

Work Task C39: Post-Stocking Distribution and Survival of Bonytail in Reach 3

FY11 Estimate	FY11 Actual Obligations	Cumulative Expenditures Through FY11	FY12 Approved Estimate	FY13 Proposed Estimate	FY14 Proposed Estimate	FY15 Proposed Estimate
\$250,000	\$174,690.00	\$371,856.17	\$250,000	\$250,000	\$250,000	\$250,000

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Start Date: FY10

Expected Duration: FY15

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

Conservation Measures: BONY3, BONY5.

Location: Reach 3 to include main stem and backwater habitats.

Purpose: To determine the distribution and post-stocking survival of BONY within Reach 3.

Connections with Other Work Tasks (past and future): This work is related to work tasks B2, B3, and B4, all of which provide BONY for augmentation stocking. Study results will add to the database used to complete D8.

Project Description: This study will follow stocked fish after they are released into Reach 3 of the Colorado River to design and test ways to improve post-stocking survival. Techniques for monitoring will include marking, tagging, netting, electro-fishing, and visual observations. A final report will make recommendations for future BONY augmentation stockings.

Previous Activities: The first round of acoustic telemetry implemented under the reported work task was completed. On 13 April 2010, 20 bonytail (mean total length = 410 mm) reared at Dexter National Fish Hatchery and Technology Center (NFHTC) were each surgically implanted with an acoustic transmitter and released with 1,900 additional bonytail into Lake Havasu at the Bill Williams River NWR boat ramp. Fish were monitored for a three month post-stocking period using active and passive tracking techniques to determine survival and dispersal. All acoustic tagged bonytail were contacted and by the end of the 90-day study period fish had dispersed as much as 30-km upstream from the stocking area. Post-stocking survival over the course of the three-month study was high (95%); only one transmitter was recovered by divers from the bottom of the reservoir. All other fish were assumed to be living at the end of the study.

Concurrent to the work in Lake Havasu, a captive fish experiment was implemented at Dexter NFHTC to assess surgical techniques and to monitor fish health and tag retention over a three month period. Twenty bonytail (10 implanted with 3-month acoustic tags and 10 with six-month

acoustic tags) and twenty control fish were held in an indoor raceway for a period of three months. At the conclusion of the study, all fish remained healthy and no transmitters were shed. No adverse affects of tag implantation were apparent when necropsies were performed on five fish.

FY11 Accomplishments: A second acoustic telemetry study was completed and a third telemetry study was initiated during FY11. Twenty-seven Submersible Ultrasonic Receivers (SURs) were deployed throughout the study area. On 3 December 2010, 20 bonytail (mean total length = 390 mm) were implanted with six-month transmitters and released at the Bill Williams River NWR boat ramp along with 2,060 additional bonytail. All stocked fish originated from Achii Hanyo Fish Rearing Facility. Acoustic tagged bonytail were monitored through June 2011 using active and passive tracking techniques to determine survival and dispersal. All individuals were contacted and by the end of the first month fish had dispersed as much as 30-km upstream from their point of release. The maximum distance fish dispersed away from the stocking site became smaller as the study progressed, and by the end of six months most contacts were recorded within or near the Bill Williams River NWR. Three-month post-stocking survival was lower than the previous study (45% vs. 95%, respectively), and by the end of the six month study period 35% of acoustic tagged fish were alive. Twelve of thirteen immobile transmitters were recovered from the bottom of the reservoir using SCUBA. A majority of all fish contacts (~99%) for the first two telemetry studies occurred within or near the Bill Williams River NWR.

FY12 Activities: In order to assess whether bonytail dispersal, habitat preference, and survival was related to stocking location, a third telemetry study was initiated. An additional stocking site was chosen based on the mean maximum linear distance fish dispersed away from Bill Williams River NWR during both previous telemetry studies (7.7 km for the April 2010 study and 10.7 km for the December 2010 study). On 29 November 2011, 1,796 PIT-tagged bonytail originating from Dexter NFH were stocked at the Cattail Cove State Park boat ramp and 2,111 PIT-tagged bonytail were stocked at the Bill Williams River NWR boat ramp. Both of these stockings were accomplished under a dispensation that allowed certain, specific, lots of fish from Dexter NFH to be stocked prior to that facility regaining its level A fish health certification. Fifteen fish from each stocking were implanted with an acoustic tag (five fish from each group received 45-day battery life depth sensing acoustic tags, and ten fish from each group received 6-month battery life acoustic tags). Remote PIT-scanning antennae were utilized throughout Bill Williams River NWR during the first week post-stocking. Acoustic tagged fish were tracked actively and passively with the aid of 27 SURs. Turbidity readings were taken at the exact contact location and depth of each fish containing a depth tag. Additional turbidity measurements were taken throughout the water column at predetermined locations across the study area to assess habitat differences.

Passive and active tracking of acoustic tagged fish stocked in November 2011 will continue through June 2012. Turbidity measurements and habitat association will continue. Annual bonytail and razorback sucker trammel netting surveys will be conducted with USFWS, AZDFG, CDFG, and BLM during February 2012. Remote PIT-scanning stations will be deployed in areas of concentrated habitat use during the annual netting surveys.

Proposed FY13 Activities: A fourth iteration of acoustic telemetry to further determine post-stocking survival, dispersal, and habitat use of bonytail will be initiated during late 2012. The

study design will be based on the results of the November 2011 telemetry work and may include another stocking split between two locations. Remote PIT-scanning stations will be deployed in areas of concentrated habitat use as determined by results from preceding acoustic telemetry work. Annual netting surveys will continue in collaboration with partnering agencies.

Pertinent Reports: *Distribution and Post-stocking Survival of Bonytail in Lake Havasu 2010 Annual Report* is posted to the LCR MSCP website.