

**COLORADO RIVER RECOVERY PROGRAM
FY 2013 PROPOSED SCOPE-OF-WORK for:**

Project No.: 167

Smallmouth bass control in the White River

Lead Agency: U. S. Fish and Wildlife Service

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Date: January 20, 2012; Revised January 30, 2013

Category:

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

Expected Funding Sources:

- Annual funds
- Capital funds
- Other (explain)

I. Title of Proposal:

Smallmouth bass control in the White 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.

GREEN RIVER ACTION PLAN: WHITE RIVER

- 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.B.2. Preclude new nonnative species introductions, translocations or invasions to preserve native species dominance within critical habitat.
- 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 (USFWS 2002a-c): Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*). The highest catch rates of adult and sub-adult Colorado pikeminnow in the Green River sub-basin are observed in the White River (Bestgen et al. 2010). Furthermore, 47 adult razorback sucker, many in spawning condition, were collected in the White River during 2011 spring sampling (Osmundson, USFWS-CRFP Grand Junction; pers. comm.) and larval razorback sucker were documented for the first time in June 2011 (Webber, USFWS-CRFP Vernal; pers. comm.), suggesting this species is now utilizing this system for spawning purposes. Additionally, the White River is a stronghold for unlisted native species (Lanigan and Berry 1981; Martinez et al. 1994; Breen and Hedrick 2009, 2010), thus providing an important forage base for Colorado pikeminnow (Osmundson et al. 1998).

Smallmouth bass (*Micropterus dolomieu*) have been documented in the White River for over three decades (Crosby 1975), yet proliferation of this population has not occurred as in other systems (e.g., Yampa River). However, 41 smallmouth bass were collected during one low flow native species sampling pass (42.5 mile reach in Utah) conducted during in 2009 (Breen and Hedrick 2010). In addition, a total of 89 smallmouth bass were collected in three passes from Taylor Draw Dam to the confluence with the Green River (104 river miles) during Colorado pikeminnow population estimates in April-May 2011 (Osmundson, USFWS-CRFP Grand Junction; pers. comm.). Forty-five, 40, and four bass were captured in reaches in Colorado, Cowboy Canyon (UT), and Ute Tribal lands, respectively. Adult bass were mainly distributed in the Colorado reach ($n=37$), with fewer captured in Cowboy Canyon ($n=21$). Of great concern, age-1 smallmouth bass (< 100 mm TL) were captured in the Colorado reach, suggesting fish may be spawning in upstream areas. One young-of-year smallmouth bass collected at river mile 65.7 in September 2011 (Breen, unpublished data) confirms this suspicion. It is important to note that sampling protocols for pikeminnow and native species are not ideal for sampling smallmouth bass, so data gathered from these passes may represent a low estimate for bass numbers. Therefore, we propose an investigation focusing on smallmouth bass removal in the White River as a precautionary measure to preclude potential population expansion in order to protect the robust native fish community in this system (Breen and Hedrick 2009, 2010).

During our initial investigation in 2012, we learned that the majority of smallmouth bass were found in the first ten miles below Taylor Draw Dam, and further downstream densities decreased dramatically. With this knowledge, we decided to focus removal efforts in the upper reaches of the study area for the 2013 field season. Pending our findings in 2013, we will adaptively allocate removal effort where it seems most valuable.

IV. Study Goals, Objectives, End Product:

Goal:

Sufficiently reduce the abundance of adult smallmouth bass in the White River such that their potential to spawn and their predatory and competitive impacts on the growth, recruitment, and survival of endangered and other native fishes is minimized.

Objectives:

1. Conduct removal passes for smallmouth bass in the White River from the Taylor Draw Dam (RM 104) to the BLM Enron Takeout (RM 24). Effort will be distributed based on greatest efficiency of bass removal.
2. Determine the feasibility of smallmouth bass removal in the White River and identify levels of control necessary to prevent population expansion.

End Product:

An annual report will provide initial information on the extent of the smallmouth bass population in the White River. Metrics to be summarized include: total abundance of adult and juvenile smallmouth bass, total CPUE, CPUE by river mile and size class, CPUE for other nonnatives, and knowledge of spawning and nesting periods and locations.

