

# UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2022 Annual Report

PROJECT: 179

**Project Title:** PIA operation/maintenance and PIT equipment

**Bureau of Reclamation Agreement Numbers:**

R19AC00153, 140R4018D0012

**Project/Grant Period:**

Start date: 09/16/2019

End date: 09/30/2024

Reporting period end date: 9/30/2022

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 FY2022, we monitored all sites remotely and made several visits to perform upgrades, updates and other operation/maintenance tasks at four PIA locations in the Upper Colorado River Basin (Green River Canal, Tusher Diversion, Price River (three sites), San Rafael River (three sites). Reclamation purchased battery packs and tagging equipment for the Vernal FWCO in March 2022 and used unspent, end-of-year Program funds to purchase 210,000 pre-loaded PIT tags, four submersible antennas and eight battery packs, 10 HPE lite scanners, tagging guns and gun needles. 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.

### Green River Action Plan

II. Restore habitat

II.B.2 Screen Tusher Wash diversion to prevent endangered fish entrainment.

II.B.2.b Design.

V. Research and Monitoring

### White River Action Plan.

V. Research and Monitoring

V.A Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.

### Colorado River Action Plan

II. Restore Habitat

II.B.2 Restore fish passage at Price Stubb.

II.B.2.a.(5) Monitor and evaluate success.

V. Research and Monitoring

V.A Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.

### Dolores River Action Plan.

V. Research and Monitoring

V.A Survey native and nonnative fish in Dolores River

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

Task 1: PIA operation and maintenance:

#### **October 2021 – September 2022:**

Personnel from the Utah State University Fish Ecology Lab (USU; Peter MacKinnon, Gary Thiede) to repaired and updated PIAs in various locations throughout the Upper Colorado River Basin and provided technical support to multiple agencies involved with the various fixed PIA's and mobile monitoring equipment. USU also worked with agencies on purchasing, distribution, deployment, and

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maintenance of mobile submersible (wagon wheel) systems that have seen increased use over the past few years. USU personnel also attended various meetings and planning sessions for determining expansion of the PIA network in the Upper Colorado River Basin.

Additionally, 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, Dolores at Disappointment Creek, San Rafael River (three sites), Price River (three sites), Tusher Wash Diversion, White River at 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 data base at the Colorado Natural Heritage Center. USU is working directly with the programmers at the Heritage Center and Chris Michaud (Recovery Program) to continue the process of automating data collection from the various PIA sites in the basin.

Personnel from USU and Reclamation traveled the Green River Utah on March 20-24, 2022 to assess the antenna systems at Tusher Wash, the Green River Canal, Price River, three sites on the San Rafael River.

### Green River Canal and Tusher Wash:

We evaluated noise problems at Tusher Wash, tried a battery switcher to see if noise is resolved. The battery switcher did not help the noise issue. They changed out the 4G cell modem for LTE modem connected to the Biomark Biologic web interface, which still didn't resolve the noise issue, although the system is still detecting and logging tag numbers. We also visited the Green River Canal, and no problems were noted there.

### Price River Woodside:

We visited the Price River Woodside PIA to determine if they could exchange the damaged antenna. The river was running too high for in-river work, so a 20' antenna to the Woodside site was left behind for installation when river conditions allow.

### San Rafael Cottonwood Wash, and Hatts Ranch:

We checked on both Cottonwood Wash system and Hatts Ranch system. They pulled a damaged cable node from the Cottonwood Wash site (antenna 3) which had been chewed by an animal. They also removed 'dead' tags from 2 antennas at Hatts Ranch, where all four antennas were functioning well.

### Dolores and San Miguel rivers:

Although not supported by Recovery Program funding, USU had recently installed a PIA system in the Dolores River near Paradox, CO and one in the San Miguel several miles upstream from its confluence with the Dolores. USU visited the San Miguel PIA during the March trip, and minor adjustments were made to its data logger.

