

I. Project Title:

Gunnison River Temperature Model Development and Scenario Testing

II. Principal Investigator(s):

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III. Project Summary:

Recently drafted Recovery Goals for the bonytail, Colorado pikeminnow, and razorback sucker (U.S. Fish and Wildlife Service 2001a, 2001b, and 2001c) call for investigation of options for providing appropriate water temperatures in the Gunnison River that would allow for range expansion of these species, to include investigating the feasibility of modifying releases from Aspinall Unit dams to increase water temperatures in the Gunnison River.

Moreover, the Recovery Goals require that from Aspinall Unit dams be modified to increase water temperatures in the Gunnison River, if determined feasible and necessary to achieve demographic criteria for the upper Colorado River subbasin. This project is intended to answer the question of technical feasibility.

This project has two phases, the second phase contingent on the findings of the first phase. The objective of Phase I was to determine the feasibility of increasing stream temperatures in the Gunnison River at and below Delta, Colorado through structural and/or operational modifications to the Aspinall Unit reservoirs. This phase includes data collection and assessment; an overview of factors that may constrain the Recovery Program's ability to meet temperature objectives; a cursory analysis of the data with the intent of gaining insight into the primary physical processes governing water temperature in the basin; and modeling recommendations for the second phase of the work.

A draft Phase I report was submitted to the Biology Committee in September 2001. A revised draft was submitted for peer review in October and will be finalized in FY 2002. A joint FY 2002-03 SOW for Phase II work was submitted by the principal investigator of Phase I studies and Amy Cutler (Bureau of Reclamation, Salt Lake City) and approved by the Biology Committee in December 2001.

IV. Study Schedule:

Phase I – Draft report FY 2001; final report FY 2002

Phase II – FY 2002-03, pending Management Committee approval of revised SOW

V. Relationship to RIPRAP:

Colorado River Action Plan: Gunnison River

I. Provide and Protect Instream Flows

II. Restore Habitat

VI. Accomplishment of FY 2001 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

All FY 2001 tasks were completed. A draft report was submitted to the Biology Committee in September 2001. A thorough discussion of initial findings and shortcomings can be found in that document. A final Phase I report is due in FY 2002.

VII. Recommendations:

_____ Based on the data analysis, we strongly recommend modeling all three Aspinall reservoirs, using QUAL-w2, and a multi-variate statistical model of Gunnison River temperatures. Stratification of Morrow Point and Crystal Reservoirs is complicated by hypolimnetic inflows from Blue Mesa, and a mechanistic model is needed to predict changes in stratification due to a temperature control device (TCD) and changes in releases from Blue Mesa to satisfy Fish and Wildlife Service flow recommendations and/or National Park Service reserve water rights. Phase II of the study should be carried out in FY 2002-03.

A revised SOW for FY 2002-03 reflects changes in the role and responsibilities of the Phase I principal investigator, John Carron, who would develop a model for the Bureau of Reclamation (Amy Cutler) to use in assessing alternative scenarios. This model should be sufficiently flexible to accommodate changes in releases from the Aspinall Unit described above. It should also allow the Bureau to model impacts of reservoir reoperation on both reservoir and tailwater fisheries, with and without a TCD.

VIII. Project Status:

Phase I is complete. A revised FY 2002-03 SOW was submitted jointly by Hydrosphere and Bureau of Reclamation. This reflects a change from the original FY 2001-02 SOW submitted by Hydrosphere. The original SOW had called for expenditure of \$52-90K in FY 2002. In addition to redefining the respective roles of the collaborators, the new SOW calls for expenditure of ~\$72K in FY 2002 and ~\$24K in FY 2003, for a total of ~\$96K. Continuation of the project beyond FY 2001 contingent on approval of the revised SOW.

IX. FY 2001 Budget Status

- A. Funds Provided: \$30,000
- B. Funds Expended: \$30,000
- C. Difference: \$0
- D. Percent of the FY 2001 work completed: 100%
- E. Recovery Program funds spent for publication charges: \$0

X. Status of Data Submission (Where applicable): N/A

XI. Signed: John Carron December 10, 2001
Principal Investigator Date