

I. Project Title: MONITORING THE COLORADO PIKEMINNOW POPULATION IN THE MAINSTEM COLORADO RIVER VIA PERIODIC POPULATION ESTIMATES

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III. Project Summary:

The Interagency Standardized Monitoring Program (ISMP) was developed in 1986 to monitor population trends of Colorado pikeminnow and humpback chub in the Upper Colorado River Basin using catch per effort (CPE) indices. ISMP was expanded in 1998 to include mark-recapture population estimates of the major Colorado pikeminnow and humpback chub populations. For Colorado pikeminnow in the upper Colorado River, population estimates were conducted annually during 1991–1994, 1998–2000, and 2003–2005. A fourth such three-year field effort began in 2008 and continued during 2009.

In **2008**, four complete passes were made through the upper and lower reaches of the Colorado River study area (12-mile-long Westwater Canyon, separating the two reaches, was not sampled) using a combination of electrofishing and backwater trammel-netting. Crews had just enough time to squeeze in an extra, or fifth, pass through the upper reach. Sampling was conducted from April 3 through June 19. Although the field effort went very well, the number of Colorado pikeminnow captured was fairly low relative to previous years. In the upper reach, there was a mean of 17 fish captured per pass (85 total) compared to 14 in 2003, 20 in 2004, and 31 in 2005 (Table 1). In the lower reach, there was a mean of 25 fish captured per pass (100 total) compared to 28 in 2003, 30 in 2004, and 39 in 2005. The number of fish marked in the first passes that were subsequently recaptured in later passes was also low compared to previous years, especially in the upper reach: there, only five within-year recaptures were made compared to three in 2003, 10 in 2004, and 22 in 2005. In the lower reach, the within-year recapture rate was somewhat better: there were 10 in 2008 compared to two in 2003, three in 2004, and 27 in 2005.

In **2009**, four complete passes were made through the upper and lower reaches as planned; in addition, a fifth pass was completed in the upper reach. Sampling was conducted from April 1 through June 24. Numbers of fish captured were similar to 2008. In the upper reach, there was a mean of 19 Colorado pikeminnow captured per pass (93 total); in the lower reach, a mean of 24 Colorado pikeminnow were captured per pass (95 total). Total within-year recaptures in the upper reach were higher in 2009 (11) than in 2008 (five), but in the lower reach, total within-year recaptures were fewer in 2009 (seven) than in 2008 (10).

In both 2008 and 2009, the duration of spring runoff was especially long and made for good electrofishing and backwater netting conditions. In 2008, there were 41 boat-days expended on trammel-netting compared to 37 in 2003, three in 2004, and 41 in 2005. In 2009, there were 37 boat-days expended on trammel-netting. So lack of backwaters cannot account for the lower numbers of captures in the past two years. Subtracting the number of captures

attributable to the smallmouth bass removal effort (Project No. 126), the total number of pikeminnow captured in 2005 was 319 (four passes in upper reach; five passes in lower reach). In contrast, the total captured in 2008 was 185 (five passes in upper reach; four passes in lower reach), or 42% less than in 2005. Similarly, in 2009 there was a total of 188 Colorado pikeminnow captured (five passes in upper reach; four passes in lower reach), or 41% lower than in 2005. During 2003–2005, there was a large group of young Colorado pikeminnow detected that was attributed to a strong year class produced in 1998 (see Osmundson and White 2009). No such strong year class was detected in 2008 or 2009. In addition, probability of capture was found to vary fairly substantially among years, in part explaining the higher numbers of fish captured in 2005 than in 2003 or 2004. Hence, the 41–42% lower number of Colorado pikeminnow captured in 2008 and 2009 than in 2005 cannot be ascribed at this time to the population declining by such amounts, but instead may be a function of lower probabilities of capture. Until program MARK is used to analyze the data, caution must be exercised when interpreting these numbers of total captures.

