EXPERIMENTAL AUGMENTATION AND MONITORING OF RIO GRANDE SILVERY MINNOW IN THE MIDDLE RIO GRANDE, NEW MEXICO

Annual Report June 2003 - May 2004

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EXECUTIVE SUMMARY

Rio Grande silvery minnow (*Hybognathus amarus*) was historically found in the mainstem Rio Grande and its larger tributaries (Rio Chama and Jemez River) from near Española to the Gulf of Mexico, and in the Pecos River from Santa Rosa downstream to its confluence with the Rio Grande (Bestgen and Platania 1991). Recently, Rio Grande silvery minnow was found in the Middle Rio Grande, New Mexico (MRGNM) below Cochiti Dam downstream to Elephant Butte Reservoir, representing 283 km (176 mi) or 5-7% of its historical range. Within the last several years, continued river drying in Isleta and San Acacia reaches has dramatically decreased densities to a level where Angostura Reach now has the highest catch rates of Rio Grande silvery minnow (Dudley et al. 2004). Direct and indirect evidence indicates that augmentation efforts in the Angostura Reach are partially contributing to the increase in upstream catch rates. In comparison, 5 years ago it was estimated more than 70% of Rio Grande silvery minnow inhabited the San Acacia Reach (San Acacia diversion dam downstream to Elephant Butte Reservoir) (U.S. Fish and Wildlife Service 1999). With frequent river intermittency downstream of Isleta Dam and unknown population status above Angostura Dam, these areas currently do not provide adequate and/or continuous population status. Human and environmental factors have reduced the continually flowing range of Rio Grande silvery minnow to the Angostura Reach (below Angostura Dam to Isleta Dam), which is only 65 km (40.4 mi) or 1% of its historic range. Nevertheless, the potential for intermittency should not outweigh the potential for continued occupation and existence in the lower reaches.

Throughout much of its historic and current range, the decline of Rio Grande silvery minnow may be attributed to modification of stream discharge and altered sediment loads, channel dessication, obstructions to upstream movement (i.e., impoundments and diversion dams), channelization, competition and predation by nonnative species, and water quality degradation (U.S. Fish and Wildlife Service 1999). There are doubtless other factors that have affected and are continuing to affect Rio Grande silvery minnow, but river intermittency on a nearly annual basis within designated critical habitat hampers effective recovery efforts.

As a direct result of this project, since June of 2002 nearly a quarter of a million hatchery raised Rio Grande silvery minnow have been augmented into the Rio Grande in the Angostura Reach, with an estimated 100,000 to be released within the next 12 months. The effects of these releases may be beginning to show up in various monitoring efforts. Over the past 12 months, the overall catch rate of Rio Grande silvery minnow was 0.99 fish/100 m^2, compared to 0.37 fish/100 m^2 in the previous 12 months. From this information, we are able to provide information as to the best stocking procedures to aide in the conservation of Rio Grande silvery minnow. Secondary information is also being collected on survival, growth, and retention of released fish. Direct and indirect information indicates that hatchery raised individuals can be released back to the wild with adequate retention in or near original release sites, can experience survival of at least 2 years after release, and ultimately can contribute to future spawning efforts.

Within the next year, continued releases and monitoring will provide information as to the best conditions for releases. In 2004-2005, we will be evaluating different release strategies such as time of year, time of day, specific release habitats, and various hatchery environments (natural outdoor ponds vs. indoor facilities). All this information will add to the knowledge needed for future conservation while providing active management strategies for the Middle Rio Grande and potential re-establishment sites.

INTRODUCTION

Emergency efforts in 1996, 1998, and 1999 located an estimated 11,000 adult and juvenile Rio Grande silvery minnow (*Hybognathus amarus*) in isolated pools downstream of San Acacia Dam. These fish were transported to upstream locations in Isleta and Angostura reaches and released. However, the small number of individuals salvaged in emergency efforts was relatively minor compared to the extent of habitat loss in the Rio Grande. Thus, relocation of adult Rio Grande silvery minnow may not contribute substantially to reestablishment and long-term population viability within permanently flowing reaches.

From May to June 2000, an estimated 204,000 larval and 414 adult Rio Grande silvery minnow were stocked by personnel from the Museum of Southwestern Biology near the New Mexico Highway 6 Bridge in Los Lunas and U.S. Highway 550 Bridge in Bernalillo. Larval fish were the result of captive spawning of wild adults from the San Acacia Reach. After spawning, surviving adults were returned to the river. However, the continued benefits of these stocking attempts are unknown. It is necessary to evaluate translocations and other stocking attempts to provide guidance for future management.

Beginning in June 2002, the New Mexico Fishery Resources Office (NMFRO) began experimental augmentation and monitoring of Rio Grande silvery minnow in the Middle Rio Grande, New Mexico (MRGNM). Funding was provided by the Middle Rio Grande Endangered Species Act Collaborative Program (MRGESACP). This annual report summarizes findings over the 12 month period beginning June 2003 and ending May 2004. The time frame reflects the second 12 month period of the study and also follows the yearly cycle of the Rio Grande silvery minnow. The sampling cycle is performed during three phases: 1) beginning in June after the peak spawning activity of Rio Grande silvery minnow; 2) before young-of-year become susceptible to sampling gear; and 3) through the following May. Sampling efforts focused on the evaluation of experimental stocking success of Rio Grande silvery minnow reared in captive propagation facilities and released in Angostura Reach (Angostura Diversion Dam to Isleta Diversion Dam).

This effort reflects management needs identified in the MRGESACP, Item A.2.2 for the Rio Grande silvery minnow as well as the Rio Grande Silvery Minnow Recovery Plan (RGSMRP; 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 MRGESACP and the RGSMRP.

The ultimate goal of augmentation efforts is to re-establish self-sustaining populations of Rio Grande silvery minnow in the MRGNM and throughout its former range. The long-term benefits of this study are to: 1) augment populations within the MRGNM; 2) evaluate stocking efforts and provide a better understanding for propagation methods, stocking times and methods; and 3) evaluate monitoring efforts needed for Rio Grande silvery minnow populations. The specific objectives of this experimental augmentation and monitoring plan are to:

1) Determine survival of stocked Rio Grande silvery minnow (salvaged eggs, larvae, and adults, and captive-spawned individuals)

2) Determine temporal and spatial upstream and downstream movement of stocked Rio Grande silvery minnow within Angostura Reach (and possibly among reaches)

3) Identify and characterize river reaches where retention and survival of stocked Rio Grande silvery minnow are maximized

4) Evaluate how (and amount) augmentation of Rio Grande silvery minnow is affecting subsequent recruitment within the reach

5) Provide guidance for augmentation activities to maximize survival of Rio Grande silvery minnow.

Success of this experimental augmentation will be determined by the ability to reach these objectives. These actions will allow better management decisions to be made in regard to the future stocking of Rio Grande silvery minnow throughout its current and historical range.

STUDY AREA

The MRGNM was separated into four reaches and designated by upstream structures: Cochiti Dam, Angostura, Isleta, and San Acacia diversion dams (Figure 1). Cochiti Reach has not been sampled since 1994 (Platania 1995), where Rio Grande silvery minnow may still be present, although reduced in abundance compared with historic collections. Within Cochiti Reach, Rio Grande silvery minnow were last collected on Cochiti Pueblo in 1988 (Platania 1993), and on Santo Domingo and San Felipe pueblos in 1994 (Platania 1995). Status and distribution of Rio Grande silvery minnow in Cochiti Reach must be further documented to accurately assess status of the species. This would require permission from and cooperation with Cochiti, Santo Domingo, and San Felipe pueblos.

Surveys since 1992 indicate that populations in Angostura, Isleta, and San Acacia reaches continue to decline, with highest catch rates of Rio Grande silvery minnow now found in the Angostura Reach (Dudley et al. 2004). Decline of Rio Grande silvery minnow in Angostura Reach was most likely related to sediment and flow modifications caused by Cochiti Dam (Bestgen and Platania 1991). The closure of Cochiti Dam in 1973 altered the river from a warmwater, sand-bed dominated river to a coolwater, gravel-sand dominated and armored bed river (U.S. Fish and Wildlife Service 1999).

MATERIALS AND METHODS

This investigation concentrates on Angostura Reach (Figure 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. With cooperation from Sandia Pueblo, four of the five sites were located within the Sandia Pueblo boundary to monitor their success and movement. Within this reach, the selection of sites was based on year-round access throughout the study and the maximization of benefits produced by survey efforts.

