

Work Task C25: Imperial Ponds Native Fish Research

FY08 Estimates	FY08 Actual	Cumulative Accomplishment Through FY08	FY09 Approved Estimate	FY10 Proposed Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate
\$225,000	\$210,841.42	\$210,841.42	\$225,000	\$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 newly 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. The work will be directed by native fish experts who will interpret all field data and make recommendations as appropriate to guide the overall operation and future management of the ponds for native fish refugia.

A fishery coordination and advisory team will be formed with representatives from the USFWS, Reclamation, AGFD, and ASU. This team will meet on-site, quarterly throughout the period of study to keep all parties abreast of ongoing activities.

Previous Activities: This is a new start for FY08.

FY08 Accomplishments: Monitoring of pond temperature, conductivity, pH, and dissolved oxygen began in September (FY07) and continued at fixed water quality stations within each pond on a monthly basis from October to May, and twice a month from May through September FY08. During the hottest months, June-September, water was pumped into all six ponds between midnight and 7:30 a.m. to maintain adequate dissolved oxygen and lower water temperature.

A total of 577 RASU were split between two ponds and stocked in November 2007, and two ponds were stocked with a total of 1,601 BONY in December 2007. All fish were PIT tagged prior to release. After the stockings 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 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.

Spawning activity was not observed in any ponds stocked with native fish due to poor water clarity, but 23 RASU larvae were collected in pond 1, and juvenile BONY were observed and collected in pond 3. Eight adult RASU and one adult BONY were captured during autumn sampling along with 64 juvenile BONY in one pond. In addition, a suite of nonnative fish species was captured in all six ponds: threadfin shad (*Dorosoma petenense*), redear sunfish (*Lepomis microlophus*), bluegill (*Lepomis macrochirus*), warmouth (*Lepomis gulosus*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*).

FY09 Activities: Monitoring of pond temperature, conductivity, pH, and dissolved oxygen will continue along with the deployment of remote PIT-tag scanning units. An estimate of recruitment will be made using mark-recapture for young-of-year BONY in January FY09. Spawning activity will be monitored using a combination of remote PIT-tag scanning units and direct observation. Supplemental stockings of RASU are planned for December and January FY09, and renovation of at least one pond is planned in order to eliminate or reduce nonnative fish species. Mapping software and aerial photography will be used to map discrete habitats in each pond and habitat use data will be acquired using remote PIT-tag scanning units or additional techniques as made available. Data comparisons will include evaluation of BONY and RASU population parameters relative to physico-chemical and habitat features of each pond, and to presence of non-native species.

Proposed 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, rip-rap shore, gravel substrate, aquatic vegetation, and pond survival and recruitment.

Pertinent Reports: A progress report covering the 2007-2008 field seasons has been posted to the LCR MSCP Web site. The study plan for the research activities, which began in October 2008, is available upon request.