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Upper Colorado River Endangered Fish Recovery Program

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Memorandum

To: Implementation/Management Committee, Consultants, and Interested Parties

From: ACTING Deputy Regional Director, Mountain-Prairie Region (6), U.S. Fish and Wildlife Service

Subject: Assessment of "Sufficient Progress" under the Upper Colorado River Endangered Fish Recovery Program in the Upper Colorado River Basin, and of Implementation of Action Items in the December 20, 1999, 15-Mile Reach Programmatic Biological Opinion

I. "SUFFICIENT PROGRESS"

In accordance with the Section 7, Sufficient Progress, and Historic Projects Agreement, the U.S. Fish and Wildlife Service (Service) has reviewed the 2004 (including consideration of 2005 results thus far) and cumulative accomplishments and shortcomings of the Upper Colorado River Endangered Fish Recovery Program (Recovery Program) in the Upper Colorado River Basin. Per that Agreement, the Service used the following criteria to evaluate whether the Recovery Program is making "sufficient progress" toward recovery of the four listed fish species:

- actions which result in a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction;
- status of the fish populations;
- adequacy of flows; and
- magnitude of the impact of projects.

A complete assessment of recent (current as of February 24, 2005, including some updates as of June 2005) accomplishments and shortcomings of the Recovery Program under the Recovery Implementation Program Recovery Action Plan (RIPRAP) is attached. Previous years' accomplishments and shortcomings are described in previous "sufficient progress" memoranda and outlined in the RIPRAP itself.

A. Status of the Species

Wild populations of Colorado pikeminnow and humpback chub have been studied since the 1960s, and population dynamics and responses to management actions have been evaluated since the early 1980s. It is anticipated that self-sustaining populations of razorback sucker and bonytail will be reestablished over the next 15 years, during which time population dynamics and responses to management actions will be evaluated. Regions 6 and 2 of the Service are collaborating to ensure a coordinated effort to achieve recovery in both the upper (including the San Juan River) and lower basins.

Significant changes in the status of the four species generally are not detected on a year-to-year basis. Closed-population, multiple mark-recapture estimators are being used (where possible) in the Upper Colorado River Basin to derive population point estimates for Colorado pikeminnow and humpback chub for tracking of population trends. The accuracy and precision of each point estimate is assessed by the Service in cooperation with the Recovery Program and in consultation with investigators developing the point estimates and qualified statisticians and population ecologists. Additionally, an evaluation of stocked razorback sucker and bonytail is ongoing, and a draft of the initial report is expected by summer 2005.

To date, the Service has convened two workshops on population estimates. The first workshop was held in December 2001 to assess sampling protocols and data analyses and to recommend changes in methods to increase the reliability of population point estimates. Another outcome of that workshop was that numeric targets for capture probability and coefficients of variation were recommended to help evaluate confidence in the point estimates.

The second workshop was held in August 2004 to further assess, discuss, and understand the population point estimates and trends in population abundance and structure. An objective of that workshop was to begin discussions on environmental variables and life-history traits influencing population estimates and population dynamics. An *ad hoc* group of species experts reviewed information presented at the workshop and has prepared a draft summary report (with recommendations) that will be used to guide future research and management.

The most current estimates of the mean number of wild adult Colorado pikeminnow and humpback chub are shown in Table 1. This information was gathered from presentations at the August 2004 population estimates workshop. Many of these estimates are preliminary (analyses ongoing), and some are contained in draft reports undergoing peer and Biology Committee review. These data indicate recent downward trends in the abundance of Colorado pikeminnow in the Green River subbasin and in the abundance of humpback chub in Black Rocks, Westwater Canyon, and Desolation/Gray Canyons. Table 1 also provides a general overview of Colorado pikeminnow stocking in unoccupied reaches of the upper Colorado River subbasin, and stocking efforts to reestablish a population in the San Juan River. Table 2 provides a general overview of stocking efforts to reestablish razorback sucker and bonytail populations in the Upper Colorado River Basin (including the San Juan River).

Table 1.—Summary of Colorado pikeminnow and humpback chub status (includes preliminary data and data in draft reports undergoing peer and Biology Committee review gathered from presentations at the August 2004 population estimates workshop).

SPECIES	RIVER SYSTEM		
	MIDDLE GREEN	LOWER GREEN	UPPER COLORADO
Colorado pikeminnow	Estimates of wild adults is ranged from about 2,300 in 2003 to about 3,100 in 2001. Final draft report on the Green River subbasin population has been submitted for Biology Committee approval.		Estimates of wild adults ranged from about 450 in 1992 to about 780 in 2003. Under the 2003 integrated upper basin stocking plan (Nesler et al. 2003), 4,426 hatchery-produced subadults have been stocked to date in unoccupied reaches (plans to continue these stockings will be reevaluated).
	SAN JUAN: An estimate of about 20 wild adults was based on data collected in the early to mid-1990's. Stocking of juvenile fish is ongoing under the 2003 augmentation plan. Over 668,000 juveniles were stocked in 2002–2004, and about 300,000 juveniles are scheduled to be stocked in fall 2005. Survival of stocked fish has been documented.		
Humpback chub	Yampa Canyon: Population is small, with an estimate of about 400 wild in 1998–2000.	Desolation/Gray Canyons: Estimates of wild adults vary from about 2,000 in 2001, 2,200 in 2002, and 1,000 in 2003. Sampling in 2001 and 2002 was conducted in summer, whereas sampling in 2003 was conducted in fall. Final draft report on this population was approved by the Biology Committee in July 2005.	Black Rocks Canyon: Estimates of wild adults vary from about 800 in 1998, 900 in 1999, and 500 in 2000 and 2003. Westwater Canyon: Estimates of wild adults range from about 4,700 in 1998 to 2,500 in 1999, 2000, and 2003. Cataract Canyon: Population is small, with an estimate of about 150 wild adults in 2003.
	LOWER COLORADO, GRAND CANYON: 2,000–4,000 wild adults (not including the mainstem); methods being reviewed to improve estimate.		

Table 2. General overview of stocking efforts to reestablish razorback sucker and bonytail populations in the Upper Colorado River Basin (including the San Juan River).

SPECIES	RIVER SYSTEM		
	MIDDLE GREEN	LOWER GREEN	UPPER COLORADO
Razorback sucker	From 1995 through 2004, 89,730 PIT-tagged razorback sucker subadults were stocked in the Green and upper Colorado River subbasins. Of those, 24,840 were stocked under the 2003 integrated upper basin stocking plan (Nesler et al. 2003). Monitoring and evaluation of fish stocked in 2003–2004 is currently being accomplished through analysis of data collected in sampling conducted for other population estimates and nonnative fish control. Initial draft of the report to evaluate stocked fish is expected in summer 2005.		
	Data from 1998–1999 suggested that about 100 wild adults remained at that time, with an estimated annual survival rate of about 70%. The population is being augmented through stocking, which has been expanded with excess fish stocked into selected floodplain depressions. Stocked fish in reproductive condition have been captured at spawning sites, and captures of larvae suggest that these fish are reproducing.	Few wild adults have been captured in recent years. The population is being augmented through stocking.	Few wild adults have been captured in recent years. The population is being augmented through stocking. Larvae were collected in the Gunnison River in 2002 and 2003, indicating reproduction by stocked fish.
	SAN JUAN: No estimate of adults is available. Stocking 1-year-old-plus fish (greater than 300 mm total length) is ongoing under the 2003 augmentation plan. Since 1994, about 10,850 subadults and adults have been stocked. Reproduction by stocked fish at separate locations has been documented through collection of larvae every year since 1998, and juveniles were found in 2002 and 2003.		
Bonytail	From 1996 through 2004, 44,472 tagged bonytail subadults were stocked in the Green and upper Colorado River subbasins. Of those, 23,791 were stocked under the 2003 integrated upper basin stocking plan. Stocked bonytail have been recaptured at several locations throughout the upper basin. During September–November 2003, 16 stocked bonytail were recaptured in Cataract Canyon after about 1 year post stocking. Monitoring and evaluation of fish stocked in 2003–2004 is currently being accomplished through analysis of data collected in sampling conducted for other population estimates and nonnative fish control. Initial draft of the report to evaluate stocked fish is expected in summer 2005.		

B. Accomplishments

Recovery Program participants accomplished several important objectives in 2004 and in 2005 (to date), including:

- progress on nonnative fish management;
- success of stocking efforts;
- restoration and research of floodplain habitats;
- increases in YOY Colorado pikeminnow catch rates in the Green River;
- completion of the Yampa River Basin management plan and programmatic biological opinion, and signing of the cooperative agreement to implement the management plan;
- initiation of Elkhead Reservoir enlargement construction;
- completion of the Duchesne River biological opinion, and efforts of the Duchesne River workgroup to implement the flow recommendations;
- continued augmentation of base flows in the 15-Mile Reach; and
- completion of the Grand Valley Project fish passage, and soon to be completed fish screens in the Grand Valley Project and Redlands diversion canals.