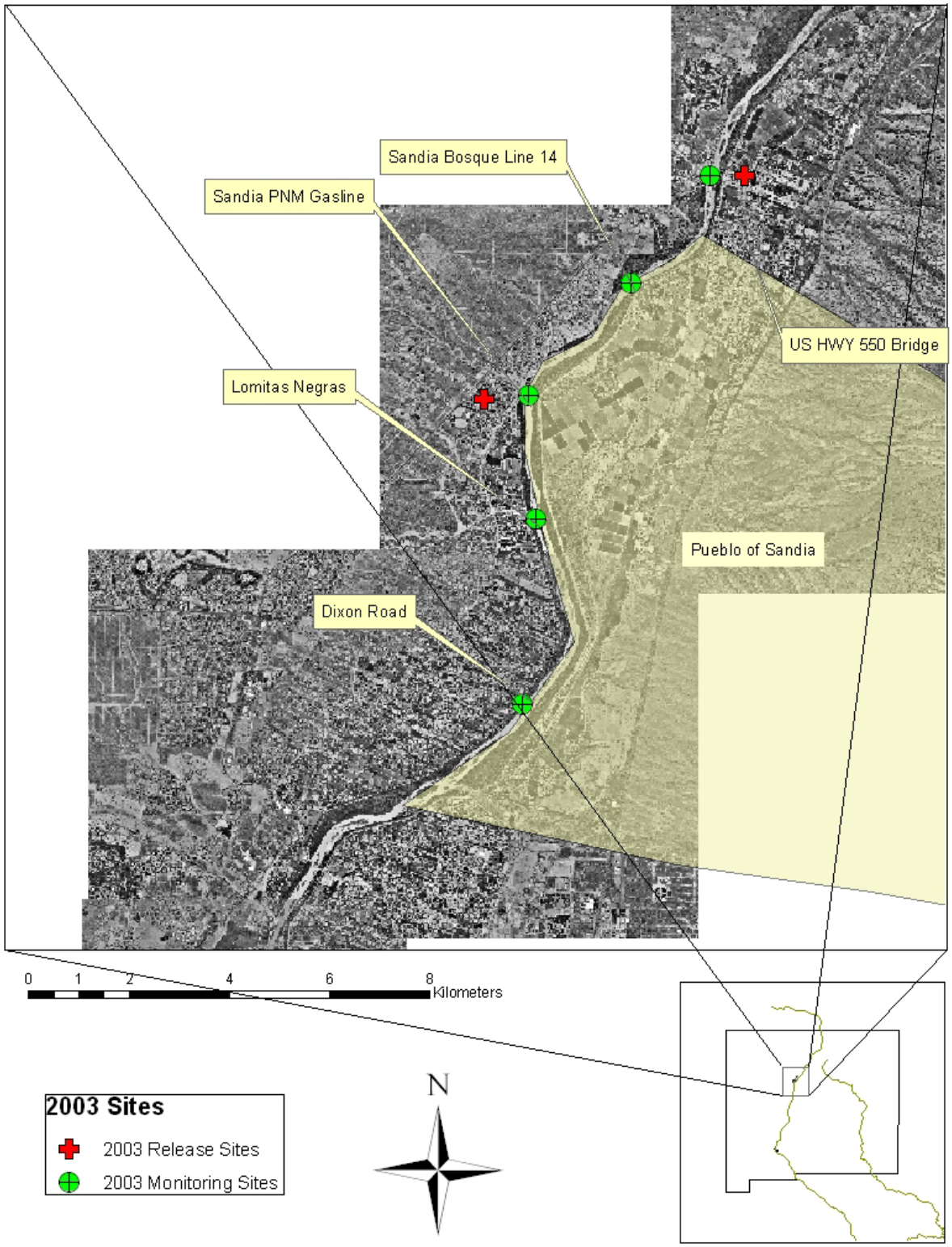

Figure 1. Map of study area.

All transplanted fish were reared at Dexter National Fish Hatchery and Technology Center, New Mexico State University – A Mountain Facility, Albuquerque Biological Park, or the U.S. Fish and Wildlife Service - NMFRO. Stocked fish originated from several sources including: 1) wild-captured eggs reared in hatchery; 2) eggs of domestic stock; and 3) eggs of wild stock. All individuals were marked using a Visible Implant Elastomer (VIE) and/or calcein. Both methods are considered batch-marking techniques. The VIE tag is a soft pliable tag that is injected into each fish. Calcein is an immersion dye that can be seen under special lighting and appears on the scales, fins, and bony structures.

Fish released on different dates were marked with a different VIE color and/or body position (Table 1). In addition, fish were marked differently from those released in previous years to differentiate between stockings. Few Rio Grande silvery minnow are thought to survive past age-2 in the wild (U.S. Fish and Wildlife Service, 1999), but different colors and body positions ensured differentiation between age classes.

Table 1. Rio Grande silvery minnow release information by New Mexico Fishery Resources Office since 2002.

VIE Color	Body Location	Released	Release Site	Release Date
orange	right, predorsal	2,082	Alameda	June 2002
orange	left, predorsal	41,500	Corrales	December 2002
green	left, predorsal	61,118	Bernalillo	January 2003
red	left, predorsal	22,266	Rio Rancho	April 2003
yellow	right, predorsal	48,513	Corrales	January 2004
red	right, predorsal	56,644	Bernalillo	April 2004
green	right, predorsal	8,500	Bernalillo	April 2004
orange	right, predorsal	1,500	Bernalillo	April 2004

Monitoring of stocked fish involved specific post-stocking surveys at 1-month intervals to determine movement and habitat use. These efforts were used to evaluate success of stocking efforts, movement patterns, habitat use, catch rates, and growth, with secondary information on fish community structure. Fish were collected with a 3 m x 1 m, 3 mm mesh seine. Length of seine haul was measured to the nearest 0.1 meter to estimate sampling effort, which was calculated by multiplying the distance of each seine haul by the width of the seine (3 m). All habitat types were sampled within each reach with 20-40 seine hauls at each sampling location. A qualitative description was made of the habitat, depth, and velocity within each seine haul. Water quality parameters were measured (pH, conductivity, water temperature, air temperature, total dissolved solids, and salinity) at each monitoring site, before and after each visit. Total lengths of captured individuals of known age were compared to all wild-caught individuals to estimate age of each fish. All fish captured were identified and enumerated in the field and subsequently released.

Habitat variables were summarized by visually identified categories and features (Table 1) and subsequently analyzed with chi-square (χ^2) tests similar to methods used in recent habitat work on the Rio Grande (Remshardt and Tashjian 2003).

RESULTS

Rio Grande silvery minnow

From June 2003 to May 2004, a total of 115,157 Rio Grande silvery minnow were marked and released in the Angostura Reach. The first release occurred in January 2004 and included 48,513 individuals. This release represented groups of eggs salvaged in May 2003 in the San Acacia Reach, reared at Dexter NFH&TC and were stocked near Corrales, New Mexico. This site, near RM 199.9 included several deep (>0.5 m), low-velocity (near 0 m/sec) habitats where wild individuals were previously collected. The second release occurred in April 2004 and included 66,644 individuals. The April release represented groups of fish salvaged as eggs in May 2003 in the San Acacia Reach and/or were produced from artifical spawning activities. Sources include the City of Albuquerque's Biological Park-Rio Grande silvery minnow refugium (10,000), Dexter NFH&TC (46,545), and New Mexico FRO-"A" Mountain Facility on the campus of New Mexico State University (10,099). These fish were released by raft into backwater habitats located between Bernalillo (RM 203.5, U.S. 550 Bridge) and Paseo del Norte Bridge (RM 191.2) in the Angostura Reach.

Preliminary tests in 2003 indicated batch-marking with calcein dye allowed quicker marking times and reduced handling and stress. Therefore, in the January 2004 release all fish were marked with calcein while 10% of these were double marked with VIE tags. This allowed us to verify the retention of calcein in natural conditions, while preserving our VIE tag procedure. Although the amount of time spent marking fish was reduced, the calcein marks were difficult to identify in the field. This was determined after four individuals that were marked with VIE tags and calcein were not identified as such in the field.

There were a total of 450 Rio Grande silvery minnow collected from June 2003 to May 2004, including 99 that were positively identified as previously released individuals (Table 3). Rio Grande silvery minnow represented 1.7% of all fish captured, were collected in 5.4% of all seine hauls with an overall catch rate of 0.99 individuals/100 m^2 (Table 4). Of the 99 marked individuals recaptured, the majority (n=52) were recaptures from the December 2002 release (Table 3). Over the 12 month sampling period, catch rates varied for Rio Grande silvery minnow, with the largest collection of 101 individuals occurring in March of 2004. Marked individuals were captured during every month except September and December of 2003. Overall, 34.6% of age 1 or older fish were marked individuals, with the majority of unmarked adults being captured from January to May 2004 (Figure 2). Catch rates varied between sites as well, with the highest number of both marked and unmarked Rio Grande silvery minnow occurring at RM 199.9 (PNM Gasline) (Figure 3). This site has produced high catch rates of unmarked fish in past sampling events and has been used as a specific release location on two occasions. Average growth of age-0 individuals from July to November 2003 was estimated to be 5-10 mm/month with maximum total lengths of 60 mm by December 2003 (Figures 4-5).

Table 2. Mesohabatat and feature definitions used for seine haul descriptions

Mesohabitats
Run – Fluvial habitat with direction of flow generally parallel with the adjacent shore. Dominant mesohabitat with varying depths and velocities.
Riffle – Fluvial habitat with flow direction generally parallel with the adjacent shore, shallow and with higher gradient than adjacent habitats.
Plunge – A turbulent pool created by water spilling over a feature such as riffle, dune, or debris pile.
Bank – Flowing habitat along a submerged feature similar to shoreline that is parallel to flow.
Confluence – Turbulent pool created at the junction of two flowing channels.
Pool – Fluvial habitat with direction generally parallel to adjacent shore, deeper and slower than adjacent habitats.
Backwater – Non-fluvial habitat found at downstream end of abandoned channels.
Forewater – Non-fluvial habitat found at abandoned inlets of high flow channels.
Embayment – Transitional habitat between fluvial and non-fluvial habitats with minimal velocities, perpendicular to adjacent river bank.
Isolated Pool – An abandoned, off-channel, remnant pool sometimes fed by subsurface seepage
Features
Shoreline – Interface between water and dry land without undercut, angle more than 90 degrees.
Debris Pile – Instream obstruction to flow, commonly formed by tumbleweeds, downed trees, or rootwads.
Eddy – turbulent zone within a mesohabitat, with upstream flow direction
Undercut – Shoreline with angle less than 90 degrees, creating overhead cover.

Fish Community

From June 2003 to May 2004 (2003), 2,395 seine hauls totaling 45,284.2 m^2 were conducted. In these samples, 26,201 individuals representing 21 species were collected (Table 4). Native cyprinids such as red shiner (*Cyprinella lutrensis*), Rio Grande silvery minnow, fathead minnow (*Pimephales promelas*), flathead chub (*Platygobio gracilis*), and longnose dace (*Rhinichthys cataractae*) represented 68.1% of all species collected. Rio Grande silvery minnow were a relatively small portion of the fish community, accounting for 1.7% of all fish collected. One hybrid sunfish (bluegill (*Lepomis macrochirus*) X green sunfish (*Lepomis cyanellus*)) was collected on 12 January 2004 at Lomitas Negras (RM 198.3). Water quality parameters reflected expected conditions without noticeable change, except seasonal differences in water temperature.

Table 3. Number of marked Rio Grande silvery minnow collected by site between June 2003 and May 2004, identified by release date (total released).

