Work Task C23: Evaluation of Remote Sensing Techniques for PIT-Tagged Fish

FY09 Estimates	FY09 Actual	Cumulative Accomplishment Through FY09	FY10 Approved Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate	FY13 Proposed Estimate
$60,000	$70,985.95	$385,138.21	$0	$0	$0	$0

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Start Date: FY07

Expected Duration: Closed in FY09

Long-term Goal: Conduct long-term system monitoring and adaptively manage augmentation stockings of RASU and BONY.

Conservation Measures: BONY5 and RASU6

Location: Reaches 2 and 3 and Willow Beach NFH; Arizona, Nevada, and California

Purpose: Monitor augmentation stockings in a cost-effective and passive manner.

Connections with Other Work Tasks (past and future): This work task migrated out of G3. This action is related to B8 as results may influence future PIT-tag equipment purchases. This technique will be incorporated into the system monitoring work task (D8).

Project Description: Current efforts to contact repatriated native fish are labor intensive and require direct handling of fish during the spawning season. Remote sensing may prove to be less costly, more efficient, and less stressful on these sensitive native fish species. Under this work task, Reclamation will test the effectiveness of flat plate, circular, and directional antennae, and associated hardware and software for remote sensing of PIT-tagged RASU and BONY. The project will evaluate designs for guided as well as non-guided systems for the detection of PIT-tagged fish at spawning areas. Methods for collecting, storing, and retrieving contact data will be investigated.

Previous Activities: Starting in FY07, Passive Integrated Transponder (PIT) antennae and receivers were purchased from suppliers and deployed under controlled laboratory conditions at Willow Beach NFH. Results were very promising for the new 134-kHz tags. PIT-tag receivers were then tested in Lake Mohave. In the field, the flat-plate antennae, attached to receivers by 5-m cables, were deployed at known RASU congregating sites on gravel shoals below Hoover Dam. These tests evaluated both contact efficiency and field readiness of the deployment package. Deployment and data

collection were also conducted in conjunction with RASU larvae collection trips around Cottonwood Basin. Between 13 February and 30 April 2008, remote sensing units logged 1,400 channel hours of deployment time, resulting in 1,731 contacts with PIT-tagged RASU at four spawning locations representing 167 unique RASU.

FY09 Accomplishments: Remote detection units were deployed at known RASU spawning sites as either free-floating or shore-based stations with a maximum antennae depth of 5 meters and battery life of up to 48 hours. Deployment and data collection were again conducted in conjunction with RASU larvae collections. Between February and April 2009, remote sensing units logged 1,049 channel hours of deployment time, resulting in 3,083 contacts with PIT-tagged RASU at four spawning locations, representing 191 unique RASU. Total contacts between 2008 and 2009 nearly doubled due in large part to a new experimental antennae design that increased detection area six-fold. In addition, 20 PIT-tagged RASU were detected at two spawning sites, indicating a level of spawning site migration that previously could only be detected with sonic tag telemetry. Modifications made during 2009 incorporated solar battery chargers, which doubled deployment time (now up to 96 hours).

FY10 Activities: Closed in FY09.

Proposed FY11 Activities: Closed in FY09.

Pertinent Reports: The final report will be posted to the LCR MSCP Web site.