadways, such as impacts on aesthetics, air  
25 quality, biological resources, cultural resources, hazards (due to the use of hazardous materials  
26 during construction), water quality (due to the use of hazardous materials during construction),  
27 and geology and soils.

##### 28 *Cumulative Impacts with the Proposed Action*

29 Although the proposed action could result in the conversion of agricultural land to other land  
30 cover types, the tribal irrigation projects would have beneficial impacts on agriculture by  
31 increasing the amount of land in agricultural production; therefore, no adverse cumulative  
32 impacts would occur.

33 Both the proposed action and the tribal irrigation projects would result in construction-related  
34 air quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions  
35 from both projects would be mobile and intermittent and would be *cumulatively less than*  
36 *significant*. The proposed action would result in a significant, potentially unavoidable, impact  
37 from increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and  
38 tribal irrigation projects occurred at the same general time and in the same general location,  
39 fugitive dust emissions would be *cumulatively significant*.

1 The tribal irrigation projects could potentially convert other land cover types to agricultural  
2 land, which could result in an adverse impact on biological resources, but the proposed action  
3 would create 8,132 acres of land cover types that provide habitat for covered species. Thus, it  
4 would not contribute to a long-term cumulative impact in combination with the tribal irrigation  
5 projects.

6 Both the proposed action and the tribal irrigation projects would cause adverse impacts on  
7 aesthetics during construction; however, these impacts would be *cumulatively less than significant*  
8 because they would be temporary and localized. The tribal irrigation projects could result in  
9 changes to the visual character along the LCR if they converted undeveloped land to  
10 agricultural uses, but the proposed action would have long-term beneficial aesthetic impacts  
11 and would not contribute to a cumulative impact in combination with the tribal irrigation  
12 projects.

13 Construction-related activities would result in *cumulatively less than significant* impacts on the  
14 remaining resource areas mentioned above because they would be short-term, minor, and  
15 localized.

#### 16 ***Yuma Area Water Resources Management Group Drainage Project***

##### 17 *Project Description*

18 The Yuma Area Water Resource Management Group Drainage Project is a plan by Reclamation  
19 to achieve better control of groundwater levels in the Yuma Area. This is being accomplished  
20 by increasing total drainage pumping on the Yuma Mesa and in the Yuma Valley to reduce  
21 groundwater levels in the Yuma Valley to acceptable levels of 6–8 feet below the ground  
22 surface. Under the plan, the original drainage wells have been upgraded and are being  
23 operated for a larger portion of the year, and six new drainage wells and additional  
24 groundwater monitoring wells have been installed. Once the desired groundwater levels are  
25 achieved, the drainage pumping on the Yuma Mesa and Yuma Valley will be reduced to  
26 maintain those levels in the future. It is expected that the highest drainage pumping will occur  
27 during the first 5 years after installation of the new facilities, and then the pumping will be  
28 reduced to that required to maintain the desired groundwater levels. The plan calls for  
29 increasing drainage pumping by about 40,000–50,000 af for 5 years, beginning in 2003. The  
30 drainage pumping will then be reduced to maintain those groundwater levels in the future. Of  
31 the total drainage pumping, some drainage will be discharged to the Colorado River above the  
32 NIB and some will be discharged into the Yuma Valley drainage system for delivery to Mexico  
33 at the SIB.

##### 34 *Project's Environmental Analysis Status and Anticipated Impacts*

35 A Categorical Exclusion was prepared for *Repairs and Modifications to the Yuma Mesa Conduit*  
36 *(YMC) Drainage System* (YAO-CE No. 2001-02) on March 16, 2001 (USBR 2001b). On September  
37 7, 2003, the Categorical Exclusion was supplemented by an analysis entitled *Effects on Riparian*  
38 *and Marsh Communities along the Colorado River Due to Water Table Reduction in the Yuma Valley*  
39 (USBR 2003b). The Categorical Exclusion concluded that the project would be implemented in  
40 highly disturbed areas and would not affect sensitive species or cultural resources or  
41 significantly affect other environmental resources. It also concluded that the project would help

1 control groundwater levels in the Yuma Valley and improve the salinity of flows into Mexico at  
2 the SIB. The Supplemental Analysis concluded that no effects to habitat or endangered or  
3 special listed species would occur as a result of the project due to careful monitoring and  
4 modification of the drainage pumping program to avoid impacts to habitat.

5 *Cumulative Impacts with the Proposed Action*

6 The drainage project would result in changes to groundwater levels in the Yuma Valley; the  
7 proposed action, however, would not affect this resource, and no cumulative impacts would  
8 occur.

9 **4.2.2 Urban Development Projects**

10 ***Emerald River and Associated Townhome Development***

11 *Project Description*

12 The Emerald River project is an approximately 275-acre development project along the  
13 Colorado River in Laughlin, Nevada. The project would include a small hotel, approximately  
14 600 residential units, and a marina in the Laughlin Bay lagoon area. A 43-unit townhome  
15 development is associated with this project and would occur on approximately 7 acres.

16 *Project's Environmental Analysis Status and Anticipated Impacts*

17 Environmental documentation has not been completed for this project. Part of the Major Project  
18 process for development will include submittal of a Public Facilities Needs Assessment to  
19 address issues such as transportation, flood control, fire and police protection, parks, schools,  
20 water, and sewer services. Potential environmental impacts include biological impacts in the  
21 lagoon area and construction-related impacts, such as impacts on aesthetics, air quality, hazards  
22 (due to the use of hazardous materials during construction), noise, water quality (due to the use  
23 of hazardous materials during construction), and geology and soils. Long-term transportation,  
24 public services, noise, and aesthetic impacts may also occur.

25 *Cumulative Impacts with the Proposed Action*

26 Both the proposed action and the Emerald River project would result in construction-related air  
27 quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions from  
28 both projects would be mobile and intermittent and would be cumulatively *less than significant*.  
29 The proposed action would result in a significant, potentially unavoidable, impact from  
30 increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and Emerald  
31 River project occurred at the same general time and in the same general location, fugitive dust  
32 emissions would be *cumulatively significant*.

33 Both projects would have the potential for impacts on aquatic, and possibly to terrestrial  
34 biological resources, but these would be cumulatively *less than significant* because the impacts of  
35 the proposed action would be temporary and localized and would not cause substantial adverse  
36 changes to vegetation or wildlife communities along the LCR. The extent to which long-term  
37 impacts on biological resources would as a result of the Emerald River project is not known at

1 this time, but the long-term impacts of the proposed action would be beneficial and would not  
2 contribute to a cumulative impact in combination with the development project.

3 Both projects would result in construction-related short-term disturbances to aesthetics, but  
4 these would be *cumulatively less than significant* because they would be temporary and localized.  
5 The Emerald River project would result in long-term changes to the visual character of the LCR,  
6 but the proposed action would have long-term beneficial aesthetic impacts and would not  
7 contribute to a cumulative impact in combination with the development project.

8 Both projects would result in increased ambient noise levels during construction, but impacts  
9 would be *cumulatively less than significant* because noise impacts are highly localized, and  
10 impacts would be temporary, lasting only for the duration of the construction. Both the  
11 proposed action and the Emerald River project likely would have only minor, short-term, and  
12 localized impacts on hazards, geology and soils, and water quality, and the impact would be  
13 *cumulatively less than significant*. The proposed action would have only negligible impacts on  
14 transportation and public services and would not contribute to a cumulative impact.

#### 15 ***Riverfront Specific Plan #01-0001 and Tract Maps #946 and #947***

##### 16 *Project Description*

17 The owners of an 80-acre parcel west of the Colorado River, Rio del Sol, LLC and River Estates,  
18 are developing 34 residential lots and 9 open space lots. This site is located in Imperial County.

##### 19 *Project's Environmental Analysis Status and Anticipated Impacts*

20 A Mitigated Negative Declaration was approved in February 2003. The anticipated impacts  
21 include less than significant impacts on aesthetics (due to the conversion of existing open space  
22 to developed land and the creation of a new source of light and glare); air quality (generation of  
23 dust); geology and soils (due to seismic and/or flood hazards and impacts from septic systems);  
24 hydrology and water quality (the project would change the flow of Vinagre Wash, resulting in  
25 interference with groundwater recharge, and would have water quality impacts); land use and  
26 planning (potential conflicts with habitat conservation); noise (increase in ambient noise levels);  
27 population and housing (growth inducement); public services (impacts on schools, law  
28 enforcement services, and the use of the Colorado River for recreational purposes); and  
29 recreation (impacts associated with increased usage of the Colorado River and other facilities).

30 Potentially significant but mitigable impacts were identified to biological resources (potential  
31 impacts on wetlands, and the project may be in southwestern willow flycatcher, Yuma clapper  
32 rail, Gila woodpecker, yellow-billed cuckoo, and desert tortoise habitat); cultural resources;  
33 hazards and hazardous materials (increased fire hazard); hydrology and water quality (the  
34 project lies within a 100-year flood zone and may alter drainage patterns); land use and  
35 planning (the proposed project may be located in southwestern willow flycatcher habitat);  
36 public services (impacts associated with fire protection); transportation and traffic (increased  
37 traffic and fire hazards); and utilities and service systems (due to the construction of new water  
38 treatment/storm water drainage facilities and impacts on landfills).

##### 1 Cumulative Impacts with the Proposed Action

2 Both the proposed action and the Riverfront project would result in construction-related air  
3 quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions from  
4 both projects would be mobile and intermittent and would be cumulatively *less than significant*.  
5 The proposed action would result in a significant, potentially unavoidable, impact from  
6 increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and  
7 Riverfront project occurred at the same general time and in the same general location, fugitive  
8 dust emissions would be cumulatively *significant*.

9 Both projects would result in construction-related short-term disturbances to aesthetics, but  
10 these would be *cumulatively less than significant* because they would be temporary and localized.  
11 The Riverfront project would result in long-term changes to the visual character near the LCR,  
12 but the proposed action would have long-term beneficial aesthetic impacts and would not  
13 contribute to a cumulative impact in combination with the development project.

14 Both projects would have the potential for impacts on terrestrial and aquatic biological  
15 resources, but these would be cumulatively *less than significant* because the impacts of the  
16 proposed action would be temporary and localized and would not cause substantial adverse  
17 changes to vegetation or wildlife communities along the LCR. The proposed action would have  
18 long-term beneficial impacts on the biological resources that may be impacted by the Riverfront  
19 project (i.e., southwestern willow flycatcher, Yuma clapper rail, desert tortoise, Gila  
20 woodpecker, and yellow-billed cuckoo) and would not contribute to a cumulative impact in  
21 combination with the development project.

22 Both projects could require the use of hazardous materials. The cumulative impact would be  
23 *less than significant* because spills would be small and localized. Additionally, most construction  
24 associated with the proposed action would be located in unpopulated areas, and best  
25 management practices would be implemented to minimize the potential for accidents to occur.  
26 All spills would be cleaned up in accordance with permit conditions. Both projects would  
27 result in increased ambient noise levels during construction, but impacts would be considered  
28 *cumulatively less than significant* because noise impacts are highly localized, and impacts would  
29 be temporary, lasting only for the duration of the construction; moreover, the proposed  
30 conservation measures would not be constructed in proximity to a developed area. Cumulative  
31 impacts associated with cultural resources would be *significant* since both the proposed action  
32 and the Riverfront project would result in significant impacts on this resource.

33 The minor traffic impacts associated with the proposed action would be localized and would  
34 not contribute to a cumulative impact. The proposed action would have less than significant  
35 impacts on recreation, and the limited displacement of recreational uses to other areas would  
36 not result in the degradation of these areas (a relatively small area would be affected in  
37 relationship to the total area available because the planning area contains approximately  
38 423,500 acres of recreational area and a maximum of 8,132 acres would be affected). Moreover,  
39 the proposed action would not result in increased population and would not increase the  
40 demand for recreational activities. The impact on recreation would be *cumulatively less than*  
41 *significant*.

1 The proposed action would result in minimal impacts on water treatment, storm drainage, and  
2 landfill capacity and would not contribute to a cumulative impact on these resources. The other  
3 impacts associated with the Riverfront project (i.e., on geology and soils, hydrology and water  
4 quality, population and housing, and public services) would not result in cumulative impacts in  
5 combination with the proposed action because the proposed action would not have the same  
6 types of impacts.

#### 7 *Palo Verde River Properties*

##### 8 *Project Description*

9 The Palo Verde River Properties subdivision project is an 18-parcel subdivision (12 parcels  
10 would be adjacent to the LCR) located in Imperial County. Each of the 18 lots included in the  
11 project would range in size from approximately 0.5 acre to 6 acres, and the total site is 31.7  
12 acres. The intent of the project is to create lots for residential purposes and individual  
13 ownership along the LCR. The project would potentially include the construction of up to 18  
14 wells and would include septic tank leach field systems.

##### 15 *Project's Environmental Analysis Status and Anticipated Impacts*

16 A Mitigated Negative Declaration was completed for this project in 1991. Potential impacts  
17 were identified for the following resources: changes in population distribution; transportation  
18 (increased traffic, etc., associated with a residential area); geology and soils (primarily  
19 construction related); air quality (construction-related and potential odors from septic tanks);  
20 water resources (including changes in drainage patterns, runoff amounts, flow of groundwater  
21 and flood waters, water quality due to contamination from septic tanks, flood hazards, and  
22 water supplies); biological resources (due to clearing/grading activities and the removal of  
23 approximately 30 acres of habitat for wildlife and plants); noise (increased noise levels resulting  
24 from the development and the exposure of people to airport noise); increased light and glare;  
25 land use (conversion of undisturbed land along the LCR); aesthetics (removal of natural  
26 vegetation); hazards and hazardous materials (associated with urban areas and possible  
27 interference with emergency response plans); public services (police and fire protection,  
28 schools, access to LCR recreational areas, increased roadway maintenance, and other public  
29 services); utilities (related to septic tanks, stormwater drainage, and solid waste); human health  
30 (associated with flood hazards and flood detention areas that could be mosquito breeding  
31 grounds that could expose people to encephalitis); recreation (limitation on access to the fish  
32 and wildlife habitat along the LCR); and cultural resources (potential impacts on cultural  
33 resources associated with construction).

##### 34 *Cumulative Impacts with the Proposed Action*

35 Both the proposed action and the Palo Verde River Properties subdivision would result in  
36 construction-related air quality impacts from increased combustive and PM<sub>10</sub> emissions.  
37 Combustive emissions from both projects would be mobile and intermittent and would be  
38 *cumulatively less than significant*. The proposed action would result in a significant, potentially  
39 unavoidable, impact from increased PM<sub>10</sub> emissions, and if construction associated with the  
40 proposed action and subdivision occurred at the same general time and in the same general  
41 location, fugitive dust emissions would be *cumulatively significant*. The proposed action would

#### 4.0 Cumulative Impacts

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1 not result in odors and would not contribute to a cumulative impact associated with  
2 objectionable odors.

3 Both projects would have the potential for *impacts on* biological resources, but these would be  
4 *cumulatively less than significant* because the impacts of the proposed action would be temporary  
5 and localized and would not cause substantial adverse changes to vegetation or wildlife  
6 communities along the LCR. The subdivision project would result in long-term impacts on  
7 biological resources, but the long-term impacts of the proposed action would be beneficial and  
8 would not contribute to a cumulative impact in combination with the development project.

9 Both projects would result in construction-related short-term disturbances to aesthetics, but  
10 these would be *cumulatively less than significant* because they would be temporary and localized.  
11 The subdivision project would result in long-term changes to the visual character of the LCR,  
12 but the proposed action would have long-term beneficial aesthetic impacts and would not  
13 contribute to a cumulative impact in combination with the development project.

14 Both projects would result in increased ambient noise levels during construction, but impacts  
15 would be *cumulatively less than significant* because noise impacts are highly localized, and  
16 impacts would be temporary, lasting only for the duration of the construction. The proposed  
17 action would not affect/change population distributions and would have minor, localized  
18 transportation impacts; thus, no cumulative impacts on these resources would occur. Both  
19 projects would have only minor, short-term, and localized impacts on geology and soils, and  
20 the impact would be *cumulatively less than significant*. The proposed action would not affect the  
21 flow of groundwater or floodwaters, and no cumulative impacts would occur. The proposed  
22 action would have only minor, short-term, and localized impacts associated with hazardous  
23 materials and water quality, and would not likely be implemented near developed areas, and  
24 the impact would be *cumulatively less than significant*.

25 The proposed action would have minor impacts on public services and utilities (i.e., water  
26 treatment, storm drainage, water supply, and landfill capacity) from construction and  
27 operations, and would not contribute to a cumulative impact. The proposed action would not  
28 affect emergency response plans or increase flooding risks, but would have less than significant  
29 impacts associated with fires and exposing people to vectors. The proposed action would avoid  
30 developed areas, however, and the cumulative impacts associated would be *less than significant*.

31 The proposed action would have less than significant impacts on recreation, and the limited  
32 displacement of recreational uses to other areas would not result in the degradation of these  
33 areas (a relatively small area would be affected in relationship to the total area available because  
34 the planning area contains approximately 423,500 acres of recreational area and a maximum of  
35 8,132 acres would be affected. Moreover, the Palo Verde River Properties project would affect  
36 only a small area (approximately 30 acres). The impact on recreation would be *cumulatively less*  
37 *than significant*.

38 The proposed action would have significant impacts on cultural resources, and if the Palo Verde  
39 River Properties project also affected cultural resources, cumulative impacts could be  
40 *cumulatively significant*.

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### 1 ***Blythe Mobile Home Park Solar Power Conversion***

#### 2 *Project Description*

3 The Blythe Mobile Home Park is located adjacent to the Colorado River south of I-10 in the City  
4 of Blythe. This project involves the conversion of buildings within the park to solar power. The  
5 completion date is scheduled for June 30, 2008 (personal communication, B. Loew 2003).

#### 6 *Project's Environmental Analysis Status and Anticipated Impacts*

7 A Negative Declaration was completed for this project and no adverse environmental impacts  
8 were identified (personal communication, B. Loew 2003).

#### 9 *Cumulative Impacts with the Proposed Action*

10 No cumulative impacts would result because the Blythe Mobile Home Park Solar Power  
11 Conversion project would have no adverse environmental impacts.

### 12 ***Riverview Estates***

#### 13 *Project Description*

14 The Riverview Estates project is located in the City of Blythe along the west bank of the LCR.  
15 The project is a phased 79-lot single-family residential subdivision on an approximately 50-acre  
16 site. Site grading and public improvements are under construction. In addition to the  
17 residential lots, the project would include an open space area (approximately 1 acre) that would  
18 consist of a community beach and boat launching dock. The project would also include a sand  
19 and oil interceptor to reduce the risk of hazardous waste entering the LCR in drainage waters.

#### 20 *Project's Environmental Analysis Status and Anticipated Impacts*

21 A Negative Declaration was completed for this project in January 2000. Less than significant  
22 impacts were identified for aesthetics (creation of light or glare); air quality (due to construction  
23 and future project-related traffic); hydrology and water quality (alteration of drainage patterns);  
24 land use and planning (incompatibility with existing land uses in the vicinity); noise  
25 (substantial permanent and temporary/periodic increase in ambient noise levels in the project  
26 area); population and housing (growth inducement); public services (fire, police, schools, public  
27 services maintenance, and other government services); transportation and circulation  
28 (substantial increase in traffic); and utilities and service systems (require or result in the  
29 construction of new water, wastewater, or stormwater facilities).

30 Potentially significant impacts were identified for geology and soils (construction-related  
31 erosion); hydrology and water quality (increased runoff); and land use and planning (conflicts  
32 with existing zoning or general plan designation).

#### 33 *Cumulative Impacts with the Proposed Action*

34 Cumulative construction-related impacts would not occur because the Riverview Estates project  
35 is currently under construction and would likely be completed before construction of LCR

1 MSCP construction projects would begin. The proposed action would not result in an increase  
2 in light and glare, would not be growth-inducing, would not affect drainage patterns, and  
3 would have only minimal traffic and public services and utilities impacts (including  
4 runoff/storm drainage); thus, cumulative impacts would not occur in combination with the  
5 proposed action. The proposed action would generally be considered a permitted use in the  
6 undeveloped and agricultural areas where it would occur, and the zoning of each potential  
7 conservation project site would be reviewed to minimize any potential land use conflicts. Thus,  
8 cumulative impacts on land use and planning would be *less than significant*.

#### 9 ***Palo Verde Oasis***

##### 10 *Project Description*

11 The Palo Verde Oasis project is a 29-unit single-family residential development located in the  
12 City of Blythe. This portion of the project is the final phase of a 106-unit single-family  
13 residential development and is currently in the pre-construction phase.

##### 14 *Project's Environmental Analysis Status and Anticipated Impacts*

15 A Negative Declaration was completed for the complete 106-unit project in June of 1996. Less  
16 than significant impacts were identified for noise (exposure of people to I-10 noise due to the  
17 proximity of the residential development I-10), and utilities and service systems (increased need  
18 for water treatment/sewer systems).

##### 19 *Cumulative Impacts with the Proposed Action*

20 Both the proposed action and the Palo Verde Oasis subdivision would result in construction-  
21 related air quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive  
22 emissions from both projects would be mobile and intermittent and would be cumulatively *less*  
23 *than significant*. The proposed action would result in a significant, potentially unavoidable,  
24 impact from increased PM<sub>10</sub> emissions, and if construction associated with the proposed action  
25 and subdivision occurred at the same general time and in the same general location, fugitive  
26 dust emissions would be cumulatively *significant*.

27 Both projects would result in increased ambient noise levels during construction, but impacts  
28 would be *cumulatively less than significant* because noise impacts are highly localized, and  
29 impacts would be temporary, lasting only for the duration of the construction. Moreover, the  
30 proposed action would avoid developed areas like the subdivision site. Cumulative impacts on  
31 utilities and service systems would not occur because the water use for the proposed action  
32 would be associated primarily with irrigation and would not require treatment. The two  
33 potential field facilities associated with the proposed action would require only minimal  
34 potable water use and therefore would not require the construction of new water treatment  
35 facilities or the expansion of existing facilities. The proposed action would also not generate  
36 wastewater except at the two potential field facilities, which would generate only minimal  
37 amounts. Thus, no cumulative impacts on existing wastewater conveyance and treatment  
38 facilities would occur.

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## 1 *Mayflower Park Improvements and Expansion*

### 2 *Project Description*

3 The Mayflower Park Improvements and Expansion project will be located in an unincorporated  
4 area approximately 4 miles north of the City of Blythe. The project includes a total of 12  
5 individual projects, including planning and development of the park expansion site,  
6 infrastructure improvements, lagoon improvements, and construction of new recreational  
7 buildings and restrooms on an approximately 85-acre site (of which approximately 65 acres  
8 have been purchased for the expansion). All individual projects are expected to be completed  
9 in 2008 (personal communication, B. Loew 2003).

### 10 *Project's Environmental Analysis Status and Anticipated Impacts*

11 A Mitigated Negative Declaration has been completed for this project. Anticipated environ-  
12 mental impacts include less than significant impacts on aesthetics (introduction of new sources  
13 of nighttime light to the area) and agricultural resources (conversion of 65 acres of Prime  
14 Farmland). Potentially significant but mitigable impacts were identified for geology and soils  
15 (liquefaction and subsidence hazards).

### 16 *Cumulative Impacts with the Proposed Action*

17 Both the proposed action and the Mayflower Park project would result in construction-related  
18 air quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions  
19 from both projects would be mobile and intermittent and would be cumulatively *less than*  
20 *significant*. The proposed action would result in a significant, potentially unavoidable, impact  
21 from increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and  
22 Mayflower Park project occurred at the same general time and in the same general location,  
23 fugitive dust emissions would be cumulatively *significant*.

24 Both projects would result in construction-related short-term disturbances to aesthetics, but  
25 these would be *cumulatively less than significant* because they would be temporary and localized.  
26 The subdivision project would result in long-term changes to the visual character of the LCR,  
27 but the proposed action would have long-term beneficial aesthetic impacts and would not  
28 contribute to a cumulative impact in combination with the development project.

29 Both projects would result in the conversion of Important Farmland, but impacts would be  
30 *cumulatively less than significant* since the total amount that could be affected is not substantial  
31 compared to the overall amount available in the planning area (i.e., approximately 3.7 percent  
32 of the total Important Farmland in the planning area could be affected by the two projects). The  
33 proposed action would not result in liquefaction or subsidence impacts; therefore, no  
34 cumulative impacts would occur. No other common resources would be affected by the  
35 implementation of the proposed action and the Mayflower Park Improvements and Expansion  
36 project and, therefore, no other cumulative impacts would occur.

### 1 **Queshan Park Improvements**

#### 2 *Project Description*

3 Queshan Park is located adjacent to the Colorado River just north of I-10 in the City of Blythe.  
4 This project includes the planning, design, and construction of improvements including a boat  
5 launch, RV parking, new campsites, limited boat slips, restaurant, and lagoon improvements.  
6 The project schedule is not finalized.

#### 7 *Project's Environmental Analysis Status and Anticipated Impacts*

8 The City of Blythe is the lead agency and has not yet conducted CEQA analysis on this project;  
9 therefore, the project's impacts have not been identified (personal communication, B. Loew  
10 2003). It is anticipated that the project could result in impacts on aesthetics, air quality, water  
11 quality, biological resources, hazards related to construction activity, and geology and soils.

#### 12 *Cumulative Impacts with the Proposed Action*

13 Both the proposed action and the Queshan Park project would result in construction-related air  
14 quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions from  
15 both projects would be mobile and intermittent and would be cumulatively *less than significant*.  
16 The proposed action would result in a significant, potentially unavoidable, impact from  
17 increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and Queshan  
18 Park project occurred at the same general time and in the same general location, fugitive dust  
19 emissions would be cumulatively *significant*.

20 The extent to which the Queshan project could affect biological resources is not known, but it is  
21 assumed it would have the potential for such impacts. Short-term impacts would be  
22 *cumulatively less than significant* because the impacts of the proposed action would be temporary  
23 and localized and would not cause substantial adverse changes to vegetation or wildlife  
24 communities along the LCR. The Queshan project could result in long-term impacts on  
25 biological resources, but the long-term impacts of the proposed action would be beneficial and  
26 would not contribute to a cumulative impact in combination with the development project.

27 Both projects could result in construction-related short-term disturbances to aesthetics, but  
28 these would be *cumulatively less than significant* because they would be temporary and localized.  
29 The Queshan project could result in long-term changes to the visual character of the LCR, but  
30 the proposed action would have long-term beneficial aesthetic impacts and would not  
31 contribute to a cumulative impact in combination with the development project. Both projects  
32 likely would have only minor, short-term, and localized impacts on geology and soils, hazards,  
33 and water quality, and the cumulative impact would be *less than significant*.

### 34 **Needles Highway Improvement Project**

#### 35 *Project Description*

36 The Needles Highway Improvement Project, which is under the jurisdiction of Caltrans (District  
37 8-San Bernardino County), would improve the highway pavement and add passing lanes,

1 thereby reducing accidents caused by traffic congestion. The project would include horizontal  
2 and vertical alignment changes, including possibly bypassing a section of roadway with a  
3 separate alignment; pavement widening; passing lanes; left turn pockets as needed; shoulder  
4 widening; and pavement rehabilitation at various locations. Right-of-way would be acquired to  
5 achieve the engineered design. The comprehensive project is the complete reconstruction of 20  
6 miles of the Needles Highway from Needles, California, to Laughlin, Nevada with a right-of-  
7 way of approximately 300 feet in width. Thus, the project area would encompass  
8 approximately 730 acres.

#### 9 *Project's Environmental Analysis Status and Anticipated Impacts*

10 A draft preliminary environmental study has been prepared, as well as a draft study  
11 methodology and outline. The latest project schedule shows the completion of environmental  
12 documentation in December 2004. Depending on the alignment chosen, impacts on biological  
13 and cultural resources may occur. Biological resources that may be present in the study area  
14 include the Mojave desert tortoise, the Arizona bill's vireo, elf owl, yellow-breasted chat,  
15 Sonoran yellow warbler, Crissal thrasher, prairie falcon, Le Conte's thrasher, burrowing owls,  
16 and desert mesquite vegetation. Although the amount of habitat for each species that would be  
17 impacted has not yet been determined, the project is not expected to affect these habitats in the  
18 entire project area (personal communication, D. Clark 2004). Additionally, the preliminary  
19 environmental study has identified the potential to disrupt agricultural activities on the Fort  
20 Mojave Indian Reservation, although no Important Farmland is expected to be affected. Other  
21 anticipated impacts could include construction-related impacts such as impacts on aesthetics,  
22 air quality, water quality, hazards related to construction activity, and geology and soils.  
23 Additionally, traffic impacts during construction would be expected.

#### 24 *Cumulative Impacts with the Proposed Action*

25 Both the proposed action and the Needles Highway Improvement project would result in  
26 construction-related air quality impacts from increased combustive and PM<sub>10</sub> emissions.  
27 Combustive emissions from both projects would be mobile and intermittent and would be  
28 cumulatively *less than significant*. The proposed action would result in a significant, potentially  
29 unavoidable impact, from increased PM<sub>10</sub> emissions, and if construction associated with the  
30 proposed action and highway improvement project occurred at the same general time and in  
31 the same general location, fugitive dust emissions would be cumulatively *significant*.

