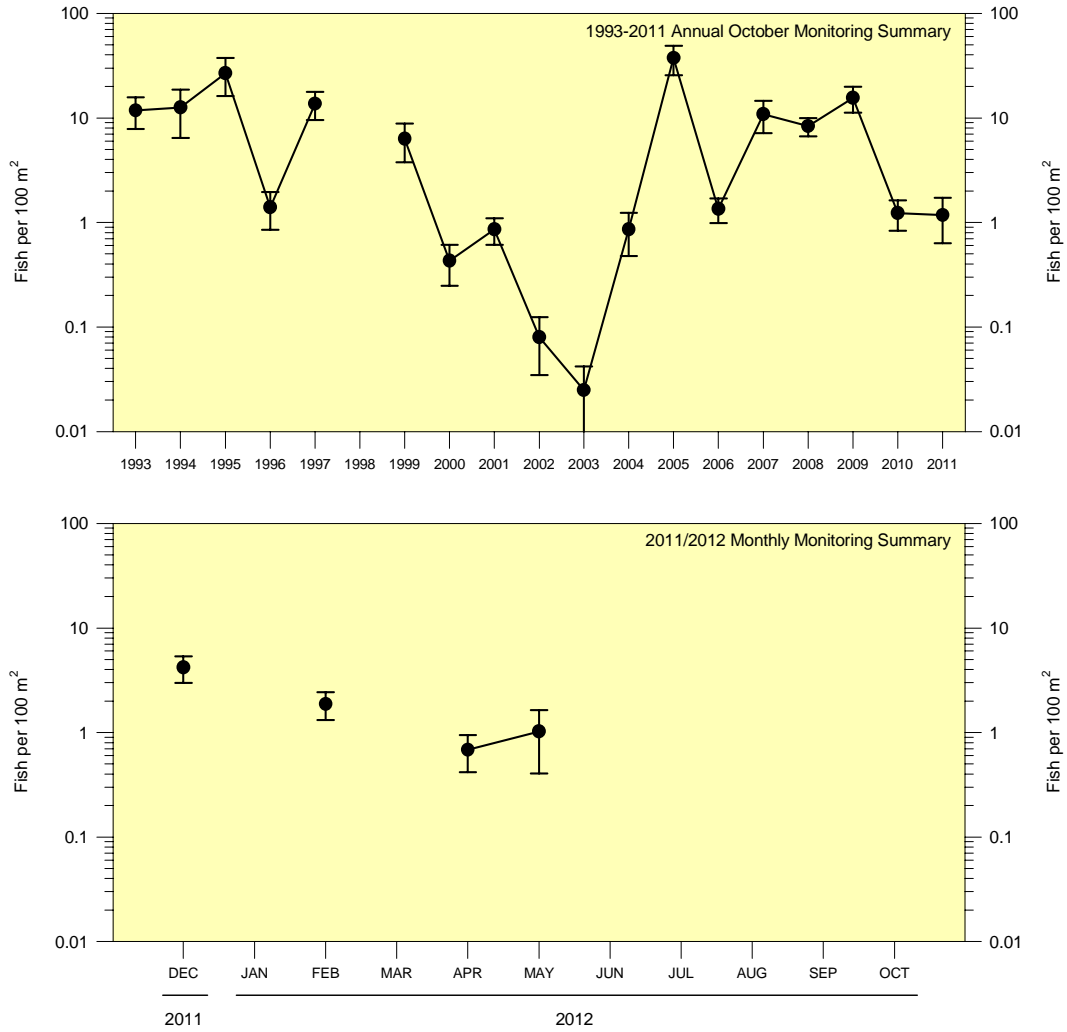


**SUMMARY OF THE RIO GRANDE SILVERY MINNOW
POPULATION MONITORING PROGRAM RESULTS FROM MAY 2012**

**A MIDDLE RIO GRANDE ENDANGERED SPECIES ACT
COLLABORATIVE PROGRAM FUNDED RESEARCH PROJECT**



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15 June 2012

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prepared for:

MIDDLE RIO GRANDE ENDANGERED SPECIES ACT COLLABORATIVE PROGRAM

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15 June 2012

SUMMARY OF OVERALL MAY 2012 POPULATION MONITORING EFFORTS

The fourth sampling effort of the 2012 Rio Grande silvery minnow population monitoring program was conducted at 20 sites throughout the Middle Rio Grande. Five sites were located in the Angostura Reach, six sites in the Isleta Reach, and nine sites in the San Acacia Reach. A list of collection localities is appended (Table A-1).

Adult and juvenile fish were obtained by rapidly drawing a 3.1 m x 1.8 m small mesh (3/16th inch) seine through discrete mesohabitats. During appropriate times of the year, larval fish were collected with a 1.0 m x 1.0 m fine mesh (1/16th inch) seine. Rio Grande silvery minnow were counted and identified to age-class. Other fishes were identified to species and enumerated, but age-class was not determined. Figures illustrating catch rates (number of fish per 100 m² sampled) were prepared for the ten focal species, including Rio Grande silvery minnow, to facilitate comparisons among reaches.

During May 2012, sampling covered 9,901.3 m² (surface area) of water and yielded 5,602 fish. Cumulative fish density during May was 56.6 individuals/100 m² sampled as compared with 29.0 individuals/100 m² sampled in April 2012. Rio Grande silvery minnow was the fourth-most abundant taxon in May (N = 108; 1.1 individuals/100 m² sampled) and composed 1.9% of the total catch. Other common species included red shiner (N = 4,890), western mosquitofish (N = 140), and flathead chub (N = 140). The May cumulative catch of Rio Grande silvery minnow was comprised mostly of individuals from the San Acacia Reach (N = 89), with lesser numbers in the Isleta Reach (N = 16) and Angostura Reach (N = 3). Rio Grande silvery minnow was present in 31 of the 286 seine hauls that yielded fish during May 2012, as compared with 41 of the 245 seine hauls that yielded fish during April 2012.

