

COLORADO RIVER RECOVERY PROGRAM
FY 2007 PROPOSED SCOPE-OF-WORK for:
Nonnative fish control in the middle Green River

Project No.: 123b

Lead Agency: UDWR

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Category:

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

Expected Funding Sources:

- Annual funds
- Capital funds
- Other (explain)

I. Title of Proposal:

Nonnative Fish Control in the middle Green River

II. 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 fishes.
 - III.A.2. Identify and implement viable active control measures.
 - III.A.2.c. Implement and evaluate the effectiveness of viable active control measures.

GREEN RIVER ACTION PLAN: MAINSTEM

- III. Reduce impacts of nonnative fishes and sportfish management activities (nonnative and sportfish management).
 - III.A. Reduce negative impacts to endangered fishes from sportfish management activities.

- III.A.4. Develop and implement control programs for nonnative fishes in river reaches occupied by the endangered fishes to identify required levels of control. Each control activity will be evaluated for effectiveness, and then continued as needed.
- III.A.4.a. Northern pike in the middle Green River.

III. Study Background/Rationale and Hypotheses:

The Upper Colorado River Endangered Fish Recovery Program has determined that control of nonnative fish in the upper Colorado River basin is essential to the recovery of the four endangered fish species: Colorado pikeminnow, razorback sucker, humpback chub, and bonytail. This determination has been documented specifically for Colorado pikeminnow, razorback sucker, and bonytail in nursery habitats and in the mainstem middle Green River in Section 4.3.2 of each species' Recovery Goals (USFWS 2002) document.

Smallmouth bass abundance has dramatically increased in the Green River since 2000. This increase resulted in a recommendation from the December 2003 Nonnative Fish Control Workshop (Grand Junction, CO) to attempt control of this species in the Green River. Three years of removal, from 2004-2006 and annual Nonnative Fish Control Workshops have added to the knowledge base of the effort required to successfully remove smallmouth bass from the Green River. During the December 2006 workshop, participants discussed the importance of increasing this removal effort and discussed the need for a dramatic increase to be able to adequately suppress the middle Green River smallmouth bass population.

Northern pike are a significant predatory and competitive threat to the endangered fishes and were rated as one of the six nonnative species of greatest concern by experts on the Colorado River native fish assemblage (Hawkins and Nesler 1991). Northern pike became established in the Yampa River in the early 1980's. Originally introduced as game fish in Elkhead Reservoir in 1977, the species escaped and invaded the upper Yampa River and have expanded their number and range within the Yampa and Green rivers; in previous years, there has been evidence of successful spawning in Stewart Lake near Jensen, Utah and in Old Charlie Wash on the Ouray National Wildlife Refuge. A control program for northern pike in the Yampa River was initiated in 1999 and removal of northern pike in the middle Green River was initiated in 2001. Based on trends in catch rates of subsequent years, removal efforts have been successful at significantly reducing the number of northern pike in the middle Green River. Control efforts since 2003 have resulted in the capture of less than 40 northern pike and as a result, total effort was reduced to only a maintenance level beginning in 2005. Effort in 2007 is expected to be the minimal effort needed to keep their numbers under control. Northern pike populations will be monitored (and captured individuals removed) to locate ripe adults and to determine if this lower level of effort is sufficient to minimize threats to endangered and other native fishes.

IV. Study Goals, Objectives, End Product:

Goal: Control smallmouth bass and northern pike populations in the middle Green River in order to sufficiently reduce the abundance of adults, thereby reducing their potential to spawn and their predatory and competitive impacts on growth, recruitment, and survival of endangered and other native fishes are minimized.

Objectives:

1. Conduct one tagging pass and nine removal passes for smallmouth bass in the middle Green River from Split Mountain boat ramp (RM 319.3) to the Duchesne River confluence (RM 247.9).
2. Maintain low occurrence of adult northern pike in the middle Green River.
3. Determine efficiency of smallmouth bass and northern pike removal efforts.
4. Calculate an annual population estimate of smallmouth bass in the middle Green River.
5. Identify the means and levels of smallmouth bass and northern pike control necessary to minimize the threat of predation/competition on endangered and other native fishes.

