

## Work Task C25: Imperial Ponds Native Fish Research

FY12 Estimate	FY12 Actual Obligations	Cumulative Expenditures Through FY12	FY13 Approved Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate
\$250,000	\$246,544.45	\$1,065,280.10	\$250,000	\$250,000	\$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:** Evaluate six ponds created as backwater habitats at Imperial NWR to assess the efficacy of the ponds for native fish species, specifically BONY and RASU.

**Connections with Other Work Tasks (past and future):** BONY and RASU to be stocked into the ponds are provided through: Lake Mohave Razorback Sucker Larvae Collection (B1), Willow Beach National Fish Hatchery (B2), Achii Hanyo Rearing Station (B3), Dexter National Fish Hatchery (B4), and Bubbling Ponds Fish Hatchery (B5). Ponds were developed under Imperial Ponds Conservation Area (E14), and additional monitoring support will be provided through Post-Development Monitoring of Fish Restoration Sites (F5). Data are maintained in part under Data Management (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 developing self-sustaining native fish populations.

**Previous Activities:** Several fish monitoring techniques have been assessed for native fish monitoring at Imperial Ponds. Imaging sonar provided 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 by using entanglement nets during autumn sampling. Remote PIT-tag scanning units were developed and tested. These units can provide PIT tagging data for BONY and RASU year-round without causing distress to the fish.

Habitat use was evaluated for RASU in pond 2, 4, and 6. Habitat use for RASU shifted across seasons, but habitat preference in any given season was different for RASU populations in each pond.

BONY and RASU were implanted with acoustic transmitters to assess distribution. BONY were distributed in deep waters along the north, south, and northeast corner during daylight, and in open water across the length of the pond avoiding shallow areas during nighttime. RASU utilized deep waters west of the hummock during the day, night time monitoring results found RASU concentrated on the boat ramp and on or around the spawning beds. Spatial overlap was minimal between the two species.

**FY12 Accomplishments:** Remote PIT scanners were used to monitor population size and habitat association of BONY and RASU in Pond 1. Adult BONY population estimates ranged from 53 (March 2012) to 11 (August 2012). Adult RASU population estimates ranged from 131 (January 2012) to 103 (August 2012).

BONY survival was estimated at 53.5% and adult RASU survival was estimated at 92% over the 11-month study period. During annual autumn sampling, 28 BONY and 30 RASU were captured. Mean daily growth was 0.34 mm/day for BONY and 0.07 mm/day for RASU. No specific health issues were identified for either native species. No larval BONY or RASU were encountered, but juvenile RASU were captured and the population of new recruits was estimated at 130 fish.

BONY and RASU habitat associations were evaluated from targeted remote PIT scanning data. There were consistently more contacts for both species at night than during daytime. During summer deep open water areas were preferred by both species and little activity was detected. BONY contacts were few and habitat associations generally equivocal. RASU were associated with gravel beds during the nominal spawning season that peaked in late winter/spring.

Water quality was measured monthly or bi-monthly (temp > 27°C). Most parameters remained within established acceptable limits in all ponds (pH < 9.0, DO > 4 mg/l, and temperature < 33.3° C).

Development of a five-year research plan for Imperial Ponds was postponed pending results of a water management study in ponds 2 through 6. Results may influence future water needs and pond management.

**FY13 Activities:** Survivorship and recruitment of BONY and RASU will be evaluated in pond 1. Water quality and chemistry will continue to be monitored in all ponds. A five-year research plan will be drafted to include water management and fisheries research and management.

**Proposed FY14 Activities:** Research will continue based on the priorities developed under the five-year plan with an emphasis on factors influencing post-stocking mortality.

**Pertinent Reports:** The scopes of work are available upon request. Annual reports are posted to the LCR MSCP website.