

**COLORADO RIVER RECOVERY PROGRAM
FY 2000 ANNUAL PROJECT REPORT**

**RECOVERY PROGRAM
PROJECT NUMBER: CAP-6-GP**

- I. Project Title: Removal of Nonnative Fishes from Sloped Gravel Pit Ponds and Evaluating the Use of Sloped Gravel Pit Ponds by Endangered and Native Fishes in the Upper Colorado River near Grand Junction, Colorado**
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III. Project Summary:

Project goals are to 1) evaluate gravel pits traditionally reclaimed as depressions but reconfigured, backfilled, and sloped to drain and behave as ephemeral, floodplain habitats for adult Colorado pikeminnow and other native fishes, and 2) remove and dispose of nonnative fishes from these same modified ponds.

This is the third and final year of a three-year field project. Sampling was conducted with trap nets, barge electrofishing, and seines at two sites, Gardner Pond and Jarvis Restoration Site during runoff and post-runoff. Usage by native fish at these two sites declined in 2000 from the previous 2 years. One hundred-one native and 6,813 nonnative fish were collected from both Gardner and Jarvis ponds during runoff and post-runoff river stages in 2000. Green sunfish (45%), black bullhead (20%), and red shiner (10%) were the predominant nonnative fishes collected. Gardner Pond continues to be a suitable spawning area for green sunfish and largemouth bass. Spawning of green sunfish and largemouth bass was successful in Gardner Pond as demonstrated by the high numbers of YOY fish produced and collected in 2000. Only three adult Colorado pikeminnow were captured—all from Gardner Pond compared to 17 captured in 1999 and 11 in 1998. Two razorback sucker, one stocked in Gunnison River and one stocked in Colorado River upstream, were collected in Gardner Pond. No Colorado pikeminnow or other endangered fishes were captured in Jarvis Pond. Results to date on endangered fish use at the Jarvis Site are still inconclusive. Final report due May 2001.

- IV. Study Schedule:**
a. initial year: 1998
b. final year: 2001

- V. **Relationship to RIPRAP: Colorado River Action Plan: Colorado River;**
II.A. Restore and manage flooded bottomland habitat: monitor and evaluate success. III.A. Reduce negative impacts of nonnative fishes and sportfish to endangered fishes: control nonnative fishes.

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

A. **FY-2000 Tasks and Deliverables:**

Task 1. Capture native and nonnative fishes using trap and fyke nets, trammel nets, electrofishing, and seines.

Task completed.

Task 2. Remove all nonnative fishes captured by mechanical means from graded gravel-pit ponds adjacent to the Upper Colorado River. Enumerate all native fishes captured by species and age-group captured with various gear types.

Task completed.

Task 3. Prepare RIP annual progress report.

Task completed.

Task 4. Analyze field data; prepare final report.

Field data for 2000 were computerized and analyzed.

B. Findings

This is the third and final year of a three-year field project to collect fish from off-channel, gravel-pit habitats. Two ponds were initially selected for this study, Jarvis Pond (river mile 170.9) near the confluence with the Gunnison River, and Gardner Pond (river mile 174.4). Gardner Pond is a former gravel-pit pond that was formerly reclaimed as a depression. Next, it was reconnected to the river by a channel. During the winter of 1997/1998, it was reconfigured and reshaped to slope toward the river to fill during runoff and drain during post-runoff. No sampling was conducted in 1998 at the Jarvis Restoration Site because contract negotiations with the City of Grand Junction and the Recovery Program were delayed, and on-site work to connect Jarvis Pond to the river and reconfigure it to slope toward the river had not begun when this study commenced in May 1998. Therefore, Pickup Pond (river mile 175.0) was selected as a replacement for the Jarvis site in 1998.

In 2000, field work was conducted during runoff and post-runoff river stage over a 10-week period from 10 May to 18 July in Gardner Pond. Trap nets and barge electrofishing were used to sample and collect fish in 2000 from Gardner Pond. The Jarvis Restoration Site was sampled with seines and barge

electrofishing in 2000. Trap nets were not used at the Jarvis Site in 2000. Pickup Pond, sampled only in 1998, was not sampled in either 1999 or 2000. Trap nets were fished continuously during the weekdays, but for the most part, were not fished during the weekends. Only during Memorial Day weekend were trap nets checked. Trap nets fished a total of 4,697.5 hours in 2000. As a result of a low runoff in 2000, trammel nets and boat-boom electrofishing were not used at either site because water depth was too shallow in the ponds for these gear types to fish effectively.

