COLORADO RIVER RECOVERY PROGRAM RECOVERY PROGRAM
FY 2017 ANNUAL PROJECT REPORT PROJECT NUMBER: C-28a

I. Project Title: Stationary PIT detection system in the Green River Canal, Green River, UT

II. USU Cooperative Agreement Number: R11AC40005
Lead Agency: U.S. Bureau of Reclamation

III. Principal Investigators:

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IV. Abstract:

The goal of this project is to evaluate entrainment of native fish (PIT-tagged non-listed and endangered individuals) in the Green River Canal (near Green River, Utah) using a passive interrogation array (PIA). The PIA includes two sub-arrays (one each below the first flume and the first siphon downstream of the canal head gates) consisting of two antennas each. In 2017, 273 individual fish were detected in the Green River Canal during the irrigation season (March – November), which represents the second lowest number of individual fish entrained annually since antennas were installed in 2013. Of these, 219 were identified through Species Tagging, Research and Monitoring System (STReaMS; streamsystem.org) and were comprised of 165 razorback sucker, 37 bonytail, 13 Colorado pikeminnow, and 4 flannelmouth sucker. Detection frequency tended to be highest following cessation of spring peak flows in early July.

V. Study schedule: FY13-FY22 (approx.)
VI. 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.
II.B.2.c Construct.

VII. Accomplishment during FY 2017: Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: March-November, 2017 (irrigation season): Activate and operate system; download antennae data, perform diagnostics, repair system if necessary; system shut-down.

The flume and siphon PIA sub-arrays were activated prior to the onset of the 2017 irrigation season (late March). A disruption in communications with the flume antenna occurred in June 2017 when it was discovered that the cell antenna had been stolen. A new antenna was installed in August, and the data collected during the communication blackout was manually downloaded in September. Our fish detection engineer worked closely with the Colorado Natural History Program to upload data, monitor data files and answer data- or site-related questions pertaining to the Green River Canal PIA.

Task 2: December: Annual report.

A total of 273 individual tagged fish were detected by at least one PIA sub-array in the Green River Canal in 2017 (Figure 1a-f), the second lowest number since antennas went into operation in 2013. Of these, 54 were not identifiable using STReams and will need to be revisited after recent stocking and field collection data is added to the system. Razorback sucker comprised 75% (165 fish) of all identifiable fish detected in 2017, followed in order of frequency of detection by bonytail (17%; 37 fish), Colorado pikeminnow (6%; 13 fish), and flannelmouth sucker (2%; four fish).

The highest rates of entrainment occurred in the base flow months of August (65 unique fish entrained), September (42 fish) and October (61 fish), which collectively accounted for 62% of all fish entrained in the seven month monitoring period. Entrainment rates were lowest in June (17 fish entrained), perhaps in relation to peak flows (ca. 22,000 cfs), but similar flows were observed in May when 28 fish were entrained. Razorback sucker entrainment occurred throughout the irrigation season but peaked in October (43 fish entrained). Bonytail were detected at low levels throughout the irrigation season but peaked slightly on isolated occasions in April and September. Colorado pikeminnow entrainment did not occur until mid-July.
VIII. Recommendations:

- Continue to analyze data to determine entrainment characteristics (species, timing).
- Continue to pursue a remedy for entrainment under Project C28. Currently, construction of a fish excluding weir near the top of the Green River Canal is slated to begin during the winter of 2018–2019. Weir design will include PIA installations at several locations including above and below the weir and in the return channel to the Green River. Thus, we will be able to assess efficacy of fish exclusion prior to and following construction of the weir.

IX. Project Status: Ongoing

X. FY 2016 Budget Status

A. Funds Provided: $6,025
B. Funds Expended as of September 30, 2016: $6,025
C. Difference: $0
D. Percent of the FY 2016 work completed, and projected costs to complete: 100%.
E. Recovery Program funds spent for publication charges: $0

XI. Status of Data Submission (where applicable): Entrainment data from March through November 8, 2017 has been submitted to STReaMS.

Signed: /s/ Dave Speas Nov 13 2017
Principal Investigator
Figure 1a - f. Detections of individual fish (first detection only) in the Green River Canal, irrigation season 2017. Data are preliminary, please do not cite.