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

Annual Report 2009



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Cover Photo: Release of Rio Grande silvery minnow at Bosque del Apache NWR, 2009

Credit: Kelly Kowalski, KUNM, 2009, video capture (www.youtube.com/watch?v=PVAy4Hfakfw)

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EXECUTIVE SUMMARY

- In 2009, we continued to implement the 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 population monitoring catch rates, only 1 site required stocking in 2009, compared with no stocking in 2008.
- In 2009, we continued monitoring on tribal lands in Angostura and Isleta reaches to supplement data collection from other researchers.
- In 2009, no recaptures of hatchery released Rio Grande silvery minnow were documented. This is due in part to reduced numbers of released fish in late 2009 and no released fish in 2008, combined with reduced standard population monitoring conducted by other researchers.

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 2008b). In 2008, favorable conditions and recruitment meant that no augmentation was needed. 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.

This annual report summarizes findings between January and December 2009. 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 revised Rio Grande Silvery Minnow Recovery Plan (RGSMRP; U.S. Fish and Wildlife Service 2009). These include development and refinement of augmentation protocols for use in the middle Rio Grande and coordinating augmentation needs with propagation activities as identified as a needed task (Task 3.2) by the Program and RGSMRP, respectively.

In the current revised RGSMRP, there are specific criteria listed for catch rates for downlisting from endangered to threatened (U.S. Fish and Wildlife Service 2009). For Recovery Goal 2, Criterion 2-A-1 states that catch rates for October population monitoring must be above 5 fish/100 m² for all sites for at least 5 consecutive years. While hatchery released individuals cannot count directly towards recovery goals, their presence and reproduction ultimately result in increased numbers that benefit the species. Augmentation data analysis has shown that stocking is most effective when wild fish densities are below 1 fish/100 m². This target was selected based on effectiveness and recommendations from the Rio Grande silvery minnow genetics and propagation working group. Not only does this strategy allow us to be most effective, but it also strives to maintain wild fish genetic structure.

The ultimate goal of augmentation is to re-establish self-sustaining populations of Rio Grande silvery minnow in the MRGNM. 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 2009 were to:

- 1) Continue using revised stocking protocol; calculate number of Rio Grande silvery minnow necessary to meet target densities.
- 2) Continue using revised stocking protocol; closely monitor Angostura Reach Rio Grande silvery minnow densities for effects of augmentation.
- 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.

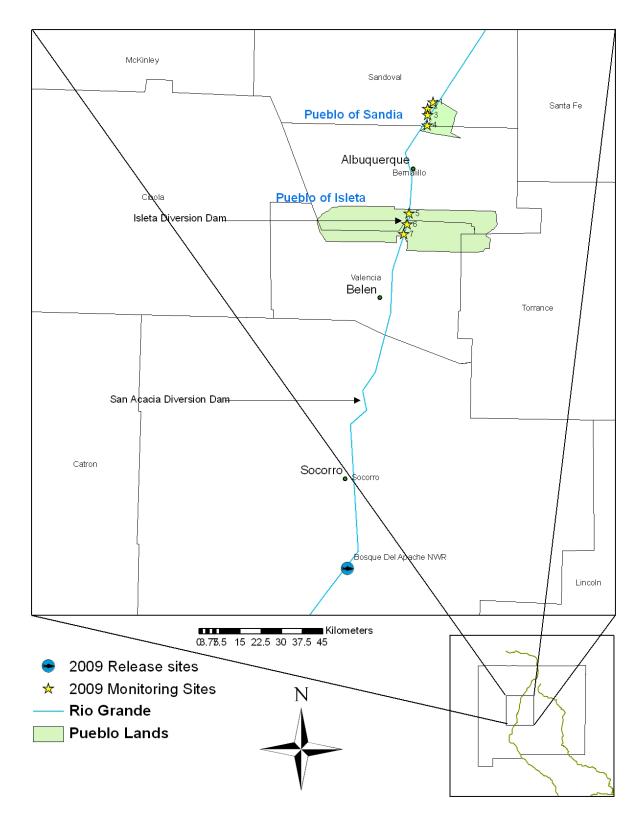


Figure 1. Map of study area for Rio Grande silvery minnow augmentation and monitoring 2009.

Augmentation

As detailed in the revised RGSM augmentation plan 2008-2012 (Appendix D; Remshardt 2008b), augmentation efforts were focused only within the Isleta and San Acacia reaches in 2009 and will continue through 2012. 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:

 $AS_{i} = (C_{t}-C_{o}) x \text{ (total estimated area } m^{2} \text{ between } S_{i} \text{ and } S_{i+1})$ where; $C_{t} = \text{Target catch rate at each site, or 1 fish / 100 m^{2},}$ $C_{o} = \text{Observed catch rate at each site in September}$ $S_{i} = \text{Site of release}$ $S_{i+1} = \text{Next downstream site.}$

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.

Site #	Site Name	Description
Ango	stura 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 (Be	IDD elow Isleta Diversion 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

Table 1. Rio Grande silvery minnow augmentation monitoring site descriptions, 2009.

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 can be used to conduct an examination of the overall distance traveled of VIE marked fish. Expected and observed recaptures can then be summarized. Various other projects and researchers conducted monitoring activities throughout the Middle Rio Grande (although standard population monitoring was not conducted between January and August, 2009) and 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 usually provide in this report, but no VIE marked fish were recaptured in 2009, therefore this analysis was not conducted. Based on the fact that adequate population numbers in 2008 resulted in no need to release fish, and limited amount of population monitoring in 2009, it was not unexpected to not recapture any fish this year.

Fish Community

A summary table of fish collections for the current study period (January 2009 to December 2009) 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 m^2). 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 2009 catch rates from the standard RGSM population monitoring conducted by American Southwest Ichthyological Research Foundation (ASIRF) (Dudley and Platania 2009), a request for release in the Middle Rio Grande in 2009 was made through the RGSM augmentation program for 21,218 fish.

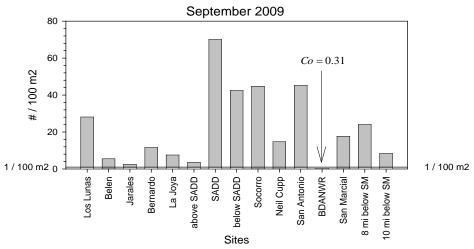


Figure 2. Catch rates for September 2009 Population Monitoring (from Dudley and Platania 2009)

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). 14 of the 15 sites in the Isleta and San Acacia reaches had catch rates over this target, including a majority of the sites with significantly higher catch rates. Therefore, only 1 release site for Rio Grande silvery minnow was necessary in the Middle Rio Grande during 2009. The site is Bosque del Apache National Wildlife Refuge (BDANWR) (Site 15 from ASIRF, Figure 1,2), which had a catch rate (C_0 =0.31) below the target of 1.00/ 100 m².

On 12 November 2009, 21,218 Rio Grande silvery minnow were released at the BDANWR site by NMFWCO personnel. All of these fish had a yellow, left, predorsal VIE tag. Block nets were placed across a backwater at the site prior to release. All fish were released inside the blocked area to prevent immediate dispersal related to the stress of handling and transport and increase short-term survival. The block nets were removed the next day.

Apart from the site within BDANWR, increases in catch rates were observed at the majority of sites compared with 2008. A combination of factors in 2009 led to increased catch rates including optimal spring runoff, recruitment flows throughout the early summer, and no river intermittency in 2008. The low catch rate at the BDANWR site was in direct response to river intermittency throughout this section of the river during the summer of 2009.

In a research project separate from the augmentation program, approximately 6,000 PIT tagged RGSM were released in July 2009 by New Mexico Fish and Wildlife Conservation Office near the fish passage associated with the Albuquerque-Bernalillo County Water Users 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 project is planned to continue through 2011 but 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 2009. These monitoring efforts are conducted by NMFWCO in conjuction with the associated environment departments of each Pueblo. For these monitoring sites, there were a total of 3,694 Rio Grande silvery minnow collected between January and December 2009 (Table 2). Rio Grande silvery minnow represented 24.1% of all fish captured, were collected in 24.4% of all seine hauls with an overall catch rate of 7.64 individuals/100 m² (Table 2). Over the sampling period, catch rates varied for Rio Grande silvery minnow, with the largest collection of 450 individuals occurring in July 2009 at the Alejandro Gate site. During monitoring conducted by NMFWCO in 2009, there were no recaptures of VIE marked Rio Grande silvery minnow.

N=native and I=introduced. Subspecific nan	nes inclu	de citati	ons belo	w.	
Species	Status	n	% of	Percent	Density
		7.000	Total	Occurrence	(fish/100m ²)
red shiner Cyprinella lutrensis	Ν	7,383	48.1	28.7	15.28
common carp Cyprinus carpio	Ι	77	0.5	1.2	0.16
Rio Grande silvery minnow Hybognathus amarus	Ν	3,694	24.1	24.4	7.64
fathead minnow Pimephales promelas	Ν	228	1.5	5.1	0.47
flathead chub Platygobio gracilis gulonella ^a	Ν	884	5.8	13.9	1.83
longnose dace Rhinichthys cataractae cataractae ^b	Ν	122	0.8	3.4	0.25
river carpsucker Carpiodes carpio elongatus ^c	Ν	251	1.6	3.0	0.52
white sucker Catostomus commersoni	Ι	839	5.5	5.9	1.74
black bullhead Ameiurus melas	Ι	1	< 0.1	< 0.1	< 0.01
yellow bullhead Ameiurus natalis	Ι	7	< 0.1	0.3	0.01
channel catfish Ictalurus punctatus	Ι	201	1.3	5.0	0.42
western mosquitofish Gambusia affinis	Ι	1,447	9.4	5.9	2.99
white bass Morone chrysops	Ι	13	0.1	0.5	0.03
green sunfish Lepomis cyanellus	Ι	41	0.3	1.0	0.08
bluegill Lepomis macrochirus speciosus ^d	Ν	53	0.3	1.0	0.11
largemouth bass Micropterus salmoides	Ι	84	0.5	1.7	0.17
yellow perch Percina flavescens	Ι	1	< 0.1	0.0	< 0.01
white crappie Pomoxis annularis	Ι	14	0.1	0.5	0.03
walleye Sander vitreus	Ι	2	< 0.1	0.1	< 0.01
TOTAL		15,342	100	54.2	31.74

Table 2. Status, numbers, percent of total, percent occurrence, and density for all species collected during NMFWCO augmentation monitoring at all sites combined in 2009. For status, N=native and I=introduced. Subspecific names include citations below.

^aOlund and Cross (1961)

^b Jenkins and Burkhead (1993)

^cTrautman (1981)

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

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 766 unmarked in the length-frequency dataset captured in 2009. There were no marked recaptures in 2009, therefore no analysis of lenth-frequency was completed for hatchery released fish. 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 1.54 mm/month (Figure 3), with even higher growth rates of 4.2-9.3 mm/month observed during the initial 4 months for juvenile fish.