SUMMARY OF MAY 2012 POPULATION MONITORING EFFORT BY RIVER REACH

Angostura Reach

Mean daily discharge in the Angostura Reach (Rio Grande at Albuquerque, NM; USGS Gauge 08330000) ranged from 624 cfs to 1,150 cfs from 16 April to 15 May, and was lower compared with the period from 16 March to 15 April 2012 (range = 770 cfs to 2,550 cfs). Water temperatures were moderate (range = 14.7 to 17.7 °C) during the Angostura Reach sampling efforts (ca. 0830 h to 1430 h); temperatures during May 2012 sampling were warmer than those recorded in April 2012 (range = 10.9 to 12.9 °C). The water clarity was low to moderate throughout the reach; Secchi disk measurements ranged from 15 cm (Site #4) to 58 cm (Site #0).

Sampling for fishes in the Angostura Reach during May 2012 yielded 541 individuals as compared with 652 individuals observed in April 2012. The overall sampling effort in the Angostura Reach covered 2,582.9 m² (surface area) of water. Densities in the Angostura Reach, for all fish species combined, ranged from 8.0 to 32.5 individuals per 100 m². Eight fish species were collected during May as compared to twelve species in April. Red shiner was the most abundant taxon (N = 389), followed by flathead chub (N = 55), and white sucker (N=54).

In May, Rio Grande silvery minnow density in the Angostura Reach was 0.1 individuals per 100 m² as compared with 0.4 individuals per 100 m² during April 2012. Densities of Rio Grande silvery minnow at sites within the Angostura Reach ranged from 0.0 to 0.4 individuals per 100 m². The highest number of Rio Grande silvery minnow was observed at Site #3 (N = 2). Rio Grande silvery minnow collected in the Angostura Reach appeared to be age-1 individuals, based on their lengths.

Isleta Reach

In the Isleta Reach, mean daily discharge (Rio Grande at Isleta Lakes near Isleta, NM; USGS Gauge 08354900) ranged from 650 to 1,270 cfs from 16 April to 15 May, which was lower as compared to that recorded during the period from 16 March to 15 April 2012 (range = 712 to 2,710 cfs). Water temperatures ranged from 18.7 to 26.1 °C throughout the sampling localities during the

day (0930 h to 1600 h); temperatures in May 2012 were higher as compared to April 2012 (range = 11.1 to 15.4 °C). The water varied slightly in turbidity throughout the reach; Secchi disk readings ranged from 3 to 11 cm during sampling.

The Isleta Reach produced the highest number of fish in any given reach. There were 4,111 individuals collected in May 2012 as compared with 1,437 individuals collected in April 2012. The total sampling effort in the Isleta Reach during May 2012 covered 2,790.4 m² (surface area) of water. Fish densities (all species combined) at the six sites ranged from 41.5 to 246.2 individuals per 100 m² sampled. Eleven fish species were collected in the Isleta Reach during May 2012. Red shiner was the most abundant taxon (N = 3,771), followed by western mosquitofish (N = 102), and fathead minnow (N = 90).

In May, Rio Grande silvery minnow density in the Isleta Reach was 0.6 individuals per 100 m² as compared with 0.6 individuals per 100 m² during April 2012. Densities of Rio Grande silvery minnow at sites within the Isleta Reach ranged from 0.0 to 1.5 individuals per 100 m². The highest number of Rio Grande silvery minnow was observed at Site #5 (N = 7). Rio Grande silvery minnow collected in the Isleta Reach appeared to be age-1 individuals, based on their lengths.

San Acacia Reach

Flow at San Acacia (Rio Grande Floodway at San Acacia, NM; USGS Gauge 08354900) from 16 April to 15 May was higher (range = 388 to 989 cfs) as compared to San Marcial (Rio Grande Floodway at San Marcial, NM; USGS Gauge 08358400) during the same period (range = 135 to 739 cfs). Water temperatures in May for the San Acacia Reach ranged from 19.6 to 22.7 °C (ca. 0930 h to 1500 h); which was warmer than April 2012 (range = 12.7 to 14.7 °C). Water turbidity was relatively high throughout the reach (3 to 7 cm Secchi disk readings among all sites).

Population monitoring efforts in the San Acacia Reach during May 2012 yielded 950 individuals as compared with 421 individuals collected during April 2012. Sampling in the San Acacia Reach covered an area of 4,528.0 m² of water during May 2012. Fish densities (all species combined) ranged from 3.6 to 60.3 individuals per 100 m² sampled in the San Acacia Reach. Of the twelve fish species collected in the San Acacia Reach, red shiner was the most abundant taxon (N = 730), followed by Rio Grande silvery minnow (N = 89), and flathead chub (N = 69).

During May 2012, San Acacia Reach density of Rio Grande silvery minnow was 2.0 individuals per 100 m² as compared with 1.0 individuals per 100 m² during April 2012. The highest number of Rio Grande silvery minnow was observed at Site #11 (N = 71). Rio Grande silvery minnow densities at sites within the San Acacia Reach ranged from 0.0 to 12.6 individuals per 100 m². Rio Grande silvery minnow collected in the San Acacia Reach appeared to be age-1 individuals, based on their lengths.

Conclusions

During the May 2012 sampling effort, Rio Grande silvery minnow was present at 12 of the 20 sampling sites in the Middle Rio Grande, New Mexico. Rio Grande silvery minnow was most common in the San Acacia Reach, followed by the Isleta Reach, and the Angostura Reach. Catch rates of Rio Grande silvery minnow were variable among sampling sites but overall densities were generally low (0.0 to 1.6 individuals per 100 m²) with the exception of Site #10 (12.6 individuals per 100 m²). Based on standard length measurements, all Rio Grande silvery minnow collected were age-1 fish. Large numbers of hatchery-reared Rio Grande silvery minnow were released at sites in both the Isleta and San Acacia reaches during November 2011. These stocked fish were collected at four of our sampling sites during May 2012 and composed a large proportion (67.6%) of Rio Grande silvery minnow collected. Most of the hatchery reared Rio Grande silvery minnow were collected in the San Acacia Reach (N = 70) and only a few individuals were collected in the Isleta Reach (N = 3) during the May 2012 monitoring effort. The highest densities of Rio Grande silvery minnow were recorded just downstream of San Acacia Diversion Dam, which could indicate possible upstream movement prior to spawning.

