

RIO GRANDE SILVERY MINNOW AUGMENTATION IN THE MIDDLE RIO GRANDE,
NEW MEXICO

Annual Report 2008



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Middle Rio Grande Endangered Species Act Collaborative Program

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Cover Photo: Rio Grande at Lomas Negras, side channel formed just downstream of Rio Rancho Wastewater Treatment Plant Outfall, Corrales, New Mexico. Credit USFWS, 2008.

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EXECUTIVE SUMMARY

- In 2008, we implemented a revised augmentation plan. This revised augmentation plan provides a detailed stocking strategy only for the Middle Rio Grande, New Mexico between 2008 and 2012 for Isleta and San Acacia Reaches.
- Based on current population monitoring catch rates, no Rio Grande silvery minnow were needed for augmentation in 2008.
- In 2008, we continued monitoring throughout all reaches, focusing on tribal lands that provide additional data while monitoring Angostura Reach for long-term effects of augmentation.
- The core population within the Middle Rio Grande, New Mexico remains the priority for all conservation activities including augmentation, but when conditions warrant, other stocking projects should benefit.

INTRODUCTION

In 2001, the “Rio Grande silvery minnow augmentation plan” was created. Since that time, over 1,000,000 hatchery-raised Rio Grande silvery minnow have been released into the Middle Rio Grande, New Mexico. Initially the goal was to produce 500,000 annually for release based primarily on the expected capacities of propagation facilities, along with knowledge about current population status and suggestions from geneticists. Our stocking and monitoring efforts were initially focused in the Angostura Reach (Albuquerque) where catch rates of wild Rio Grande silvery minnow were extremely low and the expected benefit of augmentation could be maximized (Remshardt and Davenport 2003). Between 2002 and 2004, 100,000 to 200,000 Rio Grande silvery minnow were released annually in the Angostura Reach.

Starting in 2005, augmentation was expanded to include the Isleta and San Acacia Reaches. Between 2005 and 2007, 100,000 to 400,000 Rio Grande silvery minnow were released annually throughout all reaches (Remshardt 2008). In addition to augmentation and other conservation measures such as habitat improvement, improved spring runoff and habitat conditions for juvenile survival in 2005 created an opportunity for Rio Grande silvery minnow to increase in abundance. While hatchery released individuals cannot count directly towards recovery goals, their presence and reproduction ultimately result in increased numbers that benefit the species.

This annual report summarizes findings between January and December 2008. This effort reflects management needs identified in the Middle Rio Grande Endangered Species Program (Program), Item A.2.2 for Rio Grande silvery minnow as well as the Rio Grande Silvery Minnow Recovery Plan (RGSMP; U.S. Fish and Wildlife Service 1999). These include development and refinement of augmentation protocols for use in the middle Rio Grande (Task 8b) and annual monitoring of augmented populations as identified as a needed task (Task 8d) by the Program and RGSMP, respectively.

The ultimate goal of augmentation is to re-establish self-sustaining populations of Rio Grande silvery minnow in the MRGNM and throughout its former range. Long-term benefits of this study are to: 1) augment populations within the MRGNM; and 2) evaluate stocking efforts and methods.

Specific objectives of augmentation and monitoring activities in 2008 were to:

- 1) Using revised stocking protocol; calculate number of Rio Grande silvery minnow necessary to meet target densities.
- 2) Using revised stocking protocol, closely monitor Angostura Reach Rio Grande silvery minnow densities for effects of augmentation and future needs.
- 3) Determine temporal and spatial upstream and downstream movement of previously stocked Rio Grande silvery minnow within and among reaches.
- 4) Provide guidance for augmentation activities to maximize survival of Rio Grande silvery minnow.

METHODS

Study Area

This investigation concentrates on areas relative to the known current range within Angostura, Isleta, and San Acacia reaches (Figure 1, Table 1). Angostura Reach (61 km) extends from Angostura Diversion Dam (River Mile (RM) 209.7) to Isleta Diversion Dam (RM 169.3) and includes the cities of Bernalillo, Corrales, and Albuquerque. Isleta Reach (90 km) extends from Isleta Diversion Dam to San Acacia Diversion Dam. This reach includes the southern portion of Isleta Pueblo, cities of Bosque Farms, Valencia, Los Lunas, Belen, and smaller villages such as La Joya, and Bernardo, along with Sevilleta National Wildlife Refuge, all within Bernalillo, Valencia, and Socorro counties. The San Acacia Reach (roughly 76 km) extends from San Acacia Diversion Dam to the headwaters of Elephant Butte Reservoir (the exact location of the lower boundary varies depending upon reservoir water-surface elevation). This reach is relatively remote, including only the city of Socorro and villages of San Acacia, Lemitar, Escondida, and San Antonio along with Bosque del Apache National Wildlife Refuge, within Socorro and Sierra counties.

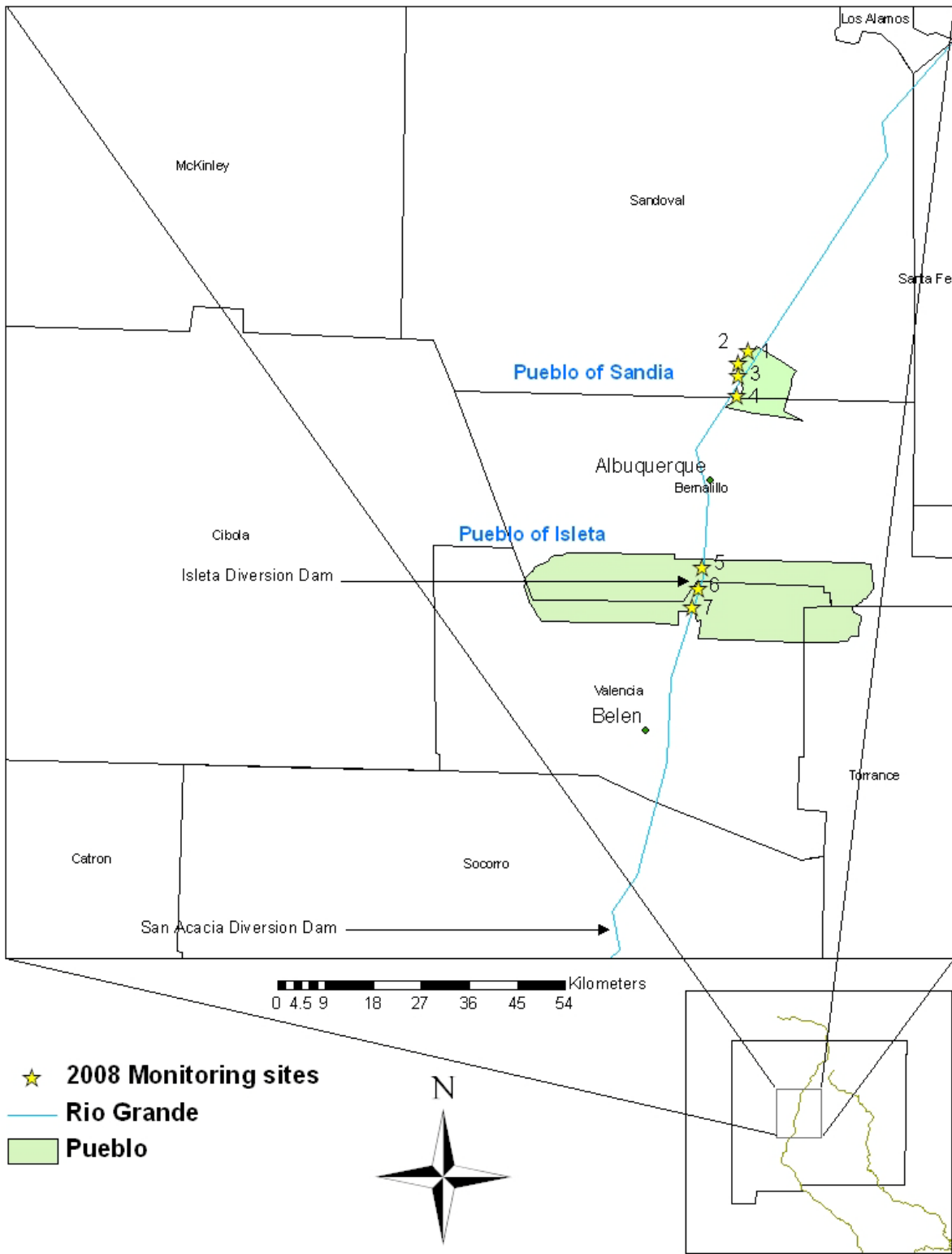


Figure 1. Map of study area for Rio Grande silvery minnow augmentation and monitoring.

Augmentation

As detailed in the revised RGSM augmentation plan 2008-2012 (Remshardt 2008b), augmentation will focus only within the Isleta and San Acacia reaches in the next 5 years. This will allow us to accurately assess the long-term benefits of recent (2002-2007) augmentation in the Angostura Reach. The release number (A) for each site (S_i) is calculated using the following formula:

$$AS_i = (C_t - C_o) \times (\text{total estimated area } m^2 \text{ between } S_i \text{ and } S_{i+1})$$

where; C_t = Target catch rate at each site, or 1 fish / 100 m²,
 C_o = Observed catch rate at each site in September
 S_i = Site of release
 S_{i+1} = Next downstream site.

Post-Augmentation Monitoring

Monitoring of stocked fish involved specific post-stocking surveys at 1-month intervals to determine survival, growth and movement by NMFWCO. Monitoring sites are currently maintained within Pueblo boundaries to collect additional recapture data not available from standard population monitoring. These efforts were also used to collect secondary information on fish community structure. Fish were collected with a 3 m x 1.8 m, 3 mm mesh seine. Length of individual seine hauls were measured to the nearest 0.1 meter to estimate sampling effort, which was calculated by multiplying the distance of each seine haul by the effective width of the seine (2.5 m). Catch rates for all fish were calculated as number of fish per 100 m² sampled. All mesohabitat types were sampled within each site with a minimum of 30 seine hauls at each sampling location, except at high flows when safe wading was difficult or during intermittent conditions when seinable habitat was limited. Water quality parameters were measured (pH, conductivity, water temperature, air temperature, total dissolved solids, and salinity) at each monitoring site. Standard and total lengths were measured from a minimum of 10 Rio Grande silvery minnow per site, age class (young-of-year and age 1+), including marked and unmarked individuals. All other fish captured were identified and enumerated for each individual seine haul in the field and subsequently released. Scientific and common names are arranged in phylogenetic order and follow Nelson et al. (2004), except where subspecies are noted. The use of subspecific epithets reflects the importance of geographical subdivisions in evolution.

