

Project Title

Sub-Adult and Adult Large-Bodied Fish Community Monitoring

Bureau of Reclamation Agreement Number:

R17PG00084

Reclamation Agreement Term

July 1, 2017 – June 15,2022

Note: Recovery Program FY23 scopes of work are drafted in May 2022. 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 and changing hydrological conditions.

Lead Agency:

US Fish and Wildlife Service

Principal Investigator:

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Category:

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

Expected Funding Source:

- Annual funds
- Capital funds
- Other [explain]

Relationship to LRP:

Element 4, Task 4.1.1.2. Conduct larval, juvenile, and adult fish sampling to determine if reproduction is occurring, locate spawning and nursery areas, gauge extent of annual reproduction, and identify distribution of fish (SJRIP 2016).

Study Background/Rationale and Hypotheses:

Studies performed before 1991 documented a native San Juan River fish fauna of eight species, including Colorado Pikeminnow, Razorback Sucker, and Roundtail Chub and provided baseline information on distribution and abundance of native and introduced fish species in the San Juan River. These studies indicated that at least one of the two endangered fish species (i.e., Colorado Pikeminnow) was still a viable member of the San Juan River fish community.

Between 1991 and 1998, the Main Channel Fish Community Monitoring study (called “Adult Monitoring” for short), greatly refined our understanding of the San Juan River fish community. The main sampling technique employed during the 1991-1998 Adult Monitoring study was raft-borne electrofishing, although radio telemetry was also heavily employed. Data collected during the 1991-1998 Adult Monitoring study provided information on specific habitat usage by rare fish species. In addition, data gathered during the 1991-1998 Adult Monitoring study aided in the selection of specific sites for detailed hydrologic measurements and larval drift sampling. Integration of 1991-1998 Adult Monitoring data along with data from Colorado Pikeminnow macrohabitat studies, Razorback Sucker experimental stocking studies, tributary and secondary channel studies, fish health studies, contaminants studies, habitat mapping studies, and non-native species interaction studies, helped provide a logical framework upon which to make flow recommendations for the reoperation of Navajo Reservoir that would benefit the San Juan River’s endangered fishes (as well as other members of the native fish community).

The Sub-Adult & Adult Large-Bodied Fish Community Monitoring study (also referred to as Adult Monitoring), which began in 1999 and continued annually until 2017, is a direct offshoot of the 1991-1998 Adult Monitoring study. In 2018, Adult Monitoring was not able to be completed due to uncertainties in funding. In 2019, efforts were directed towards Demographic Monitoring, which was more directed at quantifying abundance, capture probability, and survival of Razorback Suckers and Colorado Pikeminnow. Demographic Monitoring was scheduled for 2019 through 2021 however due to a pandemic, sampling was not able to be conducted in 2020 and the scheduled time was move forward into 2022 to complete three years of this project. Moving forward, Adult Monitoring will be scheduled during off years of Demographic Monitoring (two years of Adult Monitoring, three years of Demographic Monitoring, repeat).

Adult Monitoring is one of a suite of long-term monitoring efforts detailed in the San Juan River Recovery Implementation Program’s (SJRIP) Monitoring Plan and Protocols (SJRIP 2012) that are designed to help evaluate progress of the two endangered fish species towards recovery under the SJRIP’s Long Range Plan (SJRIP 2016). The current Adult Monitoring study incorporates essentially the same monitoring protocols as did its 1991-1998 precursor study (e.g., sampling via raft-borne electrofishing). This allows for data collected during the current Adult Monitoring study to be validly combined with and compared to the older 1991-1998 Adult Monitoring data. The combination of these two data sets provides statistically powerful, long-term trend data through which the SJRIP’s Biology Committee can view changes in the San Juan River’s large-bodied fish community over time. This long-term trend data allows the SJRIP Biology Committee to evaluate whether various management actions being implemented are having the desired effects on the San Juan River fish community. In addition, Adult Monitoring has proven to be an effective tool for monitoring populations of both stocked Razorback Sucker and Colorado Pikeminnow.

Study Goals, Objectives, End Product(s):

- 1) Two out of every five years, in autumn, document fish community structure, species abundance (presented as catch/time, CPUE), and distribution (fish by species, per river mile), and size structure among populations of both native and nonnative large-bodied fishes in San Juan River.