Site	River Mile	Marked and Released RGSM recaptures					
		06-02 (2,082)	12-02 (41,500)	01-03 61,118)	04-03 (22,266)	01-04 (48,513)	04-04 (66,644)
U.S. 550 Bridge	203.8	0	4	0	0	0	7
Sandia Line 14	202.0	0	6	0	0	0	5
Sandia PNM Gasline	199.9	0	35	5	12	3	6
Lomitas Negras	198.3	0	2	0	1	0	3
Dixon Road	195.5	0	5	2	1	1	1
Total	**-**	**0**	**52**	**7**	**14**	**4**	**22**

Although the total number of species (21) collected remained the same compared to 2002 (June 2002-May 2003), there was replacement of two rarely encountered introduced species. Single collections of threadfin shad (*Dorosoma petenense*) and brown trout (*Salmo trutta*) in 2002 were replaced by goldfish (*Carassius auratus*) and spotted bass (*Micropterus punctulatus*) in 2003. Catch rates of all native fish increased between 2002 and 2003. The only common species that showed a decline in catch rate was the introduced white sucker (*Catostomus commersoni*), with 8.1 individuals/100m^2 in 2002 compared with 2.28 individuals/100m^2 in 2003. Of the most common species collected, Rio Grande silvery minnow, fathead minnow, and western mosquitofish (*Gambusia affinis*) all increased their rank in relative abundance by one position between 2002 and 2003, while white sucker dropped three positions from second most abundant to fifth. Of the three species that increased their rank, Rio Grande silvery minnow had the highest percentage increase (65%) in relative abundance.

Mesohabitat associations

Whenvever available, all mesohabitats at a site were sampled. Runs dominated all samples (70%), and along with embayments (11%) and pools (10%), represented the vast majority of seine haul locations (Figure 6). Habitats occupied by Rio Grande silvery minnow were significantly different than available $\chi^2 = 52.23767$, $P < 0.05$. Specifically, Rio Grande silvery minnow were collected less frequently in runs and more frequently in backwaters and embayments than available, especially when those mesohabitats contained features such as shoreline or debris.

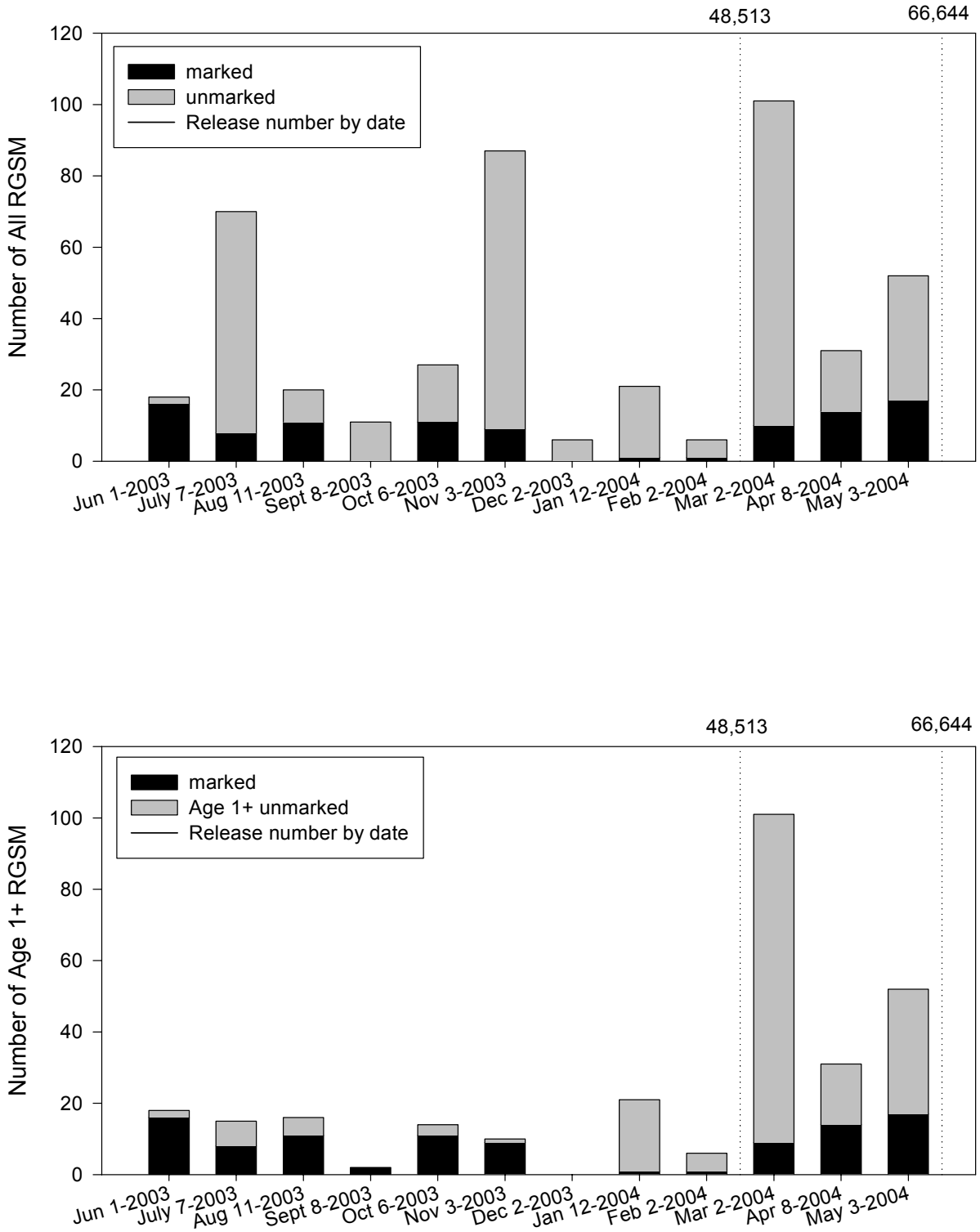

Figure 2. Number of unmarked and marked Rio Grande silvery minnow captured by date from June 2003 to May 2004. Dashed lines represent release dates and number of individuals released.

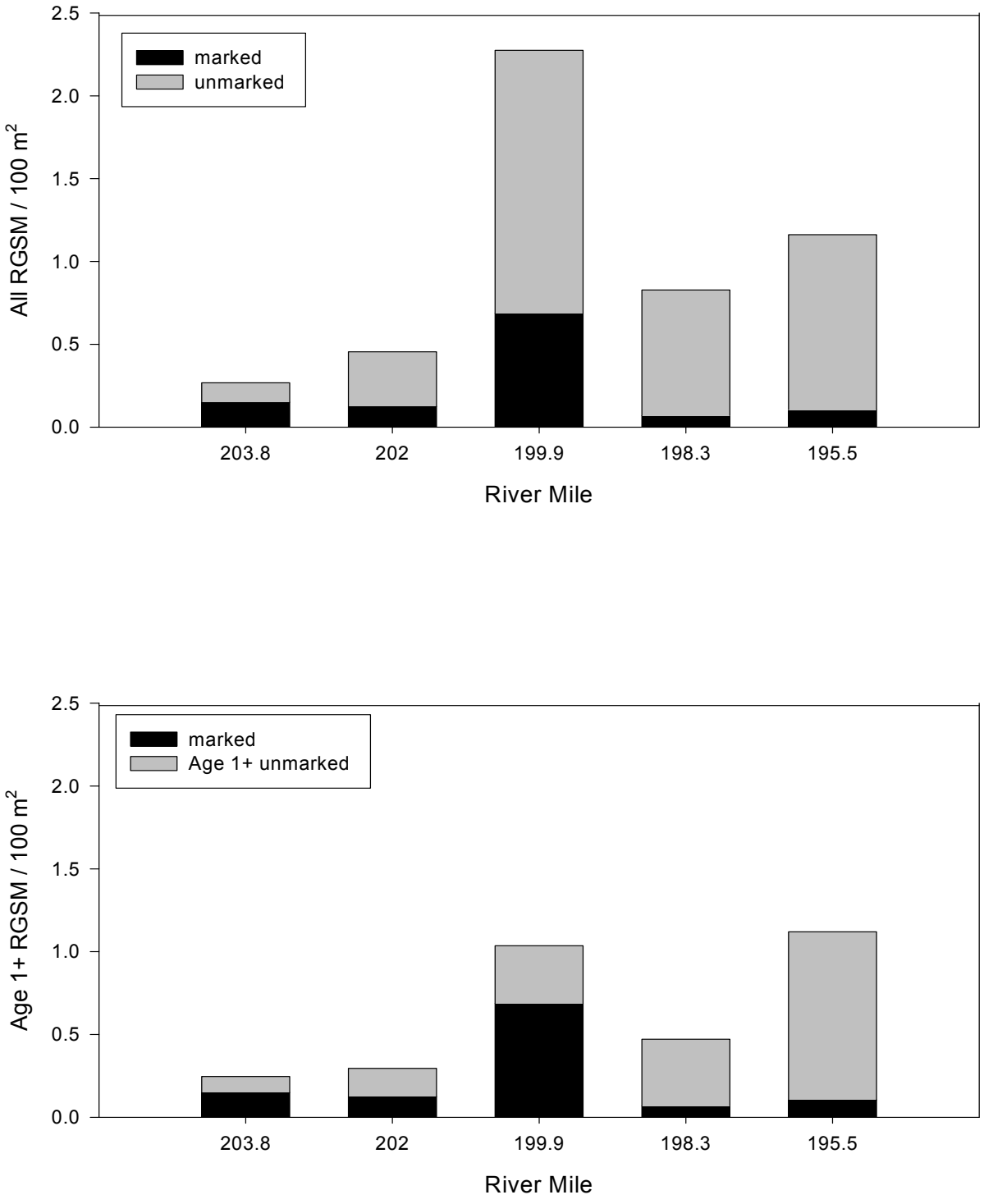

Figure 3. Number of unmarked and marked Rio Grande silvery minnow captured by site from June 2003 to May 2004. Dashed lines represent release dates and number of individuals released.