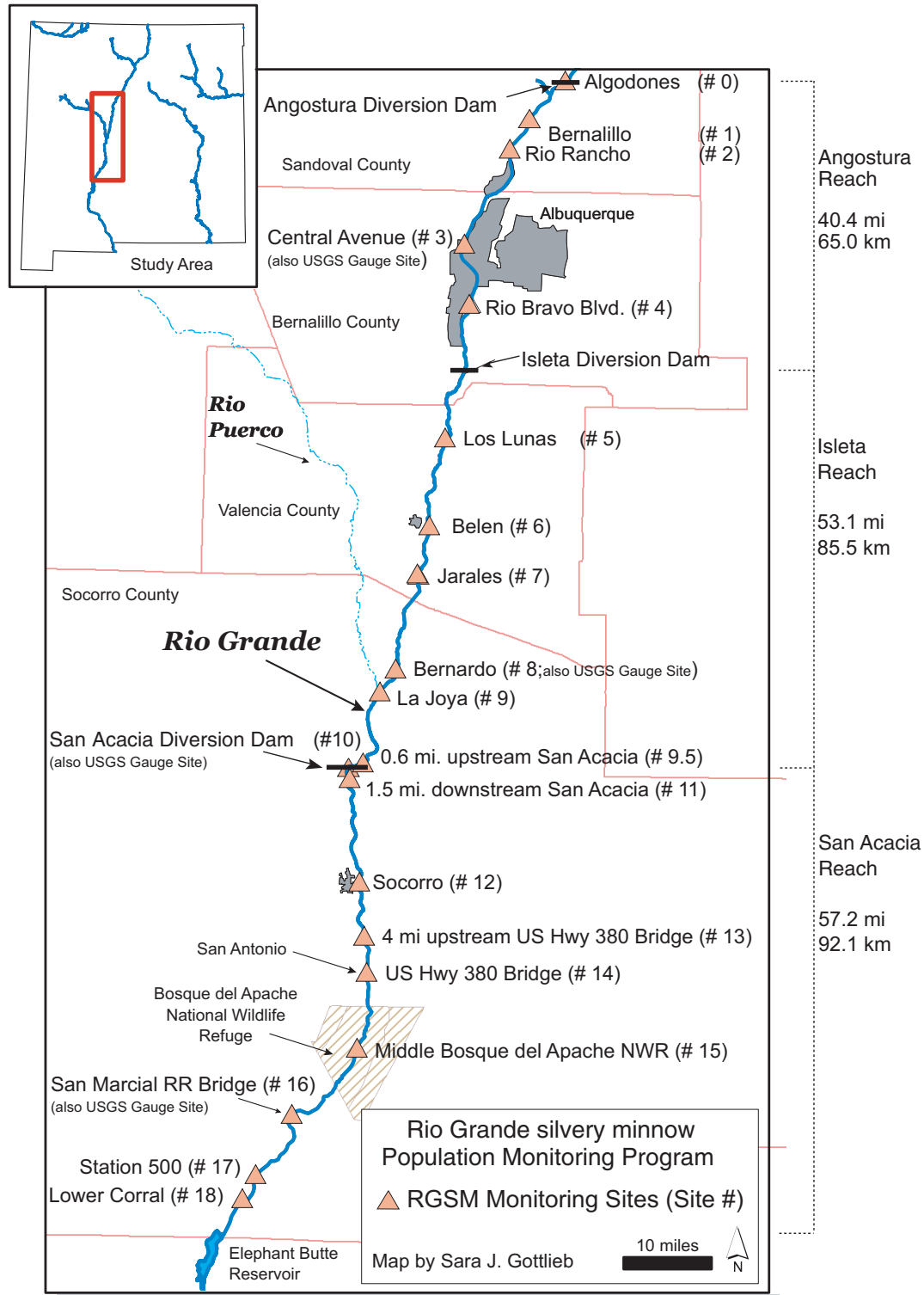


Figure 1. Map of the study area and sampling localities (numbered) for the Rio Grande silvery minnow population monitoring program. Sampling locality information that correspond with the numbered localities are provided in Appendix A (Table A-1).

