

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

Annual Report June 2002 through May 2003

26 August 2003

Submitted To:

Middle Rio Grande Endangered Species Act Collaborative Program

c/o

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Table of Contents

ABSTRACT	1
INTRODUCTION	1
Project Justification	1
Project Objectives	1
Background	2
Risks	3
MATERIALS AND METHODS	4
Description of Study Area	4
Source of Fish	4
Marking Techniques	4
Monitoring	4
RESULTS	5
Phase I	6
Phase II	6
Phase III	6
DISCUSSION	9
LITERATURE CITED	14
APPENDIX I. Results from hoop net surveys following release of <i>Hybognathus amarus</i> marked with Visible Implant Elastomer tags on 9 December 2002	15
APPENDIX II. Results from seining surveys of <i>Hybognathus amarus</i> marked with Visible Implant Elastomer tags between 17 June 2002 and 7 May 2003	18

List of Tables

Table 1.	<i>Hybognathus amarus</i> record of release, January 2002 through June 2003	7
Table 2.	Tag retention study of Visible Implant Elastomer tagged <i>Hybognathus amarus</i> held at Dexter National Fish Hatchery and Technology Center	7
Table 3.	<i>Hybognathus amarus</i> collected between 17 June 2002 and 4 November 2002 during seine surveys	10
Table 4.	<i>Hybognathus amarus</i> collected between 16 December 2002 and 7 May 2003 during seine surveys	10
Table 5.	Status, numbers, frequency of occurrence, percent occurrence, and density for all species collected for all sites combined	13

List of Figures

Figure 1.	Map of study area	11
Figure 2.	Total catch of marked and unmarked <i>Hybognathus amarus</i> by date	12
Figure 3.	Density of marked and unmarked <i>Hybognathus amarus</i> by site	12

Abstract

Rio Grande silvery minnow *Hybognathus amarus* (Girard) was historically found in the mainstem Rio Grande and its larger tributaries (Rio Chama and Jemez River) from near Espanola, New Mexico to the Gulf of Mexico, and in the Pecos River from Santa Rosa, New Mexico downstream to its confluence with the Rio Grande. Currently, *H. amarus* is found in the Middle Rio Grande, New Mexico between Cochiti Dam and Elephant Butte Reservoir, representing 283 km (176 miles), or 5 to 7% of its historic range. The species has declined throughout its remaining range, and of the three reaches of known distribution (Angostura, Isleta, and San Acacia), Angostura Reach has the lowest catch rates of *H. amarus* and the lowest possibility of river drying. These factors give Angostura Reach the highest potential for augmentation efforts.

Post-stock monitoring within Angostura Reach following release of Visible Implant Elastomer marked *H. amarus* indicated immediate downstream dispersal following release. Continued monitoring showed that released *H. amarus* remained within Angostura Reach, and several have been recaptured upstream of release locations. Released *H. amarus* have been captured up to 6 months following release and marked *H. amarus* have been recaptured with unmarked *H. amarus*. These details indicate persistence of released *H. amarus* and similar habitat use by these and unmarked (presumed wild) *H. amarus*. With upcoming releases and continued monitoring, more information on the persistence and contribution of augmented populations of *H. amarus* will be collected.

Introduction

Project Justification: This effort reflects management needs identified in the Middle Rio Grande Endangered Species Act Collaborative Program (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.

Project Objectives: The ultimate goal of augmentation efforts is to re-establish self-sustaining populations of *H. amarus* in the Middle Rio Grande of New Mexico (MRGNM) and throughout its former range. The long-term benefits of this study are to augment populations within the MRGNM, and to evaluate stocking efforts and provide a better understanding for propagation methods, stocking times and methods, and monitoring efforts needed for re-establishing efforts. The specific objectives of this experimental augmentation and monitoring plan are to:

- 1) Determine survival of stocked *H. amarus* (salvaged eggs, larvae, and adults, and captive-spawned individuals)
- 2) Determine temporal and spatial dispersal of stocked *H. amarus* within Angostura Reach (and possibly among reaches)
- 3) Identify and characterize river reaches where retention and survival of stocked *H. amarus* are maximized

Experimental Augmentation Annual Report

- 4) Evaluate how (and amount) augmentation of *H. amarus* is affecting subsequent recruitment within the reach
- 5) Guide future augmentation activities to maximize survival of *H. amarus*.

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 *H. amarus* throughout its current and historical range.

This report summarizes experimental augmentation and monitoring activities for *H. amarus* performed by U.S. Fish and Wildlife Service, New Mexico Fishery Resources Office (NMFRO) personnel between June 2002 and May 2003. Efforts focused on the evaluation of experimental stocking success of *H. amarus* reared in captive propagation facilities and released in Angostura Reach (Angostura Diversion Dam to Isleta Diversion Dam). All stocked fish were externally batch-marked with Visible Implant Elastomer (VIE) tags for future identification.

Background: Throughout much of its historic and current range, the decline of *H. amarus* may be attributed to modification of stream discharge and altered sediment loads, channel desiccation, 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 *H. amarus*. One factor of considerable importance is loss of nursery habitat. During spawning, propagules may passively drift between 194 and 390 km downstream before actively moving out of the drift (Platania 2000). If spawning were to occur given current uniform channel conditions at the uppermost location (Cochiti Dam), many larvae could be transferred past Angostura and Isleta diversion dams before being able to actively seek low-flow nursery areas.

The MRGNM is separated into four reaches, each designated by its upstream structure: Cochiti Dam, Angostura, Isleta, and San Acacia diversion dams. Cochiti Reach has not been monitored since 1994, when *H. amarus* was present on Santo Domingo Pueblo and San Felipe Pueblo (Platania 1995). *Hybognathus amarus* was last collected on Cochiti Pueblo in 1988 downstream of Cochiti Dam (Platania 1993) and may still be present in Cochiti Reach, although reduced in abundance compared with historic collections (Platania 1995). Status and distribution of *H. amarus* in Cochiti Reach must be further documented to accurately assess status of the species there. This will 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 are declining, and the majority of *H. amarus* are found in the San Acacia Reach (U.S. Fish and Wildlife Service 1999). Decline of *H. amarus* in Angostura Reach was most likely related to sediment and flow modifications caused by Cochiti Dam (Bestgen and Platania 1991). Once Cochiti Dam was closed (1973), the river below the dam changed from a warmwater, sand-bed dominated river to a coolwater, gravel-sand dominated and armored bed river (U.S. Fish and Wildlife Service 1999). Even though most *H. amarus* are found in San Acacia Reach, this reach is most susceptible to drying and negative impacts by water diversion from the Rio Grande (U.S. Fish and Wildlife Service 1999).

Emergency salvage in 1996, 1998, and 1999 relocated an estimated 11,000 individuals (adults and juveniles) from isolated pools below San Acacia Dam (San Acacia Reach) upstream to several locations within Isleta and Angostura reaches. However, the small number of individuals salvaged in emergency efforts was relatively minor compared to the extent of impacted Rio Grande habitats and to the number needed to have any considerable effect. To date, the efficacy of salvaged and transplanted *H. amarus*, in terms of survival, has not been done. Thus, salvage activities of adult *H. amarus* may not contribute substantially to reestablishment and long-term population viability within permanently flowing reaches.

In May-June 2000, an estimated 204,000 larval and 414 adult *H. amarus* were stocked by personnel of the Museum of Southwestern Biology (MSB) near New Mexico Highway 6 Bridge in Los Lunas and U.S. Highway 550 Bridge in Bernalillo. These 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 effectiveness of these and other stocking attempts are questionable due to the limited numbers of *H. amarus* that were collected near or downstream of these locations after stocking. It is necessary to evaluate translocations and other stocking attempts to provide guidance to future management. In addition to these, 11,900 VIE marked *H. amarus* were released in the San Acacia Reach by MSB (Platania, et al. 2003).

Risks: Releasing captive-reared fish into the wild is not without risks. There are genetic and ecological risks that must be evaluated against anticipated benefits of augmentation efforts. Ongoing genetic research on effects of augmentation on wild population with captively reared propagules by University of New Mexico, Department of Biology (UNM) personnel will provide guidance for future augmentation efforts.

Ecological concerns associated with stocking captive-reared *H. amarus* in the wild include passive downstream movement, pathogen and parasite transmission, intra- and interspecific competition, and predation. By allowing fish to attain adult size before stocking, downstream drift associated with larval *H. amarus* is precluded, therefore possibly increasing the chance of retention within the reach stocked. Samples from all sources of stocked fish will be analyzed for presence of pathogens and parasites before transfer or stocking into Rio Grande habitats. Due to low numbers of *H. amarus* located during monitoring surveys, competition between wild and captive-reared individuals should be minimal.

Several species of native and nonnative fish have been collected in areas within the known distribution of *H. amarus*. Native species include fathead minnow (*Pimephales promelas*), river carpsucker (*Carpionodes carpio*), red shiner (*Cyprinella lutrensis*), flathead chub (*Platygobio gracilis*), and longnose dace (*Rhinichthys cataractae*). Introduced species include white sucker (*Catostomus commersoni*), western mosquitofish (*Gambusia affinis*), common carp (*Cyprinus carpio*), and gizzard shad (*Dorosoma cepedianum*). The effects that any or all of these species may have on *H. amarus* are unknown but many share habitats.

Several nonnative piscivorous fish species are present in the MRGNM including black bullhead (*Ameiurus melas*), yellow bullhead (*Ameiurus natalis*), channel catfish (*Ictalurus punctatus*), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), white bass (*Morone chrysops*), green sunfish (*Lepomis cyanellus*), longear sunfish (*Lepomis megalotis*), spotted bass (*Micropterus punctulatus*), largemouth bass (*Micropterus salmoides*), white crappie (*Pomoxis annularis*), black

Experimental Augmentation Annual Report

crappie (*Pomoxis nigromaculatus*), yellow perch (*Perca flavescens*), and walleye (*Sander vitreus*). Native piscivorous species that may also be present include blue catfish (*Ictalurus furcatus*), flathead catfish (*Pylodictus olivaris*) and bluegill (*Lepomis macrochirus*). All of these fish may pose a predation threat to *H. amarus*. These interspecific interactions may be increased during periods of low flows because of concentration of all fish species in habitat reduced in size and quality (Power, et al. 1985).

