

COLORADO RIVER RECOVERY PROGRAM
FY 2009 – 2010 PROPOSED SCOPE-OF-WORK for:
Smallmouth Bass control in the Green River

Project No.: 123a

Lead Agency: USFWS

Submitted by: Paul Badame
Utah Division of Wildlife Resources
Moab Field Station
1165 S. Hwy 191 – Suite 4
Moab, UT 84532
435-259-3780/fax 435-259-3785
E-mail: paulbadame@utah.gov

Tildon Jones
Colorado River Fish Project
U. S. Fish and Wildlife Service
Vernal, UT 84078
Phone: (435) 789-0366 ext. 14; Fax: (435) 789-4805
E-mail: tildon_jones@fws.gov

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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 Echo Park to Split Mountain Reach of the Green River, Utah

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: 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. 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. Smallmouth bass abundance has dramatically increased in the Green River since 2000. This information 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. Five years of removal and 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 the removal effort and reallocating effort to concentration areas, resulting in this revised scope of work for the Echo Park to Split Mountain reach of the Green River in Utah. For 2009, channel catfish have been added to the scope of work for removal.

IV. Study Goals, Objectives, End Product:

Goal: Control smallmouth bass populations and channel catfish in the Green River.

Objectives:

1. Remove smallmouth bass, channel catfish, and other nonnative fishes in the Green River from Echo Park (RM 344.5) to Split Mountain (RM 319.5).
2. Calculate an annual population estimate of adult and juvenile smallmouth bass for this reach of the Green River.
3. Attain at least a 65% annual exploitation rate for smallmouth bass over 150 mm.
4. Estimate the abundance of channel catfish in this reach and determine the exploitation rate.

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,

for CPUE by river mile and size class, monthly length frequency histograms, catches 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 is located on the Green River from Echo Park (RM 344.5) to Split Mountain boat ramp (RM 319.5); a total of 26 miles. Crews from UDWR - Moab and USFWS CRFP will both work in this reach to complete a total of sixteen passes. The UDWR – Moab crew will complete back-to-back sampling trips (with a one day camp break) in each of their 4 visits (8 trips) to minimize mileage and other travel related costs.

VI. Study Methods/Approach

Sampling: Smallmouth bass will be removed primarily by electrofishing. 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. 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. Sixteen electrofishing passes will be conducted beginning June and ending in late September or early October. All smallmouth bass captured during the first two passes will be tagged with individually numbered Floy tags. The smallmouth bass population estimate will be conducted during the first four sampling passes--two marking passes and two subsequent removal / recapture passes. All bass captured in subsequent passes will be removed.

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 back estimate spawning period and to locate spawning areas.

Three additional capture techniques will be experimented with as time and conditions permit. The first will include the use of an adult fish block/trap seine. The first method is to deploy the block/trap seine at the bottom of a riffle or shallow run and electrofish toward it, the seine is used to capture stunned fish which are not visible due to high turbidity. The second method could be used if localized spawning locations are found; this method would use a large adult beach seine to partition off a spawning area and crowd fish downstream into a block/trap seine. The third technique is the use of a 30' long DC electric seine with a boat mounted generator fished upstream in shallow habitats. The electric seine was successfully used in this reach in 2006 to capture YOY smallmouth bass; this method would again be used during late September or early October when YOY smallmouth have reached a size available to capture.

In addition to smallmouth bass removal efforts, we will also remove channel catfish in an

effort to determine the effectiveness and feasibility of catfish removal during smallmouth bass removal passes. We will not capture channel catfish during the first four passes so as to not compromise the smallmouth bass annual population estimate. Channel catfish will be floy tagged and released on pass five and removed on all subsequent passes. Channel catfish recaptured on the sixth pass will be used to generate a population estimate for the study reach. As with smallmouth bass, the cumulative removal of channel catfish (all removal passes combined) will be used to determine our annual exploitation rate (% of the population estimate).

Data Analysis: Population estimates will be calculated using a Lincoln-Petersen estimate with Chapman's correction. Other population models may be explored using Program Mark and recapture rates for all passes. The annual abundance estimate of adult and juvenile bass will be used to calculate the related exploitation rates for the year. Estimates of age 1 fish will be compiled and then analyzed to estimate annual YOY over-winter recruitment. Exploitation rates and recruitment estimates will be used in a population dynamics model to examine removal effectiveness and project future effort needed to reach the smallmouth bass target criteria.

