RECOVERY PROGRAM Recovery Program Project Number: FR-164
FY 2018-2019 SCOPE OF WORK for:
Middle Green River floodplain sampling and management

Reclamation Agreement number: R15PG00083
Reclamation Agreement term: 10/01/2014-09/30/2019

Note: Recovery Program FY18-19 scopes of work are drafted in May 2017. 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: U.S. Fish & Wildlife Service
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Category:
X Ongoing project
__ Ongoing-revised project
__ Requested new project
__ Unsolicited proposal

Expected Funding Source:
X Annual funds
__ Capital funds
__ Other *[explain]*

I. Title of Proposal: Middle Green River floodplain sampling and management.

II. Relationship to RIPRAP: Green River Action Plan
II. Restore Habitat
II.A. Restore and manage flooded bottomland habitat
II.A.5. Manage priority floodplain sites for nursery habitat for endangered fish
II.A.5.b. Johnson Bottom
II.A.5.c. Old Charlie Wash
II.A.5.d. Sheppard Bottom
II.A.5.e. Other sites (Leota Bottom, Above Brennan, Escalante Ranch)

III. Study Background/Rationale and Hypotheses:
Endangered fish of the Colorado River basin use wetlands during various stages to complete their life history. Although researchers in the Green River system spend considerable time sampling fish populations in the main stem river, less work has traditionally been conducted in wetlands to determine endangered fish presence. Razorback sucker (*Xyrauchen texanus*) (RZB), in particular, use floodplain wetlands throughout their lives, and specifically rely on these habitats during early development from larval to juvenile stages (Modde 1996). Until recently, researchers have had little success documenting these life stages for wild-produced fish (Modde et al. 2001). After several years of meeting stocking goals for hatchery RZB, larval production has increased (Bestgen et al. 2011). In the fall of 2011, wild-spawned RZB were documented in two floodplain wetlands following near-record spring flows and flooding (Webber 2013). In subsequent years, management of Stewart Lake using the Larval Trigger

Study Plan (LTSP 2012) has resulted in successful entrainment and recruitment of juvenile RZBs (Skorupski et al. 2013; Schelly et al. 2014, 2016; Schelly and Breen 2015). In addition, other wetland sites have entrained wild larvae under LTSP management, although survival to the juvenile stage has been limited (Webber et al. 2014; Jones et al. 2015, 2016). This confirms that the adult RZB population is sufficient to produce larvae, larvae can be entrained into wetland habitats, and recruitment of larvae to juvenile size is feasible. Bonytail (*Gila elegans*) have also been found in Stewart Lake and Johnson Bottom, both as stocked adults and wild-produced juveniles (Bestgen et al. 2017). Now that evidence exists that recruitment is possible, the goal of this project is to continue monitoring and managing wetland habitats for young-of-year RZB and bonytail. We also plan on conducting more extensive bonytail monitoring in Johnson Bottom by using PIT tag antennas to track survival of these fish post-stocking. This project will also fulfill some of the monitoring and assessment objectives in the RZB monitoring plan (Bestgen et al. 2012) and assess LTSP flow recommendations for Flaming Gorge operations. USFWS obtained grants to renovate the Johnson Bottom and Sheppard Bottom floodplains, with a specific focus on establishing floodplain connection for implementing the LTSP. Much of the monitoring and management for both sites will occur under this SOW, and we anticipate the sites will be able to connect in low to moderate flow conditions, thus making them available on a more frequent basis. If negotiations to renew the lease for Old Charlie Wash are successful, we also plan to manage that site under this project.

IV. Study Goals, Objectives, End Products:
Goals: Determine endangered fish use of wetlands and manage wetlands to benefit these fish.

