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

FY08 Estimates	FY08 Actual	Cumulative Accomplishment Through FY08	FY09 Approved Estimate	FY10 Proposed Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate
$145,000	$148,207.26	$287,152.26	$60,000	$0	$0	$0

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Start Date: FY07

Expected Duration: 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.

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. In conjunction with fish-tagging operations, flat-plate PIT-tag antennae were set in the bottom of holding tanks with tagged fish introduced above the antennae. Netting was set at known distances (0, 2, 4, and 6 inches) above the antennae. Individual detections were recorded to determine maximum detection distance.

PIT-tag receivers, batteries, and associated equipment were then installed in water-proof containers for field deployment. 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. Modifications were made as needed to improve reliability in the field. Data were collected and submitted to ASU for analysis and will be evaluated in a final report with recommendations for final application to the system monitoring program.

FY08 Accomplishments: Deployment of remote detection equipment at known RASU and BONY spawning sites was conducted. Four, 2-channel remote sensing units were deployed 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 conducted in conjunction with RASU larvae collection field trips in an effort to reduce travel costs. Between February 13 and April 30, 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 Activities: Remote PIT-tag sensing units will again be deployed at spawning sites during the larval fish collection period (February to April). Up to three additional remote sensing units will be constructed for use on Lake Mohave and for use in main stem and off-channel applications. Different antennae configurations will be evaluated in an effort to expand detection area per channel. Solar battery charging systems will be evaluated to extend the deployment time in secure, off channel sites. A final report will be prepared.

Proposed FY10 Activities: Remote sensing will be incorporated into continued RASU and BONY monitoring as part of work tasks D8, C12, and F5.

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