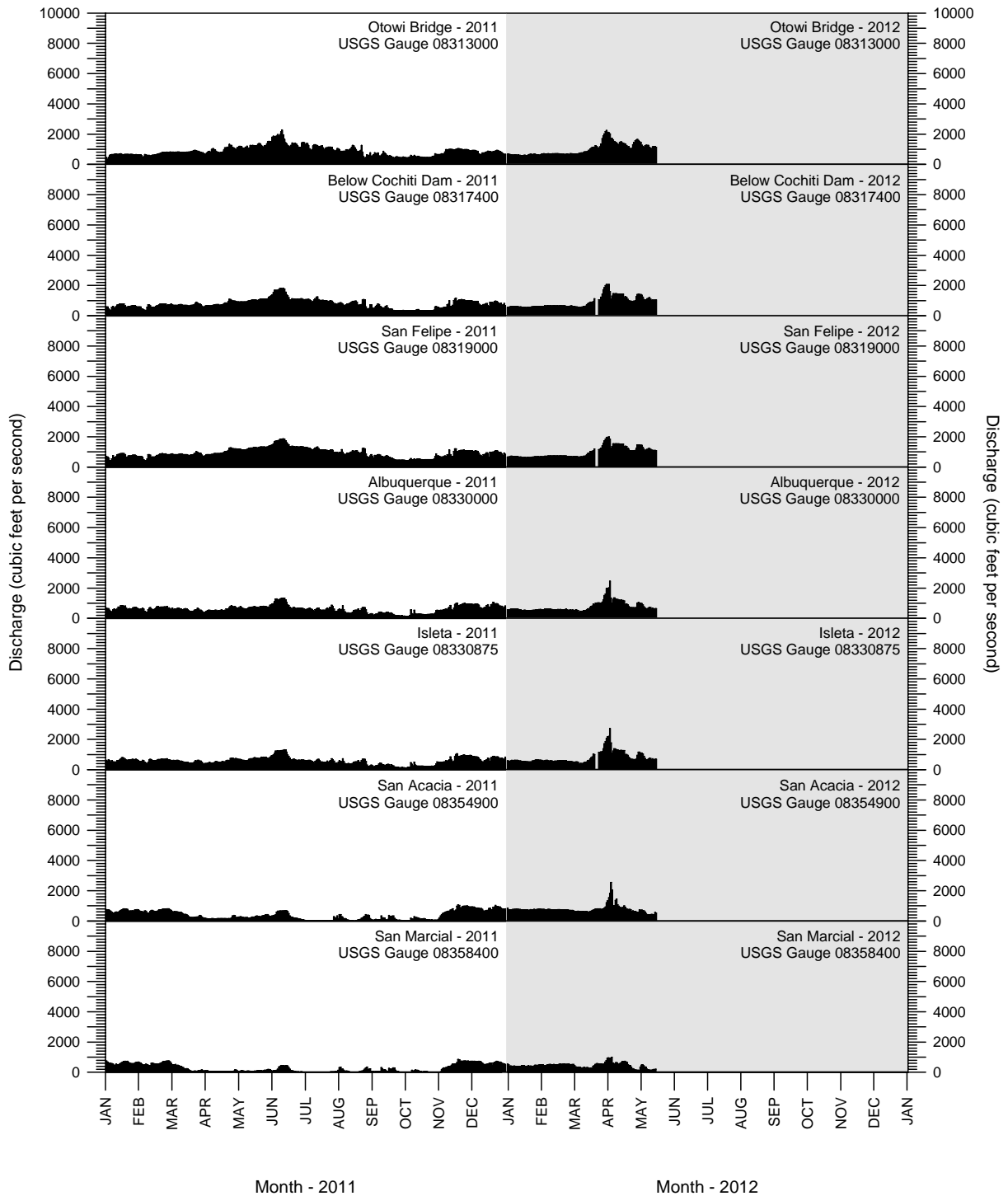


Figure 2. Discharge in the Rio Grande from 1 January 2011 through 15 May 2012 as recorded at seven U. S. Geological Survey (USGS) gauge stations. The Otowi Bridge gauge site is outside of the study area (ca. 25.5 river miles upstream of Cochiti Dam) and provided for reference. **Discharge data are provisional and subject to change.

Table 1. Scientific and common names and species codes of fish collected in the Middle Rio Grande during the Rio Grande silvery minnow population monitoring program (since 1993).

Scientific Name	Common Name	Code
Order Clupeiformes		
Family Clupeidae		
	herrings	
<i>Dorosoma cepedianum</i>	gizzard shad	(DORCEP)
<i>Dorosoma petenense</i>	threadfin shad	(DORPET)
Order Cypriniformes		
Family Cyprinidae		
	carps and minnows	
<i>Campostoma anomalum</i>	central stoneroller	(CAMANO)
<i>Carassius auratus</i>	goldfish	(CARAUR)
<i>Cyprinella lutrensis</i>	red shiner ¹	(CYPLUT)
<i>Cyprinus carpio</i>	common carp ¹	(CYPCAR)
<i>Gila pandora</i>	Rio Grande chub	(GILPAN)
<i>Hybognathus amarus</i>	Rio Grande	
	silvery minnow ¹	(HYBAMA)
<i>Notemigonus crysoleucas</i>	golden shiner	(NOTCRY)
<i>Pimephales promelas</i>	fathead minnow ¹	(PIMPRO)
<i>Pimephales vigilax</i>	bullhead minnow	(PIMVIG)
<i>Platygobio gracilis</i>	flathead chub ¹	(PLAGRA)
<i>Rhinichthys cataractae</i>	longnose dace ¹	(RHICAT)
Family Catostomidae		
	suckers	
<i>Carpiodes carpio</i>	river carpsucker ¹	(CARCAR)
<i>Catostomus commersonii</i>	white sucker ¹	(CATCOM)
<i>Ictiobus bubalus</i>	smallmouth buffalo	(ICTBUB)
Order Siluriformes		
Family Ictaluridae		
	North American catfishes	
<i>Ameiurus melas</i>	black bullhead	(AMEMEL)
<i>Ameiurus natalis</i>	yellow bullhead	(AMENAT)
<i>Ictalurus furcatus</i>	blue catfish	(ICTFUR)
<i>Ictalurus punctatus</i>	channel catfish ¹	(ICTPUN)
<i>Pylodictis olivaris</i>	flathead catfish	(PYLOLI)
Order Salmoniformes		
Family Salmonidae		
	trouts and salmons	
<i>Oncorhynchus mykiss</i>	rainbow trout	(ONCMYK)
<i>Salmo trutta</i>	brown trout	(SALTRU)

Table 1. Scientific and common names and species codes of fish collected in the Middle Rio Grande during the Rio Grande silvery minnow population monitoring program (since 1993).

Scientific Name	Common Name	Code
Order Cyprinodontiformes		
Family Poeciliidae	livebearers	
<i>Gambusia affinis</i>	western mosquitofish ¹	(GAMAFF)
Order Perciformes		
Family Moronidae	temperate basses	
<i>Morone chrysops</i>	white bass	(MORCHR)
<i>Morone saxatilis</i>	striped bass	(MORSAX)
Order Perciformes		
Family Centrarchidae	sunfishes	
<i>Lepomis cyanellus</i>	green sunfish	(LEPCYA)
<i>Lepomis macrochirus</i>	bluegill	(LEPMAC)
<i>Lepomis megalotis</i>	longear sunfish	(LEPMEG)
<i>Micropterus dolomieu</i>	smallmouth bass	(MICDOL)
<i>Micropterus salmoides</i>	largemouth bass	(MICSAL)
<i>Pomoxis annularis</i>	white crappie	(POMANN)
<i>Pomoxis nigromaculatus</i>	black crappie	(POMNIG)
Family Percidae	perches	
<i>Perca flavescens</i>	yellow perch	(PERFLA)
<i>Percina macrolepida</i>	bigscale logperch	(PERMAC)
<i>Sander vitreus</i>	walleye	(SANVIT)

¹ Focal taxa represent the most abundant species present in recent Middle Rio Grande collections; these species are illustrated in monthly plots of data.

Table 2. Summary of the May 2012 Rio Grande silvery minnow population monitoring program results (species list is based on fish collected since 1993).

