

**COLORADO RIVER RECOVERY PROGRAM  
FY-2009 PROPOSED SCOPE-OF-WORK:**

**No: 160**

**Lead Agency:** Utah Division of Wildlife

**Submitted:** Paul Badame (Lead)  
**Address:** Utah Division of Wildlife Resources (UDWR)  
Moab Field Station  
1165 South HWY 191 - Suite 4  
Moab, UT 84532  
435-259-3782/(fax) 435-259-3785  
[paulbadame@utah.gov](mailto:paulbadame@utah.gov)

Category:

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

Expected Funding Source:

- Annual funds  
 Capital funds  
 Other (explain)

Date: 11 February 2009

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

**II. Relationship to RIPRAP:**

Green River Action Plan: Mainstem:

V.D. Conduct abundance estimate for razorback sucker. Develop plan in FY 09 (based, in part, on recommendations from evaluation of stocked razorback report).

**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 lower Green River. By the mid 1990's most wild riverine adult razorbacks in the Green River basin were limited to one population in the middle Green River with an estimated size of about 500 adults (Modde et al. 1996). Although sampling from 1992-96 did verify the presence of larval razorback in both the middle and lower Green River it was believed that mortality rates on those larvae were very high and did not provide any significant recruitment into the wild population (Muth et al. 1998). Muth et al. (2000) identified the habitats for razorback sucker larvae as ephemeral shoreline, ponded lower portions of flooded tributary streams, side canyons, washes, canals, and channels. Historic collections sites for larvae were Millard Canyon, the confluence of the San Rafael River, and Green River Valley area. By 2000, wild adult razorback suckers in the Green River Basin were very rare and the few remaining have likely perished (Bestgen et al. 2002). Stocking of

hatchery reared razorback sucker in the Green River basin began in 1999 as a means to augment the population and continues through this current time (US Fish and Wildlife Service 2002). Thus, all current reproduction observed is likely by stocked adults. Determining the reproductive success of stocked fish in the Green River is key to understanding their ability to maintain a viable self sustaining population.

During sampling for adult Colorado pikeminnow *Ptychocheilus lucius* (2001-2003 and 2006-2008; UDWR unpublished data), within the lower Green River, the occurrence of adult razorback captures has increased greatly from 9-10 individuals per year to an average of 320 captures between 2006 and 2008. During the last two years of adult pikeminnow sampling an increased number of ripe adult razorbacks have been captured throughout the lower Green River and in two specific locations congregations of ripe razorbacks displaying spawning behavior have been observed and captured. In 2008, three age 1+ razorbacks were captured within the lower Green as well. This progression of events over the last three years strongly suggests that adult stocked razorback are now persisting in large enough numbers within the lower Green to facilitate successful spawning.

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 should be considered to provide information about potential road blocks to future recruitment of young suckers into the adult population.

#### **IV. Goals, Objectives, End Product:**

Goal: The goals of this project are to determine presence of larvae and their relative abundance in historic collection sites in the lower Green River system; and collect young razorback sucker (young of year to age-1+) in flooded channels, side canyons, etc. of the lower Green River. This sampling protocol and effort should serve as baseline to a much larger razorback sucker monitoring program being developed.

#### Objectives:

- 1) To determine timing and duration of presence and abundance of larvae in the system as measured by capture of larvae in light traps at historic sampling sites.
- 2) To determine the presence/absence of young razorback sucker in inundated washes, side canyons, etc. of the lower Green River.

## **V. Study area:**

The study area for larval razorback sucker sampling is the lower Green River 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 may be conducted in other locations within the lower Green River if suitable habitat is found. Field crews have flexibility to change sites or sample additional sites based on discharge, accessibility, and habitat conditions at each location.

## **VI. Study Methods/Approach:**

Approaches for sampling razorback sucker larvae in the Green River system were outlined in recommendations by Muth (1998), which were based on comprehensive literature and data reviews. Areas with high captures of larval razorback sucker in the past will be targeted for sampling. Light-trap sampling will occur at night in low-velocity nursery habitats. The light traps will be a floating, quatrefoil design commercially available from Southern Concepts in Birmingham, Alabama. Additionally, 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 consist of three nights of light trapping and four days of seining between light trapping areas. Sampling trips will be conducted every other week 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 and possibly three seine hauls (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 and area sampled by each seine haul.

Larger fish identifiable in the field will be counted and measured on site and released. Other fish will be euthanized with an overdose of tricaine methanesulfonate (MS222), preserved in 100% ethanol, and returned to the UDWR office for processing. The UDWR will be responsible for preliminary larval fish identification and processing and preparing overall annual reports. All larval fish will be sent to the CSU Larval Fish Lab for ID verification.