V. Study Area:

The study area encompasses the entire lower White River below Kenney Reservoir (Colorado and Utah), where we will remove smallmouth bass from the Taylor Draw Dam (RM 104) to the BLM Enron Takeout (RM 24). Crews from UDWR – Vernal and USFWS CRFP – Vernal will share the workload to complete removal efforts through this 80 mile sample reach, thus the Colorado/Utah border (RM 72) will serve as break point for two distinct sections. We will not sample the lower 24 miles of the White River given that this is a reach of poor habitat availability with low fish densities (Breen and Hedrick 2009), and we aim to make best use of our efforts.

VI. Study Methods/Approach:

Smallmouth bass will be removed primarily by electrofishing. Two electrofishing rafts will simultaneously electrofish each shoreline of the river. Effort will be focused on shoreline habitat that is likely to contain smallmouth bass. 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. Electrofishing passes will be conducted from June to early July, focusing on the descending limb of the hydrograph when water temperatures will likely favor smallmouth bass spawning and nesting. During removal passes, all collected smallmouth bass will be disposed of according to Colorado Parks and Wildlife protocols for fish collected in Colorado. We will not tag and release any bass for population estimates.

Several methods will be used in an attempt to identify 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 appearance in catches will be noted and tracked to estimate spawning period and to locate spawning areas. Otolith collection and preservation may provide further insight on exact hatch dates at the request of the Recovery Program.

In addition to the targeted smallmouth bass, other nonnative species encountered will be removed as feasible with the exception of common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), and small-bodied cyprinids. All endangered fishes captured will be scanned for a PIT tag, tagged if needed, weighed (g), measured TL (mm), and released alive. Endangered fish data will then be reported to appropriate principal investigators and included in annual reporting.

VII. Task Description and Schedule:

Task 1. Smallmouth bass removal effort from Taylor Draw Dam to the Colorado/Utah border; June–July 2013

Task 2. One smallmouth bass removal pass from the Colorado/Utah border to Enron; June–July 2013

Task 3. Data entry, analysis, and reporting; October–December 2013

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

Recovery Program annual progress report: November 2013

FY 2013 Budget:

Task 1. Removal from Taylor Draw Dam to the Colorado/Utah border.

Hourly	
rate	hours

Labor			
GS-12 Biologist trip prep	\$52.69	16	\$843.04
3 GS-5 Techs trip prep	\$18.80	48	\$902.40
Taylor Draw Dam to Rangely river bridge			
GS-12 Biologist	\$52.69	20	\$1,053.80
3 GS-5 Tech	\$18.80	48	\$902.40
GS-5 Tech OT	\$28.20	12	\$338.40
Rangely river bridge to CO/UT line			
GS-12 Biologist	\$52.69	60	\$3,161.40
3 GS-5 Tech	\$18.80	144	\$2,707.20
GS-5 Tech OT	\$28.20	36	\$1,015.20
GS-08 maintenance and equipment repair	\$38.45	16	\$615.20
Subtotal			\$11,539.04
Travel, Per Diem, Equipment			
Vernal to Taylor Draw Dam round trip			
(3 trucks/trip x 118 mi/truck x \$0.30/mi x 2 trips)			\$212.40
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 1 day/trip x 2 trips)			\$96.00
Boat oil (1 qt. Oil/boat x \$11/qt x 2 boats/day x 1 day/trip x 2 trips)			\$44.00
Vernal to Rangely river bridge to pipeline round trip (3 day trips)			
(3 trucks/trip x 273 mi/truck x \$0.30/mi x 3 days/trip x 2 trips)			\$1,474.20
Boat gas (12 gal gas/boat x \$4.00/gal x 2 boats/day x 3 days/trip x 2 trips)			\$576.00
Boat oil (2 qts. Oil/boat x \$11/qt x 2 boats/day x 3 days/trip x 2 trips)			\$264.00
GSA truck leases (3 trucks x \$334/mo)			\$1,002.00
Equipment and supplies			\$1,000.00
Subtotal			\$4,668.60
Total			\$15,733.09

Task 2. One removal pass from the Colorado/Utah border to Enron.

