

**COLORADO RIVER RECOVERY PROGRAM
FY2012-2013 PROPOSED SCOPE OF WORK**

Project No.: 110

Title: Smallmouth bass control in the lower Yampa River

Lead Agency: U.S. Fish and Wildlife Service

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Major revisions for FY2012:

- Reduce number of passes from 7 to 6.**
- Cease marking bass for population estimates.**
- Purchase ETS electrofishing units to update and standardize fleet to Recovery Program specifications**

Category:	Expected Funding Source:
X Ongoing project	x Annual funds
Ongoing-revised project	Capital funds
Requested new projects	Other (explain)
Unsolicited proposals	

I. Title of Proposal: Smallmouth bass control in the lower Yampa River within Yampa Canyon.

II. Relationship to RIPRAP: Green River Action Plan: Yampa and Little Snake Rivers

A.1.c.(1) Nonnative fish removal in Yampa Canyon.

III. Study Background/Rationale and Hypotheses:

Nonnative fishes have become established in rivers of the upper Colorado River basin, and certain species contribute to reductions in the distribution and abundance of native fishes primarily through predation and competition (e.g., Hawkins and Nesler 1991; Lentsch et al. 1996; Tyus and Saunders 1996). Controlling problematic nonnative fishes is necessary for recovery of endangered humpback chub *Gila cypha*, bonytail *G. elegans*, Colorado pikeminnow *Ptychocheilus lucius*, and razorback sucker *Xyrauchen texanus* in the upper Colorado River basin. One of five extant wild populations of humpback chub in the upper Colorado River basin occurs in Yampa Canyon on the lower Yampa River, Colorado (Valdez

and Carothers 1998). Introduced ictalurids and centrarchids are implicated in the demise of native and endangered fishes (Tyus and Saunder 1996; USFWS 2002).

The nonnative smallmouth bass *Micropterus dolomieu* was first introduced into Colorado in 1951 (Colorado Division of Wildlife NDIS 2009) and has increased in abundance and range throughout much of the upper Colorado River basin. Smallmouth bass have been recognized as the principal predator and competitor affecting humpback chub populations in the upper Colorado River basin. Electrofishing catch rates of smallmouth bass dramatically increased in the Yampa River in 2004 (Fuller 2004). It is our opinion that the increase in smallmouth bass abundance will exacerbate the impacts that nonnatives have on the already distressed native fauna in the Yampa River. Concerns for humpback chub and Colorado pikeminnow susceptibility to smallmouth bass predation have resulted in annual RIP nonnative fish control workshops since 2003. Smallmouth bass may now pose the greatest threat to endangered and native fishes in the lower Yampa River. In light of this, removal efforts were shifted primarily towards bass in 2007. Large catfish (≤ 400 mm TL) will also be removed since studies have found an increased incidence of piscivory in channel catfish greater than 400mm total length (Tyus and Nikirk 1990).

IV. Study Goals, Objectives, End Product:

The purpose of this study is to develop an effective control program for smallmouth bass in Yampa Canyon, and to sufficiently reduce the abundance of smallmouth bass such that predatory and competitive impacts on growth, recruitment, and survival of resident humpback chub and Colorado pikeminnow are minimized. We will evaluate reductions in bass density by comparing catch rates from this study across previous years. Additionally, five one-mile sub-reaches will be selected within the ten contiguous reaches to monitor large fish composition and determine a native fish response to control. The study specific objectives are:

1. To reduce the abundance of smallmouth bass in Yampa Canyon by capture and removal.
2. Compare the catch rates of smallmouth bass to determine the efficacy of removal efforts.
3. Determine annual sub-adult and adult native and nonnative fish composition.

End Products: Annual reports to the upper Colorado River Endangered Fishes Recovery Program (RIP) for each year of the study and as required throughout the duration of the project. Data describing combined catch rates, catch rates per reach, and length frequencies will be presented for all years of study within each annual report.

V. Study Area:

The lower Yampa River in Yampa Canyon (from Deerlodge Park [river mile 46] downstream to the Green River confluence [river mile 0]). This section of the Yampa River is within the boundary of Dinosaur National Monument and subject to U.S. National Park Service operating regulations.

VI. Study Methods/Approach:

We will conduct six removal passes following peak runoff flows, which usually occurs June-July. Sampling occasions will be implemented strategically to match optimal sampling conditions particularly when environmental and biological cues are known to improve catch rates, for instance after the onset of 15°C when bass are likely spawning.