Table 1. Rio Grande silvery minnow augmentation monitoring site descriptions, 2008.

Site #	Site Name	Description
Angostura Reach		
1	Sandia Bosque Line 14	New Mexico, Sandoval County, Rio Grande, Pueblo of Sandia, 1.5 miles downstream of U.S. 550 Bridge crossing, RM 202.0.
2	Lomitas Negras	New Mexico, Sandoval County, Rio Grande, below Rio Ranch #3 Wastewater Treatment Plant Outfall, RM 198.3
3	Dixon Road	New Mexico, Sandoval County, Rio Grande, at Sandia Wasteway Outfall, RM 196.0
4	North Amafca	New Mexico, Sandoval County, Rio Grande, Pueblo of Sandia, 1.0 miles upstream of Alameda Bridge crossing, RM 193.2.
5	Atrisco Outfall	New Mexico, Bernalillo County, Rio Grande, Pueblo of Isleta, 1.9 miles upstream of Isleta Diversion Dam, RM 171.2.
Isleta Reach		
6	Below Isleta Dam	New Mexico, Bernalillo County, Rio Grande, Pueblo of Isleta, 0.1 miles downstream of Isleta Diversion Dam, RM 169.3
7	Alejandro Gate	New Mexico, Valencia County, Rio Grande, Pueblo of Isleta, 2.7 miles downstream of Isleta Diversion Dam, RM 166.6

Length-Frequency

Standard lengths of captured Rio Grande silvery minnow were compared by sampling trip to evaluate potential differences in growth rates. The Petersen method of length-frequency analysis was used to estimate age groups (Isaac 1990, Devries and Frie 1996). In this method, the frequency of individuals was plotted as a function of 2 mm standard length increments for each monthly monitoring sample. Age was then assigned to each individually measured fish. Similarly, the known age of recaptured marked and measured Rio Grande silvery minnow was assigned to each individual. Linear regression was used to compare the potential differences between and among marked and unmarked fish by plotting standard length against estimated (or known) ages. The regression coefficient β , or slope was also used as an estimate of instantaneous growth, or in this case monthly growth rate since each sample was spaced approximately one month apart. Student's *t* was used to test the hypothesis about equality of two

population regression coefficients, or in this case, the equality of growth rates between and among marked and unmarked Rio Grande silvery minnow ($\alpha = 0.05$).

Movement

Recapture data were used to conduct an examination of the overall distance traveled. Expected and observed recaptures were summarized. Various other projects and researchers conducted monitoring activities throughout the Middle Rio Grande in 2008. All researchers are asked to volunteer recapture information on VIE-marked Rio Grande silvery minnow. These projects have varying objectives and methods, but a summary of recaptures can provide an overall view of movement. Details on these recaptures together with this study are provided in Appendix A.

Recapture data for 2008 were summarized from projects including monitoring activities from Rio Grande silvery minnow salvage (NMFWCO), Rio Grande silvery minnow population monitoring (American Southwest Ichthyological Research Foundation). These surveys represented collections throughout the calendar year and current range downstream of Angostura Diversion Dam (RM 209.7) to the upstream portion of Elephant Butte Lake State Park (RM 57.7).

Fish Community

A summary table of fish collections for the current study period (January 2008 to December 2008) was constructed with observations made for each species, including status of the species (native or introduced), total number of individuals, relative percentage of each species, percent occurrence in individual seine hauls, and density (fish / 100 m²). Observations were also made on total number of species, total effort, and uncommon species. Most fish names in this report are those in the American Fisheries Society's "A List of Common and Scientific Names of Fishes from the United States and Canada" (Nelson et al. 2004). Use of subspecific names includes additional citations.

RESULTS

Augmentation

Based on the September 2008 catch rates from the standard RGSM population monitoring conducted by American Southwest Ichthyological Research Foundation (ASIRF) (Dudley and Platania 2008), there was no requirement for releases in the Middle Rio Grande in 2008 through the RGSM augmentation program.

For planning purposes, an estimated 120,000 fish were being held for release into the Middle Rio Grande if necessary. As it happened, these fish were not required and were made available for the initial reintroduction into Big Bend, Texas, in December 2008.

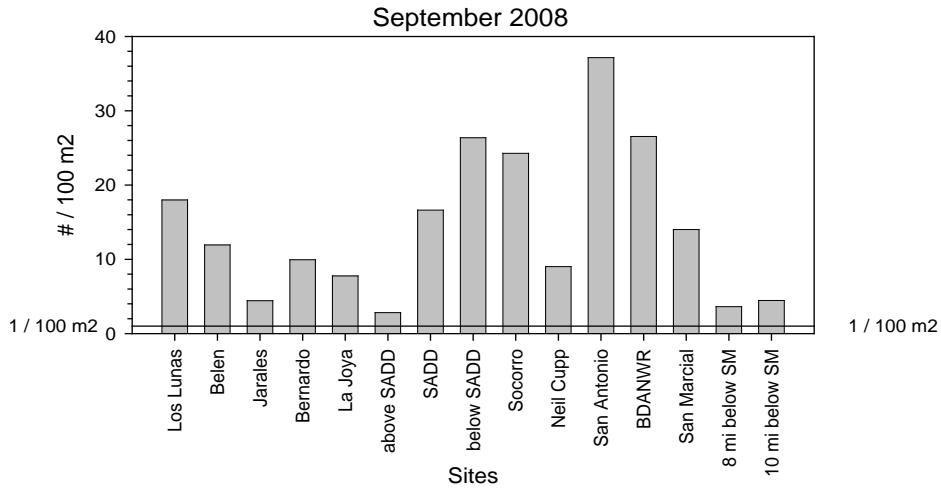


Figure 2. Catch rates for September 2008 Population Monitoring (from Dudley and Platania 2009)

The catch rates from the September monitoring (Dudley and Platania 2009) were compared with the target catch rate of 1 RGSM / 100 m² for each site (Figure 2). All 15 sites had catch rates over this target, including a majority of the sites with significantly higher catch rates. Therefore, no augmentation of Rio Grande silvery minnow was necessary in the Middle Rio Grande during 2008. Fish that were to be available for the Middle Rio Grande were made available for the initial reintroduction in Big Bend, Texas in December 2008.

A combination of factors in 2008 has led to these increased catch rates, including optimal spring runoff, recruitment flows throughout the early summer, and no river intermittency. In a research project separate from the augmentation program, in 2008 and 2009, approximately 5,000 PIT tagged RGSM were released by New Mexico Fish and Wildlife Conservation Office near the fish passage associated with the Albuquerque-Bernalillo County Water Utility Authority diversion dam near Alameda Bridge. This fish passage is equipped with antennas that will document PIT-tagged RGSM as they pass through the facility. This one-time release of 10,000 fish should not appreciably affect the ability to detect the effectiveness of the augmentation program. No other research-related projects (2008-2012) that require RGSM releases in Angostura Reach are known at this point, but will be evaluated against the needs of the augmentation program.

Post-Augmentation Monitoring

Augmentation monitoring within pueblo boundaries continued in 2008. These monitoring efforts are conducted by NMFWCO in conjunction with the associated environment departments of each Pueblo. For these monitoring sites, there were a total of 9,783 Rio Grande silvery minnow collected between January and December 2008 (Table 2). Rio Grande silvery minnow represented 38.2% of all fish captured, were collected in 35.4% of all seine hauls with an overall catch rate of 16.70 individuals/100 m² (Table 2). Of the 5 marked individuals recaptured, the majority (n=3) were recaptures at Isleta Diversion Dam and were from the fall 2007 release near U.S. Highway 60 Bridge near Bernardo. Over the sampling period, catch rates varied for Rio Grande silvery minnow, with the largest collection of 1,246 individuals occurring in June 2008 below Isleta Diversion Dam. All recaptures occurred between January and March 2008.

During monitoring conducted by NMFWCO, there were a total of 5 Rio Grande silvery minnow positively identified as previously released individuals, or 0.05% of all Rio Grande silvery minnow captured (Table 3). One of these recaptures was from a release in 2006, 1 from the spring release near Albuquerque in 2007, the remaining 3 were from fall releases in 2007 in both the Isleta and San Acacia reaches. There were no releases in 2008.

Table 2. Status, numbers, percent of total, percent occurrence, and density for all species collected during NMFWCO augmentation monitoring at all sites combined in 2008. For status, N=native and I=introduced. Subspecific names include citations below.

Species	Status	n	% of Total	Percent Occurrence	Density (fish/100m ²)
common carp <i>Cyprinus carpio</i>	I	491	1.9	5.5	0.84
red shiner <i>Cyprinella lutrensis</i>	N	6,535	25.5	31.9	11.16
Rio Grande silvery minnow <i>Hybognathus amarus</i>	N	9,783	38.2	35.4	16.70
fathead minnow <i>Pimephales promelas</i>	N	855	3.3	9.2	1.46
flathead chub <i>Platygobio gracilis gulonella</i> ^a	N	852	3.3	10.3	1.45
longnose dace <i>Rhinichthys cataractae cataractae</i> ^b	N	526	2.1	5.7	0.90
river carpsucker <i>Carpionodes carpio elongatus</i> ^c	N	363	1.4	2.9	0.62
white sucker <i>Catostomus commersonii</i>	I	3,757	14.7	11.0	6.41
yellow bullhead <i>Ameiurus natalis</i>	I	3	<0.1	0.1	0.01
channel catfish <i>Ictalurus punctatus</i>	I	448	1.8	7.4	0.76
western mosquitofish <i>Gambusia affinis</i>	I	1,621	6.3	7.0	2.77
white bass <i>Morone chrysops</i>	I	192	0.8	0.9	0.33
green sunfish <i>Lepomis cyanellus</i>	I	6	<0.1	0.3	0.01
bluegill <i>Lepomis macrochirus speciosus</i> ^d	N	26	0.1	0.8	0.04
largemouth bass <i>Micropterus salmoides</i>	I	88	0.3	2.2	0.15
white crappie <i>Pomoxis annularis</i>	I	25	0.1	0.7	0.04
walleye <i>Sander vitreus</i>	I	4	<0.1	0.1	0.01
TOTAL		25,586	100.0	56.5	43.68

^a Olund and Cross (1961)

^b Jenkins and Burkhead (1993)

^c Trautman (1981)

^d Hubbs and Lagler (1958), Avise and Smith (1974)

Table 3. Number of marked/unmarked Rio Grande silvery minnow captured by site in 2008.

