

**RECOVERY PROGRAM**  
**FY 2014-2015 SCOPE OF WORK for:**  
**Smallmouth bass control in the lower Yampa River**

Recovery Program Project Number: **110**

Reclamation Agreement number: **R11PG40024**  
Reclamation Agreement term: **9/16/2011-9/30/2016**

Note: Recovery Program FY14-15 scopes of work are drafted in May 2013. They often are revised before final Program approval and may subsequently be revised again in response to changing Program needs. Program participants also recognize the need and allow for some flexibility in scopes of work to accommodate new information (especially in nonnative fish management projects) and changing hydrological conditions.

Lead agency: USFWS

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Date Last Modified: 2 May 2013; ATK revisions 17 June 2013.

Category:

Ongoing project

Ongoing-revised project

Requested new project

Unsolicited proposal

Expected Funding Source:

Annual funds

Capital funds

Other [explain]

- I. Title of Proposal: Smallmouth bass control in the lower Yampa River within Yampa Canyon, Dinosaur National Monument
- II. Relationship to RIPRAP: Green River Action Plan: Yampa and Little Snake Rivers  
III.B.2. Control nonnative fishes via mechanical removal, and related sub-activities
- 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 wild populations of humpback chub in the upper Colorado River basin historically occurred in Yampa Canyon on the lower Yampa River, Colorado (Valdez and Carothers 1998), and one of two known spawning sites in the Green River basin occurs in the canyon. Razorback sucker have also historically spawned in the lower canyon near Echo Park. 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 nonnative fishes 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(s):

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 whether there has been 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: Yampa River within Dinosaur National Monument from Deerlodge Park (RMI 46) to the Green River confluence and Echo Park, May-July

#### 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 ETS MBS 1-D 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°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.

VIII. Deliverables, Due Dates, and Budget by Fiscal Year:

**FY2014:**

Deliverables/Due Dates: Annual Report by November 2014.

**2014**

<b>Task Activity</b>	<b>Rate \$/h</b>	<b>Hours</b>	<b>Cost</b>
<b>Task 1</b>			
<b>Labor</b>			
GS-12 Biologist	\$52.31	390	\$20,401
4 GS-5 Tech/ WG-5 Boat Operator	\$18.91	768	\$14,523
4 GS-5 Technicians trip prep	\$18.91	192	\$3,631
Overtime for GS-5 technicians	\$28.37	192	\$5,447
<b>Subtotal</b>			<b>\$44,002</b>
<b>Travel</b>			
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
<b>Subtotal</b>			<b>\$6,300</b>
<b>Equipment</b>			
(3 trucks/trip x 275 mi/truck x \$0.31/mi x 6 trips) Vernal to Deerlodge to Echo, round trip			\$1,535
(12 gal gas/boat x 2 boats/trip x \$4.00/gal x 6 trips)			\$576
(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)	\$313	6	\$1,878
GS-8 Fish Tech maintenance work	\$37.49	261	\$9,785
Maintenance/replacement of rafting gear, sampling nets, electrofishing gear, safety equipment, etc.			\$4,338
Mercury 9.9hp 4 stroke motor replacement	\$2,260	1	\$2,260
<b>Subtotal</b>			<b>\$20,636</b>
<b>TASK 1 TOTAL</b>			<b>\$70,937</b>
<b>Task 2- Data Analysis, Annual Report</b>			
<b>Labor</b>			
GS-12 Supervisory Fish Biologist	\$52.31	384	\$20,087
GS-9 Admin Assist.	\$36.89	116	\$4,279
<b>Subtotal</b>			<b>\$24,366</b>
<b>Travel</b>			
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 \$0.31/mi x 1 trip)			\$89
<b>Subtotal</b>			<b>\$500</b>
<b>TASK 2 TOTAL</b>			<b>\$24,866</b>
<b>SOW TOTAL</b>			<b>\$95,803</b>

**FY2015:**

Deliverables/Due Dates: Annual Report by November 2015.

