

I. Project Title: **Lower Green River Razorback Sucker larval and Young-of-Year Monitoring Pilot Study.**

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III. Project Summary: 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. We will also determine the distribution of larvae and the probable timing and locations of spawning activity. Collections focus on historic larval sampling sites: Millard Canyon, the confluence of the San Rafael River, and Green River Valley area.

During sampling for adult Colorado pikeminnow *Ptychocheilus lucius* (2001-2003 and 2006-2008; UDWR unpublished data), within the lower Green River, the occurrence of adult razorback captures has increased greatly from 9-10 individuals per year to an average of 320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. An increased number of ripe adult razorbacks have been also 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 strongly suggests that adult stocked razorbacks 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.

This sampling protocol and effort should serve as baseline to a much larger razorback sucker monitoring program being developed.

IV. Study Schedule: Initial year 2009, final year 2010. It is anticipated that a comprehensive razorback monitoring plan will be developed and initiated following 2010.

V. 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).

VI. Accomplishment of FY 2009 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Task 1: Collect light trap samples – Light trapping began May 21 as main channel water temperatures hit 14-18° C. Main channel temperatures varied between 14-21° C over the entire larval sampling period. The first two weeks of larval sampling was conducted in the Green River Valley (RM 120–115); during this period light trapping was the primary method with 36 samples collected by June 9. Between June 10 and June 26, light traps were also in the San Rafael River area (RM 106–94) and Millard Canyon sites (RM 34–27). A total of 21 samples were collected in the lower sites. In addition to light trapping 1 m wide larval kick seines were used to sample 116.6 m² between May 21 and June 26.

A total of 57 larval light trap samples were collected and 49 of those were sent to the CSU Larval Fish Lab for identification (Project #15). In addition 38 samples were collected via larval kick seine and 18 of those were sent to CSU LFL. This annual report will be updated as the samples are identified and data is made available.

Light trapping and produced 170 razorback sucker larvae and kick seining produced 8 individuals. Razorback sucker larvae were present in 5 of 6 sites sampled with light traps and in all three major segments of the 120 RM reach. All larvae from kick seines were found in sites not sampled with light traps and one individual was captured at Spring Canyon (RM 67.5) which is over 25 miles downstream of the San Rafael area sampling sites. Razorback captures outside of the established light trapping sites have provided us with insight about light trapping locations for 2010.

Over the entire sample period, 83% of larvae were collected at the Millard Bottom sites; this is very similar to what was observed during sampling in this reach during 1993–1996 (Muth et al. 1998). The mean light trapping CPUE for the entire sample period with all sample sites combined was 0.39 (Table 1). The mean CPUE for each reach segment was 0.08 for the Green River Valley, 0.08 for the San Rafael River area, and 2.08 for the Millard Canyon area (Table 1).

The first larva was captured via light trap on May 21 and the other 169 were captured between June 3–26. It should be noted that sampling in the more productive lower sites did not begin until June 10. Larvae captured via kick seining appeared between June 10–24.

Razorback sucker hatching and spawning dates were back calculated from formulas

developed by Muth et al. (1998). Estimated spawning dates ranged from April 21 to June 8 with spikes around May 8 and May 28 (Fig. 1). Over the span of the spawning period average main channel temperatures were estimated at 13.7° C and flows averaged 14,458 cfs (Fig 1.). The majority of spawning appeared to have occurred during the ascending limb of the hydrograph.

Task 2: Sample for young of year razorback sucker via seines – In late July and mid August, two seining trips were completed; sampling available YOY habitat between Green River (RM 120) and the confluence of with the Colorado River (RM 0). Main channel water temperatures varied between 25-28 ° C and backwater habitats ranged from 26-32 ° C. A total of 3,640 m² were seined during the trips collecting 78 samples, of which 17 were sent to CSU for ID.

From the 17 samples sent to CSU only one early juvenile razorback sucker (28 mm) was identified. The individual was captured at RM 95.5 in a small flooded wash mouth about a ½ mile below the San Rafael River confluence. The estimated spawn date for the individual was May 10.

Tracking survival of first year razorbacks into the summer and fall may prove unsuccessful if only seining of backwater habitats is used. September seining catch rates for razorbacks have been very minimal since the initiation of ISMP sampling in 1986. The lack of razorbacks in these samples either suggest little to no survival from the larval stage or that they are utilizing different habitats after they reach the early juvenile life stage (>25 mm). If the latter is the case, we may not have effective sampling methods for detecting razorbacks until they are larger than 100–150 mm and become susceptible to fyke netting or possibly electrofishing.

Task 3: Annual Reporting – An annual report will be completed and submitted to UCRRIP by November 13, 2009. The annual report will be updated as the samples are identified and data is made available.

VII. Recommendations: Pending the ID results provided by CSU: determine which methods were most efficient for larval or YOY razorback collection and reallocate FY10 effort to best track reproduction.

VIII. Project Status: On Track and on going.

IX. FY 2009 Budget Status

A.	Funds Provided:	\$23,336
B.	Funds Expended:	\$23,336
C.	Difference:	\$ 0
D.	Percent FY 2009 work completed:	\$ 100
E.	Recovery Program funds spent for publication charges:	\$ 0

Table 1. Number of razorback sucker larvae captures and collections (parenthetic) via light trapping for all sample locations, river miles (RM), and dates during the 2009 sampling on the lower Green River.

