

**RECOVERY PROGRAM
FY 2016-2017 SCOPE OF WORK for:**

Recovery Program Project Number: 98b

Upper Yampa River northern pike management and monitoring

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

Note: Recovery Program FY16-17 scopes of work are drafted in May 2015. 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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Category:

Ongoing project

Ongoing-revised project

Requested new project

Unsolicited proposal

Expected Funding Source:

Annual funds

Capital funds

Other [*explain*]

I. Title of Proposal: Upper Yampa River northern pike management and monitoring

II. Relationship to RIPRAP:

Yampa River Action Plan

III.B.2. Control nonnative fishes via mechanical removal

III.B.2.d. Remove northern pike from Yampa River

III.B.2.e. Remove smallmouth bass

III. Study Background/Rationale and Hypotheses:

Northern pike (*Esox lucius*) is an exotic, predatory species that has become established in the Yampa River. Northern pike escaped from Elkhead Reservoir (a reservoir on Elkhead Creek, which is a tributary to the Yampa River near Craig, CO) where they were originally stocked to provide sportfishing. Since escapement, they have established large, reproducing populations in the upper Yampa River (Nesler 1995, Zelasko et al. 2014). The large populations likely provide a source for continual movement of northern pike into the lower Yampa River and further downstream into the Green River where they occur in critical habitat for four endangered fishes — Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), and humpback chub (*Gila cypha*), and bonytail (*Gila elegans*). Approximately 130 miles of the Yampa River below Craig, Colorado is designated critical habitat for these species. Northern pike pose a significant predatory risk to these endangered

fish, especially juveniles and small adults of Colorado pikeminnow and razorback sucker. Additionally, northern pike represent a predatory risk to other native species in the basin (e.g., flannelmouth sucker *Catostomus latipinnis* and roundtail chub *G. robusta*) that have been considered for listing under the Endangered Species Act in the past (Martinez 1995; Nesler 1995). Northern pike and smallmouth bass have been identified as significant threats to the endangered fishes by a majority of upper basin researchers in surveys conducted during the late 1980s (Hawkins and Nesler 1991), as well as through bioenergetics modeling (Johnson et al. 2008).

The Recovery Program has established an active program to control nonnative fishes in the main rivers of the upper basin to assist in recovery of the endangered fishes found there. To date, the Recovery Program has initiated nonnative reduction efforts for channel catfish, walleye, northern pike, and smallmouth bass in the Yampa and Green rivers, and small cyprinids in the Colorado and Green River drainages.

IV. Study Goals, Objectives, End Product:

Goal:

Improve survival of endangered fish in the Yampa and Green rivers.

Objective:

1. Reduce numbers of northern pike, smallmouth bass, and white sucker in the study reach.

End products: Annual reports due November 2016; presentation of results at annual Non-native Fish Workshop

V. Study Area: Upper Yampa River (upstream from Craig, CO); river miles 171.5-134.5

VI. Study Methods/Approach:

Temporarily reducing riverine smallmouth bass and northern pike populations appears viable under certain environmental conditions but both species can easily reverse these reductions in population abundance and return to pre-removal abundances under favorable environmental conditions (Breton et al. 2014; Zelasko et al. 2015). Therefore, mechanical removal efforts will attempt to reach eradication of nonnative fish populations in the river. However, recent synthesis reports investigating effectiveness of in-river removal efforts for northern pike and smallmouth bass determined that reducing in-river populations of these two species would not be successful unless in-river reproduction and reservoir escapement were controlled (Breton et al. 2014; Zelasko et al. 2015). Therefore, mechanical removal efforts will continue to temporarily suppress riverine populations, and will focus on reducing in-river reproduction when feasible. Simultaneously, Program partners will work on other means to reduce in-river reproduction and reservoir escapement, in order to make mechanical removal more effective and to attempt to reach complete eradication of riverine populations.