Site	River Mile	RGSM captures by site/release period (number tagged and released)			Unmarked (% marked)
		Fall 06 (148,963)	Spring 07 (21,118)	Fall 07 (94,966)	
Sandia Line 14	202.0	0	0	0	717 (0.00%)
Lomitas Negras	198.3	1	0	0	585 (0.17%)
Dixon Road	195.5	0	0	0	833 (0.00%)
North AMAFCA	193.0	0	0	0	1,162 (0.00%)
Atrisco Outfall	171.2	0	0	0	549 (0.00%)
Below Isleta DD	169.3	0	0	3	3,177 (0.09%)
Alejandro Gate	166.6	0	1	0	2,755 (0.04%)
2008 Total		1	1	3	9,783 (0.05%)
2008 Total*	-	5	1	36	n/a
2007 Total*		175	11	86	n/a
2006 Total*		333	-	-	n/a
Total*		513	12	122	n/a
Percent Recapture*		0.34%	0.06%	0.13%	-

* indicates total VIE captures including data from all other researchers (see Appendix A)

Length-Frequency

Age at month estimates were created by visually determining breaks in the length-frequency distribution of measured Rio Grande silvery minnow by month (Figures 4-5). While not exact, it is an adequate qualitative method for examining general patterns in age-class strength and growth rates. There were 762 unmarked and 4 marked Rio Grande silvery minnow in the length-frequency dataset captured in 2008. Linear regression was used to estimate monthly (instantaneous) growth rate. The slope the regression line (B) for unmarked Rio Grande silvery minnow was estimated at 2.098 mm/month (Figure 3), with even higher growth rates of 6-8.5 mm/month observed during the initial 4-5 months for juvenile fish. Only 4 recaptures of marked Rio Grande silvery minnow were collected in 2008, therefore growth rates were not calculated for these fish.

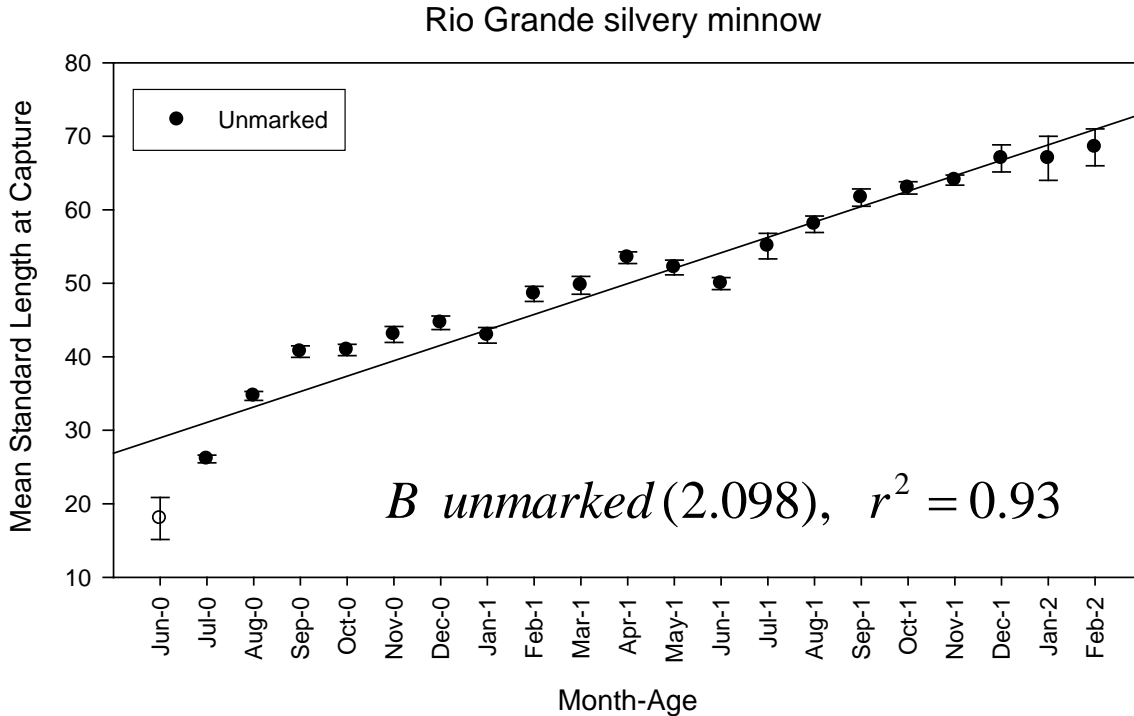


Figure 3. Growth rate for unmarked Rio Grande silvery minnow from slope (B) of the regression for mean standard lengths between age at month estimates in 2008.

Upon examination of length-frequency data by month, there appeared to be two age classes present in any one month. This is generally represented by ages 0 and 1 individuals between June and February and ages 1 and 2 individuals in January and February. Based on length-frequency observations, maximum age of Rio Grande silvery minnow was approximately 21 months old. These two individuals were captured in February, with a mean SL of 68.5 mm and likely represent the 2006 year class (Figures 4-5). There was strong representation in both the 2007 and 2008 year class as well.

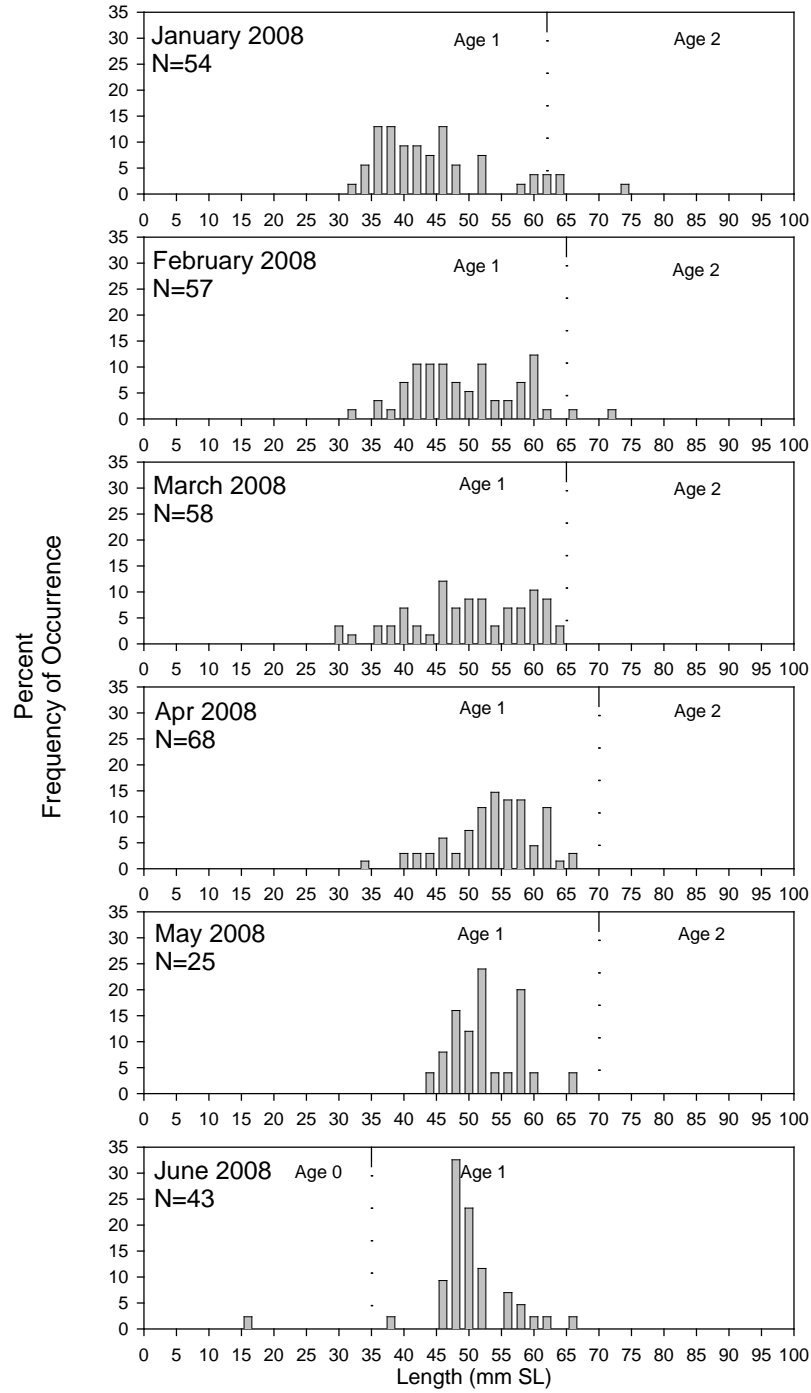


Figure 4. Length-frequency histograms of unmarked Rio Grande silvery minnow captured between January and June 2008. Dashed lines represent estimated breaks between year classes.

