

**COLORADO RIVER RECOVERY PROGRAM
FY 2014-15 PROPOSED SCOPE OF WORK for:**

Project No.: 160

Assessment of Stocked Razorback Sucker Reproduction in the Lower Green and Colorado Rivers

Reclamation Agreement number: R09AP40904
Reclamation Agreement term: 10/1/2010-4/30/2015

Lead Agency: Utah Division of Wildlife Resources

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Category:

- Ongoing project
 Ongoing-revised project
 Requested new project
 Unsolicited proposal

Expected Funding Sources:

- Annual funds
 Capital funds
 Other (explain)

I. Title of Proposal: Assessment of Stocked Razorback Sucker Reproduction in the Lower Green and Colorado River via Larvae and Young of Year Collections.

II. Relationship to RIPRAP:

GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).
V.A. Measure and document population and habitat parameters to determine status and biological response to recovery actions.
V.B.2. Conduct appropriate studies to provide needed life history information.

GREEN RIVER ACTION PLAN: MAINSTEM

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).
- V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.
- V.D. Complete monitoring plan in FY 11 (based, in part, on recommendations from evaluation of stocked razorback report).

COLORADO RIVER ACTION PLAN: MAINSTEM

- V. Monitor populations and habitat and conduct research to support recovery actions (research, monitoring, and data management).
- V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions

III. Study Background/Rationale and Hypotheses:

This project is designed as a pilot study to determine the presence/absence of early life stages of endangered razorback sucker *Xyrauchen texanus* in the lower Green River and potentially in the Colorado River. By the mid 1990's most wild riverine adult razorbacks in the Upper Colorado River basin were limited to one population in the middle Green River with an estimated size of about 500 adults (Modde et al. 1996). Green River sampling from 1993-1999 verified the presence of larval razorback in both the middle and lower Green River, however, it was believed that mortality rates of those larvae were very high and did not provide significant recruitment into the wild population (Muth et al. 1998). Stocking of hatchery reared razorback sucker in the Green River basin began in 1995 as a means to augment the population and continues through the present (US Fish and Wildlife Service 2002). By 2000, wild adult razorback suckers in the Green River Basin were very rare and the few remaining likely have perished (Bestgen et al. 2002). In the Colorado River, razorback populations suffered a similar fate as those in the Green River with the last wild razorback sucker captured near Grand Junction, Colorado in 1998 (Osmundson and Seal 2009). Stocking of hatchery reared razorback sucker in the upper Colorado River began in 1999 and continues into the present (Osmundson and Seal 2009).

In the lower Green River, during sampling for adult Colorado pikeminnow *Ptychocheilus lucius* (2001-2003, 2006-2008 and 2011-2012 ; UDWR unpublished data) the occurrence of adult razorback captures increased greatly from 9-10 individuals per trip in 2001-2003 to over 300 captures per trip in 2006-2008 and 2011-2012. In addition, congregations of ripe razorbacks displaying spawning behavior have been observed and many ripe individuals were captured during 2007-2008 and again in 2011-2012. In 2008, three age 1+ razorbacks were captured and in 2012 sampling for Project 138 resulted in the capture of three YOY razorback sucker within the lower Green River section (Creighton et al. 2012). The increase in adult razorback presence, the capture of age 1 and YOY fish, the

capture of ripe adults and observations of spawning behavior suggests that stocked adult razorback are persisting in large enough numbers within the lower Green River to facilitate successful spawning.