32 Both projects would have the potential for construction-related impacts on biological resources,  
33 but these would be *cumulatively less than significant* because the impacts would be temporary  
34 and localized and would not cause substantial adverse changes to vegetation or wildlife  
35 communities along the LCR. Both projects could result in construction-related short-term  
36 disturbances to aesthetics, but these would be *cumulatively less than significant* because they  
37 would be temporary and localized.

38 Both the proposed action and the highway improvement project would have only minor, short-  
39 term, and localized impacts on geology and soils, hazards, and water quality, and the  
40 cumulative impact would be *less than significant*. Both projects could result in significant  
41 impacts on cultural resources and the impact would, therefore, also be *cumulatively significant*.  
42 Cumulative impacts on agricultural resources would be *cumulatively less than significant* because

1 the highway improvement project would not result in the conversion of Important Farmland in  
2 to nonagricultural use, although it could result in some disturbance agricultural activities. The  
3 proposed action would result in only minor, localized transportation impacts would not  
4 contribute to a cumulative impact in combination with the highway improvement project.

5 ***Gateway Park***

6 *Project Description*

7 Gateway Park is a planned recreation and historic interpretive park located in the Yuma area.  
8 The project includes 20 acres of recreational and historic interpretative park improvements  
9 using native vegetation. The project is anticipated to begin in December 2004 and completion is  
10 anticipated in December 2005. The park will use only native vegetation that should provide  
11 ancillary habitat for listed or unlisted species.

12 *Project's Environmental Analysis Status and Anticipated Impacts*

13 No environmental documentation has been completed for this project; however, no impacts are  
14 anticipated. Project-related improvements would occur above the ordinary high water mark  
15 and, therefore, no impacts would occur to wetlands (personal communication, M. Spriggs 2003).

16 *Cumulative Impacts with the Proposed Action*

17 No cumulative impacts would result from the Gateway Park project and the proposed action  
18 because no adverse impacts were identified for the Gateway Park project and it would be  
19 completed before the onset of construction activities associated with the proposed action.

20 ***Replacement of the Somerton Wastewater Treatment Facility***

21 *Project Description*

22 The City of Somerton, Arizona is proposing to reconstruct the existing Wastewater Treatment  
23 Plant (WWTP), which is currently unable to adequately treat wastewater and has experienced  
24 recurrent NPDES permit violations. The project is also necessary to alleviate existing adverse  
25 environmental effects associated with the Somerton WWTP, which include the generation of  
26 offensive odors, and risks to human health and safety. The proposed treatment units are being  
27 designed at 0.8 million gallons per day (mgd), which allow for a 30 percent increase in flows  
28 over current conditions. However, to allow for future expansion, the headworks, pump station,  
29 and outfall will be built for approximately 1.4 mgd. Construction is scheduled to begin the first  
30 quarter of 2004 and startup of the new WWTP is anticipated for the first quarter of 2005. The  
31 project site is approximately 15 acres.

32 *Project's Environmental Analysis Status and Anticipated Impacts*

33 The EPA has prepared an Environmental Assessment (EA), in compliance with NEPA, that  
34 examined the potential environmental impacts of the proposed action in the United States, as  
35 well as the transboundary impacts that might occur in Mexico. The EA did not identify any  
36 significant impacts on the environment that would result from the implementation of the  
37 project. Less than significant impacts included minor impacts on wildlife due to the removal of

1 lagoons that would eliminate bird resting areas; temporary construction-related noise impacts;  
2 aesthetic impacts due to the construction of tanks; minor environmental justice impacts  
3 associated with increased noise levels during construction; minor increases in energy use; and  
4 minor indirect impacts relating to the support of growth.

#### 5 *Cumulative Impacts with the Proposed Action*

6 No cumulative construction-related impacts would occur because construction of the WWTP  
7 would be completed prior to the onset of construction of the LCR MSCP conservation projects.  
8 The WWTP project would have long-term, less than significant impacts on aesthetics from new  
9 facilities, as well as from increased energy use during operations. It also would have indirect  
10 impacts associated with population growth. The proposed action would have beneficial long-  
11 term impacts on aesthetics, would have minimal energy demands, and would not result in  
12 population growth; thus, no cumulative impacts on these resources would occur.

#### 13 ***Bullhead City Development Projects***

##### 14 *Project Description*

15 Between 90 and 100 platted and proposed residential, commercial, and other development  
16 projects could be constructed in Bullhead City, Arizona.

##### 17 *Project's Environmental Analysis Status and Anticipated Impacts*

18 Environmental documentation for these projects has not been completed. Anticipated impacts  
19 of these projects include construction-related impacts such as impacts on aesthetics, biological  
20 resources, air quality, hazards (due to the use of hazardous materials during construction),  
21 water quality (due to the use of hazardous materials during construction), and geology and  
22 soils. Long-term aesthetic impacts may also occur.

#### 23 *Cumulative Impacts with the Proposed Action*

24 Both the proposed action and the Bullhead City projects would result in construction-related air  
25 quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions from  
26 both projects would be mobile and intermittent and would be *cumulatively less than significant*.  
27 The proposed action would result in a significant, potentially unavoidable, impact from  
28 increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and  
29 development projects occurred at the same general time and in the same general location,  
30 fugitive dust emissions would be *cumulatively significant*.

31 The extent to which the Bullhead City projects could affect biological resources is not known,  
32 but it is assumed that they would have some adverse impacts. Short-term construction-related  
33 would be *cumulatively less than significant* because the impacts of the proposed action would be  
34 temporary and localized and would not cause substantial adverse changes to vegetation or  
35 wildlife communities along the LCR. The Bullhead City projects could result in long-term  
36 impacts on biological resources, but the long-term impacts of the proposed action would be  
37 beneficial and would not contribute to a cumulative impact in combination with the  
38 development projects.

1 Both the proposed action and the Bullhead City projects could result in construction-related  
2 short-term disturbances to aesthetics, but these would be *cumulatively less than significant*  
3 because they would be temporary and localized. The Bullhead City projects could result in  
4 long-term changes to the visual character of the LCR, but the proposed action would have long-  
5 term beneficial aesthetic impacts and would not contribute to a cumulative impact in  
6 combination with the development projects.

7 The proposed action and Bullhead City projects likely would have only minor, short-term, and  
8 localized impacts on hazards, geology and soils, and water quality, and the impact would be  
9 *cumulatively less than significant*.

### 10 4.2.3 Habitat Enhancement Projects

#### 11 *Mittry Lake Emergency Stabilization and Rehabilitation*

##### 12 *Project Description*

13 This project is an emergency stabilization and rehabilitation effort on approximately 475 acres  
14 of BLM-administered lands located within the Mittry Lake Wildlife Area, which is being  
15 undertaken in response to disturbance caused by the Mittry Lake Fire that occurred in March  
16 2003. All efforts would occur within Yuma County, Arizona. The proposed rehabilitation  
17 includes mechanical clearing, mulching, grubbing, planting, caging, fertilizing, pruning and  
18 seeding, irrigation, herbicide application, soil analysis, and California black rail habitat  
19 improvement. The purpose of this project is to re-establish stands of cottonwood, willow, and  
20 mesquite.

##### 21 *Project's Environmental Analysis Status and Anticipated Impacts*

22 A Decision Record (BLMYFO 2003a) for this project was signed in July 2003 by the BLMYFO,  
23 and is supported with the Mittry Lake Emergency Stabilization and Rehabilitation EA  
24 (BLMYFO 2003b) and Finding of No Significant Impact. The EA determined that the project  
25 would have limited impacts on recreational resources due to temporary restricted access to  
26 recreational areas (although long-term impacts would be beneficial); air quality (construction-  
27 related emissions); aesthetics (short-term, construction-related degradation of visual quality);  
28 biological resources (temporary disturbance from construction activities); water quality  
29 (increased nutrient loading to Mittry Lake); and geology and soils (erosion impacts).

##### 30 *Cumulative Impacts with the Proposed Action*

31 Both the proposed action and the Mittry Lake project would result in construction-related air  
32 quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions from  
33 both projects would be mobile and intermittent and would be *cumulatively less than significant*.  
34 The proposed action would result in a significant, potentially unavoidable, impact from  
35 increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and Mittry  
36 Lake project occurred at the same general time and in the same general location, fugitive dust  
37 emissions would be *cumulatively significant*.

1 Both projects would result in construction-related short-term disturbances to aesthetics, but  
2 these would be *cumulatively less than significant* because they would be temporary and localized.  
3 Both projects would have long-term beneficial aesthetic impacts through the creation or  
4 restoration of a combined total of 8,607 acres of land cover types dominated by native  
5 vegetation; thus, the long-term impacts would be *cumulatively beneficial*.

6 Both projects would have the potential for construction-related impacts on biological resources,  
7 but these would be *cumulatively less than significant* because the impacts would be temporary  
8 and localized and would not cause substantial adverse changes to vegetation or wildlife  
9 communities along the LCR. Both projects would have long-term beneficial impacts on  
10 biological resources through the creation or restoration of a combined total of 8,607 acres of land  
11 cover types that provide habitat for covered and non-covered species; thus, the long-term  
12 impacts would be *cumulatively beneficial*.

13 Both the proposed action and Mittry Lake project would have only minor, short-term, and  
14 localized impacts on water quality and geology and soils, and the impact would be *cumulatively*  
15 *less than significant*. The proposed action would result in the loss of access to recreational uses,  
16 but the amount of recreational area that could be removed from public use is small in  
17 comparison to the area available. The recreational impacts associated with the Mittry Lake  
18 project would be temporary, and it would have long-term beneficial impacts on recreational  
19 resources. Therefore, impacts would be *cumulatively less than significant*.

#### 20 ***Mittry Lake Hazardous Fuels Reduction and Riparian Restoration***

##### 21 *Project Description*

22 The BLMYFO is proposing to restore riparian plant communities along the LCR on selected  
23 sites deemed suitable for intensive revegetation. Approximately 80 acres of land would be  
24 revegetated with native plants following removal of saltcedar at the south end of Mittry Lake.  
25 This project is being proposed to improve wildlife species diversity, encourage wildlife species  
26 numbers, increase habitat complexity, and reduce the amount of hazardous fuels in the project  
27 area.

##### 28 *Project's Environmental Analysis Status and Anticipated Impacts*

29 An EA was completed for this project in December 2002. The EA determined that minor  
30 impacts on air quality (increased PM<sub>10</sub> and construction-related emissions for a period of  
31 approximately 1 month), aesthetics (due to the clearing of land resulting in patchy topography),  
32 and water quality (nutrient loading to Mittry Lake) would result from the Mittry Lake  
33 Hazardous Fuels Reduction and Riparian Restoration project.

##### 34 *Cumulative Impacts with the Proposed Action*

35 Both the proposed action and the Mittry Lake project would result in construction-related air  
36 quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions from  
37 both projects would be mobile and intermittent and would be *cumulatively less than significant*.  
38 The proposed action would result in a significant, potentially unavoidable, impact from  
39 increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and Mittry

1 Lake project occurred at the same general time and in the same general location, fugitive dust  
2 emissions would be cumulatively *significant*.

3 Both projects would result in construction-related short-term disturbances to aesthetics, but  
4 these would be *cumulatively less than significant* because they would be temporary and localized.  
5 Both projects would have long-term beneficial aesthetic impacts through the creation or  
6 restoration of a combined total of 8,212 acres of native land cover types; thus, the long-term  
7 impacts would be *cumulatively beneficial*.

8 Both projects would have the potential for construction-related impacts on biological resources,  
9 but these would be *cumulatively less than significant* because the impacts would be temporary  
10 and localized and would not cause substantial adverse changes to vegetation or wildlife  
11 communities along the LCR. Both projects would have long-term beneficial impacts on  
12 biological resources through the creation or restoration of a combined total of 8,212 acres of land  
13 cover types that provide habitat for covered and non-covered species; thus, the long-term  
14 impacts would be *cumulatively beneficial*.

15 Both the proposed action and Mitrtry Lake project would have only minor, short-term, and  
16 localized impacts on water quality and geology and soils, and the impact would be *cumulatively*  
17 *less than significant*.

#### 18 ***Yuma East Wetlands Restoration Project***

##### 19 *Project Description*

20 The Yuma East Wetlands Restoration Project (YEW) is a 1,400-acre native riparian and river  
21 restoration project that is centered on the restoration of habitat for wetland-associated species  
22 through the re-opening of historic channels and sloughs, clearing of non-native species, and  
23 revegetation of the area with native plants and trees. A formal plan was completed in July of  
24 2001 for the area by the Quechan Indian Nation, the City of Yuma, and the Yuma Crossing  
25 National Heritage Area acting as the lead entities. The project is scheduled to begin in winter  
26 2003, and completed, depending on funding, between 2008-2013.

##### 27 *Project's Environmental Analysis Status and Anticipated Impacts*

28 A Section 404 permit has been issued by the Corps of Engineers for the YEW project. The  
29 project could result in the conversion of approximately 400 acres of agricultural land to native  
30 vegetation and would have construction-related impacts on air quality. Currently, the owners  
31 of an 80-acre cultivated area and the owners of a 200-acre area within the project boundary are  
32 in the process of considering if these lands may be included in the restoration effort. It is  
33 anticipated that these lands will be included; however, owner agreement is still pending. No  
34 determination has been made whether the agricultural land that would be converted to  
35 wetlands is Important Farmland.

##### 36 *Cumulative Impacts with the Proposed Action*

37 Both the proposed action and the YEW project would result in construction-related air quality  
38 impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions from both

1 projects would be mobile and intermittent and would be cumulatively *less than significant*. The  
2 proposed action would result in a significant, potentially unavoidable, impact from increased  
3 PM<sub>10</sub> emissions, and if construction associated with the proposed action and YEW project  
4 occurred at the same general time and in the same general location, fugitive dust emissions  
5 would be *cumulatively significant*.

6 The proposed action has the potential to convert Important Farmland to native vegetation, as  
7 could the YEW project. It is not known if the YEW project would convert Important Farmland,  
8 but even if it were, the impact would be *cumulatively less than significant* because the total  
9 amount that could be affected is not substantial compared to the overall amount available in the  
10 planning area (i.e., approximately 3.8 percent of the total Important Farmland in the planning  
11 area could be affected by the two projects).

12 The implementation of both projects would result in long-term, *cumulatively beneficial* impacts  
13 on aesthetics and biological resources since both would create or restore native vegetation.

#### 14 ***Yuma West Wetlands***

##### 15 *Project Description*

16 The Yuma West Wetlands (YWW) is a 110-acre former landfill and includes another 35 acres of  
17 wetland restoration through the removal of exotic plant species and revegetation with native  
18 plants and trees on the lower bench within jurisdictional Waters of the U.S. YWW has received  
19 its Section 404 permit and 25 acres of the lower bench has been revegetated. Ongoing  
20 monitoring and additional revegetation will occur within the project area. The remaining 10  
21 acres of revegetation is expected to begin construction in winter 2003 or late summer 2004  
22 depending upon the timing of migration season and project timing. Landfill conversion to a  
23 recreational park will be completed in 2007 and the revegetation, depending on funding, will be  
24 complete in 2005.

##### 25 *Project's Environmental Analysis Status and Anticipated Impacts*

26 An EA was completed for the YWW project that identified potential beneficial impacts on  
27 aesthetics, recreation, socioeconomics, wildlife habitat, and wetlands. Potential adverse impacts  
28 (the level of significance of these impacts was not specifically identified) included temporary  
29 construction-related air quality impacts, including fugitive dust emissions (these impacts would  
30 be minimized by spraying water on disturbed areas) and exhaust from construction  
31 equipment/vehicles; groundwater impacts due to fuels and other construction-related  
32 contaminants leaching into groundwater (a spill response plan would minimize potential  
33 impacts); surface water impacts due to sedimentation during construction activities (these  
34 impacts would be minimized by complying with permit requirements); temporary  
35 displacement of wildlife during construction; potential but unlikely impacts on the  
36 southwestern willow flycatcher due to disruption of habitat; and limited socioeconomic impacts  
37 related to air quality, noise, and traffic.

1 *Cumulative Impacts with the Proposed Action*

2 No adverse cumulative impacts with the proposed action would result because construction  
3 periods would not likely overlap and all adverse impacts associated with the YWW project are  
4 construction-related. The implementation of both projects would result in long-term, *cumula-*  
5 *tively beneficial* impacts on aesthetics and biological resources since both would create or restore  
6 native vegetation, and the YWW would convert a landfill to a park.

7 *Clark County Multiple Species Habitat Conservation Plan*

8 *Project Description*

9 Clark County, Nevada, has prepared an MSHCP to conserve a wide variety of species and their  
10 habitats throughout the county. The MSHCP is an extension of the effort begun with the Clark  
11 County Desert Conservation Plan (DCP), which was prepared in response to the Federal listing  
12 of the desert tortoise as a threatened species. Whereas the DCP focused primarily on the  
13 conservation of the desert tortoise, the MSHCP was prepared to establish a means to address  
14 the conservation needs of the entire range of biological resources within Clark County. The  
15 provisions of the DCP have been integrated into the MSHCP and supersede the provisions of  
16 the DCP.

17 The MSHCP was prepared pursuant to section 10(a) of the ESA, as amended. It identifies those  
18 actions necessary to maintain the viability of natural habitats in the county for approximately  
19 232 species residing in those habitats. While the MSHCP addresses all 232 species, it proposes  
20 that 79 of these species be covered by a section 10(a)(1)(B) permit for those species that are  
21 currently listed and Prelisting Agreements for those species that are not listed (covered species).  
22 Among the 79 covered species are the southwestern willow flycatcher (*Empidonax traillii*  
23 *extimus*); Mojave desert tortoise (*Gopherus agassizii*); and blue diamond cholla (*Opuntia whipplei*  
24 *var. multigeniculata*). All covered species are treated as though they were listed and are subject  
25 to the standards set forth in section 10(a)1(B) of the ESA and 50 C.F.R. 17.32(b) and 17.22(b).

26 *Project's Environmental Analysis Status and Anticipated Impacts*

27 The Final MSHCP and accompanying EIS were issued by the Clark County Department of  
28 Comprehensive Planning and the Service in September 2000. The Service subsequently issued a  
29 30-year permit authorizing the incidental take of the listed species covered by the plan. The EIS  
30 concluded that the MSHCP would have impacts on recreation, mineral extraction,  
31 transportation, and utility rights-of-way.

32 *Cumulative Impacts with the Proposed Action*

33 The proposed action would have either no impacts or less than significant impacts on most  
34 resources affected by the Clark County MSHCP. Impacts on recreation would be *cumulatively*  
35 *less than significant* because the total area affected would be small in comparison to the total  
36 recreational area available in the planning area (approximately 423,500 acres). Both projects  
37 would have an overall beneficial impact on aesthetic and biological resources since they are  
38 designed to establish or conserve native vegetation; therefore, a *cumulatively beneficial* impact  
39 would result from their implementation.

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## 1 **Cocopah Tribe River Restoration Project**

### 2 *Project Description*

3 The Cocopah Tribe River Restoration Project is currently in the conceptual phase and therefore  
4 does not have a well-defined project description. The project would involve saltcedar  
5 eradication and replanting with honey mesquite and cottonwood-willow.

### 6 *Project's Environmental Analysis Status and Anticipated Impacts*

7 It is anticipated that this restoration project would have long-term beneficial impacts on  
8 aesthetics and biological resources. Vegetation removal and replanting activities would likely  
9 result in similar impacts as the proposed action, including impacts on aesthetics, biological  
10 resources, air quality, hydrology, geology and soils, cultural resources, and noise.

### 11 *Cumulative Impacts with the Proposed Action*

12 Both the proposed action and the tribal restoration project would result in construction-related  
13 air quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions  
14 from both projects would be mobile and intermittent and would be cumulatively *less than*  
15 *significant*. The proposed action would result in a significant, potentially unavoidable, impact  
16 from increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and  
17 tribal restoration project occurred at the same general time and in the same general location,  
18 fugitive dust emissions would be cumulatively *significant*.

19 Both projects would have the potential for construction-related impacts on biological resources,  
20 but these would be *cumulatively less than significant* because the impacts would be temporary  
21 and localized and would not cause substantial adverse changes to vegetation or wildlife  
22 communities along the LCR. Both projects would have long-term beneficial impacts on  
23 biological resources through the establishment of native vegetation; thus, the long-term impacts  
24 would be *cumulatively beneficial*.

25 Both projects would result in construction-related short-term disturbances to aesthetic  
26 resources, but these would be *cumulatively less than significant* since they would be temporary  
27 and localized. The implementation of both projects would result in long-term, *cumulatively*  
28 *beneficial* impacts on aesthetics since both would establish native vegetation.

29 Cumulative impacts on cultural resources could be *cumulatively significant* because construction  
30 associated with both actions could affect significant cultural resources. All other cumulative  
31 impacts on the resources identified above would be *less than significant* since impacts would be  
32 short-term and localized.

### 33 **4.2.4 Other Conservation and Restoration Projects**

34 A number of conservation and restoration projects are ongoing within the planning area. These  
35 include ongoing razorback sucker and bonytail conservation including the Native Fish Work  
36 Group projects and improvements to Willow Beach National Fish Hatchery, among others. The  
37 impact on biological resources from the implementation of the proposed action in combination

1 with these other restoration projects would be *cumulatively beneficial*. *Cumulatively less than*  
2 *significant*, localized, construction-related impacts may occur associated with dredging  
3 activities.

4 **4.2.5 Other Projects**

5 ***Land Management, Crop Rotation, and Water Supply Program in the Palo Verde Irrigation***  
6 ***District***

7 *Project Description*

8 Metropolitan and the PVID are developing a land management, crop rotation, and water supply  
9 program in the Palo Verde Valley. The program's objective is to develop a flexible and reliable  
10 water supply for Metropolitan of approximately 111,000 AFY for 35 years and to assist in  
11 stabilizing the farm economy within the Palo Verde Valley through sign-up payments and  
12 annual payments for participating farmers and through implementation of specific community  
13 improvement programs. Participation in the program would be voluntary. Participating  
14 farmers would, at Metropolitan's request and with specific notice periods, not irrigate a portion  
15 of their farmland. The same land would not be irrigated for a minimum of a 1-year term and a  
16 maximum of a 3-year term at the farmer's option. A base load area of 6,000 acres would not be  
17 irrigated each year of the 35 years. Metropolitan would have the option to increase the non-  
18 irrigated area from 6,000 acres up to a maximum of 26,500 acres. Overall, a maximum of 24,000  
19 acres in any 25-year period or 26,500 acres in any 10-year period during the 35-year program  
20 would be dedicated to the program. Metropolitan would provide financial compensation to the  
21 participating farmers. Not irrigating a portion of the Palo Verde Valley's farmland would result  
22 in less Colorado River water being used by PVID. The amount of water conserved by the  
23 program would be determined on an annual basis by a verification committee composed of  
24 Metropolitan, PVID, and Reclamation and made available for diversion by Metropolitan at Lake  
25 Havasu through the CRA.

26 *Project's Environmental Analysis Status and Anticipated Impacts*

27 A Final EIR was completed for this project in September 2002 that focused on five  
28 environmental resource areas: agricultural resources, geology and soils, air quality, hydrology  
29 and water quality, and biological resources. No impacts on air quality would occur, nor would  
30 the project convert farmland to other uses. The following less than significant impacts were  
31 identified: erosion-related impacts; decreases in groundwater levels; reduced flow in some  
32 areas of the LCR; agricultural impacts due to a reduction in the amount of farmland being  
33 irrigated at any one time; and indirect impacts on biological resources that forage in agricultural  
34 areas.

35 *Cumulative Impacts with the Proposed Action*

36 Erosion-related impacts for both projects would be temporary, localized, and *cumulatively less*  
37 *than significant*. The proposed action would not decrease groundwater levels or affect river  
38 flow; thus, no cumulative impacts on hydrology or biological resources from such changes  
39 would occur. The PVID project would result in less than significant impacts on agriculture due  
40 to a reduction in the amount of farmland being irrigated at any one time. The proposed action

1 could result in the conversion of Important Farmland to other land cover types; however,  
2 impacts on agricultural resources would be *cumulatively less than significant* because the PVID  
3 project would not convert farmland to non-agricultural use, and the proposed action would  
4 affect only a small percentage of the agricultural land along the LCR. Impacts on biological  
5 resources would be *cumulatively less than significant*. The PVID project would have a less than  
6 significant impact on species that forage and winter on agricultural lands due to changes in  
7 irrigation and crop-planting regimes, and the proposed action would have temporary, less than  
8 significant impacts on these species due to the conversion of this land to native land cover  
9 types. The establishment of additional native land cover types would allow population  
10 expansion for these species, however, which is a long-term beneficial impact.

### 11 *All-American Canal Lining Project*

#### 12 *Project Description*

13 Lining the All-American Canal was authorized by Title II of Public Law 100-675, dated January  
14 25, 1988. This Act authorized the Secretary to construct a new lined canal or to line the  
15 previously unlined portions of the All-American Canal to reduce seepage of water. Title II  
16 authorizes the Secretary to determine the amount of water conserved by this canal lining. The  
17 Act further directs that the water so conserved be made available for consumptive use by  
18 California contractors within their service areas according to their priority under the  
19 Seven-Party Agreement. The preferred project alternative for controlling seepage from the  
20 AAC (constructing a parallel canal) would reduce seepage by approximately 67.7 kafy.

#### 21 *Project's Environmental Analysis Status and Anticipated Impacts*

22 A Final EIS/EIR for the All-American Canal Lining Project was released in March 1994.  
23 Environmental impacts were identified in the following areas: groundwater, water quality in  
24 Mexico, biological resources (wetlands including wetlands along the canal and along the  
25 impacted reach of the Colorado River, terrestrial plant communities and associated wildlife,  
26 and special status species), canal fisheries, air quality, cultural resources, hydroelectric power,  
27 and recreation (USBR and IID 1994). A variety of mitigation measures have been incorporated  
28 into the project, including establishing 43 acres of honey mesquite and cottonwood/willow and  
29 1 acre of marsh, restoring shelter for juvenile fish by constructing artificial reefs in the canal,  
30 replacing and protecting habitat for special status species and to help maintain the fishery for  
31 recreational fishing, and avoiding cultural resources sites where feasible.

32 A ROD was prepared and signed by the Lower Colorado Region's Regional Director on July 29,  
33 1994. On November 22, 1999, Reclamation determined that the EIS and ROD continued to meet  
34 the requirements of NEPA.

#### 35 *Cumulative Impacts with the Proposed Action*

36 Only a small segment of the canal-lining project would occur in the planning area, and air  
37 quality from construction is the only resource that would potentially contribute to a cumulative  
38 impact. Both the proposed action and the canal-lining project would result in construction-  
39 related air quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive  
40 emissions from both projects would be mobile and intermittent and would be cumulatively *less*

1 *than significant.* The proposed action would result in a significant, potentially unavoidable,  
2 impact from increased PM<sub>10</sub> emissions, and if construction associated with the proposed action  
3 and canal-lining project occurred at the same general time and in the same general location,  
4 fugitive dust emissions would be cumulatively *significant.*

#### 5 ***Lower Colorado River Boundary and Capacity Preservation Project***

##### 6 *Project Description*

7 The Lower Colorado River Boundary and Capacity Preservation Project is proposed by the  
8 USIBWC. The project is located along the Limitrophe Division of the Colorado River, the 23.7  
9 mile “international segment” of the Colorado River. This portion of the river serves as the  
10 border between the United States (State of Arizona) and Mexico (State of Baja California del  
11 Norte). The study area begins west of Yuma, Arizona, at the NIB, the northernmost point  
12 where the river begins to serve as the international boundary and continues south to the SIB,  
13 just west of San Luis, Arizona, where the Colorado River flows south into Mexico. The study  
14 area includes Morelos Diversion Dam, which is south of the NIB. The project would include  
15 measures to preserve and stabilize the international boundary and improve flood control of the  
16 channel, as well as long-term operations and maintenance activities. The project may also  
17 include clearing a 100-foot wide path upstream and downstream of the centerline of the cable  
18 on the United States side of the cable crossing approximately 1.1 mile upstream of Morelos  
19 Diversion Dam. This would affect 72,000 square feet in the United States.

##### 20 *Project’s Environmental Analysis Status and Anticipated Impacts*

21 The Draft EIS for this project is expected to be completed by early 2005. The USIBWC, assisted  
22 by the Corps, is preparing the EIS and will evaluate specific options for three related actions:

- 23 • The preservation and stability of the international boundary between the U.S. and  
24 Mexico.
- 25 • Enhancement of the channel’s carrying capacity so it provides flood carrying capacity of  
26 140,000 cfs and a pilot channel with a capacity of 15,000 cfs.
- 27 • Maintenance activities to ensure that channel capacity and boundary stability are  
28 retained in the future.