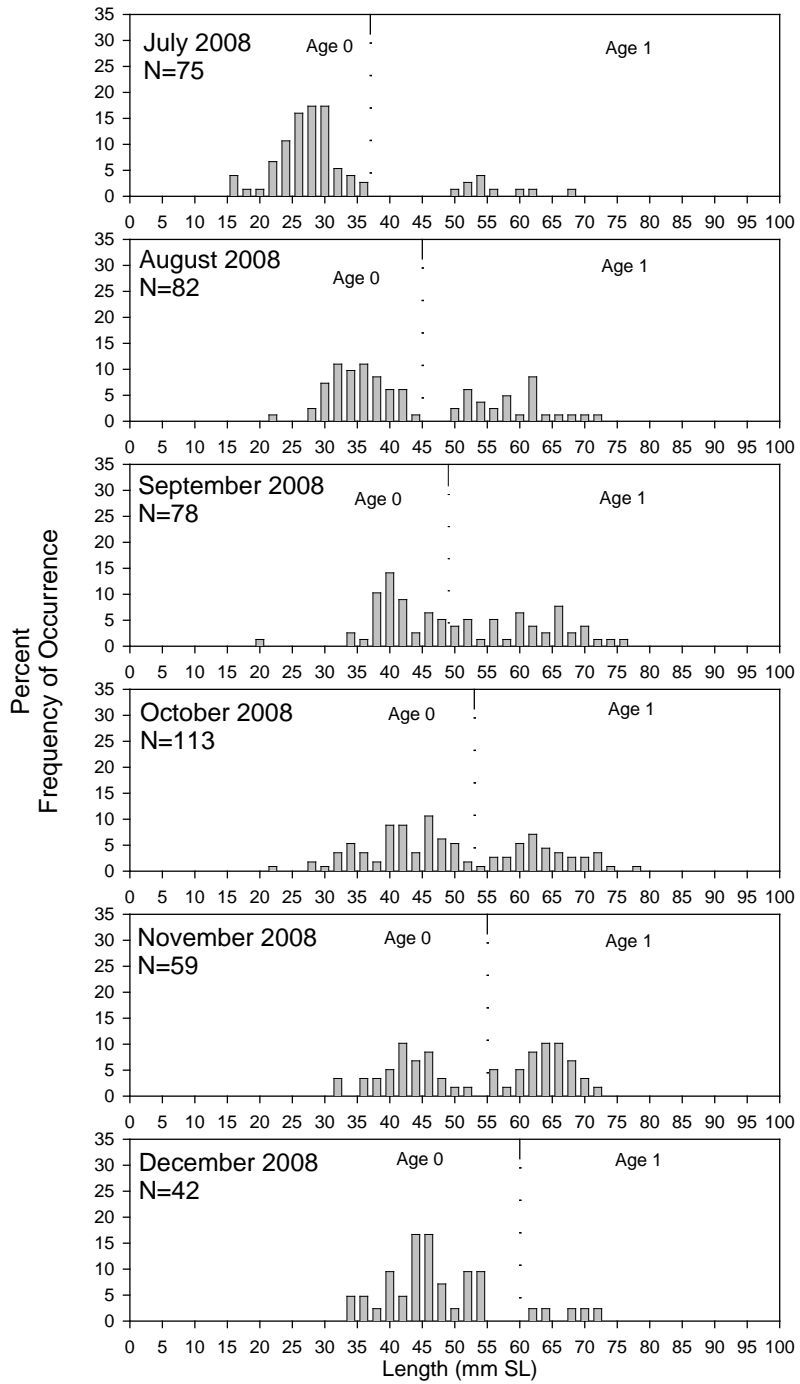


Figure 5. Length-frequency histograms of unmarked Rio Grande silvery minnow captured between July and December 2008. Dashed lines represent estimated breaks between year classes.

Movement

When combining all researchers, a total of 42 Rio Grande silvery minnow were recaptured in 2008. Recaptures were variable with both upstream and downstream movement documented, with 36% of all recaptures upstream, 33% downstream, and 30% recaptured at the release site. Over 70% of recaptures were within 15 miles of the release site (Figure 6). Fifty percent of recaptures occurred within 64 days and 90% were within 306 days of release. Maximum distance traveled from release to recapture was 38.7 miles upstream. This recapture location was immediately downstream of Isleta Diversion Dam, which may be a barrier to upstream movement (Appendix A, WJR08-712 and LTT08-002). Maximum number of days after release occurred 631 days after release only 1.5 miles downstream of the release point downstream of San Acacia Diversion Dam (Appendix A, RKD08-092). Based on stocking information, this fish was released as part of a group of 6 month-old individuals and was an age 2 fish.

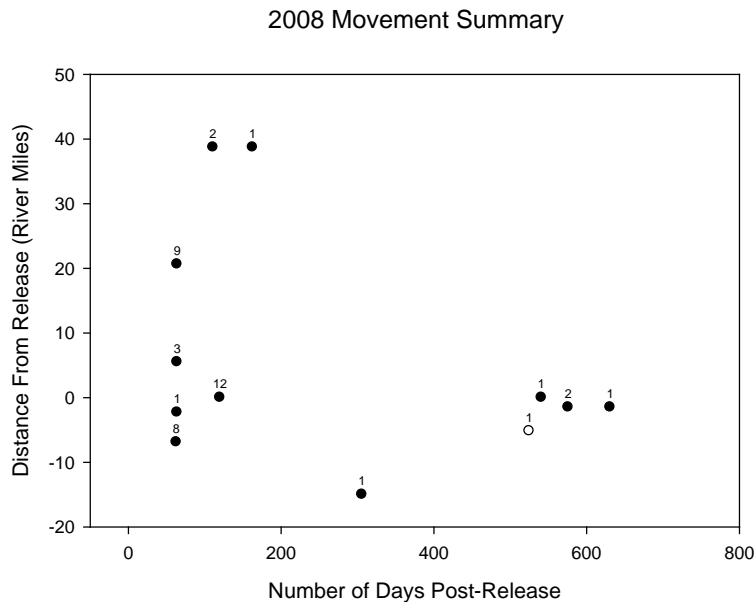


Figure 6. Movement summary for recaptured Rio Grande silvery minnow in 2008 (Numbers above points indicate multiple fish).

Fish Community

From January to December 2008, 2,317 seine hauls totaling 58,571.8 m² were conducted. In these samples, 25,586 individuals representing 17 species were collected (Table 2). Native cyprinids including red shiner (*Cyprinella lutrensis*), Rio Grande silvery minnow, fathead minnow (*Pimephales promelas*), flathead chub (*Platygobio gracilis gulonella*), and longnose dace (*Rhinichthys cataractae cataractae*) represented 72% of all individuals collected. Rio Grande silvery minnow was the numerically most dominant species of the fish community and accounted for 38% of all fish collected.

DISCUSSION

Augmentation efforts in 2008 concluded the seventh year in the Middle Rio Grande, New Mexico. Since 2002, 1,114,890 Rio Grande silvery minnow have been released. 2008 represented the first year of implementation for a revised 5-year augmentation plan (2008-2012) for the Middle Rio Grande. As a result of this revised augmentation strategy and favorable conditions for Rio Grande silvery minnow in the wild, no fish were required for augmentation in 2008.

Recaptures of VIE tagged Rio Grande silvery minnow in 2008 were decreased across all sites visited by all researchers, due primarily to the fact that there were no releases in 2008. Previous results have indicated that recaptures occur primarily within the first 6 months after a release, with catch rates decreasing out to 24 months after a release when catch of released fish nearly disappears. Individuals that are recaptured out to 24 months after a release could be up to 3 years old based on age at release. These individuals would make up a very small percentage of the population, but are present nonetheless.

With only 5 recaptures in 2008 (Table 3), the fall 2006 release group of 148,963 VIE tagged individuals is likely absent from the system. This release encompassed the current range of the species and over the course of the last 3 years resulted in at least 513 recaptures from all researchers within the middle Rio Grande. Assuming minimal number of multiple recaptures, this means that about 1 out of every 300 released fish was recaptured. Monitoring events are spread out over the course of the year and are not designed to maximize capture of fish, they are usually designed to compare across dates and sites. Past results have indicated that estimated survival rates from released fish were comparable if not higher than that for wild fish (Remshardt 2008). That is to say, that while 1 out of every 300 released fish was handled at one point or another, there were significantly more that were present in the system and eventually contributed to future spawning events and subsequent generations. For example, standard population monitoring across all 20 sites in September of 2008 resulted in approximately 10,000 m² of habitat sampled, while there are approximately 40,000,000 m² of potential habitat between combining all reaches (Dudley and Platania 2009, Dudley et al. 2009). Although capture efficiencies are relatively high (0.6 – 0.7) this further reduced the chances of encountering released fish. It is quickly evident that even a moderate number of recaptures indicate significantly more impact than just raw catch rates.

Even when combining data from a variety of research projects in 2008, there were only 46 recaptures. Again, this low number makes it difficult to make any significant observations, including those of movement and survival. Included in the revised augmentation plan is a strategy to reduce downstream movement immediately after release due to the stress of handling and transport. We now “soft-release” all augmentation-related Rio Grande silvery minnow. This has likely led to decreased initial movement and associated mortality. With batch-marking such as VIE, it is difficult to monitor movement from month to month without knowing the specific actions of each fish. Nonetheless, some individuals continue to be observed significant distances from release points. Maximum distance from release observed in 2008 was 38.7 miles upstream, and that location was below Isleta Diversion Dam, possibly reducing further movement. Still, the majority of recaptured VIE tagged fish are found within 15 miles of the

release location. Specific information on individual movement (including juveniles) is still an important information gap in Rio Grande silvery minnow biology.

Under the revised stocking protocol, we determined that augmentation in the Isleta and San Acacia Reaches was not necessary in 2008. The catch rates from the September 2008 monitoring were compared with the target catch rate of 1 RGSM / 100 m² for each site (Dudley and Platania 2009). All 15 sites had catch rates over this target, including a majority of the sites with significantly higher catch rates. A combination of factors in 2008 led to these increased catch rates including optimal spring runoff, recruitment flows throughout the early summer, and no river intermittency.

In addition, we are also closely monitoring the Angostura Reach catch rates to determine the long-term effects of augmentation on this reach and determine if this portion of the population is self-sustainable. In September 2008, catch rates in the Angostura Reach were less than both the Isleta and San Acacia reaches and one site (Rio Bravo) did not record any Rio Grande silvery minnow (Dudley and Platania 2009). This site, along with the site just below Angostura Diversion Dam, had September catch rates below the target of 1 RGSM / 100 m², but the overall reach catch rate was 4.65 RGSM / 100 m². We will continue to monitor all of these sites in this reach in 2009, if the overall catch rate for this reach falls below 0.1 RGSM / 100 m² during fall surveys, then augmentation will be re-initiated in the following year.

With the temporary removal of augmentation from Angostura Reach, it is anticipated that catch rates in this reach will decrease in relation to catch rates in the lower reaches. This observation may be clouded by benefits gained from other restoration activities and detracted by continued threats such as habitat fragmentation.

Augmentation through 2012 will be focused in the Isleta and San Acacia Reaches while evaluating past efforts in the Angostura Reach. The primary way to determine the effects of augmentation in the Angostura Reach is to remove augmentation and monitor the changes in catch rates (and population estimates). Initial observations throughout the Middle Rio Grande indicate that the majority of the population is located in the Isleta and San Acacia Reaches. If this trend continues and catch rates in the Angostura Reach drop to levels observed prior to augmentation (2002), then it can be expected that augmentation (along with favorable habitat and flow conditions) was a driving force in the temporary increase in catch rates observed between 2003 and 2006. Long-term persistence of Rio Grande silvery minnow in the Middle Rio Grande, New Mexico will likely depend, in part, on continued augmentation.

