Work Task C25: Imperial Ponds Native Fish Research

FY09 Estimates	FY09 Actual	Cumulative Accomplishment Through FY09	FY10 Approved Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate	FY13 Proposed Estimate
$225,000	$228,412.27	$439,253.69	$235,000	$235,000	$250,000	$250,000

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Start Date: FY08

Expected Duration: FY18

Long-term Goal: Species research, backwater restoration

Conservation Measures: RASU2, BONY2

Location: Reach 5, Imperial National Wildlife Refuge, Arizona

Purpose: Monitor six ponds created as native fish refugia on Imperial NWR to ascertain the overall success of each pond in producing viable populations of native fish, and evaluate the role and contribution of various structures and features developed within the ponds in attaining this success.

Connections with Other Work Tasks (past and future): The RASU and BONY to be stocked into the ponds are provided through B1, B2, B3, B4, and B5. Ponds were developed under E14, and additional monitoring support will be provided through F5. Data are maintained in part under G1.

Project Description: This activity will monitor and evaluate the development of native fish refugia in six constructed ponds on Imperial NWR. Pond construction incorporated design features such as riprap, spawning gravels, hummocks, and increased depth, all thought to provide suitable habitat for life cycle completion by BONY and RASU. The experimental design of this research program will evaluate the role and importance of each of these features toward accomplishing successful communities of native fishes. The design includes an initial fish stocking strategy for the ponds, and a monitoring program for selected features of the habitat and fish.

Previous Activities: Water quality is currently being monitored at fixed water quality stations within each pond. The monitoring of pond temperature, conductivity, pH, and dissolved oxygen will occur on a monthly basis from October to May, and twice a month from May through September.

A total of 1,601 BONY and 834 RASU were stocked in five of the six ponds. One pond received both BONY and RASU. All fish were PIT tagged prior to release. Several fish monitoring techniques were assessed. Imaging sonar was determined to provide inconsistent data and was discarded as a viable monitoring technique. Swimming transects was marginally successful when water clarity was greater than 3 meters. Hoop netting in autumn was effective in capturing young-of-year BONY, but adult BONY were rare. Adult RASU were effectively captured only by using entanglement nets during autumn sampling. Five remote PIT-tag scanning units were developed and tested. These units provided multiple mark-recapture population estimates for each pond prior to autumn sampling, and declines in abundance of native species in all four ponds were documented.

FY09 Accomplishments: Monitoring of pond temperature, conductivity, pH, and dissolved oxygen will continue along with the deployment of remote PIT-tag scanning units. Spawning activity will be monitored using a combination of remote PIT-tag scanning units and direct observation. Pond 6 was stocked with 198 RASU in January 2009. Renovation of pond 1 through dewatering to eliminate nonnative fish species was unsuccessful as western mosquitofish (*Gambusia affinis*) are still present. Mapping software and aerial photography were used to map discrete habitats in each pond and habitat use data was acquired using remote PIT-tag scanning units.

FY10 Activities: Monitoring and research activities will continue with increasing emphasis on habitat use, recruitment dynamics, individual and population growth, and effects of non-native species. Habitat use will be assessed in context with pond components such as hummocks, riprap, gravel substrate, aquatic vegetation, and pond survival and recruitment. Renovations will continue on the ponds. Treatment techniques will be tested and evaluated at full pool to compare with treatments conducted following draw downs.

Proposed FY11 Activities: Monitoring and research activities associated with stocked fish populations will continue. Evaluation of spawning gravels and artificial cover added in 2009 and 2010 will be completed. Tests will be conducted to evaluate water quality management systems. Quarterly team meetings will continue to be held on site.

Pertinent Reports: The scopes of work are available upon request, and completed work project reports are posted to the LCR MSCP Web site.