Unlike in 2004 and 2005, when Colorado pikeminnow handled in July during the subsequent smallmouth bass removal effort were added to the third pass of the upper reach (2004) or provided a fifth upper-reach pass (2005), no such Colorado pikeminnow were captured during the smallmouth bass removal project in 2008 and 2009 that might have been used here to supplement captures. Colorado pikeminnow seen during smallmouth bass electrofishing were allowed to escape without capture or handling in an effort to minimize stress during the spawning season.

To date, data from 2008 and 2009 have been entered into Excel and checked for errors. However, no preliminary estimates of population abundance or other vital rates are available.

Table 1. Total number of Colorado pikeminnow ≥ 250 mm TL captured in each sampling pass and year in the Colorado River study area, Colorado and Utah, 1991–2009. Totals include recaptures of the same fish caught in previous passes of the same year (parentheses). Captures are partitioned by upper and lower reach.

Year	Lower reach passes					Upper reach passes				
	1	2	3	4	5	1	2	3	4	5
1991	37	-	-	-	-	23	17 (4)	25 (2)	-	-
1992	18	15 (1)	-	-	-	21	24 (2)	23 (2)	-	-
1993	51	41 (4)	-	-	-	31	31 (6)	33 (11)	-	-
1994	47	22 (3)	-	-	-	28	37 (3)	38 (6)	-	-
1998	31	56 (6)	-	-	-	47	73 (8)	55 (16)	-	-
1999	38	24 (2)	-	-	-	52	65 (8)	54 (18)	-	-
2000	31	19 (1)	-	-	-	51	52 (8)	28 (6)	-	-
2003	11	16 (0)	44 (0)	40 (2)	-	11	15 (0)	16 (2)	11 (1)	-
2004	28	36 (1)	27 (0)	-	-	19	16 (2)	48 (8)	-	-
2005	26	50 (3)	46 (7)	36 (6)	34 (5)	22	30 (4)	26 (4)	46 (5)	38 (9)
2008	13	29 (0)	35 (3)	23 (7)	-	17	15 (0)	17 (1)	20 (2)	16 (2)
2009	11	35 (0)	28 (3)	21 (4)	-	10	13 (0)	32 (0)	15 (2)	23 (9)

IV. Study Schedule: 2008-2011.

- V. Relationship to RIPRAP:
Colorado River Action Plan: Colorado River Mainstem
V. Monitor populations and habitat and conduct research to support recovery actions.
V.A. Conduct research to acquire life history information and enhance scientific techniques required to complete recovery actions.

VI. Accomplishment of FY 08 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Tasks

1. Capture and PIT tag Colorado pikeminnow (early April to late June).
2. Analyze data.
3. Write annual report.

In 2009, Task 1 was completed on schedule. Task 2 was not completed because most of the PI's time after the field season was devoted to catching up on an overdue report (larval razorback sucker monitoring; Project 121). Some analysis of the new data may be performed this winter as time allows. This annual report constitutes completion of Task 3.

- VII. Recommendations: Continue analyzing new data and prepare for 2011 field season. For future monitoring, the current schedule of three years of active sampling followed by a two-year rest period is recommended. Four passes per year continues to be the sampling goal contingent on runoff conditions.
- VIII. Project Status: Field effort on schedule; data analysis somewhat behind schedule. The synthesis of 1991–2005 data in a 2009 report has now been completed but preliminary analysis of 2008 and 2009 data (Task 2) has been pushed back.

IX. FY 09 Budget

A.	Funds Provided:	166,850
B.	Funds Expended:	166,850
C.	Difference:	0
D.	N/A (BR projects)	0
E.	Publication Charges	0

- X. Status of Data Submission: Capture data for Colorado pikeminnow, razorback sucker and bonytail, as well as predacious non-natives, encountered during this project are submitted to the database manager as error-checking is completed. The data from 2008 has been submitted; the 2009 data will be submitted as soon as the PI can complete a final check for errors.

XI. Signed: *Doug Osmundson*, November 9, 2009.

Literature cited:

Osmundson, D. B, and G. C. White. 2009. Population status and trends of Colorado pikeminnow of the upper Colorado River, 1991–2005.