- 2) Obtain data that will aid in the evaluation of the responses (e.g., year-to-year survival, reproduction, recruitment, growth, and condition factor) of both native and nonnative large-bodied fishes to management actions.
- 3) Continue to perform activities that support other studies and recovery actions being implemented by the SJRIP. These include the following:
 - a. Remove nonnative fish species which prey upon and may compete with native fish species in the San Juan River.
 - b. Collect tissue samples from various fish species for stable isotope, genetics, and contaminants studies.

Through the handling of large numbers of fish for other study objectives and because of its long-term dataset, Adult Monitoring provides chances to opportunistically observe and monitor other information on the San Juan River's large-bodied fish community. This includes, but is not limited to: 1) the incidence of disease and abnormalities among fish populations; 2) the distribution and abundance of nonnative white sucker and the rate of hybridization between this species and native sucker species; 3) hybridization rates among native sucker species, specifically the endangered razorback sucker and flannelmouth sucker; 4) negative interactions between channel catfish and native fish species, specifically endangered Colorado pikeminnow and razorback sucker; and, 5) documenting episodic events, such as the invasion of the San Juan River by fish species from Lake Powell or collecting rare, but potentially important fish species, such as grass carp.

Study Area:

The main stem of the San Juan River, starting in Bloomfield, NM (RM 196.0) downstream to Clay Hills, UT (RM 2.9). Sampling will start in early September 2023 and finish no later than early October 2023.

Study Methods/Approach:

Raft-borne electrofishing will be the primary sampling technique. Electrofishing will follow the methods set forth in the SJRIP Monitoring Plan and Protocols (SJRIP 2012). Two oar-powered rafts, with one netter each, will electrofish in a continuous downstream fashion, with one raft on each shoreline. Netters will net all stunned fish that can possibly be collected, regardless of species or body size. Sampling crews will consist of approximately five people, four for electrofishing and 1 for baggage rafts. Electrofishing will sample every mile (approximately 193 total sampled miles). All fish collected will be enumerated by species and life stage at the end of every sampled mile. Every fourth sampled mile (known as a "designated mile" or DM), all fish collected will be weighed and measured. All native fish collected will be returned alive to the river. All nonnative fish collected will be removed from the river, unless tagged and part of another study. Less common nonnative predatory fishes (e.g. - walleye, striped bass, largemouth bass, smallmouth bass) collected will be weighed and measured, and have stomach contents inspected, before being removed from the river. Tag numbers, total and standard lengths, and weight will be recorded on all recaptured, FLOY-tagged fish (both native and nonnative), as well as any rare fish collected. Colorado Pikeminnow, Razorback Sucker, and Roundtail Chub greater than 130 mm TL will be implanted with 134 kHz PIT (Passive Integrated Transponder) tag prior to release if one is not present upon capture. Notes will be kept on any parasites and/or abnormalities observed on collected fishes.

Catch per unit effort (CPUE), measured in fish per hour of electrofishing, for each species will

be compared within year across all species. Additionally, CPUE for each individual species, in different life stages and aggregate, will be compared to previous years' CPUE when conducted in the same longitudinal extent of the river. Length frequency histograms, distribution, and length at weight data will be provided as well for the main six large-bodied fish species Colorado Pikeminnow, Razorback Sucker, Flannelmouth Sucker, Bluehead Sucker, Channel Catfish, and Common Carp.

Task Description, Deliverables and Schedule:

All data collected will be provided to the Program Office and uploaded into the STReAMS database by December 31, 2023. A draft report will be completed by March 31, 2024, with a final report and response to comments completed by June 30, 2024. A presentation will be delivered at the February 2024 Biology Committee meeting as well.

Budget Summary:

FY Year	<i>GJFWCO</i>	<i>[Office 2]</i>
2023	\$129,936.01	
2024	\$132,369.89	
2025		
2026		
Total		

Reviewers:

References:

SJRIP (San Juan River Basin Recovery Implementation Program). 2012. San Juan River Basin Recovery Implementation Program Monitoring Plan and Protocols. San Juan River Basin Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

SJRIP (San Juan River Basin Recovery Implementation Program). 2016. San Juan River Basin Recovery Implementation Program Long-range plan. San Juan River Basin Recovery Implementation Program, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.