Objectives:

1) Sample wetlands during RZB larval drift period to determine where entrainment has occurred and to assess LTSP effectiveness in connecting focal habitats.
2) Describe connection flows, period of connection, and collect water quality information at wetlands sampled each year.
3) Manage water control structures and nonnative fish exclusion features at Johnson and Sheppard Bottoms in order to entrain RZB into these wetlands.
4) Coordinate bonytail stocking into focal wetlands.
5) Sample wetlands periodically to determine survival of entrained RZB and stocked bonytail. Sample wetlands in fall and return collected fish back to the river.
6) Conduct draining at Johnson Bottom in order to quantify RZB and bonytail numbers returned to the river and to preclude nonnative fish escapement.
7) Conduct spring sampling in wetlands where endangered fish were previously confirmed to determine over winter survival.

End product: Annual report summarizing presence/absence data for endangered fish in wetlands. The report will also summarize LTSP operations and sites connected under given hydrological conditions, as well as describing fish communities in wetlands sampled during the summer and fall.

V. Study Area: Green River wetlands between river miles 311 and 248 (Razorback Bar to Ouray Bridge).

VI. Study Methods/Approach:

This project will be conducted and coordinated under the guidance of the razorback sucker monitoring plan (Bestgen et al. 2012) and the Larval Trigger Study Plan (LTSP 2012). We will select sampling sites based on each year's hydrology and floodplain habitats identified in these study plans for a given hydrologic regime. We will focus on locations that connect to the river in spring or other observations that may require special attention (e.g., finding a northern pike source at Thunder Ranch in 2011), with particular emphasis on Stirrup, Above Brennan, Johnson Bottom, Sheppard Bottom, and Old Charlie Wash (if access is granted). We will sample each wetland with any of the following methods: fyke nets, trammel nets, hoop nets, minnow traps, light traps, electrofishing, or hook and line sampling. The goal is to document endangered fish and sample as many sites as possible, rather than extensive characterization of any particular site. Any endangered fish captured will be measured, weighed, and PIT tagged if not already tagged, and the location to which it will be released will depend on whether or not we believe the fish can survive through winter in its current location. Nonnative fish community information (species, relative order of abundance) will be gathered in each wetland, and nonnative fish will be euthanized. We will also preserve a subsample of the nonnative fish captured to characterize the fish community. Temperature and dissolved oxygen loggers will be deployed at these sites to collect water quality information. This information would be summarized and provided to the Program Director's office in the form of an annual report, although significant or unusual findings will be communicated as they occur (e.g., if wild-produced razorback sucker juveniles are found or an alarming amount of nonnative fish of concern are found like the case of northern pike in Thunder Ranch 2011).

For Johnson and Sheppard Bottoms, this project will initiate floodplain inundation once larval RZBs are detected in the river. The water control structures have been modified to preclude entrainment of adult nonnative fishes, by the use of ½" screens. The wetlands will be monitored periodically throughout the summer for both fish presence and growth, as well as water quality. At Sheppard, we will have the ability to add supplemental water using the Pelican Lake pipeline. We have the ability to pump water into Johnson Bottom using 8" pumps, but this is not reflected in budgets below. Finally, the wetlands will be sampled and/or drained, in coordination with Ouray NWR objectives, in the fall, either to release any juvenile RZBs back to the river or to facilitate resetting the wetland of any nonnative populations.

VII. Task Description and Schedule:

Task 1: Sample flooded wetlands via light trapping during larval RZB drift.
Task 2: Collect data on floodplain connection and manage wetlands for fish entrainment.
Task 3: Sample wetlands during summer to determine survival and fish community composition. In 2019 and 2020, conduct PIT tag antenna monitoring to track survival of stocked bonytail.
Task 4: Drain managed wetlands and sample all wetlands for fish survival and community composition.
Task 5: Analyze data, summarize findings in annual report, submit data to database manager.

VIII. Deliverables, Due Dates, and Budget by Fiscal Year:
USFWS personnel costs are based on FY2017 GS and WG tables, with current benefit rates included for each position. Future rates were determined assuming a 2% inflation and cost of living increase. Vehicle and travel costs are based on current GSA rates, again assuming a 2% rate of inflation in future years.

