

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2023 Annual Report

PROJECT: 179

Project Title: PIA operation/maintenance and PIT equipment

Bureau of Reclamation Agreement Numbers:

R19AC00153 (Utah State University, 140R4018D0012 (BioMark))

Project/Grant Period:

Start date: 09/16/2019

End date: 09/30/2024

Reporting period end date: 12/6/2023

Is this the final report? No

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Abstract:

The goals of this project are 1) to maximize continuity and performance of passive interrogation array (PIA) operations by performing routine annual operation and maintenance (O/M), repair, and replacement activities and 2) provide Recovery Program investigators and hatchery staff with PIT tags and related tagging and scanning equipment for use on an annual basis. In FY2023, we monitored PIA sites remotely and made several visits to perform upgrades, updates and other operation/maintenance tasks at 11 PIA locations in the Upper Colorado River Basin (Green River Canal, Dolores River, potential new sites). Using Bipartisan Infrastructure Law (BIL) funding, Reclamation purchased equipment for 12 new autonomous PIAs and 50 portable submersible antennas for use by Upper Basin field offices (about 7 per office). We also conducted reconnaissance and began permitting for several new potential PIA locations in the 15 mile reach of the Colorado River and at Razorback Bar on the middle Green River. USU also purchased some equipment for use on O/M tasks. All communications fees were paid.

Study Schedule:

Ongoing

Relationship to RIPRAP:

General Action Plan:

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V.A Measure and document population and habitat parameters to determine status and biological response to recovery actions.

V.A.1.a Develop basin wide razorback monitoring program (implementation to be reflected in sub-basin worksheets).

V.A.1.a.(2) Investigate improving recapture rates through passive PIT tag monitoring, nets, etc. to improve population abundance estimates.

V.A.3. Collect and submit data according to standard protocol (e.g., location, PIT tag #, length, weight, etc.) on endangered fish encountered in all field activities in order to provide annual information on population status outside of formal population estimates.

V.D Establish sampling procedures to minimize adverse impacts to endangered fishes.

V.F Assess relative biological importance of tributaries and their potential contributions to endangered fish recovery.

FY22 Accomplishments, Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: PIA operation and maintenance:

General:

Peter Mackinnon of Biomark LLC and the Utah State University Fish Ecology Lab (USU) remotely monitored performance and data collection of 11 fixed PIA detection sites throughout the Upper Colorado River Basin, including the Dolores Rio Mesa Center, three sites on the San Rafael River, three sites on the Price River, Tusher Wash Diversion, Green River Canal, White River Bonanza Bridge, and the Price-Stubb Diversion. Issues detected at the antennas were either dealt with remotely or used to schedule maintenance trips. Data from all active PIA sites are remotely uploaded to the Biomark Biologic Site and to the STReAMS database at the Colorado Natural Heritage Center. Peter and other USU staff worked directly with the programmers at the Heritage Center and Chris Michaud to continue the process of automating data collection from the various PIA sites in the basin.

From October 1, 2022, through September 30, 2023, USU undertook multiple trips to repair and update PIAs in various locations throughout the Upper Colorado River Basin; provide technical support to multiple agencies involved with the various fixed PIA's and mobile monitoring equipment. Peter working with agencies on purchasing, distribution, deployment, and maintenance of mobile submersible (wagon wheel) systems that have seen increased use over FY2023. Peter and various technicians from USU assisted on various maintenance trips and efforts were made to consolidate trips by visiting multiple sites in the San Juan and Upper Colorado basins and accomplishing various tasks per trip. Peter participated in various meetings and planning sessions for determining expansion of the PIA network in the Upper Colorado River Basin.

29-31 March 2023

Reclamation, USU and USFWS representatives assessed multiple sites on the Green and Colorado Rivers for autonomous antenna installation feasibility. Six or seven sites are under consideration in the Grand Valley reach of the Colorado River in the following areas: Riverbend Park (Palisade, CO), Corn Lake/Beswicks Pond (Colorado Parks and Wildlife, CPW), Orchard Mesa Wildlife Area (Reclamation), Grand Junction Wildlife Area (Reclamation), and Horsethief Wildlife Area (Reclamation/CPW).

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(Grand Valley USBR properties). An additional site at Salt Creek (Bureau of Land Management) near Mack, CO is also being discussed.

In the Cisco reach of the Colorado River, one very promising site was located on BLM land near Cisco Wash, and a second is under investigation near Fish Ford. Another site located on state property near the Moab highway bridge over the Colorado River is pending evaluation.

In the Razorback Bar area of the middle Green River, two sites were identified for autonomous PIAs: One on river left immediately below the spawning bar island (School and Institutional Lands Administration/State of Utah) and river right on NPS lands at the bottom of the island. NEPA and cultural surveys for the Green River sites were completed by Reclamation's Provo Area Office Environmental Division (with assistance from Dinosaur National Monument staff) on November 3, 2023, and similar surveys for the Grand Valley sites were conducted on November 7, 2023 by the USBR Western Colorado Area Office environmental staff. Compliance documents are forthcoming in 2024.