29 In addition to the required “no action alternative,” the EIS will evaluate four alternatives that  
30 incorporate various pilot channel routes and designs between the levees, each of which would  
31 become the new international boundary and provide the required flood protection.  
32 Alternatives will also consider raising the levees in certain locations along the Limitrophe  
33 Division.

34 The environmental impacts of the project may include loss of vegetation and associated wildlife  
35 habitat between the river levees as a result of clearing for the pilot channel. The extent of that  
36 impact will depend on the actual route of the channel, which is now being developed. Other  
37 impacts could include air quality impacts since the project construction area is located in a PM<sub>10</sub>  
38 non-attainment area and the project would include a significant amount of construction, and  
39 other construction-related impacts on aesthetics, hazards, geology and soils, and water quality.

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1 *Cumulative Impacts with the Proposed Action*

2 Both the proposed action and the USIBWC project would result in construction-related air  
3 quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions from  
4 both projects would be mobile and intermittent and would be cumulatively less than  
5 significant. The proposed action would result in a significant, potentially unavoidable, impact  
6 from increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and  
7 IBWC project occurred at the same general time and in the same general location, fugitive dust  
8 emissions would be cumulatively *significant*.

9 Both projects would have the potential for impacts on aquatic and terrestrial biological  
10 resources, but these would be cumulatively *less than significant* because the impacts of the  
11 proposed action would be temporary and localized and would not cause substantial adverse  
12 changes to vegetation or wildlife communities along the LCR. The extent to which long-term  
13 impacts on biological resources would occur as a result of the USIBWC project is not known at  
14 this time, but the long-term impacts of the proposed action would be beneficial and would not  
15 contribute to a cumulative impact in combination with the development project.

16 Both projects would result in construction-related short-term disturbances to aesthetics, but  
17 these would be *cumulatively less than significant* because they would be temporary and localized.  
18 The USIBWC project could result in long-term visual changes to the LCR, but the proposed  
19 action would have long-term beneficial aesthetic impacts and would not contribute to a  
20 cumulative impact in combination with the development project.

21 Both projects would result in increased ambient noise levels during construction, but impacts  
22 would be *cumulatively less than significant* because noise impacts are highly localized, and  
23 impacts would be temporary, lasting only for the duration of the construction. Both the  
24 proposed action and the USIBWC project likely would have only minor, short-term, and  
25 localized impacts on hazards, geology and soils, and water quality, and the impact would be  
26 *cumulatively less than significant*.

27 *Nevada Division of State Lands Floating Docks*

28 *Project Description*

29 This project would involve the replacement of a dock system and ramps for private use near the  
30 Regency Casino property near Laughlin in Clark County, Nevada. In order to protect property  
31 from erosion from heavy flows in the early 1980s, Clark County Public Works, the State of  
32 Nevada, and Reclamation cooperated in the emergency placement of several jetties and riprap  
33 protection along the developed portion of the LCR in the project area and subsequently the  
34 dock system was constructed.

35 *Project's Environmental Analysis Status and Anticipated Impacts*

36 No environmental documentation has been prepared for this project. Impacts likely would be  
37 construction related, including impacts on aesthetics, biological resources, air quality, hazards  
38 (due to the use of hazardous materials during construction), water quality (due to the use of  
39 hazardous materials during construction), and geology and soils. Long-term aesthetic impacts

1 may also occur. The permit issued by the Corps of Engineers, however, requires compliance  
2 with applicable water quality standards (including compliance with Section 404 of the Clean  
3 Water Act); minimization of adverse impacts on wildlife; the institution of measures to cover  
4 exposed foam floatation on the dock to avoid degradation due to wave action or fauna;  
5 avoidance of toxic pollutants in discharged dredge material; and the implementation of erosion  
6 avoidance measures.

#### 7 *Cumulative Impacts with the Proposed Action*

8 Both the proposed action and the floating docks project would result in construction-related air  
9 quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive emissions from  
10 both projects would be mobile and intermittent and would be cumulatively *less than significant*.  
11 The proposed action would result in a significant, potentially unavoidable, impact from  
12 increased PM<sub>10</sub> emissions, and if construction associated with the proposed action and floating  
13 docks project occurred at the same general time and in the same general location, fugitive dust  
14 emissions would be cumulatively *significant*.

15 Both projects would have the potential for impacts on aquatic and terrestrial biological  
16 resources, but these would be cumulatively *less than significant* because the impacts of the  
17 proposed action would be temporary and localized and would not cause substantial adverse  
18 changes to vegetation or wildlife communities along the LCR. Additionally, the Corps permit  
19 would require the implementation of measures that would minimize adverse impacts on  
20 wildlife.

21 Both projects would result in construction-related short-term disturbances to aesthetic  
22 resources, but these would be *less than significant* since they would be temporary and localized.  
23 Since the floating docks project would involve the replacement of existing docks and ramps, it  
24 would not result in long-term aesthetic impacts and no long-term cumulative impacts would  
25 occur. The proposed action and the floating docks project would have only minor, short-term,  
26 and localized construction-related impacts on hazards, geology and soils, and water quality,  
27 and the cumulative impact would be *less than significant*.

#### 28 *South Point/Calpine Cogeneration Plant*

##### 29 *Project Description*

30 This project would involve the long-term lease of Fort Mojave Indian Reservation lands in  
31 Mohave County, Arizona to Calpine for the development of the Southpoint Power Plant. The  
32 power plant would be a natural gas fired, 500 megawatt, combined cycle power facility on a  
33 320-acre site. The Southpoint Power Plant project would use water withdrawn from the LCR  
34 and piped to the plant in a buried pipeline. Two onsite wells would provide a backup water  
35 supply. The project would require up to 4,000 af of water per year. Wastewater produced by  
36 the plant would be piped for disposal to a lined evaporation pond. Approximately 94 af of  
37 water per year would be piped to the pond to evaporate. A similarly lined 3-acre interim  
38 storage pond would also be constructed as part of the project. Stormwater would be retained in  
39 on-site retention basins approximately 30 acres in size. Approximately 212 acres of the site  
40 would remain undeveloped and would serve as a buffer surrounding the power plant.

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1 *Project's Environmental Analysis Status and Anticipated Impacts*

2 A Final EIS for the Southpoint Power Plant project was issued by the BIA in January of 1999.  
3 Significant but mitigable impacts were identified for the project's preferred alternative for  
4 transportation (increased traffic on County Route 227 and State Route 95 during construction);  
5 air resources (construction and plant operational activities); and community infrastructure  
6 (hazardous materials and fire protection response capabilities).

7 *Cumulative Impacts with the Proposed Action*

8 Both the proposed action and the cogeneration plant project would result in construction-  
9 related air quality impacts from increased combustive and PM<sub>10</sub> emissions. Combustive  
10 emissions from both projects would be mobile and intermittent and would be *cumulatively less*  
11 *than significant*. The proposed action would result in a significant, potentially unavoidable,  
12 impact from increased PM<sub>10</sub> emissions, and if construction associated with the proposed action  
13 and the cogeneration plant project occurred at the same general time and in the same general  
14 location, fugitive dust emissions would be *cumulatively significant*. The cogeneration plant  
15 would have long-term air quality impacts, but the proposed action would have only  
16 intermittent impacts associated with maintenance activities spread over a wide area, and long-  
17 term cumulative air quality impacts would not occur.

18 The proposed action would result in minor, temporary, and localized transportation impacts,  
19 and no cumulative impact would occur.

20 Impacts related to hazardous materials would be *cumulatively less than significant* since impacts  
21 of the proposed action would be temporary and minor and impacts of both would be localized.  
22 The proposed action would not impact fire protection response capabilities, and no cumulative  
23 impacts would occur.

24 **4.3 IMPACTS BY RESOURCE**

25 This section provides a summary of the potential cumulative impacts, organized by resource  
26 area, which would result from the implementation of the proposed action and the projects  
27 analyzed above. Mitigation measures to reduce significant impacts are also identified.

28 **4.3.1 Aesthetics**

29 No significant cumulative impacts would result from implementation of the proposed action in  
30 combination with the projects described above. *Cumulatively less than significant* construction-  
31 related impacts would result from the proposed action and other projects since they would be  
32 short-term, localized, and would not result in substantial adverse aesthetic changes. While the  
33 development projects would result in visual changes to the character of the LCR through the  
34 development of open space, the proposed action would result in overall long-term beneficial  
35 aesthetic impacts. Therefore, no long-term adverse cumulative impacts would result from the  
36 implementation of the proposed action in combination with the development projects. Long-  
37 term impacts of the proposed action would be *cumulatively beneficial* in combination with other  
38 restoration projects since a more natural appearance would be restored to the affected lands.

1 **4.3.2 Agricultural Resources**

2 The proposed action may result in the conversion Important Farmland to other land cover  
3 types, and other projects also could affect agricultural resources. For example, the changes in  
4 points of diversion of up to 1.574 mafy of Colorado River could result in long-term fallowing of  
5 agricultural land, the YEW project would result in the conversion of farmland to other uses (400  
6 acres), the Mayflower Park Improvements and Expansion project would convert 65 acres of  
7 Important Farmland, the PVID project would result in less than significant impacts on  
8 agricultural uses, and the Needles Highway Improvement project would disrupt tribal  
9 agricultural activities. The impact would, however, be *cumulatively less than significant* because  
10 the total amount of farmland that could be affected is not substantial compared to the overall  
11 amount available in the planning area. Assuming the proposed action converted 8,132 acres, a  
12 total of 8,597 acres would be converted in the planning area or approximately 3.8 percent of the  
13 total Important Farmland in the planning area. Moreover, these impacts would be offset by the  
14 implementation of a number of tribal farmland development/irrigation projects described in  
15 section 4.2.1, including the (1) CRIT plan to bring an additional 25,000 acres into agricultural  
16 production should Congress appropriate adequate funds; (2) Fort Mojave Tribe plan to fully  
17 develop its farmland, which would increase farmed acreage by approximately 3,745 acres; (3)  
18 the Chemehuevi Tribe plan to irrigate up to 1,855 acres of agricultural land; (4) Fort Yuma  
19 Agency plan to irrigate 650 acres of agricultural land; and the (5) Cocopah Tribe plan to irrigate  
20 three agricultural sites, totaling 500 acres.

21 **4.3.3 Air Quality**

22 *Cumulatively significant* impacts associated with PM<sub>10</sub> and NO<sub>x</sub> emissions could occur if the  
23 proposed action were implemented at the same time and in the same general location as other  
24 projects requiring construction or controlled burns. These impacts would be at least partially  
25 mitigable through the implementation of the mitigation measures listed below; however,  
26 residual, *cumulatively significant and unavoidable* impacts could occur since these measures may  
27 not adequately reduce impacts below the significance thresholds identified in this EIS/EIR.

28 **C-AQ-1** One or more of the following measures shall be implemented as standard operating  
29 practices to minimize fugitive dust (PM<sub>10</sub>) emissions during construction activities.

- 30 1. Comply with applicable local and state rules that regulate proposed sources of  
31 fugitive dust.
- 32 2. Apply water or other dust palliatives to areas where vehicles and equipment  
33 perform ground-disturbing activities on dry soil.
- 34 3. Reduce dust from dirt roads used by project equipment with the use of pavement,  
35 gravel, water, or non-toxic soil stabilizers.
- 36 4. Increase water applications or reduce ground-disturbing activities as wind speeds  
37 increase. Curtail ground-disturbing activities when sustained wind speeds exceed  
38 25 miles per hour.
- 39 5. Minimize the amount of disturbed area.

- 1           6. Cover inactive soil stockpiles or treat them with soil binders, such as crusting
- 2           agents or water them to keep moist.
- 3           7. Cover trucks that haul soils or fine aggregate materials.
- 4           8. Clean dirt from construction vehicle tires and undercarriages when leaving the
- 5           construction site and before entering local roadways.
- 6           9. Sweep streets near the construction area at the end of the day if soil track-out
- 7           occurs on these roadways.
- 8           10. Designate personnel to monitor dust control program activities to ensure that they
- 9           effectively minimize fugitive dust emissions.

10 **C-AQ-2** A smoke management plan shall be implemented for all construction and  
11 maintenance activities involving the use of fire.

12 **C-AQ-3** Implementation of Best Available Control Technology (BACT) measures will be  
13 implemented to minimize operational impacts from the Southpoint Power Plant  
14 project.

#### 15 **4.3.4 Biological Resources**

16 The proposed action could result in construction-related, less than significant impacts on most  
17 biological resources, although some impacts associated with backwater creation would be  
18 significant but mitigable, as would impacts on common and sensitive native fish species in the  
19 Virgin and Muddy rivers. Other projects also could result in temporary, construction-related  
20 impacts on biological resources. The combined impacts of these projects generally would be  
21 *cumulatively less than significant* since the impacts of all projects would be temporary and  
22 localized and would not cause substantial adverse changes to vegetation or wildlife  
23 communities along the LCR. To the extent that other projects affected native fish species along  
24 the Virgin and Muddy rivers, impacts could be *cumulatively significant but mitigable to less than*  
25 *significant*.

26 While the development projects could result in long-term impacts on biological resources  
27 through the development of open space, the proposed action would result in overall long-term  
28 beneficial impacts on biological resources. Therefore, no long-term, adverse cumulative  
29 impacts would result from the implementation of the proposed action in combination with the  
30 development projects. Moreover, *cumulatively beneficial* biological impacts would result from  
31 the proposed action in combination with other restoration projects. The proposed action would  
32 establish 8,132 acres of conservation area with native plant community restoration, and a  
33 number of other projects also would result in native vegetation and aquatic habitat restoration,  
34 including the Mittry Lake Emergency Stabilization Project (475 acres), Mittry Lake Hazardous  
35 Fuels Reduction and Riparian Restoration Project (80 acres), YEW (1,400 acres), YWW (145  
36 acres), Clark County HSHCP (100,000 acres), and the Cocopah Tribe River Restoration Project  
37 (unknown acreage). Additionally, as described in section 4.2.4, a number of other conservation  
38 and restoration projects are ongoing in the planning area.

39 Mitigation measures for significant cumulative impacts on native species in the Virgin and  
40 Muddy rivers are as follows:

1 **C-BIO-1** Design site-specific land cover type establishment plans to avoid and minimize  
2 potential effects on sensitive native fish habitats along the Virgin and Muddy rivers.  
3 Preparation of the design plans shall be coordinated with and approved by the  
4 Service as part of section 7 consultation. If appropriate, design plans shall include  
5 measures to rehabilitate any affected habitat.

6 **4.3.5 Cultural and Historic Resources**

7 *Cumulatively significant* impacts could occur because the proposed action could result in  
8 significant impacts on cultural resources, as could the Riverfront project and possibly other  
9 projects requiring ground disturbance, such as the construction of water conservation measures  
10 associated with the changes in points of diversion of up to 1.574 mafy of Colorado River water.  
11 These impacts would be *mitigable to less than significant* through the implementation of the  
12 following measures.

13 **C-CULT-1:** One or more of the following mitigation measures shall be implemented:

- 14 1. Consult with the appropriate SHPO(s), tribes, and other interested parties, perform  
15 archival research, interview informants, and conduct cultural resource inventories  
16 during site-specific environmental review to identify any cultural resources that may be  
17 affected. Consult with geologists, geomorphologists, and/or geophysicists to determine  
18 if there are areas that may contain buried cultural deposits and to determine the  
19 appropriate methods/techniques for locating these. Implement subsurface exploration  
20 activities as a part of the inventory and identification program.
- 21 2. Evaluate all identified cultural resources for potential listing on the NRHP or state or  
22 local registers with respect to applicable criteria and appropriate historic themes,  
23 research questions, and data requirements as identified in regional, local, and/or project  
24 specific historic contexts.
- 25 3. Modify project design, if feasible, to avoid cultural resources found eligible for listing on  
26 the national, state, or local registers.
- 27 4. When required (i.e., in California), consult with the SHPO, tribes, and other interested  
28 parties to develop and implement, prior to construction, a "Testing and Evaluation  
29 Plan" if "potentially significant" archaeological sites cannot be avoided through project  
30 redesign.
- 31 5. If an archaeological site eligible for listing on the national, state, or local registers of  
32 historic places cannot be avoided through project redesign, in consultation with the  
33 appropriate SHPO, tribes, and other interested parties, develop and implement a Data  
34 Recovery Plan. If the eligible property is a building or structure, consult with the  
35 appropriate SHPO and other interested parties, and document the resource to the agreed  
36 to standards.
- 37 6. Develop a Cultural Resources Construction Monitoring Plan prior to construction if  
38 ground disturbance would occur within any areas of potential archaeological sensitivity.
- 39 7. In the event of an unanticipated cultural resource discovery during construction, re-  
40 direct construction to other areas until the discovery has been documented by a  
41 qualified archaeologist and its potential significance evaluated in terms of applicable

1 criteria. Resources considered significant would be avoided or subject to a testing and  
2 evaluation program and/or a data recovery program as described above.

3 8. If the project has the potential to discover or otherwise result in the excavation of Native  
4 American cultural items on Federal or tribal lands, then the appropriate Federal agency  
5 or agencies will initiate consultation with any known lineal descendants and relevant  
6 Indian tribes as per the Native American Graves Protection and Repatriation Act  
7 (NAGPRA). Consultation would identify, among other things, procedures that would  
8 be followed in the event that project-related activities resulted in the excavation or  
9 discovery of Native American human remains on Federal or tribal lands. If cultural  
10 resources or human remains were discovered on non-Federal or non-tribal lands, state  
11 and local laws would be followed.

12 9. Procedures that would be identified under item 8, above, would be incorporated into all  
13 archaeological testing and data recovery plans and the Cultural Resources Construction  
14 Monitoring Plan as appropriate.

#### 15 4.3.6 Energy and Depletable Resources

16 The proposed action would require only minor consumption of energy and depletable  
17 resources and would not adversely affect hydropower production. Cumulative impacts would  
18 be minor.

#### 19 4.3.7 Environmental Justice

20 The proposed action would result in environmental justice impacts associated with air quality  
21 and noise emissions and the loss of agricultural jobs. Impacts associated with air quality and  
22 noise emissions would be short-term and localized (with the exception of impacts associated  
23 with noise from pumps, which would be ongoing, but highly localized, affecting only those  
24 persons in the immediate vicinity). Noise impacts from individual projects could, however,  
25 disproportionately affect low income and minority populations. These impacts would be  
26 *mitigable* through implementation of **Mitigation Measures C-EJ-1 and C-EJ-2**.

27 Air quality-related impacts could be short-term but could cumulatively disproportionately  
28 affect low income and minority populations if construction occurred in the same geographic  
29 area at the same time. Implementation of **Mitigation Measures C-AQ-1, C-AQ-2, and C-AQ-3**,  
30 identified in section 4.3.3, would reduce cumulative impacts, but those associated with fugitive  
31 dust could be *substantial* on a temporary basis.

32 A number of projects considered in the cumulative impact analysis could result in the loss of  
33 agricultural jobs, including the proposed action, which could convert up to 8,132 acres of  
34 agricultural land to other land cover types; the changes in points of diversion of up to 1.574  
35 mafy of Colorado River water, which could result in long-term fallowing; the YEW project,  
36 which would result in the conversion of 400 acres of farmland to other uses; and the Mayflower  
37 Park Improvements and Expansion project, which would convert 65 acres of Important  
38 Farmland. To some extent, this could be offset by the tribal farmland and irrigation projects  
39 described in section 4.2.1, including the (1) CRIT plan to bring an additional 25,000 acres into  
40 agricultural production should Congress appropriate adequate funds; (2) Fort Mojave Tribe  
41 plan to fully develop its farmland, which would increase farmed acreage by approximately

1 3,745 acres; (3) the Chemehuevi Tribe plan to irrigate up to 1,855 acres of agricultural land; (4)  
2 Fort Yuma Agency plan to irrigate 650 acres of agricultural land; and the (5) Cocopah Tribe plan  
3 to irrigate three agricultural sites, totaling 500 acres. The potential still exists, however, for  
4 disproportionate cumulative impacts on minority and low-income populations from the loss of  
5 agricultural jobs. This impact would be *mitigable* through the implementation of **Mitigation**  
6 **Measure C-EJ-3**.

7 **C-EJ-1** When construction occurs sufficiently close to noise-sensitive receptors so that noise  
8 from construction activities exceeds local regulatory standards or causes a substantial  
9 increase in ambient noise levels, one or more of the following measures shall be  
10 implemented. This list does not preclude the use of additional mitigation measures if  
11 appropriate.

- 12 • Use hydraulically or electrically powered impact tools when possible. If the use of  
13 pneumatically powered tools is unavoidable, use an exhaust muffler on the  
14 compressed air exhaust.
- 15 • Install manufacturer's standard noise control devices, such as mufflers, on  
16 construction equipment.
- 17 • Locate stationary equipment as far as possible from noise-sensitive receptors.
- 18 • Notify nearby property users whenever extremely noisy work might occur.
- 19 • Use stockpiles as noise barriers when feasible.
- 20 • Keep idling of construction equipment to a minimum (no more than 30 minutes)  
21 when not in use.
- 22 • Install temporary or portable acoustic barriers around stationary construction  
23 noise sources.
- 24 • As appropriate, modify noise enclosures with acoustical louvers, baffle walls,  
25 and/or acoustical panels.
- 26 • Whenever possible, limit construction activities to non-mating, non-nesting  
27 seasons of noise-sensitive species.

28 **C-EJ-2** If pumps cannot be located at sufficient distances from sensitive receptors to avoid the  
29 exceedance of a local noise standard or a substantial increase in the ambient noise level  
30 at the sensitive receptors, then barriers or enclosures shall be constructed to ensure  
31 adherence to local standards.

32 **C-EJ-3** The lead agencies shall work with local jurisdictions and/or growers to ensure that  
33 agricultural workers are notified as soon as possible of the potential for a loss of jobs  
34 once specific project locations have been identified. They will encourage the local  
35 jurisdictions and/or growers to provide timely information and assistance to  
36 agricultural workers regarding the availability of alternative employment.

1 **4.3.8 Hazards and Hazardous Materials**

2 No significant cumulative impacts associated with hazards or hazardous materials were  
3 identified. Impacts would be minor and localized, and impacts would be *cumulatively less than*  
4 *significant*.

5 **4.3.9 Hydrology and Water Quality**

6 No significant cumulative impacts associated with hydrology and water quality were identified.  
7 Impacts of the proposed action would be minor and localized and would not contribute to a  
8 cumulative impact in combination with the impacts of other projects.

9 **4.3.10 Indian Trust Assets**

10 The proposed action could affect ITAs, but none of the projects described above have identified  
11 impacts on ITAs; therefore, no cumulative impacts would occur.

12 **4.3.11 Land Use**

13 No significant cumulative impacts would result from the implementation of the proposed  
14 action in combination with the projects described above. The proposed action would result in  
15 the change of undeveloped or agricultural land to other land cover types, but the Conservation  
16 Plan would be implemented in a manner that was consistent with local zoning ordinances and  
17 general plan requirements and thus would not contribute to an adverse cumulative impact.

18 **4.3.12 Noise**

19 No significant cumulative impacts associated with noise were identified. Noise from the  
20 proposed action would be highly localized, and impacts from construction would be short-  
21 term. Since noise impacts from the proposed action and other projects would be unlikely to  
22 occur in the same time and at the same location, and the proposed action would avoid  
23 developed areas, impacts would be *cumulatively less than significant*.

24 **4.3.13 Population and Housing**

25 No significant cumulative impacts would result from the implementation of the proposed  
26 action in combination with the projects described above. The proposed action would not affect  
27 population or housing and thus would not contribute to a cumulative impact.

28 **4.3.14 Public Utilities and Services**

29 No significant cumulative impacts would result from the implementation of the proposed  
30 action in combination with the projects described above. The proposed action would have  
31 negligible impacts on public utilities and services and would not contribute to a significant  
32 cumulative impact in combination with other projects.

1 **4.3.15 Recreation**

2 *Cumulatively less than significant* impacts would result from the implementation of the proposed  
3 action in combination with the projects described above. The proposed action would result in a  
4 minor loss of recreational opportunities. The Riverfront project also would have impacts on  
5 recreational resources from the increased use of the LCR. This increased use from the creation  
6 of 34 residences would not result in a significant cumulative impact on recreational resources in  
7 combination with the proposed action, particularly in light of the large amount of area available  
8 for recreational activities along the river. Some projects, such as the YWW and Mittry Lake  
9 Emergency Stabilization and Rehabilitation Project, would result in long-term beneficial  
10 impacts on recreational resources. Short-term loss of access to the recreational resources of  
11 Mittry Lake from the latter project would not contribute to a cumulative impact in combination  
12 with the proposed action since they likely would not overlap in time.

13 **4.3.16 Socioeconomics**

14 The proposed action would result in the loss of agricultural jobs and revenue and could result  
15 in a reduction in property and sales tax, as well. Similar impacts could result from other  
16 projects, identified in section 4.3.2, that would result in the conversion of agricultural land to  
17 other uses. The amount of jobs and taxes affected by these projects would be minor in  
18 comparison to the overall regional economy. The Farmland Development/Construction of  
19 Irrigation Systems project could result in increased agricultural employment opportunities, and  
20 could increase sales tax revenues to the extent that products related to agricultural uses were  
21 purchased. Other urban development projects could result in increased property and sales tax  
22 revenues and could create other employment opportunities. The adverse cumulative  
23 socioeconomic impacts of these projects would not be substantial.

24 **4.3.17 Topography, Geology, Soils, and Mineral Resources**

25 *Cumulatively less than significant* impacts would result from the implementation of the proposed  
26 action in combination with the projects described above. Impacts of the projects considered  
27 would be short-term and localized and would not contribute to a significant cumulative impact.

28 **4.3.18 Transboundary Impacts**

29 The proposed action could result in temporary fugitive dust emissions and intermittent  
30 combustive emissions. These air emissions would last only for the duration of the construction  
31 or maintenance activity and would dissipate as the distance from the construction site  
32 increased. The portion of Mexico that is near Reach 7 is in agricultural use and is sparsely  
33 populated. Thus, sensitive receptors would not be adversely affected by these air emissions.  
34 Over the long-term, to the extent that agricultural land is converted to other land cover types,  
35 emissions would be reduced since fields would no longer be plowed. The proposed action  
36 would not result in substantial adverse impacts on Mexico. The Lower Colorado River  
37 Boundary and Capacity Preservation Project could result in air quality impacts, but cumulative  
38 impacts would only occur if construction activities of both projects took place at the same time  
39 near Mexico. Cumulative impacts would not be substantial because the portion of Mexico that  
40 is near Reach 7 is in agricultural use and is sparsely populated and because impacts would be  
41 temporary.

1 **4.3.19 Transportation**

2 No significant cumulative impacts would result from the implementation of the proposed  
3 action in combination with the projects described above. Transportation impacts of the  
4 proposed action would be minor, short-term, and localized and would be unlikely to occur in  
5 the same location at the same time as those of other projects.

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## 5.0 SUMMARY COMPARISON OF ALTERNATIVES

### 5.1 COMPARATIVE DESCRIPTION OF ALTERNATIVES AND EFFECTS

NEPA requires a comparative analysis of project alternatives to provide the basis for the choice that is to be made by the decisionmaker and to define the issues for the public (40 C.F.R. section 1502.14). CEQA similarly requires a comparison of the alternatives with the proposed project (14 C.C.R. section 15126.6[d]). This section compares the alternatives that have been analyzed in this EIS/EIR. The comparison of impacts is summarized in Table 5.1-1, located at the end of this chapter. Section 5.2 compares the action alternatives to no action.

The proposed action (Alternative 1) has the potential to cause impacts to environmental resources, as described in Chapter 3. Many of these potential impacts would be caused by construction activities, such as grading required to establish the proper topography for growing riparian vegetation or to develop backwaters and marsh land cover. Once the habitat has been established, ongoing maintenance activities would not significantly impact most resources. Potential construction-related temporary and less than significant impacts have been identified for aesthetics, biological resources, hazards and hazardous materials, hydrology, geology, and transportation. Construction also could result in significant impacts to agricultural resources, air quality, biological resources (associated with backwater creation), cultural resources, and noise. Additionally, construction would result in temporary environmental justice impacts (associated with air quality and noise) and transboundary impacts (associated with air quality). It also could result in long-term changes to ITAs. Mitigation measures have been identified that would reduce most of the potential significant impacts to a less than significant level. (Impacts to aesthetics, hazards and hazardous materials, hydrology, ITAs, geology, transboundary impacts, and transportation do not require mitigation, nor do some impacts to air quality and biological resources.) Depending on the characteristics of specific conservation sites and construction methods implemented, there may be significant temporary impacts to air quality and associated impacts to environmental justice that cannot be avoided.

Potential impacts that may result from the maintenance and monitoring of the conservation sites after construction is completed and from implementing other conservation measures are either less than significant or can be mitigated to be less than significant, with the exception of air quality impacts from the largest prescribed burns and associated environmental justice impacts.