The main channel of the Yampa River between Highway 40 Bridge upstream of Hayden, Colorado and the Highway 13 Bridge in Craig, CO will be electrofished using hard-bottom electrofishing boats and rafts, with effort concentrated in habitats of higher pike density, such as sloughs and flooded backwaters. The entire river reach will be electrofished seven times

between March and July. Special effort will be made to conduct 3-5 electrofishing passes as early as possible to take advantage of high catch rates for northern pike during their spawn. The remaining passes will be conducted as late as water will allow to attempt to disrupt smallmouth bass spawning activity known to occur in this reach. The effort for two passes will be used at the PI's discretion to target the disruption of spawning for northern pike and smallmouth bass. The entire study area will be divided into two-mile sections that will be sampled individually. All northern pike captured will be measured, euthanized, and disposed of in the Craig, Colorado landfill. All smallmouth bass and white sucker will be euthanized. Any endangered fish captured will be identified to species, checked for tags, and length (TL) and weight will be recorded along with GPS coordinates.

All capture and length data on northern pike, smallmouth bass, and other species collected during the sampling effort in the Yampa River will be added to the Recovery Program database. A brief summary report will be produced after sampling is completed and distributed through the Recovery Program's annual reporting process. In addition, results will be presented at the annual nonnative fish workshop.

VII. Task Description and Schedule:

1. April - July: Electrofish the Yampa River between Hayden and Craig, CO.
2. April: Gill net large sloughs/backwaters to block pike spawning habitats
3. October: Consolidate data and provide to CPW and to the Recovery Program database.
4. November- January: Prepare annual reports. Attend nonnative fish workshop and annual researchers meeting.

VIII. Deliverables, Due Dates, and Budget by Fiscal Year:
 FY2016: Annual report due November 2016

2016

Task Activity	Rate \$/h	Hours	Cost
Task 1			
Preparatory Labor/Training/Field Work			
GS-7 Biologist	\$28.44	280	\$7,963
GS-8 Fisheries Tech Maintenance work	\$38.72	196	\$7,589
3 GS-5 Technicians	\$24.96	672	\$16,773
Overtime for GS-5 technicians	\$37.44	126	\$4,717
Subtotal			\$37,043
Travel			
Vernal to Craig round trip and daily river shuttles (2 trucks/trip x 500 mi/truck x \$0.31/mi x 7 trips)			\$2,170
Per diem (4 people/day x \$129.00/person x 21 days)			\$10,836
Subtotal			\$13,006
Equipment			
Boat gas (8 gal gas/boat x \$4.00/gal x 2 boats/day x 21 trips)			\$1,344
Boat oil (2 qt. Oil/boat x \$11.00/qt x 2 boats x 7 passes)			\$308
GSA truck (2 trucks x rate/mo x # truck-months)	\$313	3	\$1,878
Evinrude Etec 30 hp outboard motor (2016 only)			\$3,905
Equipment and maintenance (net replacement and repairs, motor repairs and maintenance, boat repairs and maintenance, electrofishing equipment repairs, electrofishing safety pedal and mat replacement, boots, waders, and gloves for field crew, based on average expenditures for the past five years)			\$6,692
Subtotal			\$14,127
TASK 1 TOTAL			\$64,176
Task 2			
Field Work			
2 GS-5 Technicians	\$24.96	320	\$7,987
Subtotal			\$7,987
Travel			
Vernal to Craig round trip (1 trucks/trip x 240 mi/truck x \$0.31/mi x 4 trips)			\$298
Per diem (2 people/day x \$129.00/person x 20 days)			\$5,160
Subtotal			\$5,458
Equipment			
Gill net repair and replacement (4 nets @ \$114/each)			\$456
Subtotal			\$456
TASK 2 TOTAL			\$13,901

