

COLORADO RIVER RECOVERY PROGRAM
FY 2014 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: C-28a

Stationary PIT detection system in the Green River Canal, Green River, UT

USU cooperative agreement number R11AC40005

Period of performance Oct 1 2013 – Sept 30 2014.

Lead Agency: U.S. Bureau of Reclamation

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I: Abstract: The goal of this project is to evaluate entrainment of PIT-tagged native fish, both non-listed and endangered, in the Green River Canal (near Green River, Utah) using a passive interrogation array (PIA). We obtained permission from the Green River Canal Company to install and operate a PIA in the Green River Canal on January 7, 2013. On March 20, 2013 we completed our installation and activated the system. In 2013, canal operations began in early April and lasted to mid-November. The system functioned uninterrupted for the entirety of the 2013 irrigation season and detected a number of PIT-tagged fish during that time. During spring 2014 we installed a second PIA several hundred meters below the existing PIA and below a canal siphon. The purpose of this installation was to further evaluate distance fish travelled through the canal and increase detection efficiency of the study. Preliminary results indicate

659 and 311 native fish were detected in the canal in 2013 and 2014, respectively. These were primarily endangered species, with Razorback Sucker *Xyrauchen texanus* comprising the majority of entrained fish in both years, followed by Colorado Pikeminnow *Ptychocheilus lucius* and Flannelmouth Sucker *Catostomus latipinnis*. Further data analysis is pending.

II. Study schedule: FY13-FY16

III. Relationship to RIPRAP:

Green River Action Plan

II. Restore habitat

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

II.B.2.b Design.

IV. Accomplishment during FY 2014: Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: April-November 2014 (irrigation season): Activate and operate system; download antennae data, perform diagnostics, repair system if necessary; system shut-down.

System was activated prior to the onset of the 2014 irrigation season (late March 2014). Additionally, in 2014, we installed a second PIA several hundred meters below the existing PIA and below a canal siphon. The purpose of this installation was to further evaluate distance fish travelled through the canal and increase detection efficiency of the study. The new system consisted of upgraded components (2 Biomark IS1001 antenna nodes with master controller and 2, 20' "stout" pass-by antennas). System shut-down is pending at this time (canal is in the process of being dewatered). Data is being consistently downloaded to PIs computers during the irrigation season.

Task 2: December 2014: Annual report.

Preliminary results indicate 659 and 311 native fish were detected in the canal in 2013 and 2014, respectively. These are primarily endangered, with Razorback Sucker comprising the majority of entrained fish in both years (82% and 79% during 2013 and 2014, respectively), followed by Colorado Pikeminnow (12% and 5%) and Flannelmouth Sucker (5% and 10%). A single Humpback Chub *Gila cypha* was also entrained in 2013. However, it should be noted that these data are not meant to be representative of all the fish entrained in the canal, as many individual native and nonnative fish are entrained that do not contain PIT tags.

Initial contact with canal operator yielded anecdotal canal diversion amounts.

Using these approximations, we calculated that the canal diverted about 43% of the Green River from July – September during 2013 but only 19% in 2014 during the same time period. Peak entrainment of fish occurred immediately after runoff (July) during both years. Most entrained razorback sucker were stocked in Green River, UT (river mile [RM] 120) but about a third came from Middle Green River (>RM 300 upstream). Based on tagging data from other studies in 2013, 14 of 20 entrained Colorado Pikeminnow came from areas upstream of the canal (5 fish moved >300 RM [White River], 3 moved 50-100 RM and 6 moved 50 RM or less); only 6 fish moved upstream (< 50 RM) and became entrained. Most Bonytail *Gila elegans* detected in 2014 were stocked in the White River and some made the 300+ mile journey to the canal in as little as 6 days (mean time at large = 40 d). During the 2014 irrigation season, the upper antenna array, installed in 2013, did not detect about one third of all fish detected by the lower antenna array, installed in 2014. The lower system should be replaced with upgraded equipment to withstand electrical interference and improve detection efficiency.

V. Recommendations:

- Resume PIA operations prior to the onset of the 2015 irrigation season.
- Consider installation of upgraded PIA components at the upper PIA location to increase detection efficiency.
- Use newly created Recovery Program database to conduct a thorough investigation into the capture histories of fish entrained into the canal.

VI. Project Status: Ongoing

VII. FY 2014 Budget Status

- A. Funds Provided: \$33,918
- B. Funds Expended as of September 30, 2013: \$33,918
- C. Difference: \$0
- D. Percent of the FY 2014 work completed, and projected costs to complete: 100%.
- E. Recovery Program funds spent for publication charges: \$0

VIII. Status of Data Submission (where applicable): Not Applicable

Signed: /s/ Dave Speas
Principal Investigator

November 14, 2014