RM	Location	May 21	May 27	May 28	Jun 3	Jun 9	Jun 10	Jun 11	Jun 24	Jun 25	Jun 26	Totals
31	Anderson Bttm.							52 (1)				52 (1)
33.7	Millard Canyon							28 (4)		61 (4)		89 (8)
101.7	Dry Lake Wash						3 (4)		2 (4)			5 (8)
114.9	L. Grand Wash	1 (3)	0 (3)	0 (3)	5 (4)	7 (3)					5 (4)	18 (20)
119.4	Browns Wash		0 (2)									0 (2)
119.5	Salaterus Wash	0 (3)	0 (3)	0 (5)	4 (3)	2 (4)						6 (18)
Totals		1 (6)	0 (8)	0 (8)	9 (7)	9 (7)	3 (4)	80 (5)	2 (4)	61 (4)	5 (4)	170 (57)

Table 2. Catch per unit effort for light trapping (LT) and larval seining (SE) from 1993–1996 and 2009 by river segment within the lower Green River reach (RM 0–120). Dashes represent areas not sampled in a given year.

Year	Green River Valley ^a	San Rafael River Area ^a	Millard Canyon Area ^a	Annual Mean
1993	–	–	1.36	1.36
1994	–	0.21	0.23	0.22
1995	–	0.01	0.01	0.01
1996	<0.01	0.03	1.52	0.06
2009	0.08	0.08	2.08	0.39

^aGreen River Valley (RM 120–114), San Rafael River area (RM 106–94) and Millard Canyon area (RM 34–27)

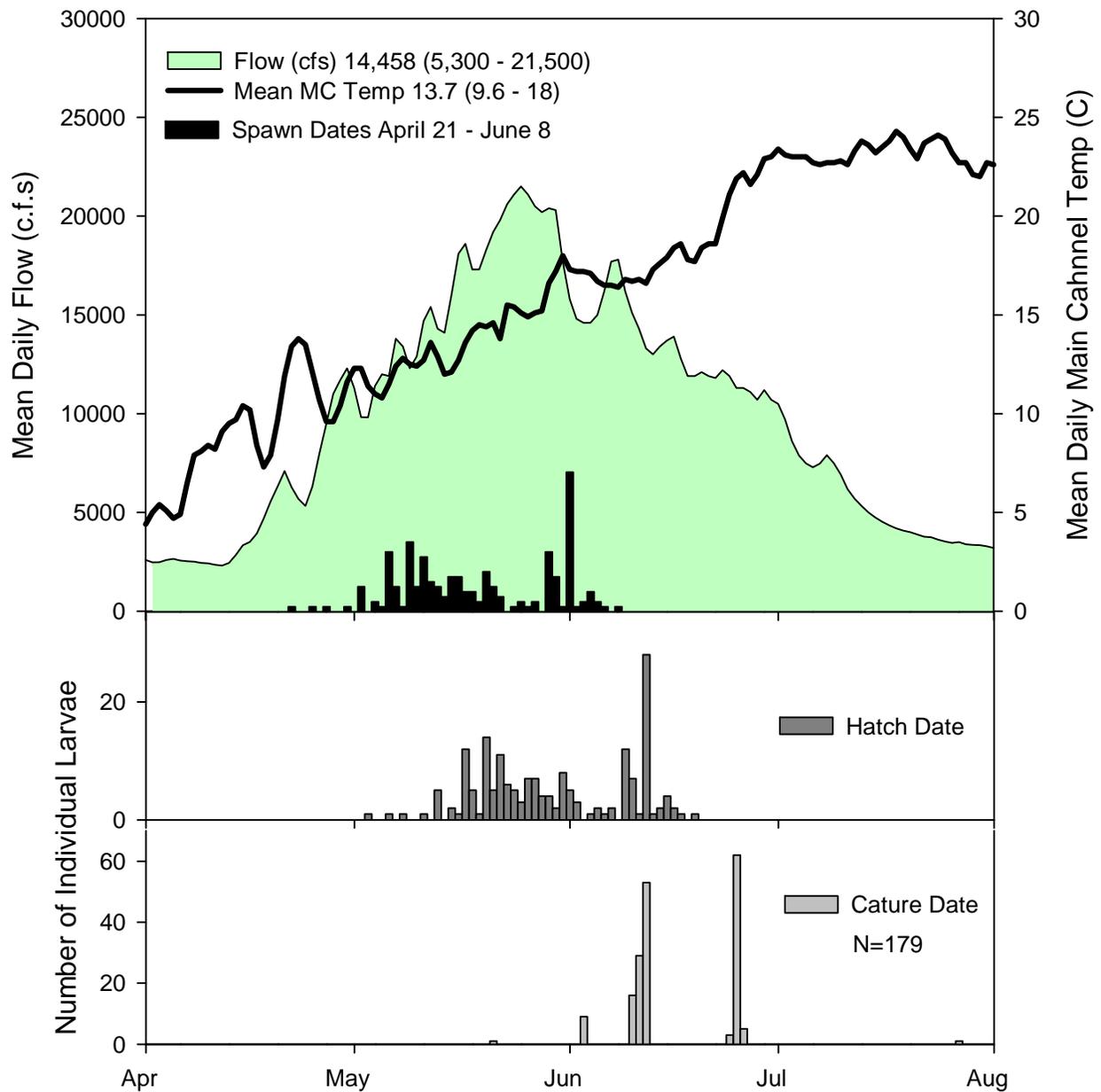


Figure 1. Number of razorback sucker larvae collected via all methods (bottom, lt. gray), estimated hatching dates for each individual (center, gray), estimated spawning dates (upper black bars), and the corresponding flows from the USGS Gauge near Green River, UT. Main channel temperatures are not available at the Green River gauge so temperatures from the Jensen, UT gauge were used and increased based on temperature data collected during our sampling.