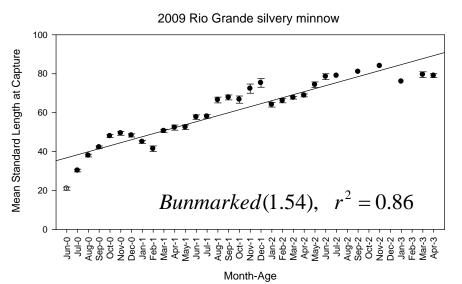


Figure 3. Growth rate for unmarked Rio Grande silvery minnow from slope (B) of the regression for mean standard lengths between age at month estimates in 2009.

Upon examination of length-frequency data by month, there appeared to be two or three age classes present in any one month's sample. This is generally represented by ages 1-3 between January and May and ages 0, 1, and 2 individuals between June and December. Based on length-frequency observations, maximum age of Rio Grande silvery minnow was estimated to be approximately 34-35 months old near 80 mm SL. These individuals likely represent the 2006 year class (Figures 4-5). Between January and July, the 2008 year class was well represented, between July and December the 2009 year class became the dominant year class, indicating relatively strong recruitment.

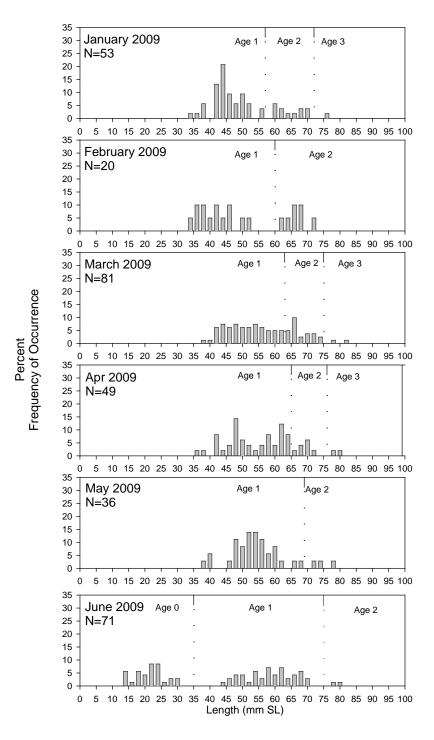


Figure 4. Length-frequency histograms of unmarked Rio Grande silvery minnow captured between January and June 2009. Dashed lines represent estimated breaks between year classes.

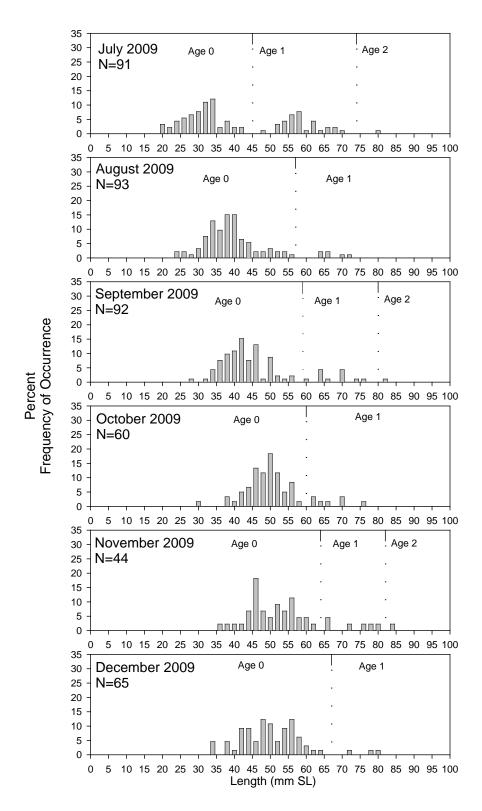


Figure 5. Length-frequency histograms of unmarked Rio Grande silvery minnow captured between July and December 2009. Dashed lines represent estimated breaks between year classes.

Fish Community

From January to December 2009, 2,235 seine hauls totaling 48,329.4 m² were conducted. In these samples, 15,342 individuals representing 19 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 80% of all individuals collected. Red shiner was the numerically dominant species of the fish community and accounted for 48% of all fish collected.

DISCUSSION

Augmentation efforts in 2009 concluded the eighth year in the Middle Rio Grande, New Mexico. Since 2002, 1,146,964 Rio Grande silvery minnow have been released. 2009 represented the second 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 continued favorable conditions for Rio Grande silvery minnow in the wild, only 1 site required stocking in 2009, as compared with no fish being required for augmentation in 2008.

There were no recaptures of VIE tagged Rio Grande silvery minnow in 2009. This was due primarily to the fact that there were no releases in 2008 and only a small release in late 2009. Another factor was the reduced standard population monitoring conducted by ASIRF in 2009 due to contracting issues. 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.

Under the revised stocking protocol, we determined that augmentation in the Isleta and San Acacia Reaches was only necessary at one site in 2009. A total of 21,218 VIE tagged RGSM were needed for augmentation at the Bosque del Apache National Wildlife Refuge site in the San Acacia Reach. Additional fish that were scheduled for the Middle Rio Grande were made available and released as part of the continued reintroduction in Big Bend, Texas in October October 2009. All other sites had catch rates over this target of 1 fish/100 m², including a majority of the sites with significantly higher catch rates. A combination of factors in 2009 led to these increased catch rates including optimal spring runoff, recruitment flows throughout the early summer, and no river intermittency. Expectedly, the one site that required stocking was the only site within the study area that experienced intermittency in 2009.

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 2006, 2008a). There are more present in the system than observed and eventually contribute to future spawning events and subsequent generations. For example, standard population monitoring across all 20 sites in September of 2010 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. 2011). From population estimation work on Rio Grande silvery minnow, detection probabilities have been estimated at 0.4 for all fish (or 40% chance of observing an individual when in fact it is present in a mesohabitat sampled) (Dudley et al. 2011). Using our example above, the effectively sampled area is now 4,000 m². This equates to a 1 in 10,000 chance of observing a particular VIE tagged fish. All of this information suggests that the chances of encountering released fish need to be examined based on the relative sampled area. It is quickly evident that even a moderate number of recaptures indicate significantly more impact than just raw numbers of observations.

Even when combining data from a variety of research projects in 2009, there were no recaptures. This precluded any obersvations of movement and survival. Included in the revised augmentation plan is a strategy to reduce downstream movement immediately afer 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. Still, past evidence has shown that 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.

Catch rates in the Angostura Reach in 2009 were lower than in 2008. We will continue to monitor the change within this reach in relation to our current augmentation strategy. It is possible that temporarily removing Angostura Reach from augmentation has resulted in decreased catch rates of wild fish. As noted in the augmentation plan, if catch rates in Angostura Reach remain low, we will reinitiate augmentation activities in this reach prior to 2012. In September 2009, catch rates in the Angostura Reach were higher than the Isleta Reach but lower than the San Acacia Reach. The overall reach catch rate for Angostura Reach was 7.8 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 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 obscured 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. Similarly, the flow and habitat conditions over the last 3 years (2007-2009) must be taken into consideration when evaluating the impacts of augmentation. Regardless of the outcome, the period of augmentation removal (2008-2012) should be sufficient to evaluate the effects.

Continued monitoring of an augmented population is critical for evaluating the success of any project (George et al. 2009). Within the last three 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. Ichthyofaunal composition of 2009 Rio Grande silvery minnow augmentation monitoring surveys

2009 Report

SANDIA LINE 14 27 January 2009	DJM09-004		31 seine hauls	Effort:	457.5 m ²
Evan B. Anderson, Dustin J. Myers					
	2 Minute	<u>Scientific name</u>			N
		Cyprinella lutrens	is	1	6
		Hybognathus amo	arus	6	8
		Platygobio gracili	s		2
		Catostomus comr	mersoni		1
NORTH AMAFCA					
27 January 2009	DJM09-002		31 seine hauls	Effort:	514.8 m ⁻²
Evan B. Anderson, Dustin J. Myers					
		<u>Scientific name</u> Cyprinella lutrens	ic		
				6	
		Hybognathus amo	arus	1	
		Cyprinus carpio			1
		Platygobio gracili			5
		Catostomus comr			1
		Lepomis macroch	irus		1
		Micropterus salm	oides		1
LOMITAS NEGRAS					
27 January 2009	DJM09-003		30 seine hauls	Effort:	618.0 m ⁻²
Evan B. Anderson, Dustin J. Myers	n in the twenties and the "nearest section of the s				
		<u>Scientific name</u> Gambusia affinis			
			•	1	
		Lepomis macroch			1
		Micropterus salm	oides		2
DIXON ROAD	DIN 400.004		20	F ((594.8 m ²
27 January 2009 Evan B. Anderson, Dustin J. Myers	DJM09-001		30 seine hauls	Effort:	594.8 m -
Evan D. Anderson, Dusting, wyers		Scientific name		-	N
		Cyprinella lutrens	is		<u>N</u> 2
		Hybognathus amo			1
		Pimephales prom			
		Platygobio gracili			1
					2
		Rhinichthys catar	actae		1

ATRISCO OUT 30 January 2	2009	WJR09-835		30 seine hauls	Effort:	959.5 m ²
W. Jason Remshardt,	Tristan J. Austring,	, воррук. і			75	
			Scientific name Cyprinella lutrensis	_		<u>N</u>
						4
			Hybognathus ama			2
			Platygobio gracilis		8	7
			Carpiodes carpio			1
			Ameiurus natalis			2
ALEJANDRO G						
30 January 2		WJR09-837		21 seine hauls	Effort:	526.0 m ⁻²
W. Jason Remshardt,	Tristan J. Austring,	, Bobby R. I	1211			
			Scientific name			<u>N</u>
			Cyprinella lutrensis			1
			Hybognathus ama	irus	28	Э
			Pimephales prome	elas		1
			Platygobio gracilis			1
	IDD					
30 January 2		WJR09-836		30 seine hauls	Effort:	651.5 m ²
W. Jason Remshardt,	Tristan J. Austring,	, Bobby R. I	Duran			
			Scientific name			<u>N</u>
			Cyprinella lutrensis		7.	5
			Hybognathus ama	irus	1	1
			Pimephales prome	elas	2	3
			Platygobio gracilis	1		1
SANDIA LIN	E 14					
26 February 2		WJR09-841		30 seine hauls	Effort:	639.0 m ⁻²
W. Jason Remshardt,	Evan B. Anderson,	Thomas P.	Archdeacon, Mar	rk Morales, Clint Sando	val	
			Scientific name		<u> </u>	<u>N</u>
			Cyprinella lutrensi:	S	2	5
			Hybognathus ama	irus	7	7
			Pimephales prome	elas		3
			Platygobio gracilis	t	1	4
			Rhinichthys catara	ictae	3	4
			Catostomus comm	nersoni		3
			Ictalurus punctatu	'S		1
						_