Continued monitoring of an augmented population is critical for evaluating the success of the project (George et al. 2009). Within the last two years, we have implemented new protocols that have been adapted from information learned in previous years. Evaluation of these populations has not just focused on documenting the presence or absence of released fish, but has included information on growth, movement, survival. Cooperative research includes genetic monitoring and providing information and fish for reintroduction. Augmentation such as this is not intended to be a continuous effort (USFWS 2000), and must not continue for the population to be by definition of a “self-sustaining population”. Although various conservation efforts have been undertaken in the past and others are currently being carried out in the middle Rio Grande, and

abundance in recent years is increasing, the threat of extinction of the Rio Grande silvery minnow continues because of the high probability of continued drought, the fragmented and isolated nature of currently occupied habitat, and the absence of silvery minnows in other parts of the historic range. Additional work needs to be done to conserve this species and the ecosystems upon which it depends.

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Appendix A.
Recapture information of Rio Grande silvery minnow in 2008 from augmentation monitoring
and other researchers.

Field #	N	Recapture Date	Release Date	Number of Days Post-Release	rm release	rm recapture	Distance Traveled (RM)*
Green Left Dorsal, 21 September 2006 @ 550 Bridge							
WJR08-720	1	2/28/2008	9/21/2006	525	203.5	198.3	-5.2
Orange Left Dorsal, 16 October 2006 @ below San Acacia Diversion Dam							
RKD08-030	1	4/9/2008	10/16/2006	541	116.1	116.1	0
RKD08-050	2	5/14/2008	10/16/2006	576	116.1	114.6	-1.5
RKD08-092	1	7/8/2008	10/16/2006	631	116.1	114.6	-1.5
Pink Right Dorsal, 29 May 2007 @ Bridge Street							
LTT08-003	1	3/30/2008	5/29/2007	306	181.6	166.6	-15
Pink Left Dorsal, 9 October, 25 October, and 3 December 2007 @ U.S. 60 Bridge, 1.5 mi below SADD and Brown's Arroyo							
WJR08-712	2	1/28/2008	10/9/2007	111	130.6	169.3	38.7
RKD08-005	8	2/4/2008	12/3/2007	63	94	87.1	-6.9
RKD08-006	1	2/5/2008	12/3/2007	64	94	91.7	-2.3
RKD08-007	3	2/5/2008	12/3/2007	64	94	99.5	5.5
RKD08-008	9	2/5/2008	12/3/2007	64	94	114.6	20.6
RKD08-012	12	2/6/2008	10/9/2007	120	130.6	130.6	0.0
LTT08-002	1	3/20/2008	10/9/2007	163	130.6	169.3	38.7

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NMFWCO Augmentation Monitoring
 ASIRF Pop Monitoring

* calculated as the minimum unidirectional distance between release and recapture points within the river channel

Appendix B.
Ichthyofaunal composition of 2008 Rio Grande silvery minnow augmentation monitoring
surveys

Rio Grande silvery minnow Augmentation Monitoring 2008

Dixon Road

25 January 2008 WJR08-706 30 seine hauls Effort: 766.6 m²
 Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	43
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	1
Poeciliidae	<i>Gambusia affinis</i>	1

North Amafca

25 January 2008 WJR08-707 30 seine hauls Effort: 699.2 m²
 Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	23
Cyprinidae	<i>Hybognathus amarus</i>	5
Cyprinidae	<i>Platygobio gracilis</i>	1
Centrarchidae	<i>Lepomis macrochirus</i>	1
Centrarchidae	<i>Micropterus salmoides</i>	4

Lomitas Negras

25 January 2008 WJR08-708 30 seine hauls Effort: 803.4 m²
 Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	5
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	6
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	2
Catostomidae	<i>Carpiodes carpio</i>	14
Poeciliidae	<i>Gambusia affinis</i>	43
Centrarchidae	<i>Micropterus salmoides</i>	2

Sandia Line 14

25 January 2008 WJR08-708 30 seine hauls Effort: 877.1 m²
 Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	6
Cyprinidae	<i>Hybognathus amarus</i>	8

Atrisco Outfall

28 January 2008

WJR08-711

30 seine hauls

Effort: 903.7 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	165
Cyprinidae	<i>Hybognathus amarus</i>	57
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	1
Catostomidae	<i>Carpionodes carpio</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	1

Isleta Dam

28 January 2008

WJR08-712

30 seine hauls

Effort: 734.5 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	272
Cyprinidae	<i>Hybognathus amarus</i>	339
Cyprinidae	<i>Pimephales promelas</i>	7
Catostomidae	<i>Carpionodes carpio</i>	6
Ictaluridae	<i>Ictalurus punctatus</i>	1

Alejandro Gate

28 January 2008

WJR08-712

30 seine hauls

Effort: 833.2 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	110
Cyprinidae	<i>Hybognathus amarus</i>	77
Cyprinidae	<i>Platygobio gracilis</i>	3
Catostomidae	<i>Carpionodes carpio</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1

Atrisco Outfall

28 February 2008

WJR08-716

30 seine hauls

Effort: 700.0 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	15
Cyprinidae	<i>Hybognathus amarus</i>	70
Cyprinidae	<i>Pimephales promelas</i>	5
Cyprinidae	<i>Platygobio gracilis</i>	4
Cyprinidae	<i>Rhinichthys cataractae</i>	1

Isleta Dam

28 February 2008

WJR08-717

30 seine hauls

Effort: 789.8 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	4
Cyprinidae	<i>Hybognathus amarus</i>	62
Cyprinidae	<i>Pimephales promelas</i>	1
Poeciliidae	<i>Gambusia affinis</i>	1
Centrarchidae	<i>Pomoxis annularis</i>	1

Dixon Road

28 February 2008

WJR08-718

30 seine hauls

Effort: 842.3 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	26
Cyprinidae	<i>Hybognathus amarus</i>	25
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	4
Catostomidae	<i>Catostomus commersonii</i>	2

North Amafca

28 February 2008

WJR08-719

30 seine hauls

Effort: 727.2 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	5
Cyprinidae	<i>Hybognathus amarus</i>	28
Cyprinidae	<i>Pimephales promelas</i>	1

Lomitas Negras

28 February 2008

WJR08-720

30 seine hauls

Effort: 662.4 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	118
Cyprinidae	<i>Hybognathus amarus</i>	22
Cyprinidae	<i>Pimephales promelas</i>	25
Cyprinidae	<i>Platygobio gracilis</i>	1
Catostomidae	<i>Carpiodes carpio</i>	50
Centrarchidae	<i>Micropterus salmoides</i>	3

Sandia Line 14

28 February 2008

WJR08-721

30 seine hauls

Effort: 779.3 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Hybognathus amarus</i>	8
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Carpiodes carpio</i>	1

Atrisco Outfall

20 March 2008

LTT08-001

4 seine hauls

Effort: 70.0 m²

Personnel: Leeanna T. Torres,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	3

Isleta Dam

20 March 2008

LTT08-002

30 seine hauls

Effort: 639.5 m²

Personnel: Leeanna T. Torres,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	15
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	52
Poeciliidae	<i>Gambusia affinis</i>	1

Alejandro Gate

20 March 2008

LTT08-003

5 seine hauls

Effort: 77.5 m²

Personnel: Leeanna T. Torres,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	13
Cyprinidae	<i>Hybognathus amarus</i>	82
Cyprinidae	<i>Pimephales promelas</i>	2

Dixon Road

28 March 2008

WJR08-722

30 seine hauls

Effort: 903.0 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	14
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	6
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersonii</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1

North Amafca

28 March 2008

WJR08-723

30 seine hauls

Effort: 492.9 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	6
Cyprinidae	<i>Hybognathus amarus</i>	16
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	3
Catostomidae	<i>Catostomus commersonii</i>	17
Centrarchidae	<i>Lepomis macrochirus</i>	1

Lomitas Negras

28 March 2008

WJR08-724

30 seine hauls

Effort: 730.8 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	43
Cyprinidae	<i>Pimephales promelas</i>	7
Cyprinidae	<i>Platygobio gracilis</i>	6
Catostomidae	<i>Carpionodes carpio</i>	1
Catostomidae	<i>Catostomus commersonii</i>	6
Poeciliidae	<i>Gambusia affinis</i>	11
Centrarchidae	<i>Lepomis macrochirus</i>	1

Sandia Line 14

28 March 2008

WJR08-725

30 seine hauls

Effort: 747.4 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Hybognathus amarus</i>	6
Cyprinidae	<i>Pimephales promelas</i>	2

Dixon Road

25 April 2008

TPA08-001

30 seine hauls

Effort: 936.4 m²

Personnel: Thomas P. Archdeacon,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	5
Cyprinidae	<i>Hybognathus amarus</i>	30
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	3
Cyprinidae	<i>Rhinichthys cataractae</i>	5
Catostomidae	<i>Catostomus commersonii</i>	1

North Amafca

25 April 2008

TPA08-002

23 seine hauls

Effort: 259.2 m²

Personnel: Thomas P. Archdeacon,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	6
Cyprinidae	<i>Hybognathus amarus</i>	48
Cyprinidae	<i>Pimephales promelas</i>	7
Cyprinidae	<i>Platygobio gracilis</i>	2
Catostomidae	<i>Catostomus commersonii</i>	31

Atrisco Outfall

25 April 2008

TPA08-003

30 seine hauls

Effort: 526.7 m²

Personnel: Thomas P. Archdeacon,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	3
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	100
Cyprinidae	<i>Pimephales promelas</i>	3
Cyprinidae	<i>Platygobio gracilis</i>	1
Catostomidae	<i>Carpiodes carpio</i>	12
Catostomidae	<i>Catostomus commersonii</i>	1
Ictaluridae	<i>Ameiurus melas</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1
Centrarchidae	<i>Lepomis macrochirus</i>	10
Centrarchidae	<i>Micropterus salmoides</i>	2

Sandia Line 14

25 April 2008

TPA08-004

30 seine hauls

Effort: 888.5 m²

Personnel: Thomas P. Archdeacon,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	16
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersonii</i>	1

Atrisco Outfall

30 April 2008

TPA08-009

30 seine hauls

Effort: 770.1 m²

Personnel: Thomas P. Archdeacon,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	11
Cyprinidae	<i>Hybognathus amarus</i>	32
Cyprinidae	<i>Platygobio gracilis</i>	8
Catostomidae	<i>Carpionodes carpio</i>	1
Catostomidae	<i>Catostomus commersonii</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	7
Poeciliidae	<i>Gambusia affinis</i>	1

