

**THE STATE OF NATURAL AND CULTURAL RESOURCES  
IN THE COLORADO RIVER ECOSYSTEM:  
DRAFT ANNUAL REPORT OUTLINE**

**EXECUTIVE SUMMARY**

**ABSTRACT**

**INTRODUCTION**

Administrative background of this report

Study area

Ecosystem processes and components

Monitoring and research activities this year

Data management and availability this year

Contents of the annual SORE report

Table: Monitoring and research activities this year

Table: Master list of resources and processes and changes in relation to previous  
years

Figure: Map of study area

Figure: Flow diagram of ecosystem processes

Figure: Flow diagram of cultural-ecosystem components

**CLIMATE**

**Monitoring**

Descriptive text, with comparison to previous years and long-term trends.

Figures: Temperature and precipitation at Phantom Ranch for period of record.

Table: Minimum, mean and maximum monthly temperature and precipitation at  
Phantom Ranch for period of record

Research analyses (new information)

Synthesis of this year's findings

**FLOW AND WATER QUALITY**

**Discharge**

Text describing this year's data, and comparing this year with past years, and long-term trends. Describe any exceptional events

Figures: Daily minimum, mean and maximum daily flow for period of record from  
Glen Canyon Dam, Lees Ferry, Phantom Ranch and Diamond Creek streamflow  
gages, as well as gaged tributaries

**Water Quality**

**Lake Powell**

Text describing this year's data, and comparing this year with past years, and  
long-term trends. Describe any exceptional events.

Figures: Seasonal minimum, mean and maximum monthly temperature, DO, specific conductance and pH across depth in Lake Powell for period of record

Downstream river

Text describing this year's data, and comparing this year with past years, and long-term trends. Describe any exceptional events.

Figures: Daily minimum, mean and maximum monthly temperature, DO, specific conductance and pH for period of record from Glen Canyon Dam, and as measured elsewhere

Research analyses (new information)

Synthesis of this year's findings

## **PHYSICAL RESOURCES**

### **Tributary sediment transport**

Text describing this year's data, and comparing this year with past years, and long-term trends. Describe any exceptional events.

Figures: Paria River, Little Colorado River, other gaged and ungaged tributaries

### **Mainstream sediment transport**

Text describing this year's data, and comparing this year with past years, and long-term trends. Describe any exceptional events.

Figures: Lees Ferry, Phantom Ranch and Diamond Creek daily sediment transport.

### **Sandbars**

Text describing individual and reach-based analyses of this year's data, and comparing this year with past years, and long-term trends.

Figures: Sand bar volumes over period of record by kilometer and reach

### **Debris Fans and Rapids**

Text describing this year's data, and comparing this year with past years, and long-term trends. Describe any exceptional events.

Figure: Number of significant debris fans/yr that reach the river.

Research analyses (new information) and synthesis

## **BIOLOGICAL RESOURCES**

### **Aquatic Food Base**

Text describing individual and reach-based analyses of this year's data, and comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Water quality (temperature, DO, specific conductance and pH), macrophyte standing mass, benthic invertebrate standing mass, drift (including plankton) mass over distance and time

Research analyses (new information)

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## Fisheries

### Native Fish

Text describing individual and reach-based analyses of this year's spawning, larval, juvenile and adult data, and comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Abundance and condition of each species at four life history stages: spawning, larval, juvenile, and adult.

Figures: Estimated abundance and standing mass by habitat (e.g., mainstream, vegetated and unvegetated shoreline, backwater) and geomorphic reach

### Trout in Glen Canyon Reach

Text describing individual and reach-based analyses of this year's spawning, larval, juvenile and adult data, and comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Abundance, condition and standing mass of each species at four life history stages: spawning, larval, juvenile, and adult by habitat (e.g., mainstream, vegetated and unvegetated shoreline, backwater)

### Non-native Fish

~~Text describing individual and reach-based analyses of this year's spawning, larval, juvenile and adult data, and comparing this year with past years, and long-term trends. Description of exceptional events or observations.~~

~~Figures: Abundance and condition of each species at four life history stages: spawning, larval, juvenile, and adult~~

~~Figures: Estimated abundance and standing mass by reach by habitat (e.g., mainstream, vegetated and unvegetated shoreline, backwater) and geomorphic reach~~

### Fish Habitat

Text describing individual and reach-based analyses of this year's fish habitat availability, with emphasis on long-term trends. Description of exceptional events or observations.

Figures: Fish habitat availability by reach

### Research analyses (new information)

### Synthesis of this year's findings

## Terrestrial Processes and Biota

### Wetland and Riparian Vegetation

Text describing individual site, reach-based and system-wide analyses of this vegetation data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Cover estimates and composition, and changes over time

### Species of Concern: endangered Kanab ambersnail

Text describing population and habitat data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Population and habitat cover this year, and changes over time  
Species of Concern: endangered southwestern willow flycatcher  
Text describing population and habitat data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.  
Figures: Population size, nesting success and habitat availability this year, and changes over time  
Species of Concern: other listed species (bald eagle, peregrine falcon)  
Text describing individual and reach-based analyses of population and habitat data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.  
Figures: Population size, nesting success and habitat availability this year, and changes over time  
Species of Concern: Other native Colorado River corridor fauna (especially northern leopard frog, Niobara ambersnail, osprey, and belted kingfisher)  
Text describing individual and reach-based analyses of population and habitat data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.  
Figures: Population size, reproductive success and habitat availability this year, and changes over time  
Species of Concern: Non-native fauna  
Text describing individual and reach-based analyses of population and habitat data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.  
Figures: Population size, reproductive success and habitat availability this year, and changes over time  
Research analyses (new information) and synthesis  
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## **CULTURAL RESOURCES**

### **Archaeological Sites**

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

Research analyses (new information) and synthesis

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### **Traditional Cultural Properties**

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

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#### Traditional Cultural Resources

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

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#### Recreation

##### Fishing

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

##### Day rafting

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

##### Whitewater boating

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

##### Economic benefits

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

##### Safety

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

##### Visitor satisfaction

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

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## **AIR QUALITY**

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

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## **POWER**

Annual economic costs or benefits

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

Wholesale rates

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

Retail rates

Text describing individual and reach-based analyses of this year's data, comparing this year with past years, and long-term trends. Description of exceptional events or observations.

Figures: Condition by resource, and over time

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## **ACKNOWLEDGEMENTS**

## **LITERATURE CITED**

## **APPENDICES**