FAMILY	SPECIES COMMON NAME	RESIDENCE STATUS ¹	TOTAL NUMBER OF SPECIMENS	PERCENT (%) OF TOTAL	FREQUENCY OF OCCURRENCE ²	% FREQUENCY OCCURRENCE ²
Clupeidae	gizzard shad	N	3	0.05	3	15
Clupeidae	threadfin shad	I	-	-	-	-
Cyprinidae	central stoneroller	I	-	-	-	-
Cyprinidae	goldfish	I	-	-	-	-
Cyprinidae	red shiner	N	4,890	87.29	20	100
Cyprinidae	common carp	I	4	0.07	4	20
Cyprinidae	Rio Grande chub	N	-	-	-	-
Cyprinidae	Rio Grande silvery minnow	N	108	1.93	12	60
Cyprinidae	golden shiner	I	-	-	-	-
Cyprinidae	fathead minnow	N	94	1.68	8	40
Cyprinidae	bullhead minnow	I	-	-	-	-
Cyprinidae	flathead chub	N	140	2.5	10	50
Cyprinidae	longnose dace	N	20	0.36	3	15
Catostomidae	river carpsucker	N	92	1.64	7	35
Catostomidae	white sucker	I	88	1.57	8	40
Catostomidae	smallmouth buffalo	N	1	0.02	1	5
Ictaluridae	black bullhead	I	-	-	-	-
Ictaluridae	yellow bullhead	I	-	-	-	-
Ictaluridae	blue catfish	N	4	0.07	3	15
Ictaluridae	channel catfish	I	16	0.29	9	45
Ictaluridae	flathead catfish	N	-	-	-	-
Salmonidae	rainbow trout	I	-	-	-	-
Salmonidae	brown trout	I	-	-	-	-
Poeciliidae	western mosquitofish	I	140	2.5	15	75
Moronidae	white bass	I	-	-	-	-
Moronidae	striped bass	I	-	-	-	-
Centrarchidae	green sunfish	I	-	-	-	-
Centrarchidae	bluegill	N	-	-	-	-
Centrarchidae	longear sunfish	I	-	-	-	-
Centrarchidae	smallmouth bass	I	-	-	-	-
Centrarchidae	largemouth bass	I	-	-	-	-
Centrarchidae	white crappie	I	2	0.04	1	5
Centrarchidae	black crappie	I	-	-	-	-
Percidae	yellow perch	I	-	-	-	-
Percidae	bigscale logperch	I	-	-	-	-
Percidae	walleye	I	-	-	-	-
TOTAL			5,602			

¹ N = native; I = introduced

² Frequency and % frequency of occurrence are based on n=20 sample sites

Table 3. Summary of the monthly 2011/2012 Rio Grande silvery minnow population monitoring program results (species list is based on fish collected since 1993).

FAMILY	SPECIES COMMON NAME	D E C	F E B	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	T O T A L
Clupeidae	gizzard shad	1	-	8	3	-	-	-	-	-	12
Clupeidae	threadfin shad	-	-	-	-	-	-	-	-	-	0
Cyprinidae	central stoneroller	-	-	-	-	-	-	-	-	-	0
Cyprinidae	goldfish	-	-	-	-	-	-	-	-	-	0
Cyprinidae	red shiner	1,876	1,339	2,073	4,890	-	-	-	-	-	10,178
Cyprinidae	common carp	7	1	14	4	-	-	-	-	-	26
Cyprinidae	Rio Grande chub	-	-	-	-	-	-	-	-	-	0
Cyprinidae	Rio Grande silvery minnow	395	201	64	108	-	-	-	-	-	768
Cyprinidae	golden shiner	-	-	-	-	-	-	-	-	-	0
Cyprinidae	fathead minnow	96	4	59	94	-	-	-	-	-	253
Cyprinidae	bullhead minnow	2	-	1	-	-	-	-	-	-	3
Cyprinidae	flathead chub	151	41	83	140	-	-	-	-	-	415
Cyprinidae	longnose dace	2	-	6	20	-	-	-	-	-	28
Catostomidae	river carpsucker	105	10	20	92	-	-	-	-	-	227
Catostomidae	white sucker	-	-	46	88	-	-	-	-	-	134
Catostomidae	smallmouth buffalo	-	-	-	1	-	-	-	-	-	1
Ictaluridae	black bullhead	-	-	-	-	-	-	-	-	-	0
Ictaluridae	yellow bullhead	1	-	1	-	-	-	-	-	-	2
Ictaluridae	blue catfish	-	-	-	4	-	-	-	-	-	4
Ictaluridae	channel catfish	50	26	43	16	-	-	-	-	-	135
Ictaluridae	flathead catfish	-	-	-	-	-	-	-	-	-	0
Salmonidae	rainbow trout	-	-	-	-	-	-	-	-	-	0
Salmonidae	brown trout	-	-	-	-	-	-	-	-	-	0
Poeciliidae	western mosquitofish	126	51	88	140	-	-	-	-	-	405
Moronidae	white bass	-	-	-	-	-	-	-	-	-	0
Moronidae	striped bass	-	-	-	-	-	-	-	-	-	0
Centrarchidae	green sunfish	-	-	-	-	-	-	-	-	-	0
Centrarchidae	bluegill	1	-	3	-	-	-	-	-	-	4
Centrarchidae	longear sunfish	-	-	-	-	-	-	-	-	-	0
Centrarchidae	smallmouth bass	-	-	-	-	-	-	-	-	-	0
Centrarchidae	largemouth bass	-	-	-	-	-	-	-	-	-	0
Centrarchidae	white crappie	-	4	-	2	-	-	-	-	-	6
Centrarchidae	black crappie	-	-	-	-	-	-	-	-	-	0
Percidae	yellow perch	-	-	1	-	-	-	-	-	-	1
Percidae	bigscale logperch	-	-	-	-	-	-	-	-	-	0
Percidae	walleye	-	-	-	-	-	-	-	-	-	0
MONTHLY TOTALS		2,813	1,677	2,510	5,602	0	0	0	0	0	12,602

Table 4. Summary of the monthly catch of Rio Grande silvery minnow, by site and reach, during the 2011/2012 Rio Grande silvery minnow population monitoring program. Numerals in parenthesis are the number of individuals in a site collection that were marked (subset of the total).