**2015**

<b>Task Activity</b>	<b>Rate \$/h</b>	<b>Hours</b>	<b>Cost</b>
<b>Task 1</b>			
<b>Labor</b>			
GS-12 Biologist	\$53.36	390	\$20,810
4 GS-5 Tech/ WG-5 Boat Operator	\$19.29	768	\$14,815
4 GS-5 Technicians trip prep	\$19.29	192	\$3,704
Overtime for GS-5 technicians	\$28.94	192	\$5,556
<b>Subtotal</b>			<b>\$44,885</b>
<b>Travel</b>			
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
<b>Subtotal</b>			<b>\$6,300</b>
<b>Equipment</b>			
(3 trucks/trip x 275 mi/truck x \$0.32/mi x 6 trips) Vernal to Deerlodge to Echo, round trip			\$1,584
(12 gal gas/boat x 2 boats/trip x \$4.00/gal x 6 trips)			\$576
(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)	\$320	6	\$1,920
GS-8 Fish Tech maintenance work	\$38.24	261	\$9,981
Maintenance/replacement of rafting gear, sampling nets, electrofishing gear, safety equipment, etc.			\$1,043
<b>Subtotal</b>			<b>\$15,368</b>
<b>TASK 1 TOTAL</b>			<b>\$66,553</b>
<b>Task 2- Data Analysis, Annual Report</b>			
<b>Labor</b>			
GS-12 Supervisory Fish Biologist	\$53.36	384	\$20,490
GS-9 Admin Assist.	\$38.65	116	\$4,483
<b>Subtotal</b>			<b>\$24,973</b>
<b>Travel</b>			
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 \$0.32/mi x 1 trip)			\$92
<b>Subtotal</b>			<b>\$503</b>
<b>TASK 2 TOTAL</b>			<b>\$25,476</b>
<b>SOW TOTAL</b>			<b>\$92,029</b>

**FY2016:**

Deliverables/Due Dates: Annual Report by November 2016.

**2016**

<b>Task Activity</b>	<b>Rate \$/h</b>	<b>Hours</b>	<b>Cost</b>
<b>Task 1</b>			
<b>Labor</b>			
GS-12 Biologist	\$54.43	390	\$21,228
4 GS-5 Tech/ WG-5 Boat Operator	\$19.68	768	\$15,114
4 GS-5 Technicians trip prep	\$19.68	192	\$3,779
Overtime for GS-5 technicians	\$29.52	192	\$5,668
<b>Subtotal</b>			<b>\$45,788</b>
<b>Travel</b>			
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
<b>Subtotal</b>			<b>\$6,300</b>
<b>Equipment</b>			
(3 trucks/trip x 275 mi/truck x \$0.33/mi x 6 trips) Vernal to Deerlodge to Echo, round trip			\$1,634
(12 gal gas/boat x 2 boats/trip x \$4.00/gal x 6 trips)			\$576
(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)	\$325	6	\$1,950
GS-8 Fish Tech maintenance work	\$39.01	261	\$10,182
Maintenance/replacement of rafting gear, sampling nets, electrofishing gear, safety equipment, etc.			\$1,043
<b>Subtotal</b>			<b>\$15,649</b>
<b>TASK 1 TOTAL</b>			<b>\$67,737</b>
<b>Task 2- Data Analysis, Annual Report</b>			
<b>Labor</b>			
GS-13 Assistant Project Leader	\$62.19	80	\$4,975
GS-12 Supervisory Fish Biologist	\$54.43	384	\$20,901
GS-9 Admin Assist.	\$39.43	116	\$4,574
<b>Subtotal</b>			<b>\$25,475</b>
<b>Travel</b>			
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 \$0.33/mi x 1 trip)			\$95
<b>Subtotal</b>			<b>\$506</b>
<b>TASK 2 TOTAL</b>			<b>\$25,981</b>
<b>SOW TOTAL</b>			<b>\$93,718</b>

**FY2017:**

Deliverables/Due Dates: Annual Report by November 2017.