Materials and Methods

Description of Study Area: This investigation concentrates on Angostura Reach. Angostura Reach (61 km) extends from Angostura Diversion Dam (River Mile 209.7) downstream to Isleta Diversion Dam (River Mile 169.3) which includes the cities of Bernalillo, Corrales, and Albuquerque (Figure 1). Sites were selected within Angostura Reach to stock *H. amarus* and monitor their success and movement. Within this reach, these sites were selected from areas where access is assured throughout the study and potential benefit was maximized.

Source of Fish: All transplanted fish originated from Dexter National Fish Hatchery and Technology Center (NFH&TC), New Mexico State University – “A” Mountain Facility, Albuquerque Biological Park (ABP), or the 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.

Marking Techniques: The method used for marking all individuals was the injection of a Visible fluorescent Implant Elastomer (VIE) distributed by Northwest Marine Technology, Inc. This marking technique is suitable for fish too small for other marking techniques. The tag is injected as a liquid with a hypodermic needle and solidifies into a visible, bio-compatible and pliable mark. Injected elastomer tags have been recently tested with *H. amarus*, with minimal immediate (~5.0 - 10.0%) and short term (180 day, ~ 20.0 %) mortality with high tag retention (~ 90.0 %; James Henne, Mora NFH&TC, pers. comm.). Based on the preliminary success of VIE tags with *H. amarus*, this method was used for marking in this experimental augmentation effort.

Fish were identified by site and date of release using different colors in combination with different locations on body. Fish marked in this experimental augmentation effort will be marked differently from those used in movement studies currently being conducted in San Acacia Reach. For fish released in different seasons and subsequent years of stocking, alternate colors and/or body position will be used to differentiate between year classes. In addition, fish will be marked differently for each season to differentiate between potential spring and fall stockings. Few *H. amarus* are thought to survive past age-2 in the wild (U.S. Fish and Wildlife Service 1999), but different colors will ensure differentiation among age classes.

Monitoring: Post stocking monitoring of marked and released *H. amarus* was accomplished in three stages. Phase I consisted of Dexter NFH&TC retaining 110 marked *H. amarus* for a tag retention study. Phase II consisted of a hoop net survey to evaluate immediate (48 hours) post release dispersal. Phase III consisted of post-stocking seining surveys at one and two week intervals followed by monthly seining surveys to monitor long term movements.

Phase II monitoring was conducted on two occasions. On 6 June, 2002 a total of five hoop-nets were placed upstream and downstream of the release site at Alameda Bridge. The hoop-nets were

24-36" diameter consisting of six hoops with two throats and were of 1/8" mesh. A single hoop-net was placed 1000 meters, 500 meters and 100 meters upstream of the release site. Downstream of the release site a single hoop-net was placed 500 meters and 100 meters from the release site. The hoop-nets were checked every hour for six hours and every six hours thereafter for a total of 48 hours of post-stocking sampling. On 9 December 2002 eighteen hoop-nets were placed upstream and downstream of the release site after the release at 1200 of the same day. The hoop-nets were 24" diameter, consisting of three hoops with a single throat. Hoop-nets were placed at 1000 meters, 500 meters and 100 meters upstream and downstream of the release site. Three nets were placed at each site, and nets were placed in low velocity habitat in water deep enough to maintain throat opening below water surface. Hoop-net throats (openings) were positioned towards the release site. Downstream hoop-nets had throats positioned upstream and upstream hoop-nets had throats positioned downstream. Hoop-nets were checked every six hours after release for a period of 48 hours.

Phase III of the augmentation project involved monitoring on one-week, two-week and monthly intervals by seining. Fish were sampled with a 3.0 m x 1.0 m x 3.0 mm mesh seine, approximately 40 seine hauls were done at each site. Fish were visually inspected for presence of VIE tags and returned to the river with the exception of a single threadfin shad (*Dorosoma petenense*) which was preserved for identification. All *H. amarus* that were captured were measured (standard and total length), and all unmarked fish were considered wild and were fin clipped to provide genetic material to Dr. Thomas Turner, UNM, Biology Department. Sites were chosen that gave easy access by vehicle upstream and downstream of the release site. A qualitative description was made of the habitat 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.

Results

Experimental augmentation of marked *H. amarus* from captive propagation began in June of 2002 with the release of 2,082 at Alameda Bridge (RM 192.2) (Table 1). By April of 2003, 126,966 Rio Grande silvery minnow have been marked with a VIE tag and subsequently released in the Albuquerque area by NMFRO personnel. Each batch of released fish were marked with a different VIE color (January 13 and 24 release were considered a single batch). Post-stocking monitoring consisted of three phases and occurred after each release. Phase I involved retaining individuals at the NMFRO facility to monitor survival and tag retention. Phase II involved hoop netting surveys to evaluate immediate (48 hours) post-stocking dispersal. Phase III involved seining surveys at approximately 1-week, 2-week, and monthly intervals to evaluate long-term post-stocking dispersal. The following summary includes data after the initial release in June 2002.

The origin of the augmented *H. amarus* is of interest to an ongoing analysis of the effects of captive propagation on genetic viability of the wild population by researchers at UNM. The 41,500 and 60,200 *H. amarus* released December 2002 and January 2003 respectively were raised at Dexter NFH&TC, and were originally captured as eggs from the San Acacia reach. The 22,266 *H. amarus* released April 2003 on Sandia Pueblo at the Sandia PNM Gasline site (RM 200.0) were reared at either the USFWS propagation unit located at New Mexico State University or at Dexter NFH&TC and were originally collected as eggs on May of 2002 from the San Acacia reach. The 918 *H. amarus* released at U.S. Highway 550 Bridge on 24 January 2003 were previously held at Yankton Ecotoxicology Research Center, U.S. Geological Survey - Biological Resources Division (Yankton)

Experimental Augmentation Annual Report

and were captive bred at ABP. A total of 2,082 *H. amarus* were eventually released on 6 June 2002. These were from a total of 2,104 *H. amarus* that were marked with VIE tags, and 22 were retained to record post-marking survival and tag retention. These fish were from a variety of sources including:

- 14 Wild caught as adults April 2002- San Acacia Reach
- 300 F₂ August 2001 spawn, from original stock of wild-caught adults- San Acacia Reach.
- 360 Age 3 adults, wild caught as eggs May 2000- San Acacia reach
- 872 F₂ October 2001 spawn from original stock of wild-caught adults- San Acacia reach.
- 558 Yankton.

Phase I: Dexter NFH&TC retains a sub-sample of *H. amarus* marked with VIE tags from four tagging efforts (Table 2). The fish tagged on 1-6 December, 2002 and released on 9 December, 2002 had a tag retention rate of 98% when sampled on 8 January, 2003. Previously, a group of 100 *H. amarus* retained from a marking effort on 8 November, 2001 had a retention rate of 78% when sampled in July 2002 (Table 2). The group with a tag retention rate of 78% had the longest period between date tagged and date sampled, and may give the most accurate data on retention rate.

Phase II: Following the 6 June 2002 release, a total of two *H. amarus* were collected in the hoop-net survey, both marked on the right side, pre-dorsal, with an orange VIE tag. Both fish were collected 100 meters upstream of the stocking location at 2220 hours, June 6, 13 hours post-stocking. In addition to the *H. amarus* three other species of fish were collected: red shiner (*Cyprinella lutrensis*), white sucker (*Catostomus commersoni*), and fathead minnow (*Pimephales promelas*). Effort for hoop-net monitoring equaled 240 net/hours, and 0.008 fish/net hour. Following the 9 December 2002 release, a total of 964 *H. amarus* were collected in hoop-net monitoring. This effort is summarized in Appendix I. Of these, 954 were identified with VIE tags. In the first 24 hours of sampling, 922 of the 964 fish were collected. 915 of these fish (913 marked and 2 unmarked) were collected in the downstream hoop-nets. A total of nine *H. amarus* were collected in upstream hoopnets; eight were tagged and one was untagged. All other fish were collected in the downstream hoopnets. Effort for this hoop-net survey equaled 756 net/hours, and 1.3 fish/net hour.

In addition to *H. amarus* the following fish were captured during the 9 December 2002 Phase II hoop-net surveys: red shiner (*Cyprinella lutrensis*), flathead chub (*Platygobio gracilis*), longnose dace (*Rhinichthys cataractae*) fathead minnow (*Pimephales promelas*), river carpsucker (*Carpiodes carpio*), white sucker (*Catostomus commersoni*), channel catfish (*Ictalurus punctatus*), and western mosquitofish (*Gambusia affinis*).

Phase III: Following the release of *H. amarus* on 6 June 2002 at Alameda Bridge, five sites were sampled by seine on six occasions between 17 June and 4 November, 2002 (Table 3). Sites and river mile (RM) sampled were: Lomitas Negras (RM 198.3), Dixon Road (RM 196.0), Alameda Bridge (192.2), Paseo del Norte Bridge (RM 191.2), and La Orilla Drain Return (RM 189.0). A total of 32 *H. amarus* were collected, six were marked with orange VIE tags on right dorsal (Table 3). All tagged fish were collected at Paseo del Norte Bridge (RM 191.2). A total of 1,194 seine hauls were done, and total area seined was 23,970.3 m².

Following the releases of 9 December 2002, 13 and 24 January, and 7 April 2003 seine surveys were conducted to collect marked *H. amarus*. Between 16 December and 7 May 2003, 1,466 seine hauls were

Remshardt and Davenport 2003

Table 1. *Hybognathus amarus* record of release, January 2002 through June 2003. Includes release dates, release location, river mile, number of RGSM released, color of mark, location of mark, agency responsible for release, and propagation facility. University of New Mexico, Museum of Southwestern Biology (UNM, MSB). New Mexico Fishery Resources Office (NMFRO). Dexter National Fish Hatchery and Technology Center (Dexter NFH&TC). Albuquerque Biological Park (ABP).

Date	Release Location	River Mile	Number released	Color	Mark location	Agency	Propagation facility
January 2002	San Acacia	57.7	4,600	Yellow	Left, predorsal	UNM, MSB	Dexter NFH&TC
January 2002	San Acacia	57.7	7,300	Green	Left, predorsal	UNM, MSB	Dexter NFH&TC
June 6, 2002	Alameda Bridge	192.2	2,082	Orange	Right, predorsal	NMFRO	ABP
December 9, 2002	Corrales Siphon	202.0	41,500	Orange	Left, predorsal	NMFRO	Dexter NFH&TC
January 13, 2003	Bernalillo Bridge	203.8	60,200	Green	Left, predorsal	NMFRO	Dexter NFH&TC
January 24 2003	Bernalillo Bridge	203.8	918	Green	Left, predorsal	NMFRO	Dexter NFH&TC
April 7, 2003	Sandia Pueblo	199.9	22,266	Red	Left, predorsal	NMFRO	Dexter NFH&TC
Total	-	-	138,784	-	-	-	-
			NMFRO-126,966				

Table 2. Tag retention study of Visible Implant Elastomer tagged *Hybognathus amarus* held at Dexter National Fish Hatchery and Technology Center. Number of fish retained, tag location, color of tag, date sampled, percent retention and percent survival.