Details of these accomplishments by subbasin or river follow.

General (Upper Colorado River and Green River Subbasins)

- On February 4, 2004, the Recovery Program adopted a nonnative fish management policy that addresses the process of identifying and implementing nonnative fish management actions needed to recover the endangered fishes. The policy ensures that a more consistent message is included in strategic communication efforts intended to enhance agency and public understanding and gain support for these necessary actions. I&E efforts continue and focus on press releases, communicating with elected officials, and coordinating public outreach with partner agencies.

  Results of the 2003 nonnative fish management projects were reviewed at a December 2003 workshop, and appropriate revisions were made to the scopes of work for 2004. Revisions included placing emphasis on nonnative fish control in the Yampa River, shifting from a treatment/control approach to depletion analysis (i.e., fish are tagged and released on the first sampling pass in a river reach, then removed during subsequent passes to estimate initial abundance and to demonstrate a depletive effect and level over time), and shifting emphasis from channel catfish to smallmouth bass. Results of the 2004 nonnative fish management projects were reviewed at a December 2004 workshop, and appropriate revisions were made to the scopes of work for 2005 to further increase capture efficiency and improve overall catch rates.

Management of northern pike in the Yampa and Green rivers appeared to be relatively effective in 2004, as evidenced by approximately 60 to 68% within-year reductions in abundance in the targeted sections of the Yampa River. Efforts and studies in 2005 are designed to determine if these reductions in abundance will endure, or if numbers will rebound as the result of recruitment and/or immigration from areas outside of critical habitat. Tagging of northern pike in the Yampa River upstream of the Hayden Bridge began in 2004 to help determine downstream movements into critical habitat and guide decisions to expand management efforts. Data since 2001 strongly indicate that efforts to manage northern pike in the middle Green River in Utah are having a depletive effect (248 northern pike removed in 2001, 42 in 2002, 22 in 2003, and 29 in 2004).

Smallmouth bass management yielded variable results in 2004, but provided valuable information about smallmouth bass abundance and the effort required to deplete a population to targeted levels. Depending on the section of river, within-year reductions in abundance ranged from 8 to 69% (20–69% in the Yampa River and 8–42% in the Green River). To improve catch rates of bass in 2005, adjustments will be made to increase capture efficiency and, where appropriate, increase effort. Additional time and effort will be spent by electrofishing slowly and methodically, and spending more time in concentration areas. Electric seines will be used in some areas. The sampling period will be extended into the fall when bass are more vulnerable to capture. In addition to larger bass, smaller bass (age-0 and age-1) will be targeted in an attempt to limit recruitment. In Yampa Canyon, light-weight rafts and generators will be used to improve capture efficiency at lower flows.

A depletive effect has been shown for channel catfish in Yampa Canyon, with a steady decline in the average length of fish captured since 2001.

Where appropriate and practical, nonnative fish removed from the Yampa River are relocated to area ponds and reservoirs to provide sportfishing opportunities for the angling public. In 2004, approximately 2,600 smallmouth bass were relocated to Elkhead Reservoir, and approximately 1,600 northern pike were relocated to the Yampa State Wildlife Area ponds, Loudy-Simpson pond, or Rio Blanco Reservoir.

To monitor fish species response to the nonnative fish management activities, a study is underway on the Yampa River where northern pike and smallmouth bass management are occurring. Results of data collected in the fall of 2004 are not yet available. It is expected to take 2 or more years to detect a response, first in small-bodied prey-sized fishes, then in native fishes, and ultimately in endangered fishes. The study will continue in 2005. Also in 2005, data will be collected in the Green River to establish a baseline from which to compare fish community responses to nonnative fish management efforts. The Recovery Program is developing criteria to evaluate the effectiveness of Yampa River nonnative fish management.

The next nonnative fish management workshop will be held in December 2005. The purpose of this workshop is to present and evaluate results of work completed in 2002–2005 and to develop recommendations for revising 2006 nonnative fish management projects.

The Service is encouraged by progress in implementing nonnative fish management actions, and is optimistic that the modified and increased nonnative fish management efforts will have the desired effect of reducing the abundance of problematic nonnative fishes while bringing about positive responses in populations of endangered and other native fishes. However, the Service remains very concerned about the impacts of problematic nonnative fishes on the endangered and other native fishes, and will closely follow the effectiveness of nonnative fish management actions.

- The Recovery Program's stocking efforts continue to produce positive results (see Table 2). Razorback suckers stocked in the middle Green River have been recaptured in reproductive condition at spawning sites, and recent captures of larvae suggest that these fish are reproducing. Razorback suckers stocked in the upper Colorado River subbasin are being recaptured, and reproduction by razorback suckers stocked in the Gunnison River has been documented by collection of larvae. Stocked bonytails are being recaptured throughout the upper basin. Colorado pikeminnow stocked in unoccupied reaches of the upper Colorado River subbasin are being recaptured, but this stocking will be reevaluated due to catches of these fish in downstream (occupied) reaches. An initial draft of the report to evaluate fish stocked under the 2003 integrated upper basin stocking plan (Nesler et al. 2003) is expected in summer 2005.

  Under the 2003 integrated upper basin stocking, stocking targets (numbers) in 2004 were largely met or exceeded for bonytail (except for the lower Green River where only 58% of the target number was stocked [but more fish were stocked in the middle Green and Colorado rivers]) and Colorado pikeminnow. The 2004 stocking target for razorback sucker was exceeded for the middle Green River, but stocking targets for other areas in 2004 were not met (percent of target achieved ranged from 17% for the Butch-Craig floodplain wetland on the Gunnison River to 86% for the Colorado River).

Green River Subbasin – Green River

- Research was successfully conducted during spring runoff in 2005 in the middle Green River downstream of Jensen, Utah, to evaluate larval razorback sucker drift and entrainment into floodplain habitats, physical characteristics of restored floodplain sites, areal extent of floodplain inundation, and sediment deposition over the Escalante razorback sucker spawning bar. These studies had been postponed for several years due to the drought, and their successful conduct in 2005 was due to excellent cooperation among the participating agencies.
  Target flows of 14,000, 16,000, and 18,000 cubic-feet-per-second (cfs) at the Jensen gage

were established according to requirements of the planned research. Flows in the Green River near Jensen peaked at 19,600 cfs on May 26, and the peak flow near Ouray, Utah, was greater than 30,000 cfs.

Early in the planning process in April, Reclamation worked cooperatively to form an arrangement whereby bypass releases from Flaming Gorge Dam (above power plant capacity) would be made, if needed, to support the desired target flows. Spring flows in the Yampa River were higher than expected, and Reclamation released an additional 1,700 cfs for 2 days before the peak to help meet the 14,000 cfs target and 2,300 for 2 days after the peak to help meet the 16,000 cfs target.

- Restoration of the 333-acre wetland on the Thunder Ranch floodplain property near Jensen, Utah, was completed in July 2004 with the installation of manifolds and pipelines to divert selenium-laden waters to the river and breaching of levees. This wetland is expected to provide important nursery habitat in a key location for young razorback suckers and greatly contribute toward recovery of the species. Numerous wild razorback sucker larvae were captured just upstream of this site in 2004, and preliminary results from research conducted in spring 2005 suggest a similar pattern. Physical evaluation of this site was conducted during spring runoff in 2005, with follow-up evaluation scheduled in summer 2005.

- Continued Colorado pikeminnow young-of-the-year (YOY) monitoring in the Green River is helping to provide insight into year-class strength and relationships to annual flows. Catch-per-unit-effort estimates for YOY Colorado pikeminnow in 2004 were the highest they have been since 1996 in the middle Green River and since 2000 in the lower Green River.

Green River Subbasin – Yampa River

- The final *Management Plan for Endangered Fishes in the Yampa River Basin and Environmental Assessment* was released in October 2004. The final programmatic biological opinion for the Yampa River management plan was signed on January 10, 2005, and a cooperative agreement to implement the Yampa River management plan was signed on January 19, 2005.

- The Yampa PBO covered the Corp of Engineers' issuance of a 404 permit for the project to enlarge Elkhead Reservoir on February 11, 2005, and the various agreements/leases/contracts associated with the enlargement project were signed on March 26, 2005. Construction began in early April 2005 and is slated for completion in 2007. When finished, the Recovery Program will have a permanent source of 5,000 af/year for augmentation of base flows in the Yampa River with an option to lease up to 2,000 af/year of additional augmentation water.

