

**COLORADO RIVER RECOVERY PROGRAM
FY 2014-2015 PROPOSED SCOPE-OF-WORK for:**

Project No.: 167

Reclamation Agreement number: R13PG400020

Smallmouth bass control in the White River

Lead Agency: U. S. Fish and Wildlife Service

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Date: April 3, 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 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 catch 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 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 USFWS CRFP – Vernal and UDWR – 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 2014

Task 2. One smallmouth bass removal pass from the Colorado/Utah border to Enron; June–July 2014

Task 3. Data entry, analysis, and reporting; October–December 2014

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

Recovery Program annual progress report: November 2014

FY 2014 Budget:

Task 1. Removal from Taylor Draw Dam to the pipeline upstream of Colorado/Utah border (USFWS-Vernal).

Hourly hours

	rate		
Labor			
GS-11 Biologist trip prep	\$45.06	16	\$720.96
3 GS-5 Techs trip prep	\$16.91	48	\$811.68
Taylor Draw Dam to Rangely river bridge (5 days)			
GS-11 Biologist	\$45.06	60	\$2,703.60
3 GS-5 Tech	\$16.91	120	\$2,029.20
GS-5 Tech OT	\$25.37	60	\$1,522.20
Rangely river bridge to Pipe line (2 days)			
GS-11 Biologist	\$45.06	20	\$901.20
3 GS-5 Tech	\$16.91	48	\$811.68
GS-5 Tech OT	\$25.37	12	\$304.44
GS-08 maintenance and equipment repair	\$37.49	261	\$9,784.89
Subtotal			\$19,589.85
Travel, Equipment			
Vernal to White River round trips			
(2 trucks/trip x 150 mi/truck x \$0.31/mi x 8 trips)			\$744
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 1 day/trip x 8 trips)			\$384
Boat oil (1 qt. Oil/boat x \$11/qt x 2 boats/day x 1 day/trip x 8 trips)			\$176
GSA truck leases (3 trucks x \$313/mo)			\$939
Mercury 9.9hp 4 stroke motor replacement			\$2,260
Equipment and supplies			\$1,000
Subtotal			\$5,503
Total			\$25,092.85

Task 2. One removal pass from the Colorado/Utah border to Enron (UDWR-Vernal).

	Rate	Hours/Units	Cost
Labor			
Project Leader	31.95	40	1278
Biologist II	32.70	40	1308
Journey Maintenance/Construction Specialist	25.92	60	1555
Technician II	22.24	40	889
Technician I	15.91	100	1591
Shuttle Drivers	16.25	40	650
	Subtotal		\$7,272
Travel^a			
2 trucks @ 4% of annual use	13600.00	0.04	544
Per diem (4 days x 5 people)	38.00	20	760
	Subtotal		\$1,304
Equipment			
Boat fuel (gallons)	4.00	48	192
Boat/motor repair and maintenance			515
Camping supplies			300
Sampling equipment			500
	Subtotal		\$1,507
	Task 2 Total		\$10,083

^a 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.

	Rate	Hours/Units	Cost
Labor			
Project Leader	31.95	20	639
Technician II	22.24	20	445
Task 3 Subtotal			\$1,084

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

Task 3			
Labor	Hourly rate	Hours	
GS-12 Supervisory Biologist	\$52.31	80	\$4,184.80
GS-11 Biologist	\$45.06	80	\$3,604.80
GS-9 Admin. Assist.	\$36.89	116	\$4,279.24
Subtotal			\$12,068.84

FY 2014 TOTAL

UDWR – Vernal	\$11,167
USFWS CRFP – Vernal	\$37,161.40

FY 2015 Budget:

Task 1. Removal from Taylor Draw Dam to the pipeline upstream of Colorado/Utah border (USFWS-Vernal).

	Hourly rate	hours	
Labor			
GS-11 Biologist trip prep	\$45.96	16	\$735.36
3 GS-5 Techs trip prep	\$17.25	48	\$828
Taylor Draw Dam to Rangely river bridge (5 days)			
GS-11 Biologist	\$45.96	60	\$2,757.60
3 GS-5 Tech	\$17.25	120	\$2,070
GS-5 Tech OT	\$25.88	60	\$1,552.80
Rangely river bridge to Pipe line (2 days)			
GS-11 Biologist	\$45.96	20	\$919.20
3 GS-5 Tech	\$17.25	48	\$828
GS-5 Tech OT	\$25.88	12	\$310.56
GS-08 maintenance and equipment repair	\$38.24	261	\$9,980.64

Subtotal

\$19,982.16

Travel, Equipment

Vernal to White River round trips

(2 trucks/trip x 150 mi/truck x \$0.31/mi x 8 trips)	\$744
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 1 day/trip x 8 trips)	\$384
Boat oil (1 qt. Oil/boat x \$11/qt x 2 boats/day x 1 day/trip x 8 trips)	\$176
GSA truck leases (3 trucks x \$313/mo)	\$939
Equipment and supplies	\$1,000

Subtotal

\$3,243

Total

\$23,225.16

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

	Rate	Hours/Units	Cost
Labor			
Project Leader	32.58	40	1303
Biologist II	33.35	40	1334
Journey Maintenance/Construction Specialist	26.44	60	1587
Technician II	22.68	40	907
Technician I	16.23	100	1623
Shuttle Drivers	16.58	40	663
		Subtotal	\$7,417
Travel^a			
2 trucks @ 4% of annual use	13872.00	0.04	555
Per diem (4 days x 5 people)	38.76	20	775
		Subtotal	\$1,330
Equipment			
Boat fuel (gallons)	4.08	48	196
Boat/motor repair and maintenance			525
Camping supplies			306
Sampling equipment			510
		Subtotal	\$1,537
		Task 2 Total	\$10,285

^a 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.