Date tagged	Number of fish kept for study	Tag location	Color	Date sampled	Percent retention	Percent survival
November 8 2002	100	Left dorsal	Yellow	July 1 2002	78	68
December 6 2001	100	Left dorsal	Green	July 1 2002	82	76
June 6 2002	28	Right dorsal	Orange	September 9 2002	77	46
December 6 2002	110	Left dorsal	Orange	January 8 2003	98	100
January 9 2003	100	Left dorsal	Green	January 11 2003	100	100

Experimental Augmentation Annual Report

conducted, and total area seined was 29,501.1 m². A total of 164 *H. amarus* were collected, 67 marked with VIE tags: Eleven orange/left (released on 2 December 2002), nine green/left (released on 3 January 2003), 47 red/left (released on 3 April 2003), and 97 with no marks (Table 4). Between three and five sites were sampled on eight occasions. The sites sampled were same as listed above, but also included U.S. Highway 550 Bridge (RM 203.5), Sandia Bosque Line 12 (RM 201.0), Sandia Bosque Line 14 (RM 202.0), Sandia PNM Gasline (RM 200.0) and Corrales Siphon (RM 199.9). Sandia Bosque Line 12, Sandia Bosque Line 14 and Sandia PNM Gasline were all located on and accessed through Sandia Pueblo. Sampling sites were added due to addition of U.S. Highway 550 and Sandia PNM Gasline as release sites.

Between 17 June 2002 and 7 May 2003 a total of 2,660 seine hauls were done with a total area seined of 53,471.4 m². Twenty one species of fish were collected including 196 *H. amarus*, 73 were marked with VIE tags (Table 3) and 123 were unmarked. *H. amarus* had a frequency of occurrence of 1.2%, a percent occurrence of 3.2% and a density of 0.37 fish/ 100 m² (Table 5). Results from seine sampling at each monitoring site are presented in Apenndix II.

Red shiner (*Cyprinella lutrensis*) were the most abundant native fish and white sucker (*Catostomus commersoni*) were the most abundant non native. In addition to *H. amarus* the following fish were collected in Phase III seine surveys : *D. petenense*, common carp (*Cyprinus carpio*), red shiner (*Cyprinella lutrensis*), flathead chub (*Platygobio gracilis*), longnose dace (*Rhinichthys cataractae*), fathead minnow (*Pimephales promelas*), river carpsucker (*Carpiodes carpio*), white sucker (*Catostomus commersoni*), black bullhead (*Ameiurus melas*), yellow bullhead (*Ameiurus natalis*), channel catfish (*Ictalurus punctatus*), western mosquitofish (*Gambusia affinis*), white bass (*Morone chrysops*), white crappie (*Pomoxis annularis*), largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), walleye (*Sander vitreus*), and yellow perch (*Perca flavescens*). The collection of a single *D. petenense* represents the first collection of this species in the Angostura reach during our monitoring. It is presumed to have originated through stocking in either Jemez Canyon Reservoir or Cochiti Reservoir and been displaced downstream.

Catch rate of marked fish remained relatively low until after the 7 April 2003 release (Figure 2). In the eleven sampling trips between June 17, 2002 and March 10, 2003 four or fewer marked *H. amarus* were collected per sampling trip. After the 7 April 2003 release the number of marked fish collected increased to greater than twenty per sampling trip until 7 May 2003 when the number decreased to less than ten (Figure 2). Marked individuals recaptured after 7 April 2003 included those from releases in December 2002, January 2003, and April 2003, but the majority of these (48 of 59, 81.4%) were from the 7 April 2003 release. After the release on 7 April 2003 the number of marked fish collected exceeded unmarked fish by greater than two to one (Figure 2). The density of marked and unmarked *H. amarus* was greatest at Sandia PNM Gasline (RM 200) (Figure 3). Most of the *H. amarus* from this site were collected from a side-channel on river left. Marked fish have been collected from each release, but two monitoring sites, Alameda Bridge (RM 192.2) and La Orilla (RM 189.0) produced no marked *H. amarus*.

Other monitoring efforts conducted in the Middle Rio Grande have provided additional information on survival and movement potential of released *H. amarus*. While conducting monthly *H. amarus* monitoring throughout the Middle Rio Grande, MSB personnel have identified several marked *H. amarus* (S. Platania, pers. comm.) They have identified *H. amarus* that were released at river mile 203.8 on 13 and 24 January 2003. These individuals were marked on the left with a green VIE tag and were recaptured from Isleta Reach (Los Lunas, RM 161.4) and three sites in Angostura Reach (1-Rio

Bravo Bridge, RM 178.3; 2-Central Bridge, RM 183.4; and 3-Rio Rancho, RM 200.0). The recapture in Isleta Reach at Los Lunas included two individuals, which was 21 days after and 42.4 miles downstream of the release site at U.S. Highway 550 Bridge (RM 203.8). All other left, green marked recaptures involved a single individual. Also, *H. amarus* that were released on 9 December 2002 and marked with an orange VIE tag on the left, predorsal area have been recaptured. These were captured at the Central Bridge (RM 183.4) and Rio Rancho (RM 200.0) sites. A single recapture of a red, left predorsal VIE marked *H. amarus* occurred near the release site (Rio Rancho, RM 200.0). Marked and released *H. amarus* have also been collected during a separate study of *H. amarus* habitat preference conducted by NMFRO and U.S. Fish and Wildlife Service, Water Resources Division (Remshardt and Tashjian 2003). Three orange left VIE marked *H. amarus* were collected at RM 189.0 (La Orilla) on 19 December 2002 about 1 week after their release at U.S. Highway 550 Bridge (RM 203.8). A single green left VIE marked *H. amarus* was collected at RM 183.0 on 17 January 2003. This recapture occurred 4 days after the release on 13 January 2003, which occurred 20.8 miles upstream at U.S. Highway 550 Bridge (RM 203.8).

Discussion

The information presented in this report represents preliminary information collected during the first year of a multi-year project. The first release occurred in June 2002, and was small (2,082 individuals) compared to later releases between December 2002 and April 2003 (123,966). Monitoring conducted since December 2002 has produced an increased number of marked individuals. More releases and monitoring are planned for 2003 & 2004. This (and data from other monitoring projects) will provide information on the movements and survival of released fish. Through time and with multiple releases the number of individuals in the Angostura Reach may increase. The continued presence of marked *H. amarus* in seine surveys indicates that these individuals were present up to six months after their release at or near the release location. In several collections, marked and unmarked *H. amarus* were collected in the same seine hauls indicating that hatchery raised individuals are using similar habitats as unmarked (presumed wild) individuals.

Post-release hoop-net data indicates the immediate downstream dispersal of released individuals. This is likely due to passive dispersal related to handling stress and release into flowing habitats, not active downstream movements. In order to minimize downstream displacement future releases will be chosen with low velocity habitat. Based on recapture data, it appears that one release site in particular (Sandia PNM Gasline, RM 200.0) provided and continues to provide suitable habitat for release and retention of released *H. amarus*. This site is a side-channel on the east side of the river bordering the Pueblo of Sandia. This site has consistently produced marked and unmarked individuals throughout the sampling period. Depending on continued support and consent from the Pueblo of Sandia, this site will be used for upcoming releases.

Experimental Augmentation Annual Report

Table 3. Total number of *Hybognathus amarus* collected between 17 June 2002 and 11 November 2002 during seine surveys. All *H. amarus* (total of 2,082) were tagged on the right pre-dorsal with orange Visible Implant Elastomer tag and released at Alameda Bridge on 6 June 2002.

Sites and River Mile (RM)					
Date	Lomitas Negras RM 198.3	Dixon Road RM 195.5	Alameda Bridge RM 192.2	Paseo del Norte RM 190.8	La Orilla Drain RM 189.0
17 June 2002	0	0	1	2 orange/right	0
24 June 2002	0	0	2	3/ 2 orange/right	1
9 July 2002	0	0	0	3	1
12 August 2002	0	0	3	1 orange/right	0
25 Sept. 2002	2	1	1	0	2
11 Nov. 2002	1	1	4	1 orange/right	0
Total	3	2	11	12/ 6 orange/right	4

Table 4. *Hybognathus amarus* collected between 16 December 2002 and 7 May 2003 during seine surveys. All *H. amarus* (total of 124,884) were tagged either with orange, green or red on left pre-dorsal with Visible Implant Elastomer tag and released at Corrales Siphon (9 December 2002), US HWY 550 Bridge (13 & 24 January 2003) or Sandia PNM Gasline (7 April 2003). A dash – indicates site was not sampled on that date.