Tasks 3 and 4- Data Analysis, Annual Report, Project Presentation, Administration				
Labor				
GS-12 Supervisory Fish Biologist	\$55.14	40		\$2,206
GS-7 Fisheries Biologist	\$28.44	220		\$6,257
GS-9 Admin Assist.	\$39.19	84		\$3,292
Subtotal				\$11,754
Travel				
Per diem (1 person x \$129/day x 3 days) Vernal to Grand Junction				\$387
Travel to give presentations at workshops and meetings (1 truck/trip x 288 mi/truck x \$0.31/mi x 1 trip)				\$89
Subtotal				\$476
TASKS 3 & 4 TOTAL				\$12,230
SOW TOTAL				\$90,307

FY2017: Annual report due November 2017

2017

Task Activity	Rate \$/h	Hours	Cost
Task 1			
Preparatory Labor/Training/Field Work			
GS-7 Biologist	\$35.36	280	\$9,901
GS-8 Fisheries Tech Maintenance work	\$39.74	196	\$7,789
3 GS-5 Technicians	\$25.70	672	\$17,270
Overtime for GS-5 technicians	\$38.55	126	\$4,857
Subtotal			\$39,818
Travel			
Vernal to Craig round trip and daily river shuttles (2 trucks/trip x 500 mi/truck x \$0.32/mi x 7 trips)			\$2,240
Per diem (4 people/day x \$132.00/person x 21 days)			\$11,088
Subtotal			\$13,328
Equipment			
Boat gas (8 gal gas/boat x \$4.00/gal x 2 boats/day x 21 trips)			\$1,344
Boat oil (2 qt. Oil/boat x \$11.00/qt x 2 boats x 7 passes)			\$308
GSA truck (2 trucks x rate/mo x # truck-months)	\$320	3	\$1,920
Equipment and maintenance (net replacement and repairs, motor repairs and maintenance, boat repairs and maintenance, electrofishing equipment repairs, electrofishing safety pedal and mat replacement, boots, waders, and gloves for field crew, based on average expenditures for the past five years)			\$6,692
Subtotal			\$10,264
TASK 1 TOTAL			\$63,409

Task 2				
Field Work				
2 GS-5 Technicians	\$25.70	320		\$8,224
Subtotal				\$8,224
Travel				
Vernal to Craig round trip (1 trucks/trip x 240 mi/truck x \$0.32/mi x 4 trips)				\$307
Per diem (2 people/day x \$132.00/person x 20 days)				\$5,280
Subtotal				\$5,587
Equipment				
Gill net repair and replacement (4 nets @ \$114/each)				\$456
Subtotal				\$456
TASK 2 TOTAL				\$14,267

Tasks 3 and 4- Data Analysis, Annual Report, Project Presentation, Administration				
Labor				
GS-12 Supervisory Fish Biologist	\$56.25	40		\$2,250
GS-7 Fisheries Biologist	\$35.36	220		\$7,779
GS-9 Admin Assist.	\$39.98	84		\$3,358
Subtotal				\$13,388
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 \$0.32/mi x 1 trip)				\$92
Subtotal				\$503
TASKS 3 & 4 TOTAL				\$13,891
SOW TOTAL				\$91,567

FY2018: Annual report due November 2018

2018

Task Activity	Rate \$/h	Hours	Cost
Task 1			
Preparatory Labor/Training/Field Work			
GS-7 Biologist	\$42.93	280	\$12,020
GS-8 Fisheries Tech Maintenance work	\$40.53	196	\$7,944
3 GS-5 Technicians	\$26.21	672	\$17,613
Overtime for GS-5 technicians	\$39.32	126	\$4,954
Subtotal			\$42,532

Travel

Vernal to Craig round trip and daily river shuttles (2 trucks/trip x 500 mi/truck x \$0.33/mi x 7 trips)			\$2,310
Per diem (4 people/day x \$135.00/person x 21 days)			\$11,340
	Subtotal		\$13,650