**2017**

Task Activity	Rate \$/h	Hours	Cost
<b>Task 1</b>			
<b>Labor</b>			
GS-12 Biologist	\$55.51	390	\$21,649
4 GS-5 Tech/ WG-5 Boat Operator	\$20.07	768	\$15,414
4 GS-5 Technicians trip prep	\$20.07	192	\$3,853
Overtime for GS-5 technicians	\$30.11	192	\$5,781
<b>Subtotal</b>			<b>\$46,697</b>
<b>Travel</b>			
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
<b>Subtotal</b>			<b>\$6,300</b>
<b>Equipment</b>			
(3 trucks/trip x 275 mi/truck x \$0.34/mi x 6 trips) Vernal to Deerlodge to Echo, round trip			\$1,683
(12 gal gas/boat x 2 boats/trip x \$4.00/gal x 6 trips)			\$576
(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)	\$332	6	\$1,992
GS-8 Fish Tech maintenance work	\$39.79	261	\$10,385
Maintenance/replacement of rafting gear, sampling nets, electrofishing gear, safety equipment, etc.			\$1,043
<b>Subtotal</b>			<b>\$15,943</b>
<b>TASK 1 TOTAL</b>			<b>\$68,940</b>
<b>Task 2- Data Analysis, Annual Report</b>			
<b>Labor</b>			
GS-12 Supervisory Fish Biologist	\$55.51	384	\$21,316
GS-9 Admin Assist.	\$40.22	116	\$4,666
<b>Subtotal</b>			<b>\$25,982</b>
<b>Travel</b>			
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 \$0.34/mi x 1 trip)			\$98
<b>Subtotal</b>			<b>\$509</b>
<b>TASK 2 TOTAL</b>			<b>\$26,491</b>
<b>SOW TOTAL</b>			<b>\$95,431</b>

**FY2018:**

Deliverables/Due Dates: Annual Report by November 2018.

**2018**

Task Activity	Rate \$/h	Hours	Cost
<b>Task 1</b>			
<b>Labor</b>			
GS-12 Biologist	\$56.62	390	\$22,082
4 GS-5 Tech/ WG-5 Boat Operator	\$20.47	768	\$15,721
4 GS-5 Technicians trip prep	\$20.47	192	\$3,930
Overtime for GS-5 technicians	\$30.71	192	\$5,896
<b>Subtotal</b>			<b>\$47,629</b>
<b>Travel</b>			
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
<b>Subtotal</b>			<b>\$6,300</b>
<b>Equipment</b>			
(3 trucks/trip x 275 mi/truck x \$0.35/mi x 6 trips) Vernal to Deerlodge to Echo, round trip			\$1,733
(12 gal gas/boat x 2 boats/trip x \$4.00/gal x 6 trips)			\$576
(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)	\$332	6	\$1,992
GS-8 Fish Tech maintenance work	\$40.58	261	\$10,591
Maintenance/replacement of rafting gear, sampling nets, electrofishing gear, safety equipment, etc.			\$1,043
<b>Subtotal</b>			<b>\$16,199</b>
<b>TASK 1 TOTAL</b>			<b>\$70,129</b>
<b>Task 2- Data Analysis, Annual Report</b>			
<b>Labor</b>			
GS-12 Supervisory Fish Biologist	\$56.62	384	\$21,742
GS-9 Admin Assist.	\$41.02	116	\$4,758
<b>Subtotal</b>			<b>\$26,500</b>
<b>Travel</b>			
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 \$0.35/mi x 1 trip)			\$101
<b>Subtotal</b>			<b>\$512</b>
<b>TASK 2 TOTAL</b>			<b>\$27,012</b>
<b>SOW TOTAL</b>			<b>\$97,141</b>

IX. Budget Summary USFWS Vernal:

FY 2014: \$95,803  
FY 2015: \$92,029  
FY 2016: \$93,718  
FY 2017: \$95,431  
FY 2018: \$97,141  
Total           \$474,122

X. Reviewers:

XI. References:

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