Sites and River Mile (RM)						
Date	Lomitas Negras (198.3)	Dixon Road (195.5)	Corrales Siphon / Sandia PNM Gasline (199.9/200.0)	Sandia Bosque Line 12 RM 190.8	Sandia Bosque Line 14 RM 189.0	US HWY 550 Bridge RM 203.8
16 Dec. 2002	0	0	0	16/ 1 orange/left	0	-
23 Dec. 2002	1	0	1	3	0	-
21 Jan. 2003	0	0	0	3/ 2 green/left	0	-
10 Feb. 2003	0	0	54/ 2 green/left	1 orange/right	1	0
10 March 2003	2	0	4	-	1	1 green/left
14 April 2003	8/ 1 orange/left 7 red/left	1 red/left	16/ 3 orange/left 11 red left 2 no mark	-	2/ 1 orange/left	0
21 April 2003	15/ 1 green/left 12 red/left 2 no mark	1 red/left	17/ 1 orange/left 11 red/left 5 no mark	-	5/ 1 red/left	1 orange/left
7 May 2003	7/ 1 green/left 4 red/left 1 no mark	2/ 1 orange/left 1 green/left	-	-	-	0
Total	33/27 marked	4 marked	92/28 marked	23/4 marked	9/2 marked	2 marked

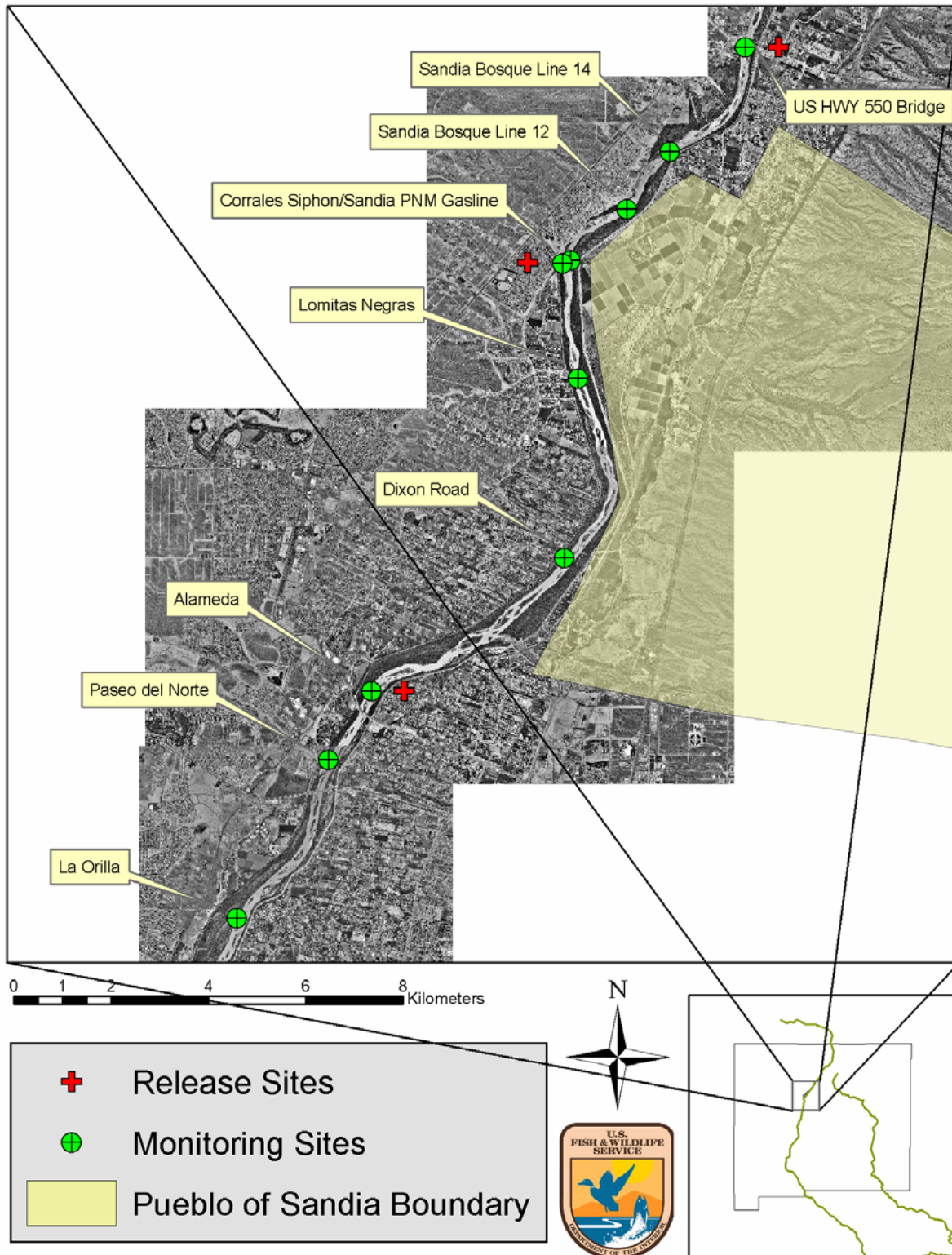


Figure 1. Map of study area

Experimental Augmentation Annual Report

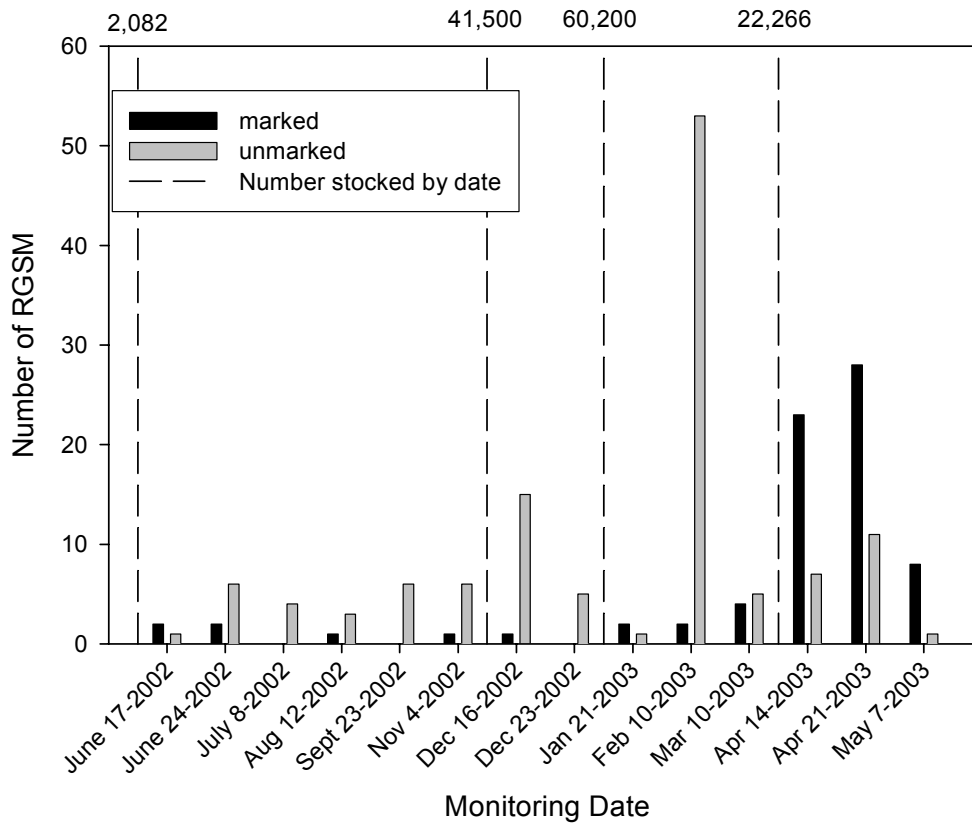


Figure 2. Total catch of marked and unmarked *Hybognathus amarus* by date.

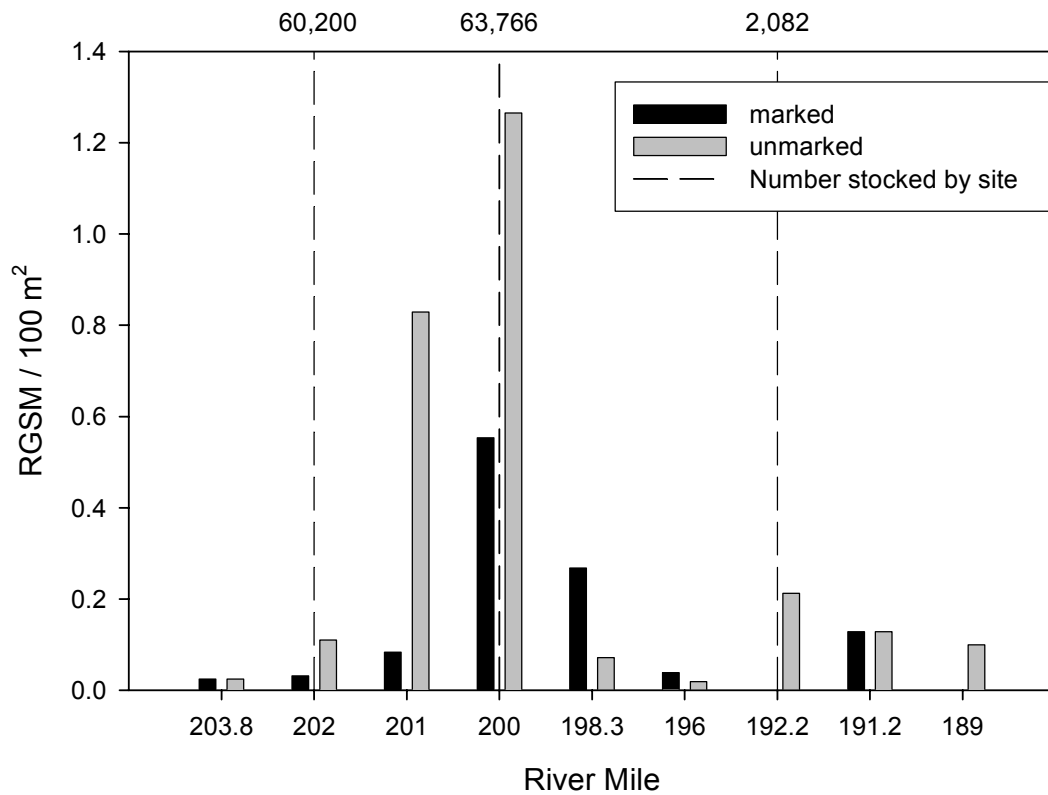


Figure 3. Density of marked and unmarked *Hybognathus amarus* by site.

Table 5. Status, numbers, frequency of occurrence, percent occurrence and density for all species collected for all sites combined. Collections period was between 17 June 2002 and 7 May 2003. For status native = N and introduced = I. For percent of total and percent occurrence – denotes less than 0.1 % and for density – denotes less than 0.01 fish/100m².

Species	Status	n	Percent of total	Percent occurrence	Density Fish/100m ²
<i>Dorosoma petenense</i> *	I	1	-	-	-
<i>Salmo trutta</i>	I	1	-	-	-
<i>Cyprinus carpio</i>	I	100	-	2.0	0.19
<i>Cyprinella lutrensis</i>	N	6289	37.5	32.3	11.76
<i>Hybognathus amarus</i>	N	196	1.2	3.2	0.37
<i>Pimephales promelas</i>	N	1222	7.3	7.8	2.29
<i>Platygobio gracilis</i>	N	648	3.9	11.9	1.21
<i>Rhinichthys cataractae</i>	N	383	2.3	7.2	0.72
<i>Carpionodes carpio</i>	N	438	2.6	4.9	0.82
<i>Catostomus commersoni</i>	I	4430	26.4	16.7	8.28
<i>Ameiurus melas</i>	I	2	-	0.1	-
<i>Ameiurus natalis</i>	I	25	-	0.8	0.05
<i>Ictalurus punctatus</i>	I	423	2.5	6.8	0.79
<i>Gambusia affinis</i>	I	2594	15.5	9.9	4.85
<i>Morone chrysops</i>	I	3	-	0.1	0.01
<i>Lepomis cyanellus</i>	I	2	-	0.1	-
<i>Lepomis macrochirus</i>	N	16	-	0.5	0.03
<i>Micropterus salmoides</i>	I	6	-	0.2	0.01
<i>Pomoxis annularis</i>	I	7	-	0.2	0.01
<i>Perca flavescens</i>	I	2	-	0.1	-
<i>Sander vitreus</i>	I	1	-	-	-
Total	-	16,789	100.0	-	31.40

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Appendix I

Results from hoop net surveys following release of *Hybognathus amarus* marked with Visible Implant Elastomer tags on 9 December 2002.