No significant long-term operational impacts have been identified for the proposed action with the exception of potential noise impacts from pump operation and associated environmental justice impacts. The potential long-term effects to agricultural resources, land use, environmental justice, and socioeconomics would be less than significant. Furthermore, the proposed action would result in long-term beneficial impacts on biological resources, aesthetics, and water quality.

The no action alternative (Alternative 2) is assumed to include many of the same conservation measures as the proposed action. These measures would be implemented on a case-by-case basis as required to mitigate the effects of covered actions that are undertaken by the various agencies. Although the construction, maintenance, and operation of these individual

1 conservation projects have the potential to cause impacts that are similar to those of the  
2 proposed action, there would be differences in the scope of those impacts. In the absence of a  
3 coordinated conservation program, the individual conservation projects are likely to be smaller  
4 and more widely scattered. It also is likely that conservation would focus only on listed species,  
5 thus reducing the total amount of conservation area that would be created.

6 These factors may reduce the effects on agricultural resources, land use, environmental justice  
7 (loss of agricultural jobs), and socioeconomics below those caused by the proposed action.  
8 However, there would likely be similar levels of impacts to aesthetics, air quality, cultural  
9 resources, and transportation. The potential for significant air quality and associated  
10 environmental justice impacts would still exist, even with adoption of mitigation measures,  
11 depending on the location and size of the conservation projects. Although less than significant,  
12 impacts would likely be greater than those caused by the proposed action for hazards and  
13 hazardous materials and noise because of the increased number of individual projects involved  
14 and the greater likelihood that the conservation sites would be located closer to developed areas  
15 near existing facilities used in implementing the covered actions. The no action alternative  
16 could include conservation in the off-site conservation areas. To the extent that this occurred,  
17 short-term impacts on environmental justice associated with air quality and noise, ITAs, and  
18 transboundary impacts would be reduced because these impacts would not occur in the off-site  
19 areas.

20 More importantly, the no action alternative would provide fewer benefits to biological  
21 resources, along with reduced benefits to aesthetics and water quality. In the absence of a  
22 coordinated program with the capacity to develop large blocks of conservation area, the  
23 multiple individual mitigation sites that would be developed under this alternative would be  
24 smaller, with greater edge areas proportionate to their size, and are less likely to be located in  
25 proximity to existing occupied habitat. These factors would reduce the effectiveness of the  
26 mitigation sites as compared to the conservation measures in the proposed action.  
27 Furthermore, the absence of a coordinated monitoring and adaptive management program for  
28 the individual projects would reduce their likelihood of success in providing the benefits for the  
29 biological resources that would result from the program proposed for the LCR MSCP. Impacts  
30 to native fish species along the Virgin and Muddy rivers also could occur under this alternative,  
31 however, which would represent a greater impact to biological resources than identified for the  
32 proposed action.

33 Overall, under the no action alternative, the short-term, construction-related impacts are  
34 potentially greater, while the permanent agricultural and associated environmental justice  
35 impacts and biological, aesthetic, and water quality benefits are potentially less than those of the  
36 proposed action.

37 The listed species only alternative (Alternative 3) would require the construction of a smaller  
38 amount of conservation area, reducing the short-term, construction-related impacts from the  
39 levels that would be caused by the proposed action. Unlike the no action alternative, the  
40 construction of the conservation projects would still be a coordinated effort, focusing on  
41 creating large size patches of integrated mosaics of vegetation. This approach would likely  
42 involve fewer construction sites than would be required under the proposed action, but there  
43 would still be the potential for significant unmitigable impacts to air quality and related

1 environmental justice impacts, depending on the location and size of the sites. Other  
2 construction-related, short-term impacts would likely be less than those identified for the  
3 proposed action. Effects on agricultural resources, land use, environmental justice (from noise  
4 and loss of agricultural jobs), and socioeconomics would also likely be less since fewer acres of  
5 existing agricultural land would be subject to conversion for conservation area use. As with the  
6 proposed action, these effects would be less than significant. However, this alternative would  
7 not provide the same level of long-term, beneficial impacts to biological and aesthetic resources  
8 and water quality that are provided by the proposed action.

9 The off-site conservation alternative (Alternative 4) differs from the proposed action in the  
10 location, but not the quantity, of the riparian and mesquite habitat that would be created. As a  
11 result, the scope of short-term, construction-related impacts would be similar to those identified  
12 for the proposed action, although transboundary and ITA impacts would not occur, and the  
13 potential for short-term environmental justice impacts associated with air quality and noise and  
14 long-term impacts associated with noise would be greatly lessened. The potential for  
15 significant, unmitigable impacts to air quality remains, although the California air quality  
16 standards would not be applicable to this alternative since none of the conservation areas for  
17 riparian or marsh land cover types would be created in California. The environmental justice  
18 impacts associated with noise and air quality would not occur in the off-site conservation areas  
19 since the percentage of low-income and minority populations in these locations is less than in  
20 the larger community of comparison; they would be associated only with the creation of 360  
21 acres of backwaters. Effects to agricultural resources, land use, environmental justice (loss of  
22 agricultural jobs), and socioeconomics would be similar to the proposed action, and less than  
23 significant. Potential impacts to ITAs would be greatly lessened under this alternative because  
24 they are not present in the off-site conservation areas, and impacts would occur only in the  
25 areas where the 360 acres of backwaters would be created.

26 This alternative would provide the same long-term benefits to biological resources, aesthetic  
27 resources, and water quality as the proposed action, but it has the potential to cause significant  
28 unavoidable short- and long-term impacts to biological resources that are present at off-site  
29 conservation areas (native common and sensitive fish inhabiting the Virgin and Muddy rivers)  
30 that are not present in the planning area. These potential short- and long-term impacts to  
31 biological resources offset the difference between this alternative and the proposed action with  
32 respect to short-term air quality and associated environmental justice impacts, as well as  
33 environmental impacts associated with noise since this impact would be feasibly mitigable.  
34 Alternative 4 would not result in transboundary impacts, but these are impacts that would  
35 occur in a different location than those of the proposed action; they are not different types of  
36 impacts. Alternative 4 also would not result in impacts to ITAs (with the exception of potential  
37 impacts from backwater creation), but these, too, are feasibly mitigable.

## 38 **5.2 COMPARISON OF THE NO ACTION ALTERNATIVE AND ACTION** 39 **ALTERNATIVES**

40 As described in section 2.1.2, under the no action alternative (Alternative 2), the covered  
41 activities described in the LCR MSCP BA and LCR MSCP HCP would likely be implemented,  
42 but regulatory compliance would be required and applied on a case-by-case basis as each action

## 5.0 Summary Comparison of Alternatives

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1 is considered and approved. In the absence of a comprehensive, coordinated conservation  
2 program, the following would be expected:

- 3 • It is unlikely that funding would be provided to maintain existing habitat that is not  
4 impacted by the individual projects.
- 5 • The individual project mitigation programs likely would not provide the regional  
6 wildfire suppression and law enforcement funding proposed in the Conservation Plan.
- 7 • Coordinated monitoring and adaptive management programs would not be  
8 implemented.
- 9 • Since each individual project would establish its own mitigation sites, it is likely that  
10 more maintenance and storage facilities would be required.
- 11 • More, smaller mitigation sites would be established, requiring more infrastructure  
12 (access roads and irrigation pipelines/canals and pump facilities).
- 13 • To the extent that the agencies undertaking the covered activities proceed with ESA  
14 compliance, there may be a reduced number of covered species because unlisted species  
15 likely would not be included.

16 Thus, the no action alternative would not result in a continuation of existing conditions. Its  
17 impacts generally would be similar to those of the action alternatives because similar  
18 conservation measures likely would be implemented, and differences in impacts typically  
19 would be a matter of degree rather than kind. Table 5.2-1, which follows Table 5.1-1 at the end  
20 of this chapter, compares the magnitude of the impacts of the action alternatives to those of no  
21 action. In general, the impacts that are directly associated with the amount of conservation area  
22 established (including beneficial impacts) would be comparable to those of Alternative 3 and  
23 less than those of Alternatives 1 and 4.

24 The no action alternative would result in similar types of construction-related impacts as the  
25 action alternatives. In some cases, the intensity of the impact would be comparable to  
26 Alternative 3 and less than under Alternatives 1 and 4 (e.g., short-term aesthetic impacts to  
27 conservation area establishment sites; impacts from erosion). In other cases (e.g., air quality,  
28 noise), short-term impacts would be greater because the lack of a comprehensive, coordinated  
29 effort could result in more, smaller projects, and the need to develop more infrastructure and  
30 support facilities. As noted above, this may reduce the effects to agricultural resources, land  
31 use, environmental justice (loss of agricultural jobs) and socioeconomics below those caused by  
32 the proposed action and Alternative 4 (off-site conservation).

33 Beneficial impacts to aesthetic resources and water quality would be less than under  
34 Alternatives 1 and 4 because a smaller amount of conservation area would be created and  
35 comparable to those of Alternative 3 because similar amounts of conservation area would be  
36 created. Beneficial impacts to biological resources that are directly linked to the amount of  
37 conservation area created would be less than under Alternatives 1 and 4 and comparable to  
38 Alternative 3. Beneficial impacts of all action alternatives to biological resources would be  
39 reduced under the no action alternative because funding would not be provided to maintain  
40 existing habitat that is not impacted by the individual projects, regional wildfire suppression

1 and law enforcement funding likely would not be provided, and coordinated monitoring and  
2 adaptive management programs would not be implemented.

3 Long-term noise from pump operation could be slightly greater than under the proposed action  
4 and Alternative 4 because conservation measures would be more likely to be implemented  
5 closer to developed areas and approximately equal to those of Alternative 3.

6 The no action alternative could include conservation in the off-site conservation areas. To the  
7 extent that this occurred, short-term impacts on environmental justice associated with air  
8 quality and noise, ITAs, and transboundary impacts identified for Alternatives 1 and 3 would  
9 be reduced because these impacts would not occur in the off-site areas. Impacts to native fish  
10 species along the Virgin and Muddy rivers could occur under this alternative, as is the case for  
11 Alternative 4. This would represent a greater impact to biological resources than identified for  
12 Alternatives 2 or 3.

### 13 **5.3 ENVIRONMENTALLY PREFERRED ALTERNATIVE**

14 Both NEPA and CEQA require identification of the environmentally preferred (or  
15 environmentally superior) alternative. This section discusses the comparisons of the potential  
16 effects of the alternatives.

17 As discussed above, each of the alternatives would have the potential to cause short-term,  
18 construction-related impacts to many of the resources analyzed in this EIS/EIR. Although these  
19 potential impacts may be less for Alternatives 2 (no action), and 3 (listed species only), they can  
20 be mitigated to less than significant levels for all of the alternatives, except for the potential  
21 impacts to air quality and associated environmental justice impacts. Some impacts would not  
22 occur or would be reduced under Alternatives 2 and 4 because ITAs are not present in the off-  
23 site conservation areas, and transboundary impacts and environmental justice impacts  
24 associated with noise and air quality would not occur as a result of construction in these off-site  
25 areas. These impacts would all be feasibly mitigable with the exception of air quality-related  
26 impacts, as noted above. Depending on the location and size of conservation project sites, there  
27 may be significant air quality impacts that cannot be mitigated to a less than significant level,  
28 and this potential exists for each alternative, although the associated environmental justice  
29 impacts would be greatly reduced under Alternative 4, and the transboundary impacts would  
30 be avoided. To the extent that conservation occurred in the off-site conservation areas as part of  
31 Alternative 2, these impacts would be reduced or avoided as well.

32 Similarly, each of the alternatives could cause long-term impacts through ongoing maintenance  
33 of created habitat. These impacts would be less than significant for each alternative, with the  
34 exception of air quality impacts from prescribed burns, which could be unavoidable for the  
35 largest burns. The effects to agricultural resources, land use, environmental justice, and  
36 socioeconomics would be less for Alternatives 2 and 3, although environmental justice impacts  
37 associated with noise and air quality could be lessened under Alternative 2 to the extent that  
38 conservation occurred in the off-site conservation areas. Alternatives 2 and 3, however, would  
39 not provide the same level of long-term biological, aesthetic, or water quality benefits as the  
40 proposed action or Alternative 4 (off-site conservation). These long-term benefits would offset  
41 the less than significant short-term effects to other resources. Alternative 4, like Alternative 2,  
42 would potentially cause greater biological impacts than the proposed action, which would

## 5.0 Summary Comparison of Alternatives

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1 offset the equal benefit that it would provide to these resources. These long-term biological  
2 beneficial impacts would outweigh the short-term air quality and environmental justice impacts  
3 and the feasibly mitigable environmental justice impact associated with noise from pumps that  
4 would be avoided under Alternative 4.

5 Overall, most of the short-term, construction-related impacts that would potentially occur  
6 under each alternative can be mitigated to less than significant levels. The potentially  
7 significant air quality impacts would exist for all the alternatives and do not provide a basis for  
8 distinguishing between them, although short-term air quality impacts associated with  
9 environmental justice would be lessened under Alternative 4, and transboundary impacts,  
10 which are not considered substantial impacts, would not occur. The long-term impacts, with  
11 the implementation of the mitigation measures identified in this EIS/EIR, would similarly be  
12 less than significant for all the alternatives. The primary difference between the alternatives lies  
13 with the level of benefit that is provided to the biological resources. Both Alternatives 1 and 4  
14 provide the same level of benefit, but Alternative 4 poses the potential for short- and long-term  
15 impacts to endangered fish species that inhabit the Virgin and Muddy rivers where the off-site  
16 conservation projects would be sited. Therefore, Alternative 1 is the environmentally preferred  
17 alternative.

Table 5.1-1. Comparison of Impacts of Project Alternatives

| <i>Impacts of the Proposed Action (Alternative 1)</i>   | MAGNITUDE OF IMPACTS OF PROJECT ALTERNATIVES COMPARED TO THE PROPOSED ACTION <sup>1</sup> |  |  |
|---|---|--|--|
|   | <i>Alternative 2<br/>No Action</i>  | <i>Alternative 3<br/>Listed Species<br/>Only</i> | <i>Alternative 4<br/>Off-Site<br/>Conservation</i> |
| AESTHETICS  |   |  |  |
| AESTH-1: Construction/maintenance activities would temporarily lessen the visual quality of the conservation area establishment sites located on or near visually sensitive resources ( <i>less than significant impact</i> ).  | =   | <  | =  |
| AESTH-2: The construction of field facilities and fish-rearing facilities could be required, which could alter the visual quality of the selected sites ( <i>less than significant impact</i> ).  | >   | =  | =  |
| AESTH-3: Conservation area establishment would return sites to a more natural appearance ( <i>beneficial impact</i> ).  | <   | <  | =  |
| AGRICULTURAL RESOURCES  |   |  |  |
| AG-1: Important Farmland could be converted to a nonagricultural use ( <i>less than significant impact</i> ).   | <   | <  | =  |
| AG-2: Waterfowl attracted to established backwaters and marshes could destroy crops grown on adjacent farmland ( <i>less than significant impact</i> ).   | =   | =  | =  |
| AG-3: Runoff from established conservation areas could alter the slopes of adjoining laser-leveled fields ( <i>significant impact</i> ).  | <   | <  | =  |
| AG-4: Covered species attracted to established conservation areas could disperse to other lands within the planning area ( <i>less than significant impact</i> ).   | <   | <  | =  |
| AIR QUALITY   |   |  |  |
| AQ-1: The use of fossil fuel-fired construction equipment during construction, maintenance, and operational activities would result in intermittent combustive emissions that would not violate any air quality standard or contribute substantially to an existing or projected air quality violation ( <i>less than significant impact</i> ). | =   | <  | =  |
| AQ-2: The development of the largest projects would produce fugitive dust emissions that could exceed an ambient 24-hour PM10 standard ( <i>significant impact</i> ).   | =   | <  | =  |
| AQ-3: Emissions from the largest prescribed burns during terrestrial vegetation establishment or maintenance activities would produce emissions that could contribute to an exceedance of an ambient 24-hour PM10 standard ( <i>significant impact</i> ).   | =   | <  | =  |
| AQ-4: Air emissions from proposed conservation area establishment activities and facility construction could exceed the MDAQMD daily NO <sub>x</sub> or PM10 emission significance thresholds, which would result in a cumulatively considerable net increase of a nonattainment pollutant ( <i>significant impact</i> ).                       | =   | <  | Not<br>Applicable                                  |

**Table 5.1-1. Comparison of Impacts of Project Alternatives (continued)**

| Impacts of the Proposed Action (Alternative 1)   | ACTION <sup>1</sup>        |   |   |
|--|----------------------------|---|---|
|  | Alternative 2<br>No Action | Alternative 3<br>Listed Species<br>Only | Alternative 4<br>Off-Site<br>Conservation |
| AIR QUALITY (CONTINUED)  |                            |   |   |
| AQ-5: Air emissions from the proposed conservation area establishment activities would not expose sensitive receptors to substantial pollutant concentrations ( <i>less than significant impact</i> ).   | =                          | <                                       | =   |
| AQ-6: Air emissions from the proposed conservation area establishment activities would not create objectionable odors that affect a substantial number of people ( <i>less than significant impact</i> ).  | =                          | <                                       | =   |
| BIOLOGICAL RESOURCES <sup>2</sup>  |                            |   |   |
| BIO-1: Issuance of the section 10(a)(1)(B) permit would authorize the incidental take of up to 27 covered species from implementation of both the covered activities and the Conservation Plan ( <i>less than significant impact</i> ).  | Not<br>Applicable          | <                                       | =   |
| BIO-2: The establishment of 7,260 acres of cottonwood-willow and honey mesquite land cover would increase the extent of cottonwood-willow riparian forest and mesquite woodland sensitive communities ( <i>beneficial</i> ).   | <                          | <                                       | =   |
| BIO-3: Clearing, grading, planting, and site maintenance during conversion of agricultural lands to cottonwood-willow and/or honey mesquite land cover types would result in the elimination of existing low value habitat used by resident and migratory wildlife, removal of weedy vegetation and crops, alteration of habitat characteristics through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ). | <                          | <                                       | =   |
| BIO-4: Clearing, grading, planting, and site maintenance during conversion of undeveloped lands (primarily saltcedar) to cottonwood-willow and/or honey mesquite land cover types would result in the elimination of existing non-native vegetation and the habitat it provides for wildlife, short-term effects on habitat characteristics from alteration of local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).      | <                          | <                                       | =   |
| BIO-5: Clearing, grading, planting, and site maintenance during establishment of marsh would result in the long-term elimination of existing vegetation and the habitat it provides for wildlife, alteration of habitat conditions through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).   | <                          | <                                       | =   |
| BIO-6: Clearing, grading, and site maintenance during establishment of backwaters would result in the long-term elimination of existing vegetation and the habitat it provides for wildlife, alteration of habitat conditions through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant or significant short-term impacts; beneficial long-term impacts</i> ).   | <                          | <                                       | =   |
| BIO-7: Maintenance of established habitats would result in the removal of invasive non-native vegetation, alteration of habitat characteristics through changes in local hydrology, and short-term elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; less than significant or beneficial long-term impacts</i> ).  | <                          | <                                       | =   |

**Table 5.1-1. Comparison of Impacts of Project Alternatives (continued)**

| Impacts of the Proposed Action (Alternative 1)  | ACTION <sup>1</sup>        |   |   |
|---|----------------------------|---|---|
|   | Alternative 2<br>No Action | Alternative 3<br>Listed Species<br>Only | Alternative 4<br>Off-Site<br>Conservation |
| BIOLOGICAL RESOURCES <sup>2</sup>   |                            |   |   |
| BIO-8: Population enhancement activities for covered fish and bird species could adversely affect existing individuals or populations of covered or sensitive species ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).  | <                          | <                                       | =   |
| BIO-9: Native land cover type establishment and maintenance could temporarily affect wetlands and waters of the U.S. ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).   | <                          | <                                       | =   |
| CULTURAL AND HISTORIC RESOURCES   |                            |   |   |
| CULT-1: Disturbance of the ground surface could directly or indirectly disturb or destroy significant archaeological or historical resources, particularly in undeveloped or previously undisturbed areas ( <i>significant impact</i> ).                  | =                          | <                                       | =   |
| CULT-2: Cultural resources may be affected by unauthorized artifact collection during construction or by a lack of awareness of cultural resource mitigation measures on the part of construction personnel ( <i>significant impact</i> ).                | =                          | <                                       | =   |
| ENERGY AND DEPLETABLE RESOURCES   |                            |   |   |
| Minor impact associated with use of diesel fuel and electrical power during construction and operations. Negligible impact to hydropower production due to consumptive use of water for conservation areas.   | =                          | =                                       | =   |
| ENVIRONMENTAL JUSTICE   |                            |   |   |
| EJ-1: Significant, short-term air quality impacts from construction activities and prescribed burns in or near agricultural areas could result in disproportionate impacts to minority and low-income populations.  | < <sup>3</sup>             | <                                       | < <sup>3</sup>                            |
| EJ-2: Noise from construction and pumps that exceeded local standards could disproportionately affect minority and low-income populations.  | < <sup>3</sup>             | <                                       | < <sup>3</sup>                            |
| EJ-3: If agricultural land were converted to conservation areas, the loss of agricultural jobs would disproportionately affect minority and low-income populations.   | <                          | <                                       | =   |
| HAZARDS AND HAZARDOUS MATERIALS   |                            |   |   |
| HAZ-1: The use of pesticides, lubricants, fuels, and other hazardous materials during construction, operations, and maintenance could result in localized spills, which could create a hazard to the environment ( <i>less than significant impact</i> ). | >                          | <                                       | =   |
| HAZ-2: The increase in riparian and backwater areas could result in an increase in vectors ( <i>less than significant impact</i> ).   | >                          | <                                       | =   |
| HAZ-3: Construction activities could cause wildfires ( <i>less than significant impact</i> ).   | >                          | <                                       | =   |
| HAZ-4: Fire used as a construction and maintenance tool could escape control and become a wildland fire ( <i>less than significant impact</i> ).  | <                          | <                                       | =   |

**Table 5.1-1. Comparison of Impacts of Project Alternatives (continued)**

| Impacts of the Proposed Action (Alternative 1)   | ACTION <sup>1</sup>        |   |   |
|--|----------------------------|---|---|
|  | Alternative 2<br>No Action | Alternative 3<br>Listed Species<br>Only | Alternative 4<br>Off-Site<br>Conservation |
| HAZARDS AND HAZARDOUS MATERIALS  |                            |   |   |
| HAZ-5: Conservation area establishment actions implemented within an Accident Potential Zone of an airport or near a private airstrip could cause a comparatively minor increase in bird populations ( <i>less than significant impact</i> ).  | <                          | <                                       | Not<br>Applicable                         |
| HYDROLOGY AND WATER QUALITY  |                            |   |   |
| HYDRO-1: Habitat installation activities could result in erosion-induced siltation ( <i>less than significant impact</i> ).  | <                          | <                                       | =   |
| HYDRO-2: Habitat establishment could have a short-term adverse effect to water quality if irrigation mobilized (released) pesticides, salts, or other contaminants ( <i>less than significant impact</i> ).  | <                          | <                                       | =   |
| HYDRO-3: Water quality in created or restored backwaters and marshes could be affected by increasing concentrations of various naturally occurring and man-made chemicals (both in the soil and the water column) that result from evaporation of water ( <i>less than significant impact</i> ). | =                          | =                                       | =   |
| HYDRO-4: Conservation area establishment would result in a long-term improvement to water quality if agricultural land were used ( <i>beneficial impact</i> ).   | <                          | <                                       | =   |
| INDIAN TRUST ASSETS  |                            |   |   |
| ITA-1: Implementing conservation measures on tribal land could result in changes to all classes of ITAs.   | < <sup>4</sup>             | <                                       | < <sup>4</sup>                            |
| LAND USE   |                            |   |   |
| No significant impacts specific to land use were identified, although significant land use conflicts were identified in the agricultural resources and noise analyses (Impacts AG-3, AG-4, NOI-1, and NOI-2).  | <                          | <                                       | =   |
| NOISE  |                            |   |   |
| NOI-1: Construction activities could cause a temporary, substantial increase in ambient noise levels that could exceed local standards if construction occurred in proximity to noise-sensitive receptors ( <i>significant impact</i> ).   | >                          | <                                       | =   |
| NOI-2: Pumps located near noise-sensitive receptors could cause a substantial increase in ambient noise levels or exceed regulatory thresholds ( <i>significant impact</i> ).  | >                          | <                                       | =   |
| POPULATION AND HOUSING   |                            |   |   |
| No impact on population or housing.  | =                          | =                                       | =   |

Table 5.1-1. Comparison of Impacts of Project Alternatives (continued)

| Impacts of the Proposed Action (Alternative 1)   | ACTION <sup>1</sup>        |   |   |
|--|----------------------------|---|---|
|  | Alternative 2<br>No Action | Alternative 3<br>Listed Species<br>Only | Alternative 4<br>Off-Site<br>Conservation |
| PUBLIC SERVICES AND UTILITIES  |                            |   |   |
| Minimal impacts to water treatment, storm drainage, and water supply from the potential construction and operation of two field facilities. Minor impacts to landfill capacity from construction and operations. | =                          | =                                       | =   |
| RECREATION   |                            |   |   |
| REC-1: The implementation of certain conservation measures could result in the loss of recreational opportunities ( <i>less than significant impact</i> ).   | <                          | <                                       | =   |
| SOCIOECONOMICS   |                            |   |   |
| SOC-1: Agricultural jobs would be lost if agricultural land were converted to conservation areas.  | <                          | <                                       | =   |
| SOC-2: Agricultural-related revenue would be lost if agricultural land were converted to conservation areas.   | <                          | <                                       | =   |
| SOC-3: Local property tax revenues could be reduced if privately owned land were leased or acquired by the Federal or state participants in the LCR MSCP.  | <                          | <                                       | =   |
| SOC-4: Local sales tax from the purchase of products related to agricultural uses would be reduced if privately owned agricultural land were placed in public ownership.   | <                          | <                                       | =   |
| TOPOGRAPHY, GEOLOGY, SOILS, AND MINERAL RESOURCES  |                            |   |   |
| GEO-1: Activities associated with conservation area establishment could result in erosion-induced siltation of the Colorado River ( <i>less than significant impact</i> ).                                       | <                          | <                                       | =   |
| TRANSBOUNDARY IMPACTS  |                            |   |   |
| TRANS-1: PM10 and combustive emissions from the construction and maintenance of created conservation areas in Reach 7 could disperse to Mexico.  | < <sup>5</sup>             | <                                       | Not<br>Applicable                         |
| TRANSPORTATION   |                            |   |   |
| Minor impact from construction traffic.  | =                          | =                                       | =   |

**Table 5.1-1. Comparison of Impacts of Project Alternatives (continued)**

| <i>Impacts of the Proposed Action (Alternative 1)</i>   | ACTION <sup>1</sup>                |  |  |
|---|------------------------------------|--|--|
|   | <i>Alternative 2<br/>No Action</i> | <i>Alternative 3<br/>Listed Species<br/>Only</i> | <i>Alternative 4<br/>Off-Site<br/>Conservation</i> |
| <p>1 &lt; Impact is less than the proposed action.<br/>                     &gt; Impact is greater than the proposed action.<br/>                     = Impact is equal to the proposed action.</p> <p>2 Impacts BIO-9 and BIO-10 are not included here since they are not impacts of the proposed action and would only occur in the off-site alternative areas (under Alternatives 2 and 4).</p> <p>3 Air quality and noise impacts would not disproportionately affect minority and low-income populations in the off-site conservation areas. Under Alternative 2, these impacts would occur only to the extent that conservation measures were implemented in the planning area. Under Alternative 4, impacts would be associated only with the creation of 360 acres of backwaters along the LCR.</p> <p>4 No tribal lands or ITAs are present in any of the off-site conservation areas. Under Alternative 2, these impacts would occur only to the extent that conservation measures were implemented in the planning area. Under Alternative 4, impacts would be associated only with the creation of 360 acres of backwaters along the LCR.</p> <p>5 Transboundary impacts would not occur in any of the off-site conservation areas because these sites are not sufficiently close to Mexico. Under Alternative 2, these impacts would occur only to the extent that conservation measures were implemented in the planning area. Under Alternative 4, no transboundary impacts would occur because no construction would occur in Reach 7 of the LCR.</p> |                                    |  |  |