	Work days	UDWR-Vernal Cost
Labor		
Technician II (\$271/day) ^a	6	1,626
Technician I (\$195/day)	8	1,560
Technician II (\$250/day)	4	1,000
Biologist II (\$342/day)	4	1,368
Project Leader (\$354/day)	4	1,416
Shuttle Drivers (\$149/day)	2	298
Subtotal		\$7,268
Travel^b		
2 trucks @ 4% of annual use		544
1 truck @ 1% of annual use		68

Per diem (5 people x 4 days @ \$38/day)	760
Subtotal	\$1,372
Equipment	
Boat gas and oil	100
Equipment repair, camping & sampling supplies	1000
Subtotal	\$1,100
Task 2 Total	\$9,740

Task 3. Data entry, analysis, and reporting.

	Work days	UDWR-Vernal Cost
Data Entry		
Technician II (\$250/day)	2	500
Report Prep		
Leader (\$354/day)	2	708
Task 3 Total		\$1,208

Task 3. Data entry, analysis, and reporting, USFWS Vernal.

Task 3			
Labor	Hourly rate	Hours	
GS-12 Biologist data management	\$52.69	24	\$1,264.56
GS-9 Admin. Assist.	\$38.54	16	\$616.64
Subtotal			\$1,931.20

FY 2013 TOTAL

UDWR – Vernal	\$10,948
USFWS CRFP – Vernal	\$18,139

FY 2014 Budget:

Task 1. Removal from Taylor Draw Dam to the Colorado/Utah border.

	Hourly rate	hours	
Labor			
GS-12 Biologist trip prep	\$53.74	16	\$859.84
3 GS-5 Techs trip prep	\$19.18	48	\$920.64
Taylor Draw Dam to Rangely river bridge			
GS-12 Biologist	\$53.74	20	\$1,074.80
3 GS-5 Tech	\$19.18	48	\$920.64
GS-5 Tech OT	\$28.76	12	\$345.12
Rangely river bridge to CO/UT line			
GS-12 Biologist	\$53.74	60	\$3,224.40

3 GS-5 Tech	\$19.18	144	\$2,761.92
GS-5 Tech OT	\$28.76	36	\$1,035.36
GS-08 maintenance and equipment repair	\$39.22	16	\$627.52

Subtotal			\$11,770.24
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Travel, Per Diem, Equipment

Vernal to Taylor Draw Dam round trip

(3 trucks/trip x 118 mi/truck x \$0.30/mi x 2 trips)			\$212.40
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 1 day/trip x 2 trips)			\$96.00
Boat oil (1 qt. Oil/boat x \$11/qt x 2 boats/day x 1 day/trip x 2 trips)			\$44.00

Vernal to Rangely river bridge to pipeline round trip (3 day trips)

(3 trucks/trip x 273 mi/truck x \$0.30/mi x 3 days/trip x 2 trips)			\$1,474.20
Boat gas (12 gal gas/boat x \$4.00/gal x 2 boats/day x 3 days/trip x 2 trips)			\$576.00
Boat oil (2 qts. Oil/boat x \$11/qt x 2 boats/day x 3 days/trip x 2 trips)			\$264.00
GSA truck leases (3 trucks x \$334/mo)			\$1,002.00
Equipment and supplies			\$1,000.00

Subtotal			\$4,668.60
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Total			\$16,438.84
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Task 2. One removal pass from the Colorado/Utah border to Enron.

	Work days	UDWR-Vernal Cost
Labor		
Technician II (\$276/day) ^a	6	1,659
Technician I (\$200/day)	8	1,603
Technician II (\$255/day)	4	1,022
Biologist II (\$347/day)	4	1,390
Project Leader (\$359/day)	4	1,438
Shuttle Drivers (\$154/day)	2	309
Subtotal		\$7,420
Travel^b		
2 trucks @ 4% of annual use		544
1 truck @ 1% of annual use		68
Per diem (5 people x 4 days @ \$40/day)		800
Subtotal		\$1,412
Equipment		
Boat gas and oil		100
Equipment repair, camping & sampling supplies		1000
Subtotal		\$1,100
Task 2 Total		\$9,932

^a Journey Maintenance Specialist; includes equipment maintenance and field support.

^b The State of Utah uses Automotive Resources Inc. for motor pool operations. Each motor pool vehicle we rent costs approximately \$6,800/year (includes all charges: fleet rental, mileage, and gas), which is based on the average annual cost for all trucks used in our program.

Task 3. Data entry, analysis, and reporting, UDWR-Vernal.