Isleta Dam

30 April 2008

TPA08-010

30 seine hauls

Effort: 770.1 m²

Personnel: Thomas P. Archdeacon,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	175
Cyprinidae	<i>Hybognathus amarus</i>	226
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	4
Catostomidae	<i>Catostomus commersonii</i>	1
Poeciliidae	<i>Gambusia affinis</i>	1

Alejandro Gate

30 April 2008

TPA08-011

18 seine hauls

Effort: 639.7 m²

Personnel: Thomas P. Archdeacon,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	166
Cyprinidae	<i>Hybognathus amarus</i>	315
Poeciliidae	<i>Gambusia affinis</i>	27

Atrisco Outfall

29 May 2008

WJR08-799

30 seine hauls

Effort: 753.6 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Hybognathus amarus</i>	9
Poeciliidae	<i>Gambusia affinis</i>	3
Centrarchidae	<i>Micropterus salmoides</i>	6

Isleta Dam

29 May 2008

WJR08-800

30 seine hauls

Effort: 600.6 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	299
Cyprinidae	<i>Hybognathus amarus</i>	237
Cyprinidae	<i>Platygobio gracilis</i>	2
Catostomidae	<i>Carpionodes carpio</i>	1
Catostomidae	<i>Catostomus commersonii</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	1

Alejandro Gate

29 May 2008

WJR08-801

30 seine hauls

Effort: 600.6 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	215
Cyprinidae	<i>Hybognathus amarus</i>	247
Ictaluridae	<i>Ameiurus natalis</i>	1
Poeciliidae	<i>Gambusia affinis</i>	4
Centrarchidae	<i>Pomoxis annularis</i>	1

Dixon Road

30 May 2008

WJR08-802

30 seine hauls

Effort: 924.7 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	10
Cyprinidae	<i>Hybognathus amarus</i>	72
Cyprinidae	<i>Platygobio gracilis</i>	10
Cyprinidae	<i>Rhinichthys cataractae</i>	49
Catostomidae	<i>Catostomus commersonii</i>	1

North Amafca

30 May 2008

WJR08-803

30 seine hauls

Effort: 428.3 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	17
Cyprinidae	<i>Cyprinus carpio</i>	12
Cyprinidae	<i>Hybognathus amarus</i>	30
Poeciliidae	<i>Gambusia affinis</i>	1

Lomitas Negras

30 May 2008

WJR08-804

30 seine hauls

Effort: 613.8 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	4
Cyprinidae	<i>Cyprinus carpio</i>	23
Cyprinidae	<i>Hybognathus amarus</i>	40
Cyprinidae	<i>Platygobio gracilis</i>	2
Catostomidae	<i>Catostomus commersonii</i>	8
Centrarchidae	<i>Lepomis macrochirus</i>	1

Sandia Line 14

30 May 2008

WJR08-805

30 seine hauls

Effort: 759.8 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	11
Cyprinidae	<i>Platygobio gracilis</i>	2
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersonii</i>	4
Ictaluridae	<i>Ictalurus punctatus</i>	2

Dixon Road

23 June 2008

WJR08-806

30 seine hauls

Effort: 784.9 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	102
Cyprinidae	<i>Hybognathus amarus</i>	6
Cyprinidae	<i>Platygobio gracilis</i>	7
Cyprinidae	<i>Rhinichthys cataractae</i>	8
Catostomidae	<i>Carpionodes carpio</i>	2
Catostomidae	<i>Catostomus commersonii</i>	35

North Amafca

23 June 2008

WJR08-807

30 seine hauls

Effort: 636.0 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	119
Cyprinidae	<i>Cyprinus carpio</i>	6
Cyprinidae	<i>Hybognathus amarus</i>	17
Cyprinidae	<i>Pimephales promelas</i>	136
Cyprinidae	<i>Rhinichthys cataractae</i>	4
Catostomidae	<i>Carpiodes carpio</i>	591
Ictaluridae	<i>Ictalurus punctatus</i>	1
Moronidae	<i>Morone chrysops</i>	190
Centrarchidae	<i>Lepomis macrochirus</i>	3
Centrarchidae	<i>Micropterus salmoides</i>	2
Centrarchidae	<i>Sander vitreus</i>	1

Lomitas Negras

23 June 2008

WJR08-808

30 seine hauls

Effort: 584.0 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	41
Cyprinidae	<i>Cyprinus carpio</i>	25
Cyprinidae	<i>Hybognathus amarus</i>	82
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Carpiodes carpio</i>	1
Catostomidae	<i>Catostomus commersonii</i>	1799
Poeciliidae	<i>Gambusia affinis</i>	7

Sandia Line 14

24 June 2008

WJR08-809

30 seine hauls

Effort: 719.1 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	93
Cyprinidae	<i>Hybognathus amarus</i>	67
Cyprinidae	<i>Rhinichthys cataractae</i>	3
Catostomidae	<i>Catostomus commersonii</i>	415

Atrisco Outfall

24 June 2008

WJR08-810

30 seine hauls

Effort: 818.4 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	27
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	121
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersonii</i>	28

Isleta Dam

24 June 2008

WJR08-811

30 seine hauls

Effort: 725.1 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	1124
Cyprinidae	<i>Cyprinus carpio</i>	20
Cyprinidae	<i>Hybognathus amarus</i>	1246
Cyprinidae	<i>Pimephales promelas</i>	13
Cyprinidae	<i>Platygobio gracilis</i>	5
Catostomidae	<i>Carpiodes carpio</i>	2
Catostomidae	<i>Catostomus commersonii</i>	63
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	126

Alejandro Gate

24 June 2008

WJR08-812

30 seine hauls

Effort: 543.2 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	72
Cyprinidae	<i>Cyprinus carpio</i>	114
Cyprinidae	<i>Hybognathus amarus</i>	50
Cyprinidae	<i>Pimephales promelas</i>	24
Catostomidae	<i>Catostomus commersonii</i>	3
Ictaluridae	<i>Ameiurus natalis</i>	1
Poeciliidae	<i>Gambusia affinis</i>	7
Centrarchidae	<i>Micropterus salmoides</i>	15
Centrarchidae	<i>Pomoxis annularis</i>	1

Atrisco Outfall

23 July 2008

TLK08-040

30 seine hauls

Effort: 1042.2 m²

Personnel: Tammy L. Knecht,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	5
Cyprinidae	<i>Cyprinus carpio</i>	52
Cyprinidae	<i>Hybognathus amarus</i>	127
Cyprinidae	<i>Pimephales promelas</i>	44
Cyprinidae	<i>Platygobio gracilis</i>	20
Cyprinidae	<i>Rhinichthys cataractae</i>	10
Catostomidae	<i>Carpiodes carpio</i>	10
Catostomidae	<i>Catostomus commersonii</i>	215
Ictaluridae	<i>Ameiurus natalis</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	52
Poeciliidae	<i>Gambusia affinis</i>	14

Isleta Dam

23 July 2008

TLK08-041

30 seine hauls

Effort: 947.9 m²

Personnel: Tammy L. Knecht,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	278
Cyprinidae	<i>Cyprinus carpio</i>	3
Cyprinidae	<i>Hybognathus amarus</i>	467
Cyprinidae	<i>Pimephales promelas</i>	6
Cyprinidae	<i>Platygobio gracilis</i>	21
Cyprinidae	<i>Rhinichthys cataractae</i>	3
Catostomidae	<i>Carpiodes carpio</i>	5
Ictaluridae	<i>Ictalurus punctatus</i>	40
Poeciliidae	<i>Gambusia affinis</i>	23
Centrarchidae	<i>Lepomis spp</i>	6
Centrarchidae	<i>Micropterus salmoides</i>	3

Alejandro Gate

23 July 2008

TLK08-042

30 seine hauls

Effort: 999.0 m²

Personnel: Tammy L. Knecht,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	307
Cyprinidae	<i>Cyprinus carpio</i>	6
Cyprinidae	<i>Hybognathus amarus</i>	1139
Cyprinidae	<i>Pimephales promelas</i>	6
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Carpiodes carpio</i>	3
Catostomidae	<i>Catostomus commersonii</i>	37
Ictaluridae	<i>Ictalurus punctatus</i>	9
Poeciliidae	<i>Gambusia affinis</i>	29

Alejandro Gate

24 July 2008

CRS08-003

30 seine hauls

Effort: 905.8 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	145
Cyprinidae	<i>Cyprinus carpio</i>	49
Cyprinidae	<i>Hybognathus amarus</i>	230
Cyprinidae	<i>Pimephales promelas</i>	24
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	42
Catostomidae	<i>Catostomus commersonii</i>	128
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	27
Centrarchidae	<i>Micropterus salmoides</i>	6

North Amafca

24 July 2008

CRS08-003

30 seine hauls

Effort: 905.8 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	145
Cyprinidae	<i>Cyprinus carpio</i>	49
Cyprinidae	<i>Hybognathus amarus</i>	230
Cyprinidae	<i>Pimephales promelas</i>	24
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	42
Catostomidae	<i>Catostomus commersonii</i>	128
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	27
Centrarchidae	<i>Micropterus salmoides</i>	6

Lomitas Negras

24 July 2008

CRS08-005

30 seine hauls

Effort: 925.6 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	48
Cyprinidae	<i>Cyprinus carpio</i>	89
Cyprinidae	<i>Hybognathus amarus</i>	93
Cyprinidae	<i>Pimephales promelas</i>	84
Cyprinidae	<i>Platygobio gracilis</i>	4
Cyprinidae	<i>Rhinichthys cataractae</i>	40
Catostomidae	<i>Carpiodes carpio</i>	109
Catostomidae	<i>Catostomus commersonii</i>	74
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	324
Centrarchidae	<i>Micropterus salmoides</i>	11

Sandia Line 14

24 July 2008

CRS08-006

30 seine hauls

Effort: 822.1 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	71
Cyprinidae	<i>Cyprinus carpio</i>	34
Cyprinidae	<i>Hybognathus amarus</i>	159
Cyprinidae	<i>Pimephales promelas</i>	5
Cyprinidae	<i>Platygobio gracilis</i>	2
Cyprinidae	<i>Rhinichthys cataractae</i>	35
Catostomidae	<i>Catostomus commersonii</i>	29
Poeciliidae	<i>Gambusia affinis</i>	5

Atrisco Outfall

2 September 2008

WJR08-820

30 seine hauls

Effort: 1050.2 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	51
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	19
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	12
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Carpionodes carpio</i>	42
Ictaluridae	<i>Ictalurus punctatus</i>	80
Poeciliidae	<i>Gambusia affinis</i>	92

