I. Project Title: Monitoring Multi-Life Stages of the Fish Community in the Lower Gunnison and Upper Colorado Rivers, with Emphasis on Colorado Pikeminnow and Razorback Sucker Populations, in Response to Reoperation of the Aspinall Unit and Implementation of the Selenium Management Plan.

II. Principal Investigator(s):

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III. Project Summary:

The Programmatic Biological Opinion (PBO) for water depletions in the Gunnison River Basin (USFWS 2009) stipulates that endangered fishes, as well as the entire fish community, be monitored to determine the status of the species before and after the Selenium Management Plan (SMP) is implemented and following reoperation of the Aspinall Unit reservoirs. The PBO calls for multi-life stage monitoring and density estimates of Colorado pikeminnow and razorback sucker in the Gunnison and Colorado rivers.

The fish assemblage, including the endangered fish, are being monitored in the Gunnison River using electrofishing catch-per-effort as an index to track trends in relative abundance of each species. Burdick (1995) conducted four passes of raft-based electrofishing to characterize the Gunnison River fish community in 1992 and 1993. He sampled once during pre-runnoff, once during runoff and twice during post-runoff. To allow comparison of our results with those of Burdick (1995), collected almost 20 years earlier, the methodology used here is similar to that of Burdick's but the number of electrofishing passes are scaled back to two and conducted only during post-runoff. Additionally, the Gunnison River study area is stratified according to geomorphic type rather than by segments between boat launches.

For young-of-the-year (YOY) and small-bodied fish monitoring, beach seine sampling during fall (late September-early October) is being conducted using ISMP methodology (see McAda 1994). Burdick (1995) found that Gunnison River backwater habitat was very scarce and therefore he deviated from the ISMP protocol (sampling two backwaters in every five-mile segment) by sampling every backwater encountered. We follow Burdick's modification of the ISMP methodology in this regard.

Concurrent with fish community monitoring in the Gunnison River, tissue samples are collected to determine selenium concentrations in fish before and after implementation of the SMP. Muscle plug samples will be collected from all adult Colorado pikeminnow and razorback suckers encountered. Because numbers of endangered fish are expected to

be low, muscle plug samples are also collected during initial survey efforts from 30 carp (a ubiquitous species) to insure that statistical comparisons can be made regarding selenium in fish tissue before and during SMP implementation. Selenium concentrations will also be analyzed in any larval fish samples collected and confirmed to be either razorback sucker or Colorado pikeminnow.

In the Colorado River, downstream of the Gunnison River inflow, the Colorado pikeminnow adult population is already being monitored with mark-recapture abundance estimation (see Osmundson and White 2009). During field sampling, razorback sucker capture-recapture data is also collected. As part of Aspinall monitoring, we will develop estimates of adult razorback sucker abundance in the Colorado River from these data. In 2012, abundance estimates will be developed for adult razorback sucker in the Colorado River for the years 2008, 2009, and 2010. Distribution of running ripe females will also be mapped to help ascertain spawning site locations. The assumption here is that improvement in flow regimes in the Gunnison River will have positive ramifications in the downstream Colorado River as well and hopefully result in improved endangered fish populations in both rivers.

Osmundson and Seal (2009) found increasing catch rates of razorback sucker larvae in the Colorado River from 2004 to 2007 and an apparent (non-significant) decrease in catch rate in the Gunnison River. Hand-seine larval sampling is being reinitiated here in both rivers and the duration of sampling extended to encompass both the razorback sucker (Mid-May to early-July) and Colorado pikeminnow (mid-June to mid-August) spawning periods. This sampling will provide an index to reproductive success of each species using catch-per-effort (mean number/sample) of endangered fish larvae. However, during the first two years of monitoring, only the razorback sucker spawning period will be sampled because of funding limitations.

Trends in large-bodied fish community composition and species relative abundance are also monitored in the Colorado River in the 18-mile reach immediately downstream of the Gunnison River inflow. As in the Gunnison River, shoreline electrofishing will be used to generate annual catch-per-effort statistics as a monitoring index. The Interagency Standardized Monitoring Program (ISMP) of the 1980s and 1990s included an annual, adult, spring, electrofishing survey, but was designed to detect trends only in endangered species and thus no systematic sampling of the fish community was performed. The only systematic community sampling conducted under the auspices of the Recovery Program that could now serve as a baseline for future monitoring was the electrofishing sampling conducted in 1994 and 1995 as part of the food-availability study, Project No. 48-A (see Osmundson 1999). The new Aspinall-related monitoring program replicates the 1994-1995 sampling protocol and samples the same randomly-selected reaches so that results in coming years can be compared to those earlier catch rates.

IV. Study Schedule: 2011-2015.

V. Relationship to RIPRAP:

Gunnison River Action Plan: Gunnison River Mainstem,

V. Monitor populations and habitat and conduct research to support recovery actions.

V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.

Colorado River Action Plan: Colorado River Mainstem

V. Monitor populations and habitat and conduct research to support recovery actions.
V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.

VI. Accomplishment of FY 2011 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Tasks

Task 1. Electrofish fish community (August and October)
Task 2. Sample fish larvae (early to Mid-May to July)
Task 3. Seine sampling of backwaters (September-October)
Task 4. Analyze tissue samples for selenium
Task 5. Analyze data
Task 6. Write annual reports

Deliverables

Annual report

Accomplishments and Initial Findings

Tasks 1, 2 and 3 were completed according to planned field schedules. Tissue samples from carp, roundtail chub, speckled dace and bonytail have been submitted for laboratory analysis (Task 4). No tissue samples from Colorado pikeminnow or razorback sucker were collected. Samples of larvae and YOY and small-bodied fish from seine surveys have been preserved but cannot be identified until a later year when more funding is available. Species, length, and weight data collected during the August Gunnison River electrofishing sampling have been inputted and partially analyzed but no initial findings are available.

VII. Recommendations: Continue analyzing new data and prepare for 2012 field season. For future monitoring, electrofishing catch-per-effort will be continued as the index for trends in endangered fish adult abundance as too few were captured in the Gunnison River to allow a planned mark-recapture study to be conducted.

VIII. Project Status: Field effort on schedule; data analysis progressing.

IX. FY 2011 Budget

A.	Funds Provided:	75,000
B.	Funds Expended:	75,000
C.	Difference:	0
D.	N/A (BR projects)	0
E.	Publication Charges	0

X. Status of Data Submission: Capture data from electrofishing surveys will be submitted to the database manager as inputting and error-checking is completed. No data from 2011 has yet been submitted.

XI. Signed: *Doug Osmundson*, November 13, 2011.

Literature cited:

Burdick, B. D. 1995. Ichthyofaunal studies of the Gunnison River, Colorado, 1992-1994. Final Report. U. S. Fish and Wildlife Service, Grand Junction, Colorado.

McAda, C. M. 1994. Interagency standardized monitoring program: summary of results, 1986-1992. Final Report. U. S. Fish and Wildlife Service, Grand Junction, Colorado.

Osmundson, D. B. 1999. Longitudinal variation in fish community structure and water temperature in the upper Colorado River. Final Report. U. S. Fish and Wildlife Service, Grand Junction, Colorado.

Osmundson, D. B., and S. C. Seal. 2009. Successful spawning by stocked razorback sucker in the Gunnison and Colorado rivers, as evidenced by larval fish collections, 2002-2007. Final Report. U. S. Fish and Wildlife Service, Grand Junction, Colorado.

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