Table 5.2-1. Comparison of Project Alternatives to No Action

| Impacts of No Action (Alternative 2)  | MAGNITUDE OF IMPACTS OF PROJECT ALTERNATIVES COMPARED TO NO ACTION <sup>1</sup> |   |   |
|---|---|---|---|
|   | Alternative 1<br>Proposed<br>Action   | Alternative 3<br>Listed Species<br>Only | Alternative 4<br>Off-Site<br>Conservation |
| AESTHETICS  |   |   |   |
| AESTH-1: Construction/maintenance activities would temporarily lessen the visual quality of the conservation area establishment sites located on or near visually sensitive resources ( <i>less than significant impact</i> ).  | >   | =                                       | >   |
| AESTH-2: The construction of field facilities and fish-rearing facilities could be required, which could alter the visual quality of the selected sites ( <i>less than significant impact</i> ).  | <   | <                                       | <   |
| AESTH-3: Conservation area establishment would return sites to a more natural appearance ( <i>beneficial impact</i> ).  | >   | =                                       | >   |
| AGRICULTURAL RESOURCES  |   |   |   |
| AG-1: Important Farmland could be converted to a nonagricultural use ( <i>less than significant impact</i> ).   | >   | =                                       | >   |
| AG-2: Waterfowl attracted to established backwaters and marshes could destroy crops grown on adjacent farmland ( <i>less than significant impact</i> ).   | =   | =                                       | =   |
| AG-3: Runoff from established conservation areas could alter the slopes of adjoining laser-leveled fields ( <i>significant impact</i> ).  | >   | =                                       | >   |
| AG-4: Covered species attracted to established conservation areas could disperse to other lands within the planning area ( <i>less than significant impact</i> ).   | >   | =                                       | >   |
| AIR QUALITY   |   |   |   |
| AQ-1: The use of fossil fuel-fired construction equipment during construction, maintenance, and operational activities would result in intermittent combustive emissions that would not violate any air quality standard or contribute substantially to an existing or projected air quality violation ( <i>less than significant impact</i> ). | =   | <                                       | =   |
| AQ-2: The development of the largest projects would produce fugitive dust emissions that could exceed an ambient 24-hour PM10 standard ( <i>significant impact</i> ).   | =   | <                                       | =   |
| AQ-3: Emissions from the largest prescribed burns during terrestrial vegetation establishment or maintenance activities would produce emissions that could contribute to an exceedance of an ambient 24-hour PM10 standard ( <i>significant impact</i> ).   | =   | <                                       | =   |
| AQ-4: Air emissions from proposed conservation area establishment activities and facility construction could exceed the MDAQMD daily NO <sub>x</sub> or PM10 emission significance thresholds, which would result in a cumulatively considerable net increase of a nonattainment pollutant ( <i>significant impact</i> ).                       | =   | <                                       | Not<br>Applicable                         |
| AQ-5: Air emissions from the proposed conservation area establishment activities would not expose sensitive receptors to substantial pollutant concentrations ( <i>less than significant impact</i> ).  | =   | <                                       | =   |

**Table 5.2-1. Comparison of Project Alternatives to No Action (continued)**

| Impacts of No Action (Alternative 2)   | MAGNITUDE OF IMPACTS OF PROJECT ALTERNATIVES COMPARED TO NO ACTION <sup>1</sup> |   |   |
|--|---|---|---|
|  | Alternative 1<br>Proposed<br>Action   | Alternative 3<br>Listed Species<br>Only | Alternative 4<br>Off-Site<br>Conservation |
| AIR QUALITY  |   |   |   |
| AQ-6: Air emissions from the proposed conservation area establishment activities would not create objectionable odors that affect a substantial number of people ( <i>less than significant impact</i> ).  | =   | <                                       | =   |
| BIOLOGICAL RESOURCES <sup>2</sup>  |   |   |   |
| BIO-2: The establishment of 7,260 acres of cottonwood-willow and honey mesquite land cover would increase the extent of cottonwood-willow riparian forest and mesquite woodland sensitive communities ( <i>beneficial</i> ).   | >   | =                                       | >   |
| BIO-3: Clearing, grading, planting, and site maintenance during conversion of agricultural lands to cottonwood-willow and/or honey mesquite land cover types would result in the elimination of existing low value habitat used by resident and migratory wildlife, removal of weedy vegetation and crops, alteration of habitat characteristics through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ). | >   | =                                       | >   |
| BIO-4: Clearing, grading, planting, and site maintenance during conversion of undeveloped lands (primarily saltcedar) to cottonwood-willow and/or honey mesquite land cover types would result in the elimination of existing non-native vegetation and the habitat it provides for wildlife, short-term effects on habitat characteristics from alteration of local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).      | >   | =                                       | >   |
| BIO-5: Clearing, grading, planting, and site maintenance during establishment of marsh would result in the long-term elimination of existing vegetation and the habitat it provides for wildlife, alteration of habitat conditions through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).   | >   | =                                       | >   |
| BIO-6: Clearing, grading, and site maintenance during establishment of backwaters would result in the long-term elimination of existing vegetation and the habitat it provides for wildlife, alteration of habitat conditions through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant or significant short-term impacts; beneficial long-term impacts</i> ).   | >   | =                                       | >   |
| BIO-7: Maintenance of established habitats would result in the removal of invasive non-native vegetation, alteration of habitat characteristics through changes in local hydrology, and short-term elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; less than significant or beneficial long-term impacts</i> ).  | >   | =                                       | >   |

Table 5.2-1. Comparison of Project Alternatives to No Action (continued)

| Impacts of No Action (Alternative 2)  | MAGNITUDE OF IMPACTS OF PROJECT ALTERNATIVES COMPARED TO NO ACTION <sup>1</sup> |   |   |
|---|---|---|---|
|   | Alternative 1<br>Proposed<br>Action   | Alternative 3<br>Listed Species<br>Only | Alternative 4<br>Off-Site<br>Conservation |
| BIOLOGICAL RESOURCES  |   |   |   |
| BIO-8: Population enhancement activities for covered fish and bird species could adversely affect existing individuals or populations of covered or sensitive species ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).  | =   | =                                       | =   |
| BIO-9: Native land cover type establishment and maintenance could temporarily affect wetlands and waters of the U.S ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).  | >   | =                                       | >   |
| BIO-10: Land cover type establishment and maintenance activities could result in periodic short-term impacts on sensitive and common native fishes inhabiting the Virgin and Muddy rivers ( <i>less than significant impact</i> ).                        | Not<br>Applicable   | Not<br>Applicable                       | =   |
| BIO-11: Construction to establish/enhance native land cover types could result in the long-term loss or degradation of sensitive native fish habitats in the Virgin and Muddy rivers ( <i>significant impact</i> ).                                       | Not<br>Applicable   | Not<br>Applicable                       | =   |
| CULTURAL AND HISTORIC RESOURCES   |   |   |   |
| CULT-1: Disturbance of the ground surface could directly or indirectly disturb or destroy significant archaeological or historical resources, particularly in undeveloped or previously undisturbed areas ( <i>significant impact</i> ).                  | =   | <                                       | =   |
| CULT-2 Cultural resources may be affected by unauthorized artifact collection during construction or by a lack of awareness of cultural resource mitigation measures on the part of construction personnel ( <i>significant impact</i> ).                 | =   | <                                       | =   |
| ENERGY AND DEPLETABLE RESOURCES   |   |   |   |
| Minor impact associated with use of diesel fuel and electrical power during construction and operations. Negligible impact to hydropower production due to consumptive use of water for conservation areas.   | =   | =                                       | =   |
| ENVIRONMENTAL JUSTICE   |   |   |   |
| EJ-1: Significant, short-term air quality impacts from construction activities and prescribed burns in or near agricultural areas could result in disproportionate impacts to minority and low-income populations. <sup>3</sup>                           | =   | =                                       | < <sup>3</sup>                            |
| EJ-2: Noise from construction and pumps that exceeded local standards could disproportionately affect minority and low-income populations. <sup>3</sup>   | <   | =                                       | < <sup>3</sup>                            |
| EJ-3: If agricultural land were converted to conservation areas, the loss of agricultural jobs would disproportionately affect minority and low-income populations.   | >   | =                                       | >   |
| HAZARDS AND HAZARDOUS MATERIALS   |   |   |   |
| HAZ-1: The use of pesticides, lubricants, fuels, and other hazardous materials during construction, operations, and maintenance could result in localized spills, which could create a hazard to the environment ( <i>less than significant impact</i> ). | <   | <                                       | <   |

**Table 5.2-1. Comparison of Project Alternatives to No Action (continued)**

| <i>Impacts of No Action (Alternative 2)</i>  | MAGNITUDE OF IMPACTS OF PROJECT ALTERNATIVES COMPARED TO NO ACTION <sup>1</sup> |  |  |
|--|---|--|--|
|  | <i>Alternative 1 Proposed Action</i>  | <i>Alternative 3 Listed Species Only</i> | <i>Alternative 4 Off-Site Conservation</i> |
| HAZARDS AND HAZARDOUS MATERIALS  |   |  |  |
| HAZ-2: The increase in riparian and backwater areas could result in an increase in vectors ( <i>less than significant impact</i> ).  | <   | <  | <  |
| HAZ-3: Construction activities could cause wildfires ( <i>less than significant impact</i> ).  | <   | =  | <  |
| HAZ-4: Fire used as a construction and maintenance tool could escape control and become a wildland fire ( <i>less than significant impact</i> ).   | >   | <  | >  |
| HAZ-5: Conservation area establishment actions implemented within an Accident Potential Zone of an airport or near a private airstrip could cause a comparatively minor increase in bird populations ( <i>less than significant impact</i> ).  | >   | <  | Not Applicable                             |
| HYDROLOGY AND WATER QUALITY  |   |  |  |
| HYDRO-1: Habitat establishment activities could result in erosion-induced siltation ( <i>less than significant impact</i> ).   | >   | =  | >  |
| HYDRO-2: Habitat establishment could have a short-term adverse effect to water quality if irrigation mobilized (released) pesticides, salts, or other contaminants ( <i>less than significant impact</i> ).  | >   | =  | >  |
| HYDRO-3: Water quality in created or restored backwaters and marshes could be affected by increasing concentrations of various naturally occurring and man-made chemicals (both in the soil and the water column) that result from evaporation of water ( <i>less than significant impact</i> ). | =   | =  | =  |
| HYDRO-4: Conservation area establishment would result in a long-term improvement to water quality if agricultural land were used ( <i>beneficial impact</i> ).   | >   | =  | >  |
| INDIAN TRUST ASSETS  |   |  |  |
| ITA-1: Implementing conservation measures on tribal land could result in changes to all classes of ITAs. <sup>4</sup>  | >   | =  | < <sup>3</sup>                             |
| LAND USE   |   |  |  |
| No significant impacts specific to land use were identified, although significant land use conflicts were identified in the agricultural resources and noise analyses (Impacts AG-3, AG-4, NOI-1, and NOI-2).  | >   | =  | >  |
| NOISE  |   |  |  |
| NOI-1: Construction activities could cause a temporary, substantial increase in ambient noise levels that could exceed local standards if construction occurred in proximity to noise-sensitive receptors ( <i>significant impact</i> ).   | <   | =  | <  |
| NOI-2: Pumps located near noise-sensitive receptors could cause a substantial increase in ambient noise levels or exceed regulatory thresholds ( <i>significant impact</i> ).  | <   | =  | <  |

Table 5.2-1. Comparison of Project Alternatives to No Action (continued)

| Impacts of No Action (Alternative 2)   | MAGNITUDE OF IMPACTS OF PROJECT ALTERNATIVES COMPARED TO NO ACTION <sup>1</sup> |   |   |
|--|---|---|---|
|  | Alternative 1<br>Proposed<br>Action   | Alternative 3<br>Listed Species<br>Only | Alternative 4<br>Off-Site<br>Conservation |
| POPULATION AND HOUSING   |   |   |   |
| No impact on population or housing.  | =   | =                                       | =   |
| PUBLIC SERVICES AND UTILITIES  |   |   |   |
| Minimal impacts to water treatment, storm drainage, and water supply from the potential construction and operation of two field facilities. Minor impacts to landfill capacity from construction and operations. | =   | =                                       | =   |
| RECREATION   |   |   |   |
| REC-1: The implementation of certain conservation measures could result in the loss of recreational opportunities ( <i>less than significant impact</i> ).   | >   | =                                       | >   |
| SOCIOECONOMICS   |   |   |   |
| SOC-1: Agricultural jobs would be lost if agricultural land were converted to conservation areas.  | >   | =                                       | >   |
| SOC-2: Agricultural-related revenue would be lost if agricultural land were converted to conservation areas.   | >   | =                                       | >   |
| SOC-3: Local property tax revenues could be reduced if privately owned land were leased or acquired by the Federal or state participants in the LCR MSCP.  | >   | =                                       | >   |
| SOC-4: Local sales tax from the purchase of products related to agricultural uses would be reduced if privately owned agricultural land were placed in public ownership.   | >   | =                                       | >   |
| TOPOGRAPHY, GEOLOGY, SOILS, AND MINERAL RESOURCES  |   |   |   |
| GEO-1: Activities associated with conservation area establishment could result in erosion-induced siltation of the Colorado River ( <i>less than significant impact</i> ).                                       | >   | =                                       | >   |
| TRANSBOUNDARY IMPACTS  |   |   |   |
| TRANS-1: PM10 and combusive emissions from the construction and maintenance of created conservation areas in Reach 7 could disperse to Mexico. <sup>5</sup>  | >   | =                                       | Not<br>Applicable                         |
| TRANSPORTATION   |   |   |   |
| Minor impact from construction traffic.  | =   | =                                       | =   |

**Table 5.2-1. Comparison of Project Alternatives to No Action (continued)**

| <i>Impacts of No Action (Alternative 2)</i>  | MAGNITUDE OF IMPACTS OF PROJECT ALTERNATIVES COMPARED TO NO ACTION <sup>1</sup> |  |  |
|--|---|--|--|
|  | <i>Alternative 1<br/>Proposed<br/>Action</i>                                    | <i>Alternative 3<br/>Listed Species<br/>Only</i> | <i>Alternative 4<br/>Off-Site<br/>Conservation</i> |
| 1 < Impact is less than the proposed action.<br>> Impact is greater than the proposed action.<br>= Impact is equal to the proposed action.   |   |  |  |
| 2 Impact BIO-1 is not applicable to the No Action Alternative because no section 10(a)(1)(B) permit would be issued and the take associated with the permit would not occur.   |   |  |  |
| 3 Air quality and noise impacts would not disproportionately affect minority and low-income populations in the off-site conservation areas. Under Alternative 2, these impacts would occur only to the extent that conservation measures were implemented in the planning area. Under Alternative 4, impacts would be associated only with the creation of 360 acres of backwaters along the LCR.    |   |  |  |
| 4 No tribal lands or ITAs are present in any of the off-site conservation areas. Under Alternative 2, these impacts would occur only to the extent that conservation measures were implemented in the planning area. Under Alternative 4, impacts would be associated only with the creation of 360 acres of backwaters along the LCR.   |   |  |  |
| 5 Transboundary impacts would not occur in any of the off-site conservation areas because these sites are not sufficiently close to Mexico. Under Alternative 2, these impacts would occur only to the extent that conservation measures were implemented in the planning area. Under Alternative 4, no transboundary impacts would occur because no construction would occur in Reach 7 of the LCR. |   |  |  |

## 6.0 OTHER SECTIONS REQUIRED BY NEPA AND/OR CEQA

### 6.1 GROWTH-INDUCING IMPACTS

Both NEPA and CEQA require consideration of indirect impacts of an action, including growth-inducing impacts. CEQ regulations (section 1508.8[b]) provide guidance to Federal agencies for evaluating indirect effects:

Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

State CEQA Guidelines section 15126.2(d) gives the most specific guidance for assessing growth-inducing impacts, stating that an EIR must discuss the ways in which a project could:

- foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment;
- remove obstacles to population growth;
- require the construction of new community facilities that could cause significant environmental effects; or
- encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively.

The Conservation Plan would not foster economic growth or the construction of additional housing, nor would it create new job opportunities. Rather, as discussed in section 3.16.2.1, agricultural jobs and revenue could be lost if agricultural lands were used for the establishment of conservation areas. The implementation of the proposed action would not remove an obstacle to growth since no major infrastructure would be constructed, nor would any existing conditions that prevent growth be altered by the proposed action. New access roads and irrigation infrastructure would be sized and positioned to serve only the conservation areas or new field or fish rearing facilities. The Conservation Plan also would not require new community facilities. It is anticipated that one new law enforcement officer and one new wildland fire fighter would be provided, respectively, for every 5,000 and 2,500 acres of conserved land not already in public ownership. All new personnel would be stationed at existing facilities. Additionally, the Conservation Plan includes a number of provisions that would minimize the potential impacts from wildland fires and thus would not require the expansion of fire protection services by other agencies.

As described under the no action alternative (section 2.1.2), the covered activities likely would be implemented whether or not the Conservation Plan were carried forward. Thus, no other aspects of the proposed action would encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively.

The proposed action would not have growth-inducing impacts, nor would the other action alternatives, since they involve the implementation of a Conservation Plan with the same

1 general elements as the proposed action and would differ only with regard to the location and  
2 amount of conservation area established.

3 **6.2 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM**  
4 **PRODUCTIVITY**

5 NEPA (40 CFR 1502.16) requires that an EIS include a discussion of the relationship between the  
6 short-term uses of man's environment and the maintenance and enhancement of long-term  
7 productivity. All of the alternatives would result in the long-term use of the environment for  
8 conservation area establishment. Construction of this habitat could result in short-term impacts  
9 to resources such as aesthetics, air quality, biological resources, energy, hazards, hydrology and  
10 water quality, noise, and geology. With the exception of construction-related impacts  
11 associated with air quality, including environmental justice impacts under Alternatives 1, 2, and  
12 3, these impacts are found to be less than significant or would be mitigated to less than  
13 significant through the implementation of measures identified in this EIS/EIR. Long-term  
14 adverse impacts would be associated with the potential conversion of agricultural land to other  
15 land cover types, along with concomitant socioeconomic and environmental justice impacts.  
16 Additionally, Alternative 4 could result in significant but mitigable impacts to sensitive native  
17 fish habitat along the Virgin and Muddy rivers. To the extent that agricultural lands were  
18 converted to other land cover types, the economic productivity of these lands would be lost, but  
19 these effects are not significant.

20 The Conservation Plan would result in long-term benefits to biological resources, as well as  
21 more modest benefits to aesthetics and water quality. The proposed action would result in the  
22 creation of 7,260 acres of cottonwood-willow and honey mesquite land cover type, which would  
23 increase the extent of cottonwood-willow and mesquite woodland sensitive communities. The  
24 proposed action also would result in the establishment of 512 acres of marsh and 360 acres of  
25 backwaters. These actions would represent a beneficial impact for vegetation as well as for the  
26 covered and non-covered wildlife species using these habitat types. Expansion of native plant  
27 communities would provide habitat for native species, including species whose populations  
28 have declined due to loss or degradation of habitat, and help to restore the natural ecosystems  
29 that these communities can support. The establishment of additional habitat would allow  
30 population expansion for these species, a beneficial impact. The level of disturbance to wildlife  
31 by agricultural workers and machinery would be reduced. In addition, the conversion of  
32 agricultural land to riparian land cover types would lessen the input of sediment, salts,  
33 nutrients, and agricultural chemicals to the river, improving water quality and aquatic habitat  
34 conditions. The establishment of riparian vegetation along an expanded portion of the river  
35 would provide increased shading, water filtration, and nutrient and pollutant uptake,  
36 improving water quality and aquatic habitat conditions downstream. Establishing native plant  
37 communities would aid in soil stabilization, a benefit for micro-organisms and invertebrates  
38 that live in the soil as well as vertebrates that burrow in the ground. Irrigation that mimics  
39 natural hydrologic regimes would also benefit native ground-dwelling species adapted to those  
40 conditions.

41 Aesthetic benefits would result from returning conservation sites to a more natural appearance.  
42 Implementation of the Conservation Plan would establish and maintain over 8,100 acres of land  
43 that are currently in agricultural production or undeveloped land that is characterized by

1 invasive, non-native species. The proposed action also includes measures that would establish  
2 native vegetation in the event of wildfires. Currently, when fires occur, native vegetation is  
3 often supplanted by saltcedar, which is an invasive, introduced species.

4 Long-term water quality benefits would occur if agricultural land were converted to habitat  
5 since the conversion of agricultural land to riparian habitat would lessen the input of nutrients  
6 and agricultural chemicals to the river, improving water quality and aquatic habitat conditions.  
7 The establishment of riparian vegetation along an expanded portion of the river would provide  
8 increased shading, water filtration, and nutrient and pollutant uptake, improving water quality  
9 and aquatic habitat conditions downstream. This impact would be beneficial.

### 10 **6.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF** 11 **RESOURCES**

12 State CEQA Guidelines section 15126.2(c) requires that an EIR analyze:

13 ...significant irreversible environmental changes which would be caused by the  
14 Proposed Project should it be implemented. Uses of nonrenewable resources  
15 during the initial and continued phases of the project may be irreversible since a  
16 large commitment of such resources makes removal or nonuse thereafter  
17 unlikely. Primary impacts and, particularly, secondary impacts (such as  
18 highway improvement which provides access to a previously inaccessible area)  
19 generally commit future generations to similar uses. Also, irreversible damage  
20 can result from environmental accidents associated with the project.  
21 Irretrievable commitments of resources should be evaluated to assure that such  
22 current consumption is justified.

23 The Conservation Plan would require use of a variety of construction materials for the  
24 construction of irrigation and field facilities as well as roadways. In addition, agricultural  
25 lands, including Important Farmlands, used for conservation area establishment would be  
26 committed to non-agricultural use for the 50-year duration of the LCR MSCP. After this time,  
27 however, the land could conceivably be returned to agricultural use since the soils would not be  
28 removed. Water would be required to establish and maintain habitat and would be unavailable  
29 for other purposes for the 50-year duration of the LCR MSCP. Minimal amounts of potable  
30 water would be required to serve the two field facilities should they be constructed.

### 31 **6.4 UNAVOIDABLE ADVERSE IMPACTS**

32 Unavoidable adverse impacts are those significant environmental effects of the proposed project  
33 that cannot be avoided or substantially lessened as required under CEQA (State CEQA  
34 Guidelines section 15091). The proposed action and alternatives would result in significant,  
35 potentially unavoidable short-term air quality impacts. Table 6.4-1 summarizes the impacts of  
36 the proposed action and alternatives, including unavoidable adverse impacts on those  
37 environmental resources evaluated pursuant to CEQA. NEPA does not require the  
38 determination of unavoidable adverse impacts.

**Table 6.4-1. Summary of Impacts and Mitigation Measures**

| Impact  | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure <sup>3</sup>  | Unavoidable Adverse Impacts |
|---|--------------------------------|-------------------------|---|-------------------------------|--|-----------------------------|
|   | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |  |                             |
| AESTHETICS  |                                |                         |   |                               |  |                             |
| AESTH-1: Construction/maintenance activities would temporarily lessen the visual quality of the conservation area establishment sites located on or near visually sensitive resources ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required  | None                        |
| AESTH-2: The construction of field facilities and fish-rearing facilities could be required, which could alter the visual quality of the selected sites ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required  | None                        |
| AESTH-3: Conservation area establishment would return sites to a more natural appearance ( <i>beneficial impact</i> ).  | X                              | X                       | X   | X                             | None required  | None                        |
| AGRICULTURAL RESOURCES  |                                |                         |   |                               |  |                             |
| AG-1: Important Farmland could be converted to a nonagricultural use ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required  | None                        |
| AG-2: Waterfowl attracted to established backwaters and marshes could destroy crops grown on adjacent farmland ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required  | None                        |
| AG-3: Runoff from established conservation areas could alter the slopes of adjoining laser-leveled fields ( <i>significant impact</i> ).  | X                              | X                       | X   | X                             | AG-1: Develop grading plans for newly established conservation areas that direct runoff away from adjacent agricultural lands to ensure that flow rates from the conservation area do not exceed existing discharge rates. | None                        |
| AG-4: Covered species attracted to established conservation areas could disperse to other lands within the planning area ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required  | None                        |
| AIR QUALITY   |                                |                         |   |                               |  |                             |
| AQ-1: The use of fossil fuel-fired construction equipment during construction, maintenance, and operational activities would result in intermittent combustive emissions that would not violate any air quality standard or contribute substantially to an existing or projected air quality violation ( <i>less than significant impact</i> ). | X                              | X                       | X   | X                             | None required  | None                        |

Table 6.4-1. Summary of Impacts and Mitigation Measures (continued)

| Impact  | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure <sup>3</sup>   | Unavoidable Adverse Impacts |
|---|--------------------------------|-------------------------|---|-------------------------------|---|-----------------------------|
|   | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |   |                             |
| AIR QUALITY   |                                |                         |   |                               |   |                             |
| AQ-2: The development of the largest projects would produce fugitive dust emissions that could exceed an ambient 24-hour PM10 standard ( <i>significant impact</i> ).   | X                              | X                       | X   | X                             | AQ-1: Implement standard operating practices to minimize fugitive dust (PM10) emissions during construction activities. | Potentially Significant     |
| AQ-3: Emissions from the largest prescribed burns during terrestrial vegetation establishment or maintenance activities would produce emissions that could contribute to an exceedance of an ambient 24-hour PM10 standard ( <i>significant impact</i> ).   | X                              | X                       | X   | X                             | AQ-2: Implement a smoke management plan for all construction and maintenance activities involving the use of fire.      | Potentially Significant     |
| AQ-4: Air emissions from proposed conservation area establishment activities and facility construction could exceed the MDAQMD daily NO <sub>x</sub> or PM10 emission significance thresholds, which would result in a cumulatively considerable net increase of a nonattainment pollutant ( <i>significant impact</i> ). | X                              | X                       | X   |                               | See Mitigation Measure AQ-1.  | Significant                 |
| AQ-5: Air emissions from the proposed conservation area establishment activities would not expose sensitive receptors to substantial pollutant concentrations ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required   | None                        |
| AQ-6: Air emissions from the proposed conservation area establishment activities would not create objectionable odors that affect a substantial number of people ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required   | None                        |
| BIOLOGICAL RESOURCES  |                                |                         |   |                               |   |                             |
| BIO-1: Issuance of the section 10(a)(1)(B) permit would authorize the incidental take of up to 27 covered species from implementation of both the covered activities and the Conservation Plan ( <i>less than significant impact</i> ).   |                                | X                       | X   | X                             | None required   | None                        |

**Table 6.4-1. Summary of Impacts and Mitigation Measures (continued)**

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure <sup>3</sup> | Unavoidable Adverse Impacts |
|--|--------------------------------|-------------------------|---|-------------------------------|---------------------------------|-----------------------------|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |                                 |                             |
| BIOLOGICAL RESOURCES   |                                |                         |   |                               |                                 |                             |
| BIO-2: The establishment of 7,260 acres of cottonwood-willow and honey mesquite land cover would increase the extent of cottonwood-willow riparian forest and mesquite woodland sensitive communities ( <i>beneficial</i> ).   | X                              | X                       | X <sup>4</sup>                              | X                             | None required                   | None                        |
| BIO-3: Clearing, grading, planting, and site maintenance during conversion of agricultural lands to cottonwood-willow and/or honey mesquite land cover types would result in the elimination of existing low value habitat used by resident and migratory wildlife, removal of weedy vegetation and crops, alteration of habitat characteristics through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ). | X                              | X                       | X   | X                             | None required                   | None                        |
| BIO-4: Clearing, grading, planting, and site maintenance during conversion of undeveloped lands (primarily saltcedar) to cottonwood-willow and/or honey mesquite land cover types would result in the elimination of existing non-native vegetation and the habitat it provides for wildlife, short-term effects on habitat characteristics from alteration of local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).      | X                              | X                       | X   | X                             | None required                   | None                        |
| BIO-5: Clearing, grading, planting, and site maintenance during establishment of marsh would result in the long-term elimination of existing vegetation and the habitat it provides for wildlife, alteration of habitat conditions through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).   | X                              | X                       | X   | X                             | None required                   | None                        |

Table 6.4-1. Summary of Impacts and Mitigation Measures (continued)

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure <sup>3</sup>  | Unavoidable Adverse Impacts |
|--|--------------------------------|-------------------------|---|-------------------------------|--|-----------------------------|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |  |                             |
| BIOLOGICAL RESOURCES   |                                |                         |   |                               |  |                             |
| BIO-6: Clearing, grading, and site maintenance during establishment of backwaters would result in the long-term elimination of existing vegetation and the habitat it provides for wildlife, alteration of habitat conditions through changes in local hydrology and exposure of soil to erosion, and elimination or displacement of resident wildlife ( <i>less than significant or significant short-term impacts; beneficial long-term impacts</i> ). | X                              | X                       | X   | X                             | BIO-1: Conduct site-specific surveys for non-covered sensitive species during selection of land cover type establishment or enhancement (e.g., existing backwaters) areas and, if any are found, then implement measures appropriate for the specific site and species to avoid or minimize impacts to the extent feasible without causing impacts on covered species. These may include measures specified in the Conservation Plan to avoid or minimize potential effects on covered species (e.g., scheduling to avoid breeding times). | None                        |
| BIO-7: Maintenance of established habitats would result in the removal of invasive non-native vegetation, alteration of habitat characteristics through changes in local hydrology, and short-term elimination or displacement of resident wildlife ( <i>less than significant short-term impacts; less than significant or beneficial long-term impacts</i> ).  | X                              | X                       | X   | X                             | None required  | None                        |
| BIO-8: Population enhancement activities for covered fish and bird species could adversely affect existing individuals or populations of covered or sensitive species ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).   | X                              | X                       | X   | X                             | None required  | None                        |
| BIO-9: Native land cover type establishment and maintenance could temporarily affect wetlands and waters of the U.S ( <i>less than significant short-term impacts; beneficial long-term impacts</i> ).   | X                              | X                       | X   | X                             | None required  | None                        |
| BIO-10: Land cover type establishment and maintenance activities could result in periodic short-term impacts on sensitive and common native fishes inhabiting the Virgin and Muddy rivers ( <i>less than significant impact</i> ).   | X                              |                         |   | X                             | None required  | None                        |