	Rate	Hours/Units	Cost
Labor			
Project Leader	31.95	20	652
Technician II	22.24	20	454
		Task 3 Subtotal	\$1,105

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

Task 3			
Labor	Hourly rate	Hours	
GS-12 Supervisory Biologist	\$53.36	80	\$4,268.80
GS-11 Biologist	\$45.96	80	\$3,676.80
GS-9 Admin. Assist.	\$38.65	116	\$4,483.40
Subtotal			\$12,429.00

FY 2015 TOTAL

UDWR – Vernal	\$11,390
USFWS CRFP – Vernal	\$35,654.16

FY 2016 Budget:

Task 1. Removal from Taylor Draw Dam to the pipeline upstream of Colorado/Utah border (USFWS-Vernal).

Labor	Hourly rate	hours	
GS-11 Biologist trip prep	\$46.88	16	\$750.08
3 GS-5 Techs trip prep	\$17.60	48	\$844.80
Taylor Draw Dam to Rangely river bridge (5 days)			
GS-11 Biologist	\$46.88	60	\$2,812.80
3 GS-5 Tech	\$17.60	120	\$2,112
GS-5 Tech OT	\$26.40	60	\$1,584
Rangely river bridge to Pipe line (2 days)			
GS-11 Biologist	\$46.88	20	\$937.60
3 GS-5 Tech	\$17.60	48	\$844.80
GS-5 Tech OT	\$26.40	12	\$316.80
GS-08 maintenance and equipment repair	\$39.01	261	\$10,181.61
Subtotal			\$20,384.49

Travel, Equipment

Vernal to White River round trips

(2 trucks/trip x 150 mi/truck x \$0.31/mi x 8 trips)	\$744
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 1 day/trip x 8 trips)	\$384
Boat oil (1 qt. Oil/boat x \$11/qt x 2 boats/day x 1 day/trip x 8 trips)	\$176
GSA truck leases (3 trucks x \$313/mo)	\$939
Equipment and supplies	\$1,000

Subtotal	\$3,243
Total	\$23,627.49

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

	Rate	Hours/Units	Cost
Labor			
Project Leader	33.24	40	1329
Biologist II	34.02	40	1361
Journey Maintenance/Construction Specialist	26.97	60	1618
Technician II	23.13	40	925
Technician I	16.55	100	1655
Shuttle Drivers	16.91	40	676
		Subtotal	\$7,566
Travel^a			
2 trucks @ 4% of annual use	14149.44	0.04	566
Per diem (4 days x 5 people)	39.54	20	791
		Subtotal	\$1,357
Equipment			
Boat fuel (gallons)	4.16	48	200
Boat/motor repair and maintenance			536
Camping supplies			312
Sampling equipment			520
		Subtotal	\$1,568
		Task 2 Total	\$10,490

^a 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.

	Rate	Hours/Units	Cost
Labor			
Project Leader	31.95	20	665
Technician II	22.24	20	463
		Task 3 Subtotal	\$1,127

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

Task 3			
	Hourly rate	Hours	
Labor			
GS-12 Supervisory Biologist	\$54.43	80	\$4,354.40
GS-11 Biologist	\$46.88	80	\$3,750.40
GS-9 Admin. Assist.	\$39.43	116	\$4,573.88
			Subtotal
			\$12,678.68

FY 2016 TOTAL

UDWR – Vernal	\$11,617
USFWS CRFP – Vernal	\$36,306.17

FY 2017 Budget:

Task 1. Removal from Taylor Draw Dam to the pipeline upstream of Colorado/Utah border (USFWS-Vernal).

	Hourly rate	hours	
Labor			
GS-11 Biologist trip prep	\$47.82	16	\$765.12
3 GS-5 Techs trip prep	\$17.95	48	\$861.60
Taylor Draw Dam to Rangely river bridge (5 days)			
GS-11 Biologist	\$47.82	60	\$2,869.20
3 GS-5 Tech	\$17.95	120	\$2,154
GS-5 Tech OT	\$26.93	60	\$1,615.80
Rangely river bridge to Pipe line (2 days)			
GS-11 Biologist	\$47.82	20	\$956.40
3 GS-5 Tech	\$17.95	48	\$861.60
GS-5 Tech OT	\$26.93	12	\$323.16
GS-08 maintenance and equipment repair	\$39.79	261	\$10,385.19
Subtotal			\$20,792.07
Travel, Equipment			
Vernal to White River round trips			
(2 trucks/trip x 150 mi/truck x \$0.31/mi x 8 trips)			\$744
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 1 day/trip x 8 trips)			\$384
Boat oil (1 qt. Oil/boat x \$11/qt x 2 boats/day x 1 day/trip x 8 trips)			\$176
GSA truck leases (3 trucks x \$313/mo)			\$939
Equipment and supplies			\$1,000
Subtotal			\$3,243
Total			\$24,035.07