Experimental Augmentation Annual Report

Results from hoop-netting survey. 9 December, 2002 at **1800 hrs**. All *H. amarus* marked with orange Visible Implant Elastomer on left pre-dorsal. Unmarked fish are noted in parenthesis.

Meters from release site	Downstream hoop-nets	Upstream hoop-nets
	No. of <i>H. amarus</i>	No. of <i>H. amarus</i>
100	293	1
500	343	4 (unmarked)
1000	36	0
Total	672	5

Results from hoop-netting survey. 10 December, 2002 at **2400 hrs**. All *H. amarus* marked with orange Visible Implant Elastomer on left pre-dorsal. Unmarked fish are noted in parenthesis.

Meters from release site	Downstream hoop-nets	Upstream hoop-nets
	No. of <i>H. amarus</i>	No. of <i>H. amarus</i>
100	47	0
500	27	0
1000	2	0
Total	76	0

Results from hoop-netting survey. 10 December, 2002 at **0600 hrs**. All *H. amarus* marked with orange Visible Implant Elastomer on left pre-dorsal. Unmarked fish are noted in parenthesis.

Meters from release site	Downstream hoop-nets	Upstream hoop-nets
	No. of <i>H. amarus</i>	No. of <i>H. amarus</i>
100	57	0
500	15	0
1000	13	0
Total	85	0

Results from hoop-netting survey. 10 December, 2002 at **1200 hrs**. All *H. amarus* marked with orange Visible Implant Elastomer on left pre-dorsal. Unmarked fish are noted in parenthesis.

Meters from release site	Downstream hoop-nets	Upstream hoop-nets
	No. of <i>H. amarus</i>	No. of <i>H. amarus</i>
100	33 (1 unmarked)	0
500	19	0
1000	1	0
Total	53	0

Remshardt and Davenport 2003

Results from hoop-netting survey. 10 December, 2002 at **1800 hrs**. All *H. amarus* marked with orange Visible Implant Elastomer on left pre-dorsal. Unmarked fish are noted in parenthesis.

Meters from release site	Downstream hoop-nets	Upstream hoop-nets
	No. of <i>H. amarus</i>	No. of <i>H. amarus</i>
100	23	0
500	5 (1 unmarked)	2 (unmarked)
1000	1	0
Total	29	2

Results from hoop-netting survey. 11 December, 2002 at **2400 hrs**. All *H. amarus* marked with orange Visible Implant Elastomer on left pre-dorsal. Unmarked fish are noted in parenthesis.

Meters from release site	Downstream hoop-nets	Upstream hoop-nets
	No. of <i>H. amarus</i>	No. of <i>H. amarus</i>
100	15	0
500	4	1 (unmarked)
1000	0	0
Total	19	1

Results from hoop-netting survey. 11 December, 2002 at **0600 hrs**. All *H. amarus* marked with orange Visible Implant Elastomer on left pre-dorsal. Unmarked fish are noted in parenthesis.

Meters from release site	Downstream hoop-nets	Upstream hoop-nets
	No. of <i>H. amarus</i>	No. of <i>H. amarus</i>
100	10	0
500	1	0
1000	0	1 (unmarked)
Total	11	1

Results from hoop-netting survey. 11 December, 2002 at **1200 hrs**. All *H. amarus* marked with orange Visible Implant Elastomer on left pre-dorsal. Unmarked fish are noted in parenthesis.

Meters from release site	Downstream hoop-nets	Upstream hoop-nets
	Number	Number
100	3	0
500	7	0
1000	0	0
Total	10	0

Appendix II

Results from seining survey of *Hybognathus amarus* marked with Visible Implant Elastomer tags between 17 June 2002 and 7 May 2003.

Remshardt and Davenport 2003

June 17 2002

Lomitas Negras (Romero Road) River Mile 198.3

Date 17 June 2002 Collector: WJR 036 Samples: 40 Effort: 762.3 m²

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

Family	Species	Num/color/position
Cyprinidae	<i>Cyprinella lutrensis</i>	105
Cyprinidae	<i>Platygobio gracilis</i>	1
Catostomidae	<i>Catostomus commersoni</i>	253

Dixon Road, River Mile 195.5

Date 17 June 2002 Collector: WJR 037 Samples: 40 Effort: 783.3 m²

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

Family	Species	Num/color/position
Cyprinidae	<i>Cyprinella lutrensis</i>	69
Cyprinidae	<i>Cyprinus carpio</i>	3
Cyprinidae	<i>Pimephales promelas</i>	4
Cyprinidae	<i>Platygobio gracilis</i>	4
Catostomidae	<i>Catostomus commersoni</i>	426
Ictaluridae	<i>Ameiurus melas</i>	1
Ictaluridae	<i>Ameiurus natalis</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	2

Alameda Bridge, River Mile 192.3

Date 17 June 2002 Collector: WJR 038 Samples: 40 Effort: 836.7 m²

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

Family	Species	Num/color/position
Cyprinidae	<i>Cyprinella lutrensis</i>	43
Cyprinidae	<i>Cyprinus carpio</i>	6
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	8
Catostomidae	<i>Catostomus commersoni</i>	103
Catostomidae	<i>Carpiodes carpio</i>	1
Poeciliidae	<i>Gambusia affinis</i>	14
Centrarchidae	<i>Micropterus salmoides</i>	1

Paseo del Norte Bridge, River Mile 191.2

Date 17 June 2002 Collector: WJR 039 Samples: 40 Effort: 945.6 m²

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

Family	Species	Num/color/position
Clupeidae	<i>Dorosoma petenense</i>	1
Cyprinidae	<i>Cyprinella lutrensis</i>	24
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	2/orange/right
Cyprinidae	<i>Pimephales promelas</i>	43
Cyprinidae	<i>Platygobio gracilis</i>	1
Catostomidae	<i>Catostomus commersoni</i>	154
Catostomidae	<i>Carpiodes carpio</i>	2
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	18
Percidae	<i>Sander vitreus</i>	1

Experimental Augmentation Annual Report

La Orilla Drain Return, River Mile 189.0

Date 17 June 2002

Collector: WJR 040

Samples: 40

Effort: 607.0 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	11
Cyprinidae	<i>Pimephales promelas</i>	1
Catostomidae	<i>Catostomus commersoni</i>	24
Catostomidae	<i>Carpiodes carpio</i>	4
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	4

June 24 2002

Lomitas Negras (Romero Road) River Mile 198.3

Date 24 June 2002

Collector: SRD 069

Samples: 40

Effort: 888.9 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	62
Cyprinidae	<i>Cyprinus carpio</i>	3
Cyprinidae	<i>Platygobio gracilis</i>	4
Cyprinidae	<i>Rhinichthys cataractae</i>	9
Catostomidae	<i>Catostomus commersoni</i>	561
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	6

Dixon Road, River Mile 195.5

Date 24 June 2002

Collector: SRD 070

Samples: 40

Effort: 714.3 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	37
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	5
Catostomidae	<i>Catostomus commersoni</i>	928
Ictaluridae	<i>Ameiurus natalis</i>	2
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	3

Alameda Bridge, River Mile 192.3

Date 24 June 2002

Collector: SRD 071

Samples: 40

Effort: 887.7 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	19
Cyprinidae	<i>Cyprinus carpio</i>	23
Cyprinidae	<i>Hybognathus amarus</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	6
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersoni</i>	310
Catostomidae	<i>Carpiodes carpio</i>	2
Ictaluridae	<i>Ictalurus punctatus</i>	5
Poeciliidae	<i>Gambusia affinis</i>	36

Remshardt and Davenport 2003

Paseo del Norte Bridge, River Mile 191.2

Date 24 June 2002

Collector: SRD 072

Samples:40

Effort: 753.0 m²

Personnel: S. R. Davenport, D. Gonzales, Leanna T. Torres; NMFO, S. Bulgrin; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	38
Cyprinidae	<i>Cyprinus carpio</i>	5
Cyprinidae	<i>Hybognathus amarus</i>	5/2/orange/right
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	3
Catostomidae	<i>Catostomus commersoni</i>	453
Catostomidae	<i>Carpodes carpio</i>	4
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	54

La Orilla Drain Return, River Mile 189.0

Date 24 June 2002

Collector: SRD 073

Samples:40

Effort: 724.2 m²

Personnel: S. R. Davenport, D. Gonzales, Leanna T. Torres; NMFO, S. Bulgrin; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	18
Cyprinidae	<i>Cyprinus carpio</i>	17
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	2
Catostomidae	<i>Catostomus commersoni</i>	214
Ictaluridae	<i>Ictalurus punctatus</i>	5
Poeciliidae	<i>Gambusia affinis</i>	41
Percidae	<i>Pomoxis annularis</i>	5

8 July 2002

Lomitas Negras (Romero Road) River Mile 198.3

Date 8 July 2002

Collector: WJR 041

Samples: 40

Effort: 1024.2 m²

Personnel: W.J. Remshardt, D. Gonzales, L. T. Torres; NMFO, S. Bulgrin, J. Tsethlika; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	50
Cyprinidae	<i>Cyprinus carpio</i>	4
Cyprinidae	<i>Pimephales promelas</i>	30
Cyprinidae	<i>Platygobio gracilis</i>	7
Cyprinidae	<i>Rhinichthys cataractae</i>	10
Catostomidae	<i>Carpodes carpio</i>	3
Catostomidae	<i>Catostomus commersoni</i>	219
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	37
Percidae	<i>Perca flavescens</i>	1

