

**COLORADO RIVER RECOVERY PROGRAM
FY-2001 PROPOSED SCOPE OF WORK**

Project #: 105
Pikeminnow Translocation

Lead Agency: Fish and Wildlife Service
Colorado River Fishery Project

Submitted by: Frank K. Pfeifer, Project Leader
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Category:

- Ongoing project
- Ongoing-revised project
- Requested new project
- Unsolicited proposal

Expected Funding Source:

- Annual funds
- Capital funds
- Other (explain)

I. Title of Proposal: Evaluation of Stocking Sub-adult Colorado pikeminnow via Translocation in the Upper Colorado River between Palisade and Rifle, Colorado

II. Relationship to RIPRAP: Colorado River Action Plan: Mainstem, IV. A. 1.b.(3): Monitor and evaluate results; make recommendations regarding further augmentation.

III. Study Background/Rationale and Hypotheses:

The Palisade to Rifle reach of the Upper Colorado River is historical habitat for both Colorado pikeminnow and razorback sucker, and Anderson (1997) recommended that appropriate habitat was available for reintroduction of these two fishes. Burdick (1992) proposed stocking razorback sucker in the Palisade to Rifle reach of the Upper Colorado River. As a result, twenty, sub-adult and adult razorback sucker, captured from Etter Pond, were implanted with radio tags and stocked into the Upper Colorado River in this stream reach in the spring of 1994 (Burdick and Bonar 1997). A later stocking plan (Burdick et al. 1995) proposed stocking large numbers of 4-, 8-, 12-inch razorback sucker into the Upper Colorado River. In 1999, 3,498 juvenile (mean total length=172 mm; range total length=106-310 mm) razorback suckers were released on five different dates between 20 September and 29 October in the Upper Colorado River, at river mile 227.

Colorado pikeminnow are thought to have occupied the stream reach upstream of Government Highline Diversion Dam; historical accounts and records of Colorado pikeminnow upstream of the Palisade are scant. The last and only record is from an anecdotal account of the capture, by angling, of a 15-inch Colorado pikeminnow, above Glenwood Springs (Pressey 1968 [in Nesler 1998]). In the early 1960's, fishermen reported catching Colorado pikeminnow in Plateau Creek (personal communication, George Kidd; Kidd 1974). Investigators conducting fishery surveys in warmwater reaches of Plateau Creek from the mouth upstream did not report collecting any razorback sucker or Colorado pikeminnow (Carlson and Platania 1984; Wick and Hawkins 1983). Plateau Creek is a small tributary to the Colorado River; the confluence being approximately 0.4 miles downstream from Government Highline Diversion Dam. The last wild adult razorback suckers captured in a riverine environment upstream of Government Highline Diversion Dam was in 1981 at a river mile 220.7 and 223.5 near Parachute, Colorado (Valdez et al. 1982). One adult razorback sucker was collected in 1991 from an isolated pond (river mile 234.8) downstream of Rifle, Colorado. Since 1991, over 100 sub-adult and adult razorback sucker were collected from Etter Pond (river mile 204.5), a human-made gravel pit, immediately downstream Debeque, Colorado.

The State of Colorado finalized an aggressive 5-year stocking plan throughout the state's waters and recommended razorback sucker and Colorado pikeminnow be stocked in the Upper Colorado River from Rifle to Debeque Canyon (Nesler 1998). The goal of Colorado's stocking plan is to establish 475 razorback sucker/river mile and 10 Colorado pikeminnow/river mile to repatriate this species in the Rifle to Debeque Canyon stream reach. Stocking wild and hatchery-reared sub-adult and/or young adult Colorado pikeminnow from downstream stream reaches of the Upper Colorado River via translocation proposed in this SOW may provide useful information on residency, movement within the stocked reach, and possible downstream migration over the Grand Valley Water User's (Government Highline) Diversion Dam (river mile 193.7). Large sub-adult (420-450 mm) and young adult (450 mm-550 mm) Colorado pikeminnow have shown to exhibit greater upstream dispersal distances (mean of 33.6 km upstream) than larger (greater than 550 mm; mean 7.5 km) pikeminnow in the Upper Colorado River (Osmundson et al. 1998). Several hypotheses (see Osmundson et al. 1998) have been offered for the upstream movements by smaller pikeminnow: 1) a response to food resource gradients, i.e., movements may be motivated by hunger, 2) an innate physiological mechanism to move upstream, and 3) the urge to spawn, and better foraging areas are discovered in the process. Colorado pikeminnow less than 550 mm may not have established a home range like that of their larger counterparts. Their inclination to move long distances upstream as they mature may make them candidates to naturally colonize upstream reaches.