Fish Handling and Disposal: All other centrarchids (green sunfish, bluegill, black crappie, and largemouth bass), northern pike, and walleye encountered will be removed. Any nonnative species of special concern such as grass carp, gizzard shad, or burbot which are encountered will be removed and the appropriate state Fish and Game agencies will be contacted. All nonnative fish removed in Dinosaur National Park will be euthanized and buried on banks, as advised by the National Park Service. 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 then be reported to appropriate principal investigators and included in annual reporting.

VII. Task Description and Schedule

Task 1. Eight removal passes from Echo Park to Split Mountain boat ramp (USFWS CRFP – Vernal; August – October 2009).

Task 2. Two marking (bass) and six removal passes (one includes marking for catfish) from Echo Park to Split Mountain boat ramp (UDWR Moab; June - August 2009).

Task 3. Data entry, analysis, and reporting – October/November 2009.

VIII. FY2009(-2010) Work Deliverables/Due Dates

Recovery Program annual progress report: November 2009

Task 1. Eight removal passes from Echo Park to Split Mountain boat ramp (USFWS CRFP – Vernal; August – October 2009).

Task 1 - USFWS, Smallmouth bass removal	Days	Cost
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Labor		
GS-11 Biologist (\$397/day)	27	\$10,719
GS-11 Biologist trip prep	16	\$6,352
GS-8 Fish Tech (\$356/day)	24	\$8,544
GS-8 Fish Tech trip prep	16	\$5,696
3 GS-5 Tech (\$175/day)	24	\$12,600
3 GS-5 Technicians trip prep	16	\$8,400

Subtotal		\$52,311
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Travel, Shuttle Drivers, Boat gas, Per Diem, Equipment, etc.		
(3 trucks/trip x 175 mi/truck x \$0.505/mi x 8 trips) Vernal to Echo Park, round trip		\$2,121
(12 gal gas/boat x 3 boats/trip x \$3.50/gal x 8 trips)		\$1,008
(2 qts motor boat oil/boat x 3 boats/trip x \$3.00/qt x 8 trips)		\$144
Shuttle (3 trucks/trip x \$150/truck x 8 trips) Echo to Split Mountain		\$3,600
GSA trucks	2	\$5,400
Vehicle maintenance (oil chgs, tires, cleaning, etc.)		\$2,000
Per diem (5 people/day x \$30/person x 3 days/trip x 8 trips)		\$3,600
1 outboard motor		\$2,500
Maintenance/replacement of rafting gear, sampling nets, electrofishing gear, etc.		\$7,000
GS-8 Fish Tech maintenance work (\$356/day)	20	\$7,120

Subtotal		\$34,493
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Task 1 Total		\$86,804
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Task 2. Two marking and six removal passes from Echo Park to Split Mountain boat ramp (UDWR Moab; June - August 2009).

Task Activity	Work Days	UDWR – Moab Cost
Labor		
Technician (\$195/day)	206	40,170
Biologist (\$340/day)	41	13,940
Project Leader (\$451/day)	10	4,510
	Subtotal	\$58,620
Travel		
Mileage Moab to Echo Park round trip: Back-to-back trip (2 trucks/trip x 654 mi/truck x \$0.41/mi + \$5/day rent x 3 trips)		2,611
Shuttle service: 2 trucks X 8 trips @ \$150 per truck		2,400
Per diem: 5 people x \$30/person x 4 days/trip x 8 trips		4,800
	Subtotal	\$9,811
Equipment		
Maintenance of outboard motors, rafts, electrofishing gear, outboards & generator fuel (30 gal./pass), and oil.		2,000
Nets: 1- 30' block/trap seine, 1 - beach seine		750
	Subtotal	\$2,750
	Task 2 Total	\$71,181

Task 3. Data management and reporting

Task 3 - USFWS, Data collection, summary, analysis, report writing	Cost
Labor	
GS-14 Project Leader (\$535/day x 10 days)	\$5,350
GS-11 Biologist (\$397/day x 30 days)	\$11,910
GS-9 Admin. Assist. (\$271/day x 5 days)	\$1,355
Supplies (paper, computer disks, copies, etc.)	\$1,000
Meetings/Workshops	
Per diem (1 person x \$140/day x 6 days) Vernal to Grand Junction	\$840
Travel to give presentations at workshops and meetings (1 truck/trip x 275 mi/truck x \$0.505/mi x 2 trips)	\$278
Subtotal	\$20,733

Labor – UDWR - Moab		
Biologist (\$340/day x 15 days)		\$5,100
Technician. (\$195/day x 4 days)		\$780
Project Leader (\$451/day x 1 days)		\$451
	UDWR Subtotal	\$6,331
	Task 3 Total	\$22,477

FY2010(-2011) Work Deliverables/Due Dates

Recovery Program annual progress report: November 2010

Task 1. Eight removal passes from Echo Park to Split Mountain boat ramp (USFWS CRFP – Vernal; August – October 2010).