**Table 6.4-1. Summary of Impacts and Mitigation Measures (continued)**

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure <sup>3</sup>   | Unavoidable Adverse Impacts |
|--|--------------------------------|-------------------------|---|-------------------------------|---|-----------------------------|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |   |                             |
| BIOLOGICAL RESOURCES   |                                |                         |   |                               |   |                             |
| BIO-11: Construction to establish/enhance native land cover types could result in the long-term loss or degradation of sensitive native fish habitats in the Virgin and Muddy rivers ( <i>significant impact</i> ).                      | X <sup>5</sup>                 |                         |   | X                             | BIO-2: Design site-specific land cover type establishment plans to avoid and minimize potential effects on sensitive native fish habitats along the Virgin and Muddy rivers. Preparation of the design plans shall be coordinated with and approved by the Service as part of section 7 consultation. If appropriate, design plans shall include measures to rehabilitate any affected habitat.   | None                        |
| CULTURAL AND HISTORIC RESOURCES  |                                |                         |   |                               |   |                             |
| CULT-1: Disturbance of the ground surface could directly or indirectly disturb or destroy significant archaeological or historical resources, particularly in undeveloped or previously undisturbed areas ( <i>significant impact</i> ). | X                              | X                       | X   | X                             | CULT-1: Consult with the appropriate SHPO(s), tribes, and other interested parties, perform archival research, interview informants, conduct cultural resource inventories; evaluate all identified cultural resources for potential listing on the NRHP or state or local registers; modify project design, when feasible, to avoid cultural resources eligible for listing; develop and implement a pre-construction Testing and Evaluation Plan, pre-construction Data Recovery Plan, and Cultural Resources Construction Monitoring Plan (CRCMP) as appropriate; re-direct construction as needed if new cultural resources sites are found, document new discoveries, and avoid sites or implement a data recovery program; initiate consultation with any known lineal descendants and relevant Indian tribes as per NAGPRA or follow state and local laws as appropriate; incorporate these procedures into all archaeological testing and/or data recovery plans and the CRCMP. | None                        |

Table 6.4-1. Summary of Impacts and Mitigation Measures (continued)

| Impact  | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure <sup>3</sup>  | Unavoidable Adverse Impacts |
|---|--------------------------------|-------------------------|---|-------------------------------|--|-----------------------------|
|   | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |  |                             |
| CULTURAL AND HISTORIC RESOURCES   |                                |                         |   |                               |  |                             |
| CULT-2: Cultural resources may be affected by unauthorized artifact collection during construction or by a lack of awareness of cultural resource mitigation measures on the part of construction personnel ( <i>significant impact</i> ).                | X                              | X                       | X   | X                             | See Mitigation Measure CULT-1  | None                        |
| ENERGY AND DEPLETABLE RESOURCES   |                                |                         |   |                               |  |                             |
| Minor impact associated with use of diesel fuel and electrical power during construction and operations. Negligible impact to hydropower production due to consumptive use of water for conservation areas.   | X                              | X                       | X   | X                             | None required  | None                        |
| ENVIRONMENTAL JUSTICE   |                                |                         |   |                               |  |                             |
| EJ-1. Significant, short-term air quality impacts from construction activities and prescribed burns in or near agricultural areas could result in disproportionate impacts to minority and low-income populations.  | X <sup>6</sup>                 | X                       | X   | X <sup>6</sup>                | Implement Mitigation Measures AQ-1 and AQ-2  | Not applicable              |
| EJ-2. Noise from construction and pumps that exceeded local standards could disproportionately affect minority and low-income populations.  | X <sup>6</sup>                 | X                       | X   | X <sup>6</sup>                | Implement Mitigation Measures NOI-1 and NOI-2  | Not applicable              |
| EJ-3: If agricultural land were converted to conservation areas, the loss of agricultural jobs would disproportionately affect minority and low-income populations.   | X                              | X                       | X   | X                             | EJ-1: Reclamation shall work with local jurisdictions and/or growers to ensure that agricultural workers are notified as soon as possible of the potential for a loss of jobs once specific project locations have been identified. Reclamation will encourage the local jurisdictions and/or growers to provide timely information and assistance to agricultural workers regarding the availability of alternative employment. | Not applicable              |
| HAZARDS AND HAZARDOUS MATERIALS   |                                |                         |   |                               |  |                             |
| HAZ-1: The use of pesticides, lubricants, fuels, and other hazardous materials during construction, operations, and maintenance could result in localized spills, which could create a hazard to the environment ( <i>less than significant impact</i> ). | X                              | X                       | X   | X                             | None required  | None                        |

**Table 6.4-1. Summary of Impacts and Mitigation Measures (continued)**

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure <sup>3</sup> | Unavoidable Adverse Impacts |
|--|--------------------------------|-------------------------|---|-------------------------------|---------------------------------|-----------------------------|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |                                 |                             |
| HAZARDS AND HAZARDOUS MATERIALS  |                                |                         |   |                               |                                 |                             |
| HAZ-2: The increase in riparian and backwater areas could result in an increase in vectors ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required                   | None                        |
| HAZ-3: Construction activities could cause wildfires ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required                   | None                        |
| HAZ-4: Fire used as a construction and maintenance tool could escape control and become a wildland fire ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required                   | None                        |
| HAZ-5: Conservation area establishment actions implemented within an Accident Potential Zone of an airport or near a private airstrip could cause a comparatively minor increase in bird populations ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required                   | None                        |
| HYDROLOGY AND WATER QUALITY  |                                |                         |   |                               |                                 |                             |
| HYDRO-1: Habitat establishment activities could result in erosion-induced siltation ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required                   | None                        |
| HYDRO-2: Habitat establishment could have a short-term adverse effect to water quality if irrigation mobilized (released) pesticides, salts, or other contaminants ( <i>less than significant impact</i> ).  | X                              | X                       | X   | X                             | None required                   | None                        |
| HYDRO-3: Water quality in created or restored backwaters and marshes could be affected by increasing concentrations of various naturally occurring and man-made chemicals (both in the soil and the water column) that result from evaporation of water ( <i>less than significant impact</i> ). | X                              | X                       | X   | X                             | None required                   | None                        |
| HYDRO-4: Conservation area establishment would result in a long-term improvement to water quality if agricultural land were used ( <i>beneficial impact</i> ).   | X                              | X                       | X   | X                             | None required                   | None                        |

Table 6.4-1. Summary of Impacts and Mitigation Measures (continued)

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure <sup>3</sup>   | Unavoidable Adverse Impacts |
|--|--------------------------------|-------------------------|---|-------------------------------|---|-----------------------------|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |   |                             |
| INDIAN TRUST ASSETS  |                                |                         |   |                               |   |                             |
| ITA-1: Implementing conservation measures on tribal land could result in changes to all classes of ITAs.   | X <sup>7</sup>                 | X                       | X   | X <sup>7</sup>                | None required.  | Not applicable              |
| LAND USE   |                                |                         |   |                               |   |                             |
| No significant impacts specific to land use were identified, although significant land use conflicts were identified in the agricultural resources and noise analyses (Impacts AG-3, AG-4, NOI-1, and NOI-2).                            | X                              | X                       | X   | X                             | Implement Mitigation Measures AG-1, NOI-1, and NOI-2.   | None                        |
| NOISE  |                                |                         |   |                               |   |                             |
| NOI-1: Construction activities could cause a temporary, substantial increase in ambient noise levels that could exceed local standards if construction occurred in proximity to noise-sensitive receptors ( <i>significant impact</i> ). | X                              | X                       | X   | X                             | NOI-1: As needed, select quieter equipment; use noise control devices on equipment, locate equipment away from sensitive receptors; notify nearby neighbors prior to work; minimize idling, use noise barriers; and where possible, limit construction to non-mating, non-nesting seasons of noise-sensitive species. | None                        |
| NOI-2: Pumps located near noise-sensitive receptors could cause a substantial increase in ambient noise levels or exceed regulatory thresholds ( <i>significant impact</i> ).  | X                              | X                       | X   | X                             | NOI-2: If pumps cannot be located at sufficient distances from sensitive receptors to avoid the exceedance of a local noise standard or a substantial increase in the ambient noise level at the sensitive receptors, construct barriers or enclosures to ensure adherence to local standards.                        | None                        |
| POPULATION AND HOUSING   |                                |                         |   |                               |   |                             |
| No impact on population or housing.  | X                              | X                       | X   | X                             | None required   | None                        |

**Table 6.4-1. Summary of Impacts and Mitigation Measures (continued)**

| Impact   | APPLICABLE ALTERNATIVE         |                         |   |                               | Mitigation Measure <sup>3</sup> | Unavoidable Adverse Impacts |
|--|--------------------------------|-------------------------|---|-------------------------------|---------------------------------|-----------------------------|
|  | 2<br>No<br>Action <sup>1</sup> | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |                                 |                             |
| PUBLIC SERVICES AND UTILITIES  |                                |                         |   |                               |                                 |                             |
| Minimal impacts to water treatment, storm drainage, and water supply from the potential construction and operation of two field facilities. Minor impacts to landfill capacity from construction and operations. | X                              | X                       | X   | X                             | None required                   | None                        |
| RECREATION   |                                |                         |   |                               |                                 |                             |
| REC-1: The implementation of certain conservation measures could result in the loss of recreational opportunities ( <i>less than significant impact</i> ).   | X                              | X                       | X   | X                             | None required                   | None                        |
| SOCIOECONOMICS   |                                |                         |   |                               |                                 |                             |
| SOC-1: Agricultural jobs would be lost if agricultural land were converted to conservation areas.  | X                              | X                       | X   | X                             | None required                   | None                        |
| SOC-2: Agricultural-related revenue would be lost if agricultural land were converted to conservation areas.   | X                              | X                       | X   | X                             | None required                   | None                        |
| SOC-3: Local property tax revenues could be reduced if privately owned land were leased or acquired by the Federal or state participants in the LCR MSCP.  | X                              | X                       | X   | X                             | None required                   | None                        |
| SOCIOECONOMICS   |                                |                         |   |                               |                                 |                             |
| SOC-4: Local sales tax from the purchase of products related to agricultural uses would be reduced if privately owned agricultural land was placed in public ownership.  | X                              | X                       | X   | X                             | None required                   | None                        |
| TOPOGRAPHY, GEOLOGY, SOILS, AND MINERAL RESOURCES  |                                |                         |   |                               |                                 |                             |
| GEO-1: Activities associated with conservation area establishment could result in erosion-induced siltation of the Colorado River ( <i>less than significant impact</i> ).                                       | X                              | X                       | X   | X                             | None required                   | None                        |
| TRANSBOUNDARY IMPACTS  |                                |                         |   |                               |                                 |                             |
| TRANS-1: PM <sub>10</sub> and combustive emissions from the construction and maintenance of created conservation areas in Reach 7 could disperse to Mexico.  | X <sup>8</sup>                 | X                       | X   |                               | None required                   | Not applicable              |

**Table 6.4-1. Summary of Impacts and Mitigation Measures (continued)**

| Impact  | APPLICABLE ALTERNATIVE  |                         |   |                               | Mitigation Measure <sup>3</sup> | Unavoidable Adverse Impacts |
|---|---|-------------------------|---|-------------------------------|---------------------------------|-----------------------------|
|   | 2<br>No<br>Action <sup>1</sup>  | 1<br>Proposed<br>Action | 3<br>Listed<br>Species<br>Only <sup>2</sup> | 4<br>Off-Site<br>Conservation |                                 |                             |
| TRANSPORTATION  |   |                         |   |                               |                                 |                             |
| Minor impact from construction traffic.   | X   | X                       | X   | X                             | None required                   | None                        |
| 1   | The no action alternative would result in similar types of impacts as the proposed action since similar conservation measures likely would be implemented. It is likely, however, that a smaller amount of conservation area would be established or maintained, thus reducing the intensity or magnitude of the impacts, including beneficial impacts. Some conservation could occur in the off-site conservation areas, and impacts could occur in these areas as well as in the planning area. |                         |   |                               |                                 |                             |
| 2   | The listed species only alternative would result in the establishment of a smaller amount of conservation area than the proposed action. The same types of impacts would occur, but the intensity, or magnitude, would be reduced, including that of beneficial impacts.  |                         |   |                               |                                 |                             |
| 3   | The development and implementation of mitigation measures for the no action alternative is outside the authority of the lead agencies for this EIS/EIR. The mitigation measures included in this table are examples of measures that could be implemented to reduce impacts associated with the no action alternative.  |                         |   |                               |                                 |                             |
| 4   | Less cottonwood-willow habitat and no honey mesquite habitat would be established under this alternative.   |                         |   |                               |                                 |                             |
| 5   | These impacts could occur under the no action alternative to the extent that conservation area creation occurred in the off-site conservation areas.  |                         |   |                               |                                 |                             |
| 6   | Under Alternative 2, these impacts would not occur to the extent that conservation areas were created in the off-site conservation areas. Air quality and noise impacts would not disproportionately affect minority and low-income populations in the off-site conservation areas. Under Alternative 4, impacts would be associated only with the creation of 360 acres of backwaters along the LCR.   |                         |   |                               |                                 |                             |
| 7   | Under Alternative 2, these impacts would not occur to the extent that conservation areas were created in the off-site conservation areas. Under Alternative 4, impacts would be associated only with the creation of 360 acres of backwaters along the LCR. No tribal lands or ITAS are present in any of the off-site conservation areas.  |                         |   |                               |                                 |                             |
| 8   | Transboundary impacts would not occur if conservation occurred only in the off-site conservation areas or in Reaches 1-6.   |                         |   |                               |                                 |                             |
| Not applicable: CEQA does not require analysis of this resource area and NEPA does not require the determination of unavoidable adverse impacts. Thus, no determination of unavoidable adverse impacts has been provided. |   |                         |   |                               |                                 |                             |

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## 7.0 COMPLIANCE, CONSULTATION, AND COORDINATION

### 7.1 REGULATORY COMPLIANCE

#### 7.1.1 Federal Laws, Regulations, and Executive Orders

##### *Endangered Species Act of 1973, Public Law 93-205*

The ESA protects threatened and endangered species (and their designated critical habitat), as listed by the Service, from unauthorized take and directs Federal agencies to ensure that their actions do not jeopardize the continued existence of such species. Section 7 of the ESA requires Federal agencies to consult with the Service to ensure that undertaking, funding, permitting, or authorizing an action is not likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat, as defined under the law. The Service may authorize take of a listed species under section 10, which also provides for the preparation of habitat conservation plans. (Refer to section 1.3 for a discussion of past compliance with the ESA for certain covered activities.)

The Conservation Plan is intended to provide long-term ESA compliance for Federal and non-Federal interests in the LCR planning area for a period of 50 years, beginning in the year 2005. As part of the proposed action, the Service would issue a section 10(a)(1)(B) permit based on a determination that the Federal action of issuing the permit and the implementation of the non-Federal covered activities would not appreciably reduce the likelihood of the survival and recovery of the covered species in the wild.

##### *Fish and Wildlife Coordination Act, 16 U.S.C. 661-666*

The Fish and Wildlife Coordination Act requires that whenever any body of water is proposed or authorized to be impounded, diverted, or otherwise controlled or modified, the lead Federal agency must consult with the Service, the state agency responsible for fish and wildlife management and, for projects affecting marine fisheries, the National Marine Fisheries Service. Section 662(b) of the Act requires the lead Federal agency to consider the Service and other agencies' recommendations. The recommendations may address wildlife conservation and development, damage to wildlife attributable to the proposed action, and measures proposed to mitigate or compensate for these damages.

Due the programmatic nature of this EIS, a Fish and Wildlife Coordination Act Report is not currently being requested for the Conservation Plan, although the LCR MSCP participants coordinated with the Service concerning the development of the Conservation Plan and potential impacts from its implementation. A determination will be made if individual conservation activities trigger the requirements of the Fish and Wildlife Coordination Act for consultation, and the need for reports for those individual conservation activities will be reviewed with the Service and the state wildlife agencies on a case-by-case basis.

1 ***Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901)***

2 The Fish and Wildlife Conservation Act, commonly known as the Nongame Act, authorizes  
3 financial and technical assistance to the states for the development, revision, and  
4 implementation of conservation plans and programs for nongame fish and wildlife. The Act  
5 also serves to encourage Federal agencies to utilize their statutory and administrative authority  
6 to conserve and to promote the conservation of nongame fish and wildlife and their habitats.  
7 Amendments adopted in 1988 and 1989 also direct the Secretary of the Interior to undertake  
8 certain activities to research and conserve migratory nongame birds.

9 The Conservation Plan is consistent with this Act because the conservation actions would  
10 promote the conservation of nongame fish and wildlife species and their habitats. Moreover,  
11 the establishment of land cover types that provide habitat for, and the conservation of,  
12 nongame migratory bird species is a central component of the Conservation Plan.

13 ***National Wildlife Refuge System Administration Act of 1966 (42 U.S.C. 668dd), as amended by***  
14 ***the National Wildlife Refuge System Improvement Act of 1997 (P.L. 105-57)***

15 This Act provides for the administration and management of the national wildlife refuge  
16 system, including wildlife refuges, areas for the protection and conservation of fish and wildlife  
17 threatened with extinction, wildlife ranges, game ranges, wildlife management areas and  
18 waterfowl production areas.

19 The Conservation Plan would be consistent with this Act because the conservation actions  
20 would include the enhancement or maintenance of habitat areas potentially located within  
21 existing refuges.

22 ***Migratory Bird Treaty Act 1918 (16 U.S.C. 703)***

23 The Migratory Bird Treaty Act protects migratory birds by limiting the hunting, capturing,  
24 selling, purchasing, transporting, importing, exporting, killing, or possession of these birds or  
25 their nests or eggs. The specific migratory birds covered are identified in separate agreements  
26 between the United States and Great Britain, Mexico, and Japan.

27 The Conservation Plan would be consistent with the Migratory Bird Treaty Act. The  
28 conservation actions would benefit migratory birds by establishing protected areas that provide  
29 habitat for bird species protected by the Act. Reclamation will consult with the Service  
30 regarding impacts to migratory birds as required by Executive Order (EO) 13186 (discussed  
31 below). The section 10(a)(1)(B) permit issued by the Service for ESA-listed birds would function  
32 as the permit required by this Act.

33 ***Migratory Bird Conservation Act of 1929 (16 U.S.C. 715)***

34 The Migratory Bird Conservation Act, which was passed by Congress in 1929, protects  
35 migratory birds by creating the Migratory Bird Conservation Commission. The Commission's  
36 purpose is to consider and approve the purchase, rental, or other acquisition of any areas of  
37 land or water that may be recommended by the Secretary of the Interior for the purpose of  
38 establishing sanctuaries for migratory birds.

1 No action is required under this Act. However, the Conservation Plan would be consistent with  
2 the goals of the Act by providing protected habitat for migratory birds.

3 ***Bald Eagle Protection Act of 1940 (16 U.S.C. 4901-4918)***

4 The Bald Eagle Protection Act imposes criminal and civil penalties on anyone in the United  
5 States or within its jurisdiction who, unless excepted, takes, possesses, sells, purchases, barter,  
6 offers to sell or purchase or barter, transports, exports or imports at any time or in any manner a  
7 bald or golden eagle, alive or dead; or any part, nest or egg of these eagles; or violates any  
8 permit or regulations issued under the Act. If compatible with the preservation of bald and  
9 golden eagles, the Secretary of the Interior may issue regulations authorizing the taking,  
10 possession and transportation of these eagles for scientific or exhibition purposes, for religious  
11 purposes of Indian Tribes or for the protection of wildlife, agricultural or other interests.

12 The Conservation Plan would be consistent with the Bald Eagle Protection Act because the  
13 conservation actions would not result in adverse impacts to bald eagles.

14 ***Section 176, Clean Air Act (42 U.S.C. 7506)***

15 The purpose of the CAA is to protect the nation's air quality by regulating emissions of air  
16 pollutants. The CAA is applicable to permits and planning procedures related to activities  
17 onshore and within the territorial sea. Section 176 of the CAA prohibits Federal agencies from  
18 engaging in any activity that does not conform to the most recent EPA-approved SIP's purpose  
19 of attaining and maintaining the NAAQS. This means that Federally supported or funded  
20 activities will not (1) cause or contribute to any new violation of any air quality standard; (2)  
21 increase the frequency or severity of any existing violation of any standard; (3) delay the timely  
22 attainment of any standard or any required interim emission reductions or other milestones in  
23 any area.

24 The proposed action would result in potential short-term, unavoidable impacts air quality  
25 impacts. The development of the largest projects would produce fugitive dust emissions that  
26 could exceed an ambient 24-hour PM<sub>10</sub> standard; emissions from the largest prescribed burns  
27 during terrestrial vegetation establishment or maintenance activities also could produce  
28 emissions that would contribute to an exceedance of an ambient 24-hour PM<sub>10</sub> standard; and air  
29 emissions from habitat establishment activities and facility construction could exceed the  
30 MDAQMD daily NO<sub>x</sub> or PM<sub>10</sub> emission significance thresholds. Mitigation Measures AQ-1 and  
31 AQ-2 have been included in this EIS/EIR and would involve implementation of standard  
32 operating practices to minimize PM<sub>10</sub> emissions during construction and the implementation of  
33 a smoke management plan, respectively. These measures would reduce impacts to air quality,  
34 but impacts could remain significant, although they would last only for the duration of the  
35 construction activity. As discussed in section 3.3, Air Quality, the lead agencies would ensure  
36 that proposed construction, maintenance, and operations activities would comply with all  
37 applicable air regulations, which would in turn ensure that the proposed action would not  
38 conflict with or obstruct implementation of an applicable air quality plan. Therefore, the  
39 Conservation Plan would be consistent with this Act.

1 **General Conformity Rule, 40 CFR, Part 51, subpart W**

2 This rule requires that Federal projects or projects receiving Federal funding conform to SIPs  
3 developed for the purpose of reaching attainment of NAAQS. The General Conformity Rule  
4 allows a Federal agency to defer a conformity analysis for a programmatic action such as the  
5 Conservation Plan until project-specific information is available upon which to base the analysis  
6 (EPA 1993). As a result, the conformity analysis for the proposed action would occur at a future  
7 date in association with project-specific proposals.

8 **Executive Order 13352, Facilitation of Cooperative Conservation**

9 EO 13352 was issued on August 26, 2004. The purpose of this order is to ensure that the  
10 Departments of Interior, Agriculture, Commerce, and Defense and the EPA implement laws  
11 relating to the environment and natural resources in a manner that promotes cooperative  
12 conservation, with an emphasis on appropriate inclusion of local participation in Federal  
13 decisionmaking, in accordance with their respective agency missions, policies, and regulations.  
14 Cooperative conservation is defined as “actions that relate to use, enhancement, and enjoyment  
15 of natural resources, protection of the environment, or both, and that involve collaborative  
16 activity among Federal, State, local, and tribal governments, private for-profit and nonprofit  
17 institutions, other nongovernmental entities and individuals.” The above-referenced agencies  
18 are directed to carry out their efforts in a manner that:

- 19
- facilitates cooperative conservation;
  - 20 • takes appropriate account of and respects the interests of persons with ownership or  
21 other legally recognized interests in land and other natural resources;
  - 22 • properly accommodates local participation in Federal decisionmaking; and
  - 23 • provides that the programs, projects, and activities are consistent with protecting public  
24 health and safety.

25 The proposed action is consistent with the principles of cooperative conservation. The LCR  
26 MSCP is intended to be a coordinated program and has been developed by a partnership of  
27 state, Federal, and other public and private stakeholders in Arizona, California, and Nevada  
28 with interests in managing the water and related resources of the LCR. The members of this  
29 partnership also would be responsible for implementing and funding the proposed  
30 Conservation Plan. The LCR MSCP participants have taken appropriate account of and respect  
31 the interests of persons with ownership or other legally recognized interests in land and other  
32 natural resources; all land would be acquired on a voluntary basis, and siting criteria and  
33 mitigation measures identified in this EIS/EIR would be sufficient to reduce or avoid potential  
34 adverse impacts of the proposed action (with the exception of potential short-term air quality  
35 impacts). As discussed in section 3.8 of this EIS/EIR, the LCR MSCP activities would be  
36 implemented in a manner that is consistent with protecting public health and safety.

37 **Executive Order 11988, Floodplain Management**

38 EO 11988 states that each [Federal] agency shall avoid development in floodplain areas to the  
39 extent practicable, in order to reduce the risk of flood loss, to minimize the impact of floods on

1 human safety, health, and welfare, and to restore and preserve the natural and beneficial values  
2 served by floodplains. Federal agencies are directed to determine whether a proposed action  
3 will occur in a floodplain and, if so, to consider alternatives to avoid adverse effects and  
4 incompatible development in the floodplain. If development in a floodplain is deemed  
5 necessary, the Federal agency must prepare and circulate a notice explaining why the action is  
6 proposed for the floodplain area. Agencies are to provide opportunity for early public review  
7 of any proposed actions in floodplains.

8 The conservation actions would be consistent with the EO because they would not increase the  
9 risk of flood loss; or affect the impact of floods on human safety, health, and welfare. It would,  
10 however, preserve the natural and beneficial values served by floodplains by establishing  
11 native habitat. Development in the floodplain is necessary in order to adequately mitigate the  
12 impacts of the covered activities, which would affect sensitive species that inhabit the historic  
13 floodplain of the LCR.

#### 14 *Executive Order 11990, Protection of Wetlands*

15 EO 11990 states that each [Federal] agency shall provide leadership and take action to minimize  
16 the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and  
17 beneficial values of wetlands in carrying out the agency's responsibilities. The EO does not  
18 apply to Federal agencies' issuance of permits, licenses, or allocations to private parties for  
19 activities involving wetlands on non-Federal property. Federal agencies are to provide  
20 opportunity for early public review of any proposed plans or proposals for new construction in  
21 wetlands.

22 The Conservation Plan includes some actions likely to involve dredging, excavation, or  
23 placement of structures in Waters of the U.S., including wetlands. Such actions would require  
24 permits under section 404 of the CWA and/or section 10 of the Rivers and Harbors Act. The  
25 implementing parties would consult with the Corps to ensure that permitting requirements are  
26 met, including due consideration of alternative locations and methods that could accomplish  
27 the same objectives. The conservation actions would utilize locations and methods that  
28 preserve and enhance the natural and beneficial values of those wetlands. Moreover, the  
29 Conservation Plan would result in the establishment of 512 acres of marsh. The Conservation  
30 Plan would not conflict with EO 11990 and includes measures to preserve and enhance the  
31 natural and beneficial values of wetlands, as directed.

#### 32 *Executive Order 12898, Federal Actions to Address Environmental Justice in Minority* 33 *Populations and Low-Income Populations*

34 This EO mandates that each Federal agency shall make achieving environmental justice part of  
35 its mission by identifying and addressing disproportionately high and adverse human health or  
36 environmental effects of its programs, policies, and activities on minority populations and low-  
37 income populations.

38 Section 3.7, Environmental Justice, identifies environmental justice impacts associated with  
39 short-term air quality emissions during construction, noise from construction activities and  
40 operations, and the loss of agricultural jobs. The implementation of Mitigation Measures AQ-1  
41 and AQ-2 would reduce potential air quality impacts, but they could remain substantial and

1 adverse for the duration of individual construction projects. The implementation of Mitigation  
2 Measures NOI-1 and NOI-2 would effectively reduce noise impacts to low income and minority  
3 populations. The implementation of Mitigation Measure EJ-1 would effectively reduce the  
4 impact associated with the loss of agricultural jobs.

5 ***Executive Order 12962, Recreational Fisheries***

6 EO 12962 states that each [Federal] agency shall, and in cooperation with states and tribes,  
7 improve the quantity, function, sustainable productivity, and distribution of the United States'  
8 aquatic resources for increased recreational fishing opportunities.

9 The Conservation Plan would not adversely impact recreational fisheries. Therefore, the  
10 conservation actions would be consistent with EO 12962.

11 ***Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds***

12 This EO is primarily intended to assist Federal agencies in complying with the Migratory Bird  
13 Treaty Act and to reduce the risk to Federal agencies associated with unintentional take of  
14 migratory birds. It encourages agencies to carry out certain actions, as appropriate and  
15 practicable, to promote the conservation of migratory birds, such as restoring and enhancing  
16 migratory bird habitat; designing migratory bird habitat conservation measures and practices  
17 into agency plans; evaluating impacts of proposed Federal actions upon migratory birds in  
18 conjunction with complying with NEPA; and minimizing potential take of migratory birds in  
19 cooperation with the Service. Implementation of the Conservation Plan meets the intent of the  
20 EO.