Fish passage is being pursued by the Recovery Program at the Government Highline Diversion Dam and the Price-Stubbs Dam (river mile 188.3) on the Upper Colorado River. Pre-construction phase completion for fish passage at Government Highline is scheduled for FY2000; completion of the project is scheduled sometime during FY2002.

Removing Price-Stubb Dam is one of the possible options being considered to provide passage at this site. Fish passage at Price-Stubb is scheduled to be completed by the spring of 2002. If fish passage at Government Highline is not established by FY2002, then radio transmitters implanted in Colorado pikeminnow during the second year of the study may not still be active. Therefore, preliminary information on the use of this fish passageway by these radiotagged fish will probably not be collected.

It is uncertain if Colorado pikeminnow, whether those that are translocated and stocked upstream of Government Highline Diversion Dam or those that might move upstream from downstream reaches through the fish passageway at this diversion dam, will remain and spawn upstream in the reach between Rifle and the diversion dam. Or will translocated pikeminnow move downstream prior to spawning, spawn somewhere downstream, and then return upstream using the fish passageway provided them at the various diversion dams? The reach upstream of Palisade is on the fringe of the species range. And, although Anderson (1997) recommended that there was appropriate habitat and available native forage for reintroduction of pikeminnow, it is unknown whether warm enough water temperatures exist upstream of Government Highline for pikeminnow to remain. And if so, will this limit Colorado pikeminnow spawning or their upstream distribution? On the contrary, if pikeminnow stay and do spawn, then stocking fish in this reach may not be necessary. The translocation of large sub-adult and young adult Colorado pikeminnow will hopefully provide some initial answers to these questions, assist in determining if further Colorado pikeminnow stocking is needed, and help direct other management activities for this reach.

IV. Study Goals, Objectives, End Product:

Study Goals

Evaluate if translocated, wild and hatchery-reared sub-adult Colorado pikeminnow implanted with radiotags remain in the immediate vicinity of stocking, move upstream or downstream of the stocking site in the Upper Colorado River from Rifle to Palisade.

Evaluate if wild and hatchery-reared, sub-adult Colorado pikeminnow implanted with radiotags that have moved downstream over the Government Highline Diversion Dam will subsequently move upstream and use the fish passageway at the diversion dam.

Objectives

1. Determine the extent of up- and downstream movements of translocated Colorado pikeminnow following release upstream of the Government Highline Diversion Dam.

2. Determine if translocated, wild or hatchery-reared Colorado pikeminnow will remain and establish residency in stream reaches upstream of the Government Highline Diversion Dam. Document the duration that fish remain in upstream reaches.
3. Correlate spatial and temporal seasonal habitat use of radiotagged fish with water temperature upstream of Government Highline Diversion Dam.
4. Record and document any Colorado pikeminnow congregations at the time of spawning, particularly in stream reaches upstream of Government Highline Diversion Dam.
5. Determine if radiotagged Colorado pikeminnow move into the Government Highline Canal.
6. Determine if radiotagged fish that have moved downstream over Government Highline Diversion Dam will return upstream and use the fish passageway at this diversion dam.

Potential End Products

1. Information on how translocated pikeminnow behave following stocking, e.g., up- and downstream movement of translocated Colorado pikeminnow following release and the extent and duration that stocked, wild and hatchery-reared fish remain in reaches of the Upper Colorado River upstream of Government Highline Diversion Dam.
 2. Maximum upstream range of translocated Colorado pikeminnow following stocking.
 3. Residency information on sub-adult Colorado pikeminnow translocated to new upstream reaches.
 4. Information on water temperatures in stream reaches occupied by radiotagged Colorado pikeminnow.
 5. Use of the fish passageway by radiotagged Colorado pikeminnow at the Government Highline Diversion Dam.
- V. Study area: Upper Colorado River from approximately Rifle, Colorado, downstream to Loma boat landing (river miles 241-152); Government Highline Canal--diversion dam to Cameo siphon; Lower Gunnison River: Redlands Diversion Dam to Colorado/Gunnison River confluence (river mile 3.0 to 0.7).

VI. Study Methods/Approach:

Up to 20 wild, sub-adult (400-550 mm long) Colorado pikeminnow captured from downstream reaches of the Upper Colorado River (15- and 18-mile reaches), will be implanted with LOTEK® radiotags, transported by distribution truck, and released upstream of the Government Highline Diversion Dam. Wild, sub-adult Colorado pikeminnow will be captured by trammel nets in the spring ('scare and snare') and by boat-boom electrofishing. Radiotagged fish would be stocked at the following locations: the I-70 bridge at Debeque (river mile 210), Una Crossing (river mile 217), and Rulison Bridge (river mile 230). This would be conducted in both FY2000 and FY2001. In addition, up to 50, 1999 year-class of hatchery-reared Colorado pikeminnow will be PIT tagged and released upstream of Government Highline Dam. Up to seven of these 50 fish will also be implanted with LOTEK® transmitters.