Experimental Augmentation Annual Report

July 8-9 2002

Dixon Road, River Mile 195.5

Date 8 July 2002

Collector: WJR 042

Samples: 40

Effort: 847.5 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	22
Cyprinidae	<i>Cyprinus carpio</i>	9
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	29
Cyprinidae	<i>Rhinichthys cataractae</i>	3
Catostomidae	<i>Catostomus commersoni</i>	113
Catostomidae	<i>Carpionodes carpio</i>	20
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	12
Centrarchidae	<i>Lepomis cyanellus</i>	1
Percidae	<i>Perca flavescens</i>	1

Alameda Bridge, River Mile 192.3

Date 8 July 2002

Collector: WJR 043

Samples: 40

Effort: 920.4 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	12
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	5
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Catostomus commersoni</i>	36
Catostomidae	<i>Carpionodes carpio</i>	1

Paseo del Norte Bridge, River Mile 191.2

Date 8 July 2002

Collector: WJR 044

Samples: 41

Effort: 835.5 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	19
Cyprinidae	<i>Hybognathus amarus</i>	3
Cyprinidae	<i>Pimephales promelas</i>	52
Cyprinidae	<i>Platygobio gracilis</i>	13
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersoni</i>	151
Catostomidae	<i>Carpionodes carpio</i>	63
Ictaluridae	<i>Ameiurus natalis</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	68
Centrarchidae	<i>Morone chrysops</i>	1

Remshardt and Davenport 2003

La Orilla Drain Return, River Mile 189.0

Date 9 July 2002

Collector: WJR 045

Samples: 45

Effort: 884.1 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	8
Cyprinidae	<i>Cyprinus carpio</i>	4
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	144
Cyprinidae	<i>Platygobio gracilis</i>	4
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Catostomus commersoni</i>	79
Catostomidae	<i>Carpodes carpio</i>	88
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	110
Centrarchidae	<i>Pomoxis annularis</i>	2

12 August 2002

Lomitas Negras (Romero Road) River Mile 198.3

Date 12 August 2002

Collector: WJR 055

Samples: 40

Effort: 774.9 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	50
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Pimephales promelas</i>	16
Cyprinidae	<i>Platygobio gracilis</i>	27
Cyprinidae	<i>Rhinichthys cataractae</i>	18
Catostomidae	<i>Catostomus commersoni</i>	39
Catostomidae	<i>Carpodes carpio</i>	27
Ictaluridae	<i>Ictalurus punctatus</i>	24
Poeciliidae	<i>Gambusia affinis</i>	34

Dixon Road, River Mile 195.5

Date 12 August 2002

Collector: WJR 056

Samples: 42

Effort: 919.5 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	83
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Pimephales promelas</i>	29
Cyprinidae	<i>Platygobio gracilis</i>	10
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Catostomus commersoni</i>	43
Catostomidae	<i>Carpodes carpio</i>	12
Ictaluridae	<i>Ameiurus melas</i>	1
Ictaluridae	<i>Ameiurus natalis</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	8
Poeciliidae	<i>Gambusia affinis</i>	10
Centrarchidae	<i>Micropterus salmoides</i>	1

Experimental Augmentation Annual Report

Alameda Bridge, River Mile 192.3

Date 12 August 2002

Collector: WJR 061

Samples:40

Effort: 739.1 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	48
Cyprinidae	<i>Hybognathus amarus</i>	3
Cyprinidae	<i>Pimephales promelas</i>	13
Cyprinidae	<i>Platygobio gracilis</i>	7
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersoni</i>	5
Catostomidae	<i>Carpionodes carpio</i>	26
Ictaluridae	<i>Ameiurus natalis</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	49
Poeciliidae	<i>Gambusia affinis</i>	54
Centrarchidae	<i>Morone chrysops</i>	1

Paseo del Norte Bridge, River Mile 191.2

Date 12 August 2002

Collector: WJR 062

Samples:41

Effort: 777.6 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	32
Cyprinidae	<i>Hybognathus amarus</i>	1/orange/right
Cyprinidae	<i>Pimephales promelas</i>	19
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	3
Catostomidae	<i>Catostomus commersoni</i>	8
Catostomidae	<i>Carpionodes carpio</i>	31
Ictaluridae	<i>Ameiurus natalis</i>	5
Ictaluridae	<i>Ictalurus punctatus</i>	27
Poeciliidae	<i>Gambusia affinis</i>	85

La Orilla Drain Return, River Mile 189.0

Date 12 August 2002

Collector: WJR 063

Samples:42

Effort: 662.7 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	29
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Pimephales promelas</i>	5
Cyprinidae	<i>Platygobio gracilis</i>	7
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersoni</i>	3
Catostomidae	<i>Carpionodes carpio</i>	4
Ictaluridae	<i>Ameiurus natalis</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	13
Poeciliidae	<i>Gambusia affinis</i>	26

Remshardt and Davenport 2003

23 September 2002

Lomitas Negras (Romero Road) River Mile 198.3

Date 23 September 2002

Collector: SRD 074

Samples: 40

Effort: 816.3 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	183
Cyprinidae	<i>Hybognathus amarus</i>	2
Cyprinidae	<i>Pimephales promelas</i>	4
Cyprinidae	<i>Platygobio gracilis</i>	17
Cyprinidae	<i>Rhinichthys cataractae</i>	12
Catostomidae	<i>Catostomus commersoni</i>	13
Catostomidae	<i>Carpionodes carpio</i>	1
Ictaluridae	<i>Ameiurus natalis</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	28
Poeciliidae	<i>Gambusia affinis</i>	84

Dixon Road, River Mile 195.5

Date 23 September 2002

Collector: SRD 075

Samples: 44

Effort: 706.8 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	148
Cyprinidae	<i>Cyprinus carpio</i>	3
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	72
Cyprinidae	<i>Platygobio gracilis</i>	3
Cyprinidae	<i>Rhinichthys cataractae</i>	5
Catostomidae	<i>Catostomus commersoni</i>	34
Catostomidae	<i>Carpionodes carpio</i>	13
Ictaluridae	<i>Ameiurus natalis</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	5
Poeciliidae	<i>Gambusia affinis</i>	354

Alameda Bridge, River Mile 192.3

Date 23 September 2002

Collector: SRD 076

Samples: 40

Effort: 925.5 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	112
Cyprinidae	<i>Cyprinus carpio</i>	4
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	21
Catostomidae	<i>Catostomus commersoni</i>	15
Catostomidae	<i>Carpionodes carpio</i>	27
Ictaluridae	<i>Ictalurus punctatus</i>	71
Poeciliidae	<i>Gambusia affinis</i>	224

Experimental Augmentation Annual Report

Paseo del Norte Bridge, River Mile 191.2

Date 23 September 2002

Collector: SRD 077

Samples: 41

Effort: 853.8 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	137
Cyprinidae	<i>Pimephales promelas</i>	9
Cyprinidae	<i>Platygobio gracilis</i>	7
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Catostomus commersoni</i>	6
Catostomidae	<i>Carpiodes carpio</i>	20
Ictaluridae	<i>Ameiurus natalis</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	40
Poeciliidae	<i>Gambusia affinis</i>	78

La Orilla Drain Return, River Mile 189.0

Date 23 September 2002

Collector: SRD 078

Samples: 42

Effort: 648.6 m³

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	128
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	2
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	4
Catostomidae	<i>Catostomus commersoni</i>	3
Catostomidae	<i>Carpiodes carpio</i>	20
Ictaluridae	<i>Ictalurus punctatus</i>	31
Poeciliidae	<i>Gambusia affinis</i>	61
Centrarchidae	<i>Morone chrysops</i>	1

4 November 2002

Lomitas Negras (Romero Road) River Mile 198.3

Date 4 November 2002

Collector: WJR 070

Samples: 40

Effort: 980.1 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Salmonidae	<i>Salmo trutta</i>	1
Cyprinidae	<i>Cyprinella lutrensis</i>	452
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	14
Cyprinidae	<i>Platygobio gracilis</i>	38
Cyprinidae	<i>Rhinichthys cataractae</i>	20
Catostomidae	<i>Catostomus commersoni</i>	14
Catostomidae	<i>Carpiodes carpio</i>	4
Ictaluridae	<i>Ictalurus punctatus</i>	18
Poeciliidae	<i>Gambusia affinis</i>	68
Centrarchidae	<i>Lepomis macrochirus</i>	1

Remshardt and Davenport 2003

Dixon Road, River Mile 195.5

Date 4 November 2002

Collector: WJR 071

Samples:40

Effort: 887.7 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	367
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	20
Cyprinidae	<i>Platygobio gracilis</i>	19
Cyprinidae	<i>Rhinichthys cataractae</i>	5
Catostomidae	<i>Catostomus commersoni</i>	17
Catostomidae	<i>Carpionotus carpio</i>	12
Ictaluridae	<i>Ictalurus punctatus</i>	11
Poeciliidae	<i>Gambusia affinis</i>	72
Centrarchidae	<i>Micropterus salmoides</i>	1

Alameda Bridge, River Mile 192.3

Date 4 November 2002

Collector: WJR 072

Samples:40

Effort: 867.3 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	41
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Hybognathus amarus</i>	4
Cyprinidae	<i>Pimephales promelas</i>	4
Cyprinidae	<i>Platygobio gracilis</i>	37
Catostomidae	<i>Catostomus commersoni</i>	4
Catostomidae	<i>Carpionotus carpio</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	4
Poeciliidae	<i>Gambusia affinis</i>	23

Paseo del Norte Bridge, River Mile 191.2

Date 4 November 2002

Collector: WJR 073

Samples:30

Effort: 518.7 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	39
Cyprinidae	<i>Hybognathus amarus</i>	1/orange/right
Cyprinidae	<i>Platygobio gracilis</i>	11
Cyprinidae	<i>Rhinichthys cataractae</i>	14
Catostomidae	<i>Catostomus commersoni</i>	1
Catostomidae	<i>Carpionotus carpio</i>	9
Ictaluridae	<i>Ictalurus punctatus</i>	8
Poeciliidae	<i>Gambusia affinis</i>	26

La Orilla Drain Return, River Mile 189.0

Date 4 November 2002

Collector: WJR 074

Samples:30

Effort: 480.9 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	23
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Carpionotus carpio</i>	12
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	95
Centrarchidae	<i>Lepomis macrochirus</i>	1