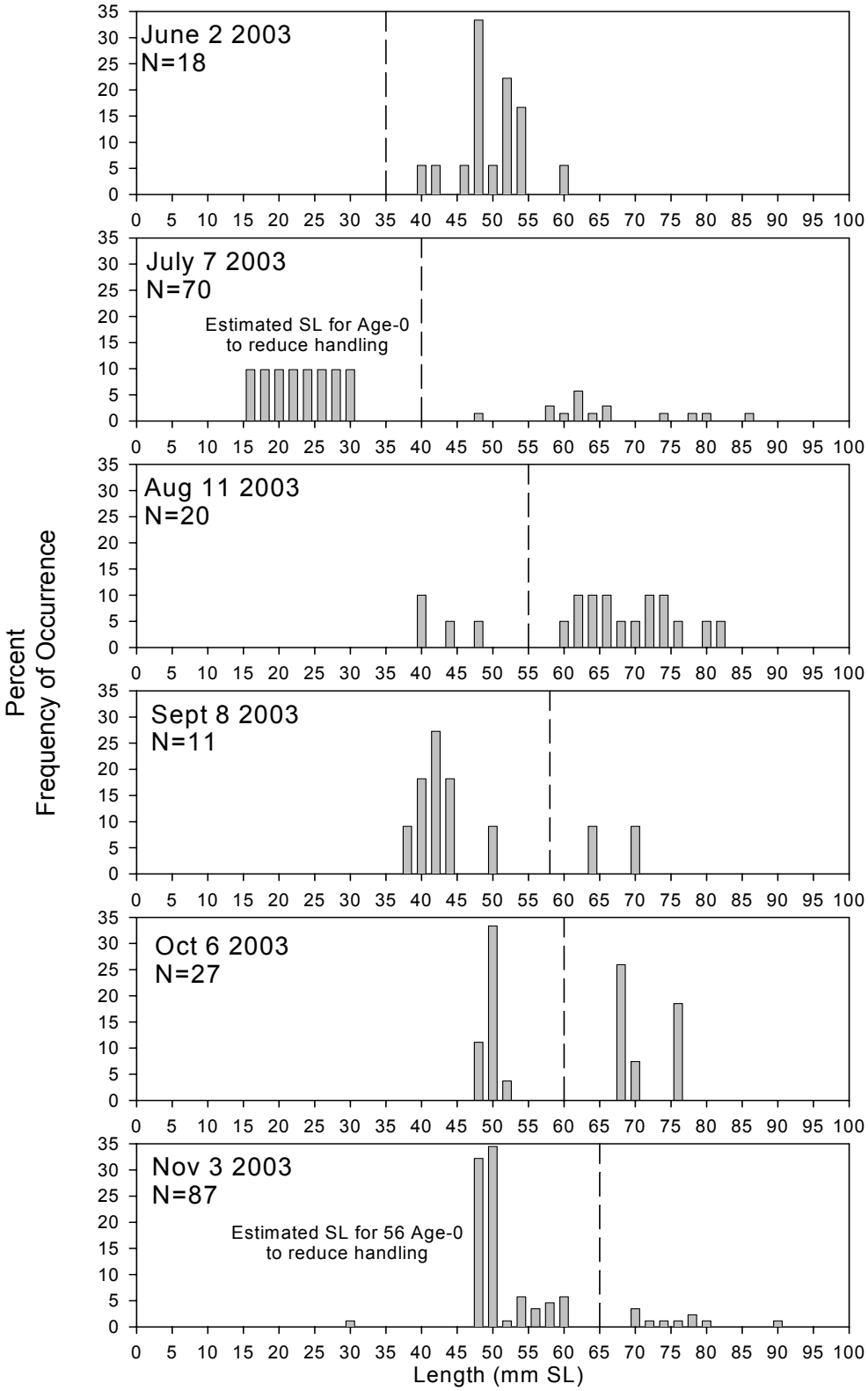

Figure 4. Standard length histograms of Rio Grande silvery minnow captured from June 2003 to November 2003. Dashed lines represent estimated breaks between year classes.

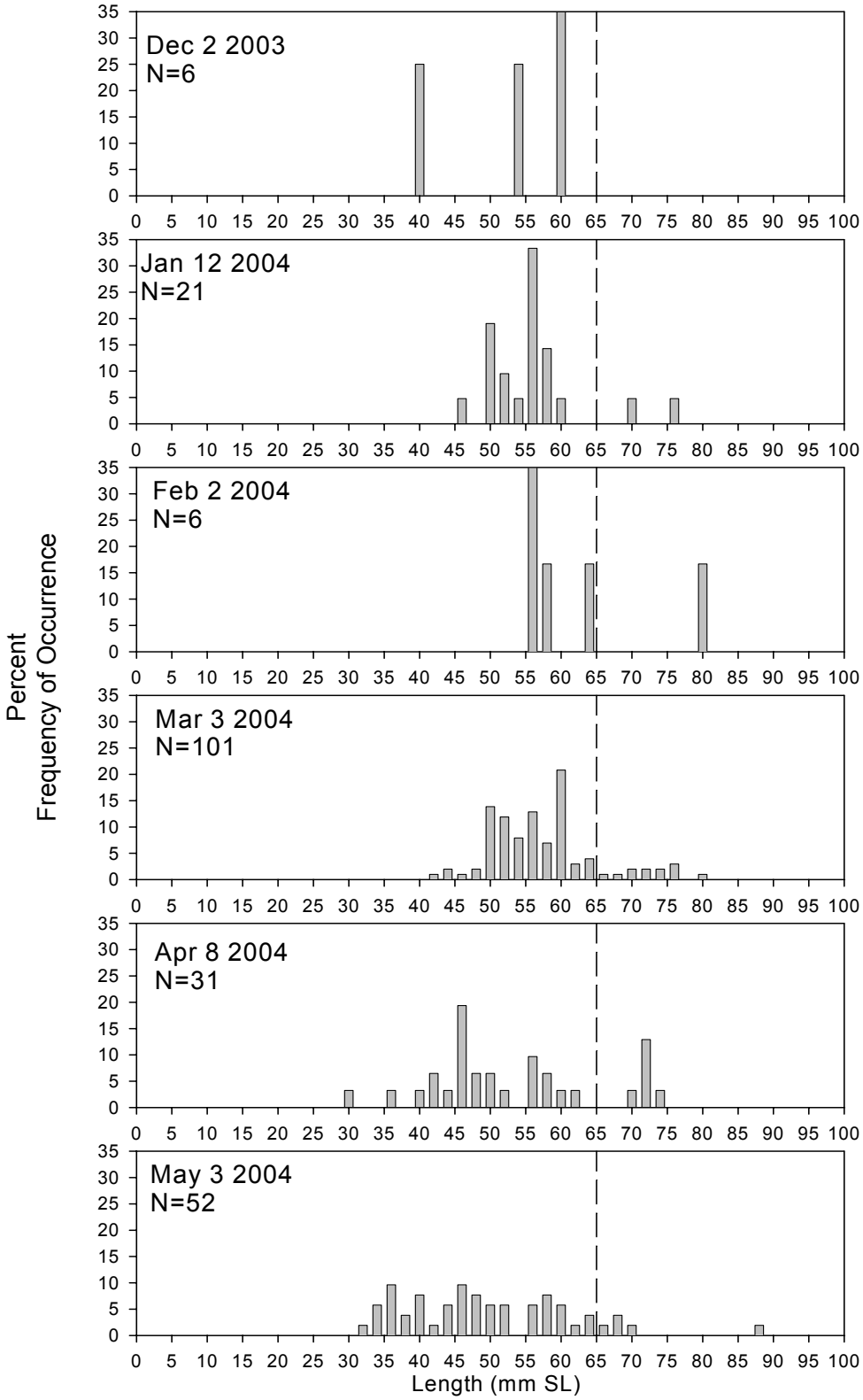

Figure 5. Standard length histograms of Rio Grande silvery minnow captured from December 2003 to May 2004. Dashed lines represent estimated breaks between year classes.

Table 4. Status, numbers, percent of total, percent occurrence, and density for all species collected for all sites combined between June 2003 and May 2004. For status, N=native and I=introduced.

Species	Status	N	% of Total	Percent Occurrence	Density (fish/100m^2)
goldfish *Carassius auratus*	I	1	<0.1	< 0.1	<0.01
red shiner *Cyprinella lutrensis lutrensis*	N	14,148	54.0	48.7	31.24
common carp *Cyprinus carpio*	I	69	0.3	1.7	0.15
Rio Grande silvery minnow *Hybognathus amarus*	N	450	1.7	5.4	0.99
fathead minnow *Pimephales promelas*	N	1,475	5.6	11.2	3.26
flathead chub *Platygobio gracilis gulonella*	N	1,120	4.3	19.7	2.47
longnose dace *Rhinichthys cataractae cataractae*	N	609	2.3	10.7	1.34
river carpsucker *Carpiodes carpio elongatus*	N	807	3.1	6.4	1.78
white sucker *Catostomus commersoni*	I	1,032	3.9	10.2	2.28
black bullhead *Ameiurus melas*	I	2	<0.1	0.1	<0.01
yellow bullhead *Ameiurus natalis*	I	16	0.1	0.6	0.04
channel catfish *Ictalurus punctatus*	I	389	1.5	6.7	0.86
western mosquitofish *Gambusia affinis*	I	5,941	22.7	12.3	13.12
white bass *Morone chrysops*	I	2	<0.1	0.1	<0.01
green sunfish *Lepomis cyanellus*	I	11	<0.1	0.3	0.02
bluegill *Lepomis macrochirus speciosus*	N	65	0.3	0.8	0.14
green sunfish X bluegill hybrid	I	1	<0.1	< 0.1	<0.01
white crappie *Pomoxis annularis*	I	24	0.1	0.1	0.05
spotted bass *Micropterus punctulatus*	I	14	0.1	0.1	0.03
largemouth bass *Micropterus salmoides*	I	10	<0.1	0.4	0.02
yellow perch *Perca flavescens*	I	14	0.1	0.4	0.03
walleye *Sander vitreus*	I	1	<0.1	< 0.1	<0.01
TOTAL		26,201	100.0	64.0	56.88

DISCUSSION

Augmentation efforts are now in the second year in the Angostura Reach of the Middle Rio Grande, New Mexico. The cumulative effects of these releases are beginning to show in the steady numbers of Rio Grande silvery minnow being collected in the Angostura Reach. Monitoring efforts from this project, as well as standard population monitoring being conducted throughout the current range of the species by other investigators, have shown similar results in the Angostura Reach (Dudley et al. 2004). When comparing current results to those in 2002, there was an increase in total numbers of Rio Grande silvery minnow collected throughout all age classes (0.99 fish/100 m^2 compared to 0.37 fish/100 m^2 in the previous 12 months), most notably in young-of-year individuals.