21 ***Clean Water Act (33 U.S.C. 1341, 1342, 1344)***

22 Section 404 of the CWA identifies conditions under which a permit is required for construction  
23 projects that result in the discharge of fill or dredged materials into Waters of the U.S.  
24 Construction activities associated with implementation of the proposed action may require a  
25 permit under section 404, depending on the location and nature of the construction.

26 The Conservation Plan includes some actions likely to involve dredging, excavation, or  
27 placement of structures in Waters of the U.S., including wetlands. Such actions would require  
28 permits under section 404 of the CWA. The implementing parties would consult with the Corps  
29 to ensure that permitting requirements are met, including due consideration [as required under  
30 section 404(b)(1)] of alternative locations and methods that could accomplish the same  
31 objectives. The conservation actions would utilize locations and methods that preserve and  
32 enhance the natural and beneficial values of those wetlands. The Conservation Plan would  
33 comply with the provisions of the CWA.

34 ***Section 10, Rivers and Harbor Act of 1899, (33 U.S.C. 403)***

35 Section 10 of the Rivers and Harbors Act prohibits the obstruction or alteration of navigable  
36 waters of the United States without a permit from the Corps. Navigable waters are defined in 33  
37 C.F.R. Part 329 as those water that are subject to the ebb and flow of the tide and/or have been  
38 used in the past, or may be used in the future to transport interstate or foreign commerce.

1 Hence, section 10 (and Corps) jurisdiction extends to the historic limits of navigability,  
2 including historic tidelands that have been diked and drained. This Act, in conjunction with the  
3 Fish and Wildlife Coordination Act (16 U.S.C. 661-666) and NEPA of 1969 (42 U.S.C. 4331-4347),  
4 permits the Corps to refuse on conservation grounds to grant a permit to dredge or fill in  
5 navigable waters.

6 The Conservation Plan includes some actions likely to involve dredging, excavation, or  
7 placement of structures in Waters of the U.S., including wetlands. Such actions would require  
8 permits under section 404 of the CWA and/or section 10 of the Rivers and Harbors Act. The  
9 implementing parties would consult with the Corps to ensure that permitting requirements are  
10 met. This would include due consideration of alternative locations and methods that could  
11 accomplish the same objectives. The conservation actions would utilize locations and methods  
12 that preserve and enhance the natural and beneficial values of those wetlands. The  
13 Conservation Plan would comply with the Act.

14 ***National Historic Preservation Act (16 U.S.C. 470)***

15 Federally funded undertakings that have the potential to impact historic properties are subject  
16 to section 106 of the NHPA. Under this Act, Federal agencies are responsible for the  
17 identification, management, and nomination to the NRHP of cultural resources that would be  
18 impacted by Federal actions. Compliance with this Act is documented in section 3.5. Each  
19 individual project would have separate NEPA and NHPA compliance as needed before it is  
20 implemented.

21 ***American Indian Religious Freedom Act (42 U.S.C. 1996)***

22 The American Indian Religious Freedom Act establishes as United States policy the protection  
23 and preservation for American Indians of their inherent right to freely believe, express, and  
24 practice their traditional religions, which includes, but is not limited to, access to sites, use and  
25 possession of sacred objects, and the freedom to worship through ceremonial and traditional  
26 rites. Federal agencies are required to make a good faith effort to learn about Indian religious  
27 practices, consult with Indian leaders and religious practitioners, and consider any adverse  
28 impacts on Indian religious practices during decisionmaking.

29 Implementation of the proposed action would not conflict with these requirements. Any use of  
30 tribal lands for conservation area establishment would be based on the voluntary consent of the  
31 tribe.

32 ***Native American Graves Protection and Repatriation Act (24 U.S.C. 3001)***

33 NAGPRA assigns ownership to Native Americans of human burials and associated grave  
34 goods, which are excavated or discovered on Federal or tribal lands. It requires Federally  
35 sponsored museums to conduct inventories of their collections, and requires a 30-day delay in  
36 project work when human remains are discovered on Federal lands. If human remains are  
37 discovered on Federal lands during the implementation of the Conservation Plan, a 30-day  
38 delay in project work activities is required.

39 Implementation of the mitigation measures identified in section 3.5 of this EIS/EIR would  
40 ensure compliance with this Act.

1 ***Executive Order 13007 Regarding Indian Sacred Sites***

2 Pursuant to EO 13007, Federal agencies must consider the effects of their actions on the physical  
3 integrity of sacred sites, and access to and ceremonial use of such sites by Indian religious  
4 practitioners. EO 13007 defines a “sacred site” as follows:

5         ...any specific, discrete, narrowly delineated location on Federal land that is  
6         identified by an Indian tribe, or Indian individual determined to be an  
7         appropriately authoritative representative of an Indian religion, as sacred by  
8         virtue of its established religious significance to, or ceremonial use by, an Indian  
9         religion; provided that the tribe or appropriately authoritative representative of  
10        an Indian religion has informed the agency of the existence of such a site.

11 EO 13007 directs Federal agencies “...to the extent practicable, permitted by law, and not clearly  
12 inconsistent with essential agency functions,” to accommodate access to and use of such sites by  
13 Native American traditional religious practitioners, and to avoid affecting their physical  
14 integrity. As described in section 3.5, in 2000 the Federal government initiated government-to-  
15 government consultation with tribes on whose reservations conservation efforts might be  
16 implemented. All tribal representatives declined to provide information on sacred sites and  
17 Traditional Cultural Properties until more information is available regarding the locations and  
18 potential impacts of specific conservation projects. The Federal government will continue the  
19 consultation process in compliance with EO 13007.

20 ***Antiquities Act (16 U.S.C. 431)***

21 The Antiquities Act of 1906 provides for the protection of historic and prehistoric remains or  
22 any object of antiquity on Federal lands; establishes criminal penalties for unauthorized  
23 destruction or appropriation of antiquities; and authorizes scientific investigation of antiquities  
24 on Federal land, subject to permit and regulations.

25 The proposed action would be in compliance with this Act.

26 ***Archaeological Resources Protection Act (16 U.S.C. 470)***

27 The Archaeological Resources Policy Act of 1979 provides for the protection of archaeological  
28 resources on public and Indian lands. Protection of archaeological resources, under the  
29 guidelines of this Act, includes consideration of excavation and removal of resources,  
30 enforcement of the Act, and confidentiality of information concerning the nature and location of  
31 archaeological resources. It also provides substantial criminal and civil penalties for those who  
32 violate the terms of the Act. The proposed action would be in compliance with this Act.

33 ***Farmland Protection Policy Act (7 U.S.C. 4201)***

34 This Act is the Federal statute that provides the basis for the policy of avoiding impacts from  
35 Federal programs. The Act does not prohibit Federal agencies from undertaking actions that  
36 convert farmland to nonagricultural use, but only requires that Federal agencies “identify and  
37 take into account the adverse effects of Federal programs on the preservation of farmland;  
38 consider alternative actions, as appropriate, that could lessen such adverse effects; and assure

1 that such Federal programs, to the extent practicable, are compatible with State (and local)  
2 programs and policies to protect farmland” (7 U.S.C. section 4202[b]).

3 The analysis in section 3.2 of this EIS/EIR identifies and takes into account the potential effects  
4 of the Conservation Plan on farmland in the whole planning area, considers alternative actions  
5 that could lessen those effects, and also assures that the Conservation Plan is compatible with  
6 state and local programs “to the extent practicable.” This analysis meets the requirements of the  
7 Farmland Protection Policy Act on a programmatic basis.

#### 8 ***Pollution Prevention Act of 1990 (42 U.S.C. 13101)***

9 The Pollution Prevention Act of 1990 was enacted to focus industry, government, and the public  
10 on source reduction (pollution prevention) rather than upon treatment and disposal. The  
11 national policy of the United States is that (1) pollution should be prevented or reduced at the  
12 source, whenever feasible; (2) pollution that cannot be prevented should be recycled in an  
13 environmentally safe manner, whenever feasible; (3) pollution that cannot be prevented or  
14 recycled should be treated in an environmentally safe manner, whenever feasible; and (4)  
15 disposal or other release into the environment should be employed only as a last resort and  
16 should be conducted in an environmentally safe manner.

17 The Conservation Plan would contribute only minor amounts of pollution, primarily during the  
18 construction phase and during maintenance activities. Moreover, only minimal amounts of  
19 solid waste requiring disposal would be generated during construction and operations and  
20 would be disposed of in an environmentally safe manner. The Conservation Plan would be  
21 consistent with this Act.

#### 22 **7.1.2 State of Arizona Laws and Regulations**

##### 23 ***House Bill 2426***

24 The U.S. EPA issued regulations in 1990 authorizing the creation of a NPDES permitting system  
25 for stormwater discharges. In Arizona, House Bill 2426, which became effective on Aug. 9,  
26 2001, created the Arizona Pollutant Discharge Elimination System (AZPDES) Program. Under  
27 the AZPDES Permit Program, all facilities that discharge pollutants from any point source,  
28 including stormwater runoff, into Waters of the U.S. (navigable waters) are required to get an  
29 AZPDES permit.

30 Permits would be required as appropriate. The Conservation Plan would be consistent with  
31 this regulation.

##### 32 ***Senate Bill 1525 (2001) Chapter 23: Military Airports; Preservation***

33 Senate Bill 1525 precludes development or improvements potentially impairing visibility or  
34 otherwise interfering with operational aircraft. Water areas, sanitary landfills, or maintenance  
35 of feeding stations attractive to birds and waterfowl are impermissible in clear zones, accident  
36 potential zones, and high noise zones.

1 The proposed action would establish only a small amount of aquatic land cover types in  
2 relation to that which already exists and would not appreciably increase the risk of bird-  
3 airstrikes. In addition, conservation areas would be developed in compliance with FAA  
4 guidelines. Thus, the proposed action would comply with this law.

### 5 *Protection of Cultural Resources*

6 Chapter 4.2 of the Arizona Revised Statutes addresses historic preservation issues. While a  
7 specific historic preservation compliance process is not identified, the preamble to Article 1  
8 states:

- 9 B. It is the intent of the legislature that this state, in cooperation with the political  
10 subdivisions of this state, Federal agencies, Indian tribes, and other persons....
- 11 2. Provide leadership in the identification and preservation of the prehistoric  
12 and historic resources of this state.
- 13 3. Administer state owned, administered or controlled prehistoric and historic  
14 resources in a spirit of stewardship for the inspiration and benefit of  
15 present and future generations.

16 Chapter 4.2, Article 1, goes on to assign responsibility for preservation of historic properties  
17 owned and controlled by the agency, to the chief administrator of each agency (Section 41-861).  
18 All state agencies are directed to cooperate with the state historic preservation officer in  
19 developing a program to locate, inventory, and nominate to the Arizona register of historic  
20 places all properties under the agency's ownership or control that appear to meet the criteria for  
21 inclusion on the register (Section 41-862). In the event a direct action or one assisted by a state  
22 agency will result in substantial alteration to or destruction of an historic property, state  
23 agencies are directed to initiate measures to document the property to the standards established  
24 by the state historic preservation officer (Section 41-863). And lastly, Section 41-864 accords the  
25 state historic preservation officer 30 days:

26 ...to review and comment on any plans of a state agency which involve property  
27 which is included on or may qualify for inclusion on the Arizona register of  
28 historic places, including any construction project, sale, lease, or acquisition of  
29 historic properties, to ensure that the prehistorical, historical, architectural or  
30 culturally significant values will be preserved or enhanced.

31 The LCR MSCP participants would comply with this statute while implementing the  
32 Conservation Plan.

### 33 **7.1.3 State of California Laws and Regulations**

#### 34 *California Endangered Species Act (Fish and Game Code secs. 2050-2097)*

35 CESA provides for the recognition and protection of rare, threatened, and endangered species  
36 of plants and animals. The Act prohibits the taking of listed species without authorization from  
37 the CDFG. CDFG may authorize the taking of a listed species through a Memorandum of  
38 Understanding that establishes the extent of take permitted by CDFG and sets forth the

1 required mitigation. The California participants in the LCR MSCP will comply with CESA to  
2 the extent it applies to their covered activities.

3 *State laws governing treatment of Native American remains (P.R.C. secs. 5097.94, 5097.98,*  
4 *5097.99; Health and Safety Code sec. 7050.5)*

5 These laws protect Native American religion, places of social significance, and cemeteries or  
6 places of worship, etc., from interference, construction, or damage and prohibits the possession  
7 or take of Native American grave-related artifacts or human remains taken from graves or  
8 cairns.

9 Implementation of the mitigation measures identified in section 3.5 of this EIS/EIR would  
10 ensure compliance with these laws.

11 *California Land Conservation Act (Williamson Act) Govt. Code sec. 51200*

12 The California Land Conservation Act of 1965, commonly referred to as the Williamson Act,  
13 established the state's primary program for the retention of private land in agriculture and open  
14 space use. The Williamson Act is a voluntary, locally administered program that offers reduced  
15 property taxes on lands that have enforceable restrictions on their use via contracts between  
16 individual land owners and local governments.

17 Lands subject to Williamson Act contracts would not be acquired for the Conservation Plan  
18 unless the local agency agreed that the contract terms allow the establishment and maintenance  
19 of conservation areas as a compatible use, and that there is no significant adverse impact from  
20 the use of non-contract lands within an agricultural preserve because fish and wildlife  
21 enhancement and preservation is a compatible use of such lands. The proposed action would  
22 comply with this Act.

23 *Porter-Cologne Water Quality Control Act (Division 7, California Water Code)*

24 The Porter-Cologne Water Quality Control Act is the primary state regulation that addresses  
25 water quality. The requirements of the Act are implemented by the SWRCB at the state level  
26 and, at the local level, by the RWQCBs. Under the direction of the SWRCB, the RWQCBs carry  
27 out planning, permitting, and enforcement activities related to water quality in California. The  
28 regional boards prepare water quality plans (called basin plans) for their regions. Basin plans  
29 identify the beneficial uses of water that should be protected, establish water quality objectives  
30 (limits or levels of water constituents based on both state and Federal laws), and define an  
31 implementation program to meet water quality objectives. The area that would be affected by  
32 the implementation of the project lies within the boundaries of the Colorado River Basin  
33 (Region 7) RWQCB. The proposed action would potentially have only minor, temporary  
34 impacts to water quality and would not conflict with this Basin Plan.

1    **7.1.4       State of Nevada Laws and Regulations**

2    *Nevada Water Pollution Control Law (N.R.S. 445A.300 to 445A.730)*

3    The intent of the Nevada Water Pollution Control Law is to (1) maintain the quality of the  
4    waters of the state consistent with the public health and enjoyment, the propagation and  
5    protection of terrestrial and aquatic life, the operation of existing industries, the pursuit of  
6    agriculture, and the economic development of the state; and (2) to encourage and promote the  
7    use of methods of waste collection and pollution control for all significant sources of water  
8    pollution (including point and diffuse [non-point] sources). Except as authorized by a permit  
9    issued by the department pursuant to the provisions of N.R.S. 445A.300 to 445A.730 inclusive,  
10   and regulations adopted by the commission, it is unlawful for any person to discharge from any  
11   point source any pollutant into any waters of the state. Discharge permits would be obtained  
12   by the LCR MSCP as required.

13   ***Protection of Cultural Resources***

14   N.R.S. Chapter 383 addresses historic preservation and archaeology. N.R.S. 383.021 provided  
15   for the establishment of the Office of Historic Preservation (OHP). A specific historic  
16   preservation compliance process is not identified. However, N.R.S. 383.121 states:

- 17       1. All departments, commissions, boards, and other agencies of the state and its political  
18       subdivisions shall cooperate with the office [i.e., OHP] in order to salvage or preserve  
19       historic, prehistoric, or paleoenvironmental evidence located on property owned or  
20       controlled by the United States, the State of Nevada, or its political subdivisions.
  
- 21       2. When any agency of the state or its political subdivisions is preparing or has contracted  
22       to excavate or perform work of any kind on property owned or controlled by the United  
23       States, the State of Nevada, or its political subdivisions which may endanger historic,  
24       prehistoric or paleoenvironmental evidence found on the property, or when any artifact,  
25       site or other historic or prehistoric evidence is discovered during the course of such  
26       excavation or work, the agency or the contractor hired by the agency shall notify the  
27       office and cooperate with the office to the fullest extent practicable, within the  
28       appropriations available to the agency or political subdivision for that purpose, to  
29       preserve or permit study of such evidence before its destruction, displacement, or  
30       removal.

31   The LCR MSCP participants would comply with this statute while implementing the  
32   Conservation Plan.

33   **7.1.5       Tribal Laws and Regulations**

34   If the Conservation Plan were implemented on tribal lands, all appropriate regulations and  
35   standards would be followed.

1 **7.2 CONSULTATION AND COORDINATION**

2 **7.2.1 Public Involvement**

3 Reclamation, the Service, and Metropolitan, with input from other LCR MSCP participants,  
4 have prepared a PIP in support of this EIS/EIR. The PIP is a dynamic document that has  
5 continued to evolve as affected individuals, agencies, organizations, and governmental entities  
6 have been consulted and included in the environmental review process. It has been reviewed  
7 periodically to ensure that its goals have been met and that the needs of the public and affected  
8 agencies have been addressed.

9 The PIP has been prepared in accordance with Reclamation's guidelines for developing public  
10 involvement plans (USBR Public Involvement Manual [1980] and USBR Draft NEPA  
11 Handbook, 2000a). The activities carried out in accordance with the PIP are consistent with and  
12 satisfy the public involvement requirements and policies of NEPA and the Federal CEQ  
13 Guidelines (40 C.F.R. 1500 et. seq.), and CEQA and the California State CEQA Guidelines (14  
14 C.C.R. 15000 et. seq.). These activities are also consistent with Executive Order 11988,  
15 Floodplain Management, which requires public review of plans or proposals in floodplains.

16 To date, a number of different outreach activities have been carried out, including compiling  
17 and using mailing lists for distribution of project information; issuing newsletters and press  
18 releases; developing a website containing information about the LCR MSCP; publishing official  
19 notices; and conducting public meetings and hearings. A summary of these activities is  
20 presented below; additional information on outreach activities is available in the PIP.

21 An LCR MSCP mailing list has been developed that identifies interested individuals, local  
22 media, community and interest groups, cities and counties, environmental organizations, and  
23 cooperating, responsible, and trustee agencies, and other affected agencies. As new, interested  
24 parties have been identified, they have been added to the mailing list, which will be kept  
25 current during the course of the process. Anyone requesting information and/or notice  
26 regarding the LCR MSCP or the environmental review process will be added to the mailing list.  
27 Parties with written requests to be removed from the mailing list will be deleted from it. Copies  
28 of relevant documents, such as the NOI/NOP for the EIS/EIR and the EIS/EIR, will be  
29 maintained at Reclamation's office in Boulder City, Nevada; the Service's office in Phoenix,  
30 Arizona; and MWD's office in Los Angeles, California. Copies of the EIS/EIR have been  
31 provided to local libraries in Yuma and Phoenix, Arizona; Boulder City, Henderson, Laughlin,  
32 and Las Vegas, Nevada; and Blythe and Ontario, California.

33 The media and public have been kept informed about key project milestones, such as the  
34 issuance of draft documents, through periodic newsletters. Newsletters are intended to explain  
35 technical information or publicize meetings or other key activities.

36 Information repositories have been established at the offices of Reclamation, the Service, and  
37 Metropolitan and contain materials accessible to the public, including newsletters, reports, and  
38 meeting notices. Meeting notices and other important documents have been posted to the  
39 website ([www.lcrmscp.org](http://www.lcrmscp.org)), which has been established to make information about the EIS/EIR  
40 process available to a wider audience. The website includes a description of the LCR MSCP,  
41 current participants, files available to download, meeting schedules, past meeting notes, news

1 and interest items, and links to other sites. Reclamation also maintains LCR MSCP information  
2 and related documents at [www.lc.usbr.gov](http://www.lc.usbr.gov). This website includes the entire PIP, notices, public  
3 scoping summaries and other information intended to help keep the public informed about the  
4 LCR MSCP. Each website has a link to the other.

5 Public notices of EIS/EIR preparation and public hearings to obtain input into the  
6 environmental review process are described in section 1.5, Scoping and Public Involvement.  
7 These notices are included in Appendix B, and scoping summary reports are included in  
8 Appendix C.

9 A Notice of Availability (NOA) and a Notice of Completion (NOC) were prepared as a  
10 combined notice and distributed to the parties on the mailing list. These documents published  
11 the fact that the Draft EIS/EIR was completed and available for public review and comment.  
12 Copies of the notices were sent to all parties on the LCR MSCP mailing list. The NOA/NOC  
13 also was sent to cooperating, responsible, and trustee agencies, published in the Federal  
14 Register, published in local newspapers in the affected areas, and posted on the website. The  
15 NOA/NOC was filed with the California Office of Planning and Research, as required by  
16 CEQA. There was a 60-day review period for the public and agencies to review the Draft  
17 EIS/EIR and provide comments. The review period formally ended on August 18, 2004;  
18 however, comments received within a reasonable timeframe after that date have been  
19 responded to in the Final EIS/EIR. A news release also announced the availability of the Draft  
20 EIS/EIR.

21 During the 60-day review period, public hearings were conducted in Phoenix, Arizona; Blythe,  
22 California; and Henderson, Nevada in order to receive public comments on the Draft EIS/EIR,  
23 Draft HCP, Draft BA, and appendices to these documents. These hearings were held in the  
24 evening to facilitate participation by members of the public, and meetings were held in urban  
25 and rural communities to obtain input from the varied populations that could be affected by the  
26 LCR MSCP. Copies of these documents were sent out approximately 30 days prior to the public  
27 hearings, which were held on July 20-22, 2004. Notices of the hearings were published in the  
28 local newspapers and posted on the LCR MSCP website. Informational handouts were  
29 available that included the LCR MSCP Fact Sheet, map, Summary of Alternatives, and the  
30 Federal Register notice. Public comment forms were available at the meetings. No public  
31 comment forms were submitted at the meetings, but written comments were received later.

32 A summary of the complete comments and responses has been posted on the LCR MSCP  
33 website. The Final EIS/EIR will be published, distributed, made available in local libraries, and  
34 at the offices of Reclamation, the Service, and state agencies.

35 The Federal lead agencies will review the Final EIS/EIR and prepare a Record of Decision  
36 (ROD). If comments are received on the Final EIS/EIR, they will address significant comments  
37 in the ROD. As the lead agency under CEQA, Metropolitan will independently evaluate and, if  
38 appropriate, certify this EIR and make CEQA findings.

### 39 **7.2.2 Federal, State, and Local Agency Consultation and Coordination**

40 All Federal, state, and local agencies with interests in managing the water and related resources  
41 of the LCR were contacted early in the development of the Conservation Plan and asked to

1 participate in the planning process. Consequently, the LCR MSCP is a partnership of many  
2 agencies that have been actively involved in the development of the Conservation Plan and  
3 accompanying environmental and regulatory compliance documents. Other agencies, such as  
4 the Corps, USIBWC, and EPA, were invited to meetings to obtain their input to these  
5 documents. The LCR MSCP also has involved consultation as required under the ESA and  
6 NHPA. Federal, state, and local agencies were notified of EIS/EIR milestones through public  
7 notifications and were provided copies of the document to review (refer to section 7.2.1). They  
8 also were contacted to obtain information regarding projects to include in the cumulative  
9 impacts analysis (Chapter 4), and contacts were made with local planning officials to obtain  
10 information included in the resource-specific analyses contained in Chapter 3. All necessary  
11 contacts have and will continue to be made.

12 **7.2.3 Tribal Consultation and Coordination**

13 Reclamation, as part of its government-to-government consultation requirements (EO 13084),  
14 contacted Native American tribes within the planning area. Letters initiating consultation were  
15 sent to all potentially affected tribes informing them of the intent to prepare an EIS/EIR for the  
16 LCR MSCP in June 1999. A follow-up briefing with the tribes was held in conjunction with the  
17 initial scoping meetings for the EIS/EIR. Additional meetings were held with each of the on-  
18 river tribes in 2000 during supplemental scoping for the EIS/EIR. A formal consultation  
19 meeting with the on-river tribes was conducted in June 2001 to discuss specific tribal concerns.

20 In spring 2001, the LCR MSCP met with the tribes to obtain input on the development of the  
21 Conservation Plan and to discuss LCR MSCP issues specific to the tribes. In addition, the LCR  
22 MSCP offered to provide the tribes with support in developing tribal conservation areas as part  
23 of the LCR MSCP. The tribes expressed interest, and conservation opportunity reports were  
24 developed for most of the tribes. In fall 2001, meetings were held with each of the Tribal  
25 Councils to determine further interest in pursuing conservation partnerships. Follow-up work  
26 has been initiated with each of the tribes.

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- 10 Gallagher, Gail. Planner II, Yuma County.
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- 12 Hopkins, Becky. Deputy Town Clerk, Town of Wellton.
- 13 Loew, Brian. Assistant General Manager, County of Riverside.
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15 Department.
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- 17 Paul, Randy. Standards Branch Supervisor, Nevada Division of Environmental Protection.
- 18 Petritz, David. Associate Planner, City of Blythe.
- 19 Pulsipher, Charles. Assistant Planning Manager, Clark County.
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- 21 Spriggs, Matthew. Senior Planner, City of Yuma.
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## 10.0 ACRONYMS & GLOSSARY OF TERMS

### 10.1 ACRONYMS

|    |        |  |
|----|--------|--|
| 3  | AAC    | All-American Canal                               |
| 4  | ADEQ   | Arizona Department of Environmental Quality      |
| 5  | ADHS   | Arizona Department of Health Services            |
| 6  | ADWR   | Arizona Department of Water Resources            |
| 7  | af     | acre-feet  |
| 8  | afy    | acre-feet per year                               |
| 9  | AGFD   | Arizona Game and Fish Department                 |
| 10 | AGL    | above ground level                               |
| 11 | AGS    | Arizona Geological Survey                        |
| 12 | AMM    | Avoidance and minimization measure               |
| 13 | APE    | Area of Potential Effect                         |
| 14 | AZPDES | Arizona Pollutant Discharge Elimination System   |
| 15 | BA     | Biological Assessment                            |
| 16 | BACT   | Best Available Control Technology                |
| 17 | BASH   | Bird-Aircraft Strike Hazards                     |
| 18 | BCPA   | Boulder Canyon Project Act                       |
| 19 | BIA    | U.S. Bureau of Indian Affairs                    |
| 20 | BLM    | U.S. Bureau of Land Management                   |
| 21 | BLMYFO | U.S. Bureau of Land Management Yuma Field Office |
| 22 | BMPs   | Best Management Practices                        |
| 23 | BO     | Biological Opinion                               |
| 24 | BWC    | Basic Water Company                              |
| 25 | CAA    | Clean Air Act                                    |

## 10.0 Acronyms and Glossary of Terms

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|    |        |   |
|----|--------|---|
| 1  | CAAQS  | California Ambient Air Quality Standards        |
| 2  | CADHS  | California Department of Health Services        |
| 3  | CAP    | Central Arizona Project                         |
| 4  | CARB   | California Air Resources Board                  |
| 5  | CCR    | California Code of Regulations                  |
| 6  | CDC    | Centers for Disease Control                     |
| 7  | CDFG   | California Department of Fish and Game          |
| 8  | CDOC   | California Department of Conservation           |
| 9  | CEQ    | Council on Environmental Quality                |
| 10 | CEQA   | California Environmental Quality Act            |
| 11 | CESA   | California Endangered Species Act               |
| 12 | CFR    | Code of Federal Regulations                     |
| 13 | cfs    | cubic feet per second                           |
| 14 | CMM    | Conservation area management measure            |
| 15 | CNDDDB | California Natural Diversity Database           |
| 16 | CNEL   | Community Noise Equivalent Level                |
| 17 | CNPS   | California Native Plant Society                 |
| 18 | COA    | Conservation Opportunity Area                   |
| 19 | COC    | Community of Comparison                         |
| 20 | Corps  | U.S. Army Corps of Engineers                    |
| 21 | CRA    | Colorado River Aqueduct                         |
| 22 | CRIT   | Colorado River Indian Tribes                    |
| 23 | CRWQCB | California Regional Water Quality Control Board |
| 24 | CRZ    | Colorado River Zone                             |
| 25 | CU     | Consumptive Use                                 |

|    |      |  |
|----|------|--|
| 1  | CWA  | Clean Water Act  |
| 2  | cy   | cubic yards  |
| 3  | dB   | decibel, a unit for measuring relative amplitude of sound                    |
| 4  | dba  | A-weighted sound, a measure of sound amplitude which gives greater           |
| 5  |      | weight to the frequencies of sound to which the human ear is most sensitive. |
| 6  | DCP  | Desert Conservation Plan   |
| 7  | DOF  | California Department of Finance   |
| 8  | DOI  | U. S. Department of Interior   |
| 9  | EA   | Environmental Assessment   |
| 10 | EIR  | Environmental Impact Report  |
| 11 | EIS  | Environmental Impact Statement   |
| 12 | EO   | Executive Order  |
| 13 | EPA  | U.S. Environmental Protection Agency   |
| 14 | ESA  | Endangered Species Act   |
| 15 | ET   | evapotranspiration   |
| 16 | FAA  | Federal Aviation Administration  |
| 17 | GAP  | Gap Analysis Program   |
| 18 | GIS  | Geographic Information Systems   |
| 19 | GLO  | Government Land Office   |
| 20 | HCP  | Habitat Conservation Plan  |
| 21 | I-15 | Interstate 15  |
| 22 | IBWC | International Boundary and Water Commission                                  |
| 23 | IID  | Imperial Irrigation District   |
| 24 | ISC  | Interim Surplus Criteria   |
| 25 | ITA  | Indian Trust Asset   |
| 26 | IFT  | Interagency Fire Team  |