A total of 6,326 YOY, juvenile, and adult nonnative fish were collected from Gardner Pond; 487 nonnative fish were collected from Jarvis Pond (Table 1). This comprised fourteen different nonnative fishes, five native fishes, and two sucker hybrids (Appendix Table 2). Ninety-eight native fish were collected from Gardner Pond; only three native fish were collected from Jarvis Pond. Surprisingly, no bluehead sucker were collected at either site. Three adult Colorado pikeminnow (mean TL=670 mm; range 610-765 mm) were captured. All pikeminnow were captured in Gardner Pond. No endangered fish were captured in Jarvis Pond in 2000. All pikeminnow had been previously captured. One pikeminnow had been caught in Gardner Pond during runoff in both 1998 and 1999; one other pikeminnow had been caught in Gardner Pond during runoff in 1998. The third pikeminnow had previously been caught at Colorado RM 168.6 in April 1993 and in May 1999 was captured near Gardner Pond at Colorado RM 176.5. In addition, two razorback sucker were captured in trap nets in early-June in Gardner Pond. Both were hatchery-produced fish that had been stocked into local rivers. One razorback sucker had previously been stocked into the Gunnison River near Delta (RM 57) in early October 1998. It was 411 mm TL at release and was from the 1995 year-class. It traveled 57 miles downstream to the Colorado River confluence, moved upstream about 3.4 miles, and located the connection channel to Gardner Pond before being captured. The other razorback sucker was stocked in mid-April 2000 near Parachute in the Colorado River (RM 220.9). Before it was caught in a trap net, it moved downstream and traversed dams at Government Highline, Price-Stubb, and Grand Valley Irrigation Diversion. It also was able to locate and negotiate the man-made connection channel into Gardner Pond, a distance of about 47 miles from its stocking location.

Green sunfish was the predominant nonnative species collected in Gardner Pond in 2000 as they comprised 45% (3,020) of all fish collected. The green sunfish population in Gardner Pond exploded in 1999. That year, they made up 65% (3,884) of the catch in this pond. Catches of green sunfish in 1999 in Gardner Pond were significantly greater (60 times) from 1998 when only 64 (9% of the total fish collected) were collected from this pond. In 2000, they were about 47 times greater than those produced and collected in 1998. At the Jarvis Restoration Site, the numbers of green sunfish collected have remained relatively low and the population has apparently not exploded as they have in Gardner

Pond. In 1999, green sunfish comprised 22% of all fish collected in Jarvis Pond; in 2000, only 15% (73). White sucker comprised just 0.6% (3) of the fish collected in Jarvis and only about 1% (70) of the fish in Gardner Pond. This is down from 1999 when white suckers comprised 40% of the catch in Jarvis and 4% in Gardner. Captures of black bullhead (1,351 24%), red shiner (689; 11%), largemouth bass (461; 7%), and carp (350; 6%) in Gardner Pond were also

Table 1. Number of young-of-year (YOY), juvenile (JUV), and adult (ADU) native and nonnative fishes collected with trap nets, barge electrofishing, and seines from two gravel-pit ponds, Gardner Pond (river mile 174.4) and Jarvis Pond (river mile 170.8), in the Upper Colorado River during runoff and post-runoff, early-May to mid-July 2000. See Appendix; Table 2 for the number of native and nonnative fishes collected by species.

Gear Type	Effort ^b	NATIVE ^a					NONNATIVE		
		YOY	JUV	ADU	CP ^c	RZ	YOY	JUV	ADU
Gardner Pond									
Trap Net	4,697.5	0	72	24	3	2	0	4,513	664
Electrofishing	1.8	0	2	0	0	0	804	179	166
Jarvis Pond									
Trap Net ^d	--	--	--	--	--	--	--	--	--
Electrofishing	1.8	0	3	0	0	0	125	123	208
Seine	660	0	0	0	0	0	0	31	0
All Totals	---	0	77	24	3	2	929	4,846	1,038

^a Juvenile razorback suckers and sub-adult Colorado pikeminnow are included under JUV and ADU headers.