FY 2018
Deliverables: Annual report in November. Data submitted to database manager.

Budget

Task Activity	Rate $/h	Hours	Cost
Tasks 1-4. Sample wetlands			
Operational Costs			
GS-11 Fisheries Biologist	$42.37	240	$10,169
GS-8 Fisheries Technician	$43.43	240	$10,423
GS-5 Fisheries Technician	$23.16	240	$5,558
Subtotal			**$26,150**
Equipment			
(1 truck/day x 60 mi/truck x $0.33/mi x 30 trips) Vernal to wetland, round trip			$594
(5 gal gas/week x $4.00/gal x 1 boat/week x 6 weeks)			$120
GSA truck (rate/mo x # truck-months)	$250	4	$1,000
Oil, motor repairs, net repair supplies, net replacement (replacement nets = $848/each)			$3,000
Subtotal			**$4,714**
TASK 1-4 TOTAL			**$30,864**
Task 5. Summarize data and report writing, administrative costs.			
Labor			
GS-9 Administrative Officer	$41.57	80	$3,326
GS-11 Fisheries Biologist	$42.37	32	$1,356
GS-12 Supervisory Fish Biologist	$60.84	40	$2,434
Subtotal			**$7,115**
TASK 5 TOTAL			**$7,115**
SOW TOTAL			**$37,979**

FY 2019

Deliverables: Annual report in November. Data submitted to database manager.

Budget

Task Activity	Rate $/h	Hours	Cost
Tasks 1-4. Sample wetlands			
Operational Costs			
GS-12 Supervisory Fish Biologist	$62.05	80	$4,964
GS-11 Fisheries Biologist	$43.73	280	$12,244
GS-8 Fisheries Technician	$44.29	246	$10,895
GS-5 Fisheries Technician	$23.63	240	$5,671
Subtotal			**$33,775**
Equipment			
(1 truck/day x 60 mi/truck x $0.34/mi x 30 trips) Vernal to wetland, round trip			$612
(5 gal gas/week x $4.00/gal x 1 boat/week x 6 weeks)			$120
GSA truck (rate/mo x # truck-months)	$255	4	$1,020
Oil, motor repairs, net repair supplies, net replacement (replacement nets = $848/each)			$3,000
Subtotal			**$4,752**
TASK 1-4 TOTAL			**$38,527**
Task 5. Summarize data and report writing, administrative costs.			
Labor			
GS-9 Administrative Officer	$42.69	105	$4,482
GS-11 Fisheries Biologist	$43.73	40	$1,749
GS-12 Supervisory Fish Biologist	$62.05	80	$4,964
Subtotal			**$11,196**
TASK 5 TOTAL			**$11,196**
SOW TOTAL			**$49,723**

FY 2020

Deliverables: Annual report in November. Data submitted to database manager.

Budget

Task Activity	Rate $/h	Hours	Cost
Tasks 1-4. Sample wetlands			
Operational Costs			
GS-12 Supervisory Fish Biologist	$63.30	80	$5,064
GS-11 Fisheries Biologist	$46.92	280	$13,138
GS-8 Fisheries Technician	$46.34	246	$11,400
GS-5 Fisheries Technician	$24.10	240	$5,784
Subtotal			**$35,385**
Equipment			
(1 truck/day x 60 mi/truck x $0.34/mi x 30 trips) Vernal to wetland, round trip			$612
(5 gal gas/week x $4.00/gal x 1 boat/week x 6 weeks)			$120
GSA truck (rate/mo x # truck-months)	$260	4	$1,040
Oil, motor repairs, net repair supplies, net replacement (replacement nets = $848/each)			$3,000
Subtotal			**$4,772**
TASK 1-4 TOTAL			**$40,157**
Task 5. Summarize data and report writing, administrative costs.			
Labor			
GS-9 Administrative Officer	$44.42	105	$4,664
GS-11 Fisheries Biologist	$46.92	40	$1,877
GS-12 Supervisory Fish Biologist	$63.30	80	$5,064
Subtotal			**$11,605**
TASK 5 TOTAL			**$11,605**
SOW TOTAL			**$51,762**

FY 2021

Deliverables: Annual report in November. Data submitted to database manager.

