COLORADO RIVER RECOVERY PROGRAM
FY 2004 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: 137

Lead Agency: Larval Fish Laboratory (LFL)

Submitted by: Kevin R. Bestgen

I. Project Title: Development of a centrarchid monitoring plan for the Colorado River, Colorado.

II. Principal Investigator(s): Kevin Bestgen

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III. Project Summary: The goal of the study was to develop a sampling methodology to more accurately detect the presence and estimate the abundance of centrarchid fishes in backwaters of the Colorado River, CO. Our approach had three main objectives. The first was to develop a sampling program and technique to determine the number of backwaters to be sampled in the reach. An optimal design will determine the minimum number of backwaters to be sampled in the reach to obtain unbiased and accurate estimates of presence and abundance of centrarchids in backwaters. Second, we will develop comparisons of seining and electrofishing techniques to detect presence and abundance of centrarchids within backwaters. Third, given data gathered in objective 2, we will develop estimates of the level of sampling intensity needed to provide unbiased estimates of centrarchid presence and abundance in backwaters that are selected. This can be accomplished partially with existing data and partially with new data.

To date, we have assembled data relevant to do analyses and simulations to arrive at an optimal sampling design to detect presence of centrarchids in backwaters of the Colorado River in the Grand Valley, Colorado. A spread sheet simulation program has been developed that allows us to determine sample size of backwaters needed for sampling to estimate presence of centrarchids in backwaters with various levels of effort.

IV. Study Schedule: 2003-2005. Funding was received late in 2003, so activity on this

project only began in 2004. Since the original scope was for two-years, we ask for a change in the final project due date to September 2005 to reflect the original time period proposed.

V. Relationship to RIPRAP:

Relationship to RIPRAP: Colorado River Action Plan: Mainstem

III. Reduce negative interactions between non-native and endangered fishes.

V. Monitor populations and habitat and conduct research to support recovery actions (Research, monitoring, and data management).

VI. Accomplishment of FY 2004 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings: Delays in receiving funding for this two-year project essentially pushed the start date of this project to the beginning of FY-04. We were not able to accomplish all project objectives in one year so we ask for a one-year extension to September 2005, which essentially still provides for the two-year project time window that was first proposed.

To date, we have assembled data relevant to do analyses and simulations to arrive at an optimal sampling design to detect presence of centrarchids in backwaters of the Colorado River in the Grand Valley, Colorado. A spread sheet simulation program has been developed that allows us to determine sample size of backwaters needed for sampling to estimate presence of centrarchids in backwaters with various levels of effort. For example, given a certain number of backwaters in the reach each year (this can be manipulated), the simulations permit evaluation of the number of backwaters to sample relative to different levels of error rates when estimating frequency of detection. In other words, does the investigator wish estimates derived from sampling to be within 10% of the true number of backwaters occupied by centrarchids or within 25%. The tradeoffs between accuracy and cost can then be considered. As one might expect, the larger the number of backwaters sampled, the smaller the error rate is for estimating frequency of detection. Further, the simulations allow evaluation of different levels for the desired frequency of correct estimation. Although correct estimation 100% of the time is desirable, this rarely happens in sampling. Because these data are probabilistic, the investigator can evaluate the relative benefits of choosing a correct level of estimation that is less than 100% (e.g., 80 to 95%) and evaluate the cost-benefit ratio associated with that. Again, as the desired frequency of correct estimation rises, a larger number of backwaters is needed for sampling.

VII. Recommendations: No modifications needed, except for end date of final report (30 September 2005).

VIII. Project Status: On track and ongoing.

IX. FY 2003 Budget Status

A. Funds Provided: total provided in late FY-03 was $28,600, which was funding for the entire project through FY-04.
B. Funds Expended: $15,549
C. Difference: $13,051.
D. Percent of the FY 2004 work completed is about 54%, no additional funds needed.
E. Recovery Program funds spent for publication charges: None.

X. Status of Data Submission (Where applicable): Not applicable.

XI. Signed: Kevin R. Bestgen 8 November 2004
Principal Investigator Date