Meanwhile, continued drying in the Isleta and San Acacia reaches has hampered any benefit to augmentation efforts. It is probable that a majority of the spawning activity in the Angostura Reach includes released Rio Grande silvery minnow. A higher unknown percentage can be attributed to second generation released individuals. Although channel intermittency has not directly affected any current monitoring sites in the Angostura Reach, potential downstream colonization by individuals in the Angostura Reach has undoubtedly been negatively affected by intermittency in 2002 and 2003.

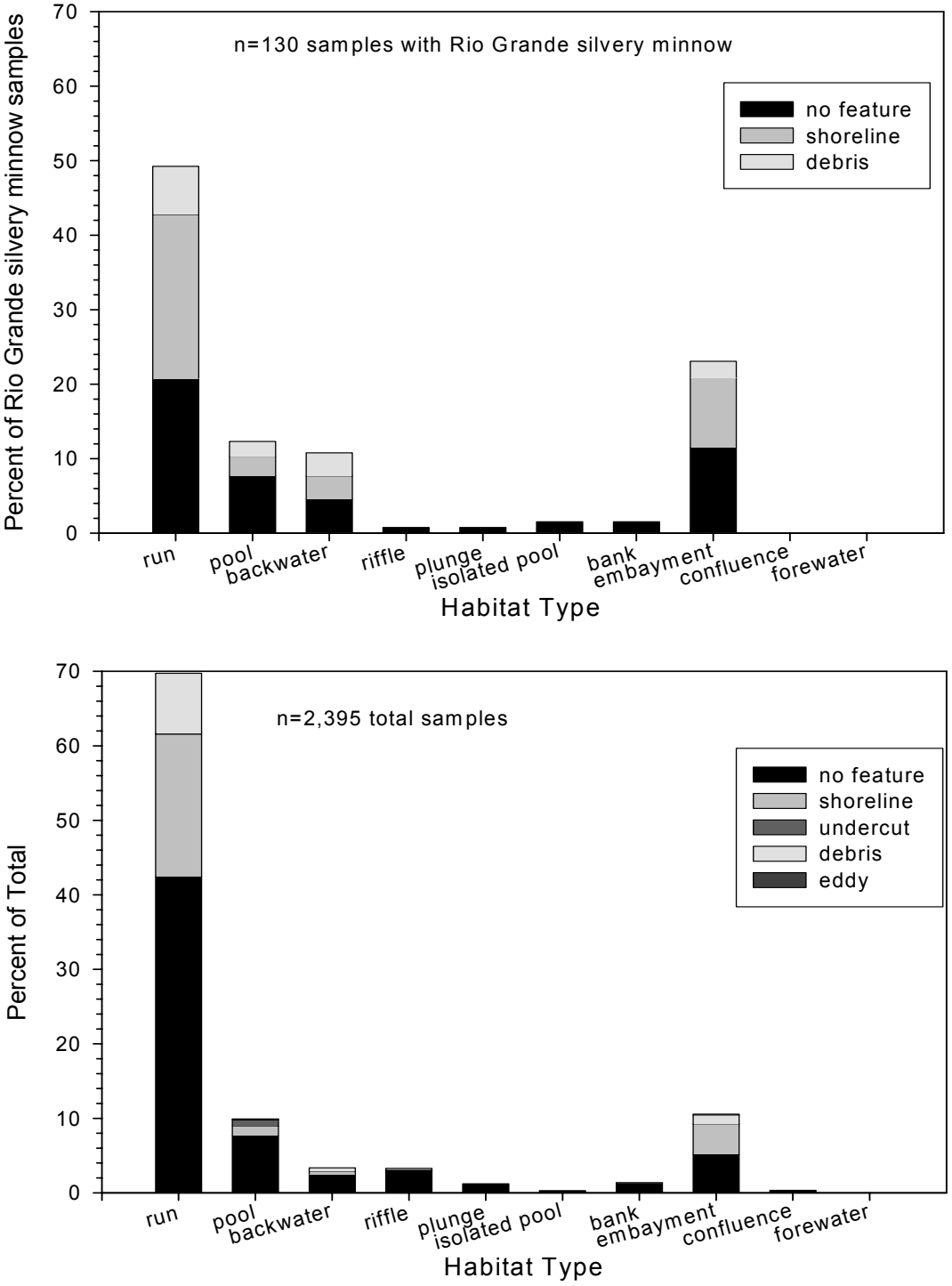

Figure 6. Comparisons of mesohabitats sampled in Rio Grande silvery minnow collections and all seine hauls.

As a direct result of this project, since June of 2002 nearly a quarter of a million hatchery raised Rio Grande silvery minnow have been augmented into Rio Grande within the Angostura Reach, with an estimated 100,000 to be released within the next 12 months. From this information, we are able to provide information as to the best stocking procedures to aide in the conservation of Rio Grande silvery minnow. Secondary information is also being collected on survival, growth, and retention of released fish. Direct and indirect information indicates that hatchery raised individuals can be released back to the wild with adequate retention in or near original release sites, can experience survival of at least 2 years after release, and ultimately can contribute to future spawning efforts.

Within the next year, continued releases and increased monitoring will provide information as to the best conditions for releases and dispersal. Poor results from calcein marking and identification will require Rio Grande silvery minnow released in the future to only be VIE marked for identification. In 2004-2005, we will be testing different release strategies such as time of year, time of day, specific release habitats, and various hatchery environments (natural outdoor ponds vs. indoor facilities). All this information will add to the knowledge needed for future conservation while providing active management strategies for the Middle Rio Grande and potential re-establishment sites.

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Appendix A.
Ichthyofaunal composition of June 2003 – May 2004 Rio Grande silvery minnow augmentation monitoring surveys

Rio Grande silvery minnow Augmentation Monitoring June 2003-May 2004

Dixon Road, RM 195.5

2 June 2003 SRD101 40 samples Effort: 801.3 m^2

Personnel: S.R. Davenport, J.B. Bowman, D. Gonzales, NMFRO; S. Mann, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	74
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Pimephales promelas*	3
Cyprinidae	*Platygobio gracilis*	5
Cyprinidae	*Rhinichthys cataractae*	4
Catostomidae	*Carpiodes carpio*	1
Catostomidae	*Catostomus commersoni*	36
Ictaluridae	*Ictalurus punctatus*	1
Poeciliidae	*Gambusia affinis*	7

Lomitas Negras (Romero Road), RM 198.3

2 June 2003 SRD102 40 samples Effort: 774.3 m^2

Personnel: S.R. Davenport, J.B. Bowman, D. Gonzales, NMFRO; S. Mann, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	170
Cyprinidae	*Hybognathus amarus*	3
Cyprinidae	*Pimephales promelas*	8
Cyprinidae	*Platygobio gracilis*	15
Cyprinidae	*Rhinichthys cataractae*	4
Catostomidae	*Carpiodes carpio*	1
Catostomidae	*Catostomus commersoni*	8
Poeciliidae	*Gambusia affinis*	7
Centrarchidae	*Lepomis macrochirus*	4

U.S. Highway 550 Bridge, RM 203.8

2 June 2003 SRD103 40 samples Effort: 989.7 m^2

Personnel: S.R. Davenport, J.B. Bowman, D. Gonzales, NMFRO; S. Mann, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	230
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	3
Cyprinidae	*Platygobio gracilis*	17
Cyprinidae	*Rhinichthys cataractae*	67
Catostomidae	*Catostomus commersoni*	6
Ictaluridae	*Ictalurus punctatus*	3

Pueblo of Sandia, Bosque Line 14, RM 202.0

2 June 2003 SRD104 40 samples Effort: 812.4 m^2

Personnel: S.R. Davenport, J.B. Bowman, D. Gonzales, NMFRO; S. Mann, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	289
Cyprinidae	*Hybognathus amarus*	3
Cyprinidae	*Pimephales promelas*	26
Cyprinidae	*Platygobio gracilis*	8
Cyprinidae	*Rhinichthys cataractae*	26
Catostomidae	*Catostomus commersoni*	25
Ictaluridae	*Ictalurus punctatus*	1
Poeciliidae	*Gambusia affinis*	24

Pueblo of Sandia, PNM Gasline, RM 200.0

2 June 2003 SRD105 40 samples Effort: 737.1 m^2

Personnel: S.R. Davenport, J.B. Bowman, D. Gonzales, NMFRO; S. Mann, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	289
Cyprinidae	*Hybognathus amarus*	11
Cyprinidae	*Pimephales promelas*	7
Cyprinidae	*Platygobio gracilis*	8
Cyprinidae	*Rhinichthys cataractae*	35
Catostomidae	*Catostomus commersoni*	18
Poeciliidae	*Gambusia affinis*	11

Dixon Road, RM 195.5

7 July 2003 WJR114 40 samples Effort: 912.0 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	55
Cyprinidae	*Cyprinus carpio*	2
Cyprinidae	*Hybognathus amarus*	4
Cyprinidae	*Pimephales promelas*	87
Cyprinidae	*Platygobio gracilis*	47
Cyprinidae	*Rhinichthys cataractae*	1
Catostomidae	*Carpiodes carpio*	10
Catostomidae	*Catostomus commersoni*	103
Ictaluridae	*Ameiurus natalis*	1
Poeciliidae	*Gambusia affinis*	38
Centrarchidae	*Micropterus salmoides*	1
Percidae	*Perca flavescens*	2