Equipment

Boat gas (8 gal gas/boat x \$4.00/gal x 2 boats/day x 21 trips)			\$1,344
Boat oil (2 qt. Oil/pass x \$11.00/qt x 2 boats/day x 7 passes)			\$308
GSA truck (rate/mo x # truck-months)	\$325	3	\$1,950
Equipment and maintenance (net replacement and repairs, motor repairs and maintenance, boat repairs and maintenance, electrofishing equipment repairs, electrofishing safety pedal and mat replacement, boots, waders, and gloves for field crew, based on average expenditures for the past five years)			\$6,692
	Subtotal		\$10,294
	TASK 1 TOTAL		\$66,476

Task 2**Field Work**

2 GS-5 Technicians	\$26.21	320	\$8,387
	Subtotal		\$8,387

Travel

Vernal to Craig round trip (1 trucks/trip x 240 mi/truck x \$0.33/mi x 4 trips)			\$317
Per diem (2 people/day x \$135.00/person x 20 days)			\$5,400
	Subtotal		\$5,717

Equipment

Gill net repair and replacement (4 nets @ \$114/each)			\$456
	Subtotal		\$456
	TASK 2 TOTAL		\$14,560

Tasks 3 and 4- Data Analysis, Annual Report, Project Presentation, Administration**Labor**

GS-12 Supervisory Fish Biologist	\$57.38	40	\$2,295
GS-11 Fisheries Biologist	\$42.93	220	\$9,445
GS-9 Admin Assist.	\$40.78	84	\$3,426
	Subtotal		\$15,165

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 \$0.33/mi x 1 trip)			\$95
	Subtotal		\$506

TASKS 3 & 4 TOTAL **\$15,671**

SOW TOTAL **\$96,707**

FY2019: Annual report due November 2019

2019

Task Activity	Rate \$/h	Hours	Cost
Task 1			
Preparatory Labor/Training/Field Work			
GS-11 Biologist	\$43.79	280	\$12,261
GS-8 Fisheries Tech Maintenance work	\$41.35	196	\$8,105
3 GS-5 Technicians	\$27.27	672	\$18,325
Overtime for GS-5 technicians	\$40.91	126	\$5,155
Subtotal			\$43,846
Travel			
Vernal to Craig round trip and daily river shuttles (2 trucks/trip x 500 mi/truck x \$0.34/mi x 7 trips)			\$2,380
Per diem (4 people/day x \$135.00/person x 21 days)			\$11,340
Subtotal			\$13,720
Equipment			
Boat gas (8 gal gas/boat x \$4.00/gal x 2 boats/day x 21 trips)			\$1,344
Boat oil (2 qt. Oil/pass x \$11.00/qt x 2 boats/day x 7 passes)			\$308
GSA truck (rate/mo x # truck-months)	\$332	3	\$1,989
Equipment and maintenance (net replacement and repairs, motor repairs and maintenance, boat repairs and maintenance, electrofishing equipment repairs, electrofishing safety pedal and mat replacement, boots, waders, and gloves for field crew, based on average expenditures for the past five years)			\$6,692
Subtotal			\$10,333
TASK 1 TOTAL			\$67,898
Task 2			
Field Work			
2 GS-5 Technicians	\$27.27	320	\$8,726
Subtotal			\$8,726
Travel			
Vernal to Craig round trip (1 trucks/trip x 240 mi/truck x \$0.34/mi x 4 trips)			\$326
Per diem (2 people/day x \$135.00/person x 20 days)			\$5,400
Subtotal			\$5,726
Equipment			
Gill net repair and replacement (4 nets @ \$114/each)			\$456
Subtotal			\$456
TASK 2 TOTAL			\$14,909

Tasks 3 and 4- Data Analysis, Annual Report, Project Presentation, Administration				
Labor				
GS-12 Supervisory Fish Biologist	\$58.53	40	\$2,341	
GS-11 Fisheries Biologist	\$43.79	220	\$9,634	
GS-9 Admin Assist.	\$41.60	84	\$3,494	
Subtotal			\$15,469	
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 \$0.34/mi x 1 trip)			\$98	
Subtotal			\$509	
TASKS 3 & 4 TOTAL			\$15,978	
SOW TOTAL			\$98,785	