^b Trap net and electrofishing effort is in hours; seine is in m². Numbers of seine hauls was 10.

^c CP=Colorado pikeminnow..

^d Not used because Jarvis Pond water depth was too shallow to use in 2000 due to low runoff.

significant in 1999. The number of YOY largemouth bass that was collected with barge electrofishing in mid-July, indicates that this species successfully spawned in 2000. Three hundred-forty YOY largemouth bass were measured and a length-histogram produced (Appendix; Figure 1). Age-0 fish ranged from 34-105 mm; modal class being 50-59 mm TL. From the number of YOY green

sunfish and largemouth bass collected from Gardner Pond in 1999 and 2000, it is apparent that this site is providing suitable spawning conditions for these two nonnative fishes to produce sufficient numbers of YOY cohorts. These, two nonnative fishes have been targeted by the RIP as detrimental to the early-life stages of some of the native listed fishes and problematic to recovery of these same native species. Fortunately for now, green sunfish and largemouth bass have not become established at the Jarvis Site as their numbers remain low.

All native fish were returned to the pond; all nonnative fish were removed.

VII. Recommendations (note underscored items):

- A. This depression and other low-lying areas should be back-filled which would allow this area to drain completely following runoff and prevent year-round habitat for nonnative fish to persist and survive. In 1999, the number of green sunfish in Gardner Pond at 29-5/8 Road increased 60 times from 1998 catches. In 2000, similar results were noticed (47 times greater than 1998). This indicates that the green sunfish population at this site has increased significantly. Gardner Pond is providing both green sunfish and largemouth bass a suitable site to spawn and annually produce large numbers of YOY fish of each species. In 1999, 95% of the green sunfish catches were from one trap net in the northeast portion of this pond. Approximately 2 acres of the most eastern portion of this pond does not drain following runoff because it is a depression. Moreover, the area is kept wet most of the year from ground-water seepage from irrigation water draining from upland areas. Sunfish populations are thought to originate and prosper because of this depression that remained when excavation crews ran out of fill material when this pond was reshaped in 1997/1998.**

Estimates to backfill this pond were solicited from both private and governmental (BR) sources in late-1999 and early-2000. The cost estimated to complete the work, as originally intended in 1997/1998, from four local private contractors ranged from \$230,000 to \$ 325,000; the governmental estimate was about \$ 520,000. The Management Committee in early-2000 decided that backfilling this site was too costly and therefore did not approve any action for backfilling.

- B. A wetland area immediately east of this depression is hydrologically isolated with the pond during non-runoff periods but is connected with the main pond during runoff. During a reconnoitering trip 2 December 1999 with CDOW personnel, this wetland was muddy, but did not hold standing water. River flows influence adjacent pond water levels year-round. Flows in the Colorado River measured at the Palisade gage were about 1,620 cfs on this date. Standing water was noted in the fall of 1998 in the wetland, however. Flows in the 15-mile reach were higher (2,200 cfs) in December**

1998 than in 1999. It is unknown to what extent the wetland contributes to the survivability of sunfish populations or how many years adequate water is retained to allow year-round survival of centrarchid populations.

Three possible options exist for the wetland. One, leave the wetland as is. Two, if the wetland is to be preserved, then a higher berm could be erected to isolate this area from the pond permanently. Or three, the low-elevation berm between the wetland and pond could be removed so that the wetland and pond would become incorporated into one body of water. In order for the eastern end of the wetland and pond to drain, this area would have to be backfilled. The immediate reaction would be to rotenone the low-lying depressions and eliminate all nonnative fishes. However, this may be problematic because the benefits from such an action may be short-lived. Previous attempts to rid the pond of nonnative fishes by draining have resulted in re-invasion of nonnative fishes in only a few months. Also, since water from the pond is currently draining from the pond into the river, rotenoning the pond will require a detoxifying agent being applied in the connection channel and/or an earthen berm be placed to prevent rotenone from escaping the pond. This site may have to be occasionally rotenoned to eliminate predaceous sunfish populations.