Isleta Dam

2 September 2008

WJR08-821

30 seine hauls

Effort: 824.9 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	229
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	318
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Carpionodes carpio</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	69
Poeciliidae	<i>Gambusia affinis</i>	9
Centrarchidae	<i>Micropterus salmoides</i>	1

Alejandro Gate

2 September 2008

WJR08-822

30 seine hauls

Effort: 926.8 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	104
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	293
Cyprinidae	<i>Platygobio gracilis</i>	1
Catostomidae	<i>Carpionodes carpio</i>	2
Ictaluridae	<i>Ictalurus punctatus</i>	28
Poeciliidae	<i>Gambusia affinis</i>	45
Centrarchidae	<i>Micropterus salmoides</i>	1
Centrarchidae	<i>Pomoxis annularis</i>	1

Dixon Road

3 September 2008

CRS08-007

30 seine hauls

Effort: 910.6 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	73
Cyprinidae	<i>Cyprinus carpio</i>	18
Cyprinidae	<i>Hybognathus amarus</i>	198
Cyprinidae	<i>Pimephales promelas</i>	46
Cyprinidae	<i>Platygobio gracilis</i>	84
Cyprinidae	<i>Rhinichthys cataractae</i>	10
Catostomidae	<i>Carpionodes carpio</i>	57
Catostomidae	<i>Catostomus commersonii</i>	31
Ictaluridae	<i>Ictalurus punctatus</i>	40
Poeciliidae	<i>Gambusia affinis</i>	25
Centrarchidae	<i>Lepomis macrochirus</i>	3
Centrarchidae	<i>Micropterus salmoides</i>	2
Centrarchidae	<i>Pomoxis annularis</i>	10

North Amafca

3 September 2008

CRS08-008

30 seine hauls

Effort: 801.4 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	51
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	203
Cyprinidae	<i>Pimephales promelas</i>	18
Cyprinidae	<i>Platygobio gracilis</i>	91
Cyprinidae	<i>Rhinichthys cataractae</i>	36
Catostomidae	<i>Carpiodes carpio</i>	8
Catostomidae	<i>Catostomus commersonii</i>	34
Ictaluridae	<i>Ictalurus punctatus</i>	20
Poeciliidae	<i>Gambusia affinis</i>	14
Centrarchidae	<i>Lepomis macrochirus</i>	
Centrarchidae	<i>Micropterus salmoides</i>	4

Lomitas Negras

3 September 2008

CRS08-009

30 seine hauls

Effort: 744.1 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	46
Cyprinidae	<i>Cyprinus carpio</i>	4
Cyprinidae	<i>Hybognathus amarus</i>	93
Cyprinidae	<i>Pimephales promelas</i>	30
Cyprinidae	<i>Platygobio gracilis</i>	50
Cyprinidae	<i>Rhinichthys cataractae</i>	51
Catostomidae	<i>Carpiodes carpio</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	5
Poeciliidae	<i>Gambusia affinis</i>	26
Centrarchidae	<i>Micropterus salmoides</i>	5

Lomitas Negras

3 September 2008

CRS08-010

30 seine hauls

Effort: 750.0 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	41
Cyprinidae	<i>Hybognathus amarus</i>	24
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	6
Cyprinidae	<i>Rhinichthys cataractae</i>	137
Catostomidae	<i>Carpiodes carpio</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	8
Centrarchidae	<i>Sander vitreus</i>	1

Dixon Road

29 September 2008

CRS08-011

30 seine hauls

Effort: 954.9 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	135
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	146
Cyprinidae	<i>Pimephales promelas</i>	145
Cyprinidae	<i>Platygobio gracilis</i>	2
Cyprinidae	<i>Rhinichthys cataractae</i>	10
Catostomidae	<i>Carpiodes carpio</i>	4
Catostomidae	<i>Catostomus commersonii</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	34
Centrarchidae	<i>Lepomis cyanellus</i>	2
Centrarchidae	<i>Micropterus salmoides</i>	2
Centrarchidae	<i>Sander vitreus</i>	2

North Amafca

29 September 2008

CRS08-012

30 seine hauls

Effort: 799.5 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	46
Cyprinidae	<i>Cyprinus carpio</i>	4
Cyprinidae	<i>Hybognathus amarus</i>	11
Cyprinidae	<i>Pimephales promelas</i>	21
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Carpiodes carpio</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	56
Centrarchidae	<i>Lepomis cyanellus</i>	1
Centrarchidae	<i>Lepomis macrochirus</i>	1
Centrarchidae	<i>Micropterus salmoides</i>	3
Centrarchidae	<i>Pomoxis annularis</i>	5
Centrarchidae	<i>Sander vitreus</i>	1

Lomitas Negras

29 September 2008

CRS08-013

30 seine hauls

Effort: 960.0 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	20
Cyprinidae	<i>Hybognathus amarus</i>	38
Cyprinidae	<i>Pimephales promelas</i>	22
Cyprinidae	<i>Platygobio gracilis</i>	5
Cyprinidae	<i>Rhinichthys cataractae</i>	12
Catostomidae	<i>Carpionodes carpio</i>	3
Catostomidae	<i>Catostomus commersonii</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	13
Centrarchidae	<i>Micropterus salmoides</i>	1

Sandia Line 14

29 September 2008

CRS08-014

30 seine hauls

Effort: 970.6 m²

Personnel: Casey R. Smith,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	100
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	57
Cyprinidae	<i>Pimephales promelas</i>	14
Cyprinidae	<i>Platygobio gracilis</i>	31
Cyprinidae	<i>Rhinichthys cataractae</i>	24
Catostomidae	<i>Catostomus commersonii</i>	4
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	3

Atrisco Outfall

30 September 2008

TPA08-068

30 seine hauls

Effort: 971.4 m²

Personnel: Thomas P. Archdeacon,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	68
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	3
Cyprinidae	<i>Pimephales promelas</i>	38
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Carpionodes carpio</i>	8
Catostomidae	<i>Catostomus commersonii</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	6
Poeciliidae	<i>Gambusia affinis</i>	228

Isleta Dam

30 September 2008

TPA08-069

30 seine hauls

Effort: 630.8 m²

Personnel: Thomas P. Archdeacon,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	206
Cyprinidae	<i>Hybognathus amarus</i>	426
Cyprinidae	<i>Pimephales promelas</i>	2
Catostomidae	<i>Carpiodes carpio</i>	6
Catostomidae	<i>Catostomus commersonii</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	18
Poeciliidae	<i>Gambusia affinis</i>	104
Centrarchidae	<i>Pomoxis annularis</i>	2

Alejandro Gate

30 September 2008

TPA08-070

30 seine hauls

Effort: 823.5 m²

Personnel: Thomas P. Archdeacon,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	201
Cyprinidae	<i>Hybognathus amarus</i>	132
Catostomidae	<i>Carpiodes carpio</i>	4
Catostomidae	<i>Catostomus commersonii</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	32
Centrarchidae	<i>Micropterus salmoides</i>	1

Atrisco Outfall

27 October 2008

WJR08-824

30 seine hauls

Effort: 790.9 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	187
Cyprinidae	<i>Hybognathus amarus</i>	60
Cyprinidae	<i>Pimephales promelas</i>	3
Cyprinidae	<i>Platygobio gracilis</i>	8
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Carpiodes carpio</i>	
Catostomidae	<i>Catostomus commersonii</i>	
Ictaluridae	<i>Ictalurus punctatus</i>	
Poeciliidae	<i>Gambusia affinis</i>	
Centrarchidae	<i>Micropterus salmoides</i>	

Atrisco Outfall

27 October 2008

WJR08-825

30 seine hauls

Effort: 751.6 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	150
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	29
Cyprinidae	<i>Pimephales promelas</i>	
Cyprinidae	<i>Platygobio gracilis</i>	2
Cyprinidae	<i>Rhinichthys cataractae</i>	
Catostomidae	<i>Carpiodes carpio</i>	
Catostomidae	<i>Catostomus commersonii</i>	
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	
Centrarchidae	<i>Micropterus salmoides</i>	1

Alejandro Gate

27 October 2008

WJR08-826

30 seine hauls

Effort: 751.6 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	187
Cyprinidae	<i>Cyprinus carpio</i>	
Cyprinidae	<i>Hybognathus amarus</i>	60
Cyprinidae	<i>Pimephales promelas</i>	
Cyprinidae	<i>Platygobio gracilis</i>	3
Cyprinidae	<i>Rhinichthys cataractae</i>	
Catostomidae	<i>Carpiodes carpio</i>	1
Catostomidae	<i>Catostomus commersonii</i>	
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	7
Centrarchidae	<i>Micropterus salmoides</i>	
Centrarchidae	<i>Pomoxis annularis</i>	1

Dixon Road

28 October 2008

WJR08-827

30 seine hauls

Effort: 696.5 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	64
Cyprinidae	<i>Cyprinus carpio</i>	
Cyprinidae	<i>Hybognathus amarus</i>	107
Cyprinidae	<i>Pimephales promelas</i>	49
Cyprinidae	<i>Platygobio gracilis</i>	41
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Carpiodes carpio</i>	
Catostomidae	<i>Catostomus commersonii</i>	4
Ictaluridae	<i>Ictalurus punctatus</i>	13
Poeciliidae	<i>Gambusia affinis</i>	90
Centrarchidae	<i>Micropterus salmoides</i>	
Centrarchidae	<i>Pomoxis annularis</i>	1

North Amafca

28 October 2008

WJR08-828

30 seine hauls

Effort: 644.9 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	13
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	22
Cyprinidae	<i>Pimephales promelas</i>	
Cyprinidae	<i>Platygobio gracilis</i>	
Cyprinidae	<i>Rhinichthys cataractae</i>	6
Catostomidae	<i>Carpiodes carpio</i>	2
Catostomidae	<i>Catostomus commersonii</i>	
Ictaluridae	<i>Ictalurus punctatus</i>	
Poeciliidae	<i>Gambusia affinis</i>	2
Centrarchidae	<i>Micropterus salmoides</i>	
Centrarchidae	<i>Pomoxis annularis</i>	1

