

Work Task C41: Role of Artificial Habitat in Survival of RASU and BONY

FY12 Estimate	FY12 Actual Obligations	Cumulative Expenditures Through FY12	FY13 Approved Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate
\$25,000	\$31,584.07	\$68,619.88	\$65,000	\$65,000	\$0	\$0

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Start Date: FY10

Expected Duration: FY14

Long-term Goal: Assess effectiveness of the fish augmentation program.

Conservation Measures: BONY3, BONY5, RASU3, RASU5, RASU6

Location: Reach 2, Davis Cove.

Purpose: To assess use and role of artificial reefs and structures by native fishes released by the LCR MSCP.

Connections with Other Work Tasks (past and future): This work is related to all work tasks in Section B that provide RASU and BONY for augmentation stocking, specifically B7, C23, and F5. Study results will add to the database used to complete D8.

Project Description: Approximately 800 acres of artificial fish habitat have been constructed and deployed in Lake Havasu over the past 15 years. Similar structures have recently been placed into coves in Lake Mohave. RASU have been periodically observed by SCUBA divers in and around these structures, along with numerous species of exotic fishes. This study will determine which if any of these structures may be preferred by native species.

This study was originally to be completed in Beal Lake. It was moved to Davis Cove due to low post-stocking survival in Beal Lake. Davis Cove, a rearing pond along Lake Mohave, provides the best opportunity to monitor and assess a native fish population's response to the deployment of artificial habitat. Davis Cove is a 2.7-acre backwater pond that has supported a native fish community since 2005. It is dominated by rock and sand shorelines with little emergent vegetation, and it is devoid of large submerged habitats. This study will place a variety of constructed habitat types into Davis Cove and attempt to determine which types of structures are preferred by native species. The information may be used to guide current habitat projects in Reaches 2 and 3, as well as facilitate the design and development of LCR MSCP backwater habitats. It will also be used to determine future stocking locations in Reaches 2 and 3. For example, if certain types of structures are known to be used as cover by native fishes, fish could be released in the vicinity of these structures.

Previous Activities: PIT-tag antennae have been purchased and are being incorporated into artificial habitats. Beal Lake was stocked with 610 PIT-tagged RASU in February 2010 and the population was tracked throughout the year using remote PIT-tag antenna. The population dropped to approximately 130 individuals by the end of the year with more than 50% of the loss occurring during the first three months post-stocking. The reason for the demise of the stocked fish is unknown, but some possibilities are predation by migratory birds, mortalities associated with stocking and handling, or water quality deficiencies.

In 2011 the site location was moved from Beal Lake to Davis Cove due to poor fish survival. Davis Cove was stocked with 376 PIT-tagged RASU (<300 mm). Two different habitat types (brush bundles, pipe structures) were constructed within a PVC frame and equipped with PIT-tag antennae. Three habitats at a time were deployed at different locations throughout Davis Cove. Each habitat was paired with a single antenna, which was placed without a habitat, approximately 10 to 15 feet away. Scanning occurred in five-day intervals (Monday through Friday) for a total of 12 intervals. Brush bundles were deployed May 9- July 1 (5 intervals), and pipe structures were deployed from July 18 to October 10 (7 intervals). Water quality profiles were taken in conjunction with PIT scanner deployment. Data analysis did not show a statistically significant difference in habitat use versus non-habitat use. Upon retrieval of the habitats, it was found that young of the year and juvenile bonytail were utilizing the inside of the PVC frames, which had pulled apart in some places.

FY12 Accomplishments: In 2012, habitat deployments in Davis Cove were reduced to a single location; two different habitat types and a control were deployed. A total of eleven scanning intervals were completed, but periodic equipment failure with the brush habitat and antenna resulted in a reduction of paired observations used in the analysis. The Wilcoxon Signed-Rank Test was used to test for differences between the two habitat types as well as each habitat type and the antenna (control). There were no statistically significant differences between the habitat types or the habitats and the control.

Short-term sonic telemetry tags were also used to track habitat use by individual razorbacks in an attempt to corroborate the scanning results. Fish were tracked at multiple times throughout the day and night over the course of one month. Detections of sonic-tagged fish were never made within the proximity of any of the deployed habitats. Razorback population estimates were monitored throughout the course of the study and the population remained stable for the duration of the scanning period.

FY13 Activities: If the razorback population persist, PIT-scanning efforts will be similar to those in FY12, and additional effort will be directed toward bonytail habitat use. Habitat scanning will be initiated earlier in the field season to allow for additional scanning and an increase in paired scanning events. Sonic tagged bonytail will be monitored with respect to their use of artificial habitats. Small-scale habitats will be integrated into fish traps to evaluate habitat preferences for the multiple size classes of non-PIT-tagged BONY in Davis Cove, this will include young of year. Water quality and population estimates will continue to be recorded with each remote sensing equipment deployment.

Proposed FY14 Activities: Activities similar to 2012 and 2013 will continue, with a continued emphasis on habitat use by bonytail since razorbacks do not appear to use artificial habitat.

Pertinent Reports: A report titled, *Role of Artificial Habitat in the Survival of Razorback and Bonytail: 2012*, is in draft and will be posted to the LCR MSCP website upon completion.