	Work days	UDWR-Vernal Cost
Data Entry		
Technician II (\$255/day)	2	511
Report Prep		
Leader (\$359/day)	2	719
Task 3 Total		\$1,230

Task 3. Data entry, analysis, and reporting, USFWS Vernal.

Task 3			
Labor	Hourly rate	Hours	
GS-12 Biologist data management	\$53.74	24	\$1,289.76
GS-9 Admin. Assist.	\$39.31	16	\$628.96
Subtotal			\$1,918.72

FY 2014 TOTAL

UDWR – Vernal	\$11,161
USFWS – Vernal	\$18,357.56

FY 2015 Budget:

Task 1. Removal from Taylor Draw Dam to the Colorado/Utah border.

Labor	Hourly rate	hours	
GS-12 Biologist trip prep	\$54.82	16	\$877.12
3 GS-5 Techs trip prep	\$19.56	48	\$938.88
Taylor Draw Dam to Rangely river bridge			
GS-12 Biologist	\$54.82	20	\$1,096.40
3 GS-5 Tech	\$19.56	48	\$938.88
GS-5 Tech OT	\$29.34	12	\$352.08
Rangely river bridge to CO/UT line			
GS-12 Biologist	\$54.82	60	\$3,289.20
3 GS-5 Tech	\$19.56	144	\$2,816.64
GS-5 Tech OT	\$29.34	36	\$1,056.24

GS-08 maintenance and equipment repair	\$40.00	16	\$640.07
Subtotal			\$12,005.51
Travel, Per Diem, Equipment			
Vernal to Taylor Draw Dam round trip			
(3 trucks/trip x 118 mi/truck x \$0.30/mi x 2 trips)			\$212.40
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 1 day/trip x 2 trips)			\$96.00
Boat oil (1 qt. Oil/boat x \$11/qt x 2 boats/day x 1 day/trip x 2 trips)			\$44.00
Vernal to Rangely river bridge to pipeline round trip (3 day trips)			
(3 trucks/trip x 273 mi/truck x \$0.30/mi x 3 days/trip x 2 trips)			\$1,474.20
Boat gas (12 gal gas/boat x \$4.00/gal x 2 boats/day x 3 days/trip x 2 trips)			\$576.00
Boat oil (2 qts. Oil/boat x \$11/qt x 2 boats/day x 3 days/trip x 2 trips)			\$264.00
GSA truck leases (3 trucks x \$334/mo)			\$1,002.00
Equipment and supplies			\$1,000.00
Subtotal			\$4,668.60
Total			\$16,674.11

Task 2. One removal pass from the Colorado/Utah border to Enron.

	Work days	UDWR-Vernal Cost
Labor		
Technician II (\$282/day) ^a	6	1,691
Technician I (\$206/day)	8	1,647
Technician II (\$261/day)	4	1,043
Biologist II (\$353/day)	4	1,411
Project Leader (\$365/day)	4	1,459
Shuttle Drivers (\$160/day)	2	320
Subtotal		\$7,572
Travel^b		
2 trucks @ 4% of annual use		544
1 truck @ 1% of annual use		68
Per diem (5 people x 4 days @ \$42/day)		840
Subtotal		\$1,452
Equipment		
Boat gas and oil		100
Equipment repair, camping & sampling supplies		1000
Subtotal		\$1,100
Task 2 Total		\$10,124

^a Journey Maintenance Specialist; includes equipment maintenance and field support.

^b The State of Utah uses Automotive Resources Inc. for motor pool operations. Each motor pool vehicle we rent costs approximately \$6,800/year (includes all charges: fleet

rental, mileage, and gas), which is based on the average annual cost for all trucks used in our program.

Task 3. Data entry, analysis, and reporting, UDWR-Vernal.

	Work days	UDWR-Vernal Cost
Data Entry Technician II (\$261/day)	2	522
Report Prep Leader (\$365/day)	2	730
Task 3 Total		\$1,251

Task 3. Data entry, analysis, and reporting, USFWS Vernal.

Task 3			
	Hourly rate	Hours	
Labor			
GS-12 Biologist data management	\$54.82	24	\$1,315.68
GS-9 Admin. Assist.	\$40.10	16	\$641.60
Subtotal			\$1,957.28

FY 2015 TOTAL

UDWR – Vernal	\$11,375
USFWS – Vernal	\$18,631.39

FY 2016 Budget:

Task 1. Removal from Taylor Draw Dam to the Colorado/Utah border.