NORTH AMAFCA 26 February 2009 W. Jason Remshardt, Evan B. A	WJR09-8 nderson, Thomas		30 seine ha Mark Morales,		Effort: val	666.0 m ²
		<u>Scientific nam</u>			<u>N</u>	
		Platygobio gr	acilis		3	
		Gambusia aff	inis		2	
LOMITAS NEGRAS						
26 February 2009	WJR09-84		30 seine ha		Effort:	602.8 m ²
W. Jason Remshardt, Evan B. A	nderson, Thomas	 Compared and the state of the s		Clint Sando		
		Scientific nam			<u>N</u>	
		Hybognathus			4	
		Pimephales p			3	
		Platygobio gr	acilis		3	
		Gambusia aff	inis		1	
		Lepomis mac	rochirus		4	
		Micropterus s	almoides		3	
DIXON ROAD						
26 February 2009	WJR09-8		30 seine ha		Effort:	707.8 m ²
		P. Archdeacon,	Mark Morales,		val	707.8 m ²
26 February 2009		P. Archdeacon, Scientific nam	Mark Morales, ne		val <u>N</u>	707.8 m ²
26 February 2009		P. Archdeacon, <u>Scientific nam</u> Cyprinella luti	Mark Morales, <u>ne</u> rensis		val	707.8 m ²
26 February 2009		P. Archdeacon, <u>Scientific nam</u> Cyprinella luti Platygobio gr	Mark Morales, n <u>e</u> rensis acilis		val <u>N</u>	707.8 m ²
26 February 2009		P. Archdeacon, <u>Scientific nam</u> Cyprinella luti	Mark Morales, n <u>e</u> rensis acilis		val <u>N</u> 5	707.8 m ²
26 February 2009		P. Archdeacon, <u>Scientific nam</u> Cyprinella luti Platygobio gr	Mark Morales, ne rensis acilis ataractae		val <u>N</u> 5 10	707.8 m ²
26 February 2009 W. Jason Remshardt, Evan B. A DIXON ROAD	nderson, Thomas	P. Archdeacon, Scientific nam Cyprinella luti Platygobio gr Rhinichthys co Gambusia aff	Mark Morales, ne rensis acilis ataractae inis	Clint Sando	val <u>N</u> 5 10 15 3	
26 February 2009 W. Jason Remshardt, Evan B. A DIXON ROAD 30 March 2009	nderson, Thomas WJR09-84	P. Archdeacon, <u>Scientific nam</u> Cyprinella luti Platygobio gr Rhinichthys co Gambusia aff	Mark Morales, ne rensis acilis ataractae inis 30 seine ha	Clint Sando	val <u>N</u> 5 10 15	707.8 m ² 886.3 m ²
26 February 2009 W. Jason Remshardt, Evan B. A DIXON ROAD	nderson, Thomas WJR09-84	P. Archdeacon, <u>Scientific nam</u> Cyprinella luti Platygobio gr Rhinichthys co Gambusia aff 42 Duran, Megan J	Mark Morales, ne rensis acilis ataractae inis 30 seine ha . Osborne	Clint Sando	val <u>N</u> 5 10 15 3 Effort:	
26 February 2009 W. Jason Remshardt, Evan B. A DIXON ROAD 30 March 2009	nderson, Thomas WJR09-84	P. Archdeacon, <u>Scientific nam</u> <i>Cyprinella luti</i> <i>Platygobio gr</i> <i>Rhinichthys co</i> <i>Gambusia aff</i> 42 Duran, Megan J <u>Scientific nam</u>	Mark Morales, ne rensis acilis ataractae inis 30 seine ha . Osborne	Clint Sando	val <u>N</u> 5 10 15 3 Effort: <u>N</u>	
26 February 2009 W. Jason Remshardt, Evan B. A DIXON ROAD 30 March 2009	nderson, Thomas WJR09-84	P. Archdeacon, <u>Scientific nam</u> <i>Cyprinella luti</i> <i>Platygobio gr</i> <i>Rhinichthys co</i> <i>Gambusia aff</i> 42 Duran, Megan J <u>Scientific nam</u> <i>Cyprinella luti</i>	Mark Morales, ne rensis acilis ataractae inis 30 seine ha . Osborne ne rensis	Clint Sando	val <u>N</u> 5 10 15 3 Effort: <u>N</u> 9	
26 February 2009 W. Jason Remshardt, Evan B. A DIXON ROAD 30 March 2009	nderson, Thomas WJR09-84	P. Archdeacon, <u>Scientific nam</u> <i>Cyprinella luti</i> <i>Platygobio gr</i> <i>Rhinichthys co</i> <i>Gambusia aff</i> 42 Duran, Megan J <u>Scientific nam</u> <i>Cyprinella luti</i> <i>Hybognathus</i>	Mark Morales, ne rensis acilis ataractae inis 30 seine ha . Osborne ne rensis amarus	Clint Sando	val <u>N</u> 5 10 15 3 Effort: <u>N</u>	
26 February 2009 W. Jason Remshardt, Evan B. A DIXON ROAD 30 March 2009	nderson, Thomas WJR09-84	P. Archdeacon, <u>Scientific nam</u> Cyprinella luti Platygobio gr Rhinichthys co Gambusia aff 42 Duran, Megan J <u>Scientific nam</u> Cyprinella luti Hybognathus Pimephales p	Mark Morales, ne rensis acilis acilis ataractae inis 30 seine ha . Osborne ne rensis amarus romelas	Clint Sando	val <u>N</u> 5 10 15 3 Effort: <u>N</u> 9	
26 February 2009 W. Jason Remshardt, Evan B. A DIXON ROAD 30 March 2009	nderson, Thomas WJR09-84	P. Archdeacon, <u>Scientific nam</u> <i>Cyprinella luti</i> <i>Platygobio gr</i> <i>Rhinichthys co</i> <i>Gambusia aff</i> 42 Duran, Megan J <u>Scientific nam</u> <i>Cyprinella luti</i> <i>Hybognathus</i>	Mark Morales, ne rensis acilis acilis ataractae inis 30 seine ha . Osborne ne rensis amarus romelas	Clint Sando	val N 5 10 15 3 Effort: N 9 117	

NORTH AMAFCA 30 March 2009 W. Jason Remshardt, Dustin J. Myers,	WJR09-843 Bobby R. Duran, Megan J	30 seine hauls I. Osborne	Effort:	594.3 m ²
	<u>Scientific nam</u>		<u>N</u>	
	Cyprinella lut		27	
	Hybognathus	amarus	21	
	Platygobio gr	acilis	2	
	Catostomus c	rommersoni	1	
LOMITAS NEGRAS 30 March 2009 W. Jason Remshardt, Dustin J. Myers,	WJR09-844 Bobby R. Duran, Megan J	30 seine hauls I. Osborne	Effort:	633.3 m ²
	<u>Scientific nam</u>		<u>N</u>	
	Cyprinella lut	rensis	16	
	Hybognathus	amarus	17	
	Pimephales p	romelas	10	
	Catostomus c	rommersoni	1	
	Ameiurus nat	alis	1	
	Lepomis mac	rochirus	3	
	Micropterus s	almoides	1	
SANDIA LINE 14 30 March 2009	WJR09-845	30 seine hauls	Effort:	503.0 m ²
W. Jason Remshardt, Dustin J. Myers,	Bobby R. Duran, Megan J	I. Osborne		
	<u>Scientific nam</u>		<u>N</u>	
	Cyprinella lut		38	
	Hybognathus		19	
	Pimephales p		6	
	Platygobio gr		14	
	Rhinichthys c	ataractae	2	
	Catostomus c	rommersoni	6	
	Ictalurus pune	ctatus	1	

27 /	S NEGRAS April 2009 Thomas P. Archdeaco	TPA09-010 n. Mark Mo		24 seine hauls	Effort:	373.8 m ²
5 40 411 01 11 1 (01 0,			Scientific name		N	
			Cyprinella lutrens	is	13	
			Hybognathus am	arus	132	
			Pimephales prom	elas	1	
			Cyprinus carpio		4	
			Platygobio gracili	s	5	
			lctalurus punctat	us	1	
			Gambusia affinis		1	
			Lepomis cyanellu	S	5	
	A LINE 14 April 2009	TPA09-011	[30 seine hauls	Effort:	540.0 m ²
Dustin J. Myers,	Thomas P. Archdeaco	n, Mark Mo	rales			
			<u>Scientific name</u>		<u>N</u>	
			Cyprinella lutrens		6	
			Hybognathus am	arus	28	
			Pimephales prom		1	
			Platygobio gracili	s	9	
			Lepomis cyanellu:	S	1	
27 /	DN ROAD April 2009	TPA09-012		30 seine hauls	Effort:	729.8 m ²
Dustin J. Wyers,	Thomas P. Archdeaco	n, warkiwo			N	
			<u>Scientific name</u> Hybognathus am	arus	<u>N</u> 9	
			Pimephales prom		1	
			Platygobio gracili		3	
			Rhinichthys catar		4	
			, Carpiodes carpio		2	
			Gambusia affinis		1	
			,,,		1.4	

27 <i>F</i>	AMAFCA April 2009	TPA09-013 ndeacon, Mark Mor		ne hauls	Effort:	401.5 m ²
Bustinis, iniçeis,			Scientific name		N	
			Cyprinella lutrensis		46	
			Hybognathus amarus		5	
			Pimephales promelas		3	
			Platygobio gracilis		5	
			Catostomus commersoni		6	
			Ictalurus punctatus		1	
	April 2009	WJR09-846 nderson, Thomas P		ne hauls	Effort:	605.5 m ²
		4 Construction Statements of the second sta	Scientific name		<u>N</u>	
			Cyprinella lutrensis		29	
			Pimephales promelas		1	
			Platygobio gracilis		50	
			Rhinichthys cataractae		2	
			Ictalurus punctatus		12	
	IDD April 2009 ardt, Evan B. Ar	WJR09-847 nderson, Thomas P		ne hauls	Effort:	620.8 m ²
	-7	P.	Scientific name		<u>N</u>	
			Cyprinella lutrensis		59	
			Hybognathus amarus		124	
			Pimephales promelas		1	
			Platygobio gracilis		3	
			Catostomus commersoni	į	1	
			Morone chrysops		3	
	RO GATE			9 X	_ 225	2
	April 2009 ardt, Evan B. Ar	WJR09-848 nderson, Thomas P		ne hauls	Effort:	477.0 m ²
			<u>Scientific name</u>		<u>N</u>	
			Cyprinella lutrensis		7	
			Pimephales promelas		3	

19 May 2009 WJR09-849 30 seine hauls Effort: 674.3 m ² W. Jason Remshardt, Thomas P. Archdeacon, Stephen R. Davenport, Mark Morales Scientific name N Cyprinella lutrensis 4	
Scientific name <u>N</u>	
CVprinella lutrensis A	
Hybognathus amarus 3	
Platygobio gracilis 28	
Rhinichthys cataractae 8	
Catostomus commersoni 1	
NORTH AMAFCA	
19 May 2009WJR09-85030 seine haulsEffort:505.5 m 2	
W. Jason Remshardt, Thomas P. Archdeacon, Mark Morales	
Scientific name N	
Cyprinella lutrensis 44	
Hybognathus amarus 5	
Pimephales promelas 2	
Platygobio gracilis 17	
Rhinichthys cataractae 1	
Catostomus commersoni 4	
Pomoxis annularis 2	
LOMITAS NEGRAS	
19 May 2009 WJR09-851 30 seine hauls Effort: 788.0 m ⁻²	
W. Jason Remshardt, Thomas P. Archdeacon, Mark Morales	
Scientific name <u>N</u>	
Cyprinella lutrensis 10	
Hybognathus amarus 6	
Cyprinus carpio 1	
Platygobio gracilis 13	
Catostomus commersoni 5	

