COLORADO RIVER RECOVERY PROGRAM Project No.: 89
FY-2002 SCOPE OF WORK

Lead Agency: Fish and Wildlife Service
Colorado River Fishery Project

Submitted by: Frank Pfeifer (Project Leader)
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Date: September 14, 2001

Category:
XX Ongoing
___ Ongoing-revised project
___ Requested new project
___ Unsolicited proposal

Expected Funding Source:
XX Annual funds
___ Capital funds
___ Other (explain)

I. Title of Proposal: Electrofishing Removal of Non-native Fish From Nursery Habitats in the Upper Colorado River.

II. Relationship to RIPRAP: Colorado River Action Plan: III. Reduce negative impacts of nonnative fishes.
III.A.3.b. Remove nonnative centrarchids from backwaters and other low velocity habitats.

III. Study Background/Rationale and Hypotheses:

The Colorado River population of Colorado pikeminnow is comparatively small; numbers are currently limited by a low frequency of strong year classes (Osmundson and Burnham 1996). Reproduction may be limited by low egg hatching success during years of unfavorable environmental conditions (high silt loads in spawning cobbles, low egg viability from high selenium levels, etc.); recruitment may be limited by low growth rate of larvae and YOY and by predation in nursery habitats (Kaeding and Osmundson 1988).

The most abundant fish predators that likely prey on Colorado pikeminnow larvae include nonnative red shiners (*Cyprinella lutrensis*) (Rupert et al. 1993) and sand shiners (*Notropis stramineus*) and perhaps mosquitofish (*Gambusia affinis*). As

larvae grow in nursery habitats they quickly move out of a size range available to these small nonnative minnows and mosquitofish. However, Osmundson (1987) found that YOY and yearling-sized Colorado pikeminnow remain highly susceptible to predation by introduced centrarchids, i.e., largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanella*) and black crappie (*Pomoxis nigromaculatus*), which also inhabit Colorado pikeminnow nursery habitats though in smaller numbers. In the upper Colorado River, largemouth bass and green sunfish are the only common, large, nonnative, piscivorous fish species that inhabit backwater habitats year-round. The omnivorous channel catfish *(Ictaluras punctatus*) is ubiquitous throughout main-channel habitats in the Colorado River and occur in flooded backwaters during spring runoff. Piscivory by channel catfish is largely limited to larger individuals (Tyus and Nikirk 1990). To date, northern pike (*Esox lucius*), smallmouth bass (*Micropterus dolomieui*), bluegill (*Lepomis macrochirus*) and black crappie remain rare.

The most likely place for young Colorado pikeminnow to come in contact with nonnative, predacious fish is in backwaters year-round and in flooded ponds during spring runoff. Colorado pikeminnow YOY first appear in backwaters in July or August of the year they are hatched; they remain in these habitats through the following June. By July, age 1 fish leave backwaters and move to main-channel habitats and a new year class of young pikeminnow move into the backwaters (USFWS unpublished data). Thus, backwaters are used by age-0 (8-110 mm TL) Colorado pikeminnow throughout the year.

To date, catch rates of largemouth bass and green sunfish have been highest in the upper reach, from the top of Westwater Canyon, Utah to Palisade, Colorado. Significant numbers of young Colorado pikeminnow were formerly caught in backwaters in this area during the late 1970's to mid-1980's (Haynes et al. 1984, Osmundson and Kaeding 1989, McAda and Kaeding 1991). In recent years, very few young Colorado pikeminnow have been found in the upper reach (McAda et al. 1994, Osmundson and Burnham 1996). Catch rates of YOY Colorado pikeminnow during fall ISMP sampling were exceptionally high in 1996 in the lower reach, particularly downstream of Moab, Utah (unpublished data). However, despite this year of good reproduction, no Colorado pikeminnow were captured from backwaters in the upper reach. During fall ISMP sampling, catch rates (not yet enumerated) of largemouth bass in upper reach backwaters were the highest ever observed. Those backwaters harboring largemouth bass yielded few minnows, either native or nonnative. To what degree the rarity of YOY Colorado pikeminnow in upper reach backwaters is attributable to the presence of introduced centrarchids is unknown, though Osmundson (1987) found that largemouth bass predation rates on yearling-sized Colorado pikeminnow stocked in ponds was very high.