End Product:

An in-depth annual report will provide the current years data for: adult and juvenile population estimates (including 95% confidence intervals, coefficients of variation, and probabilities of capture), annual exploitation estimates, total CPUE, CPUE by river mile and size class, monthly length frequency histograms, catches for experimental methods, CPUE for other nonnatives, total numbers captured for target species, and estimates of spawning/nesting periods and locations. Data from past years of sampling will be included for relevant metrics to provide background, demonstrate trends and progress toward smallmouth bass removal criteria.

V. Study Area:

The study area encompasses the middle Green River from Split Mountain boat ramp (RM 319.3) to the Duchesne River confluence (RM 247.9). UDWR – Vernal will double tag (to evaluate anchor tag retention) smallmouth bass from the Split Mountain boat ramp to the Duchesne River confluence during the first pass and remove smallmouth bass during passes two through ten. This section of river is a total of 71.4 miles. UDWR – Vernal will also sample off channel habitats for northern pike immediately after ice-off to document spawning and remove

any ripe adults. When feasible, crew members from UDWR – Vernal will assist UDWR – Moab and USFWS – CRFP with efforts between Echo Park (RM 345) and Split Mountain (RM 319.3).

VI. Study Methods/Approach:

Smallmouth bass will be removed primarily by electrofishing. Sampling crews will conduct removal activities in a manner that minimizes potential negative impacts to endangered fish as a result of electrofishing activities. This includes discontinuing electrofishing when elevated numbers of endangered fish are known to be present. Situations when this is likely to occur will be when Colorado pikeminnow are staging in tributary mouths or backwater habitats prior to spawning, when razorback sucker are on and near the spawning bar and following recent stocking of endangered fish.

Ten electrofishing passes will be conducted beginning July or when water temps reach approximately 20°C. Two electrofishing boats will simultaneously electrofish each shoreline of the river. Effort will be focused on shoreline habitat that is likely to contain smallmouth bass. All smallmouth bass will be marked with a FLOY anchor tag and an additional tag (type to be determined later) and released on the first pass. GPS locations and fish lengths and weights will be recorded on each pass. Beginning on the second pass, all smallmouth bass will be removed and examined for tags or marks and also for ripeness. All collected smallmouth bass will be taken to the UDWR – Vernal lab for stomach content analysis, examination of spawning status, and subsequent disposal. .

Results of the first two passes will allow the determination of a smallmouth bass abundance estimate using the Lincoln-Peterson approach. The first two passes may also serve to identify smallmouth bass concentration areas as well as concentrations of spawning fish. These areas will receive additional electrofishing effort in subsequent passes. If ripe fish or nesting males are encountered, additional effort will be spent at that time to capture other potential spawning or nesting fish in that area. Further effort may also give an indication as to the presence of young-of-year (YOY) bass. Locations of congregations of YOY bass will be noted and these areas will receive additional electrofishing effort as well in order to displace young-of-year bass. We do not normally see a large number of YOY bass during project #144, Native Fish Response; however, this project will continue in 2007 and all YOY smallmouth bass will be recorded, measured, and removed from the backwater. Any endangered fish captured will be scanned for a PIT tag, tagged if needed, weighed (g), measured TL (mm), and released alive.

Several methods will be used in an attempt to identify bass spawning periods and locations. First, crews will examine shoreline areas for nests and destroy any found; second, all bass captured will be examined for spawning condition; finally the time and locations of YOY smallmouth in catches will be noted and tracked to back estimate the period and location spawning areas.

Known concentration areas for northern pike in the middle Green River during spring include: the mouth of Brush Creek (RM 304.5), Cliff Creek (RM 302.9), Stewart Lake Drain (RM 300.0), Ashley Creek (RM 299.0) and Sportsman Drain (RM 296.6). These areas will be targeted for sampling. Removal will primarily be done with the use of fyke nets, but will also include trammel nets and electrofishing. All northern pike will be taken to the UDWR – Vernal lab for stomach content analysis and subsequent disposal. Any endangered fish captured will be scanned for a PIT tag, tagged if needed, weighed (g), measured TL (mm), and released alive.