SANDIA LINE 14 19 May 2009	WJR09-852	30 seine hauls	Effort:	652.5 m ²
W. Jason Remshardt, Thomas P. J	Archdeacon, Mark Morales			
	<u>Scientific r</u> Hybognati	name hus amarus	<u>N</u> 3	
	Platygobic	gracilis	7	
	Rhinichthy	s cataractae	2	
	Catostom	ıs commersoni	2	
	lctalurus p	unctatus	1	
IDD 26 May 2009 W. Jason Remshardt, Evan B. And	WJR09-854 Jerson Dustin L Myers	30 seine hauls	Effort:	637.0 m ²
	Scientific r	ame	<u>N</u>	
	Cyprinella		85	
	Hybognati	nus amarus	18	
	Pimephale	s promelas	1	
	Platygobic	gracilis	6	
	Rhinichthy	s cataractae	1	
	Catostom	ıs commersoni	1	
	Gambusia	affinis	5	
ALEJANDRO GATE 26 May 2009	WJR09-855	30 seine hauls	Effort:	623.3 m ²
W. Jason Remshardt, Evan B. And				
	<u>Scientific r</u>		<u>N</u>	
	Cyprinella		128	
	Hybognati	nus amarus	8	
	Pimephale	s promelas	1	

24 Ju	N ROAD une 2009	WJR09-856		seine hauls	Effort:	717.0 m ²
Angela P. James,	James P. Sandoval,	Scott J. Bulgrir	n, Jody Kougioulias,	Tim Smith		
			<u>Scientific name</u>		<u>N</u>	
			Cyprinella lutrensis		156	
			Hybognathus amarus		4	
			Pimephales promelas		4	
			Cyprinus carpio		1	
			Platygobio gracilis		9	
			Rhinichthys cataracta	ie	2	
			Catostomus commers	soni	29	
			Gambusia affinis		11	
			Micropterus salmoide	25	1	
24 Ju	AMAFCA une 2009 James P. Sandoval,	WJR09-857 Scott J. Bulgrir	30 n, Jody Kougioulias,	seine hauls Tim Smith	Effort:	580.8 m ²
24 Ju	une 2009	Scott J. Bulgrir			Effort: <u>N</u>	580.8 m ²
24 Ju	une 2009	Scott J. Bulgrir	n, Jody Kougioulias,			580.8 m ²
24 Ju	une 2009	Scott J. Bulgrir	n, Jody Kougioulias, <u>Scientific name</u>	Tim Smith	N	580.8 m ²
24 Ju	une 2009	Scott J. Bulgrir	n, Jody Kougioulias, <u>Scientific name</u> Cyprinella lutrensis	Tim Smith	<u>N</u> 869	580.8 m ²
24 Ju	une 2009	Scott J. Bulgrir	n, Jody Kougioulias, <u>Scientific name</u> Cyprinella lutrensis Hybognathus amarus	Tim Smith	<u>N</u> 869 1	580.8 m ²
24 Ju	une 2009	Scott J. Bulgrir	n, Jody Kougioulias, <u>Scientific name</u> Cyprinella lutrensis Hybognathus amarus Pimephales promelas	Tim Smith	<u>N</u> 869 1 13	580.8 m ²
24 Ju	une 2009	Scott J. Bulgrir	n, Jody Kougioulias, Scientific name Cyprinella lutrensis Hybognathus amarus Pimephales promelas Cyprinus carpio	Tim Smith	N 869 1 13 23	580.8 m ²
24 Ju	une 2009	Scott J. Bulgrin	n, Jody Kougioulias, Scientific name Cyprinella lutrensis Hybognathus amarus Pimephales promelas Cyprinus carpio Platygobio gracilis	Tim Smith	N 869 1 13 23 18	580.8 m ²
24 Ju	une 2009	Scott J. Bulgrin	n, Jody Kougioulias, Scientific name Cyprinella lutrensis Hybognathus amarus Pimephales promelas Cyprinus carpio Platygobio gracilis Rhinichthys cataracta	Tim Smith	N 869 1 13 23 18 7	580.8 m ²

Scientific name N Cyprinella lutrensis 332 Hybognathus amarus 7 Pimephales promelas 4 Cyprinus carpio 35 Platygobio gracills 4 Catostomus commersoni 415 Gambusia affinis 136 Micropterus salmoides 1 Sander vitreus 1 Secientific name N Cyprinella lutrensis 51 Scientific name N Cyprinella lutrensis 1 Plimephales promelas 1 Plimephales promelas 1 Plimephales promelas 1 Platygobio gracills 1 Platygobio gracills 1 Catostomus commersoni 33 Catostomus commersoni 33		NEGRAS une 2009 James P. Sandoval,	WJR09-858 Scott J. Bulgrir		30 seine hauls , Tim Smith	Effort:	612.0 m ²
Hybognathus amarus 7 Hybognathus amarus 7 Pimephales promelas 4 Cyprinus carpio 35 Platygobio gracilis 4 Catostomus commersoni 415 Catostomus commersoni 415 Gambusia affinis 136 Micropterus salmoides 1 SANDIA LINE 14 Sander vitreus 1 24 June 2009 WJR09-859 30 seine hauls Effort: 745.5 m ² Angela P. James, James P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 51 1 Cyprinella lutrensis 51 1 1 Pimephales promelas 1 1 1 Pimephales promelas 13 1 1 Pimephales promelas 13 3 3 Pimephales commersoni <td></td> <td></td> <td></td> <td>Scientific name</td> <td></td> <td><u>N</u></td> <td></td>				Scientific name		<u>N</u>	
Pimephales promelas 4 Cyprinus carpio 35 Platygobio gracills 4 Platygobio gracills 4 Catostomus commersoni 415 Gambusia affinis 136 Gambusia affinis 136 Sander vitreus 1 Sander vitreus 1 Sander vitreus 1 Sander vitreus 1 Subject P. James, James P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith Y45.5 m ² Scientific name N Cyprinella lutrensis 51 Pimephales promelas 1 Pimephales promelas 1 Pimephales promelas 1 Pintephales promelas 1 Platygobio gracills 1 Angela P. James, James P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 12 Pimephales promelas 1 Pimephales promelas 1 Pimephales promelas 1 Platygobio gracills 13 Anget promelas 13 Platygobio gracills 13 Anget promelas 13				Cyprinella lutrensis		332	
Cyprinus carpio 35 Platygobio gracilis 4 Catostomus commersoni 415 Gambusia affinis 136 Gambusia affinis 136 Micropterus salmoides 1 Sander vitreus 1 Scientific name Cyprinella lutrensis 745.5 m ² Scientific name Cyprinella lutrensis 1 Scientific name Cyprinella lutrensis 1 Pimephales promelas 1 Pimephales promelas 1 Platygobio gracilis 1 Platygobio gracilis 1 Rhinichthys cataractae 13 Catostomus commersoni 33				Hybognathus amar	rus	7	
Platygobio gracilis 4 Catostomus commersoni 415 Gambusia affinis 136 Micropterus salmoides 1 Sander vitreus 1 SANDIA LINE 14 Sander vitreus 24 June 2009 WJR09-859 30 seine hauls Effort: 745.5 m ² Angela P. James, James P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 12 12 Scientific name Cyprinella lutrensis 12 12 12 Pimephales promelas 12 12 12 Pimephales promelas 13 12 12 Rinichthys cataractae 13 13 13 Subscrute Pinephales promelas 12 13 Subscrute Pinephales promelas 13 13 Subscrute <				Pimephales prome	as	4	
Catostomus commersoni 415 Gambusia affinis 136 Micropterus salmoides 1 Sander vitreus 1 SANDIA LINE 14 Sander vitreus 24 June 2009 WJR09-859 Angela P. James, James P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith Effort: Scientific name Cyprinella lutrensis N Cyprinella lutrensis 51 Pimephales promelas 1 Platygobio gracilis 11 Rhinichthys cataractae 13 Catostomus commersoni 33				Cyprinus carpio		35	
Gambusia affinis 136 Micropterus salmoides 1 Sander vitreus 1 SANDIA LINE 14 Sander vitreus 24 June 2009 WJR09-859 Angela P. James, James P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith Effort: Scientific name N Cyprinella lutrensis 51 Pimephales promelas 1 Pimephales promelas 1 Pinephales promelas 1 Rhinichthys cataractae 13 Catostomus commersoni 33				Platygobio gracilis		4	
Micropterus salmoides 1 Sander vitreus 1 SANDIA LINE 14 Sander vitreus 1 24 June 2009 WJR09-859 30 seine hauls Effort: 745.5 m ² Angela P. James, James P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 745.5 m ² 1 Scientific name N 51 51 Cyprinella lutrensis 51 51 12 Pimephales promelas 1 12 12 Pinephales promelas 1 12 12 Pinephales promelas 1 13 13 Catostomus commersoni 33 33 33				Catostomus comme	ersoni	415	
Sander vitreus 1 SANDIA LINE 14 24 June 2009 WJR09-859 30 seine hauls Effort: 745.5 m ² Angela P. James, James P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith Scientific name N Scientific name Scientific name Scientific name Scientific name Gyprinella lutrensis 51 51 Image P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 12 12 Image P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 12 11 Image P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 11 12 Image P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 11 12 Image P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 11 12 Image P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 13 13 Image P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 13 13 Image P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith 13 Image P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim				Gambusia affinis		136	
SANDIA LINE 14 WJR09-859 30 seine hauls Effort: 745.5 m ² Angela P. James, James P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith N N Scientific name N Scientific name N Cyprinella lutrensis 51 51 Image and the set of t				Micropterus salmoi	des	1	
24 June 2009 WJR09-859 30 seine hauls Effort: 745.5 m ² Angela P. James P. Sandoval, Scott J. Bulgrin, Jody Kougioulias, Tim Smith N N Scientific name N Scientific name Scientific name Cyprinella lutrensis 51 Scientific name Scientific name Hybognathus amarus 12 Scientific name Scientific name Pimephales promelas 1 Scientific name Scientific name Platygobio gracilis 11 Scientific name Scientific name Catostomus commersoni 33 Scientific name Scientific name				Sander vitreus		1	
Scientific nameNCyprinella lutrensis51Hybognathus amarus12Pimephales promelas1Platygobio gracilis11Rhinichthys cataractae13Catostomus commersoni33	24 J	une 2009				Effort:	745.5 m ²
Cyprinella lutrensis51Hybognathus amarus12Pimephales promelas1Platygobio gracilis11Rhinichthys cataractae13Catostomus commersoni33	Angela P. James,	James P. Sandoval,	-		, im smun	N	
Hybognathus amarus12Pimephales promelas1Platygobio gracilis11Rhinichthys cataractae13Catostomus commersoni33							
Pimephales promelas 1 Platygobio gracilis 11 Rhinichthys cataractae 13 Catostomus commersoni 33							
Platygobio gracilis 11 Rhinichthys cataractae 13 Catostomus commersoni 33				5. 975			
Rhinichthys cataractae 13 Catostomus commersoni 33				160 - 160			
Catostomus commersoni 33				/5 5			
				Rhinichthys catarad	tae	1२	
				(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)			