Smallmouth bass spawning/nesting periods and locations will be determined, if possible. Spawning habitats will be identified when nests, pairing, and other spawning behaviors are observed. All adult bass will be examined for spawning status (e.g. expression of gametes), and location of spawning bass congregations will then be targeted to remove adult bass guarding nests. Temperatures will be taken to correlate with spawning activity. Other capture methodologies and techniques will be implemented on an experimental basis (e.g. electric seines to collect YOY bass, fish traps, etc).

Fish handling and disposal: Nonnative fish captures incidental to smallmouth bass including centrarchids (green sunfish, bluegill, and black crappie), northern pike, channel catfish ≥ 400 mm, white suckers, and walleye will be removed and reported. Other less common nonnative species encountered (e.g. grass carp, gizzard shad, or burbot) will be removed and reported to the appropriate state agency. During removal passes all nonnative fish taken from the river will be identified, measured and weighed, and deposited off-shore along river banks. Deposition of fish will not occur in high use areas. High use areas include designated campgrounds, picnic areas and points of interest frequented by commercial and private river runners. Any endangered fish captured will be scanned for a PIT tag, tagged if needed, weighed (g), measured TL (mm), and released alive. Endangered fish data will be reported and stored in a database in the U.S. Fish and Wildlife Service CRFP Grand Junction office.

Study Approach: Two rafts equipped with Smith-Root GPP 5.0 electrofishing units will be used to shock the entire length of study area (one per shoreline) for six 4-day trips. All reaches will be sampled by two people per raft, an operator and one netter. To allow for comparisons of removal efficiency and fish movement, the lower 46 miles of the Yampa River will be stratified into ten contiguous reaches of approximately equal length (4-5 river miles). Five one-mile sub-reaches will be selected within the ten contiguous reaches to monitor large fish composition and to identify the native fish response to control efforts. In these smaller sub-reaches all fish (native and nonnative) will be captured measured and weighed; the natives will be returned to the river and all targeted nonnatives removed.

Sampling will begin as river discharge permits, most likely in June. As identified in the December 2009 Nonnative Fish Workshop, sampling will center on removing adult bass during the spawning and nesting period (typically water temperatures $>16^{\circ}\text{C}$). Total numbers of smallmouth bass and other nonnative fish collected and catch per unit of effort will be available for each reach per trip. Length data will be used to determine the size structure of smallmouth bass removed.

VII. Task Description and Schedule:

Task 1: Conduct six removal passes for smallmouth bass after spring runoff. Monitor fish community (all species with boat based electrofishing) in five, one-mile long sub-reaches throughout Yampa Canyon. [June – September].

Task 2: Analyze data and determine the smallmouth bass rates of removal. Track smallmouth bass density in the ten river reaches and species composition in the five sub-reaches.

IX. Budget Summary

FY2012:

Deliverables/Due Dates: Annual Report by November 2012.

Task Activity	Rate \$/h	Hours	Cost
Task 1			
Labor			
GS-12 Biologist	\$49.65	390	\$19,364
4 GS-5 Tech	\$18.27	768	\$14,031
4 GS-5 Technicians trip prep	\$18.27	192	\$3,508
Overtime for GS-5 technicians	\$27.41	192	\$5,263
Subtotal			\$42,165
Travel			
Shuttle (3 trucks/trip x \$150/truck x 6 trips) Deerlodge to Echo Park			\$2,700
Per diem (5 people/day x \$30/person x 4 days/trip x 6 trips)			\$3,600
Subtotal			\$6,300
Equipment			
(3 trucks/trip x 275 mi/truck x \$0.30/mi x 6 trips) Vernal to Deerlodge to Echo, round trip			\$1,485
(12 gal gas/boat x 2 boats/trip x \$4.00/gal x 6 trips)			\$864
(2 qts motor boat oil/boat x 2 boats/trip x \$11.00/qt x 6 trips)			\$264
GSA truck (rate/mo x # truck-months)	\$334	6	\$2,004
Vehicle maintenance (oil chgs, tires, cleaning, etc.)			\$0
GS-8 Fish Tech maintenance work	\$37.38	364	\$13,606
Maintenance/replacement of rafting gear, sampling nets, electrofishing gear, etc.			\$4,338
Honda 5500W generator for new ETS system	\$2,890	3	\$8,670
ETS electrofishing control box (2012 single purchase)	\$5,725	3	\$17,175
Subtotal			\$48,406
TASK 1 TOTAL			\$96,872

Task 2- Data Analysis, Annual Report

Labor

GS-13 Assistant Project Leader	\$61.38	186	\$11,417
GS-12 Supervisory Fish Biologist	\$49.65	384	\$19,066
GS-9 Admin Assist.	\$38.54	251	\$9,674
Subtotal			\$40,156
Travel			
Per diem (1 person x \$137/day x 3 days) Vernal to Grand Junction			\$411
Travel to give presentations at workshops and meetings (1 truck/trip x 288 mi/truck x \$0.3/mi x 1 trip)			\$86
Subtotal			\$497
Equipment			
Supplies (Copies, disks, paper, etc.)			\$0
Subtotal			\$0
TASK 2 TOTAL			\$40,653
SOW TOTAL			\$137,525

FY2013:

Deliverables/Due Dates: Annual Report by November 2013.