Nonnative removal and evaluation efforts, which includes tagging and marking of endangered and target nonnative fishes, are also being conducted by other researchers and agencies in other reaches of the Green and Yampa Rivers. Therefore, sampling crews will examine all captured endangered and target nonnative fish for tags or marks and record pertinent information. This information will then be reported to principal investigators as appropriate and included in annual reporting.

Besides the targeted smallmouth bass and northern pike, other nonnative species may be encountered and removed. These include walleye, black crappie, bluegill, gizzard shad, white sucker, green sunfish and potentially burbot. These fish will also be taken back to the UDWR – Vernal lab for disposal.

VII. Task Description and Schedule:

Task 1. Capture and remove northern pike (UDWR – Vernal; March – April 2007).

Task 2. Ten smallmouth bass collecting passes from Split Mountain boat ramp to Duchesne River (UDWR – Vernal; July – November 2007).

Task 3. Data entry, analysis, and reporting – October/November 2007.

VIII. FY 2007 Work:

Deliverables/Due Dates

Recovery Program annual progress report: November 2007. Data will be presented for all years of the study within each annual report.

Budget:

Task 1. Capture and remove northern pike (UDWR – Vernal).

	Work days	UDWR-Vernal Cost
Labor		
Technician (\$195/day)	24	4680
Biologist (\$340/day)	12	4080
Leader (\$438/day)	3	1314
Subtotal		\$10074
Travel		
1 truck/trip x 75 mi/truck x \$0.43/mi + \$5/day rent	12	447
Per diem (3 people/day x \$15/person x 15 days/trip)		675
Subtotal		\$1122
Equipment		
Maintenance of outboard motors, boats, sampling nets, electrofishing gear, outboard fuel and oil etc.		1000.00
Task 1 Total		\$12,196

Task 2. Ten smallmouth bass collecting passes from Split Mountain boat ramp to the Duchesne River (UDWR – Vernal). One mark and nine removal passes.

	Work days	UDWR-Vernal Cost
Labor		
Technician (\$195/day)	252	49,140
Biologist (\$340/day)	84	28,560
Leader (\$438/day)	30	13,140
Subtotal		\$90,840
Travel		
2 trucks/trip x 75 mi/truck x \$0.43/mi + \$5/day rent	168	11,676
Per diem (4 people/day x \$15/person x 10 days/trip x 10 trips)		6,000
Subtotal		\$17,676
Equipment		
Maintenance of outboard motors, boats, sampling nets, electrofishing gear, outboard fuel and oil etc.		8,500

Task 2 Total \$117,016

Task 3. Data entry, analysis, and reporting

		UDWR - Vernal	
		Work days	UDWR-Vernal Cost
Data Entry			
Technician	(\$195/day)	8	1,560
Biologist	(\$340/day)	5	1,700
Leader	(\$438/day)		0
Report Prep			
Biologist	(\$340/day)	10	3,400
Leader	(\$438/day)	4	1,752
Task 3 Total			\$8,412

FY 2007 Total

UDWR – Vernal \$137,624

IX. Program Budget Summary

UDWR-Vernal	
FY 2007	\$137,624

X. Reviewers

XI. References

Hawkins, J.A., and T.P. Nesler. 1991. Nonnative fishes of the upper Colorado River Basin: an issue paper. Final Report of Colorado State University Larval Fish Laboratory To Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

U.S. Fish and Wildlife Service. 2002. Colorado pikeminnow (*Ptychocheilus lucius*) recovery goals: amendment and supplement to the humpback chub recovery plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

U.S. Fish and Wildlife Service. 2002. Razorback sucker (*Xyrauchen texanus*) recovery goals: amendment and supplement to the humpback chub recovery plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

U.S. Fish and Wildlife Service. 2002. Bonytail (*Gila elegans*) recovery goals: amendment and supplement to the humpback chub recovery plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.