Green River Subbasin – Duchesne River

- The update to the 1998 Duchesne River biological opinion was signed on May 4, 2005. The Duchesne River workgroup, comprised of various stakeholders, is working on cooperative ways to implement the revised 2003 Duchesne River flow recommendations. A coordinated reservoir operations model was completed in 2003, and test flows were released in 2004. Gages on the Duchesne River were upgraded to better monitor target flows in lower river.

Upper Colorado River Subbasin – Colorado River

- Recognizing the low carryover storage in the Upper Colorado River Basin reservoirs and generally drier than average conditions in 2004, the Service initially set the target flows for the 15-Mile Reach at 400 cfs which was maintained through mid-September when it was increased to 810 cfs.

  A total of 18,778 af of water was released to support late-summer target flows. This total included 119 af from Green Mountain, 15,981 af from Ruedi, and 2,678 af from Williams Fork. Wolford Mountain was drawn down to record low levels in 2002 and did not fill in 2003 or 2004; in order to build storage no water was called for from Wolford Mountain in 2004.

  The average flow in the 15-Mile Reach during the flow augmentation period of July 16 through October 31 was 830 cfs (would have been 716 cfs without augmentation). The average flow in the reach during the 400 cfs target period between July 16 and September 27 was 724 cfs (would have been 585 cfs without augmentation). Between September 29 and October 31, the average flow in the reach was 1,068 cfs (would have been 982 cfs without augmentation). Daily average flows in the 15-Mile Reach dropped below the flow targets on 10 days during 108-day augmentation period. Without flow augmentation, flows in the 15-Mile Reach would have dropped below the target flows on 27 days. However, Historic Users Pool (HUP) participants failed to reach consensus on delivery of additional augmentation water from Green Mountain Reservoir, which prevented much-needed water from being delivered during August and early September.

- A levee was lowered at the Walter Walker State Wildlife Area on the Colorado River near Grand Junction in March 2004. Within the upper Colorado River subbasin (upstream of the Green River confluence), Walter Walker was identified as the "highest-use area" for Colorado pikeminnow and, formerly, razorback sucker. Lowering the levee is expected to enhance and help maintain the habitat for use by endangered fishes. The levee excavation was done by United Sand and Gravel in cooperation with the Colorado Division of Wildlife, Recovery Program, U.S. Bureau of Reclamation, and Service.

River flows over topped the lowered levee in spring 2005. Observations made during connection indicated no problems and no potential problems with the restored site.

- Habitat restoration was completed at the Grand Valley Audubon Society's Ela Wildlife Sanctuary in August 2004. The site is located on the Colorado River downstream from Grand Junction, Colorado, and was designed as a razorback sucker nursery habitat for the 18-Mile Reach. A 50-foot levee notch was excavated to allow drifting razorback sucker larvae access to floodplain nursery habitat.

  River flows over topped the notched levee in spring 2005 and the ponds filled. No problems were observed, and the site worked as designed and constructed. Some modifications for additional berming between a portion of the easement property and adjacent private property were recommended by Reclamation.

- Construction on the fish passage at the Grand Valley Project Diversion Dam was completed in July 2004. The first trial test of the passage was conducted during the week of June 20, 2005. A total of 2,527 fish were enumerated from the fish passage trap, and included six native fish species (comprising 53% of the total trap catch), three nonnative fish species (comprising 47% of the total trap catch), and three individual sucker hybrids. One razorback sucker one humpback chub-looking fish were found using the passage. Most native fish were flannelmouth sucker (797 individuals; 32% of native catch), and most nonnative fish were white sucker (1,030 individuals; 41% of the nonnative catch). A second trial test is planned for late September 2005.

  The Grand Valley Project fish passage will begin full operation after construction of fish passage at the Price-Stubb Diversion Dam. A fish screen in the Grand Valley Project Diversion Canal (as well as in the Redlands Diversion Canal on the Gunnison River) is scheduled for completion in summer 2005.

C. Concerns

The following concerns were expressed in the Service's memorandum in December 2004 assessing sufficient progress, and are retained here for continued emphasis. Additional concerns since the December 2004 assessment are: 1) failure of the temporary fish screen on the Elkhead Reservoir spillway, and 2) flows in the 15-Mile Reach.

- recent apparent downward trends in some Colorado pikeminnow and humpback chub populations;
- increases in smallmouth bass;
- long-term protection of instream flows;
- continued delays in Flaming Gorge Dam EIS process;

- declines in Yampa River native fishes;
- operation of the GVIC fish passage and screen; and
- slow substantive progress on Aspinall EIS.

Details of the above concerns by subbasin or river follow.

General (Upper Colorado River and Green River Subbasins)

- Recent preliminary or draft data on population estimates indicate downward trends in the abundance of Colorado pikeminnow in the Green River subbasin and in the abundance of humpback chub in Black Rocks, Westwater Canyon, and Desolation/Gray Canyons. These populations are viewed as the foundations for recovery of the species.

- Results of recent sampling indicate dramatic expansions in the distribution and abundance of smallmouth bass. Recovery Program biologists believe that smallmouth bass pose a great threat to native fishes, because they are opportunistic predators and have the potential to prey on and/or compete with different life stages of the four endangered fishes.

- Long-term protection of instream flows needs to stay on the States' radar screens, as it is a requirement for achieving recovery.

Green River Subbasin – Green River

- Continued delays in the Flaming Gorge Dam EIS process have resulted in continued delays in dam re-operations to meet the Green River flow and temperature recommendations and State protection of fish flows in the Green River downstream from the Duchesne River confluence. The expectation in December 2004 was that the Flaming Gorge EIS process and the associated Section 7 consultation would be completed early in 2005 so that the flow and temperature recommendations (Muth et al. 2000) could be implemented to take full advantage of spring flow conditions. (However, see acknowledgment of coordinated efforts to provide experimental flows in spring 2005 under Accomplishments and Conclusions.) The current EIS schedule now has the Record of Decision postponed until November or December 2005.

Green River Subbasin – Yampa River

- Results of recent sampling indicate precipitous declines in native fishes in the Yampa River, which has long been considered one of the strongholds for native fishes in the Upper Colorado River Basin.

- The temporary fish screen on the notched spillway of Elkhead Reservoir failed in April 2005, potentially directly affecting nonnative fish escapement and requiring revisions to

the planned nonnative fish control efforts in 2005 in order to implement the screen failure contingency plan.

Upper Colorado River Subbasin – Colorado River

- GVIC fish passage and fish screen operations have occurred less frequently than anticipated. The structure to provide fish passage at GVIC has been in place since the late 1990's, and improvements to the fish screen on the GVIC canal were completed in time for the 2004 irrigation season, but operational problems remain.

- There has been a lack of high peak flows and extremely low base flows over the past few years potentially resulting in habitat degradation. The Recovery Program has undertaken several measures to provide additional water for the endangered fish, but flow recommendations for the 15-Mile Reach still have not been fully met.

  » Although irrigation diversions in 2004 were reduced by 29,000 af through operation of the Grand Valley Water Management Project, that water was left in the Green Mountain Reservoir HUP pool and not delivered to benefit the endangered fishes.

  » Drought conditions have prevented implementation of the Coordinated Reservoir Operations Program (CROPS) and the Coordinated Facilities Operations Program (CFOPS) to enhance spring peak flows since the PBO was issued. Although spring peak flows in 2003 and 2005 exceeded the 12,900 cfs threshold, other CROPS operating criteria were not met.

Upper Colorado River Subbasin – Gunnison River

- The Aspinall Unit Operations EIS and section 7 consultation will determine the operations of the Unit to assist in meeting the flow recommendations for the endangered fishes that will facilitate their recovery. However, substantive progress on the Aspinall Unit Operations EIS has been very slow, and there is a lack of a current, well-defined schedule of important steps in the overall process.

D. Conclusion ("Sufficient Progress")

Recovery Program participants need to actively pursue resolution of the following issues (listed by subbasin or river) that are, in part, related to concerns listed above. The Service requests that regular progress reports on these items and their effect on meeting RIPRAP schedules be provided to the Management Committee.

General (Upper Colorado River and Green River Subbasins)

1. Continue analyses of preliminary data on population estimates. Finalize current draft reports on population estimates and the summary report of the August 2004 population estimates workshop by end of FY05. Use results and recommendations of those projects (particularly information developed by the workshop's *ad hoc* group) as guidance to determine the feasibility, efficacy, and implementation of additional data analyses to further understand environmental variables and life-history traits influencing the dynamics of Colorado pikeminnow and humpback chub populations. Results of that initial research can be used to refine hypotheses and direct management actions.

   The Service is pleased that the Recovery Program initiated in FY05 Phase I of the Research Framework project to better understand how management actions are addressing factors that contribute to dynamics of endangered fish populations. It is hoped that results of Phase I will facilitate approval and implementation of Phase II in FY06. (*Note: the Research Framework scope of work can be found at http://mountain-prairie.fws.gov/crrip/sow/06-07/SOW0607.htm under the Research, Monitoring and Data Management element, project number 145.)