Lomitas Negras

28 October 2008

WJR08-829

30 seine hauls

Effort: 587.8 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	28
Cyprinidae	<i>Cyprinus carpio</i>	3
Cyprinidae	<i>Hybognathus amarus</i>	126
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	8
Cyprinidae	<i>Rhinichthys cataractae</i>	5
Catostomidae	<i>Carpiodes carpio</i>	1
Catostomidae	<i>Catostomus commersonii</i>	8
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	108
Centrarchidae	<i>Lepomis macrochirus</i>	1
Centrarchidae	<i>Micropterus salmoides</i>	7
Centrarchidae	<i>Pomoxis annularis</i>	

Sandia Line 14

28 October 2008

WJR08-830

30 seine hauls

Effort: 751.4 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	114
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	63
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	36
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Catostomus commersonii</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	2
Moronidae	<i>Morone chrysops</i>	1

Dixon Road

25 November 2008

WJR08-831

30 seine hauls

Effort: 596.3 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	4
Cyprinidae	<i>Pimephales promelas</i>	9
Cyprinidae	<i>Platygobio gracilis</i>	16
Catostomidae	<i>Catostomus commersonii</i>	6
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	1

Moronidae *Morone chrysops* 1

North Amafca

25 November 2008 WJR08-832 30 seine hauls Effort: 556.4 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	29
Cyprinidae	<i>Hybognathus amarus</i>	500
Cyprinidae	<i>Pimephales promelas</i>	3
Cyprinidae	<i>Platygobio gracilis</i>	166
Catostomidae	<i>Catostomus commersonii</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	33
Centrarchidae	<i>Micropterus salmoides</i>	1

Lomitas Negras

25 November 2008 WJR08-833 30 seine hauls Effort: 498.1 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	2
Cyprinidae	<i>Cyprinus carpio</i>	3
Cyprinidae	<i>Hybognathus amarus</i>	42
Catostomidae	<i>Catostomus commersonii</i>	1
Ictaluridae	<i>Ameiurus natalis</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	19
Centrarchidae	<i>Lepomis cyanellus</i>	1

Sandia Line 14

25 November 2008 WJR08-834 30 seine hauls Effort: 640.7 m²

Personnel: W. Jason Remshardt,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	127
Cyprinidae	<i>Hybognathus amarus</i>	274
Cyprinidae	<i>Pimephales promelas</i>	6
Cyprinidae	<i>Platygobio gracilis</i>	16
Catostomidae	<i>Catostomus commersonii</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1

Dixon Road

29 December 2008

EBA08-001

30 seine hauls

Effort: 621.4 m²

Personnel: Evan B. Anderson,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	78
Cyprinidae	<i>Rhinichthys cataractae</i>	11
Ictaluridae	<i>Ameiurus natalis</i>	1

North Amafca

29 December 2008

EBA08-002

30 seine hauls

Effort: 631.1 m²

Personnel: Evan B. Anderson,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	15
Cyprinidae	<i>Platygobio gracilis</i>	5

Lomitas Negras

29 December 2008

EBA08-003

25 seine hauls

Effort: 483.7 m²

Personnel: Evan B. Anderson,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	5
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersonii</i>	2
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	3
Centrarchidae	<i>Lepomis macrochirus</i>	3

Sandia Line 14

29 December 2008

EBA08-004

30 seine hauls

Effort: 532.7 m²

Personnel: Evan B. Anderson,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	15
Cyprinidae	<i>Hybognathus amarus</i>	24
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	17
Ictaluridae	<i>Ictalurus punctatus</i>	1

Isleta Dam

30 December 2008

EBA08-005

30 seine hauls

Effort: 655.0 m²

Personnel: Evan B. Anderson,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	21
Cyprinidae	<i>Hybognathus amarus</i>	4
Cyprinidae	<i>Pimephales promelas</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	2
Centrarchidae	<i>Lepomis cyanellus</i>	1

Atrisco Outfall

30 December 2008

EBA08-006

30 seine hauls

Effort: 823.5 m²

Personnel: Evan B. Anderson,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	11
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	5
Cyprinidae	<i>Pimephales promelas</i>	3
Cyprinidae	<i>Platygobio gracilis</i>	4
Catostomidae	<i>Carpionodes carpio</i>	1
Poeciliidae	<i>Gambusia affinis</i>	3

Alejandro Gate

30 December 2008

EBA08-007

30 seine hauls

Effort: 609.6 m²

Personnel: Evan B. Anderson,

<u>Family</u>	<u>Species</u>	<u>N</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	27
Cyprinidae	<i>Hybognathus amarus</i>	135
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	17
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	10
Centrarchidae	<i>Pomoxis annularis</i>	1

Appendix C.

Water quality measurements by collection number. For detailed site information, cross-reference with Appendix B.

Collno = collection number; Temp = water temperature (C); DO = dissolved oxygen (mg/l); SpC = specific conductance (ms/cm); TDS = total dissolved solids (mg/l); Sal = salinity (ppt). . = no water quality data available for this collection

Collno	Temp	DO	SpC	Tds	Sal	pH
WJR07-708	5.01	13.70	0.402	0.262	0.20	8.35
WJR08-706	9.26	10.31	0.470	0.305	0.23	8.04
WJR08-707	4.90	12.92	0.238	0.252	0.19	8.50
WJR08-709	4.41	13.27	0.346	0.225	0.17	8.52
WJR08-711	7.91	11.00	0.380	0.247	0.18	8.14
WJR08-712	9.53	11.99	0.204	0.266	0.20	8.34
WJR08-713	9.84	55.34	0.396	0.257	0.19	8.31
WJR08-716	6.26	10.59	0.325	0.210	0.16	8.49
WJR08-717	7.82	9.85	0.363	0.236	0.18	8.42
WJR08-718	8.31	9.90	0.408	0.262	0.20	8.30
WJR08-719	6.82	11.84	0.332	0.216	0.16	8.42
WJR08-720	7.43	12.08	0.333	0.217	0.16	8.21
WJR08-721	8.13	12.05	0.310	0.201	0.15	8.74
WJR08-724	9.46	11.93	0.315	0.217	0.15	8.22
WJR08-722	8.60	11.62	0.306	0.199	0.15	8.13
WJR08-723	8.66	11.98	0.299	0.195	0.14	8.38
WJR08-725	12.65	11.00	0.305	1.094	0.15	8.22
TPA08-001	10.53	8.38	0.245	0.185	0.28	9.28
TPA08-002	12.27	6.90	0.218	0.179	0.13	9.05
TPA08-003	12.07	.	0.253	0.185	0.14	9.34
TPA08-004	13.12	.	0.270	0.176	0.13	8.53
TPA08-009	13.26	4.85	0.263	0.171	0.13	9.23
TPA08-010	14.01	8.46	0.284	0.184	0.14	9.78
TPA08-011	15.19	4.00	0.322	0.207	0.15	8.52
WJR08-799	17.26	.	0.230	0.151	0.11	7.93
WJR08-800	.	.	.	.	.	.
WJR08-801	.	.	.	.	.	.
WJR08-802	.	.	.	.	.	.
WJR08-803	.	.	.	.	.	.
WJR08-804	.	.	.	.	.	.
WJR08-805	.	.	.	.	.	.
WJR08-806	18.58	8.56	0.228	0.149	0.11	7.98
WJR08-807	22.58	8.54	0.228	0.148	0.11	8.21
WJR08-808	21.22	8.67	0.265	0.145	0.11	8.08
WJR08-809	18.58	8.74	0.220	0.143	0.10	6.72
WJR08-810	21.91	8.09	0.236	0.153	0.11	8.11
WJR08-811	22.84	8.34	0.253	0.165	0.12	8.05
WJR08-812	24.18	8.03	0.271	0.177	0.13	8.10
TLK08-040	23.87	7.93	0.340	0.221	0.16	8.07
TLK08-041	24.39	7.11	0.348	0.226	0.17	8.02
TLK08-042	25.28	6.65	0.401	0.260	0.19	7.86
CRS08-003	20.47	6.95	0.347	0.235	0.17	7.87
CRS08-004	24.78	6.01	0.315	0.205	0.15	8.42
CRS08-005	29.37	6.52	1.145	0.745	0.56	7.82
CRS08-006	25.92	7.60	0.309	0.201	0.15	8.27
WJR08-820	21.44	8.12	0.603	0.392	0.30	8.05

Collno	Temp	DO	SpC	Tds	Sal	pH
WJR08-821	22.63	7.94	0.580	0.377	0.28	7.84
WJR08-822	24.76	7.27	0.584	0.380	0.28	8.02
CRS08-007	18.61	8.52	0.367	0.252	0.18	8.08
CRS08-008	20.36	9.39	0.324	0.211	0.16	8.38
CRS08-009	21.85	10.18	0.392	0.255	0.19	8.19
CRS08-010	20.56	8.23	0.323	0.210	0.15	8.33
CRS08-011	15.77	6.55	0.390	0.254	0.19	8.03
CRS08-012	18.39	8.67	0.306	0.199	0.15	8.73
CRS08-013	28.17	6.51	1.174	0.763	0.58	7.94
CRS08-014	20.02	9.38	0.314	0.204	0.15	8.49
TPA08-068	16.77	8.87	0.361	0.249	0.18	8.19
TPA08-069	19.10	10.05	0.415	0.269	0.20	8.36
TPA08-070	18.42	8.90	0.346	0.225	0.17	8.21
WJR08-824	10.99	10.41	0.453	0.295	0.22	8.07
WJR08-825	12.44	9.83	0.468	0.304	0.23	8.42
WJR08-826	15.16	10.08	0.399	0.286	0.21	8.21
WJR08-827	10.77	8.87	0.401	0.278	0.19	7.94
WJR08-828	11.40	11.01	0.361	0.235	0.17	8.74
WJR08-829	16.24	10.63	0.493	0.321	0.24	8.61
WJR08-830	14.95	11.69	0.350	0.227	0.17	8.46
WJR08-831	7.87	11.21	0.449	0.292	0.22	8.34
WJR08-832	7.48	12.28	0.415	0.270	0.20	8.48
WJR08-833	10.14	10.92	0.477	0.310	0.23	8.71
WJR08-834	7.67	12.63	0.378	0.245	0.18	8.49
EBA08-001	8.11	8.77	0.511	0.332	0.25	8.36
EBA08-002	3.68	11.66	0.363	0.236	0.18	8.20
EBA08-003	4.73	11.98	0.421	0.274	0.20	7.89
EBA08-004	3.64	13.12	0.340	0.222	0.16	8.20
EBA08-005	3.97	11.29	0.413	0.269	0.20	7.91
EBA08-006	3.99	11.88	0.369	0.240	0.18	7.90
EBA08-007	6.69	10.89	0.397	0.258	0.19	7.95