Lomitas Negras (Romero Road), RM 198.3

7 July 2003 WJR115 40 samples Effort: 665.4 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	87
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Hybognathus amarus*	22
Cyprinidae	*Pimephales promelas*	18
Cyprinidae	*Platygobio gracilis*	37
Cyprinidae	*Rhinichthys cataractae*	5
Catostomidae	*Carpiodes carpio*	5
Catostomidae	*Catostomus commersoni*	239
Poeciliidae	*Gambusia affinis*	56

U.S. Highway 550 Bridge, RM 203.8

7 July 2003 WJR116 40 samples Effort: 825.3 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	103
Cyprinidae	*Cyprinus carpio*	11
Cyprinidae	*Pimephales promelas*	1
Cyprinidae	*Platygobio gracilis*	25
Cyprinidae	*Rhinichthys cataractae*	26
Catostomidae	*Catostomus commersoni*	47
Ictaluridae	*Ictalurus punctatus*	1
Poeciliidae	*Gambusia affinis*	3

Pueblo of Sandia, Bosque Line 14, RM 202.0

7 July 2003 WJR117 39 samples Effort: 853.8 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	80
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Hybognathus amarus*	4
Cyprinidae	*Pimephales promelas*	3
Cyprinidae	*Platygobio gracilis*	28
Cyprinidae	*Rhinichthys cataractae*	14
Catostomidae	*Catostomus commersoni*	59
Poeciliidae	*Gambusia affinis*	20

Pueblo of Sandia, PNM Gasline, RM 200.0

7 July 2003 WJR118 40 samples Effort: 784.8 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	119
Cyprinidae	*Cyprinus carpio*	2
Cyprinidae	*Hybognathus amarus*	40
Cyprinidae	*Pimephales promelas*	16
Cyprinidae	*Platygobio gracilis*	30
Cyprinidae	*Rhinichthys cataractae*	25
Catostomidae	*Carpiodes carpio*	1
Catostomidae	*Catostomus commersoni*	99
Ictaluridae	*Ameiurus natalis*	2
Ictaluridae	*Ictalurus punctatus*	1
Poeciliidae	*Gambusia affinis*	13
Percidae	*Perca flavescens*	5

Dixon Road, RM 195.5

11 August 2003 WJR128 40 samples Effort: 679.8 m^2

Personnel: W.J. Remshardt, D. Gonzales, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	833
Cyprinidae	*Cyprinus carpio*	6
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	56
Cyprinidae	*Platygobio gracilis*	21
Cyprinidae	*Rhinichthys cataractae*	5
Catostomidae	*Carpiodes carpio*	273
Catostomidae	*Catostomus commersoni*	57
Ictaluridae	*Ictalurus punctatus*	10
Poeciliidae	*Gambusia affinis*	726

Lomitas Negras (Romero Road), RM 198.3

11 August 2003 WJR129 40 samples Effort: 788.1 m^2

Personnel: W.J. Remshardt, D. Gonzales, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	69
Cyprinidae	*Pimephales promelas*	5
Cyprinidae	*Platygobio gracilis*	27
Cyprinidae	*Rhinichthys cataractae*	7
Catostomidae	*Carpiodes carpio*	79
Catostomidae	*Catostomus commersoni*	9
Ictaluridae	*Ictalurus punctatus*	35
Poeciliidae	*Gambusia affinis*	393
Moronidae	*Morone chrysops*	2
Centrarchidae	*Lepomis cyanellus*	1
Centrarchidae	*Lepomis macrochirus*	1
Percidae	*Perca flavescens*	1

U.S. Highway 550 Bridge, RM 203.8

11 August 2003 WJR130 40 samples Effort: 696.3 m^2

Personnel: W.J. Remshardt, D. Gonzales, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	209
Cyprinidae	*Cyprinus carpio*	8
Cyprinidae	*Pimephales promelas*	1
Cyprinidae	*Platygobio gracilis*	85
Cyprinidae	*Rhinichthys cataractae*	13
Catostomidae	*Carpiodes carpio*	20
Catostomidae	*Catostomus commersoni*	17
Ictaluridae	*Ameiurus natalis*	1
Ictaluridae	*Ictalurus punctatus*	17
Poeciliidae	*Gambusia affinis*	244
Percidae	*Perca flavescens*	2

Pueblo of Sandia, Bosque Line 14, RM 202.0

11 August 2003 WJR131 40 samples Effort: 681.0 m^2

Personnel: W.J. Remshardt, D. Gonzales, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	152
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	14
Cyprinidae	*Platygobio gracilis*	39
Cyprinidae	*Rhinichthys cataractae*	4
Catostomidae	*Carpiodes carpio*	13
Catostomidae	*Catostomus commersoni*	7
Ictaluridae	*Ictalurus punctatus*	2
Poeciliidae	*Gambusia affinis*	113
Centrarchidae	*Pomoxis annularis*	1

Pueblo of Sandia, PNM Gasline, RM 200.0

11 August 2003 WJR132 40 samples Effort: 714.0 m^2

Personnel: W.J. Remshardt, D. Gonzales, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	224
Cyprinidae	*Cyprinus carpio*	9
Cyprinidae	*Hybognathus amarus*	18
Cyprinidae	*Pimephales promelas*	88
Cyprinidae	*Platygobio gracilis*	18
Cyprinidae	*Rhinichthys cataractae*	51
Catostomidae	*Carpiodes carpio*	54
Catostomidae	*Catostomus commersoni*	71
Ictaluridae	*Ameiurus natalis*	1
Ictaluridae	*Ictalurus punctatus*	71
Poeciliidae	*Gambusia affinis*	134
Percidae	*Perca flavescens*	4
Percidae	*Sander vitreus*	1

Dixon Road, RM 195.5

8 September 2003 SRD106 40 samples Effort: 819.6 m^2

Personnel: S.R. Davenport, W.J. Remshardt, NMFRO; S. Mann, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	334
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Pimephales promelas*	59
Cyprinidae	*Platygobio gracilis*	11
Cyprinidae	*Rhinichthys cataractae*	11
Catostomidae	*Carpiodes carpio*	48
Catostomidae	*Catostomus commersoni*	1
Ictaluridae	*Ameiurus natalis*	2
Ictaluridae	*Ictalurus punctatus*	12
Poeciliidae	*Gambusia affinis*	284

Lomitas Negras (Romero Road), RM 198.3

8 September 2003 SRD107 39 samples Effort: 550.2 m^2

Personnel: S.R. Davenport, W.J. Remshardt, NMFRO; S. Mann, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	114
Cyprinidae	*Cyprinus carpio*	5
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	2
Cyprinidae	*Platygobio gracilis*	13
Cyprinidae	*Rhinichthys cataractae*	14
Catostomidae	*Carpiodes carpio*	15
Ictaluridae	*Ictalurus punctatus*	19
Poeciliidae	*Gambusia affinis*	51

U.S. Highway 550 Bridge, RM 203.8

8 September 2003 SRD108 40 samples Effort: 750.6 m^2

Personnel: S.R. Davenport, W.J. Remshardt, NMFRO; S. Mann, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	316
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Hybognathus amarus*	4
Cyprinidae	*Pimephales promelas*	22
Cyprinidae	*Platygobio gracilis*	40
Cyprinidae	*Rhinichthys cataractae*	32
Catostomidae	*Catostomus commersoni*	2
Ictaluridae	*Ictalurus punctatus*	24
Poeciliidae	*Gambusia affinis*	263

Pueblo of Sandia, Bosque Line 14, RM 202.0

8 September 2003 SRD109 40 samples Effort: 655.8 m^2

Personnel: S.R. Davenport, W.J. Remshardt, NMFRO; S. Mann, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	242
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	4
Cyprinidae	*Platygobio gracilis*	25
Cyprinidae	*Rhinichthys cataractae*	7
Catostomidae	*Catostomus commersoni*	1
Ictaluridae	*Ameiurus natalis*	1
Ictaluridae	*Ictalurus punctatus*	5
Poeciliidae	*Gambusia affinis*	144

Pueblo of Sandia, PNM Gasline, RM 200.0

8 September 2003 SRD110 40 samples Effort: 878.1 m^2

Personnel: S.R. Davenport, W.J. Remshardt, NMFRO; S. Mann, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	430
Cyprinidae	*Hybognathus amarus*	5
Cyprinidae	*Pimephales promelas*	79
Cyprinidae	*Platygobio gracilis*	14
Cyprinidae	*Rhinichthys cataractae*	11
Catostomidae	*Carpiodes carpio*	93
Catostomidae	*Catostomus commersoni*	21
Ictaluridae	*Ameiurus natalis*	2
Ictaluridae	*Ictalurus punctatus*	21
Poeciliidae	*Gambusia affinis*	654

Dixon Road, RM 195.5

6 October 2003 WJR137 40 samples Effort: 1015.2 m^2

Personnel: W.J. Remshardt, D.W. Furr, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	226
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Pimephales promelas*	44
Cyprinidae	*Platygobio gracilis*	38
Cyprinidae	*Rhinichthys cataractae*	6
Catostomidae	*Carpiodes carpio*	60
Catostomidae	*Catostomus commersoni*	6
Ictaluridae	*Ictalurus punctatus*	16
Poeciliidae	*Gambusia affinis*	158
Centrarchidae	*Lepomis cyanellus*	1
Centrarchidae	*Lepomis macrochirus*	29
Centrarchidae	*Micropterus salmoides*	2

Lomitas Negras (Romero Road), RM 198.3

6 October 2003 WJR138 40 samples Effort: 926.2 m^2

Personnel: W.J. Remshardt, D.W. Furr, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	414
Cyprinidae	*Cyprinus carpio*	3
Cyprinidae	*Hybognathus amarus*	2
Cyprinidae	*Pimephales promelas*	37
Cyprinidae	*Platygobio gracilis*	39
Cyprinidae	*Rhinichthys cataractae*	8
Catostomidae	*Carpiodes carpio*	8
Catostomidae	*Catostomus commersoni*	9
Ictaluridae	*Ictalurus punctatus*	4
Poeciliidae	*Gambusia affinis*	347
Centrarchidae	*Micropterus salmoides*	1