ATRISCO OUT 07 July	2009	WJR09-860		ine hauls	Effort:	810.8 m ²
W. Jason Remshardt,	Evan B. Anderson			Z		
			<u>fic name</u>		<u>N</u>	
			ella lutrensis		8	
			nathus amarus		231	
		Pimepl	hales promelas		11	
		Cyprini	us carpio		1	
		Platygo	obio gracilis		38	
		Rhinich	nthys cataractae		4	
		Catoste	omus commerso	ni	7	
		Ictalur	us punctatus		4	
		Lepom	is macrochirus		1	
		Microp	oterus salmoides		1	
	IDD					
07 July		WJR09-861		ine hauls	Effort:	729.3 m ²
W. Jason Remshardt,	Evan B. Anderson	, Tristan J. Austring	, Adam F. Valde	Z		
			<u>fic name</u>		<u>N</u>	
			ella lutrensis		135	
			nathus amarus		80	
			obio gracilis		5	
		Catoste	omus commersoi	ni	1	
		Ictalur	us punctatus		12	
		Pomox	is annularis		5	
ALEJANDRO (Sava - A		Sectorem 1	5473 31 418
07 July		WJR09-862		ine hauls	Effort:	554.0 m ⁻²
W. Jason Remshardt,	Evan B. Anderson			2 2		
			fic name ella lutrensis		<u>N</u>	
					33	
			nathus amarus		450	
			us carpio		3	
			nthys cataractae		2	
			omus commersoi	ni	4	
			rus natalis		2	
		Gambı	usia affinis		61	
		Microp	oterus salmoides		4	

DIXON ROAD 28 July 2009	WJR09-866 30 seine h	nauls Effort: 1,137.8 m ²
W. Jason Remshardt, Jody Kougioulias,	Andrew A. ElkShoulder, Adam F. Valdez	z, Mark Morales, Thomas P. Archdeacon
	Scientific name	N
	Cyprinella lutrensis	36
	Hybognathus amarus	292
	Pimephales promelas	23
	Platygobio gracilis	48
	Rhinichthys cataractae	9
	Catostomus commersoni	40
	Ictalurus punctatus	13
	Gambusia affinis	5
	Morone chrysops	1
	Micropterus salmoides	2
NORTH AMAFCA		
28 July 2009	WJR09-867 30 seine h	nauls Effort: 810.8 m ²
W. Jason Remshardt, Jody Kougioulias,	Andrew A. ElkShoulder, Adam F. Valdez	z, Mark Morales, Thomas P. Archdeacon
	Scientific name	<u>N</u>
	Cyprinella lutrensis	43
	Hybognathus amarus	88
	Pimephales promelas	16
	Platygobio gracilis	17
	Rhinichthys cataractae	2
	Catostomus commersoni	19
	lctalurus punctatus	7
	Morone chrysops	1

LOMITAS NEGR 28 July 20 W. Jason Remshardt, J	009	WJR09-868 Andrew A. I		30 seine hai Adam F. Valdez,		ffort: s, Thomas	850.8 m ² P. Archdeacon
			Scientific nam			<u>N</u>	
			Cyprinella lutr			21	
			Hybognathus			48	
			Pimephales pi	romelas		9	
			Platygobio gro	acilis		14	
			Rhinichthys co	ataractae		7	
			Carpiodes car	pio		2	
			Catostomus c	ommersoni		7	
			Gambusia affi	inis		35	
			Lepomis macr	rochirus		1	
			Micropterus s	almoides		2	
			ter bioble ter - o ter al constant				
ATRISCO OUTF/	ALL					-	
ATRISCO OUTFA 30 July 20		TPA09-106		30 seine hau	ls E	ffort:	616.3 m ²
	009				uls E		616.3 m ²
30 July 20	009	houlder, Ad	lam F. Valdez <u>Scientific nam</u>	30 seine hau <u>e</u>	uls E		616.3 m ²
30 July 20	009	houlder, Ad	lam F. Valdez	30 seine hau <u>e</u>	uls E	ffort:	616.3 m ²
30 July 20	009	houlder, Ad	lam F. Valdez <u>Scientific nam</u>	30 seine hau <u>e</u> rensis	uls E	ffort: <u>N</u>	616.3 m ²
30 July 20	009	houlder, Ad	lam F. Valdez <u>Scientific nam</u> <i>Cyprinella lutr</i>	30 seine hau e <u>e</u> rensis amarus	uls E	iffort: <u>N</u> 6	616.3 m ²
30 July 20	009	houlder, Ad	lam F. Valdez <u>Scientific nam</u> Cyprinella lutr Hybognathus	30 seine hau eensis amarus romelas	uls E	iffort: <u>N</u> 6 75	616.3 m ²
30 July 20	009	houlder, Ad	lam F. Valdez <u>Scientific nam</u> Cyprinella lutr Hybognathus Pimephales pi	30 seine hau e rensis amarus romelas acilis	uls E	iffort: <u>N</u> 6 75 9	616.3 m ²
30 July 20	009	houlder, Ad	lam F. Valdez <u>Scientific nam</u> Cyprinella lutr Hybognathus Pimephales pi Platygobio gro	30 seine hau eensis amarus romelas acilis pio	uls E	iffort: <u>N</u> 6 75 9 2	616.3 m ²
30 July 20	009	houlder, Ad	lam F. Valdez <u>Scientific nam</u> Cyprinella lutr Hybognathus Pimephales pi Platygobio gro Carpiodes car	30 seine hau	uls E	iffort: <u>N</u> 6 75 9 2 77	616.3 m ²
30 July 20	009	houlder, Ad	lam F. Valdez <u>Scientific nam</u> Cyprinella lutr Hybognathus Pimephales pi Platygobio gro Carpiodes car Catostomus co	30 seine hau	uls E	iffort: N 6 75 9 2 77 10	616.3 m ²

IDD 30 July 2009 'homas P. Archdeacon, Andrew /	TPA09-107	30 seine hauls	Effort:	611.0 m ²
Tomas P. Archideacon, Andrew /	<u>Scientific na</u>		N	
	Cyprinella lu		130	
	Hybognath	ıs amarus	230	
	Pimephales	promelas	5	
	Platygobio	gracilis	3	
	Carpiodes c	arpio	28	
	Catostomus	commersoni	2	
	Ictalurus pu	nctatus	10	
	Gambusia a	ffinis	2	
	Micropterus	s salmoides	2	
ALEJANDRO GATE 30 July 2009	TPA09-108	26 seine hauls	Effort:	613.8 m ²
	A. ElkShoulder,Adam F. Valde	Z		613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde <u>Scientific na</u>	z me	<u>N</u>	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde <u>Scientific na</u> Cyprinella Iu	z <u>me</u> ıtrensis	<u>N</u> 98	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde <u>Scientific na</u> Cyprinella lu Hybognathu	z <u>me</u> ıtrensis ıs amarus	<u>N</u> 98 201	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde <u>Scientific na</u> Cyprinella lu Hybognathu Pimephales	z <u>me</u> ıtrensis ıs amarus promelas	<u>N</u> 98 201 2	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde Scientific na Cyprinella lu Hybognath Pimephales Platygobio g	z me Itrensis Is amarus promelas gracilis	N 98 201 2 2	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde Scientific na Cyprinella lu Hybognath Pimephales Platygobio Rhinichthys	z me Itrensis Is amarus promelas gracilis cataractae	N 98 201 2 2 1	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde Scientific na Cyprinella la Hybognatha Pimephales Platygobio Rhinichthys Carpiodes c	z me Itrensis Is amarus promelas gracilis cataractae	N 98 201 2 2 1 4	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde Scientific na Cyprinella la Hybognatha Pimephales Platygobio Rhinichthys Carpiodes c Catostomus	z <u>me</u> utrensis us amarus promelas gracilis cataractae arpio commersoni	N 98 201 2 2 1 4 3	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde Scientific na Cyprinella la Hybognatha Pimephales Platygobio Rhinichthys Carpiodes c Catostomus Ictalurus pu	z <u>me</u> utrensis us amarus promelas gracilis cataractae arpio commersoni nctatus	N 98 201 2 2 1 4 3 8	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde Scientific na Cyprinella la Hybognatha Pimephales Platygobio Rhinichthys Carpiodes c Catostomus Ictalurus pu Gambusia c	z me utrensis us amarus promelas gracilis cataractae arpio commersoni nctatus ffinis	N 98 201 2 2 1 4 3 8 8	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde Scientific na Cyprinella la Hybognatha Pimephales Platygobio g Rhinichthys Carpiodes c Catostomus Ictalurus pu Gambusia a Lepomis mo	z me itrensis us amarus promelas gracilis cataractae arpio commersoni nctatus ffinis gracilis	N 98 201 2 2 2 3 4 3 3 8 10	613.8 m ²
30 July 2009	A. ElkShoulder, Adam F. Valde Scientific na Cyprinella la Hybognatha Pimephales Platygobio Rhinichthys Carpiodes c Catostomus Ictalurus pu Gambusia c	me atrensis as amarus promelas gracilis cataractae arpio commersoni nctatus ffinis ffinis crochirus asalmoides	N 98 201 2 2 1 4 3 8 8	613.8 m ²