Unlike small-bodied nonnative minnows, annual variation in catch rates of largemouth bass and green sunfish do not appear to be related to the magnitude of

spring flows (Osmundson and Kaeding 1991). Reproduction likely occurs in protected off-channel habitats, removed from but connected to the main channel. Chronic immigration of young to the river from ponds and irrigation canals probably accounts for their continued presence in backwaters (Osmundson 1987, Nesler 1990). Though reclamation or outlet screening of ponds is perhaps the best long-term means to control centrarchid numbers (Tyus and Saunders 1996), the most immediate need is to reduce centrarchid numbers in riverine habitats where they now come in contact with and presumably prey on endangered fish. Because numbers of centrarchids are not high enough to support commercial or sport harvest, specific projects using mechanical removal methods appears to be the only viable means to accomplish this.

IV. Study Goals, Objectives, End Product:

Goal

Our goal is to increase survival rate of age-0 Colorado pikeminnow and other native species through the reduction of piscivorous, nonnative centrarchids in riverine backwaters where they are suspected of preying on juvenile, native fishes.

Objectives

1. Remove from backwaters all centrarchids and other large, nonnative species deemed detrimental to the native fish community (carp, white sucker, channel catfish).

2. Evaluate efficacy (both practicality and degree of measurable success) of using mechanical removal of predators as an ongoing recovery activity.

V. Study Area: Backwaters of the Colorado River from the Grand Valley Diversion Dam at Palisade, Colorado (RM 185.1) downstream to the top of Westwater Canyon (RM 124.8).

VI. Study Methods/Approach

All backwaters within the study area will be electrofished prior to runoff (March-April) and following runoff (August-September) for three years. One pass through the study area each season will be made using an electrofishing boat; this will be immediately followed by a second pass using a generator and vvp floated on a barge (fiberglass tub) with three netters wading alongside. The barge pass will allow removal of nonnatives from backwaters too small to be accessed by the boat on the first pass. Numbers and sizes of removed fish will be recorded. Translocation of live centrarchids to nearby fishing ponds is cumbersome and time consuming. Individuals large enough for consumption will be eviscerated and placed on ice for CDOW pick-up. Smaller individuals will be disposed of on site or at an appropriate off-site location. It is expected that large numbers of carp

will also be encountered. These will be discreetly disposed of on site.

Depletion rates from the first to second seasons of each year will be used to evaluate effectiveness of efforts.

VII. Task Description and Schedule

Description

Task 1. Remove nonnatives from backwaters and write annual reports.
Task 2. Analyze and summarize data.
Task 3. Write final report

Schedule

Task 1: 1999-2001
Tasks 2 & 3: 2002

FY-2002 Work (for multi-year study)

Deliverables/Due Dates:

Send draft report to coordinator - 1 May 2002
Send revised draft to peer reviewers and Biology Committee - 1 June 2002
Peer review comments to author, coordinator, and Biology Committee - 1 July 2002
Biology Committee comments to author and coordinator 15 July 2002
Send revised final draft to Biology Committee 15 August 2002

Budget estimate

Tasks		
Labor		
	Project Leader (1 week)	$ 1,500
	Project Biologist (8 weeks)	$ 11,000
Other		
	Travel	$ 500
Total		$13,000

VII. Budget Summary

	Project Cost
FY-2002	$ 13,000
Total	$ 13,000

IX. Reviewers: Bob Muth, Tom Nesler.

X. References:

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Tyus, H. M., and J. F. Saunders. 1996. Nonnative fishes in the upper Colorado River Basin and a strategic plan for their control. Final Report. University of Colorado, Boulder, Colorado.

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