Budget

Task Activity	Rate $/h	Hours	Cost
Tasks 1-4. Sample wetlands			
Operational Costs			
GS-11 Fisheries Biologist	$47.86	240	$11,486
GS-8 Fisheries Technician	$47.26	240	$11,342
GS-5 Fisheries Technician	$24.58	240	$5,899
Subtotal			**$28,728**
Equipment			
(1 truck/day x 60 mi/truck x $0.35/mi x 30 trips) Vernal to wetland, round trip			$630
(5 gal gas/week x $4.00/gal x 1 boat/week x 6 weeks)			$120
GSA truck (rate/mo x # truck-months)	$265	4	$1,060
Oil, motor repairs, net repair supplies, net replacement (replacement nets = $848/each)			$3,000
Subtotal			**$4,810**
TASK 1-4 TOTAL			**$33,538**
Task 5. Summarize data and report writing, administrative costs.			
Labor			
GS-9 Administrative Officer	$45.61	80	$3,649
GS-11 Fisheries Biologist	$47.86	32	$1,532
GS-12 Supervisory Fish Biologist	$66.37	40	$2,655
Subtotal			**$7,835**
TASK 5 TOTAL			**$7,835**
SOW TOTAL			**$41,373**

FY 2022

Deliverables: Annual report in November. Data submitted to database manager.

Budget

Task Activity	Rate $/h	Hours	Cost
Tasks 1-4. Sample wetlands			
Operational Costs			
GS-11 Fisheries Biologist	$48.81	240	$11,714
GS-8 Fisheries Technician	$48.21	240	$11,570
GS-5 Fisheries Technician	$25.07	240	$6,017
Subtotal			**$29,302**
Equipment			
(1 truck/day x 60 mi/truck x $0.36/mi x 30 trips) Vernal to wetland, round trip			$648
(5 gal gas/week x $4.00/gal x 1 boat/week x 6 weeks)			$120
GSA truck (rate/mo x # truck-months)	$271	4	$1,084
Oil, motor repairs, net repair supplies, net replacement (replacement nets = $848/each)			$3,000
Subtotal			**$4,852**
TASK 1-4 TOTAL			**$34,154**
Task 5. Summarize data and report writing, administrative costs.			
Labor			
GS-9 Administrative Officer	$46.53	80	$3,722
GS-11 Fisheries Biologist	$48.81	32	$1,562
GS-12 Supervisory Fish Biologist	$67.70	40	$2,708
Subtotal			**$7,992**
TASK 5 TOTAL			**$7,992**
SOW TOTAL			**$42,146**

IX. Budget Summary:

Total budget to USFWS Vernal by fiscal year:
FY2018: $37,979
FY2019: $49,723
FY2020: $51,762
FY2021: $41,373
FY2022: $42,146

X. Reviewers:

XI. References:

Bestgen, K. R., G. B. Haines, and A. A. Hill. 2011. Synthesis of flood plain wetland information: Timing of razorback sucker preproduction in the Green River, Utah, related to stream flow, water temperature, and flood plain wetland availability. Final Report to the Upper Colorado River Endangered Fish Recovery Program, Denver. Larval Fish Laboratory Contribution 163.

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Skorupski, Jr., J.A., I. Harding, and M.J. Breen. 2013. Use of the Stewart Lake floodplain by larval and adult endangered fishes. Annual report to the Upper Colorado River Endangered Fish Recovery Program, Denver, CO.

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Webber, A., C. Smith, and T. Jones. 2014. Middle Green River floodplain sampling. Annual report to the Upper Colorado River Endangered Fish Recovery Program, Denver, CO.