LOMITAS NEGRAS 26 August 2009 Thomas P. Archdeacon, Tristan	TPA09-111 J. Austring, Jody Kougioulias,	30 seine hauls Mark Morales	Effort:	659.8 m ²
	Scientific		<u>N</u>	
	Cyprinella	lutrensis	30	
	Hybognat	hus amarus	62	
	Pimephale	es promelas	2	
	Platygobi	o gracilis	42	
	Rhinichth	ys cataractae	4	
	Catostom	us commersoni	4	
	lctalurus p	ounctatus	3	
	Gambusia	a affinis	165	
	Morone c	hrysops	2	
	Lepomis c	yanellus	1	
	Lepomis n	nacrochirus	15	
	Micropter	rus salmoides	17	
DIXON ROAD				
DIXON ROAD 26 August 2009	TPA09-112	30 seine hauls	Effort:	749.6 m ²
			Effort:	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, <u>Scientific</u>	Mark Morales name	Effort: <u>N</u>	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, <u>Scientific</u> <i>Cyprinella</i>	Mark Morales <u>name</u> Iutrensis		749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, <u>Scientific</u> <i>Cyprinella</i>	Mark Morales name	<u>N</u>	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, <u>Scientific</u> Cyprinella Hybognat	Mark Morales <u>name</u> Iutrensis	<u>N</u> 80	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, <u>Scientific</u> Cyprinella Hybognat	Mark Morales name lutrensis thus amarus es promelas	<u>N</u> 80 32	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, Scientific Cyprinella Hybognat Pimephala Platygobia	Mark Morales name lutrensis thus amarus es promelas	<u>N</u> 80 32 3	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, Scientific Cyprinella Hybognat Pimephala Platygobia	Mark Morales name lutrensis thus amarus es promelas o gracilis ys cataractae	<u>№</u> 80 32 3 56	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, Scientific Cyprinella Hybognat Pimephak Platygobi Rhinichthy Carpiodes	Mark Morales name lutrensis thus amarus es promelas o gracilis ys cataractae	<u>№</u> 80 32 3 56 10	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, Scientific Cyprinella Hybognat Pimephak Platygobi Rhinichthy Carpiodes	Mark Morales name lutrensis thus amarus es promelas o gracilis ys cataractae carpio us commersoni	N 80 32 3 56 10 4	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, Scientific Cyprinella Hybognat Pimephala Platygobia Rhinichthy Carpiodes Catostom	Mark Morales name lutrensis thus amarus es promelas o gracilis ys cataractae carpio us commersoni natalis	N 80 32 3 56 10 4 18	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, Scientific Cyprinella Hybognat Pimephale Platygobio Rhinichthy Carpiodes Catostom Ameiurus	Mark Morales name lutrensis thus amarus es promelas o gracilis ys cataractae carpio us commersoni natalis ounctatus	N 80 32 3 56 10 4 18 18	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, Scientific Cyprinella Hybognat Pimephale Platygobio Rhinichthy Carpiodes Catostom Ameiurus Ictalurus p	Mark Morales name lutrensis lutrensis chus amarus es promelas o gracilis ys cataractae carpio us commersoni natalis punctatus affinis	N 80 32 3 56 10 4 18 18 1 8	749.6 m ²
26 August 2009	J. Austring, Jody Kougioulias, Scientific Cyprinella Hybognat Pimephak Platygobi Rhinichthy Carpiodes Catostom Ictalurus Gambusia Morone c	Mark Morales name lutrensis lutrensis chus amarus es promelas o gracilis ys cataractae carpio us commersoni natalis punctatus affinis	N 80 32 3 3 56 10 4 18 18 18 9	749.6 m ²

NORTH AMAFCA 26 August 2009 Thomas P. Archdeacon, Tristan J.	TPA09-113 Austring, Jody Kougioulias,	30 seine hauls Mark Morales	Effort:	540.3 m ²
	Scientific	name	<u>N</u>	
	Cyprinella	a lutrensis	82	
	Hybogna	thus amarus	7	
	Cyprinus	carpio	2	
	Platygob	io gracilis	32	
	Rhinichth	ys cataractae	1	
	Catoston	nus commersoni	4	
	Ictalurus	punctatus	3	
	Gambusi	a affinis	1	
	Lepomis	macrochirus	6	
	Micropte	rus salmoides	1	
SANDIA LINE 14				
26 August 2009	TPA09-114	30 seine hauls	Effort:	491.0 m ²
Thomas P. Archdeacon, Tristan J.	. Austring, Jody Kougioulias,	Mark Morales		
	Scientific	name	<u>N</u>	
	Cyprinella	a lutrensis	37	
	Hybogna	thus amarus	19	
	Pimepha	les promelas	2	
	Platygobi	io gracilis	18	
	Rhinichth	ys cataractae	3	
	Carpiode.	s carpio	1	
	Catostor	nus commersoni	7	
	Ictalurus	punctatus	5	
	Gambusi	a affinis	22	
	Lepomis	macrochirus	5	

ATRISCO OUTFALL 27 August 2009 Evan B. Anderson, Thomas P. A	TPA09-117 Archdeacon, Stephen R. Davenpo	30 seine hauls rt, Angela P. James	Effort:	594.3 m ²
	<u>Scientific na</u> Cyprinella lu		<u>N</u> 196	
	Hybognathu		17	
	Pimephales	promelas	6	
	Platygobio g	ıracilis	5	
	Rhinichthys	cataractae	1	
	Carpiodes co	arpio	56	
	Ictalurus pu	nctatus	9	
	Gambusia a	ffinis	5	
	Lepomis ma	crochirus	1	
ALEJANDRO GATE 27 August 2009	TPA09-118	30 seine hauls	Effort:	612.5 m ²
27 August 2009	Archdeacon, Stephen R. Davenpo	rt, Angela P. James		612.5 m ²
27 August 2009		rt, Angela P. James <u>me</u>	Effort: <u>N</u> 491	612.5 m ²
27 August 2009	Archdeacon, Stephen R. Davenpo <u>Scientific na</u>	rt, Angela P. James <u>me</u> t <i>rensis</i>	N	612.5 m ²
27 August 2009	Archdeacon, Stephen R. Davenpo <u>Scientific na</u> Cyprinella lu	rt, Angela P. James <u>me</u> trensis s amarus	<u>N</u> 491	612.5 m ²
27 August 2009	Archdeacon, Stephen R. Davenpo <u>Scientific na</u> Cyprinella lu Hybognathu	rt, Angela P. James me trensis s amarus promelas	<u>N</u> 491 58	612.5 m ²
27 August 2009	Archdeacon, Stephen R. Davenpo Scientific na Cyprinella lu Hybognathu Pimephales	rt, Angela P. James me trensis is amarus promelas uracilis	<u>N</u> 491 58 5	612.5 m ²
27 August 2009	Archdeacon, Stephen R. Davenpo Scientific na Cyprinella lu Hybognathu Pimephales Platygobio g	rt, Angela P. James me trensis is amarus promelas iracilis arpio	N 491 58 5 17	612.5 m ²
27 August 2009	Archdeacon, Stephen R. Davenpo Scientific na Cyprinella lu Hybognathu Pimephales Platygobio g Carpiodes co	rt, Angela P. James me trensis s amarus promelas uracilis arpio nctatus	N 491 58 5 17 13	612.5 m ²
27 August 2009	Archdeacon, Stephen R. Davenpo Scientific na Cyprinella lu Hybognathu Pimephales Platygobio o Carpiodes co Ictalurus pu	rt, Angela P. James me trensis s amarus promelas tracilis arpio tratus ffinis	N 491 58 5 17 13 5	612.5 m ²

	IDD gust 2009	TPA09-119	30 seine hauls	Effort:	573.0 m ²
Evan B. Anderso	n, Thomas P. Archdead	on, Stephen R. Davenpor			
		<u>Scientific nar</u>		<u>N</u>	
		Cyprinella lui		121	
		Hybognathu	s amarus	68	
		Pimephales p	promelas	2	
		Carpiodes ca	rpio	17	
		Catostomus	commersoni	3	
		lctalurus pur	ctatus	6	
		Gambusia a <u>f</u>	finis	5	
		Lepomis mac	rochirus	1	
		Pomoxis ann	ularis	2	
DIX	ON ROAD				
DIX 23 Septen	DN ROAD nber 2009	TPA09-120	30 seine hauls	Effort:	685.3 m ²
23 Septen	nber 2009	TPA09-120 n, Tristan J. Austring, Ma		Effort:	685.3 m ²
23 Septen	nber 2009		rk Morales, Joe Chavez	Effort: <u>N</u>	685.3 m ²
23 Septen	nber 2009	n, Tristan J. Austring, Ma	rk Morales, Joe Chavez ne		685.3 m ²
23 Septen	nber 2009	n, Tristan J. Austring, Ma <u>Scientific nar</u>	rk Morales, Joe Chavez <u>ne</u> r <i>ensis</i>	<u>N</u>	685.3 m ²
23 Septen	nber 2009	n, Tristan J. Austring, Ma <u>Scientific nar</u> Cyprinella lut	rk Morales, Joe Chavez n <u>e</u> r <i>ensis</i> s amarus	<u>N</u> 239	685.3 m ²
23 Septen	nber 2009	n, Tristan J. Austring, Ma <u>Scientific nar</u> Cyprinella lui Hybognathus	rk Morales, Joe Chavez ne rensis s amarus promelas	<u>N</u> 239 73	685.3 m ²
23 Septen	nber 2009	n, Tristan J. Austring, Ma <u>Scientific nar</u> Cyprinella lui Hybognathus Pimephales p	rk Morales, Joe Chavez ne rensis s amarus promelas racilis	<u>N</u> 239 73 15	685.3 m ²
23 Septen	nber 2009	n, Tristan J. Austring, Ma <u>Scientific nar</u> Cyprinella lui Hybognathui Pimephales p Platygobio g	rk Morales, Joe Chavez ne rrensis s amarus promelas racilis	N 239 73 15 31	685.3 m ²
23 Septen	nber 2009	n, Tristan J. Austring, Ma <u>Scientific nar</u> Cyprinella lui Hybognathus Pimephales p Platygobio g Carpiodes ca	rk Morales, Joe Chavez ne rrensis amarus oromelas racilis rpio	N 239 73 15 31 1	685.3 m ²
23 Septen	nber 2009	n, Tristan J. Austring, Ma Scientific nar Cyprinella lui Hybognathus Pimephales p Platygobio g Carpiodes ca Catostomus	rk Morales, Joe Chavez ne rensis s amarus oromelas racilis rpio commersoni ctatus	N 239 73 15 31 1 1 5	685.3 m ²

23 Septen	AMAFCA nber 2009 Thomas P. Archdeacon,	TPA09-121 Tristan J. Austring		ine hauls Joe Chavez	Effort:	590.0 m ²
		<u>Scient</u>	fic name		<u>N</u>	
		Cyprin	ella lutrensis		83	
		Hybog	nathus amarus		90	
		Pimep	hales promelas		11	
		Platyg	obio gracilis		61	
		Rhinici	hthys cataractae		3	
		Carpio	des carpio		2	
		Catost	omus commerson	i	2	
		Ameiu	rus natalis		1	
		lctalur	us punctatus		1	
		Gamb	usia affinis		71	
		Moron	e chrysops		1	
LOMITAS	S NEGRAS					
		TPA09-122	30 sei	ine hauls	Effort:	643.3 m ²
23 Septen					Effort:	643.3 m ²
23 Septen	nber 2009	Tristan J. Austring <u>Scienti</u>	g, Mark Morales, fic name		Effort: <u>N</u>	643.3 m ²
23 Septen	nber 2009	Tristan J. Austring <u>Scienti</u>	g, Mark Morales,			643.3 m ²
23 Septen	nber 2009	Tristan J. Austring <u>Scienti</u> Cyprin	g, Mark Morales, fic name		<u>N</u>	643.3 m ²
23 Septen	nber 2009	Tristan J. Austring <u>Scienti</u> Cyprin Hybog	g, Mark Morales, <u>fic name</u> ella lutrensis		<u>N</u> 30	643.3 m ²
23 Septen	nber 2009	Tristan J. Austring <u>Scienti</u> Cyprin Hybog Pimep	g, Mark Morales, <u>fic name</u> ella lutrensis nathus amarus		<u>N</u> 30 79	643.3 m ²
23 Septen	nber 2009	Tristan J. Austring Scienti Cyprin Hybog Pimep Platyg	g, Mark Morales, <u>fic name</u> ella lutrensis nathus amarus hales promelas		<u>N</u> 30 79 5	643.3 m ²
23 Septen	nber 2009	Tristan J. Austring Scienti Cyprin Hybog Pimep Platyg Rhinica	g, Mark Morales, fic name ella lutrensis nathus amarus hales promelas obio gracilis		<u>N</u> 30 79 5 6	643.3 m ²
23 Septen	nber 2009	Tristan J. Austring Scienti Cyprin Hybog Pimep Platyg Rhinic Carpio	g, Mark Morales, fic name ella lutrensis nathus amarus hales promelas obio gracilis hthys cataractae	Joe Chavez	N 30 79 5 6 1	643.3 m ²
23 Septen	nber 2009	Tristan J. Austring Scienti Cyprin Hybog Pimep Platyg Rhinicu Carpio Catost	g, Mark Morales, fic name ella lutrensis nathus amarus hales promelas obio gracilis hthys cataractae des carpio	Joe Chavez	N 30 79 5 6 1 2	643.3 m ²
23 Septen	nber 2009	Tristan J. Austring Scienti Cyprin Hybog Pimep Platyg Rhinic Carpio Catost Gamba	g, Mark Morales, fic name ella lutrensis nathus amarus hales promelas obio gracilis hthys cataractae des carpio omus commerson	Joe Chavez	N 30 79 5 6 1 2 3	643.3 m ²
23 Septen	nber 2009	Tristan J. Austring Scienti Cyprin Hybog Pimep Platyg Rhinic Carpio Catost Gambo	g, Mark Morales, fic name ella lutrensis nathus amarus hales promelas obio gracilis hthys cataractae des carpio omus commerson usia affinis	Joe Chavez	N 30 79 5 6 1 2 3 3	643.3 m ²