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### Current Status of UCRP PIAs

- Dolores River Rio Mesa Center: Antennas 1 and 5 appear to be offline. These are the 1<sup>st</sup> river left antennas on both rows. This system will need to be physically checked early 2023
- 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.
- Price River 3 sites: Mounds all antennas functioning. Woodside, antenna 1 still needs to be replaced. Confluence site, antennas 3 and 4, downstream row appear to be down on the Biologic site. A physical visit to the site is required in 2023.
- Price Stubb: All antennas functioning
- San Rafael 3 sites: Chaffin Ranch, 2 out of 4 antennas functioning. Still operating on the old MUX system. Plan to update site with new antennas on a Master Controller system in 2023. Cottonwood Wash, Antenna 3 node needs to be replaced. Antenna 1 and antenna 4 went offline Sep 2022. The site will need to be visited to determine the problems and repair as needed in 2023. Damage from animals (most likely beaver) continue to cause issues with San Rafael PIAs.
- Hatts Ranch, no satellite connection since 14 October 2022, all antennas were functioning before connection was lost.
- White River Bonanza Bridge: Still running on obsolete MUX system. Antennas 1 and 6 not functioning. All planning and purchasing of equipment to update to a Master Controller session was done in FY22, and equipment is ready to install. Scheduling conflicts postponed the installation to October 2022, however, and high flows at that time prevented us from conducting the work safely. The project will take place later in FY23.

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

Reclamation placed two orders were placed for PIT equipment in FY22. Six battery packs for submersible antennas and tagging needles were purchased for the Vernal FWCO in May 2022, although delivery was delayed by a few months due to supply chain issues. In August 2022, also, Reclamation placed an order for additional equipment and supplies using unspent Program funds. The order consisted of 210,000 pre-loaded PIT tags, four submersible antennas and eight battery packs, 10 HPE lite scanners, plus tagging guns and gun needles. This order currently hasn't been completely fulfilled but is expected later in 2023. Additionally, equipment for O/M activities purchased by USU included ISO1001 nodes, antenna panels, modems, and an entire master controller system for the White River/Bonanza Bridge PIA upgrade.

All Biologic account and other communication fees incurred for 2022 were paid in advance (Dec 2021).

**Additional noteworthy observations:** Passage of the Bipartisan Infrastructure Law in FY22 (PL 117-58, section 40901, subsection 12) made additional funds (about \$800,000) available to the Recovery Program for expansion of its PIA network. Preliminary planning discussions with Program Partners have identified sites for deployment of single-loop autonomous PIAs, which collectively increase frequency of detections, fill in spatial gaps in coverage ultimately increase our ability to answer research questions. About 15 or more such installations are currently being contemplated. Installation of this many new antennas will require substantial interagency coordination among field office personnel, data

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management staff, independent contractors, and landowning agencies to partake in planning, permitting, physical installation of PIAs and their operation and maintenance.

### **Recommendations:**

- 1) Continue to coordinate with field investigators and hatchery staff early in calendar 2023 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) Proceed with needed repairs in FY23 (see “Current Status of UCRP PIAs”, above) as labor and stream conditions permit.
- 4) Finalize locations for additional PIA installations in FY23 and FY24 (BIL funding).
- 5) Convene a series of meetings with Recovery Program field office staff and PDO coordinators to identify roles and responsibilities for planning, permitting, installation, operation and maintenance of additional PIAs identified in (4)

### **Project Status:**

Funds Provided in FY22: \$158,282

Funds Expended: \$105,973

Remaining FY22 funds: \$158,282\*

Percent of the FY22 tasks completed: about 50%\*\*

\*Funds expended in FY22 were drawn out of funds awarded in FY21.

\*\*We intended to complete the Bonanza Bridge PIA upgrade in FY22 but were unable to do so due to scheduling and stream flow issues.

### **Status of Data Submission**

Data uploads to STReaMS are current as of this writing.

### **Signed:**

/s/Dave Speas

Fish Biologist, USBR

December 6, 2022