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

	Rate	Hours/Units	Cost
Labor			
Project Leader	33.90	40	1356
Biologist II	34.70	40	1388
Journey Maintenance/Construction Specialist	27.51	60	1651
Technician II	23.60	40	944
Technician I	16.89	100	1689
Shuttle Drivers	17.25	40	690
		Subtotal	\$7,717
Travel^a			
2 trucks @ 4% of annual use	14432.43	0.04	577
Per diem (4 days x 5 people)	40.33	20	807
		Subtotal	\$1,384
Equipment			
Boat fuel (gallons)	4.24	48	204
Boat/motor repair and maintenance			547
Camping supplies			318

Sampling equipment		531
	Subtotal	\$1,599
	Task 2 Total	\$10,700

^a 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.

	Rate	Hours/Units	Cost
Labor			
Project Leader	31.95	20	678
Technician II	22.24	20	472
	Task 3 Subtotal		\$1,150

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

Task 3			
Labor	Hourly rate	Hours	
GS-12 Supervisory Biologist	\$55.51	80	\$4,440.80
GS-11 Biologist	\$47.82	80	\$3,825.60
GS-9 Admin. Assist.	\$40.22	116	\$4,665.52
	Subtotal		\$12,931.92

FY 2017 TOTAL

UDWR – Vernal	\$11,850
USFWS CRFP – Vernal	\$36,966.99

FY 2018 Budget:

Task 1. Removal from Taylor Draw Dam to the pipeline upstream of Colorado/Utah border (USFWS-Vernal).

	Hourly rate	hours	
Labor			
GS-11 Biologist trip prep	\$48.77	16	\$780.32
3 GS-5 Techs trip prep	\$18.31	48	\$878.88
Taylor Draw Dam to Rangely river bridge (5 days)			
GS-11 Biologist	\$48.77	60	\$2,926.20
3 GS-5 Tech	\$18.31	120	\$2,197.20
GS-5 Tech OT	\$27.47	60	\$1,648.20
Rangely river bridge to Pipe line (2 days)			
GS-11 Biologist	\$48.77	20	\$975.40
3 GS-5 Tech	\$18.31	48	\$878.88
GS-5 Tech OT	\$27.47	12	\$329.64

GS-08 maintenance and equipment repair	\$40.58	261	\$10,591.38
Subtotal			\$21,206.10

Travel, Equipment

Vernal to White River round trips

(2 trucks/trip x 150 mi/truck x \$0.31/mi x 8 trips)			\$744
Boat gas (6 gal gas/boat x \$4.00/gal x 2 boats/day x 1 day/trip x 8 trips)			\$384
Boat oil (1 qt. Oil/boat x \$11/qt x 2 boats/day x 1 day/trip x 8 trips)			\$176
GSA truck leases (3 trucks x \$313/mo)			\$939
Equipment and supplies			\$1,000

Subtotal			\$3,243
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Total			\$24,449.10
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Task 2. One removal pass from the Colorado/Utah border to Enron.

	Rate	Hours/Units	Cost
Labor			
Project Leader	34.58	40	1383
Biologist II	35.39	40	1416
Journey Maintenance/Construction Specialist	28.06	60	1684
Technician II	24.07	40	963
Technician I	17.22	100	1722
Shuttle Drivers	17.59	40	704
		Subtotal	\$7,871
Travel^a			
2 trucks @ 4% of annual use	14721.08	0.04	589
Per diem (4 days x 5 people)	41.13	20	823
		Subtotal	\$1,411
Equipment			
Boat fuel (gallons)	4.33	48	208
Boat/motor repair and maintenance			557
Camping supplies			325
Sampling equipment			541
		Subtotal	\$1,631
		Task 2 Total	\$10,914

^a 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.

	Rate	Hours/Units	Cost
Labor			
Project Leader	31.95	20	692
Technician II	22.24	20	481
		Task 3 Subtotal	\$1,173

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

Task 3			
Labor	Hourly rate	Hours	
GS-12 Supervisory Biologist	\$56.62	80	\$4,529.60
GS-11 Biologist	\$48.77	80	\$3,901.60
GS-9 Admin. Assist.	\$41.02	116	\$4,758.32
Subtotal			\$13,189.52

FY 2018 TOTAL

UDWR – Vernal	\$12,087
USFWS CRFP – Vernal	\$37,638.62

X. Reviewers

XI. References

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- U.S. Fish and Wildlife Service (USFWS). 2002b. Razorback sucker (*Xyrauchen texanus*) recovery goals: amendment and supplement to the humpback chub recovery plan.
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