REACH	SITE #	SITE NAME	D E C	F E B	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	T O T A L
Angostura	0	Angostura Dam	-	-	1	-	-	-	-	-	-	1
Angostura	1	Bernalillo	-	-	-	-	-	-	-	-	-	0
Angostura	2	Rio Rancho	2	-	3	1	-	-	-	-	-	6
Angostura	3	Central Ave.	1	-	5	2	-	-	-	-	-	8
Angostura	4	Rio Bravo Blvd.	5	-	1	-	-	-	-	-	-	6
Angostura Totals			8	0	10	3	0	0	0	0	0	21
Isleta	5	Los Lunas	13	50	11	4	-	-	-	-	-	78
Isleta	6	Belen	19	5	3	7(1)	-	-	-	-	-	34
Isleta	7	Jarales	46	3	1	2	-	-	-	-	-	52
Isleta	8	Bernardo	9(2)	-	-	-	-	-	-	-	-	9
Isleta	9	La Joya	16(11)	4(4)	1	3(2)	-	-	-	-	-	24
Isleta	9.5	North of San Acacia	38(34)	2(2)	-	-	-	-	-	-	-	40
Isleta Totals			141	64	16	16	0	0	0	0	0	237
San Acacia	10	San Acacia Dam	35(35)	7(7)	-	71(59)	-	-	-	-	-	113
San Acacia	11	South of San Acacia	36(36)	7(7)	26(16)	8(7)	-	-	-	-	-	77
San Acacia	12	Socorro	-	6(5)	-	2	-	-	-	-	-	8
San Acacia	13	North of San Antonio	-	23(23)	-	2(2)	-	-	-	-	-	25
San Acacia	14	San Antonio	-	18(18)	3(2)	-	-	-	-	-	-	21
San Acacia	15	South of San Antonio	5(5)	20(19)	-	3(2)	-	-	-	-	-	28
San Acacia	16	San Marcial	6	7	-	3	-	-	-	-	-	16
San Acacia	17	South of San Marcial 1	91	29(2)	7(2)	-	-	-	-	-	-	127
San Acacia	18	South of San Marcial 2	73(53)	20(2)	2(1)	-	-	-	-	-	-	95
San Acacia Totals			246	137	38	89	0	0	0	0	0	510
MONTHLY TOTALS			395	201	64	108	0	0	0	0	0	768

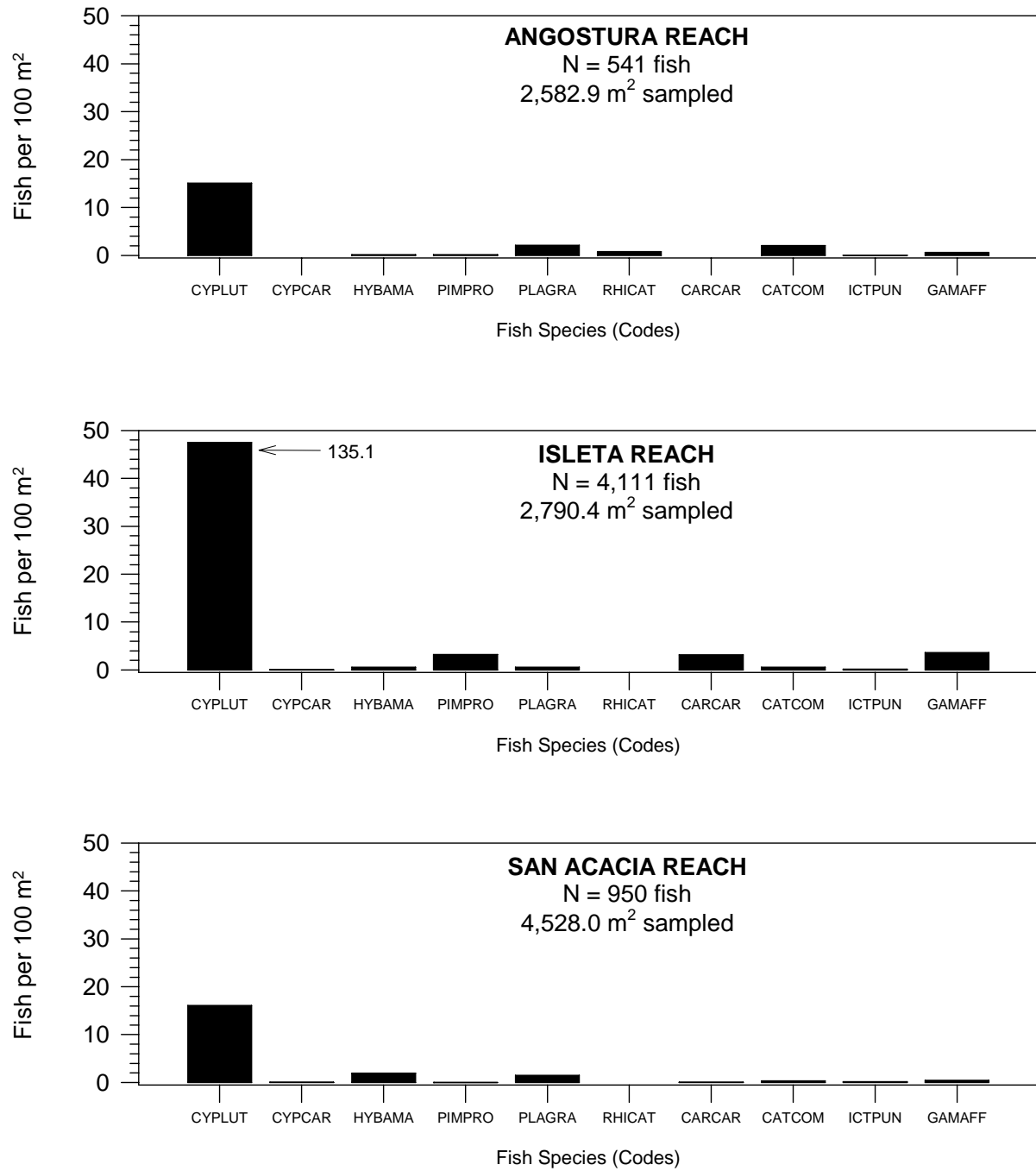


Figure 3. Catch rates, for the 10 focal species, by river reach during May 2012 at Rio Grande silvery minnow population monitoring program collection sites (see Table 1 for fish species codes).