	Hourly rate	hours	
Labor			
GS-12 Biologist trip prep	\$55.92	16	\$894.72
3 GS-5 Techs trip prep	\$19.95	48	\$957.60
Taylor Draw Dam to Rangely river bridge			
GS-12 Biologist	\$55.92	20	\$1,118.40
3 GS-5 Tech	\$19.95	48	\$957.60
GS-5 Tech OT	\$29.93	12	\$359.16
Rangely river bridge to CO/UT line			
GS-12 Biologist	\$55.92	60	\$3,355.20
3 GS-5 Tech	\$19.95	144	\$2,872.80
GS-5 Tech OT	\$29.93	36	\$1,077.48
GS-08 maintenance and equipment repair	\$40.80	16	\$652.80

Subtotal	\$12,245.76
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Travel, Per Diem, Equipment	
Vernal to Taylor Draw Dam round trip	
(3 trucks/trip x 118 mi/truck x \$0.30/mi x 2 trips)	\$212.40
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 1 day/trip x 2 trips)	\$96.00
Boat oil (1 qt. Oil/boat x \$11/qt x 2 boats/day x 1 day/trip x 2 trips)	\$44.00
Vernal to Rangely river bridge to pipeline round trip (3 day trips)	
(3 trucks/trip x 273 mi/truck x \$0.30/mi x 3 days/trip x 2 trips)	\$1,474.20
Boat gas (12 gal gas/boat x \$4.00/gal x 2 boats/day x 3 days/trip x 2 trips)	\$576.00
Boat oil (2 qts. Oil/boat x \$11/qt x 2 boats/day x 3 days/trip x 2 trips)	\$264.00
GSA truck leases (3 trucks x \$334/mo)	\$1,002.00
Equipment and supplies	\$1,000.00
Subtotal	\$4,668.60
Total	\$16,914.36

Task 2. One removal pass from the Colorado/Utah border to Enron.

	Work days	UDWR-Vernal Cost
Labor		
Technician II (\$287/day) ^a	6	1,724
Technician I (\$211/day)	8	1,690
Technician II (\$266/day)	4	1,065
Biologist II (\$358/day)	4	1,433
Project Leader (\$370/day)	4	1,481
Shuttle Drivers (\$165/day)	2	331
Subtotal		\$7,723
Travel^b		
2 trucks @ 4% of annual use		544
1 truck @ 1% of annual use		68
Per diem (5 people x 4 days @ \$44/day)		880
Subtotal		\$1,492
Equipment		
Boat gas and oil		100
Equipment repair, camping & sampling supplies		1000
Subtotal		\$1,100
Task 2 Total		\$10,315

^a Journey Maintenance Specialist; includes equipment maintenance and field support.

^b The State of Utah uses Automotive Resources Inc. for motor pool operations. Each motor pool vehicle we rent costs approximately \$6,800/year (includes all charges: fleet rental, mileage, and gas), which is based on the average annual cost for all trucks used in our program.

Task 3. Data entry, analysis, and reporting, UDWR-Vernal.

	Work days	UDWR-Vernal Cost
Data Entry		
Technician II (\$266/day)	2	533
Report Prep		
Leader (\$370/day)	2	741
Task 3 Total		\$1,273

Task 3. Data entry, analysis, and reporting, USFWS Vernal.

Task 3			
Labor	Hourly rate	Hours	
GS-12 Biologist data management	\$55.92	24	\$1,342.08
GS-9 Admin. Assist.	\$40.90	16	\$654.40
Subtotal			\$1,996.48

FY 2016 TOTAL

UDWR – Vernal	\$11,588
USFWS – Vernal	\$18,910.84

IX. Program Budget Summary

UDWR – Vernal

FY 2012 \$16,244
FY 2013 \$10,948
FY 2014 \$11,161
FY 2015 \$11,375
FY 2016 \$11,588

USFWS CRFP – Vernal

FY 2012 \$17,541
FY 2013 \$18,139
FY 2014 \$18,357.56
FY 2015 \$18,631.39
FY 2016 \$18,910.84

Combined total

FY 2012 \$33,785
FY 2013 \$29,087
FY 2014 \$29,518.56
FY 2015 \$30,006.39
FY 2016 \$30,498.84

- X. Reviewers
- XI. References

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(6), Denver, Colorado.