U.S. Highway 550 Bridge, RM 203.8

6 October 2003 WJR139 40 samples Effort: 872.4 m^2

Personnel: W.J. Remshardt, D.W. Furr, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	809
Cyprinidae	*Pimephales promelas*	15
Cyprinidae	*Platygobio gracilis*	24
Cyprinidae	*Rhinichthys cataractae*	8
Catostomidae	*Carpiodes carpio*	1
Catostomidae	*Catostomus commersoni*	2
Ictaluridae	*Ictalurus punctatus*	12
Poeciliidae	*Gambusia affinis*	113

Pueblo of Sandia, Bosque Line 14, RM 202.0

6 October 2003 WJR140 40 samples Effort: 868.2 m^2

Personnel: W.J. Remshardt, D.W. Furr, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	242
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Hybognathus amarus*	8
Cyprinidae	*Pimephales promelas*	15
Cyprinidae	*Platygobio gracilis*	40
Cyprinidae	*Rhinichthys cataractae*	3
Catostomidae	*Catostomus commersoni*	1
Ictaluridae	*Ictalurus punctatus*	1
Poeciliidae	*Gambusia affinis*	13

Pueblo of Sandia, PNM Gasline, RM 200.0

6 October 2003 WJR141 40 samples Effort: 915.6 m^2

Personnel: W.J. Remshardt, D.W. Furr, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	352
Cyprinidae	*Cyprinus carpio*	2
Cyprinidae	*Hybognathus amarus*	17
Cyprinidae	*Pimephales promelas*	50
Cyprinidae	*Platygobio gracilis*	23
Cyprinidae	*Rhinichthys cataractae*	11
Catostomidae	*Carpiodes carpio*	20
Catostomidae	*Catostomus commersoni*	21
Ictaluridae	*Ameiurus natalis*	1
Ictaluridae	*Ictalurus punctatus*	23
Poeciliidae	*Gambusia affinis*	697

Dixon Road, RM 195.5

3 November 2003 WJR142 40 samples Effort: 772.2 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	398
Cyprinidae	*Pimephales promelas*	46
Cyprinidae	*Platygobio gracilis*	20
Cyprinidae	*Rhinichthys cataractae*	1
Catostomidae	*Carpiodes carpio*	5
Catostomidae	*Catostomus commersoni*	1
Ictaluridae	*Ictalurus punctatus*	3
Poeciliidae	*Gambusia affinis*	264

Lomitas Negras (Romero Road), RM 198.3

3 November 2003 WJR143 38 samples Effort: 615.6 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	323
Cyprinidae	*Hybognathus amarus*	3
Cyprinidae	*Pimephales promelas*	45
Cyprinidae	*Platygobio gracilis*	49
Cyprinidae	*Rhinichthys cataractae*	3
Catostomidae	*Carpiodes carpio*	9
Catostomidae	*Catostomus commersoni*	1
Ictaluridae	*Ictalurus punctatus*	4
Poeciliidae	*Gambusia affinis*	149
Centrarchidae	*Micropterus punctulatus*	2

U.S. Highway 550 Bridge, RM 203.8

3 November 2003 WJR144 40 samples Effort: 713.4 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	427
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Pimephales promelas*	163
Cyprinidae	*Platygobio gracilis*	12
Cyprinidae	*Rhinichthys cataractae*	9
Catostomidae	*Carpiodes carpio*	1
Catostomidae	*Catostomus commersoni*	4
Ictaluridae	*Ictalurus punctatus*	22
Poeciliidae	*Gambusia affinis*	142

Pueblo of Sandia, Bosque Line 14, RM 202.0

3 November 2003 WJR145 39 samples Effort: 689.1 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	308
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Hybognathus amarus*	2
Cyprinidae	*Pimephales promelas*	27
Cyprinidae	*Platygobio gracilis*	21
Cyprinidae	*Rhinichthys cataractae*	3
Catostomidae	*Carpiodes carpio*	3
Ictaluridae	*Ictalurus punctatus*	13
Poeciliidae	*Gambusia affinis*	69

Pueblo of Sandia, PNM Gasline, RM 200.0

3 November 2003 WJR146 40 samples Effort: 592.5 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	401
Cyprinidae	*Hybognathus amarus*	82
Cyprinidae	*Pimephales promelas*	49
Cyprinidae	*Platygobio gracilis*	29
Cyprinidae	*Rhinichthys cataractae*	13
Catostomidae	*Carpiodes carpio*	22
Catostomidae	*Catostomus commersoni*	4
Ictaluridae	*Ictalurus punctatus*	28
Poeciliidae	*Gambusia affinis*	391

Dixon Road, RM 195.5

3 December 2003 WJR147 40 samples Effort: 842.4 m^2

Personnel: W.J. Remshardt, S.R. Davenport, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	103
Cyprinidae	*Pimephales promelas*	19
Cyprinidae	*Platygobio gracilis*	2
Catostomidae	*Carpiodes carpio*	1
Poeciliidae	*Gambusia affinis*	21

Lomitas Negras (Romero Road), RM 198.3

3 December 2003 WJR148 41 samples Effort: 676.8 m^2

Personnel: W.J. Remshardt, S.R. Davenport, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	268
Cyprinidae	*Cyprinus carpio*	2
Cyprinidae	*Hybognathus amarus*	3
Cyprinidae	*Pimephales promelas*	68
Cyprinidae	*Platygobio gracilis*	4
Catostomidae	*Carpiodes carpio*	38
Catostomidae	*Catostomus commersoni*	19
Ictaluridae	*Ictalurus punctatus*	2
Poeciliidae	*Gambusia affinis*	213
Centrarchidae	*Pomoxis annularis*	10

U.S. Highway 550 Bridge, RM 203.8

3 December 2003 WJR149 40 samples Effort: 773.1 m^2

Personnel: W.J. Remshardt, S.R. Davenport, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	591
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	37
Cyprinidae	*Platygobio gracilis*	27
Cyprinidae	*Rhinichthys cataractae*	11
Catostomidae	*Catostomus commersoni*	6
Ictaluridae	*Ameiurus natalis*	1
Ictaluridae	*Ictalurus punctatus*	1
Poeciliidae	*Gambusia affinis*	21

Pueblo of Sandia, Bosque Line 14, RM 202.0

3 December 2003 WJR150 40 samples Effort: 690.3 m^2

Personnel: W.J. Remshardt, S.R. Davenport, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	433
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	36
Cyprinidae	*Platygobio gracilis*	52
Cyprinidae	*Rhinichthys cataractae*	1
Catostomidae	*Catostomus commersoni*	4
Ictaluridae	*Ictalurus punctatus*	1
Poeciliidae	*Gambusia affinis*	10

Pueblo of Sandia, PNM Gasline, RM 200.0

3 December 2003 WJR151 40 samples Effort: 673.8 m^2

Personnel: W.J. Remshardt, S.R. Davenport, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	157
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	11
Cyprinidae	*Platygobio gracilis*	16
Cyprinidae	*Rhinichthys cataractae*	4
Catostomidae	*Carpiodes carpio*	2
Catostomidae	*Catostomus commersoni*	8
Ictaluridae	*Ictalurus punctatus*	1
Poeciliidae	*Gambusia affinis*	17

Dixon Road, RM 195.5

12 January 2004 WJR157 40 samples Effort: 807.3 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, T. Kennedy, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	63
Cyprinidae	*Cyprinus carpio*	2
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	1
Cyprinidae	*Platygobio gracilis*	4
Catostomidae	*Catostomus commersoni*	1

Lomitas Negras (Romero Road), RM 198.3

12 January 2004 WJR158 40 samples Effort: 717.0 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, T. Kennedy, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	653
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Hybognathus amarus*	18
Cyprinidae	*Pimephales promelas*	102
Cyprinidae	*Platygobio gracilis*	16
Catostomidae	*Carpiodes carpio*	3
Catostomidae	*Catostomus commersoni*	1
Ictaluridae	*Ictalurus punctatus*	2
Poeciliidae	*Gambusia affinis*	2
Centrarchidae	*Lepomis cyanellus*	1
Centrarchidae	*Lepomis cyanellus* X *Lepomis macrochirus*	1
Centrarchidae	*Micropterus punctatus*	12
Centrarchidae	*Pomoxis annularis*	13

U.S. Highway 550 Bridge, RM 203.8

12 January 2004 WJR159 40 samples Effort: 770.7 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, T. Kennedy, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	120
Cyprinidae	*Cyprinus carpio*	2
Cyprinidae	*Platygobio gracilis*	27
Cyprinidae	*Rhinichthys cataractae*	1
Catostomidae	*Catostomus commersoni*	2
Ictaluridae	*Ictalurus punctatus*	4

Pueblo of Sandia, Bosque Line 14, RM 202.0

12 January 2004 WJR160 40 samples Effort: 541.2 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, T. Kennedy, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	88
Cyprinidae	*Pimephales promelas*	1
Cyprinidae	*Platygobio gracilis*	5
Catostomidae	*Carpiodes carpio*	1
Catostomidae	*Catostomus commersoni*	1

Pueblo of Sandia, PNM Gasline, RM 200.0

12 January 2004 WJR161 41 samples Effort: 604.5 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, T. Kennedy, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	85
Cyprinidae	*Hybognathus amarus*	2
Cyprinidae	*Pimephales promelas*	2
Cyprinidae	*Platygobio gracilis*	3
Cyprinidae	*Rhinichthys cataractae*	1
Catostomidae	*Catostomus commersoni*	1
Poeciliidae	*Gambusia affinis*	1

Dixon Road, RM 195.5

2 February 2004 WJR164 40 samples Effort: 768.0 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	15
Cyprinidae	*Hybognathus amarus*	3
Cyprinidae	*Platygobio gracilis*	1

Lomitas Negras (Romero Road), RM 198.3

2 February 2004 WJR165 40 samples Effort: 654.6 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Carassius auratus*	1
Cyprinidae	*Cyprinella lutrensis*	235
Cyprinidae	*Hybognathus amarus*	2
Cyprinidae	*Pimephales promelas*	8
Cyprinidae	*Platygobio gracilis*	9
Catostomidae	*Catostomus commersoni*	3
Poeciliidae	*Gambusia affinis*	90
Centrarchidae	*Lepomis cyanellus*	1
Centrarchidae	*Lepomis macrochirus*	1
Centrarchidae	*Micropterus salmoides*	1

