

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 Office
1165 S. Highway 191 Suite 4
Moab, Utah 84532
435-259-3780 fax: 435-259-3755
email: nrdwr.smeismer@state.ut.us

Melissa Trammell
Utah Division of Wildlife Resources
Moab Field Office
1165 S. Highway 191 Suite 4
Moab, Utah 84532
435-259-3780 fax: 435-259-3755
email: nrdwr.mtrammell@state.ut.us

III. Project Summary:

The objective of the nonnative cyprinid removal project is to remove small bodied, baitfish species from habitats used by larvae and YOY (young-of-year) native endangered species (primarily Colorado pikeminnow *Ptychocheilus lucius* and razorback sucker *Xyrauchen texanus*) on the lower Green and Colorado rivers, Utah. It is thought that removal of these nonnative cyprinids will reduce predation and competition with native fish larvae (young) in these habitats, resulting in an increase in survival and growth.

We conducted five removal trips on the Green River and four on the Colorado River. Besides the five removal trips on the Green River, three trips were made to install and remove exclusionary blocknets from Schoolbus, White, and Red washes. Approximately 132,000 nonnative cyprinids of three species were handled on the Colorado River along with 333 native fish representing six species. On the Green River, approximately 56,898 nonnative cyprinids were handled along with 3,500 native fish. Numbers of native fishes were lower than in 1998 on both rivers. The mesh size of seines was increased slightly from 1/8" to 3/16" mesh to attempt to reduce negative impacts on native fishes observed last year, particularly larval suckers.

IV. Study Schedule:

- a. Initial year: 1998
- b. Final year: 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.

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.

VI. Accomplishment of FY 99 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 1998 field season finished and delivered by 3/31/99.

Task 3

Five trips were conducted on the lower Green River (RM 97.0-52.0), where 430 seine hauls were pulled through 20 habitats, resulting in removal of 56,898 nonnative cyprinids and 162 other nonnatives. Approximately 3,500 native fishes were captured during sampling and returned to habitats. One thousand four hundred forty-six age 1 or older Colorado pikeminnow were captured and returned to the habitats (78

additional Colorado pikeminnow were preserved). All fish captured in control habitats were returned as quickly as possible to the water. Nonnative species captured in experimental habitats were removed from the river while native species were returned to the water. As evidenced by the 78 Colorado pikeminnow preserved, not all natives were found in samples that were too large or debris laden and were inadvertently preserved, although every effort was made to reduce impacts on native populations.

In 1999, prior to the first trip on the Green River, two trips were made to install exclusionary block nets in three flooded tributary habitats, Schoolbus, White, and Red washes (RK 164.0, 154.0, and 153.0). These nets were constructed of 1/4" mesh plastic netting (Memphis Net and Twine) suspended from 5/8" steel rebar and 1/4" shock cord. The nets stretched across the entire width of each of the three selected habitats and 2.5-2.7 m (8-9 ft) high. Nets were put in place before inundation of habitats behind netting, assuring exclusion of nonnative fishes before habitat filling. Nets were folded approximately 8 inches at the bottom and had soil placed to anchor the net to the substrate. Nets were not placed immediately at the mouths of the habitats for various reasons, including cattle and canoeist access, and to provide habitat for adult native fishes that may use these habitats. Netting worked well for the first four weeks, before the increase in flows on the Green River due to the opening and bypass of Flaming Gorge Dam. When the flows in the river reached 22,000 cfs, the net in Schoolbus overtopped and the net in White Wash was flanked by water (~24,000 cfs), allowing fish beyond the block. A beaver also continually chewed holes through the net in Schoolbus Wash despite weekly repairs. The net in Red Wash did not inundate until water levels reached 15,000 cfs and remained intact until a log crashed into and damaged the net in late June. Nets were removed on 30 June due to reduction in flows from Flaming Gorge. Concern that adult fish that may have gotten beyond the nets at high water would be trapped as the water fell hastened the removal. All habitats were still connected to the main channel and had sufficient water behind the netting when nets were removed. Until these nets were damaged or water depth in the uncontrolled areas of backwaters became too deep to seine (> 1 m) it appeared that the netting was excluding nonnative cyprinid adults as well as other larger fish from regions behind the nets. Some fish did find ways around or through the netting, but numbers of adult fishes (> 40 mm) were fewer behind the nets. Due to the mesh size of seine being used, captures of larvae was limited. However, light traps set for larval razorback monitoring did capture bluehead and flannelmouth sucker larvae above the block nets prior to high flows in White Wash (RK153.7), suggesting that larvae can take advantage of the use of these nets.