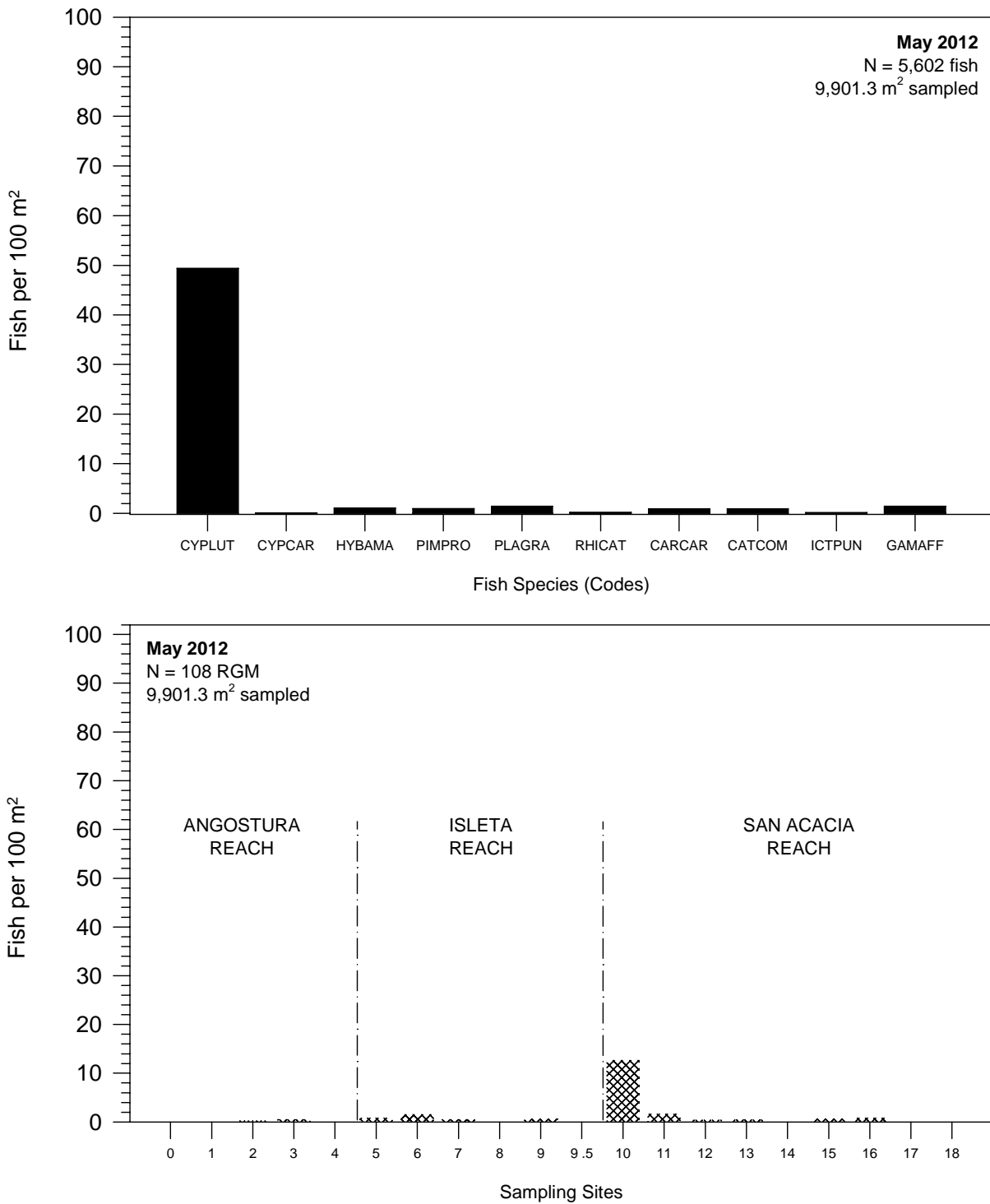


Figure 4. Catch rates for ten focal species (upper graph*), including Rio Grande silvery minnow, (RGM; lower graph*) during May 2012 at Rio Grande silvery minnow population monitoring program collection sites (see Table 1 for fish species codes).