2. The Service is encouraged by progress in implementing nonnative fish management actions, but remains very concerned about the impacts of problematic nonnative fishes on the endangered and other native fishes. Consequently, the Service will closely follow the effectiveness of these management actions and the responses of the endangered and other native fishes. Data should be reported annually, and necessary changes to nonnative fish management actions should be made in a timely fashion. Specific items requiring attention in 2005 include:

   - Develop criteria to determine the effectiveness of nonnative fish management actions.
   - Finalize the State of Colorado's lake management plan for Elkhead Reservoir.
   - Reevaluate screening of the Elkhead spillway and evaluate alternatives to screening (e.g., enhancement of Yampa River nonnative fish management actions).

Green River Subbasin – Green River

3. Complete the Flaming Gorge Dam EIS process with a Record of Decision by the end of 2005. The official draft biological opinion was submitted to the action agencies in late June 2005, and the final is expected before the end of September 2005[1].

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[1] Reclamation has agreed to fulfill its obligations under the Recovery Program and under Section 7(a)(1) of the ESA by re-operating its reservoirs (e.g., Flaming Gorge Dam and the Aspinall Unit) to promote recovery of the endangered fishes. The September 29, 1987, framework document for the Recovery Program ("Blue Book") recognized that water-resource development projects constructed by the U.S. Bureau of Reclamation may have

The Service recognizes the assistance of Reclamation and others in spring 2005 to release additional water above power plant capacity from Flaming Gorge Dam to support the flow targets needed to conduct important razorback sucker and floodplain research in the middle Green River. Completion of that research (which had been postponed for several years due to the drought) clearly demonstrates the cooperation and commitment of Recovery Program partners.

Upper Colorado River Subbasin – Colorado River

4. Provide more details in annual reports on operation and maintenance of the GVIC fish passage and fish screen, including dates of operation (or non-operation), problems encountered (reasons why the facilities were not operated as planned), remedial actions taken, and any recommendations to improve operational efficiency. (This type of information should also be included in the annual reports for other Grand Valley fish screens and passages once they are completed and operational.) The Service recognizes that, in some cases, less than full performance of these facilities can be attributed to the recent drought conditions, but believes that diligence in their operation and maintenance can be improved. Once the Grand Valley Project and Redlands fish screens are completed and operational, lessons learned there should be applied at the GVIC fish screen. Additionally, automation of the GVIC fish passage (possibly with an automated obermeyer gate) needs to be seriously pursued.

   The Service is pleased that a meeting was held in April 2005 with Grand Valley irrigators, Reclamation, and Recovery Program staff to discuss operations of Grand Valley fish screens and passages, identify problems and solutions, and document operation expectations and plans, and that a follow-up meeting was tentatively scheduled for after the 2005 irrigation season. These bi-annual meetings need to continue and need to focus on ensuring operation of the facilities.

5. Document flow thresholds and other considerations for operation of the Grand Valley Project fish passage. Water-supply issues for operation of the Grand Valley Project fish passage during low-flow conditions should be addressed prior to completion of the Price-Stubb fish passage. The Service anticipates that trial operations of the Grand Valley Project fish passage conducted in June 2005 and scheduled for September 2005 will provide information to help address these issues.

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significantly and adversely affected the endangered fishes and their habitats. Reoperation of major Federal facilities (e.g., Flaming Gorge and Aspinall Unit) to reduce or eliminate adverse impacts and contribute to recovery is a foundation principal of the Recovery Program and therefore tied to the Recovery Program's ability to continue to provide the reasonable and prudent alternatives to avoid jeopardy of historic and new water depletions. Alternatives for reoperation of Federal reservoirs will be determined through NEPA and Section 7 consultations.

6. Accomplish the following actions for providing water to the 15-Mile Reach:

   - Expedite the River District's request to secure a 5,000 acre-feet (af) contract for water from Ruedi Reservoir as a backup to the Wolford Mountain Reservoir 5,412 af augmentation water so that a contract can be in place by the end of 2005.

   - Establish better communication among HUP participants to improve cooperative management of the water available for the endangered fishes.

   - The draft report identifying options for a permanent source(s) of the east and west slope portions of the combined 10,825 af commitment needs to be opened for further review and comment, finalized, and a schedule provided for selecting the preferred alternative(s) by the end of 2005.

   - Finalize the CROPS operating criteria that were drafted in 1997 so that there is a clear understanding of the CROPS decision-making process before spring 2006. In years when implementation of CROPS is possible, efforts need to be made to expand augmentation of spring peak flows through CFOPS, which was the principal recommendation of the CFOPS Executive Committee. Specific actions associated with that recommendation need to be identified and prepared for implementation before spring 2006.

Upper Colorado River Subbasin – Gunnison River

7. By November 2005, Reclamation should provide an updated schedule of milestone events for the Aspinall Unit EIS process. The "no action" alternative should be finalized by end of 2005 (or sooner) so that hydrologic modeling and development of action alternatives can proceed in a timely and meaningful manner. The Service is pleased that the initial meeting of the hydrology committee was held on June 30, 2005, and that positive progress was made[1].

8. The intent of the reasonable and prudent alternatives for both the Dallas Creek Project (1979) and Dolores Project (1980) biological opinions was for Reclamation to offset water depletions by making releases from Reclamation facilities in accordance with flow recommendations that had not yet been determined at the time of the biological opinions. Flow recommendations have now been completed, and the Service agrees with Reclamation that the most prudent way to address the obligations of the Dolores and Dallas Creek biological operations is through the Aspinall Unit Operations EIS and section 7 processes.

   In the interim period prior to the conclusion of the Aspinall Unit Operations EIS and issuance of the biological opinion, Reclamation and the Service should work together to operate the Unit to benefit the river ecosystem and facilitate recovery of the endangered

fishes. For example, the concept of "bundling" spring releases from the Aspinall Unit matched with flows from the North Fork to enhance the spring peak to benefit the river ecosystem should be implemented when hydrologic conditions are suitable. Weekly conference calls between Reclamation and the Service during January–May need to be scheduled to improve coordination and avoid surprises.

The Service is confident that with continued cooperation by all Recovery Program participants, the Recovery Program will continue to make significant strides toward recovery of the four endangered fishes. Based on evaluation of the status of the fish, provision of flows during drought periods, magnitude of depletion impacts, and cumulative Recovery Program accomplishments and shortcomings, the Service concludes that progress in the Recovery Program is sufficient to continue to provide the reasonable and prudent alternatives which avoid the likelihood of jeopardy resulting from depletion impacts of new projects that have an annual depletion of up to 4,500 acre feet.[2]

Despite significant Recovery Program accomplishments, the Service is very concerned about recent downward trends in endangered fish populations. Accordingly, the Service strongly encourages all Recovery Program participants to remain attentive to the impacts of drought conditions and nonnative fishes on recovery of the endangered fishes, and continue to aggressively pursue management actions to alleviate threats to the species, including providing and protecting the necessary flow and habitat conditions (including evaluation of flow recommendations), and reducing the abundance of problematic nonnative fishes.

II. IMPLEMENTATION OF ITEMS IN THE 15-MILE REACH PROGRAMMATIC BIOLOGICAL OPINION

On December 20, 1999, the Service issued a final programmatic biological opinion for the Bureau of Reclamation's operations and depletions, other depletions, and funding and implementation of Recovery Program actions in the upper Colorado River upstream from the Gunnison River confluence. Known as the "15-Mile Reach Programmatic Biological Opinion (PBO)", the PBO determined that implementation of recovery actions and continued water depletions in the Colorado River would not likely jeopardize the continued existence of the endangered fishes. The PBO cites action items in the Program's Recovery Action Plan (RIPRAP) and charges the Recovery Program with the responsibility to ensure that these action items are completed and/or implemented. Page 74 of the PBO says: "In 2003 and every 2 years thereafter, for the life of the Recovery Program, the Service and Recovery Program will review implementation of the Recovery Action Plan actions to determine timely compliance with applicable schedules." The Service recently conducted this review (2005) in consultation with

[2]The 15-Mile Reach programmatic biological opinion covers an average depletion of up to 1 million acre-feet per year of existing depletions (through September 30, 1995) and up to 120,000 acre-feet of new depletions (since September 30, 1995) in the Colorado River above the confluence with the Gunnison River. The Yampa River programmatic biological opinion covers an average depletion of up to 168,000 acre-feet per year of existing depletions and up to 53,000 acre-feet per year of new depletions.