In the upper Colorado River, during Colorado pikeminnow sampling from 2005 and 2008, ripe female razorback were captured in the Colorado River between Loma, Colorado (RM 154) and Moab, Utah (RM 64) (Osmundson and Seal 2009). Similar sampling during 2009-2010 resulted in ripe females identified in areas between Moab, Utah (RM 66) downstream to Kane Springs Canyon (RM 58) (Travis Francis per. comm.) and sampling during 2013 resulted in ripe male razorback captured at Goose Island downstream of Negro Bill Canyon (RM 67.2) where previously ripe adult females were captured (Doug Osmundson per. comm.). Larval fish surveys by hand seine were completed in 2004-2007 by Osmundson and Seal (2009) in the Colorado River from just above Westwater Canyon (RM 124.8) upstream to the Price Stubb Diversion dam (RM 185.1) and larval razorback sucker were identified. Larval sampling in 2012 occurred between Goose Island (RM 65) and Mill Creek (RM 61.5); samples are awaiting identification at the Colorado State University Larval Fish Lab (Doug Osmundson per. comm.). The sampling by Osmundson and Seal (2009) showed that although larval razorback abundance was low and widespread throughout the reach there was an increase in the abundance of larvae from approximately 2% of fish sampled in 2004 to approximately 13% of fish sampled in 2007. During sampling for Project 138 in 2012 two YOY razorback were captured in backwaters just downstream of Moab, UT (RM 66) (Creighton et al. 2012). Both Bestgen et al. 2012 and Osmundson and Seal (2009) recommend that larval sampling be initiated in the Colorado River and more specifically that light traps be used to sample in areas downstream of where ripe adult female razorback have been documented in the Colorado River including areas downstream of the Osmundson and Seal (2009) study reach. Similar recommendations were made by Creighton et al (2012) and Howard (2012) to expand razorback larval and YOY sampling into the Colorado River.

Determining the reproductive success of stocked fish in the Green and Colorado Rivers is important for understanding whether they are able to maintain a viable self-sustaining population, an important requirement for the recovery of this species. Larval and young-of-year (YOY) or age 1 fish surveys are valuable tools for determining reproductive success. Surveys for razorback sucker should focus on preferred habitats identified by Muth et al. (2000) and include ephemeral shoreline, ponded lower portions of flooded tributary streams, side canyons, washes, canals, and channels. Surveys in the lower Green River should include the historic collections sites for larvae: Millard Canyon, the confluence of the San Rafael River, and Green River Valley area as well as other areas with available habitat. As few surveys for larval, YOY or age 1 fish have been completed in recent years on the Colorado River downstream of Westwater Canyon (RM 124.8) sampling should focus on appropriate habitat downstream of areas where ripe females have been documented.

Successful spawning among stocked razorback is an important component of a viable recovery for the species. Determining the timing, locations, and relative extent of larval

recruitment will help define the success of the species. Sampling focused on year one survival of larvae will provide information about potential road blocks to recruitment of young suckers into the adult population and sampling for YOY and age 1 fish will help determine if recruitment is occurring.

IV. Study Goals, Objectives, End Product(s):

Goals: The goals of this project are to determine presence of larvae and their relative abundance in historic collection sites in the lower Green River and Colorado river systems; and collect young razorback sucker (young of year to age-1+) in flooded channels, side canyons, etc. of those systems. Sampling protocol and effort from this study may be utilized in the implementation of a basin-wide razorback sucker monitoring program.

Objectives:

1. To determine timing and duration of presence and abundance of larvae in the system measured by the capture of larvae in light traps in appropriate habitat and historic sampling sites.
2. To determine the presence/absence of young razorback sucker in inundated washes, side canyons, and other appropriate habitat.

End Products: Data collected for the duration of the study will be crucial for the development of a basin-wide razorback monitoring plan

V. Study Area:

The study area on the lower Green River for larval razorback sucker sampling is from Green River State Park, Utah (RM 120) downstream to Anderson Bottom (RM 31). Three specific sampling areas within the reach were chosen due to documented presence of larval razorback sucker in the past. The sample areas are the Green River Valley area near RM 120, the San Rafael River Confluence (RM 97) and Millard Canyon (RM 33.5). These sites are associated with off-channel habitats such as tributary streams, flooded washes, or backwaters. Additional sampling will be conducted at Tenmile Canyon (RM 80.5), Keg Spring Canyon (RM 79.9) and other locations within the lower Green River when suitable habitat is encountered. Field crews have flexibility to change sites or sample additional sites based on discharge, accessibility, and habitat conditions at each location.