A digitally encoded telemetry system (LOTEK®) would be used to follow movements of radiotagged Colorado pikeminnow. Movements of radiotagged Colorado pikeminnow would also be monitored from boats about weekly to determine if fish will occupy the reach between Rifle and the Government Highline Diversion Dam or move downstream over the dam. The movements of fish that move downstream over this diversion dam would be recorded using a land-based tracking station that would be deployed at the Government Highline Diversion Dam. The land-based station would consist of a data-logging receiver and two, four-filament Yagi antennae arrays that would constantly monitor and record signals from radiotagged fish. One antennae array would be directed upstream and the second would be directed downstream to determine if radiotagged fish had moved downstream over this structure. Since the land-based, data-logging receiver would be powered by a photovoltaic panel equipped with a solar battery that stores electricity, the data logger would be capable of providing continuous information on the movement of fish immediately upstream of the diversion dam and those that potentially pass over the diversion dam.

If radiotagged fish move downstream over the Government Highline Diversion Dam, this technology will allow researchers to determine exactly when they pass over the diversion dam and if tracking the movements of these fish from boats in reaches downstream of the diversion dam should be initiated. One other fixed tracking station located on the Gunnison River at the Redlands Diversion Dam with several aerial antennae arrays and sensors in the fish passageway will also provide continuous coverage to monitor radiotagged fish that may move downstream following stocking over the Government Highline Diversion Dam and move up the Gunnison River. One other fixed tracking station located on the Gunnison River 30 miles upstream of the Redlands Diversion Dam that is presently being used to evaluate movements of Colorado pikeminnow that have moved through the Redlands fish passageway will probably be dismantled and redeployed on the Upper Colorado River somewhere between Rifle and Debeque in late-August or early-September 2000. Ground surveillance via vehicle will be used to locate fish suspected of entering the Government Highline Diversion Dam canal. Aerial

surveillance from fixed-wing aircraft may be used to locate radiotagged fish that cannot be contacted on the ground.

Water temperature recorders deployed in the Upper Colorado River at the Una Bridge (river mile 216.6) and Rulison Bridge (229.8) will be maintained and serviced by the Fish and Wildlife Service. Water temperatures recorded at these two sites and at the USGS gaging station at Cameo (river mile 199.6) will be used to associate water temperatures with seasonal locations of radiotagged Colorado pikeminnow upstream of Government Highline Diversion Dam.

VII. Task Description and Schedule

Task Description

Task 1: Capture, radiotag, and transport fish to stream reaches upstream of the Government Highline Diversion Dam; deploy fixed tracking stations

Task 2: Monitor movements of radiotagged fish

Task 3: Deploy and maintain water temperature data loggers

Task 4: a) Prepare annual progress report; b) prepare draft and final report

Task Schedule

Task 1: 4/2000-6/2000; 4/2001-6/2001

Task 2: 5/2000-11/2000; 5/2001-11/2001

Task 3: 4/2000-12/2000; 1/2001-9/2001

Task 4: a) 11/2000-12/2000; 11/2001-12/2001; b) 1/2002-8/2002

VIII. FY-2001 Work

Deliverables/Due Dates: Capture, radiotag, and transport fish upstream of the Government Highline Diversion Dam; monitor movements of radiotagged fish; monitor and maintain water temperature data loggers; prepare annual progress report

Budget

Labor	\$ 32,500
Travel	\$ 1,000
Equipment	\$ 5,000
Other	\$ 500
Total	\$ 39,000

Tasks 1-3.	\$ 34,000
<u>Tasks 4(a).</u>	<u>\$ 5,000</u>
Total	\$ 39,000

FY-2002 Work (for multi-year study)

Deliverables/Due Dates: Prepare draft and final report (final report due 8/2002)

Budget

Labor	\$ 12,000
Other (Printing and distribution of report)	\$ 1,000
Total	\$ 13,000

<u>Task 4(a&b).</u>	<u>\$ 13,000</u>
Total	\$ 13,000

IX. Budget Summary

FY-2001	\$ 39,000
<u>FY-2002</u>	<u>\$ 13,000 (estimate)</u>
Grand	
Total:	\$ 52,000

X. Reviewers:

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XI. References

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