

## Work Task C32: Determination of Salinity, Temperature, and Oxygen Limits for Bonytail and Razorback Sucker

FY08 Estimates	FY08 Actual	Cumulative Accomplishment Through FY08	FY09 Approved Estimate	FY10 Proposed Estimate	FY11 Proposed Estimate	FY12 Proposed Estimate
\$0	\$0	\$0	\$85,000	\$85,000	\$125,000	\$150,000

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**Start Date:** FY09

**Expected Duration:** FY12

**Long-term Goal:** To develop and maintain high quality backwater habitats for native fishes

**Conservation Measures:** RASU2, RASU3, RASU5, RASU6, BONY2, BONY3, BONY5

**Location:** Native Fish Laboratory, Boulder City, Nevada

**Purpose:** To determine thresholds for survival of RASU and BONY life stages for salinity, temperature, and oxygen.

**Connections with Other Work Tasks (past and future):** This work began under G3. This work is related to management of fish habitat restorations sites (e.g., E14).

**Project Description:** This study will evaluate through laboratory testing the threshold levels needed to sustain various life stages of RASU and BONY in backwater habitats developed by the LCR MSCP.

**Previous Activities:** Laboratory research began in FY07 under work task G3. Salinity levels chosen for experimentation indicated that upper salinity tolerances ranged from 10,000 to 15,000  $\mu\text{S}/\text{cm}$  and from 23,000 to 26,000  $\mu\text{S}/\text{cm}$  for RASU eggs and larvae, respectively. Observations during our larval trials showed that long-term survival may be possible at salinities as high 23,000  $\mu\text{S}/\text{cm}$  when larval RASU are properly acclimated. A plan for additional research to refine threshold salinity levels was developed following the first study year.

**FY08 Accomplishments:** Under G3, research to determine RASU early life stage salinity thresholds continued in FY08. Refined values for upper salinity tolerances were observed to range from 11,000 to 12,000  $\mu\text{S}/\text{cm}$  for eggs and from 27,300 to 27,750  $\mu\text{S}/\text{cm}$  for larvae.

**FY09 Activities:** Salinity research will continue with the evaluation of salinity tolerances for fingerling RASU. In addition, an apparatus to test threshold levels of dissolved oxygen will be developed and tested. Initial studies to determine hatchability of RASU eggs and survivability of

RASU larvae under different levels of dissolved oxygen will also be conducted. A study design to evaluate salinity thresholds for BONY eggs and larvae is in development.

**Proposed FY10 Activities:** Proposed work for FY10 includes a continuation of RASU dissolved oxygen studies, a possible start for BONY salinity threshold assays, and a detailed examination of existing literature on thermal tolerances for both of these species. Assessments of future research options will be made based on information gathered through the first three years of this study.

**Pertinent Reports:** A final report for the 2007 research, *Salinity Tolerances for Egg and Larval Stages of Razorback Sucker*, has been completed. This report is being updated to include findings from the 2008 study year.