Recovery Program partners (see attached status report) and concluded that the Recovery Program is making sufficient progress in accomplishing most of the action items listed in the PBO. Although the schedule for some tasks has slipped, the PBO recognized this might happen:

> Page 6: "Under the Recovery Program, the Recovery Program Director's office annually sends a request to all participants for recommended changes to the Recovery Program's Recovery Action Plan. These changes include revised due dates, additions and deletions of recovery actions, additional steps to complete a recovery action, or a change in the lead agency responsible for ensuring completion of a recovery action item. . .. Final changes to the Recovery Action Plan require consensus by all Implementation Committee members. If consensus is not reached on a proposed change, the subject item in the Recovery Action Plan remains unchanged. The Implementation Committee routinely makes changes to the schedule for completing recovery actions when the delay is due to uncontrollable circumstances."
>
> Page 7: "It is the Recovery Program's responsibility to ensure that all elements of the Recovery Action Plan affecting the Colorado River and other rivers are completed and/or implemented consistent with Recovery Program schedules (contained in the April 1999, "Section 7 Consultation, Sufficient Progress, and Historic Projects Agreement and Recovery Action Plan" and subsequent revisions)."

The PBO review identified the following issues (identified in the attached table of action items), most of which are also discussed under Sufficient Progress (section I of this memo):

Late Summer and Fall Base-Flow Period Augmentation

item (d)

- It is important to have adequate and dependable sources of water to augment base flows for the endangered fishes (especially during drought years). Efforts are needed to expedite the River District's request to secure a 5,000 acre-feet (af) contract for water from Ruedi Reservoir as a backup to Wolford Mountain Reservoir 5,412 af augmentation water.

item (e)

- The draft report identifying options for a permanent source(s) of the east and west slope portions of the combined 10,825 af commitment needs to be opened for further review and comment, finalized, and a schedule provided for selecting the preferred alternative(s).

item (g)

- Although irrigation diversions in 2004 were reduced by 29,000 af through operation of the Grand Valley Water Management Project, that water was left in the Green Mountain

Reservoir HUP pool and not delivered to benefit the endangered fishes. In the future, there needs to be better communication among HUP participants to improve cooperative management of the water available for the endangered fishes.

Spring Peak Enhancement

- There is general concern that lack of high spring peak flows over the past few years has negatively impacted the endangered fishes and their habitats and has exacerbated the nonnative fish problem. Drought conditions have prevented implementation of the Coordinated Reservoir Operations Program (CROPS) and the Coordinated Facilities Operations Program (CFOPS) to enhance spring peak flows since the PBO was issued. Although spring peak flows in 2003 and 2005 exceeded the 12,900 cfs threshold, other CROPS operating criteria were not met. CROPS operating criteria that were drafted in 1997 need to be finalized so that there is a clear understanding of the CROPS decision-making process. In years when implementation of CROPS is possible, efforts need to be made to expand augmentation of spring peak flows through CFOPS, which was the principal recommendation of the CFOPS Executive Committee. Specific actions associated with that recommendation need to be identified and prepared for implementation.

Floodplain Restoration and Selenium Remediation

- Land acquisition for floodplain restoration proved much more expensive than anticipated and relatively few landowners have been willing to participate. The Recovery Program is working to acquire a few more parcels and to best manage the floodplain habitat we have available. If this is not enough habitat to support a self-sustaining population of razorback sucker in the upper Colorado River subbasin, then Recovery Program participants will need to consider using additional Federal and State-owned parcels for this purpose. Additional floodplain habitat is expected to become available when passage is restored at the Price-Stubb Diversion Dam on the Colorado River.

Fish Passageways

item (a)

- Delays in completing the Price-Stubb fish passage. With the 2004 completion of the Grand Valley Project fish passage, the Price-Stubb Diversion Dam is the last physical impediment to restoring endangered fish access to 50 miles of critical habitat. However, modifications of the GVIC fish passage need to be considered to improve operations at that facility.

Native Fish Stocking

- Since completion of the integrated stocking plan in March 2003, stocking targets were far from being met for razorback sucker in 2003 and 2004 and for bonytail in 2003. Part of the

reason for not meeting those targets was the necessary adjustments in fish propagation and grow-out between the previous separate State stocking plans and the current integrated plan. However, it is expected that those adjustments are now behind us and that stocking targets will be met in the future (barring the ususal problems associated with fish culture).

Nonnative Fish Control, Removal Efforts

- Nonnative fish management has turned out to be more difficult than originally anticipated. Efforts at pond reclamation and cyprinid/centrarchid removal from backwaters proved largely ineffective, but the Recovery Program is moving forward to identify sources of nonnative fish to determine if they can be controlled at their sources. Initial work to manage channel catfish in the Colorado River showed that more effective management techniques need to be developed. Management of bass and other centrarchids in the Colorado River is ongoing and continues to be evaluated.

Research, Monitoring, and Data Management

- Recent preliminary or draft data on population estimates indicate downward trends in the abundance of humpback chub in Black Rocks and Westwater Canyon. These apparent trends are of great concern and need to be closely followed.

Fish Screens

- Problems have continued with full operation of the GVIC fish screen. Once the Grand Valley Project and Redlands fish screens are completed and operational, lessons learned at those facilities should be applied at the GVIC fish screen. With all Grand Valley fish screens and passages, bi-annual meetings with Grand Valley irrigators are essential to discuss facility operations, identify problems and solutions, and document operation expectations and plans, and need to focus on ensuring operation of the facilities.

Attachments

Recovery Actions in 15-Mile Reach PBO	RIPRAP Item #	Status	PBO Page #
Define Existing Depletions/Calculate New Depletions			
a). Develop consumptive use and losses report with CRDSS model to verify level of depletions.	Colorado: IA3b	Pending. At the February 2005 WAC meeting, representatives of CWCB reported that updating of the data sets for the upper Colorado River CRDSS model will be completed by December 2005. The Consumptive Uses and Losses report and the Depletions Accounting report (including data through 2005) will be completed on schedule by December 31, 2006.	Apx. B, #6
b). Calculate new depletions as a 10-year moving average as determined by CWCB and reported to FWS & CRRIP every 5 years.	Colorado: IA3c	Reporting of depletions as a 10-year moving average begins in 2011.	7
Habitat Protection Element			
General Protection			
Enforcement Agreement between FWS and CWCB.	General: IC1	Completed in 1993.	8
Late Summer and Fall Base-Flow Period Augmentation			
a). Instream flow decree for 581 cfs in 15-mile reach during July, August, and September.	Colorado: IA4c1	Completed in 1997.	8
b). 300 cfs instream flow right for water accretions in 15-mile reach.	Colorado: IA4c2	Completed in 1997.	8
c). 5,000 acre-feet (af) annually + 5,000 af 4 out of 5 years from Ruedi.	Colorado: IA5a	Ongoing since 1989 (second 5,000 af not available in 2002).	8
d). 21,650 af/year split evenly between Ruedi and water users.	Colorado: IA5b,c,d	Ongoing since 1997. Ruedi long-term agreement for 10,825 af through 2012 was signed in June 2003. 5,412.5 af from Williams Fork for east slope water users commitment and 5,412.5 af from Wolford for west slope water users commitment through 2010 (extendable for an additional 5 years). *Note: due to drought conditions, no water was available from Wolford in 2002-2004 (the Service is working with the River District to provide water in 2005), and only 70% of the Williams Fork water was available in 2003-2004. The River District is working to secure a 5,000 af contract for water from Ruedi as a backup to Wolford water.	8
e). After 2010, the water users must provide a permanent source of the 10,825 af (divided equally between east and west slope).	Colorado: IA5e3	Denver Water, Northern, and River District have produced a draft report (reviewed at the February 2005 WAC meeting) identifying five options for supplying the east and west slope portions of the combined 10,825 af commitment, but preferred alternatives have not yet been selected and the schedule to do so is unknown.	8-9
f). 6,000 af from Wolford.	Colorado: IA5h	Ongoing since 1996 (actual amount of water available each year is based on 10% of the storable inflow to Wolford, up to 6,000 af).	10