- C. If the depression cannot be back-filled and the wetland connects with the pond during runoff, then the connection channel previously funded by the Recovery Program should be plugged to prevent escapement of nonnative centrarchid fishes from the pond to the river. This action is the least desirable option because it will prevent Colorado pikeminnow and other native fish from using Gardner Pond because this habitat will be inaccessible during runoff. However, the negative impacts of centrarchid fishes continuing to proliferate at this site, escaping from the pond into the river, and then potentially competing with or preying on native endangered fishes in the river far outweigh the use and benefits derived by endangered fish during runoff.
- D. Whatever the action taken, followup during and at the termination of the project between Service biologists and personnel conducting the on-site excavation work is necessary to ensure that the desired objectives are met.

VIII. Project Status:

- A. Field work completed.
- B. All field data were entered into d-BASE IV.
- C. Project is ongoing and is "on-track".

IX. FY 2000 Budget

- A. Funds Provided: \$42,000
 - B. Funds Expended: \$42,000
 - C. Difference: \$ 0
 - D. Status of Work--Percent of Work Completed (if BR-funded project): 100% Completed.
 - E. Publication Costs: \$ 0
- X. Status of Data Submission: All three Colorado pikeminnow and the two razorback sucker captured were checked for a PIT-tag. Fish previously not captured were PIT-tagged and the following data collected from all fish prior to their being released: total length (mm), weight (g), reproductive condition, and date and location of capture. These data have been computerized. The total number of fishes that were collected in each pond and by each gear type has also been computerized. These completed, computerized data are provided to the UCRB database coordinator upon his request.
- XI. Signed: Bob D. Burdick 2000/12/08
Principal Investigator Date

APPENDIX:

- A. More comprehensive/final project reports. If distributed previously, simple reference the document or report. None
- B. Attached: Appendix A: one table and one figure.

Prepared and compiled by Bob D. Burdick, 00/12/08
Nonnatve.00

Appendix A

Table 2. Numbers of young-of-year (YOY), juvenile (JUV), and adult (ADU) native and nonnative fishes collected with trap nets, barge electrofishing, and seines from two gravel-pit ponds, Gardner Pond (river mile 174.4) and Jarvis Pond (river miles 170.8), in the Upper Colorado River during runoff and post runoff, early-May to mid-July 2000.

	<u>Jarvis Pond</u>			<u>Gardner Pond</u>		
	<u>YOY</u>	<u>JUV</u>	<u>ADU</u>	<u>YOY</u>	<u>JUV</u>	<u>ADU</u>
Native Fishes						
flannelmouth sucker	0	1	0	0	32	6
bluehead sucker	0	0	0	0	0	0
roundtail chub	0	1	0	0	40	15
speckled dace	0	1	0	0	0	0
Colorado pikeminnow	0	0	0	0	0	3
razorback sucker	0	0	0	0	2	0
sub-total	0	3	0	0	74	24
Nonnative Fishes						
rainbow trout	0	0	0	0	0	1
common carp	98	0	0	230	26	94
white sucker	0	2	1	0	58	12
channel catfish	0	0	1	0	9	52
black bullhead	0	2	1	139	1,209	3
black crappie	0	0	0	0	13	3
largemouth bass	2	0	0	430	28	3
smallmouth bass	0	0	0	0	0	0
green sunfish	15	58	0	5	2,996	14
bluegill	0	0	0	0	5	3
fathead minnow	0	57	188	0	23	29
sand shiner	0	1	2	0	44	22
red shiner	0	14	4	0	246	443
gambusia	5	20	0	0	34	68
plains killifish	5	0	0	0	0	0
white sucker X						
bluehead sucker	0	0	0	0	0	2
white sucker X						
flannelmouth sucker	0	0	0	0	1	0
sub-total	125	154	208	804	4,692	830
ALL TOTALS	125	157	208	804	4,766	854

Appendix A (cont)

Figure 1. Total length (mm) frequency composition of young-of-the-year (Age-0) and older largemouth bass collected by barge electrofishing from Gardner Pond (river mile 174.4) in the Upper Colorado River near Grand Junction, Colorado, 18 July 2000.