U.S. Highway 550 Bridge, RM 203.8

2 February 2004 WJR166 40 samples Effort: 728.1 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	34
Cyprinidae	*Cyprinus carpio*	2
Cyprinidae	*Platygobio gracilis*	4
Cyprinidae	*Rhinichthys cataractae*	1
Ictaluridae	*Ictalurus punctatus*	1
Centrarchidae	*Micropterus salmoides*	1

Pueblo of Sandia, Bosque Line 14, RM 202.0

2 February 2004 WJR167 41 samples Effort: 680.1 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	69
Cyprinidae	*Pimephales promelas*	6
Cyprinidae	*Rhinichthys cataractae*	1

Pueblo of Sandia, PNM Gasline, RM 200.0

2 February 2004 WJR168 41 samples Effort: 689.1 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	40
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	11
Cyprinidae	*Platygobio gracilis*	1
Cyprinidae	*Rhinichthys cataractae*	1
Catostomidae	*Catostomus commersoni*	2

Dixon Road, RM 195.5

2 March 2004 WJR170 40 samples Effort: 698.4 m^2

Personnel: W.J. Remshardt, L.T. Torres, NMFRO; M. Osborne, UNM; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	358
Cyprinidae	*Cyprinus carpio*	2
Cyprinidae	*Hybognathus amarus*	94
Cyprinidae	*Pimephales promelas*	42
Cyprinidae	*Platygobio gracilis*	3
Catostomidae	*Carpiodes carpio*	7
Catostomidae	*Catostomus commersoni*	13
Poeciliidae	*Gambusia affinis*	4
Centrarchidae	*Lepomis macrochirus*	10
Centrarchidae	*Micropterus salmoides*	2

Lomitas Negras (Romero Road), RM 198.3

2 March 2004 WJR171 40 samples Effort: 802.5 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO; M. Osborne, UNM

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	228
Cyprinidae	*Hybognathus amarus*	3
Cyprinidae	*Pimephales promelas*	20
Cyprinidae	*Platygobio gracilis*	4
Cyprinidae	*Rhinichthys cataractae*	2
Catostomidae	*Carpiodes carpio*	1
Catostomidae	*Catostomus commersoni*	2
Ictaluridae	*Ictalurus punctatus*	1
Centrarchidae	*Lepomis macrochirus*	8
Centrarchidae	*Micropterus salmoides*	2

Pueblo of Sandia, Bosque Line 14, RM 202.0

2 March 2004 WJR172 40 samples Effort: 936.3 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO; M. Osborne, UNM

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	273
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	4
Cyprinidae	*Platygobio gracilis*	3
Cyprinidae	*Rhinichthys cataractae*	2
Poeciliidae	*Gambusia affinis*	3

Pueblo of Sandia, PNM Gasline, RM 200.0

2 March 2004 WJR173 40 samples Effort: 656.1 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.C. Kitcheyan, NMFRO; M. Osborne, UNM

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	185
Cyprinidae	*Hybognathus amarus*	2
Cyprinidae	*Pimephales promelas*	12
Cyprinidae	*Platygobio gracilis*	3
Catostomidae	*Catostomus commersoni*	4
Centrarchidae	*Lepomis macrochirus*	1

U.S. Highway 550 Bridge, RM 203.8

3 March 2004 WJR174 40 samples Effort: 541.5 m^2

Personnel: W.J. Remshardt, S.R. Davenport, D.W. Furr, NMFRO

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	118
Cyprinidae	*Hybognathus amarus*	1
Cyprinidae	*Pimephales promelas*	11
Cyprinidae	*Platygobio gracilis*	5
Cyprinidae	*Rhinichthys cataractae*	4
Catostomidae	*Carpiodes carpio*	1
Catostomidae	*Catostomus commersoni*	4

Pueblo of Sandia, PNM Gasline, RM 200.0

8 April 2004 WJR177 40 samples Effort: 776.4 m^2

Personnel: W.J. Remshardt, S.R. Davenport, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	31
Cyprinidae	*Hybognathus amarus*	7
Cyprinidae	*Pimephales promelas*	1
Cyprinidae	*Platygobio gracilis*	14
Cyprinidae	*Rhinichthys cataractae*	24
Catostomidae	*Catostomus commersoni*	2

Pueblo of Sandia, Bosque Line 14, RM 202.0

8 April 2004 WJR178 40 samples Effort: 602.4 m^2

Personnel: W.J. Remshardt, S.R. Davenport, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	22
Cyprinidae	*Hybognathus amarus*	6
Cyprinidae	*Platygobio gracilis*	9
Cyprinidae	*Rhinichthys cataractae*	4
Catostomidae	*Catostomus commersoni*	3
Ictaluridae	*Ictalurus punctatus*	4

Dixon Road, RM 195.5

9 April 2004 SRD111 40 samples Effort: 760.2 m^2

Personnel: S.R. Davenport, D.C. Kitcheyan, L.T. Torres, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	147
Cyprinidae	*Cyprinus carpio*	1
Cyprinidae	*Hybognathus amarus*	4
Cyprinidae	*Pimephales promelas*	14
Cyprinidae	*Platygobio gracilis*	10
Catostomidae	*Catostomus commersoni*	7
Ictaluridae	*Ictalurus punctatus*	2
Poeciliidae	*Gambusia affinis*	1
Centrarchidae	*Lepomis cyanellus*	7
Centrarchidae	*Lepomis macrochirus*	8

U.S. Highway 550 Bridge, RM 203.8

9 April 2004 SRD112 34 samples Effort: 847.8 m^2

Personnel: S.R. Davenport, D.C. Kitcheyan, L.T. Torres, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	36
Cyprinidae	*Hybognathus amarus*	12
Cyprinidae	*Pimephales promelas*	3
Cyprinidae	*Platygobio gracilis*	5
Cyprinidae	*Rhinichthys cataractae*	28
Catostomidae	*Catostomus commersoni*	5
Ictaluridae	*Ictalurus punctatus*	5

Lomitas Negras (Romero Road), RM 198.3

9 April 2004 SRD113 40 samples Effort: 747.9 m^2

Personnel: S.R. Davenport, D.C. Kitcheyan, L.T. Torres, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	47
Cyprinidae	*Hybognathus amarus*	2
Cyprinidae	*Pimephales promelas*	1
Cyprinidae	*Platygobio gracilis*	24
Cyprinidae	*Rhinichthys cataractae*	5
Catostomidae	*Catostomus commersoni*	4
Ictaluridae	*Ictalurus punctatus*	1

Lomitas Negras (Romero Road), RM 198.3

3 May 2004 WJR183 40 samples Effort: 777.6 m^2

Personnel: W.J. Remshardt, L.T. Torres, S.R. Davenport, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	311
Cyprinidae	*Hybognathus amarus*	13
Cyprinidae	*Pimephales promelas*	44
Cyprinidae	*Platygobio gracilis*	13
Cyprinidae	*Rhinichthys cataractae*	12
Catostomidae	*Carpiodes carpio*	11
Catostomidae	*Catostomus commersoni*	23
Ictaluridae	*Ameiurus natalis*	3
Poeciliidae	*Gambusia affinis*	7
Centrarchidae	*Lepomis macrochirus*	1

Dixon Road, RM 195.5

3 May 2004 WJR184 40 samples Effort: 839.7 m^2

Personnel: W.J. Remshardt, L.T. Torres, S.R. Davenport, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	222
Cyprinidae	*Hybognathus amarus*	6
Cyprinidae	*Pimephales promelas*	9
Cyprinidae	*Platygobio gracilis*	18
Cyprinidae	*Rhinichthys cataractae*	38
Catostomidae	*Catostomus commersoni*	10
Ictaluridae	*Ameiurus natalis*	1
Ictaluridae	*Ictalurus punctatus*	7
Poeciliidae	*Gambusia affinis*	1

Dixon Road, RM 195.5

3 May 2004 WJR185 42 samples Effort: 790.5 m^2

Personnel: W.J. Remshardt, L.T. Torres, S.R. Davenport, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	170
Cyprinidae	*Hybognathus amarus*	13
Cyprinidae	*Pimephales promelas*	12
Cyprinidae	*Platygobio gracilis*	13
Cyprinidae	*Rhinichthys cataractae*	1
Ictaluridae	*Ameiurus melas*	2
Catostomidae	*Catostomus commersoni*	11
Ictaluridae	*Ictalurus punctatus*	4
Poeciliidae	*Gambusia affinis*	11

Dixon Road, RM 195.5

3 May 2004 WJR186 40 samples Effort: 860.1 m^2

Personnel: W.J. Remshardt, L.T. Torres, S.R. Davenport, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	584
Cyprinidae	*Hybognathus amarus*	16
Cyprinidae	*Pimephales promelas*	5
Cyprinidae	*Platygobio gracilis*	14
Cyprinidae	*Rhinichthys cataractae*	39
Catostomidae	*Catostomus commersoni*	8
Ictaluridae	*Ictalurus punctatus*	3
Poeciliidae	*Gambusia affinis*	2

Dixon Road, RM 195.5

3 May 2004 WJR187 40 samples Effort: 679.5 m^2

Personnel: W.J. Remshardt, L.T. Torres, S.R. Davenport, NMFRO; S.J. Bulgrin, Pueblo of Sandia

Family	Species	N
Cyprinidae	*Cyprinella lutrensis*	143
Cyprinidae	*Hybognathus amarus*	4
Cyprinidae	*Pimephales promelas*	2
Cyprinidae	*Platygobio gracilis*	3
Cyprinidae	*Rhinichthys cataractae*	2
Catostomidae	*Catostomus commersoni*	2
Ictaluridae	*Ictalurus punctatus*	1
Poeciliidae	*Gambusia affinis*	9
Centrarchidae	*Lepomis macrochirus*	2