23 Septem Dustin J. Myers,			TPA09-123 Tristan J. A	Austring, M		ne hauls Joe Chavez	Effort:	627.5 m ²
				Scientific na			<u>N</u>	
				Cyprinella li	utrensis		287	
				Hybognath	us amarus		32	
				Pimephales	promelas		3	
				Platygobio	gracilis		16	
				Rhinichthys	cataractae		3	
				Catostomus	s commerson	i	1	
				lctalurus pu	ınctatus		3	
				Gambusia c	ıffinis		128	
ATRISCO	OUTFALL							
24 Septem	ber 2009		TPA09-124		30 sei	ne hauls	Effort:	654.3 m ²
Evan B. Andersor	ı, Thomas	P. Archdeaco	n, Dustin J	. Myers				
				Scientific na			<u>N</u>	
				Cyprinella ll			157	
				Hybognath			3	
				Pimephales			3	
				Platygobio	gracilis		9	
				Carpiodes c	arpio		22	
				lctalurus pu	ınctatus		5	
ALEJAND								2-1
24 Septem			TPA09-125		30 sei	ne hauls	Effort:	520.5 m ²
Evan B. Andersor	i, Inomas	P. Archdeaco		5) 5)				
				<u>Scientific na</u> Cyprinella li			<u>N</u> 580	
				Hybognath			50	
				nybognutin	us unurus		50	
				Pimenhalos	nromelar		ir.	
				Pimephales			5	
				Cyprinus ca	rpio		1	
				Cyprinus ca Platygobio	rpio gracilis		1	
				Cyprinus ca Platygobio Rhinichthys	rpio gracilis cataractae		1 1 3	
				Cyprinus ca Platygobio	rpio gracilis cataractae unctatus		1	

IDD				
24 September 2009	TPA09-126	30 seine hauls	Effort:	460.0 m ²
Evan B. Anderson, Thomas P. Archdea	acon, Dustin J. Myers			
	<u>Scientific n</u>		<u>N</u>	
	Cyprinella		84	
	Hybognath	nus amarus	1	
	Platygobio	gracilis	2	
	Carpiodes	carpio	1	
	Catostomu	ıs commersoni	1	
	lctalurus p	unctatus	20	
	Pomoxis ai	nnularis	2	
ALEJANDRO GATE				
27 October 2009	TJA09-057	30 seine hauls	Effort:	700.3 m ²
Evan B. Anderson, Tristan J. Austring,	Stephen R. Davenport			
	<u>Scientific n</u>	<u>ame</u>	<u>N</u>	
	Cyprinella	lutrensis	474	
	Hybognath	ius amarus	11	
	Pimephale	s promelas	1	
	Platygobio	gracilis	4	
	Catostomu	is commersoni	1	
	lctalurus p	unctatus	5	
	Gambusia	affinis	8	
ATRISCO OUTFALL				
27 October 2009	TJA09-058	31 seine hauls	Effort:	753.5 m ²
Evan B. Anderson, Tristan J. Austring,	Stephen R. Davenport			
	<u>Scientific n</u>	ame	<u>N</u>	
	Cyprinella	lutrensis	146	
	Hybognath	nus amarus	7	
	Pimephale	s promelas	5	
	Platygobio	gracilis	4	
	Rhinichthy	s cataractae	2	
	Carpiodes	carpio	2	
		is commersoni	- 1	
	Ictalurus p		4	
	Gambusia			
	Gambusia	ujjinis	2	

DIXON ROAD 02 November 2009	TJA09-059		30 seine hauls	Effort:	798.5 m ²
Tristan J. Austring, Paula J. Stubbs,	Mark Morales,				
		<u>Scientific name</u> Cyprinella lutrensi		<u>N</u>	
				16	
		Hybognathus amo		24	
		Pimephales prome		1	
		Platygobio gracilis		5	
		Rhinichthys cataro	actae	1	
		Morone chrysops		2	1
SANDIA LINE 14	TI 100 000		22		240.0 2
02 November 2009	TJA09-060		30 seine hauls	Effort:	849.0 m ²
Tristan J. Austring, Paula J. Stubbs,	Wark Worales,				
		<u>Scientific name</u> Cyprinella lutrensi	s	<u>N</u> 30	
		Hybognathus amo		20	
		Pimephales prome			
				1	
		Platygobio gracilis		9	
		Catostomus comn		1	
		Ictalurus punctatu	15	1	
		Gambusia affinis		23	
LOMITAS NEGRAS	714.00.004		22		
02 November 2009 Tristan J. Austring, Paula J. Stubbs,	TJA09-061		30 seine hauls	Effort:	725.3 m ²
	wark worders,	Scientific name		Ν	
		Cyprinella lutrensi	s	<u>N</u> 19	
		Hybognathus amo		23	
		Pimephales prome		1	
		Platygobio gracilis		7	
		Gambusia affinis		24	
		Micropterus salmo	Diaes	1	

NORTH AMAFCA 02 November 2009 Tristan J. Austring, Paula J. Stubb	TJA09-062 s. Mark Morales. Joe Cl	30 seine hauls navez. Camelio Torres	Effort:	745.5 m ²
		ific name	N	
	Cyprin	ella lutrensis	49	
	Hybog	nathus amarus	2	
	Pimep	hales promelas	1	
	Platyg	obio gracilis	2	
	Rhinic	hthys cataractae	1	
	Gamb	usia affinis	51	
ATRISCO OUTFALL 23 November 2009	TPA09-127	30 seine hauls	Effort:	503.3 m ²
Thomas P. Archdeacon, Tristan J	. Austring,			
		ific name	<u>N</u>	
		ella lutrensis	227	
		nathus amarus	19	
		hales promelas	5	
	Platyg	obio gracilis	5	
	Carpic	odes carpio	3	
	Catos	tomus commersoni	4	
	Ictalu	rus punctatus	2	
	Gamb	usia affinis	10	
ALEJANDRO GATE				
23 November 2009	TPA09-128	30 seine hauls	Effort:	427.0 m ⁻²
Thomas P. Archdeacon, Tristan J	7	-	925	
		ific name ella lutrensis	<u>N</u>	
		nathus amarus	502	
			141	
		hales promelas	2	
		us carpio	2	
		obio gracilis	1	
		odes carpio	7	
		rus punctatus	1	
	Gamb	usia affinis	24	
	Micro	pterus salmoides	1	

IDD 23 November 2009 Thomas P. Archdeacon, Tristan J.	TPA09-129	25 seine hauls	Effort:	371.5 m ²
			N	
	<u>Scientific</u> Cyprinella		<u>N</u> 133	
	Hybognat	hus amarus	9	
	Cyprinus o	carpio	1	
	Platygobi	o gracilis	2	
	Carpiodes	carpio	4	
	Ictalurus į	ounctatus	2	
DIXON ROAD				
24 November 2009	TPA09-130	30 seine hauls	Effort:	855.3 m ²
Evan B. Anderson, Thomas P. Arc	chdeacon, Mark Morales, Ca	amelio Torres		
2	<u>Scientific</u>	name	<u>N</u>	
	Cyprinella	lutrensis	10	
	Platygobi	o gracilis	9	
	Catostom	us commersoni	1	
NORTH AMAFCA				
24 November 2009	TPA09-131	30 seine hauls	Effort:	814.5 m ²
Evan B. Anderson, Thomas P. Arc	chdeacon, Mark Morales, Ca	amelio Torres		
	<u>Scientific</u>	name	<u>N</u>	
	Cyprinella	lutrensis	6	
	Hybognat	hus amarus	3	
	Pimephal	es promelas	1	
	Platygobi	o gracilis	9	
	Gambusic	a affinis	9	
	Lepomis c	yanellus	1	

SANDIA LINE 14 24 November 2009	TPA09-132	30 seine hauls	Effort:	674.3 m ²
Evan B. Anderson, Thomas P. Arch				
		ntific name rinella lutrensis	<u>N</u>	
			7	
		ognathus amarus	59	
		ygobio gracilis	55	
		nichthys cataractae	1	
	lcta	lurus punctatus	2	
	Gan	nbusia affinis	49	
	Mor	rone chrysops	1	
	Lepo	omis cyanellus	9	
	Lepo	omis macrochirus	2	
	Mic	ropterus salmoides	2	
LOMITAS NEGRAS				
24 November 2009	TPA09-133	25 seine hauls	Effort:	645.3 m ²
Evan B. Anderson, Thomas P. Arch	deacon, Mark Moral	es, Camelio Torres		
Evan B. Anderson, Thomas P. Arch		es, Camelio Torres ntific name	<u>N</u>	
Evan B. Anderson, Thomas P. Arch	Scie		<u>N</u> 120	
Evan B. Anderson, Thomas P. Arch	<u>Scie</u> Cypi	ntific name		
Evan B. Anderson, Thomas P. Arch	<u>Scie</u> Сурі Нуb	ntific name rinella lutrensis	120	
Evan B. Anderson, Thomas P. Arch	<u>Scie</u> Cypi Hyb Pimi	ntific name rinella lutrensis ognathus amarus	120 3	
Evan B. Anderson, Thomas P. Arch	<u>Scie</u> Cypi Hyb Pim Plat	ntific name rinella lutrensis ognathus amarus ephales promelas	120 3 1	
Evan B. Anderson, Thomas P. Arch	<u>Scie</u> Cypi Hyb Pim Plat	ntific name rinella lutrensis ognathus amarus ephales promelas ygobio gracilis	120 3 1 3	
	<u>Scie</u> Cypi Hyb Pim Plat	ntific name rinella lutrensis ognathus amarus ephales promelas ygobio gracilis	120 3 1 3	809.3 m ²
ATRISCO OUTFALL	Scie Cype Hyb Pim Plat San TPA09-137	ntific name rinella lutrensis ognathus amarus ephales promelas ygobio gracilis der vitreus 30 seine hauls	120 3 1 3 1	809.3 m ²
ATRISCO OUTFALL 16 December 2009	Scie Cyp Hyb Pim Plat San TPA09-137 ndeacon, Tristan J. Au	ntific name rinella lutrensis ognathus amarus ephales promelas ygobio gracilis der vitreus 30 seine hauls	120 3 1 3 1	809.3 m ²
ATRISCO OUTFALL 16 December 2009	<u>Scie</u> Cypi Hyb Pim Plat San TPA09-137 Ideacon, Tristan J. Au <u>Scie</u>	ntific name rinella lutrensis ognathus amarus ephales promelas ygobio gracilis der vitreus 30 seine hauls string, Tyler J. Pilger	120 3 1 3 1 Effort:	809.3 m ²
ATRISCO OUTFALL 16 December 2009	Scie Cypi Hyb Pim Plat San TPA09-137 ideacon, Tristan J. Au Scie Cypi	ntific name rinella lutrensis ognathus amarus ephales promelas ygobio gracilis der vitreus 30 seine hauls string, Tyler J. Pilger ntific name	120 3 1 3 1 Effort: <u>N</u>	809.3 m ²
ATRISCO OUTFALL 16 December 2009	Scie Cyp Hyb Pim Plat San TPA09-137 Ideacon, Tristan J. Au Scie Cyp Hyb	ntific name rinella lutrensis ognathus amarus ephales promelas ygobio gracilis der vitreus 30 seine hauls string, Tyler J. Pilger ntific name rinella lutrensis	120 3 1 3 1 Effort: <u>N</u> 68	809.3 m ²
ATRISCO OUTFALL 16 December 2009	Scie Cyp Hyb Pim Plat San TPA09-137 ndeacon, Tristan J. Au Scie Cyp Hyb	ntific name rinella lutrensis ognathus amarus ephales promelas ygobio gracilis der vitreus 30 seine hauls string, Tyler J. Pilger ntific name rinella lutrensis	120 3 1 3 1 Effort: <u>N</u> 68 4	809.3 m ²