Recovery Actions in 15-Mile Reach PBO	RIPRAP Item #	Status	PBO Page #
g). Grand Valley Water Management - 9,000 af to 15-mile reach through Palisade Pipeline and up to 19,400 af to surplus HUP pool in Green Mt. Reservoir.	Colorado: IA5l	Construction and automation of check structures and Palisade pipeline complete and operational; completion of the Highline Lake pump station scheduled for summer 2005. Irrigation diversions were reduced by 45,000 af in 2002, 33,000 af in 2003, and 29,000 af in 2004 through operation of the Grand Valley Water Management Project. The Municipal/Recreation contract for Green Mountain Reservoir water was originally signed in 2002 and will need to be renewed by December 31, 2006 (this is on Reclamation's "watch list").	10
Spring Peak Enhancement			
a). Coordinated Reservoir Operations - in all but extremely dry or wet years.	Colorado: IA5i2	Ongoing since 1997. Spring peak flows were augmented in 1997, 1998, and 1999. Spring peak flows in 2000, 2001, 2002, and 2004 were below the 12,900 cfs threshold for implementing coordinated reservoir operations under CROPS. Spring peak flows in 2003 and 2005 exceeded the 12,900 cfs threshold, but other CROPS operating criteria were not met and therefore flows were not augmented. *Note FWS and the Recovery Program have asked Reclamation and CWCB to finalize the CROPS operating criteria that were drafted in 1997.	11
b). Coordinated Facilities Operations Program - provide up to 20,000 af.	Colorado: IA5m2	Phase II report and recommendations of the Executive Committee were completed in 2003, but, to date, no additional water from coordinated facilities operations under CFOPS has been provided. Implementation of CFOPS is linked to years with the CROPS (see CROPS status above).	11
Habitat Development and Maintenance Element			
		Program is preparing subbasin and site-specific management plans to provide clear objectives, costs, and measures of success. Draft final management plan completed and undergoing coordinator review.	
Floodplain Restoration and Selenium Remediation			
a). Gardner Pond (29-5/8 Road Gravel Pit).	IIA1	Construction complete; operation ongoing.	
b). Jarvis.	None	Construction complete; operation ongoing.	12
c). Adobe Creek.	IIA2	Construction for the research study complete, but no funding available through NIWQP to complete selenium remediation. The need to pursue restoration of this site for razorback sucker recovery may be revisited in the future.	13
d). Walter Walker.	IIA3	Construction complete; operation ongoing. More levee was removed in 2004.	13

Recovery Actions in 15-Mile Reach PBO	RIPRAP Item #	Status	PBO Page #
e). Land acquisition and levee removal.	IIA4&IIA5	The PBO estimate of acquiring interest in up to 3,500 acres of bottomland habitat in the Grand Valley and along the Gunnison River turned out to be quite high based on landowner response. Floodplain restoration has proved much more expensive than anticipated and relatively few landowners have been willing to participate. The Recovery Program has acquired 592 acres of floodplain/wetland habitat in the upper Colorado River subbasin (393.5 acres along the Colorado River and 198.2 acres along the Gunnison River), and is working to best manage the floodplain currently available. Restoration work has been completed at the Butch Craig's property and the Escalante State Wildlife Area on the Gunnison River, and the Audubon property on the Colorado River. Plans are underway to restore habitat at the "Hot Spot Complex" on the Colorado River. Until it is determined that there is enough habitat to support a self-sustaining population of razorback sucker in the upper Colorado River subbasin, Program participants will continue to consider using additional Federal and State-owned and other parcels for this purpose when additional areas become accessible following restoration of passage at the Price-Stubb Diversion Dam.	13
Fish Passageways			
a). PBO states passage to be completed at Price-Stubb in 2000 (or 2002 if dam removal alternative selected).	Colorado: IIB2a3&4	Pending, but the project has been delayed due to regulatory and landowner issues and overall budget/construction priorities. Construction of rock ramp alternative to begin in FY 06 and be complete in FY 07.	13
b). GVIC fish passage.	Colorado: IIB1a3&4	Completed in 1998, but full operation since then has been problematic. A meeting was held with FWS, Recovery Program, Reclamation, and Grand Valley irrigators in early 2005 to discuss facility operations and expectations for the GVIC, Grand Valley Project, and Redlands fish passages and screens during the upcoming irrigation season; a follow-up meeting is scheduled for this fall where problems, solutions, and future operation plans will be documented.	13
c). Grand Valley Project (Government Highline) fish passage.	Colorado: IIB3a3	Completed in 2004, but construction was delayed due to regulatory and landowner issues and overall budget/construction priorities. Trial operations conducted in 2005 and expected to continue in 2006. Full operation pending completion of Price-Stubb passage.	13

Recovery Actions in 15-Mile Reach PBO	RIPRAP Item #	Status	PBO Page #
Native Fish Stocking Element			
Raising native fish in hatcheries and grow out ponds, and stocking them in the riverine habitat.	Colorado: IVA3, IVA4, IVA5	Ongoing. The integrated stocking plan for the Upper Colorado River Basin was completed in March 2003. Annual stocking targets for subadults in the upper Colorado River subbasin are 9,930 razorback sucker (5,665 stocked in 2003, 6,258 in 2004, and target expected to be met or exceeded in 2005); 5,330 bonytail (887 stocked in 2003, 8,219 in 2004, and target expected to be met or exceeded in 2005 [2,220 already stocked this spring and fall stocking should make up the difference]); and 2,250 Colorado pikeminnow (2,061 stocked in 2003 and 2,365 in 2004 [stocking in 2005 will be reevaluated by the Biology Committee]).	14
Nonnative Fish Control Element			
Regulations and Agreements			
a). 1996 Nonnative Stocking Procedures.	General: IIIB3	Complete; scheduled for evaluation of revisions in FY 05	15
b). 1999 Restriction of stocking of private ponds in Colorado.	General: IIIB4	Complete; report on evaluation of Colorado's nonnative fish stocking regulations completed in July 2004.	15
c). Bag limits removed for nonnative warm-water sportfishes in critical habitat in Colorado.	Colorado: IIIB2	Complete.	15
d). Close river reaches to angling where and when angling mortality determined to be significant to native fish.	General: IIIA2d	CDOW agreed to do when and where necessary (to date, not deemed necessary).	15
e). CDOW Colorado River fisheries management plan.	Colorado: IIIB4	December 2003 plan completed in 2005.	16
Removal Efforts			
a). Pond Reclamation.	Colorado: IIIA2	Pond reclamation accomplished, but proved ineffective. Research initiated to document sources of nonnative fish so Program can determine if they can be controlled at the source. Final report due April 2006.	15
b). Removal of nonnative fishes from back waters.	Colorado: IIIA3	Pilot program to remove small cyprinids and centrarchids complete; techniques and level of effort produced some short-term depletions, but provided no solutions to long-term control. Research begun to document sources of nonnative fish, which may provide another avenue of control. Final report due April 2006.	16
c). Management of nonnative fish populations	Colorado: IIIA5&6	Management of bass and other centrarchids in the Colorado River ongoing since 2004; management of channel catfish on hold pending development of effective management techniques.	16

Recovery Actions in 15-Mile Reach PBO	RIPRAP Item #	Status	PBO Page #
Research, Monitoring, and Data Management Element			
a). Population estimates will be used to determine if Recovery Actions result in a positive population response.	Colorado: VB; VB3	ISMP proved to be ineffective in tracking population trends. Population indices revised to be consistent with recovery goals and ongoing population estimates. Current estimates: estimates of adult Colorado pikeminnow ranged from about 500 in 1992 to 600–700 in recent years; estimates of adult humpback chub in Black Rocks Canyon varied from about 800 in 1998, 900 in 1999, and 500 in 2000 and 2003 (wide confidence intervals); estimates of adult humpback chub in Westwater Canyon ranged from about 4,700 in 1998 (wide confidence interval) to 2,500 in 1999, 2000, and 2003 (confidence intervals narrowed over time). A workshop on population estimates was held in August 2004, and a summary report from the ad hoc committee is expected summer 2005. Service needs to determine first reliable estimates to initiate tracking of population trends. Evaluation of stocked fish is ongoing, with an initial report expected summer 2005.	16
b). Recovery goal development. If population meets or exceeds recovery or Apx. D goals, it will be considered to exhibit a positive population response.	General: VIIA5d	Recovery goals complete.	16-17
Long-term Funding and Annual Appropriations.	General: VIIB	Complete and ongoing.	17
Recovery Agreements			
a). With consultations.	N/A	Ongoing	18
b). By water users controlling a majority of existing depletions above the Gunnison River.	N/A	Complete	18
Depletion Charges on New Depletions	N/A	Ongoing	19
Incidental Take			
a). Develop plan to monitor incidental take of endangered fish in diversion structures.	Colorado: VB4a	Pending (although delayed from original 2001 date): FWS to develop plan in 2005. Anticipate plan will be similar to the 2002-2004 fish salvage efforts.	71
b). Estimate amount of incidental take of young razorback and pikeminnow in the 15-Mile Reach.	Colorado: VB4b	Pending (after screens are in place and fully operational).	71

Recovery Actions in 15-Mile Reach PBO	RIPRAP Item #	Status	PBO Page #
Fish Screens (Reasonable & Prudent Measures)			
a). GVIC.	Colorado: IIB1b	Completed in May 2002 (improvements completed in March 2004), but full operation continues to be problematic; further modifications pending completion and evaluation of Grand Valley Project and Redlands fish screens.	71
b). Grand Valley Project Gov't Highline.	Colorado: IIB3b	Construction scheduled for completion in summer 2005 (delayed to due regulatory and landowner issues and budget/construction priorities).	71
Reinitiation			
a). Review RIPRAP implementation.	Colorado: IA6	This is it (started in 2003 and every 2 years thereafter).	p.74, c.