Experimental Augmentation Annual Report

16 December 2002

Sandia Pueblo, Bosque Line 14, River Mile 202.0

Date 16 December 2002 Collector: WJR 078 Samples: 39 Effort: 1019.2 m²
 Personnel: W. J. Remshardt, D. Gonzales; NMFRO, S. Bulgrin; Pueblo of Sandia, Kim Ward; City of Albuquerque.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	18
Cyprinidae	<i>Platygobio gracilis</i>	6
Catostomidae	<i>Catostomus commersoni</i>	1
Ictaluridae	<i>Ameiurus natalis</i>	1
Poeciliidae	<i>Gambusia affinis</i>	20

Sandia Pueblo, Bosque Line 12, River Mile 201.0

Date 16 December 2002 Collector: WJR 079 Samples: 42 Effort: 820.8 m²
 Personnel: W. J. Remshardt, D. Gonzales; NMFRO, S. Bulgrin; Pueblo of Sandia, Kim Ward; City of Albuquerque.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	57
Cyprinidae	<i>Hybognathus amarus</i>	16/1orange/right
Cyprinidae	<i>Platygobio gracilis</i>	5
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Catostomus commersoni</i>	2
Ictaluridae	<i>Ameiurus natalis</i>	1
Poeciliidae	<i>Gambusia affinis</i>	74

Corrales Siphon, River Mile 199.9

Date 16 December 2002 Collector: WJR 080 Samples: 20 Effort: 507.0 m²
 Personnel: W. J. Remshardt, D. Gonzales; NMFRO, S. Bulgrin; Pueblo of Sandia, Kim Ward; City of Albuquerque.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	78
Cyprinidae	<i>Platygobio gracilis</i>	2
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Catostomus commersoni</i>	2

Lomitas Negras (Romero Road) River Mile 198.3

Date 16 December 2002 Collector: WJR 081 Samples: 21 Effort: 437.1 m²
 Personnel: W. J. Remshardt, D. Gonzales; NMFRO, S. Bulgrin; Pueblo of Sandia, Kim Ward; City of Albuquerque.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	263
Cyprinidae	<i>Cyprinus carpio</i>	1
Cyprinidae	<i>Pimephales promelas</i>	7
Cyprinidae	<i>Platygobio gracilis</i>	4
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Catostomus commersoni</i>	3
Catostomidae	<i>Carpiodes carpio</i>	3
Poeciliidae	<i>Gambusia affinis</i>	217
Centrarchidae	<i>Lepomis cyanellus</i>	1
Centrarchidae	<i>Lepomis macrochirus</i>	2

Remshardt and Davenport 2003

Dixon Road, River Mile 195.5

Date 16 December 2002

Collector: WJR 082

Samples: 20

Effort: 503.1 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	25
Cyprinidae	<i>Pimephales promelas</i>	4
Cyprinidae	<i>Platygobio gracilis</i>	1
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersoni</i>	1
Catostomidae	<i>Carpiodes carpio</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	1

23 December 2002

Sandia Pueblo, Bosque Line 14, River Mile 202.0

Date 23 December 2002

Collector: WJR 086

Samples: 40

Effort: 819.3 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	27
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	13
Cyprinidae	<i>Rhinichthys cataractae</i>	3
Catostomidae	<i>Catostomus commersoni</i>	5
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	1

Sandia Pueblo, Bosque Line 12, River Mile 201.0

Date 23 December 2002

Collector: WJR 087

Samples: 42

Effort: 756.6 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	156
Cyprinidae	<i>Hybognathus amarus</i>	3
Cyprinidae	<i>Pimephales promelas</i>	186
Cyprinidae	<i>Platygobio gracilis</i>	11
Cyprinidae	<i>Rhinichthys cataractae</i>	3
Catostomidae	<i>Catostomus commersoni</i>	1
Ictaluridae	<i>Ameiurus natalis</i>	1
Poeciliidae	<i>Gambusia affinis</i>	12

Corrales Siphon, River Mile 199.9

Date 23 December 2002

Collector: WJR 088

Samples: 40

Effort: 692.1 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	70
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	4
Cyprinidae	<i>Platygobio gracilis</i>	28
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersoni</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	3

Experimental Augmentation Annual Report

Lomitas Negras (Romero Road) River Mile 198.3

Date 23 December 2002

Collector: WJR 089

Samples: 40

Effort: 640.5 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	29
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	13
Cyprinidae	<i>Platygobio gracilis</i>	20
Cyprinidae	<i>Rhinichthys cataractae</i>	3
Catostomidae	<i>Catostomus commersoni</i>	4
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	77
Centrarchidae	<i>Lepomis macrochirus</i>	4

Dixon Road, River Mile 195.5

Date 23 December 2002

Collector: WJR 090

Samples: 40

Effort: 712.8 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	16
Cyprinidae	<i>Platygobio gracilis</i>	7
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersoni</i>	1
Poeciliidae	<i>Gambusia affinis</i>	16

21 January 2003

Sandia Pueblo, Bosque Line 14, River Mile 202.0

Date 21 January 2003

Collector: WJR 094

Samples: 40

Effort: 717.6 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	21
Cyprinidae	<i>Platygobio gracilis</i>	6
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersoni</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1

Sandia Pueblo, Bosque Line 12, River Mile 201.0

Date 21 January 2003

Collector: WJR 095

Samples: 40

Effort: 836.7 m³

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	138
Cyprinidae	<i>Hybognathus amarus</i>	3/ 2 green/left
Cyprinidae	<i>Pimephales promelas</i>	15
Cyprinidae	<i>Platygobio gracilis</i>	4
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	11

Remshardt and Davenport 2003

Lomitas Negras (Romero Road) River Mile 198.3

Date 21 January 2003 Collector: WJR 097 Samples: 40 Effort: 686.4 m²
 Personnel: W. J. Remshardt, S.R. Davenport, L.T. Torres; NMFRO, S. Bulgrin; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	68
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	10
Cyprinidae	<i>Rhinichthys cataractae</i>	7
Catostomidae	<i>Catostomus commersoni</i>	2
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	30
Centrarchidae	<i>Micropterus salmoides</i>	2

Dixon Road, River Mile 195.5

Date 21 January 2003 Collector: WJR 098 Samples: 40 Effort: 583.2 m²
 Personnel: W. J. Remshardt, S.R. Davenport, L.T. Torres; NMFRO, S. Bulgrin; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	159
Cyprinidae	<i>Pimephales promelas</i>	15
Cyprinidae	<i>Platygobio gracilis</i>	5
Catostomidae	<i>Catostomus commersoni</i>	4
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	14

Corrales Siphon, River Mile 199.9

Date 21 January 2003 Collector: WJR 096 Samples: 40 Effort: 688.8 m²
 Personnel: W. J. Remshardt, S.R. Davenport, L.T. Torres; NMFRO, S. Bulgrin; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	65
Cyprinidae	<i>Pimephales promelas</i>	4
Cyprinidae	<i>Platygobio gracilis</i>	8
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	1

10 February 2003

New Mexico Highway 550 (Bernalillo) Bridge River Mile M 203.8

Date: 10 February 2003 Collector: WJR 103 Samples: 40 Effort: 772.8 m²
 Personnel: W. J. Remshardt, L. T. Torres, D Gonzales; NMFRO, S. J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	7
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Carpoides carpio</i>	3
Catostomidae	<i>Catostomus commersoni</i>	3

Sandia Pueblo, Bosque Line 14, River Mile 202.0

Date 10 February 2003 Collector: WJR 101 Samples: 40 Effort: 927.9 m²
 Personnel: W. J. Remshardt, L. T. Torres, D Gonzales; NMFRO, S. J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	3
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	3
Cyprinidae	<i>Rhinichthys cataractae</i>	2

Experimental Augmentation Annual Report

Lomitas Negras (Romero Road) River Mile 198.3

Date 10 February 2003

Collector: WJR 104

Samples: 41

Effort: 844.5 m³

Personnel: W. J. Remshardt, L. T. Torres, D Gonzales; NMFRO, S. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	49
Cyprinidae	<i>Pimephales promelas</i>	7
Cyprinidae	<i>Platygobio gracilis</i>	10
Catostomidae	<i>Catostomus commersoni</i>	2
Poeciliidae	<i>Gambusia affinis</i>	1
Centrarchidae	<i>Micropterus salmoides</i>	1
Centrarchidae	<i>Lepomis macrochirus</i>	3

Dixon Road, River Mile 195.5

Date 10 February 2003

Collector: WJR 105

Samples: 40

Effort: 615.0 m³

Personnel: W. J. Remshardt, L. T. Torres, D Gonzales; NMFRO, S. J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	71
Cyprinidae	<i>Pimephales promelas</i>	9
Cyprinidae	<i>Platygobio gracilis</i>	2
Catostomidae	<i>Catostomus commersoni</i>	7
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	38

Corrales Siphon, River Mile 199.9

Date 10 February 2003

Collector: WJR 102

Samples: 40

Effort: 807.6 m³

Personnel: W. J. Remshardt, L. T. Torres, D Gonzales; NMFRO, S. J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	320
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	54/2 green/left
Cyprinidae	<i>Pimephales promelas</i>	232
Cyprinidae	<i>Platygobio gracilis</i>	11
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Carpionodes carpio</i>	8
Catostomidae	<i>Catostomus commersoni</i>	3
Poeciliidae	<i>Gambusia affinis</i>	10

10 March 2003

New Mexico Highway 550 (Bernalillo) Bridge River Mile M 203.8

Date: 10 March 2003

Collector: SRD 087

Samples: 41

Effort: 704.4 m³

Personnel: S. R. Davenport, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	353
Cyprinidae	<i>Hybognathus amarus</i>	1/1 green/left
Cyprinidae	<i>Pimephales promelas</i>	17
Cyprinidae	<i>Rhinichthys cataractae</i>	1
Catostomidae	<i>Catostomus commersoni</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	4

Remshardt and Davenport 2003

Sandia Pueblo, Bosque Line 14, River Mile 202.0

Date 10 March 2003 Collector: SRD 085 Samples: 40 Effort: 887.1 m²
 Personnel: S. R. Davenport, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	200
Cyprinidae	<i>Hybognathus amarus</i>	1
Cyprinidae	<i>Pimephales promelas</i>	2
Cyprinidae	<i>Platygobio gracilis</i>	7
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Catostomus commersoni</i>	4
Ictaluridae	<i>Ictalurus punctatus</i>	4

