I. Project Title: Pilot Project - Cyprinid Removal in the Lower Colorado and Green Rivers

II. Principal Investigators:

Steve Meismer
Utah Division of Wildlife Resources
Moab Field Station
1165 S. Highway 191 - Suite 4
Moab, UT 84532
phone: 435-259-3780; fax: 435-259-3755
email: nrdwr.smeismer@state.ut.us

J. Michael Hudson
Utah Division of Wildlife Resources
Moab Field Station
1165 S. Highway 191 - Suite 4
Moab, UT 84532
phone: 435-259-3781; fax: 435-259-3755
email: nrdwr.mhudson@state.ut.us

III. Project Summary:

The objective of this project is to remove small-bodied nonnative cyprinids (e.g., red shiner *Cyprinella lutrensis*, sand shiner *Notropis stramineus*, and fathead minnow *Pimephales promelas*) from habitats used by larval and young-of-year (YOY) native endangered fishes (primarily Colorado pikeminnow *Ptychocheilus lucius* and razorback sucker *Xyrauchen texanus*) on the lower Green and Colorado rivers, Utah. It is believed that removal of these nonnative cyprinids will reduce predation on and competition with young native fish in these habitats, thereby increasing their survival and growth.

In 2000, we conducted five removal trips on the lower Green River and five removal trips on the lower Colorado River in Utah. Approximately 54,900 nonnative cyprinids and 4,253 native fish were captured on the Green River from the treatment and control habitats. On the Colorado River, approximately 57,500 nonnative cyprinids and 3,224 native fish were captured. Flows in both rivers in 2000 were lower than in either of the two previous years of this project.

IV. Study Schedule: 1998-2001

V. Relationship to RIPRAP:

General Recovery Program Support Action Plan
III. Reduce negative impacts of nonnative fishes and sportfish management activities

(nonnative and sportfish management).
III. A. Reduce negative interactions between nonnative and endangered fish.
III.A.2. Identify and implement viable active control measures.
III.A.2.a. Identify options (including selective removal) to reduce negative impacts of problem species and assess regulations and options (including harvest) to reduce negative impacts on native fishes from nonnative sportfish.
III.A.2.c. Implement and evaluate the effectiveness of viable control measures.

Green River Action Plan: Mainstem
III. Reduce negative impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
III.A. Reduce negative interactions between nonnative and endangered fish.
III.A.4 Remove small nonnative cyprinids from backwaters and other low velocity habitats.

Colorado River Action Plan: Mainstem
III. Reduce negative impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
III.A. Reduce negative interactions between nonnative and endangered fish.
III.A.4 Remove small nonnative cyprinids from backwaters and other low velocity habitats.

VI. Accomplishment of FY 2000 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: Field season summary report for Utah finished and delivered.

Task 2: Draft annual report for 1999 field season finished and delivered.

Task 3: Cyprinid Removal.

Five sampling trips were conducted on the lower Green River (RM 102.0-52.0), between 24 April and 24 May 2000. During these trips, 460 seine samples were collected in 17 separate habitats. Total area sampled was 134,420 m^2 (treatment = 118,800 m^2; control = 15,620 m^2). In treatment habitats, approximately 47,500 nonnative cyprinids and 505 other nonnative fish (representing 10 species) were removed. In control habitats, 7,346 nonnative cyprinids and 228 other nonnative fish (representing four species) were returned alive to the habitats. Native fish captured as part of this project consisted of 4,253 individuals representing six species. The primary native fish captures were larval bluehead suckers (*Catostomus discobolus*) and flannelmouth suckers (*C. latipinnis*). Six hundred ninety-seven Colorado pikeminnow were captured, 46 of these were preserved.

Colorado pikeminnow ranged in size from 38 mm total length (TL) to 762 mm TL. Any pikeminnow greater than 120 mm TL were measured, PIT tagged, and returned to the river.

In 2000, field crews working on the Green River encountered species not captured in previous years, and possibly never in the Green River at the sizes captured. Both walleye (*Stizostedion vitreum)* larvae and lake trout (*Oncorhynchus nerka*) fry were collected during the course of sampling. These anomalous captures were transferred to the Larval Fish Laboratory (LFL) for identification and curation.