## **VII. Task Description and Schedule (FY-2009):**

Task 1: Collect light trap – Scheduled to begin in mid May or when water temperatures and flows are favorable (usually around the time when

bluehead sucker larvae are beginning to show up in the middle Green River light trap samples). Concentrate the majority of the effort at Green River Valley site, with two sampling trips for the San Rafael River confluence and Millard Canyon sites. Light trap sampling will be concluded by June 30, 2009.

- Task 2: Sample for young of year to age-1+ razorback sucker in flooded channels, side canyons, washes, etc., with seines on two three day trips from late July through August.
- Task 3: Preliminary Sample Identification and Data Entry – Scheduled to begin July 1, 2009 with three weeks of lab time budgeted for identifying an estimated 120 samples. Samples will need to be verified by Larval Fish Laboratory.
- Task 4: Annual Reporting – Annual report completed and submitted to UCRRIP by November 14, 2009.

### VIII. FY2009 Work

Task 1: Collection larvae via light trap samples at historic collection sites.

*Personnel:*

1 Biologist (\$349/day x 6 work days)	\$ 2,094
2 Technicians (\$200/day x 12 work days)	\$ 4,800
Subtotal	\$ 6,894

*Travel / Per Diem:*

Mileage: (2) trucks – 120 miles @ \$.42 per mi * 4 trips and \$5/day/truck for 12 days	\$ 202
Gas: (for Jon boat) 25 gal per trip * 2 trips	\$ 100
Per Diem: \$25 per day for 30 man days	\$ 750
Subtotal	\$ 1,052

*Equipment / Supplies:*

Equipment Repair and Maintenance	\$ 400
2 new light traps, Ethanol, 1 new larval seine	\$ 500
Subtotal	\$ 900

Task 1 Subtotal      \$ 8,846

Task 2: Collection young of year and age 1+ razorback via.

*Personnel:*

1 Biologist (\$349/day x 6 work days)	\$ 2,094
2 Technicians (\$200/day x 8 work days)	\$ 3,200
Subtotal	\$ 5,294

*Travel / Per Diem:*

Mileage: (2) trucks – 120 miles @ \$.42 per mi * 2 trips and \$5/day/truck for 8 days	\$ 140
---	--------

Gas: (for Jon boat) 25 gal per trip * 2 trips	\$	100
Per Diem: \$25 per day for 36 man days;	\$	900
Subtotal	\$	1,140

*Equipment / Supplies:*

Equipment Repair and Maintenance (outboards, trailers, camp equipment)	\$	200
Subtotal	\$	200

Task 2 Subtotal      \$ 6,634

Task 3: Preliminary Sample Identification and Data Entry

*Personnel:*

1 Biologist (\$349/day x 4 work days)	\$	1,396
1 Technician (\$200/day x 15 work days)	\$	3,000
<u>Task 3 Subtotal</u>	\$	4,396

Task 4: Annual Reporting

*Personnel:*

1 Biologist (\$349/day x 10 work days)	\$	3,490
<u>Task 4 Subtotal</u>	\$	3,490

**FY2009 Grand Total**      **\$ 23,336**

**IX. Program Budget Summary**

FY-2009      \$23,336

**X. Reviewers**

**XI. References**

Bestgen, K. R., G. B. Haines, R. Brunson, T. Chart, M. Trammell, G. Birchell, and K. Christopherson. 2002. Decline of the razorback sucker in the Green River Basin, Utah and Colorado. Report submitted to the Recovery Implementation Program for Endangered Fishes in the Upper Colorado River Basin. Larval Fish Laboratory Contribution 126.

Moode, T., K.P. Burnham, and E.J. Wick. 1996. Population status of the razorback sucker in the middle Green River. Conservation Biology 10:110-119.

Muth, R.T., L.W. Crist, K.E. LaGory, J.W. Hayse, K.R. Bestgen, J.K. Lyons, T.P. Ryan, and R.A. Valdez. 2000. Flow Recommendations for Endangered Fishes in the Green

River Downstream of Flaming Gorge Dam, Final Report, Upper Colorado River Endangered Fish Recovery Program Project FG-53.

Muth, R. T., G. B. Haines, S. M. Meisner, E. J. Wick, T. E. Chart, D. E. Snyder, and J. M. Bundy. 1998. Reproduction and early life history of razorback sucker in the Green River, Utah and Colorado, 1992–1996. Final Report of Colorado State University Larval Fish Laboratory to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado. 62 pp.

US Fish and Wildlife Service. 2002. Razorback sucker (*Xyrauchen texanus*) Recovery Goals: amendment and supplement to the Razorback Sucker Recovery Plan. US Fish and Wildlife Service, Mountain-Prairie Region(6), Denver, Colorado.