Revised February 24, 2005

FY 2004 DRAFT RIPRAP ASSESSMENT

Significant Accomplishments (!) and Shortcomings (*X*)

PAGE/ITEM #		STATUS ASSESSMENT
GENERAL RECOVERY ACTION PLAN		
22	IA4a	Scopes of work to develop strategy/design for studies to address geomorphic research priorities deemed not acceptable by Biology Committee in January 2004. However, USGS data retrospective was begun in FY 04 (part of FR-Sed.Mon.) and will be used to guide development of a strategic design for geomorphic research and monitoring.
>*23	IIIA2c	! On February 4, 2004, the Recovery Program adopted a nonnative fish management policy that addresses the process of identifying and implementing nonnative fish management actions needed to recover the endangered fishes. The policy ensures that a more consistent message is included in strategic communication efforts intended to enhance agency and public understanding and gain support for these necessary actions. I&E efforts continue and focus on press releases, communicating with elected officials, and coordinating public outreach with partner agencies. Results of the 2003 nonnative fish management projects were reviewed at a December 2003 workshop, and appropriate revisions were made to the scopes of work for 2004. Revisions included placing emphasis on nonnative fish control in the Yampa River, shifting from a treatment/control approach to depletion analysis (i.e., fish are tagged and released on the first sampling pass in a river reach, then removed during subsequent passes to estimate initial abundance and to demonstrate a depletive effect and level over time), and shifting emphasis from channel catfish to smallmouth bass. Results of the 2004 nonnative fish management projects were reviewed at a December 2004 workshop, and appropriate revisions were made to the scopes of work for 2005 to further increase capture efficiency and improve overall catch rates. Management of northern pike in the Yampa and Green rivers appeared to be relatively effective in 2004, as evidenced by approximately 60 to 68% within-year reductions in abundance in the targeted sections of the Yampa River. Efforts and studies in 2005 are designed to determine if these reductions in abundance will endure, or if numbers will rebound as the result of recruitment and/or immigration from areas outside of critical habitat. Tagging of northern pike in the Yampa River upstream of the Hayden Bridge began in 2004 to help determine downstream movements into critical habitat and guide decisions to expand management efforts.

Data since 2001 strongly indicate that efforts to manage northern pike in the middle Green River in Utah are having a depletive effect (248 northern pike removed in 2001, 42 in 2002, 22 in 2003, and 29 in 2004).

Smallmouth bass management yielded variable results in 2004, but provided valuable information about smallmouth bass abundance and the effort required to deplete a population to targeted levels. Depending on the section of river, reductions in abundance ranged from 8 to 69% (20–69% in the Yampa River and 8–42% in the Green River). To improve catch rates of bass in 2005, adjustments will be made to increase capture efficiency and, where appropriate, increase effort. Additional time and effort will be spent by electrofishing slowly and methodically, and spending more time in concentration areas. Electric seines will be used in some areas. The sampling period will be extended into the fall, when bass are more vulnerable to capture. In addition to larger bass, smaller bass (age-0 and age-1) will be targeted in an attempt to limit recruitment. In Yampa Canyon, light-weight rafts and generators will be used to improve capture efficiency at lower flows.

A depletive effect has been shown for channel catfish in Yampa Canyon, with a steady decline in the average length of fish captured since 2001.

Where appropriate and practical, nonnative fish removed from the Yampa River are relocated to area ponds and reservoirs to provide sportfishing opportunities for the angling public. In 2004, approximately 2,600 smallmouth bass were relocated to Elkhead Reservoir, and approximately 1,600 northern pike were relocated to the Yampa State Wildlife Area ponds, Loudy-Simpson pond, or Rio Blanco Reservoir.

To monitor fish species response to the nonnative fish management activities, a study is underway on the Yampa River where northern pike and smallmouth bass management are occurring. Results of data collected in the fall of 2004 are not yet available. It is expected to take 2 or more years to detect a response, first in small-bodied prey-sized fishes, then in native fishes, and ultimately in endangered fishes. The study will continue in 2005. Also in 2005, data will be collected in the Green River to establish a baseline from which to compare fish community responses to nonnative fish management efforts. The Recovery Program is developing criteria to evaluate the effectiveness of Yampa River nonnative fish management.

23 IIIB4a1 ! Report on effectiveness of Colorado's stocking regulations was completed (Martinez 2004).

25	VI.F.	! Six interpretive signs were installed along the Colorado Riverfront Trail in Grand Junction, Colorado. This completed a cooperative educational project supported by local community organizations, city, state, and federal agencies.

GREEN RIVER ACTION PLAN

27	IA2b2 IB2b	*X* Legal and physical availability of water not assessed in FY 04 (moved to FY 05 pending spring completion of the EIS and revised biological opinion).
>*27	IA3a,c,d	! *X* Flaming Gorge being re-operated under the 1992 Biological Opinion, but EIS on reoperation to implement the revised flow recommendations was not completed in FY 04 (scheduled for spring 2005, however).
27	IA4b1&2	*X* Public meetings and appropriation policy not done in FY 04 (won't held/implemented until after completion of the ROD and new biological opinion, to be completed by spring 2005.
>*28	IIA3c	! Larval razorback sucker and bonytail again survived in the presence of nonnative fishes in several wetlands. Final reports are due in 2005.
>*28	IIA4	! Restoration of Thunder Ranch site completed in July 2004. Numerous wild razorback sucker larvae discovered just upstream of Thunder Ranch site. Physical evaluation of the site occurred in 2005.
>*28	IIIA4a	! Pike control in the Green River continues to be successful. Twenty-nine pike removed in 2004. Suggests a depletive effect from previous years, since 22 northern pike were removed in 2003, 42 pike were removed in 2002 and 248 pike were removed in 2001.
>*28	IIIA4b1	! *X* Trammell et. al. (2005) completed. Results demonstrated that techniques and level of effort produced some short-term depletions, but provided no solutions to long-term control.
>*28	IIIA4b2	Smallmouth bass abundance is much higher in the Green River than expected. During 2004, reduction in abundance ranged from 8% to 42%. In 2005, adjustments will be made to improve sampling efficiency.
>29	IVA1c	! *X* CDOW stocked 6,600 9" bonytail in Dinosaur National Monument at Echo Park (target = 2,665 8" fish). UDWR stocked 3,500 7" bonytail in the middle Green River (target = 2,665 8" fish). *X* The lower Green River received 3,100 7" bonytail from UDWR (target = 5,330 8" fish; however more fish were stocked than intended in the middle Green and Colorado rivers).

! Ouray NFH stocked 10,126 12" razorback sucker in the middle Green River (target = 9,930 12" fish).

X >1,500 ≥12" and >1,800 12" razorback sucker were stocked in the lower Green River by Grand Valley Hatchery and Ouray NFH, respectively (target = 9,930 12" fish, with each facility's target 4,965). Fewer fish were stocked because of poor returns from leased growout ponds in Grand Valley and Uintah basin. Fish will be grown out intensively at the hatcheries in the future.

29	VB1	Report on humpback chub population estimate in Desolation/Gray 2001-2003 expected to be finalized by spring 2005.
29	VC	Report on estimate of Colorado pikeminnow in the Green River 2000-2003 expected to be finalized by spring or summer 2005.

YAMPA/LITTLE SNAKE RIVERS

30	IA2...	! Yampa Management Plan and related documents completed.
>*30	IB2a1b	! 1,367 af leased from Steamboat Lake in 2004.
30	IB2a2ai-iii	! Elkhead enlargement 404 permit issued 2/11/05, agreements complete, and major construction activities expected to begin in March.
31	IIA2a	Program guidance will solicit proposals in 2005 to evaluate entrainment into the Maybell and/or Duffey Tunnel Ditch.
31	IIIA1a1	Program agreed to temporary screen on spillway during construction and permanent screens on new outlets. Miller report on nonnative fish escapement from Elkhead Reservoir in review. Future monitoring of escapement will be conducted via Yampa River nonnative fish management activities (through FY 07). *Note: Installation of the temporary fish screen on the spillway of Elkhead Reservoir was completed on April 4. On April 16, the Program was notified that a portion of the screen had failed, and on April 22 received word that the remainder of the screen was clogged and ineffective. The prearranged contingency plan (in the event of screen failure) for adjustments to nonnative fish management efforts in the Yampa River was implemented.
>*32	IIIA1b1	! Northern pike removal efforts in FY 2004 demonstrated that the population can be reduced 60-70% within a year; removal efforts in FY 05 will attempt to substantiate this suspected depletive effect.

