

**SJRIP O&M of Existing PIT Tag Antennas and Evaluation of Data  
2017 Project Proposal**

Mark McKinstry, Ph.D. UC-735  
Bureau of Reclamation  
125 South State Street, Room 6107  
Salt Lake City, UT 84138-1147  
Phone 801-524-3835  
FAX 801-524-5499  
mmckinstry@uc.usbr.gov

**BACKGROUND:**

PIT tags are implanted in various fish species captured through various projects directly supported by the SJRIP, or funded through other agencies and projects (CDP&W, BOR, BLM, NMG&FD, and UDWR). Stationary PIT Tag antennas have been installed at various locations in the San Juan River Basin to passively detect fish as they swim above, through, or underneath the antennas. These antennas require periodic maintenance and support to keep them running and operational. Additionally cell and satellite service is required to access the antennas and download data and perform diagnostics. Locations and numbers of antennas at various sites are listed below:

- 1) PNM Weir and Fish Passage
  - a. Four pass-over antennas, modified with concrete bases are located below the weir
  - b. Two pass through antennas are located in the fish passage.
  - c. All six antennas are served by a single master controller located in a protected shed at the fish passage facility. The master controller is accessed using a Verizon cell data modem.
- 2) Hogback Irrigation Canal and Fish Weir, ~ 20 miles upstream of Shiprock, NM
  - a. Seven pass-through antennas are installed at various locations in the Hogback Fish Weir facility.
  - b. Five antennas are served by a master controller and bank of batteries in a protected shed at the Hogback Irrigation Site that controls the various gates connected to the fish weir. The master controller is accessed using a Verizon cell data modem.
  - c. Two antennas are located approximately 0.5 mi upstream of the fish weir near the canal headgate. These antennas are served by a master controller and bank of batteries (connected to 110 AC power source) located at the antennas. This site is accessed using a Verizon cell data modem.
  - d. Six antennas will be installed in 2016 in the bypass and raft launch channel that is south of the canal. These antennas will be served by the same Master Controller and power source used to operate the antennas at the head of the headgates.
- 3) TNC Restoration Site ~ 20 miles west of Shiprock
  - a. Four pass-over antennas are installed in a secondary channel created by restoration activities conducted by TNC.
  - b. The four antennas are served by a single master controller and solar-energy supplied battery bank on an island created by the restoration activities. The site is accessed using a satellite data modem.
- 4) McElmo Creek, ~ 25 miles upstream of Bluff, UT
  - a. Five pass-over antennas were installed in McElmo Creek approximately 200m upstream of the confluence with the San Juan River.
  - b. The antennas are served with a multiplexing antenna controller and the controller is accessed using a Verizon cell data modem.
- 5) Submersible antennas located near the waterfall on the San Juan River near Gouldings, AZ.

- a. Submersible antennas are installed at various locations including the waterfall near Gouldings, AZ, and Colorado pikeminnow spawning bar near 4-Corners Bridge, CO, UT, AZ, NM.
  - b. Additional submersible antennas and batteries are being purchased in 2016 to augment detections at additional sites.
- 6) Floating PIT tag antenna system
- a. A floating PIT Tag antenna system has been constructed and used in the San Juan in several locations including below the waterfall in the San Juan River and in the river between Hogback diversion and Bluff, UT. The system will also be deployed in the upstream portions of the San Juan Drainage including the Animas and upper San Juan rivers.

#### **METHODS:**

- 1) Stationary PIT tag antennas will be contacted periodically (bi-weekly) to check the settings, download the data, and perform diagnostics of the systems. Sometimes problems arise (batteries drain down due to lack of sun, antennas are washed away, wires are cut) that cannot be solved remotely. In these cases a site visit must be conducted by a technician to repair the system. The SOW and budget include the replacement of one antenna during the work period. If an antenna is not replaced the funding will be used to purchase additional PIT tags or submersible antennas to be used by other biologists.
- 2) Submersible antennas will be deployed at the waterfall for a continuous period from late February 2017 till August 2017 in an attempt to document fish movements and usage of the river immediately downstream of the waterfall.

#### **TASKS – 2017**

1. Maintain and operate stationary and portable PIT tag antennas
2. Replace one PIT tag antenna (likely at McElmo or TNC Restoration site)

#### **FY 2017 BUDGET**

#### **O&M of Existing Antenna Systems, Replacement of one Antenna, and Data Management**

##### **A) Labor**

Position	Salary total/hr	No. persons	Total Hours	Total cost
BOR Technical Representation for Contracts and Agreements	\$80.00	1	100	\$8,000.00
BioMark or USU Staff (contract)	\$80.00	1-2	200	\$16,000.00
Contract Employee Data Management	\$50.00	1	200	\$10,000.00
<b>Total</b>				<b>\$34,000.00</b>

##### **B) Travel**

Position	Destination	Purpose	Days	Lodging	Per diem	Other*	Total
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				per day/total	per day/total		
Reclamation Technical representative	Farmington, Shiprock	Project evaluation or field trips	4 trips @ 5 days/trip	\$100/\$500	\$40/\$800	\$2750	\$3,300.00
BioMark/USU representative	Boise, ID; Kennewick, WA; various	Field trips O&M Antennas	3 trips @ 5 days/trip	\$100/\$1000	\$40/\$600	\$2500	\$2000.00 \$1,500.00 \$655.00
<b>Total</b>				\$1,500.00	\$1,400.00	\$5,250.00	\$11,255.00

\*mileage of 5,000 mi at \$0.55/mile

**C) Equipment**

Item	Unit Cost	Number	Total cost
Antenna system	\$10,000	1	\$10,000
<b>Total</b>			\$10,000.00

**Budget Summary  
FY-2017**

Category	Total
Labor	\$34,000.00
Travel	\$5,250.00
Equipment	\$10,000.00
<b>Total FY2017 Budget</b>	<b>\$49,250.00</b>

**Projected funding:**  
**FY-2018** \$50,000.00  
**FY-2019** \$50,000.00