Task Activity	Rate \$/h	Hours	Cost
Task 1			
Labor			
GS-12 Biologist	\$52.69	240	\$12,646
4 GS-5 Tech	\$18.80	512	\$9,626
4 GS-5 Technicians trip prep	\$18.80	128	\$2,406
Overtime for GS-5 technicians	\$28.20	128	\$3,610
Subtotal			\$28,287
Travel			
Shuttle (3 trucks/trip x \$150/truck x 4 trips) Deerlodge to Echo Park			\$1,800
Per diem (5 people/day x \$30/person x 4 days/trip x 4 trips)			\$2,400
Subtotal			\$4,200
Equipment			
(3 trucks/trip x 275 mi/truck x \$0.30/mi x 4 trips) Vernal to Deerlodge to Echo, round trip			\$990
(12 gal gas/boat x 2 boats/trip x \$4.00/gal x 4 trips)			\$384
(2 qts motor boat oil/boat x 2 boats/trip x \$11.00/qt x 4 trips)			\$176
GSA truck (rate/mo x # truck-months)	\$334	3	\$1,002
Vehicle maintenance (oil chgs, tires, cleaning, etc.)			\$0
GS-8 Fish Tech maintenance work	\$38.45	364	\$13,996
Maintenance/replacement of rafting gear, sampling nets, electrofishing gear, etc.			\$1,043
Subtotal			\$17,591

TASK 1 TOTAL			\$50,078
Task 2- Data Analysis, Annual Report			
Labor			
GS-13 Assistant Project Leader	\$65.05	186	\$12,099
GS-12 Supervisory Fish Biologist	\$52.69	344	\$18,125
GS-11 Biologist	\$45.54	0	\$0
GS-9 Admin Assist.	\$38.54	251	\$9,674
Subtotal			\$39,898
Travel			
Per diem (1 person x \$137/day x 3 days) Vernal to Grand Junction			\$411
Travel to give presentations at workshops and meetings (1 truck/trip x 288 mi/truck x \$0.3/mi x 1 trip)			\$86
Subtotal			\$497
Equipment			
Supplies (Copies, disks, paper, etc.)			\$0
Subtotal			\$0
TASK 2 TOTAL			\$40,395
SOW TOTAL			\$90,473

IX. Budget Summary (Does not include overhead):

FY 2012 \$137,525

FY 2013 \$ 90,473

X. Reviewers: Dale Ryden, Project Leader, USFWS CRFP

XI. References:

Colorado Division of Wildlife. 2009. Natural Diversity Information Source online database. <http://ndis.nrel.colostate.edu/fishingspx.asp?SpCode=010622>. Accessed 2/2009.

Fuller, M. 2004. Development of a smallmouth bass and channel catfish control program in the lower Yampa River. Project #110. Annual report to the Recovery Implementation Program, U.S. Fish and Wildlife Service, Denver, CO.

Hawkins, J.A. and T.P. Nesler. 1991. Nonnative fishes of the upper Colorado River basin: an issue paper. Final Report. Colorado State University and Colorado Division of Wildlife. Fort Collins. 72 pp.

Lentsch, L. D., R. T. Muth, P. D. Thompson, B. G. Hoskins, and T. A. Crowl. 1996. Options for selective control of nonnative fishes in the upper Colorado River basin. Utah Division of Wildlife Resources Publication 96-14, Salt Lake City.

Tyus, H.M. and N.J. Nikirk. 1990. Abundance, growth, and diet of channel catfish, *Ictalurus punctatus*, in the Green and Yampa rivers, Colorado and Utah. *The Southwestern Naturalist* 35 (2): 188-198.

Tyus, H.M. and J.F. Saunders, III. 1996. Nonnative fishes in the Upper Colorado River Basin and a strategic plan for their control. Final Report to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin. Cooperative Agreement No. 14-48-0006-95-923, U.S. Fish and Wildlife Service, Denver, Colorado.

U.S. Fish and Wildlife Service. 2002. Colorado pikeminnow (*Ptychocheilus lucius*) Recovery Goals: amendment and supplement to the Colorado Squawfish Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

Valdez, R.A. and S.W. Carothers. 1998. The aquatic ecosystem of the Colorado River in Grand Canyon. Report prepared for the Bureau of Reclamation by SWCA Inc.