08 May-11 May 2023

Only a few of the ten antenna panels at the Dolores Rio Mesa Center PIA had been working for the past few years, so USU evaluated the system and checked status of the San Rafael and Price River PIAs. The trip was part of a longer trip including San Juan work. At the Dolores River site, it was apparent that lack functioning antennas was most likely due to connectivity or problems with individual antenna nodes, but spring flows were too high to perform any instream repairs or assessment.

30 August – 01 September 2023

Peter, Reclamation, Biomark and various USFWS volunteers from Vernal and Grand Junction worked to update the PIA at the White River Bonanza bridge site. We installed six new antennas with IS1001 nodes and a master controller. The update restores the site to six working antennas and now has an average read range of 24-28", double what the older MUX system provided. The site is uploading to the Biomark Biologic site and continues to upload to the STReAMS database.

Current Status of UCRP PIAs

- Dolores River Rio Mesa Center: Large flood and sustained high water damaged both arrays. Currently zero antenna panels are working. On 12 October 2023 after sustained high flows, we found the cable connecting the upstream antenna array to the master controller had been severed. There had been two antennas working on the river left bank of the downstream array, but had stopped working since 08 November 2023. Major repairs are needed on both upstream and downstream arrays. Low water conditions will be required, and some significant excavation is required to find the nodes and determine necessary repairs. There is interest from CPW to get this system back online as soon as possible, so opportunities for cost- or labor sharing may exist.
- Tusher Wash: No change in status since the site visit in March 2022. Antennas 1-6 are all functioning. Noise spikes are still high. The fish passage antennas have low noise.
- Green River Canal: All antennas are functioning. We need to check antenna 4's (return channel) performance before irrigation season in April 2024.

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- Price River: a) Mounds: all antennas functioning. b) Woodside: antenna 1 needs to be replaced. c) Confluence site: antennas 3 and 4, downstream row are not functioning. A physical visit to the site is required in 2024 when flows allow.
- Price-Stubb: Two antennas are showing lower than normal current. Both antennas started showing a drop in current around mid-July 2023, which could be related to high flows in 2023. These antennas will need to be checked in 2024.
- San Rafael River: a) Chaffin Ranch: two out of four antennas functioning. Still operating on the old MUX system and should be updated with new antennas on a master controller. b) Cottonwood Wash: currently only antenna 2 is working. The site will need to be visited to determine the problems and repair as needed in 2024. c) Hatt Ranch: all 4 antennas are functioning. Antennas 2 and 3 have tags stuck close to them and are reading continuously. A site visit is needed to see if the tags can be found and removed.
- White River Bonanza Bridge: All six new antennas and master controller are functioning. The site is uploading to the Biomark Biologic site, however, it is not currently pushing data to the STReaMS database. The issue has been identified and will be addressed during the upcoming data transfer upgrade scheduled for early 2024.

Task 2: Purchase PIT tags and related tagging and scanning equipment

Reclamation placed one order for PIT equipment in FY23 (August 2023). Using Bipartisan Infrastructure Law funding, we purchased antennas and associated equipment and labor to construct 12 new autonomous PIAs over the next few years as conditions and labor permit. Additionally, 50 portable submersible antennas (“wagon wheels”) and extra batteries were also purchased. Field offices should be receiving seven units and spare batteries over coming year. As of this writing, fourteen portable submersible antennas have been delivered to field offices in Vernal, UT (USFWS and UDWR). The remainder are scheduled for distribution over the coming year.

Using Recovery Program funding, all Biologic account and communication fees for calendar year 2024 were also paid in advance (August 2023 order).

Larger equipment items necessary for repairs in 2024 include a new master controller system to replace the MUX at Chaffin Ranch (San Rafael River), multiple new nodes for Dolores Rio Mesa Center PIA, and an antenna panel for the Price River-Woodside site. Pending diagnostic site visits, additional parts and equipment may be needed for other PIA sites as well.

Recommendations:

- 1) Continue to coordinate with field investigators and hatchery staff early in calendar 2024 to identify PIT equipment needs for the coming year and purchase equipment and supplies as needed.
- 2) Continue to monitor PIA performance remotely and perform O/M site visits as required.
- 3) Prioritize and proceed with needed repairs in FY24 (see “Current Status of UCRP PIAs”, above) as funding, labor and stream conditions permit.
- 4) Continue discussions with Recovery Program field office leaders and PDO coordinators about changing roles and responsibilities in the planning and installation of new PIAs and operation and maintenance of existing PIAs over the several years.

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Project Status:

Funds Provided in FY23: \$25,000

Funds Expended: \$0

Remaining FY22 funds: \$25,000 (funding from previous years was used to complete FY23 tasks).

Percent of FY22 tasks completed: about 75% (mostly White River upgrade).

Status of Data Submission

Data uploads to STReaMS are current as of this writing.

Signed:

/s/Dave Speas

Fish Biologist, USBR

December 12, 2023