32	IIIA2b2a-c	! Chris Hill report on Yampa pike spawning areas completed (although remedial measures and guidelines for new structures deemed not feasible).
>*32	IIIA1c1	! Catfish removal continued in Yampa Canyon, with indications that catfish average length continues to be reduced as a result.
>*32	IIIA1d	! Smallmouth bass removal and translocation efforts in the Yampa River in FY 04 yielded information about smallmouth abundance and effort required to deplete the population to targeted levels. Reductions in smallmouth bass abundance ranged from 20% to 69% in targeted reaches. In 2005, adjustments will be made to improve catch rates and sampling efficiency.
>32	IVA1a1	! See Green River >29 IVA1c, CDOW stocked 6,600 9" bonytail in Dinosaur National Monument at Echo Park (target = 2,665 8" fish).
32	VA	Report on Yampa humpback chub population estimate due December 2005.

DUCHESNE RIVER

33	IB2, ID1	! *X* Reclamation and CUWCD completed report on water availability and reservoir coordination, but Utah (in cooperation with workgroup) is still assessing legal and physical availability; expected completion by December 2007.
		! Update to the Duchesne biological opinion completed.
33	IF&1	! New gaging station established at Randlette (need for additional gages will continue to be evaluated).
33	IIIA3b	Due to lack of reservoir spills in FY 03 and 04, the study of nonnative fish escapement from over the spillway of Starvation Reservoir has been delayed another year. If the reservoir spills in 2005, spillway escapement will be quantified.
33	IIIA3c	Duchesne flows were not high enough in 2004 to float a boat to effectively capture and remove targeted nonnative fishes. Attempts will be made in 2005 if flows are adequate.

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35	IA3a,b	Data collection for depletion accounting report (as outlined in 15-Mile Reach PBO) ongoing by FWS and CWCB; CWCB is contracting to have accounting model updated; computer runs identifying depletion levels to be completed by 12/06.

35	IA4a3&b3	Five-year periodic review of progress under the PBO not done in FY 04, but is being done as part of this RIPRAP and the related 2005 15-MR PBO assessment. (Implementation Committee approved Management Committee's recommended approach to defer instream flow filings on the Colorado River, for 5 years, contingent upon implementation of the programmatic biological opinion.)
>*35	IA5	Recognizing the low carryover storage in the Upper Colorado River Basin reservoirs and generally drier than average conditions in 2004, the Service initially set the target flows for the 15-Mile Reach at 400 cfs which was maintained through mid-September when it was increased to 810 cfs. The average flow in the 15-Mile Reach during the flow augmentation period of July 16 through October 31 was 830 cfs (would have been 716 cfs without augmentation). The average flow in the reach during the 400 cfs target period between July 16 and September 27 was 724 cfs (would have been 585 cfs without augmentation). Between September 29 and October 31, the average flow in the reach was 1,068 cfs (would have been 982 cfs without augmentation). Daily average flows in the 15-Mile Reach dropped below the flow targets on 10 days during 108-day augmentation period. Without flow augmentation, flows in the 15-Mile Reach would have dropped below the target flows on 27 days. A total of 18,778 af of water was released to support late-summer target flows. This total included 119 af from Green Mountain, 15,981 af from Ruedi, and 2,678 af from Williams Fork. Wolford Mountain was drawn down to record low levels in 2002 and did not fill in 2003 or 2004; in order to build storage no water was called for from Wolford Mountain in 2004.
35	IA5e1	! An option study was completed in November 2004 that identifies five projects which were considered to provide the East and West slopes' commitment on the Colorado River PBO. The options were evaluated in a matrix table which provides a side-by-side analysis of the projects. The study will be forwarded to the Service and the Water Acquisition Committee for review and guidance on selection of a project to fulfill the PBO commitment.
>*36	IA5l3	*X* Although checks were put in place for Grand Valley Water Management project and fully automated in previous years, the Highline pumping plant wasn't completed in 2004 (expected in May 2005, pending delivery of final parts and supplies). Also, during 2004, extremely conservative operation of HUP prevented much-needed water from being delivered from Green Mountain Reservoir during August and early September.

36	IA6	Review of RIPRAP and comparison with PBO schedules being done in FY 2005 (in concert with this RIPRAP assessment).
36	IB2 IB3a&d, IB4b	On hold pending review/outcome of Anderson methodology. *Note: Anderson's report was discussed at the April 7-8, 2005, Biology Committee meeting. After considerable discussion, the Biology Committee declined to take any action to adopt the 2-D methodology for determining the instream flow needs of the endangered fishes.
>*37	IB4c2	Annual coordination of Aspinall operation ongoing.
37	ID1	Service still needs to determine if combination of Colorado and Green River flows below the confluence are adequate for recovery.
>*38	IIA6	! A levee was lowered at the Walter Walker State Wildlife Area on the Colorado River near Grand Junction in March 2004. Within the Colorado River sub-basin, Walter Walker has been the highest-use area by Colorado pikeminnow and, formerly, razorback sucker. Lowering the levee is expected to enhance and help maintain the habitat for use by endangered fishes. The levee excavation was done by United Sand and Gravel in cooperation with the Colorado Division of Wildlife, the Recovery Program, the U.S. Bureau of Reclamation, and the U.S. Fish and Wildlife Service. ! Habitat restoration was completed at the Grand Valley Audubon Society's Ela Wildlife Sanctuary in August 2004. The site is located on the Colorado River downstream from Grand Junction, Colorado. A 50-foot levee notch was excavated to allow drifting razorback sucker larvae access to floodplain nursery habitat. Engineering design has been completed for the Hot-Spot complex, the second-highest-use area by Colorado pikeminnow and, formerly, razorback sucker. Negotiations are ongoing with Mesa County and Colorado State Parks and the NEPA process is underway to allow for habitat restoration in 2005.
>*38	IIB1b3	*X* GVIC screen was operated intermittently in 2004. Native and endangered fish were retrieved from canal by USFWS in November 2004.
>*38	IIB3a2	! Government Highline passage completed 8/04.
39	IIIA4a	Preliminary results indicate that at least 15% of centrarchids originated in ponds.

>*39	IIIA6	Smallmouth bass removed from Colorado River in FY 04; catch rates increased with each removal pass; no changes in length-frequency detected. Numerous largemouth bass, black crappie, green sunfish, and bluegill also encountered and removed.
>*39	IIIB1a	! The fish barrier net installed in Highline Reservoir in August 1999 continues to operate successfully and is scheduled for replacement in FY 2005.
>39	IVA3b	*X* 5,709 ≥ 12" razorback were stocked (target = 6,620 12" fish) which represents 81% of the target for this river reach. Fewer fish were stocked because of poor returns from leased growout ponds in the Grand Valley. Fish will be grown out intensively at the hatchery in the future.
>39	IVA4b	! 1,809 6.5" Colorado pikeminnow were stocked by CDOW into the Colorado River near Rifle (target = 1,125 6" fish). However, on February 11, 2005, the Biology Committee recommended that Colorado pikeminnow not be stocked in the Colorado River above the Grand Valley Project Diversion Dam until the GVP screen is complete and operational (stock the fish in the San Juan River, instead). Completion of the screen is expected by August 2005.
>39	IVA5b&6c	! *X* 5,134 9" bonytail were stocked in the Palisade-Loma reach by CDOW (target = 2,665 8" fish). UDWR added 3,100 7" fish at Dewey Bridge in Utah (target = 2,665 8" fish).
40	VB4a	! "Plan" to monitor incidental take of endangered fish entrainment in diversion structures is complete in that fish are being retrieved from canals until the canals are screened and screens are fully functional (anticipated in FY 05). Screens will prevent entrainment of adult, subadult, and juvenile fish (preventing entrainment of adult and subadult fish required is by recovery goals) because the screens are 3/32 mesh. Bob Muth to draft one-page "plan" to monitor incidental take of endangered fish.
40	VC1&2	Reports on population estimate of humpback chub in Black Rocks and Westwater pending (March/April 2005).

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>*42	IIA3	! Completed habitat restoration at Butch-Craig property in October 2003.
>*42	IIB1c	! Redlands fish ladder is working for Colorado pikeminnow and native fishes. In 9 years of operation, 67 pikeminnow, 9 stocked razorback sucker, 1 stocked bonytail, and 62,400 other native fishes have used the

		passageway. Native and endangered fish comprise 85.6% of the total number of fish that have used the ladder. Nonnative fish are not passed above the diversion.
>43	IVA2b	! 1,200 7.4" Colorado pikeminnow were stocked by the CDOW into the Gunnison River above Redlands (target = 1,125 6" fish). However, on February 11, 2005, the Biology Committee recommended that Colorado pikeminnow not be stocked in the Gunnison River above the Redlands Diversion Dam until the Redlands screen is complete and operational (stock the fish in the San Juan River, instead). Completion of the screen is expected by August 2005.
>43	IVA3b	*X* 549 razorback sucker from Grand Valley were stocked in the restored Butch Craig floodplain wetland on the Gunnison River (17% of the target of 3,310 12" fish).