The study area on the Colorado River for larval razorback sucker sampling is upstream of the landing at Cisco, UT (RM 110.5) to the confluence with the Green River (RM 0.0). Sampling will focus on areas near where ripe adult females have been documented which are associated with off channel habitats such as tributary streams, flooded washes or backwaters (Doug Osmundson per. comm.).

VI. Study Methods/Approach:

Approaches for sampling razorback sucker larvae were outlined in recommendations by Muth (1998), which were based on comprehensive literature and data reviews. Areas with high captures of larval razorback sucker historically as well as other appropriate habitat will be targeted for sampling. Light trap sampling will occur at night in low-velocity nursery habitats. The light traps will be a floating, quadrafoil design commercially available from Aquatic Research Instruments. Light trap sampling trips will be conducted during mid May and June. The sampling period will be adjusted based on timing and duration of spring flows, onset of main channel water temperatures of 14°C, and temporal occurrence of larvae. Each habitat at each sampling occasion will be sampled with at least three light traps (number of collections will depend on size and complexity of habitats). If possible, light traps will be set in or near emergent vegetation at dusk and retrieved before sunrise. Unit of effort will be number of hours each light trap is set during darkness. Additionally, in the Colorado River, fine-mesh seines (1.6-mm or 3.2-mm mesh) will be used during daylight between light trapping sites to document downstream distribution. Sampling trips on the Colorado River will consist of three nights of light trapping and four days of seining between light trapping areas while sampling trips on the Green River will consist of four nights of light trapping.

Sampling for YOY and age 1 razorback will be accomplished by seining flooded tributaries, flooded washes and backwaters and will be conducted once per month from July through September (3 trips). Each trip will require four days to complete sampling for both systems. Low velocity habitats will be sampled using 1.2 m x 4 m seines with 3 mm mesh. The number of collections per habitat area will be determined by the size and complexity of each area. Unit of effort will be the area sampled by each seine haul.

Larger fish identifiable in the field will be counted and measured on site and released. Fishes not identifiable in the field will be euthanized with an overdose of tricaine methanesulfonate (MS222), preserved in 100% ethanol, and returned to the UDWR office for processing. UDWR will be responsible for preliminary larval fish identification, processing, and drafting the annual report. All larval fish will be sent to the CSU Larval Fish Lab for ID verification.

VII. Task Description and Schedule:

Task 1: Lower Green River: Light trap sampling – Begin in mid May or when water temperatures reach 14°C. Early effort will be concentrated at Green River Valley sites, with three sampling trips for the San Rafael River confluence and Millard Canyon sites. Light trap sampling will be concluded by June 30, 2014-15.

Task 2: Lower Green River: Sample for young of year to age-1+ razorback sucker in flooded channels, side canyons, washes, etc., with seines on three four-day trips from July through September 2014-15.

- Task 3: Colorado River: Light trap sampling – Begin in mid May or when water temperatures reach 14°C. Effort will focus on areas downstream of documented locations of ripe female razorback. (new task)
- Task 4: Colorado River: Sample for young of year to age-1+ razorback sucker in flooded channels, side canyons, washes, etc., with seines on three four-day trips from July through September 2014-15. (new task)
- Task 5: Preliminary Sample Identification, Data Entry, Analysis, Reporting – Scheduled to begin July 1, 2014-15 with three weeks of lab time budgeted for identifying an estimated 120 samples. All native and larval fish ID will be completed by the CSU Larval Fish Laboratory under CRFP project 15. Annual report completed and submitted to PDO by November 14, 2014-15.

Schedule: FY 2014-2018

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1					X	X						
2							X	X	X			
3					X	X						
4							X	X	X			
5							X	X	X	X	X	

VIII. Deliverables, Due Dates, and Budget by Fiscal Year:

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IX. Program Budget Summary:

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Error! Not a valid link.X. Reviewers:

XI. References:

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