FY2020: Annual report due November 2020

2020				
Task Activity	Rate \$/h	Hours	Cost	
Task 1				
Preparatory Labor/Training/Field Work				
GS-11 Biologist	\$44.67	280	\$12,506	
GS-8 Fisheries Tech Maintenance work	\$42.17	196	\$8,265	
3 GS-5 Tech	\$28.09	672	\$18,876	
Overtime for GS-5 technicians	\$42.14	126	\$5,310	
Subtotal			\$44,958	
Travel				
Vernal to Craig round trip and daily river shuttles (2 trucks/trip x 500 mi/truck x \$0.35/mi x 7 trips)			\$2,450	
Per diem (4 people/day x \$135.00/person x 21 days)			\$11,340	
Subtotal			\$13,790	
Equipment				
Boat gas (8 gal gas/boat x \$4.00/gal x 2 boats/day x 21 trips)			\$1,344	
Boat oil (2 qt. Oil/pass x \$11.00/qt x 2 boats/day x 7 passes)			\$308	
GSA truck (rate/mo x # truck-months)	\$338	3	\$2,029	
Equipment and maintenance (net replacement and repairs, motor repairs and maintenance, boat repairs and maintenance, electrofishing equipment repairs, electrofishing safety pedal and mat replacement, boots, waders, and gloves for field crew, based on average expenditures for the past five years)			\$6,692	
Subtotal			\$10,373	
TASK 1 TOTAL			\$69,120	

Task 2			
Field Work			
2 GS-5 Technicians	\$28.09	320	\$8,989
Subtotal			\$8,989
Travel			
Vernal to Craig round trip (1 trucks/trip x 240 mi/truck x \$0.35/mi x 4 trips)			\$336
Per diem (2 people/day x \$135.00/person x 20 days)			\$5,400
Subtotal			\$5,736
Equipment			
Gill net repair and replacement (4 nets @ \$114/each)			\$456
Subtotal			\$456
TASK 2 TOTAL			\$15,181
Tasks 2 and 3- Data Analysis, Annual Report, Project Presentation, Administration			
Labor			
GS-12 Supervisory Fish Biologist	\$59.70	40	\$2,388
GS-11 Fisheries Biologist	\$44.67	220	\$9,826
GS-9 Admin Assist.	\$42.43	84	\$3,564
Subtotal			\$15,778
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 \$0.35/mi x 1 trip)			\$101
Subtotal			\$512
TASKS 2 & 3 TOTAL			\$16,290
SOW TOTAL			\$100,592

IX. Budget Summary:

FY 2016: **\$90,307**
FY 2017: **\$91,567**
FY 2018: **\$96,707**
FY 2019: **\$98,785**
FY 2020: **\$100,592**

X. Reviewers: **Kevin McAbee, Jun 2015;**

XI. References:

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

Johnson, B.M., P.J. Martinez, J.A. Hawkins, and K.R. Bestgen. 2008. Ranking predatory threats by nonnative fishes in the Yampa River, Colorado, via bioenergetics modeling. *North American Journal of Fisheries Management* 28: 1941-1953.

Martinez, P. J. 1995. Coldwater Reservoir Ecology. Colorado Division of Wildlife, Federal Aid in Fish and Wildlife Restoration Project F-242R-2, Job Final Report, Fort Collins.

Zelasko, K. A., K. R. Bestgen, J. A. Hawkins, G. C. White. 2014. Abundance and population dynamics of invasive northern pike *Esox lucius*, Yampa River, Colorado, 2004–2010. Final Report to the Upper Colorado River Endangered Fish Recovery Program, Project 161b, Denver. Larval Fish Laboratory Contribution 185.