ALEJANDRO GATE 16 December 2009	TPA09-138	30 seine hauls	Effort:	513.8 m ²
Evan B. Anderson, Thomas P. Arch		en Den andere en an Den andere en an Den andere		
		<u>Scientific name</u>		
		Cyprinella lutrensis		
	Hybognat	Hybognathus amarus		
	Pimephale	Pimephales promelas		
	Platygobio	Platygobio gracilis		
	lctalurus p	Ictalurus punctatus		
	Gambusia	Gambusia affinis		
	Lepomis c	Lepomis cyanellus		
	Micropter	us salmoides	1	
IDD				
16 December 2009	EBA09-065	30 seine hauls	Effort:	368.0 m ⁻²
	10,000 000			
Evan B. Anderson, Thomas P. Arch				
Evan B. Anderson, Thomas P. Arch		Tyler J. Pilger	<u>N</u>	
Evan B. Anderson, Thomas P. Arch	deacon, Tristan J. Austring,	Tyler J. Pilger name		
Evan B. Anderson, Thomas P. Arch	deacon, Tristan J. Austring, <u>Scientific I</u> Cyprinella	Tyler J. Pilger name	<u>N</u>	
Evan B. Anderson, Thomas P. Arch	deacon, Tristan J. Austring, <u>Scientific I</u> Cyprinella	Tyler J. Pilger name Iutrensis hus amarus	<u>N</u> 28	
Evan B. Anderson, Thomas P. Arch	deacon, Tristan J. Austring, <u>Scientific I</u> Cyprinella Hybognat	Tyler J. Pilger name Iutrensis hus amarus tarpio	<u>N</u> 28 15	
Evan B. Anderson, Thomas P. Arch	deacon, Tristan J. Austring, <u>Scientific I</u> Cyprinella Hybognat Cyprinus c	Tyler J. Pilger <u>name</u> <i>lutrensis</i> <i>hus amarus</i> <i>arpio</i> <i>p gracilis</i>	<u>N</u> 28 15 2	
Evan B. Anderson, Thomas P. Arch	deacon, Tristan J. Austring, Scientific I Cyprinella Hybognat Cyprinus c Platygobio	Tyler J. Pilger <u>name</u> <i>lutrensis</i> <i>hus amarus</i> <i>arpio</i> <i>gracilis</i> <i>carpio</i>	N 28 15 2 2	
Evan B. Anderson, Thomas P. Arch	deacon, Tristan J. Austring, Scientific I Cyprinella Hybognat Cyprinus c Platygobio Carpiodes	Tyler J. Pilger hame lutrensis hus amarus arpio o gracilis carpio melas	N 28 15 2 2 1	
Evan B. Anderson, Thomas P. Arch	deacon, Tristan J. Austring, Scientific r Cyprinella Hybognat Cyprinus c Platygobio Carpiodes Ameiurus	Tyler J. Pilger hame lutrensis hus amarus arpio o gracilis carpio melas punctatus	N 28 15 2 2 1 1	
Evan B. Anderson, Thomas P. Arch	deacon, Tristan J. Austring, Scientific i Cyprinella Hybognat Cyprinus c Platygobio Carpiodes Ameiurus Ictalurus p Gambusia	Tyler J. Pilger hame lutrensis hus amarus arpio o gracilis carpio melas punctatus	N 28 15 2 2 1 1 1 2	
Evan B. Anderson, Thomas P. Arch	deacon, Tristan J. Austring, Scientific i Cyprinella Hybognat Cyprinus c Platygobio Carpiodes Ameiurus Ictalurus p Gambusia	Tyler J. Pilger	N 28 15 2 2 1 1 1 2 2 1 2 1 1	

Appendix B. Water quality measurements by collection number. For detailed site information, cross-reference with Appendix A. 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	рН
EBA09-060	8.74	9.97	0.48	0.31	0.23	8.25
EBA09-061	4.96	10.00	0.36	0.23	0.17	9.01
EBA09-062	5.57	10.74	0.37	0.25	0.18	8.92
EBA09-064	4.72	9.88	0.32	0.21	0.15	8.80
EBA09-065	7.46	10.19	0.41	0.27	0.20	8.30
TJA09-057	10.95	9.66	0.45	0.29	0.22	8.76
TJA09-058	10.71	8.30	0.41	0.27	0.20	8.87
TJA09-059	11.57	8.73	0.44	0.29	0.21	7.59
TJA09-060	11.77	9.90	0.32	0.21	0.16	8.64
TJA09-061	14.47	9.44	0.42	0.27	0.20	8.56
TJA09-062	14.41	9.48	0.36	0.24	0.17	8.59
TPA09-010	11.55	10.55	0.27	0.17	0.13	7.73
TPA09-011	12.90	59.19	0.24	0.15	0.12	7.69
TPA09-012	13.86	12.62	0.25	0.16	0.12	7.92
TPA09-013	14.56	14.08	0.25	0.16	0.12	7.90
TPA09-106	22.44	4.65	0.38	0.25	0.18 .	
TPA09-107	21.82	3.75	0.37	0.24	0.18 .	
TPA09-108	28.77	4.62	0.49	0.32	0.24 .	
TPA09-111	23.58	7.89	0.38	0.24	0.18	8.43
TPA09-112	19.31	7.58	0.29	0.19	0.14	8.69
TPA09-113	20.83	7.70	0.30	0.19	0.14	8.65
TPA09-114	23.37	8.24	0.30	0.19	0.14	8.80
TPA09-117	21.44	7.07	0.37	0.24	0.18	8.72
TPA09-118	21.70	7.70	0.42	0.27	0.20 .	
TPA09-119	23.46	8.69	0.39	0.26	0.19 .	
TPA09-120	13.51	8.40	0.32	0.21	0.15	8.26
TPA09-121	14.68	8.71	0.32	0.21	0.15	8.40
TPA09-122	19.23	8.02	0.47	0.31	0.23	8.35
TPA09-123	18.21	8.36	0.31	0.20	0.15	8.60
TPA09-124	15.47	8.44	0.50	0.33	0.25	8.05
TPA09-125	15.42	8.07	0.45	0.29	0.22	8.15
TPA09-126	17.09	7.86	0.47	0.31	0.23	8.31
TPA09-127	6.66	10.82	0.40	0.26	0.20	7.84
TPA09-128	8.94	10.23	0.42	0.28	0.21	8.18
TPA09-129	9.93	11.07	0.41	0.27	0.20	8.59
TPA09-130	9.18	7.61	0.51	0.33	0.25	8.12
TPA09-131	6.08	9.30	0.39	0.25	0.19	8.45
TPA09-132	8.31	9.00	0.37	0.26	0.19	8.53

Collno	Temp	DO	SpC	Tds	Sal	рН
TPA09-133	8.09	10.04	0.28	0.22	0.16	8.79
TPA09-137	5.50	11.25	0.39	0.26	0.19	8.20
TPA09-138	9.73	11.80	0.59	0.38	0.29	8.55
WJR09-835	4.05	12.40	0.38	0.24	0.18	7.98
WJR09-836	6.04	12.07	0.41	0.26	0.20	8.48
WJR09-837	6.73	11.95	0.40	0.26	0.19	8.47
WJR09-838	7.79	11.55	0.28	0.19	0.15 .	
WJR09-839	8.91	10.02	0.35	0.23	0.17 .	
WJR09-840	9.50	10.20	0.42	0.27	0.21 .	
WJR09-841	8.62	10.48	0.70	0.46	0.35 .	
WJR09-842	8.12	11.99	0.26	0.17	0.12	7.90
WJR09-843	7.06	13.48	0.26	0.17	0.12	7.62
WJR09-844	2.88	13.86	0.28	0.18	0.13 .	
WJR09-845						
WJR09-846	14.02	8.57	0.26	0.17	0.12	7.78
WJR09-847	15.02	9.38	0.28	0.18	0.13	7.77
WJR09-848	15.27	9.20	0.39	0.25	0.19	7.61
WJR09-849	15.70	9.64	5.40		0.10 .	
WJR09-850	22.55	8.16	2.63		0.10 .	
WJR09-851	17.65	10.37	0.25		0.10 .	
WJR09-852	25.45	5.38	0.23		0.10 .	
WJR09-853	14.30	0.45				
WJR09-854	17.35	13.06				
WJR09-855	17.50	12.60				
WJR09-856	19.78	6.27	0.30	0.19	0.14	8.28
WJR09-857	20.61	6.67	0.30	0.20	0.14	8.44
WJR09-858	21.55	7.02	0.37	0.24	0.18	8.02
WJR09-859	21.69	7.41	0.31	0.20	0.15	8.14
WJR09-860	22.63	6.05	0.35	0.23	0.17	7.85
WJR09-861	23.84	5.38	0.34	0.22	0.17	7.29
WJR09-862	23.65	5.80	0.41	0.27	0.20	7.16
WJR09-866	24.56	5.95	0.30	0.19	0.14	8.57
WJR09-867	26.19	5.80	0.29	0.19	0.14	8.77
WJR09-868	26.52	5.54	0.40	0.26	0.19	8.03