Sampling of all habitats for the first three weeks was extremely effective because water levels were low enough that they could be sampled from the mouth to the upper reaches. Between week two and three, there was a drop of about 4,000 cfs this resulted in a "silting in" of some of the smaller habitats, making it impossible to seine these areas. Once the water levels peaked (~28,000 cfs) all habitats encountered were extremely large flooded tributary mouths. Each of these habitats was several

hundred meters long, and were too deep for effective seining for 2/3 of their length (nearest the main channel). With the water levels above 25,000 cfs, an additional problem arose. Upper reaches of these habitats contain various types of vegetation (tamarisk and willow), and at the peak flows, much of this vegetation was inundated providing excellent cover for fish and causing seining to be limited to only vegetation free areas. During the course of these five weeks, Moab Field Station employees seined 97,000 m².

Green River data showed decreasing captures of nonnative cyprinids through the first four weeks with an increase during the fifth. This is similar to last years results. Compared the 1998 sampling, more nonnative cyprinids were removed, suggesting that despite intensive removal efforts last year and high flows in 1999, nonnative presence in these habitats is still extremely high.

Sampling on the Colorado River consisted of four trips again this year, because of an observed lack of low velocity habitat from which nonnative cyprinids could be effectively removed. Seven hundred twenty-four other nonnatives were removed from nursery areas along with approximately 132,000 nonnative cyprinids. Approximately 330 native fishes were handled including 85 age-1 or older Colorado pikeminnow. Trends for the Colorado River as a whole show decreasing numbers of nonnative cyprinid captures through the first three trips and an increase during the fourth trip. This trend was similar to 1998 data and is likely due to re-invasion of habitats following a period of suspension of sampling. Although effort was similar, there was an increase in captures of nonnative cyprinids of approximately 100,000 over last year. The increase from last year cannot be explained at this time, although its probably attributable to good reproduction by nonnative cyprinids after sampling ended last year.

Reduction in the number of prescribed sampling trips on the Colorado River was due to lack of habitats because of the higher than average water year. As on the Green River, a 3/16" mesh seine was used to avoid high native fish mortality. Seine mesh, coupled with an apparent poor sucker production, resulted in the widely disparate number of native fish captures between 1998 and 1999. However, nonnative cyprinid captures were extremely high, forcing field crews to sub-sample extremely large seine hauls. Sub-sampling did not allow for those fish not brought to the laboratory to be identified to species, so those were classified as nonnative cyprinids. Area seined on the Colorado River was 48,685 m².

The total capture of nonnative cyprinids on both rivers was higher in 1999 than 1998, despite removal efforts last year. Whether this increase represents more fish available for capture, better sampling efficiency, or more reproduction by nonnative cyprinids has not been determined.

Recommendations from the 1998 annual report for the nonnative removal project were incorporated in 1999. The exclusionary blocking of habitats with plastic mesh

appeared to be successful until the water levels increased and allowed fish access. Although fish would likely have skirted the nets to some extent, we have learned how we can make these exclusions better in the future.

Task 4

Sixty-four individual bags representing 45 samples were collected in the Green River along with an additional 12 collected on the Colorado River. Nonnative fish in all samples have been identified, measured to 10 mm size categories, and counted. Native fish inadvertently preserved were identified to species, measured to the nearest millimeter, and counted. All information has been entered into Quattro Pro files for analysis.

VII. Recommendations:

We recommend the continuation of block nets to exclude nonnative cyprinid adults from portions of flooded tributary habitats. Constructing these nets in more habitats than 1999 as well as increasing the height and width of the blocks used this year should account for any flows above 20,000 cfs. This method does not eliminate the need to seine these habitats, but may aid in creating a predation and competition free environment for native fishes.

VIII. Project Status: On-track and ongoing.

IX. FY 99 Budget Status:

- A. Funds budgeted: \$87,470
- B. Funds expended/obligated: \$87,470
- C. Difference: \$ -0-
- D. Percent of FY 99 work completed: 100 %
- E. Recovery Program funds spent for publication charges: \$ 0.00

X. Status of Data Submission: Submission pending, expected 15 January 2000

XI. Signed: Matthew Andersen, December 7, 1999

Matthew Andersen