

# UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM

FY 2020 ANNUAL REPORT

PROJECT: 170

## **Project Title**

Development of a Centralized PIT Tag Database for the San Juan and Upper Basin Recover Programs, 2020-2024

## **Bureau of Reclamation Agreement Number:**

R20AP00027

## **Project/Grant Period:**

Start date: 06/01/2020

End date: 12/31/2024

Reporting period end date: 09/30/2020

Is this the final report? Yes \_\_\_\_\_ No X

## **Principal Investigator:**

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## **Abstract:**

The Colorado Natural Heritage Program (CNHP) at Colorado State University developed an online data system (the Species Tagging, Research and Monitoring System or STReAMS) for the Bureau of Reclamation and the Upper Colorado and San Juan River Endangered Fish Recovery Programs. The database is designed to track PIT tags and endangered fish activities in the Upper Colorado River Basin. The data system can be accessed at [streamsystem.org](http://streamsystem.org) (registration is required). CNHP is on the sixth full year of the project. Throughout Year 6, the final release was pushed live, bug fixes were addressed, performance optimization was monitored, and software/hardware updates were ongoing. In addition, remote antenna data were monitored and imported, and the best way to seamlessly and securely facilitate automatic uploads of was discussed.

## **Study Schedule:**

FY20-FY24

## **Relationship to RIPRAP:**

General Recovery Program. Conduct interagency data management program to compile, manage, and maintain all research and monitoring data collected by the Recovery Program.

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### **Accomplishment of FY 2020 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:**

Deliverables thus far include an enhanced version of the website at <https://streamsystem.org/>. The fiscal year 2020 project had a delayed start date. The goal was to have the FY20-24 agreement in place in January, 2020; however, the agreement was not in place until June, 2020. Thus, there are still tasks to complete, the most important of which is to switch all of the Passive Interrogation Arrays (PIAs) to the Biologic system so they are included in the weekly uploads that take place on Sunday nights. This involves working closely with BioMark to ensure the current data in STReaMS is reconciled with the old system before turning on the new system to prevent data loss. It is also important to discuss the best way to automatically import these data into STReaMS into the future and ensure the process is as secure and reliable as possible.

A list of completed tasks for FY20 is below.

- Bug Fixes and Issues addressed in the latest release which can be found at <https://streamsystem.org/webAdmin/webUpdateLog.php> (log in required)
  - Testing for the release
- Other bugs addressed:
  - Fix issues with sorting columns in tables on QC attributes page
  - Rework optimization code to capture all fragmented indices
  - Fix bug with site effort uploads
- New message for the download buttons
- Adjusted hyperlink in automatic emails so it is easier to copy/paste into web browsers (response to issues with new federal email system)
- PIA work
  - Work with Biologic to restore data files that were overwritten with empty files through the automated FTPS data transfer
  - Troubleshoot broken FTPS site with BioMark
    - Adjust FTPS settings to fix compatibility issues with Biologic
  - Meeting with BioMark engineers to discuss optimal PIA data collection process
  - Compile current data status for all PIAs to prepare for switch from Loggernet to Biologic
  - Add antennas 08 and 09 to PNM Weir – these records were getting rejected because the new antenna numbers were not in STReaMS resulting in 5,000 rejected records
    - Draft code change (still on test site) to add a button to resubmit all rejected PIA records at once
  - Upload data for San Juan below Waterfall PIA (not connected to Biologic, must get data from Peter MacKinnon)
    - Reformat data format to work with upload code
- Removed 203,686 detection encounters added to STReaMS due to a stuck tag
  - Change tag status to “Shed” and fish to “Dead”
- Server and Database Maintenance
  - Monitor database logs and scheduled tasks to minimize log file sizes
  - PHP upgrades and adjustments to web code as needed
  - Windows Updates and backups
- Database Manager support

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- Set up Chris Michaud as a backend MS SQL user on the test site to use R to support recovery program annual reporting requirements and generate data summaries
- Refresh test website data periodically with data from the live site; update user permissions for R access
- Project management and administrative tasks to set up new five year agreement

### **Additional noteworthy observations:**

As of November 16, 2020 the database has:

- 1,913,782 PIT Tags
- 1,353,047 Individual Fish
- 3,196,976 Encounters

Between September 2019 and September 2020, Google Analytics show:

- 18,830 page views
- 3,081 sessions
- Average session duration of 7:38 minutes
- Average of 6.11 pages per session
- Bounce Rate of 36.19%

### **Recommendations:**

Server maintenance will continue to be the responsibility of CNHP. Recommendations under the FY20-24 agreement are listed below. CNHP will continue to work closely with Database Managers to adapt to emerging needs.

CNHP will maintain the STReaMS database and enhance existing features during the Federal FY20-24. Tasks are broken out below.

#### *Task 1: Server Maintenance*

- Maintain the server, server security, and perform regular database backups
- Maintain the test server and development environment
- Perform necessary software installs and upgrades including Windows operating system, Windows updates, MS SQL Server, MS TFS, and PHP. Create checkpoints before upgrades. Ensure all code performs as expected following updates.
- Assess overall performance and optimize resources
- Maintain Database Manager credentials to access SQL Server
- Replace hardware (e.g. server, hard drives, RAM, etc.) as needed and configure new hardware

#### *Task 2: Website Maintenance and Feature Enhancements*

- Enhancements to existing tools as funding allows
  - Batch uploads
  - QC tools

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- Calculated fields
- Work with key recovery program staff to ensure complete PIA data in STReaMS
  - Shift units from Loggernet process to new Biologic FTPS upload process as they are upgraded
  - Needs assessment and training with key staff
  - Add and remove PIAs to the automatic upload system as needed
- Work with Database Managers to develop any necessary custom queries, including nontagged fish queries
- Bug fixes
- Internal testing and stress tests
- Update online help, data dictionary, user manuals, Data Managers user guide, and system documentation
- Train Recovery Program participants on features and enhancements
- Other priorities identified by Recovery Program Database Managers

### *Task 3: Project Management*

- Prepare annual reports
- Perform project management and CSU compliance
- Maintain regular communication with Database Managers

*FY21 includes the purchase and installation of a new server to run the database and website.*

### **Project Status:**

Ongoing

### **FY 2020 Budget Status**

Funds expended are estimates only. Official financial information comes from CSU Sponsored Programs. Budget had a delayed start date of 6/1/2020.

Funds Provided: \$33,801

Funds Expended: \$12,444

Difference: \$21,357

Percent of the FY 2020 work completed, and projected costs to complete: approx. 37% work completed, estimate \$21,357 to complete

Recovery Program funds spent for publication charges: \$0

### **Status of Data Submission**

Not Applicable

### **Signed:**

Amy Greenwell

Principal Investigator

11/20/2020