Task 1 - USFWS, Smallmouth bass removal	Days	Cost
Labor		
GS-11 Biologist (\$417/day)	27	\$11,259
GS-11 Biologist trip prep	16	\$6,672
GS-8 Fish Tech (\$364/day)	24	\$8,736
GS-8 Fish Tech trip prep	16	\$5,824
3 GS-5 Tech (\$175/day)	24	\$12,600
3 GS-5 Technicians trip prep	16	\$8,400
	Subtotal	\$53,491
Travel, Shuttle Drivers, Boat gas, Per Diem, Equipment, etc.		
(3 trucks/trip x 175 mi/truck x \$0.505/mi x 8 trips) Vernal to Echo Park, round trip		\$2,121
(12 gal gas/boat x 3 boats/trip x \$3.50/gal x 8 trips)		\$1,008
(2 qts motor boat oil/boat x 3 boats/trip x \$3.00/qt x 8 trips)		\$144
Shuttle (3 trucks/trip x \$150/truck x 8 trips) Echo to Split Mountain		\$3,600
GSA trucks	2	\$5,400
Vehicle maintenance (oil chgs, tires, cleaning, etc.)		\$2,000
Per diem (5 people/day x \$30/person x 3 days/trip x 8 trips)		\$3,600
1 outboard motor		\$2,500
Maintenance/replacement of rafting gear, sampling nets, electrofishing gear, etc.		\$7,000
GS-8 Fish Tech maintenance work (\$364/day)	20	\$7,280
	Subtotal	\$34,653
	Task 1 Total	\$88,144

Task 2. Two marking and six removal passes from Echo Park to Split Mountain boat ramp (UDWR Moab; June - August 2010).

Task Activity	Work Days	UDWR – Moab Cost
Labor		
Technician (\$195/day)	206	40,170
Biologist (\$340/day)	41	13,940
Project Leader (\$451/day)	10	4,510
	Subtotal	\$58,620
Travel		
Mileage Moab to Echo Park round trip: Back-to-back trip (2 trucks/trip x 654 mi/truck x \$0.41/mi + \$5/day rent x 3 trips)		2,611
Shuttle service: 2 trucks X 8 trips @ \$150 per truck		2,400
Per diem: 5 people x \$30/person x 4 days/trip x 8 trips		4,800
	Subtotal	\$9,811
Equipment		
Maintenance of outboard motors, rafts, electrofishing gear, outboards & generator fuel (30 gal./pass), and oil.		2,000
Nets: 1- 30' block/trap seine, 1 - beach seine		750
	Subtotal	\$2,750
	Task 2 Total	\$71,181

Task 3. Data management and reporting

Task 3 - USFWS, Data collection, summary, analysis, report writing	Cost
Labor	
GS-14 Project Leader (\$535/day x 10 days)	\$5,350
GS-11 Biologist (\$417/day x 30 days)	\$12,510
GS-9 Admin. Assist. (\$271/day x 5 days)	\$1,355
Supplies (paper, computer disks, copies, etc.)	\$1,000
Meetings/Workshops	
Per diem (1 person x \$140/day x 6 days) Vernal to Grand Junction	\$840
Travel to give presentations at workshops and meetings (1 truck/trip x 275 mi/truck x \$0.505/mi x 2 trips)	\$278
Subtotal	\$21,333

Labor – UDWR - Moab		
Biologist (\$340/day x 15 days)		\$5,100
Technician. (\$195/day x 4 days)		\$780
Project Leader (\$451/day x 1 days)		\$451
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	UDWR Subtotal	\$6,331
	Task 3 Total	\$22,477
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IX. Program Budget Summary

FY 2009(-2010)	
UDWR Moab	\$77,512
USFWS Vernal	\$107,537
FY 2009(-10) Total	\$185,049

FY 2010(-2011)	
UDWR Moab	\$ 77,512
USFWS Vernal	\$109,477
FY 2010(-11) Total	\$186,989

X. Reviewers