

Work Task C10: Razorback Sucker Rearing Studies

FY13 Estimate	FY13 Actual Obligations	Cumulative Expenditures Through FY13	FY14 Approved Estimate	FY15 Proposed Estimate	FY16 Proposed Estimate	FY17 Proposed Estimate
\$125,000	\$120,874.14	\$891,233.92	\$125,000	\$0	\$0	\$0

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Start Date: FY06

Expected Duration: FY14

Long-term Goal: Provide information from research to inform management in ways to improve the efficiency and effectiveness of the Fish Augmentation Program.

Conservation Measures: RASU3, RASU4, and RASU6.

Location: Various locations including hatcheries, rearing ponds, universities, and private research facilities.

Purpose: Evaluate factors affecting rearing of subadult RASU to maximize quantity and quality of RASU produced for the LCR MSCP.

Connections with Other Work Tasks (past and future): This work task is a companion study to Bonytail Rearing Studies (C11) and may share some of the same locations, source data, and testing staff during implementation. Also, investigations carried out may be conducted at hatcheries identified in Section B.

Because of similarities in goals and scope with work task C61 (Evaluation of Alternative Stocking Methods), this work task will be merged with C61 in FY15. The proposed activities and corresponding budget estimates for FY15 will be likewise be captured under work task C61. This is a logical merger of these work tasks as information from this type of research will allow the development and testing of conditioned fish as experimental stocking treatments. These treatments will then be used to test weather different types of conditioning will translate to improved survival of stocked fish. Additionally, the sharing of overlapping resources is expected to increase efficiency in implementation and reporting and may also reduce overall expenditures.

Project Description: This work task provides funding for investigating rearing and culture practices of RASU. The goal is to investigate ways to accelerate growth and improve post-stocking survival of RASU through manipulation of physical, chemical, and biological attributes of the rearing environment.

Objectives:

- Evaluate factors affecting growth in aquaculture
- Evaluate polyculture techniques to maximize rearing capabilities
- Identify requirements to rear RASU to 500 mm using existing facilities at WBNFH
- Evaluate predator recognition and avoidance training

Previous Activities: Literature reviews, site visits to RASU aquaculture facilities, communication with fisheries professionals, and workshops led to the development of hypotheses for single-variable experimental designs.

Factors that affect RASU growth in captivity have been evaluated and methods to improve growth rates at Bubbling Ponds SFH have been identified. Results showed that growth rates of RASU are 6-9 mm/ month; this is consistent between ponds and all tested densities are temperature independent. Growth may be enhanced by separating fast-growing and slow-growing fish after the first year, substantially reducing fish density, and modifying the water delivery system to eliminate *Ichthyophthirius multifiliis* (Ich) from the hatchery source water.

Polyculture of RASU and BONY was evaluated at Achii Hanyo Rearing Station. The study concluded that polyculture of BONY and RASU is not detrimental to either species provided densities do not exceed carrying capacity. This is no longer being practiced at Achii Hanyo due to difficulties with maintaining pond densities amidst voluntarily spawned BONY.

RASU growth studies at Willow Beach NFH concluded that current production rates prohibited achieving fish growth of 500 mm TL within four years. In order to achieve the desired 500 mm TL, annual production would have to be reduced to 1,600 razorback suckers instead of the current production of 7,000 razorback suckers to 300 mm TL and 1,000 to 400 mm TL.

FY13 Accomplishments: A study was initiated to evaluate predator recognition training. The first group of larval RASU received from SNARRC had poor survival and there were not enough individuals to complete the trials. A second group of larval RASU was provided by SNARRC. These fish were grown out to 80-100 mm to be used in FY14.

FY14 Activities: RASU will concurrently be exposed to its conspecific alarm substance and a predator with a temporarily incapacitated jaw muscle. Survival trials of conditioned and unconditioned RASU when exposed to actively feeding predators will be evaluated over 24 hour intervals.

Pond reconstruction and installation of remote PIT-scanning antennae is expected to be completed by the end of summer. RASU will be grown out and conditioned in preparation for post-training survival trials.

Proposed FY15 Activities: Closed in FY14.

Pertinent Reports: Scopes of work and project reports are available upon request. *Effects of Disease Treatments on Growth of Razorback Sucker; Effects of Capture By Trammel Nets On Native Arizona Fishes; and Factors Affecting Growth of Razorback Sucker in Captivity: Literature Review and Knowledge Assessment* are available on the LCR MSCP website.