

I. Project Title: **Humpback chub monitoring in Yampa Canyon**

II. Principal Investigator(s):

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III. Project Summary: The field work for this project is completed and a draft final report has been prepared and will be submitted to the program coordinator in January, 2002.

IV. Study Schedule: 1998-2001

V. Relationship to RIPRAP: General Recovery Program Support. V. Monitor Populations.
A1. Conduct Standardized Monitoring Program.

VI. Accomplishment of FY 98 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

In 1998 we began a three year study that consisted of three sampling passes each year down the Yampa River in Dinosaur National Monument from Deerlodge to Echo Park (75 km). Sampling consisted primarily of electrofishing rafts and angling. Captured humpback chub were scanned for presence of a PIT tag; if none was found, one was inserted and the fish released. Each pass through Yampa Canyon took 4-5 days. Subsequent passes were made 7-10 days later.

Electrofishing and angling captured 89 humpback chub in Yampa Canyon. The catch distribution extended from Laddie Park (river km 17) upstream to Disappointment Draw (river km 72). This range was similar to that of historic data. The distribution was very uneven; most fish preferred deep pools and eddies associated with large boulders. Most adult sampling was directed toward capture-recapture data for the purpose of making a population estimate. We captured, PIT tagged, and released 83 fish and recaptured 3 fish. One recapture was tagged the previous year; the other two were tagged on a previous pass the same year.

We were unable to make a satisfactory population estimate. On the one hand, the study design accommodated most of the assumptions for capture-recapture studies, but on the other hand too few tagged fish were captured for a reliable population estimate. A

simulation study showed that an extraordinary effort would be required for a satisfactory estimate. This seems infeasible considering we already were using two electrofishing rafts, and additional electrofishing seems unwise, as does adding additional passes. Seining shallow shorelines, pools, backwaters, and eddies yielded 426 young *Gila* ranging over the entire length of the study area. We identified 33 as humpback chub. Young *Gila* were difficult to identify, but recent collections from Island Park sent to the Larval Fish Laboratory at Colorado State University suggest that with proper training we can make credible field identifications.

The Yampa Canyon humpback chub population appears to be stable, successfully recruiting, but sparse, consisting only of a few hundred to a few thousand adults in 52 km of river.

An efficient monitoring plan is a critical part of any recovery program. It provides feedback on the change of status of the population for possible down listing or for the need of further protection, and it provides information on population response to management activities, like non-native fish control. However, an intensive capture-recapture study that results in precise population estimate for humpback chub is not feasible for Yampa Canyon. We recommend a two phase monitoring program. First, a less intensive but long-term (> 10 years) capture-recapture monitoring of humpback chub adults, similar to what Modde et al. (1996) did with razorback sucker, combined with seining to monitor reproduction success. Adult sampling is best done electrofishing once annually. The second phase consists of monitoring surrogate species, like roundtail chub and native suckers, for measuring short-term population response to management activities. The humpback chub population is too small and too difficult to measure for reliable detection of population response. We also suggest that consideration be given to using capture-recapture methods on roundtail chub, for catch per unit effort measures are too variable. Seining to monitor reproduction success of the surrogate species would also be part of this phase.

VII. Recommendations:

1. The acquisition of a population estimate with an acceptable degree of confidence (i.e., CV=25%) for humpback chub may not be feasible in Yampa Canyon, both from an economic and fish health perspective. Therefore, the most effective method of monitoring the Yampa Canyon population may be through catch per unit effort surveys of for both adults and age-0 fishes. Length frequency distribution, distribution of fish through the canyon, and abundance of juvenile fish may be the best indicator of population status available.

2. In addition to relative abundance and length frequency distribution, the status of surrogate species such as, roundtail chub, flannelmouth sucker and bluehead sucker, may an indicator of general well being of the native fish community in Yampa Canyon.

VIII. Project Status: The field work is completed. The draft final report will be submitted to the program coordinator by the end of January.

IX. FY2001 Budget Status

- A. Funds Provided: \$20K
- B. Funds Expended:\$20K
- C. Difference: 0
- D. Recovery Program funds spent for publication charges: 0\$

X. Status of Data Submission (Where applicable): To be submitted by February 15

XI. Signed: Bruce Haines 28, Jan 2002
Principal Investigator Date