Lomitas Negras (Romero Road) River Mile 198.3

Date 10 March 2003 Collector: SRD 088 Samples: 39 Effort: 736.2 m²
 Personnel: S. R. Davenport, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	184
Cyprinidae	<i>Hybognathus amarus</i>	4/ 3 orange/left
Cyprinidae	<i>Pimephales promelas</i>	34
Cyprinidae	<i>Platygobio gracilis</i>	21
Cyprinidae	<i>Rhinichthys cataractae</i>	4
Catostomidae	<i>Carpionodes carpio</i>	1
Catostomidae	<i>Catostomus commersoni</i>	12
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	88

Dixon Road, River Mile 195.5

Date 10 March 2003 Collector: SRD 089 Samples: 40 Effort: 605.7 m²
 Personnel: S. R. Davenport, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	132
Cyprinidae	<i>Pimephales promelas</i>	5
Cyprinidae	<i>Platygobio gracilis</i>	10
Catostomidae	<i>Catostomus commersoni</i>	6
Ictaluridae	<i>Ictalurus punctatus</i>	7
Poeciliidae	<i>Gambusia affinis</i>	1

Corrales Siphon, River Mile 199.9

Date 10 March 2003 Collector: SRD 086 Samples: 40 Effort: 684.0 m²
 Personnel: S. R. Davenport, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	100
Cyprinidae	<i>Cyprinus carpio</i>	2
Cyprinidae	<i>Hybognathus amarus</i>	4
Cyprinidae	<i>Pimephales promelas</i>	67
Cyprinidae	<i>Platygobio gracilis</i>	12
Catostomidae	<i>Carpionodes carpio</i>	4
Catostomidae	<i>Catostomus commersoni</i>	5

Experimental Augmentation Annual Report

14 April 2003

Sandia Pueblo, Bosque Line 14, River Mile 202.0

Date 14 April 2003

Collector: WJR 106

Samples: 40

Effort: 856.5 m²

Personnel: W. J. Remshardt, D. Gonzales, L. T. Torres; NMFRO, C. Springer USFWS, RO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	29
Cyprinidae	<i>Hybognathus amarus</i>	2/1orange/left
Cyprinidae	<i>Pimephales promelas</i>	20
Cyprinidae	<i>Platygobio gracilis</i>	7
Cyprinidae	<i>Rhinichthys cataractae</i>	18
Catostomidae	<i>Catostomus commersoni</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	44
Centrarchidae	<i>Lepomis macrochirus</i>	1

Sandia PNM Gasline, River Mile

Date 14 April 2003

Collector: WJR 107

Samples: 40

Effort: 674.1m²

Personnel: W. J. Remshardt, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	23
Cyprinidae	<i>Hybognathus amarus</i>	16/11 red/left 2 orange/left
Cyprinidae	<i>Pimephales promelas</i>	14
Cyprinidae	<i>Platygobio gracilis</i>	4
Cyprinidae	<i>Rhinichthys cataractae</i>	12
Catostomidae	<i>Carpoides carpio</i>	5
Catostomidae	<i>Catostomus commersoni</i>	18

New Mexico Highway 550 (Bernalillo) Bridge River Mile M 203.8

Date: 14 April 2003

Collector: WJR 108

Samples: 40

Effort: 851.4 m²

Personnel: W. J. Remshardt, D. Gonzales, L. T. Torres; NMFRO; C. Springer USFWS, RO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	159
Cyprinidae	<i>Pimephales promelas</i>	11
Cyprinidae	<i>Platygobio gracilis</i>	22
Cyprinidae	<i>Rhinichthys cataractae</i>	38
Catostomidae	<i>Catostomus commersoni</i>	7
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	6

Lomitas Negras (Romero Road) River Mile 198.3

Date 14 April 2003

Collector: WJR109

Samples: 40

Effort: 741.9 m

Personnel: W. J. Remshardt, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	47
Cyprinidae	<i>Hybognathus amarus</i>	8/7 red/left 1orange/left
Cyprinidae	<i>Platygobio gracilis</i>	6
Cyprinidae	<i>Rhinichthys cataractae</i>	7
Catostomidae	<i>Carpoides carpio</i>	1
Catostomidae	<i>Catostomus commersoni</i>	2

Remshardt and Davenport 2003

Dixon Road, River Mile 195.5

Date 14 April 2003

Collector: WJR 110

Samples: 40

Effort: 714.3 m²

Personnel: W. J. Remshardt, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	90
Cyprinidae	<i>Hybognathus amarus</i>	1/orange/left
Cyprinidae	<i>Pimephales promelas</i>	6
Cyprinidae	<i>Platygobio gracilis</i>	10
Cyprinidae	<i>Rhinichthys cataractae</i>	2
Catostomidae	<i>Catostomus commersoni</i>	7
Catostomidae	<i>Carpodes carpio</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	84

21 April 2003

New Mexico Highway 550 (Bernalillo) Bridge River Mile M 203.8

Date: 21 April 2003

Collector: SRD 098

Samples: 40

Effort: 1026.3 m²

Personnel: S.R. Davenport, D. Gonzales, L. T. Torres; NMFRO; C. Springer USFWS, RO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	94
Cyprinidae	<i>Hybognathus amarus</i>	1/orange/left
Cyprinidae	<i>Pimephales promelas</i>	1
Cyprinidae	<i>Platygobio gracilis</i>	11
Cyprinidae	<i>Rhinichthys cataractae</i>	43
Catostomidae	<i>Catostomus commersoni</i>	3
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	5

Lomitas Negras (Romero Road) River Mile 198.3

Date 21 April 2003

Collector: SRD 097

Samples: 40

Effort: 1006.5 m²

Personnel: S.R. Davenport, D. Gonzales, L. T. Torres; NMFRO, C. Springer USFWS, RO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	182
Cyprinidae	<i>Hybognathus amarus</i>	15/ 12 red/left 1 green/left
Cyprinidae	<i>Pimephales promelas</i>	5
Cyprinidae	<i>Platygobio gracilis</i>	24
Cyprinidae	<i>Rhinichthys cataractae</i>	6
Catostomidae	<i>Catostomus commersoni</i>	9
Catostomidae	<i>Carpodes carpio</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	88
Centrarchidae	<i>Lepomis macrochirus</i>	1

Experimental Augmentation Annual Report

Sandia Pueblo, Bosque Line 14, River Mile 202.0

Date 21 April 2003

Collector: SRD 099

Samples: 40

Effort: 1046.2 m³

Personnel: S.R. Davenport, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	117
Cyprinidae	<i>Hybognathus amarus</i>	5/1 green left
Cyprinidae	<i>Pimephales promelas</i>	7
Cyprinidae	<i>Platygobio gracilis</i>	23
Cyprinidae	<i>Rhinichthys cataractae</i>	14
Catostomidae	<i>Carpionodes carpio</i>	1
Catostomidae	<i>Catostomus commersoni</i>	7
Ictaluridae	<i>Ictalurus punctatus</i>	2
Poeciliidae	<i>Gambusia affinis</i>	4
Centrarchidae	<i>Lepomis macrochirus</i>	3

Dixon Road, River Mile 195.5

Date 21 April 2003

Collector: SRD 096

Samples: 40

Effort: 978.6 m³

Personnel: S.R. Davenport, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	33
Cyprinidae	<i>Hybognathus amarus</i>	1/red/left
Cyprinidae	<i>Pimephales promelas</i>	5
Cyprinidae	<i>Platygobio gracilis</i>	24
Cyprinidae	<i>Rhinichthys cataractae</i>	4
Catostomidae	<i>Catostomus commersoni</i>	8
Ictaluridae	<i>Ameiurus natalis</i>	1
Poeciliidae	<i>Gambusia affinis</i>	3

Sandia Pueblo, PNM Gasline, River Mile 200.0

Date 21 April 2003

Collector: SRD 100

Samples: 40

Effort: 1005.9 m³

Personnel: S.R. Davenport, D. Gonzales, L. T. Torres; NMFRO, S.J. Mann; Pueblo of Sandia.

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	121
Cyprinidae	<i>Hybognathus amarus</i>	17/11 red/left
		1 orange/left
Cyprinidae	<i>Pimephales promelas</i>	13
Cyprinidae	<i>Platygobio gracilis</i>	16
Cyprinidae	<i>Rhinichthys cataractae</i>	27
Catostomidae	<i>Carpionodes carpio</i>	1
Catostomidae	<i>Catostomus commersoni</i>	4
Ictaluridae	<i>Ictalurus punctatus</i>	7
Poeciliidae	<i>Gambusia affinis</i>	1

Remshardt and Davenport 2003

7 May 2003

New Mexico Highway 550 (Bernalillo) Bridge River Mile M 203.8

Date: 7 May 2003

Collector: WJR 113

Samples: 40

Effort: 771.0 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	166
Cyprinidae	<i>Pimephales promelas</i>	6
Cyprinidae	<i>Platygobio gracilis</i>	9
Cyprinidae	<i>Rhinichthys cataractae</i>	40
Catostomidae	<i>Catostomus commersoni</i>	2
Ictaluridae	<i>Ictalurus punctatus</i>	5
Poeciliidae	<i>Gambusia affinis</i>	1

Lomitas Negras (Romero Road) River Mile 198.3

Date: 7 May 2003

Collector: WJR 112

Samples: 40

Effort: 868.8 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	129
Cyprinidae	<i>Hybognathus amarus</i>	7/ 4 red/left 1 green/left
Cyprinidae	<i>Pimephales promelas</i>	6
Cyprinidae	<i>Platygobio gracilis</i>	13
Cyprinidae	<i>Rhinichthys cataractae</i>	7
Catostomidae	<i>Catostomus commersoni</i>	13
Ictaluridae	<i>Ictalurus punctatus</i>	1
Poeciliidae	<i>Gambusia affinis</i>	4

Dixon Road, River Mile 195.5

Date 7 May 2003

Collector: WJR 111

Samples: 40

Effort: 881.4 m²

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

<u>Family</u>	<u>Species</u>	<u>Num/color/position</u>
Cyprinidae	<i>Cyprinella lutrensis</i>	83
Cyprinidae	<i>Hybognathus amarus</i>	2/ 1 red/left 1 green/left
Cyprinidae	<i>Pimephales promelas</i>	12
Cyprinidae	<i>Platygobio gracilis</i>	8
Cyprinidae	<i>Rhinichthys cataractae</i>	4
Catostomidae	<i>Catostomus commersoni</i>	7
Ictaluridae	<i>Ameiurus natalis</i>	1
Ictaluridae	<i>Ictalurus punctatus</i>	3
Poeciliidae	<i>Gambusia affinis</i>	42