

## Work Task C25: Imperial Ponds Native Fish Research

| FY10 Estimates | FY10 Actual  | Cumulative Accomplishment Through FY10 | FY11 Approved Estimate | FY12 Proposed Estimate | FY13 Proposed Estimate | FY14 Proposed Estimate |
|----------------|--------------|--|------------------------|------------------------|------------------------|------------------------|
| \$235,000      | \$213,756.65 | \$653,010.34                           | \$235,000              | \$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. The design includes an initial fish stocking strategy for the ponds, and a monitoring program for selected features of the habitat and fish.

Water quality is 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.

**Previous Activities:** A total of 1,601 BONY and 834 RASU have been stocked in five of the six ponds. BONY were stocked in the winter of 2007, RASU were stocked in the

winter of 2007, 2008, and 2009. Pond 2 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.

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 four ponds were documented. Renovation of pond 1 to eliminate nonnative fish species through dewatering 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 Accomplishments:** Monitoring of RASU and BONY populations continued using remote sensing, snorkeling, and netting. Autumn sampling was conducted in October 2009 and resulted in the capture of 17, 18, and 10 adult RASU in ponds 2, 4, and 6 respectively. No adult BONY were captured in FY10 although they are known to persist in Pond 2. One BONY larva and 11 RASU larvae were collected in Pond 2. Remote sensing was used in FY10 not only for adult population monitoring but also for the collection of habitat use data. Deployments were standardized and random deployment locations were stratified by habitats.

Habitat use for RASU shifted across seasons, but habitat preference in any given season was different for RASU populations in each pond. In addition, radio telemetry conducted in ponds 2 and 4 during the summer months provided additional support to the hypothesis that razorback sucker spend their days during summer in deep open water locations. Renovations continued on pond 3, with a chemical treatment applied while the ponds water elevations were at full pool, 186'. The renovation of pond 3 was successful; no fish have been detected to date.

**FY11 Activities:** Remote sensing of BONY and RASU populations in Imperial Ponds will continue. All BONY and RASU currently in ponds 2, 4, and 6 will be captured during autumn sampling and released into Pond 1 to increase the likelihood of successful recruitment. A sonic telemetry study will be conducted in Pond 1 to continue monitoring RASU behavior in the pond during summer. A five-year research priorities plan will be developed.

**Proposed FY12 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 will be posted to the LCR MSCP website.