## 10.0 Acronyms and Glossary of Terms

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|    |              |  |
|----|--------------|--|
| 1  | kaf          | thousand acre-feet   |
| 2  | kafy         | thousand acre-feet per year  |
| 3  | kWh          | kilowatt-hour  |
| 4  | LCR          | lower Colorado River   |
| 5  | LCRAS        | Lower Colorado River Accounting System                                   |
| 6  | LCR MSCP     | Lower Colorado River Multi-Species Conservation Program                  |
| 7  | Ldn          | Day/Night Average Sound Level  |
| 8  | Leq          | a common unit to measure environmental sounds, based on an average level |
| 9  |              | of sound.  |
| 10 | LIM          | Land Inventory and Monitoring  |
| 11 | maf          | million acre-feet  |
| 12 | mafy         | million acre-feet per year   |
| 13 | MAPS         | Monitor Avian Productivity and Survival                                  |
| 14 | MCAS         | Marine Corps Air Station   |
| 15 | MDAQMD       | Mojave Desert Air Quality Management District                            |
| 16 | Metropolitan | The Metropolitan Water District of Southern California                   |
| 17 | mgd          | million gallons per day  |
| 18 | mg/L         | milligrams/Liter   |
| 19 | MRM          | Monitoring and research measure  |
| 20 | MSCP         | Multi-Species Conservation Program                                       |
| 21 | MSHCP        | Multi-Species Habitat Conservation Program                               |
| 22 | msl          | mean sea level   |
| 23 | NA           | Not applicable   |
| 24 | NAAQS        | National Ambient Air Quality Standards                                   |
| 25 | NAGPRA       | Native American Graves Protection and Repatriation Act                   |
| 26 | NBAPC        | Nevada Bureau of Air Pollution Control                                   |

|    |                 |  |
|----|-----------------|--|
| 1  | NBMG            | Nevada Bureau of Mines and Geology                               |
| 2  | NBWPC           | Nevada Bureau of Water Pollution Control                         |
| 3  | NDEP            | Nevada Department of Environmental Protection                    |
| 4  | NDOW            | Nevada Department of Wildlife                                    |
| 5  | NDWR            | Nevada Division of Water Resources                               |
| 6  | NECO            | Northern and Eastern Colorado Desert Coordinated Management Plan |
| 7  | NEMO            | Northern and Eastern Mojave Desert Management Plan               |
| 8  | NEPA            | National Environmental Policy Act                                |
| 9  | NGVD            | National Geodetic Vertical Datum                                 |
| 10 | NHPA            | National Historic Preservation Act                               |
| 11 | NMDGF           | New Mexico Department of Game and Fish                           |
| 12 | NNHP            | Nevada Natural Heritage Program                                  |
| 13 | NIB             | Northerly International Boundary                                 |
| 14 | NOA             | Notice of Availability   |
| 15 | NOC             | Notice of Completion   |
| 16 | NOI             | Notice of Intent   |
| 17 | NOP             | Notice of Preparation  |
| 18 | NO <sub>x</sub> | nitrogen oxides  |
| 19 | NPDES           | National Pollutant Discharge Elimination System.                 |
| 20 | NPS             | U.S. National Park Service                                       |
| 21 | NRA             | National Recreation Area   |
| 22 | NRCS            | Natural Resources Conservation Service                           |
| 23 | NRHP            | National Register of Historic Places                             |
| 24 | NRI             | National Resources Inventory                                     |
| 25 | NRS             | Nevada Revised Statutes  |

## 10.0 Acronyms and Glossary of Terms

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|    |                  |   |
|----|------------------|---|
| 1  | NWR              | National Wildlife Refuge                            |
| 2  | O <sub>3</sub>   | ozone   |
| 3  | OHP              | Office of Historic Preservation                     |
| 4  | OHV              | off-highway vehicle                                 |
| 5  | PEIR             | Program Environmental Impact Report                 |
| 6  | PIP              | Public Involvement Plan                             |
| 7  | PM <sub>10</sub> | particulate matter less than 10 microns in diameter |
| 8  | ppm              | parts per million                                   |
| 9  | PPR              | Present Perfected Right                             |
| 10 | PRC              | Public Resources Code                               |
| 11 | PVID             | Palo Verde Irrigation District                      |
| 12 | QSA              | Quantification Settlement Agreement                 |
| 13 | Reclamation      | U.S. Bureau of Reclamation                          |
| 14 | RM               | river mile  |
| 15 | ROD              | Record of Decision                                  |
| 16 | ROI              | region of influence                                 |
| 17 | RPA              | Reasonable and Prudent Alternative                  |
| 18 | RPM              | Reasonably Prudent Measure                          |
| 19 | RWQCB            | Regional Water Quality Control Board                |
| 20 | SCS              | Soil Conservation Service                           |
| 21 | Service          | U.S. Fish and Wildlife Service                      |
| 22 | SHPO             | State Historic Preservation Officer                 |
| 23 | SIA              | Secretarial Implementation Agreement                |
| 24 | SIP              | State Implementation Plan                           |
| 25 | SHPO             | State Office of Historic Preservation               |

|    |         |  |
|----|---------|--|
| 1  | SIB     | Southerly International Boundary                                   |
| 2  | SLE     | St. Louis encephalitis   |
| 3  | SNPLMA  | Southern Nevada Public Land Management Act                         |
| 4  | SNWA    | Southern Nevada Water Authority                                    |
| 5  | SRA     | State Recreation Area  |
| 6  | SRI     | Statistical Research, Inc.   |
| 7  | SWRCB   | State Water Resources Control Board                                |
| 8  | TCP     | Traditional Cultural Property                                      |
| 9  | TDS     | Total Dissolved Solids   |
| 10 | THPO    | Tribal Historic Preservation Officer                               |
| 11 | TMDL    | Total Maximum Daily Load   |
| 12 | TNC     | The Nature Conservancy   |
| 13 | TSS     | Total Suspended Solids   |
| 14 | USACE   | U.S. Army Corps of Engineers                                       |
| 15 | USBR    | U.S. Bureau of Reclamation   |
| 16 | USC     | United States Code   |
| 17 | USDA    | U.S. Department of Agriculture                                     |
| 18 | USIBWC  | International Boundary and Water Commission, United States Section |
| 19 | USFWS   | U.S. Fish and Wildlife Service                                     |
| 20 | USGS    | U.S. Geological Survey   |
| 21 | VOC     | Volatile organic compound  |
| 22 | WAPA    | Western Area Power Administration                                  |
| 23 | WEE     | Western equine encephalitis  |
| 24 | Western | Western Area Power Administration                                  |
| 25 | WNV     | West Nile virus  |

## *10.0 Acronyms and Glossary of Terms*

---

|   |      |  |
|---|------|--|
| 1 | WWTP | Wastewater treatment plant             |
| 2 | YEW  | Yuma East Wetlands Restoration Project |
| 3 | YIA  | Yuma International Airport             |
| 4 | YWW  | Yuma West Wetlands                     |

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## 1 10.2 GLOSSARY OF TERMS

|    |                         |   |
|----|-------------------------|---|
| 2  | Accident Potential Zone | An Accident Potential Zone is defined for each airport                |
| 3  |                         | and is intended to encompass the most critical land                   |
| 4  |                         | areas (generally the arrival and departure corridors                  |
| 5  |                         | around the airport). In APZs due to the greater risk of               |
| 6  |                         | an aircraft incident, development is typically                        |
| 7  |                         | prohibited.   |
| 8  | Acre-foot               | Volume of water (43,560 cubic feet) that would cover                  |
| 9  |                         | one acre to a depth of one foot.                                      |
| 10 | Adaptive management     | A method for examining alternative strategies for                     |
| 11 |                         | meeting measurable biological goals and objectives,                   |
| 12 |                         | and then if necessary, adjusting future conservation                  |
| 13 |                         | management actions according to what is learned.                      |
| 14 | Affected environment    | Existing biological, physical, social, and economic                   |
| 15 |                         | conditions of an area subject to change, both directly                |
| 16 |                         | and indirectly, as a result of a proposed human action.               |
| 17 | Allocation, allotment   | Refers to a distribution of water through which means                 |
| 18 |                         | specific persons or legal entities are assigned                       |
| 19 |                         | individual rights to consume pro rata shares of a                     |
| 20 |                         | specific quantity of water under legal entitlements. For              |
| 21 |                         | example, a specific quantity of Colorado River water is               |
| 22 |                         | distributed for use within each Lower Division State                  |
| 23 |                         | through an apportionment. The water available for                     |
| 24 |                         | consumptive use in that state is further distributed                  |
| 25 |                         | among water users in that state through the allocation.               |
| 26 |                         | An allocation does not establish an entitlement; the                  |
| 27 |                         | entitlement is normally established by a written                      |
| 28 |                         | contract with the United States government.                           |
| 29 | Apportionment           | Refers to the distribution of water available to each                 |
| 30 |                         | Lower Division state in normal, surplus, or shortage                  |
| 31 |                         | years, as set forth, respectively, in Articles II (B)(1), II          |
| 32 |                         | (B)(2), and II (B)(3) of the Decree in <i>Arizona v. California</i> . |
| 33 | Appropriative rights    | The right to divert a specified quantity of water at a                |
| 34 |                         | specified point of diversion for reasonable and                       |
| 35 |                         | beneficial uses at a specified place of use for a specified           |
| 36 |                         | manner of use. Appropriative rights are generally                     |
| 37 |                         | “first-in-time, first-in-right”; that is, one appropriative           |
| 38 |                         | right has priority over appropriative rights established              |
| 39 |                         | later.  |

## 10.0 Acronyms and Glossary of Terms

---

|    |                          |   |
|----|--------------------------|---|
| 1  | Backwater                | A relatively small, generally shallow area of a river       |
| 2  |                          | with little or no current.                                  |
| 3  | Best Management Practice | Any program, technology, process, siting criterion,         |
| 4  |                          | operating method, measure, or device that controls,         |
| 5  |                          | prevents, removes, or reduces pollution.                    |
| 6  | Biological assessment    | To facilitate compliance with section 7(a)(2), Federal      |
| 7  |                          | agencies must prepare a BA, pursuant to section 7(c)(1)     |
| 8  |                          | that identifies the likely effects of the Federal action on |
| 9  |                          | threatened and endangered species.                          |
| 10 | Biological opinion       | Document stating the U.S. Fish and Wildlife Service's       |
| 11 |                          | opinion as to whether a Federal action is likely to         |
| 12 |                          | jeopardize the continued existence of a threatened or       |
| 13 |                          | endangered species or result in the destruction or          |
| 14 |                          | adverse modification of critical habitat.                   |
| 15 | Candidate species        | Plant or animal species not yet officially listed as        |
| 16 |                          | threatened or endangered under the ESA, but which is        |
| 17 |                          | undergoing status review by the Service.                    |
| 18 | Class I inventory survey | A literature search conducted to characterize the           |
| 19 |                          | potential conservation areas in terms of known cultural     |
| 20 |                          | resources and the nature, location and adequacy of          |
| 21 |                          | previous cultural resource studies. A Class II survey       |
| 22 |                          | would extend to a field sampling of the conservation        |
| 23 |                          | areas, and a Class III survey would involve a 100           |
| 24 |                          | percent field survey.                                       |
| 25 | CNEL                     | Community Noise Equivalent Level, a measure of the          |
| 26 |                          | cumulative noise exposure in a community, with a 5          |
| 27 |                          | dB penalty added to evening (7:00 P.M. to 10:00 P.M.)       |
| 28 |                          | and a 10 dB addition to nocturnal (10:00 P.M. to 7:00       |
| 29 |                          | A.M.) noise levels.   |
| 30 | Colorado River Basin     | The drainage basin of the Colorado River in the United      |
| 31 |                          | States.   |
| 32 | Consumptive use          | The total water diversions from the Colorado River,         |
| 33 |                          | less return flows to the river.                             |
| 34 | Contractors              | Contractors consist of the Federal government, states,      |
| 35 |                          | Indian tribes, and various public and private entities      |
| 36 |                          | that are recognized under the Decree, hold a Section 5      |
| 37 |                          | Contract with the Secretary, or have a Secretarial          |
| 38 |                          | reservation of water. Those who hold entitlements to        |
| 39 |                          | Colorado River water are referred to as Contractors.        |

|    |                               |  |
|----|-------------------------------|--|
| 1  | Covered species               | Those species addressed in the LCR MSCP conservation plan for which conservation measures would be implemented and for which authorization for take is being requested under section 10 of the ESA.  |
| 2  |                               |  |
| 3  |                               |  |
| 4  |                               |  |
| 5  | Critical habitat              | Specific areas with physical or biological features essential to the conservation of a listed species and that may require special management considerations or protection. These areas have been legally designated via <i>Federal Register</i> notices.          |
| 6  |                               |  |
| 7  |                               |  |
| 8  |                               |  |
| 9  |                               |  |
| 10 | Cultural resource             | Building, site, district, structure, or object significant in history, architecture, archeology, culture, or science.  |
| 11 |                               |  |
| 12 | dB                            | decibel, a unit for measuring relative amplitude of sound  |
| 13 |                               |  |
| 14 | dBA                           | A-weighted sound, a measure of sound amplitude which gives greater weight to the frequencies of sound to which the human ear is most sensitive.  |
| 15 |                               |  |
| 16 |                               |  |
| 17 | Designated groundwater basins | Basins where permitted groundwater rights approach or exceed the estimated average annual recharge and where the water resources are being depleted or require additional administration.  |
| 18 |                               |  |
| 19 |                               |  |
| 20 |                               |  |
| 21 | Endangered species            | A species or subspecies whose survival is in danger of extinction throughout all or a significant portion of its range.  |
| 22 |                               |  |
| 23 |                               |  |
| 24 | Endangered Species Act        | The Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1544), as amended, under section 9, provides for the prohibition of "take" of any fish or wildlife species listed as threatened or endangered under the ESA unless specifically authorized by regulation. |
| 25 |                               |  |
| 26 |                               |  |
| 27 |                               |  |
| 28 |                               |  |
| 29 | Entitlement                   | Refers to an authorization to beneficially consume Colorado River water pursuant to (1) a decreed right, (2) a contract with the United States through the Secretary of the Interior, or (3) a Secretarial reservation of water.                                   |
| 30 |                               |  |
| 31 |                               |  |
| 32 |                               |  |
| 33 |                               |  |
| 34 | Flow                          | Volume of water passing a given point per unit of time expressed in cfs.   |
| 35 |                               |  |
| 36 |                               | <i>Peak flow</i> – Maximum instantaneous flow in a specified period of time.   |
| 37 |                               |  |

|    |                                     |  |
|----|-------------------------------------|--|
| 1  |                                     | <i>Return flow</i> – Portion of water previously diverted from |
| 2  |                                     | a stream and subsequently returned to that stream or           |
| 3  |                                     | to another body of water.                                      |
| 4  | Full Domestic Surplus determination | A water supply determination made by the Secretary             |
| 5  |                                     | that governs the amount of water available for                 |
| 6  |                                     | consumptive use by the Lower Division states for a             |
| 7  |                                     | specific calendar year. Under a Full Domestic Surplus          |
| 8  |                                     | determination the amount of water available to                 |
| 9  |                                     | domestic water users and specifically to Metropolitan,         |
| 10 |                                     | SNWA and domestic users in the State of Arizona is             |
| 11 |                                     | greater than the amount that would be available under          |
| 12 |                                     | a Normal determination.  |
| 13 | Full pool                           | Volume of water in a reservoir at maximum design               |
| 14 |                                     | elevation.   |
| 15 | Gaging station                      | Specific location on a stream where systematic                 |
| 16 |                                     | observations of hydrologic data are obtained through           |
| 17 |                                     | mechanical or electrical means.                                |
| 18 | Habitat Conservation Plan           | Per section 10(a)(2)(A) of the ESA, a Habitat                  |
| 19 |                                     | Conservation Plan (HCP) is a planning document that            |
| 20 |                                     | is a mandatory component of an incidental take permit          |
| 21 |                                     | application. An HCP specifies, among other things, the         |
| 22 |                                     | impacts that are likely to result from the taking and the      |
| 23 |                                     | measures the permit applicant will undertake to                |
| 24 |                                     | minimize and mitigate such impacts.                            |
| 25 | Headwater                           | The source and upper part of a stream.                         |
| 26 | Impaired water body                 | An “impaired” water body is defined under section              |
| 27 |                                     | 303(d) of the CWA. These are identified stream                 |
| 28 |                                     | segments and water bodies where constituent                    |
| 29 |                                     | concentrations “impair” the designated beneficial uses         |
| 30 |                                     | of the water body.   |
| 31 | Important Farmland                  | As defined by the USDA NRCS (formerly the Soil                 |
| 32 |                                     | Conservation Service), Important Farmlands include             |
| 33 |                                     | Prime Farmland, Unique Farmland, Farmland of                   |
| 34 |                                     | Statewide Importance, and Farmland of Local                    |
| 35 |                                     | Importance. The categorization of farmland is                  |
| 36 |                                     | based upon a soil classification system which accounts         |
| 37 |                                     | for the physical and chemical characteristics of the land      |
| 38 |                                     | and the suitability of the land for producing crops.           |
| 39 |                                     | Important Farmlands are afforded special protection            |
| 40 |                                     | due to their importance to agricultural production.            |

|    |                     |   |
|----|---------------------|---|
| 1  | Incidental take     | “Incidental take” is defined by the ESA as take that is     |
| 2  |                     | “incidental to, and not the purpose of, the carrying out    |
| 3  |                     | of an otherwise lawful activity” (50 CFR 17.22 and          |
| 4  |                     | 17.32).   |
| 5  | Indian Trust Assets | Indian Trust Assets “are ‘legal interests’ in ‘assets’ held |
| 6  |                     | in ‘trust’ by the Federal Government for Federally          |
| 7  |                     | recognized Indian tribes or individual Indians.”            |
| 8  | Kilowatt hour (kWh) | One thousand watt-hours of electrical energy.               |
| 9  | Lacustrine habitat  | Habitat associated with lakes.                              |
| 10 | Land cover type     | A classification system to describe vegetation and other    |
| 11 |                     | habitat types (e.g., cotton-wood willow, honey              |
| 12 |                     | mesquite type III, marsh, etc.).                            |
| 13 | Law of the River    | As applied to the Colorado River, a combination of          |
| 14 |                     | Federal and state statutes, interstate compacts, court      |
| 15 |                     | decisions and decrees, Federal contracts, an                |
| 16 |                     | international treaty with Mexico, and formally              |
| 17 |                     | determined operating criteria.                              |
| 18 | L <sub>dn</sub>     | The Day/Night Average Sound Level (L <sub>dn</sub> ) is     |
| 19 |                     | essentially the same as CNEL, with the exception that       |
| 20 |                     | the evening time period is dropped and all occurrences      |
| 21 |                     | during this 3-hour period are grouped into the daytime      |
| 22 |                     | period.   |
| 23 | Lead agency         | A lead agency is an agency initiating and overseeing        |
| 24 |                     | the preparation of an environmental impact report or        |
| 25 |                     | environmental impact statement. For this project,           |
| 26 |                     | Reclamation and the Service are the lead agencies for       |
| 27 |                     | compliance with NEPA, and Metropolitan is the lead          |
| 28 |                     | agency for compliance with CEQA.                            |
| 29 | Lee Ferry           | A reference point marking division between the Upper        |
| 30 |                     | and Lower Colorado River Basins. The point is located       |
| 31 |                     | in the mainstream of the Colorado River 1 mile below        |
| 32 |                     | the mouth of the Paria River in Arizona.                    |
| 33 | Lee’s Ferry         | Location of Colorado River crossings (1873 to 1928)         |
| 34 |                     | and site of the USGS stream gage above the Paria River      |
| 35 |                     | confluence.   |
| 36 | Leq                 | Leq is an energy-equivalent sound/noise descriptor          |
| 37 |                     | that is described in terms of an average level that has     |
| 38 |                     | the same acoustical energy as the summation of all the      |

|    |                                      |   |
|----|--------------------------------------|---|
| 1  |                                      | time-varying events. The most common averaging              |
| 2  |                                      | period is hourly, but Leq can describe any series of        |
| 3  |                                      | noise events of arbitrary duration.                         |
| 4  | Lower Basin                          | The part of the Colorado River watershed below Lee          |
| 5  |                                      | Ferry, Arizona; covers parts of Arizona, California,        |
| 6  |                                      | Nevada, New Mexico, and Utah.                               |
| 7  | Lower Colorado River Accounting      | A method that estimates and distributes consumptive         |
| 8  | System                               | use by vegetation to water users along the LCR.             |
| 9  | Lower Division                       | A division of the Colorado River system that includes       |
| 10 |                                      | the states of Arizona, Nevada, and California.              |
| 11 | Lower Division states                | Arizona, California, and Nevada as defined by Article       |
| 12 |                                      | II of the Colorado River Compact of 1922.                   |
| 13 | Mean sea level                       | The average height of the sea surface for all stages of     |
| 14 |                                      | the tide, serving as the reference surface for all          |
| 15 |                                      | altitudes in atmospheric studies.                           |
| 16 | Minute 242                           | Minute 242, August 30, 1973, of the United States           |
| 17 |                                      | Section, International Boundary and Water                   |
| 18 |                                      | Commission, pursuant to the 1944 Water Treaty.              |
| 19 |                                      | Similar to an amendment.                                    |
| 20 | Monotypic                            | In taxonomy, having only one subordinate unit, as a         |
| 21 |                                      | genus with a single species.                                |
| 22 | National Register of Historic Places | The nation's official list of cultural resources worthy of  |
| 23 |                                      | preservation. Authorized under the National Historic        |
| 24 |                                      | Preservation Act of 1966, the National Register is part     |
| 25 |                                      | of a national program to coordinate and support public      |
| 26 |                                      | and private efforts to identify, evaluate, and protect      |
| 27 |                                      | our historic and archeological resources. Properties        |
| 28 |                                      | listed in the Register include districts, sites, buildings, |
| 29 |                                      | structures, and objects that are significant in American    |
| 30 |                                      | history, architecture, archeology, engineering, and         |
| 31 |                                      | culture.  |
| 32 | Normal determination                 | A water supply determination made by the Secretary          |
| 33 |                                      | that governs the amount of water available for              |
| 34 |                                      | consumptive use by the Lower Division states for a          |
| 35 |                                      | specific calendar year. Under a Normal determination        |
| 36 |                                      | consumptive use within the Lower Division states is         |
| 37 |                                      | limited to 7.5 MAF.   |
| 38 | Piscivorous                          | Habitually feeding on fish.                                 |

|    |                            |   |
|----|----------------------------|---|
| 1  | PM <sub>10</sub>           | Particulate matter less than 10 microns in mean             |
| 2  |                            | diameter.   |
| 3  | Present Perfected Right    | With respect to the Colorado River, a water right           |
| 4  |                            | exercised by the actual diversion of a specific quantity    |
| 5  |                            | of water, prior to June 25, 1929, the effective date of the |
| 6  |                            | Boulder Canyon Project.                                     |
| 7  | Priority                   | A ranking with respect to diversion of water relative to    |
| 8  |                            | other water users.  |
| 9  | Reach                      | A specified segment of a stream, channel, or other          |
| 10 |                            | water conveyance. For the purposes of the LCR MSCP          |
| 11 |                            | analysis, the planning area is divided into seven           |
| 12 |                            | reaches, defined by water surface elevations and river      |
| 13 |                            | miles.  |
| 14 | Riparian                   | Of, on, or pertaining to the bank of a river, pond, or      |
| 15 |                            | lake.   |
| 16 | River mile                 | River miles are numbered along the thalweg of the           |
| 17 |                            | LCR channel south to north starting with RM 0.0 at the      |
| 18 |                            | Southerly International Border (SIB) with Mexico.           |
| 19 |                            | Backwaters are identified by river mile by using the        |
| 20 |                            | first letter of the state the backwater is located in       |
| 21 |                            | (Arizona, California, or Nevada) and the river mile         |
| 22 |                            | distance from the SIB to the point of connection            |
| 23 |                            | between the backwater and the river (e.g., C60.7). Dam      |
| 24 |                            | locations are noted at their respective river miles.        |
| 25 | River stage                | Water surface elevation above a datum.                      |
| 26 | Salinity                   | A term used to refer to the dissolved minerals in water     |
| 27 |                            | also referred to as total dissolved solids.                 |
| 28 | Section 10(a)(1)(B) permit | Section 10(a)(1)(B) of the ESA authorizes the Service to    |
| 29 |                            | issue non-Federal entities a permit for the incidental      |
| 30 |                            | take of endangered and threatened wildlife species.         |
| 31 |                            | This permit allows the non-Federal entity to proceed        |
| 32 |                            | with an activity that is legal in all other respects, but   |
| 33 |                            | that results in the "incidental to, and not the purpose     |
| 34 |                            | of, the carrying out of an otherwise lawful activity."      |
| 35 | Secretary                  | Secretary of the Interior                                   |
| 36 | Sediment                   | Unconsolidated solid material that comes from               |
| 37 |                            | weathering of rock and is carried by, suspended in, or      |
| 38 |                            | deposited by water or wind.                                 |

## 10.0 Acronyms and Glossary of Terms

---

|    |                       |   |
|----|-----------------------|---|
| 1  | Seral                 | Relating to a series of biological communities            |
| 2  |                       | succeeding one another in the biotic development of an    |
| 3  |                       | area.   |
| 4  | Structural types      | As used in the classification of vegetation along the     |
| 5  |                       | LCR, “structural type” is based on the prevalence of      |
| 6  |                       | vegetation in different layers or height categories.      |
| 7  |                       | Roman numerals I through VI are used to distinguish       |
| 8  |                       | six structural types that range from dense forest to      |
| 9  |                       | open shrublands, and variations in between.               |
| 10 | Take                  | As defined by the ESA, “take” means to harass, harm,      |
| 11 |                       | pursue, hunt, shoot, wound, kill, trap, capture, or       |
| 12 |                       | collect, or to attempt to engage in any such conduct (16  |
| 13 |                       | U.S.C. section 1531[18]).                                 |
| 14 | Threatened species    | A species or subspecies that is likely to become          |
| 15 |                       | endangered in the foreseeable future.                     |
| 16 | Total dissolved solid | A measure of the inorganic or mineral content of          |
| 17 |                       | water, commonly expressed in milligrams per liter.        |
| 18 | Tributary             | River or stream flowing into a larger river or stream.    |
| 19 | Upper Basin           | The part of the Colorado River watershed above Lee        |
| 20 |                       | Ferry, Arizona that covers parts of Arizona, Colorado,    |
| 21 |                       | New Mexico, Utah, and Wyoming.                            |
| 22 | Waters of the U.S.    | Per the Clean Water Act, “Waters of the U.S.” include:    |
| 23 |                       | (1) all waters which may be susceptible to use in         |
| 24 |                       | interstate or foreign commerce; (2) all interstate waters |
| 25 |                       | including interstate wetlands; (3) all other waters such  |
| 26 |                       | as intrastate lakes rivers, streams (including            |
| 27 |                       | intermittent streams), mud flats, sandflats, wetlands,    |
| 28 |                       | sloughs, prairie potholes, wet meadows, playa lakes, or   |
| 29 |                       | natural ponds, the use, degradation or destruction of     |
| 30 |                       | which could affect interstate or foreign commerce         |
| 31 |                       | including any such waters; (4) all impoundments of        |
| 32 |                       | waters otherwise defined as waters of the United          |
| 33 |                       | States; (5) tributaries of waters identified in this      |
| 34 |                       | section; (6) the territorial seas; and (7) wetlands       |
| 35 |                       | adjacent to waters (other than waters that are            |
| 36 |                       | themselves wetlands) identified in this section.          |
| 37 | Watershed             | The drainage area upstream of a specified point on a      |
| 38 |                       | stream.   |

|   |                |   |
|---|----------------|---|
| 1 | Williamson Act | The Williamson Act is a voluntary, locally administered program in California that offers reduced property taxes on lands that have enforceable restrictions on their use via contracts between individual land owners and local governments. |
| 2 |                |   |
| 3 |                |   |
| 4 |                |   |
| 5 |                |   |
| 6 | Xeric habitats | Habitats characterized by minimal water.  |

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## 12.0 INDEX

2 An index for this document was not generated because most of the key terms are used  
3 frequently throughout the document. The Table of Contents provides the best index for  
4 locating information.

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