Discharge on the Green River during sampling in 1998–2000 ranged from 15,000 to 22,000 cfs in 1998, 10,000 to 27,500 cfs in 1999, and 6,800 to 13,500 cfs in 2000. The Green River peaked (provisionally) at 18,500 cfs in 2000, considerably lower than in the other two sampling years of this study (28,500 cfs in 1998 and 25,800 cfs in 1999). The difference in discharge offers an opportunity to adequately compare the results of these removal efforts between two different flow conditions. One point for comparison would be the proliferation of nonnative cyprinids during a low-flow event. However, numbers remained relatively similar for all 3 years.

In 1998 and 1999, a decreasing trend in nonnative cyprinid captures was observed through the first 4 weeks, followed by an increase during the final week. In 2000, this pattern changed slightly, exhibiting decrease through the first three weeks, followed by an increase during week four and a decrease in week five. Percentages of subadult captures were stable throughout the 5-week sampling period (64.5, 54.5, 56.6, 44.6, 49.8%, respectively). These percentages may indicate that the water temperatures were not warm enough to encourage much reproduction by nonnative cyprinids, and subadults that were present were likely produced late in the fall of 1999.

Five sampling trips were conducted on the Colorado River in 2000 in three reaches; Dewey (RM 97.0-85.0), Moab (RM 67.0-54.0), and Lathrop (RM 33.0-18.0). Total area sampled on the Colorado River in 2000 was 161,085 m^2 (treatment = 124,210 m^2), control = 36,875 m^2) from 477 seine hauls. Over 42,000 nonnative cyprinids and 2,700 other nonnative fish (representing nine species) were removed from treatment habitats. In control habitats, 15,500 nonnative cyprinids and 971 other nonnative fish were returned alive to the river. Native fish captures on the Colorado River were dominated by Colorado pikeminnow (1,159 individuals), ranging from 20mm to 60 mm TL, all YOY individuals.

Discharge on the Colorado River in 2000 was more stable than during 1998 or 1999. Due to the low water year, flows fell early and stayed relatively steady throughout the sampling period. Flows during the sampling period ranged from 4,000 to 10,500 cfs in 1998, 6,000 to 10,500 cfs in 1999, and 2,300 to 4,250 cfs (provisional) in 2000. These lower flows allowed more habitats to be sampled multiple times throughout the removal period. These multiple sampling occasions were an improvement from previous years when the variation in flows resulted in very few habitats being sampled more than one week out of four.

Unlike 1998 and 1999 removal efforts, captures of nonnative cyprinids in 2000 did not decrease through the first 3 weeks followed by an increase on the fourth. Instead, capture numbers continued to climb throughout the removal period, mainly due to the presence of subadult nonnative cyprinids (those less than 40 mm TL). During the first week of sampling, subadults made up 60% of the captures. During the final 4 weeks, subadults made up 79.7%, 97.3%, 97.5%, and 91.9%, respectively. The low water year offered an extended period of time for the nonnative cyprinids to reproduce, thus resulting in higher captures of subadult fishes.

Task 4: Samples preserved have been processed.

VII. Recommendations:

The use of block nets to exclude nonnative cyprinid adults from portions of flooded tributary habitats should be further evaluated. Block nets were used in 1999, but high flows prevented the effective evaluation of the technique. The use of block nets was not provided for in 2000. Constructing these nets in more backwater habitats than 1999, as well as increasing the height and width of the block nets used, should account for any flows greater than 20,000 cfs. In addition, low water years (such as 2000) provide for the maintenance of specific backwater habitats for a longer duration; thus, providing for a more complete evaluation of block netting. This method does not eliminate the need to seine these habitats, but may aid in creating predation and competition free environments for native fishes.

Final recommendations for this project will be included in the final report produced in FY 2001.

VIII. Project Status: Final report scheduled to be completed 5/31/01.

IX. FY 2000 Budget Status

A. Funds Provided: $91,810
B. Funds Expended: $91,810
C. Difference: $ 0
D. Percent of the FY 2000 work completed: 100%
E. Recovery Program funds spent for publication charges: $ 0.00

X. Status of Data Submission: Data on Colorado pikeminnow pittagged will be submitted to database manager by 1/1/2001. All other data will be sent upon finalization of report.

XI. Signed: *Steve Meismer*, December 8, 2000