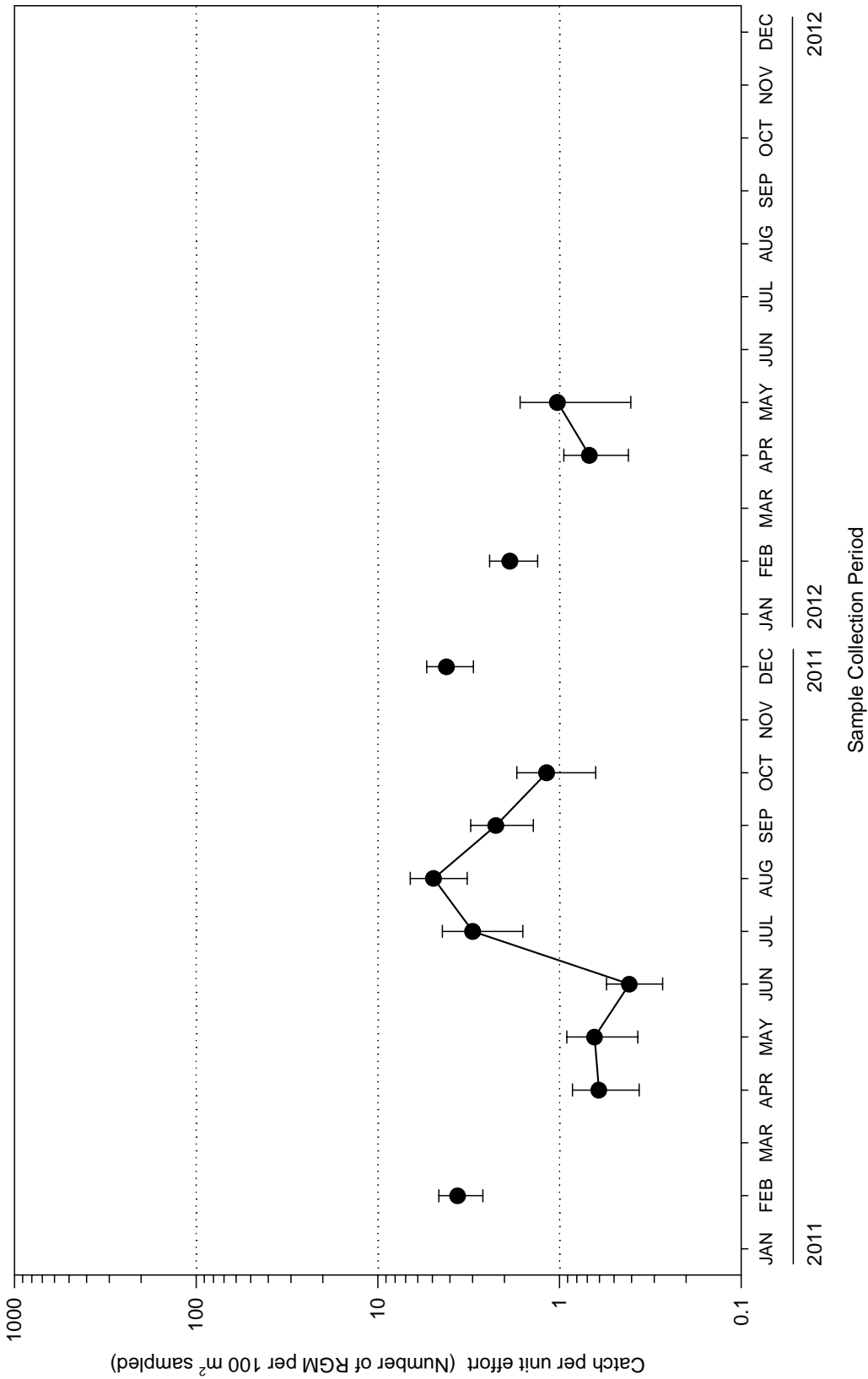


Figure 5. Monthly catch rates of Rio Grande silvery minnow during 2011 and 2012 at Rio Grande silvery minnow population monitoring program collection sites. Solid circles indicate monthly means (n=20 site per month) and capped-bars represent the standard error of the mean.

APPENDIX A.

Collection localities of the Rio Grande silvery minnow population monitoring program.

Table A-1. Collection localities of the Rio Grande silvery minnow population monitoring program.

Site #	Site Locality
ANGOSTURA REACH SITES	
SITE #	
0	New Mexico, Sandoval County, Rio Grande, below Angostura Diversion Dam, Algodones. River Mile 209.7 3916006 N SAN FELIPE PUEBLO QUADRANGLE 363811 E
1	New Mexico, Sandoval County, Rio Grande, at US Highway 550 bridge crossing, (formerly NM State Highway 44 bridge crossing), Bernalillo. River Mile 203.8 3909722 N BERNALILLO QUADRANGLE 358543 E
2	New Mexico, Sandoval County, Rio Grande, ca. 4 miles downstream of US Highway 550 bridge crossing, at Rio Rancho Wastewater Treatment Plant, Rio Rancho. River Mile 200.0 3905355 N BERNALILLO QUADRANGLE 354772 E
3	New Mexico, Bernalillo County, Rio Grande, at Central Avenue (US Highway 66) bridge crossing, Albuquerque. River Mile 183.4 3884094 N ALBUQUERQUE WEST QUADRANGLE 346840 E
4	New Mexico, Bernalillo County, Rio Grande, at Rio Bravo Boulevard bridge crossing, Albuquerque. River Mile 178.3 3877163 N ALBUQUERQUE WEST QUADRANGLE 347554 E
ISLETA REACH SITES	
SITE #	
5	New Mexico, Valencia County, Rio Grande, at Los Lunas (NM State Highway 49) bridge crossing, Los Lunas. River Mile 161.4 3852531 N LOS LUNAS QUADRANGLE 342898 E
6	New Mexico, Valencia County, Rio Grande, ca. 1.0 miles upstream of NM State Highway 309/6 bridge crossing, Belen. River Mile 151.5 3837061 N TOME QUADRANGLE 339972 E
7	New Mexico, Valencia County, Rio Grande, ca. 2.2 miles upstream of NM State Highway 346 bridge crossing (near Transwestern Natural Gas Pipeline crossing), Jarales. River Mile 143.2 3827329 N VEGUITA QUADRANGLE 338136 E

Table A-1. Collection localities of the Rio Grande silvery minnow population monitoring program (continued).

Site #	Site Locality
ISLETA REACH SITES (continued)	
SITE #	
8	New Mexico, Socorro County, Rio Grande, at US Highway 60 bridge crossing, Bernardo. River Mile 130.6 3809726 N ABEYTAS QUADRANGLE 334604 E
9	New Mexico, Socorro County, Rio Grande, ca. 3.5 miles downstream of US Highway 60 bridge crossing, La Joya. River Mile 127.0 3805229 N ABEYTAS QUADRANGLE 331094 E
9.5	New Mexico, Socorro County, Rio Grande, ca. 0.6 miles upstream of San Acacia Diversion Dam, San Acacia. River Mile 116.8 3792603 N LA JOYA QUADRANGLE 327902 E
SAN ACACIA REACH SITES	
SITE #	
10	New Mexico, Socorro County, Rio Grande, directly below San Acacia Diversion Dam, San Acacia. River Mile 116.2 3791977 N SAN ACACIA QUADRANGLE 326162 E
11	New Mexico, Socorro County, Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia. River Mile 114.6 3790442 N LEMITAR QUADRANGLE 325263 E
12	New Mexico, Socorro County, Rio Grande, 0.5 miles upstream of the Low Flow Conveyance Channel bridge, east and upstream of Socorro Wastewater Treatment Plant, Socorro. River Mile 99.5 3771043 N LOMA DE LAS CANAS QUADRANGLE 327097 E
13	New Mexico, Socorro County, Rio Grande, ca. 4.0 miles upstream of US Highway 380 bridge crossing, San Antonio. River Mile 91.7 3761283 N SAN ANTONIO QUADRANGLE 328140 E
14	New Mexico, Socorro County, Rio Grande, at US Highway 380 bridge crossing, San Antonio. River Mile 87.1 3754471 N SAN ANTONIO QUADRANGLE 328914 E

Table A-1. Collection localities of the Rio Grande silvery minnow population monitoring program (continued).

Site #	Site Locality
SAN ACACIA REACH SITES (continued)	
SITE #	
15	New Mexico, Socorro County, Rio Grande, directly east of Bosque del Apache National Wildlife Refuge headquarters, San Antonio. River Mile 79.1 SAN ANTONIO, SE QUADRANGLE 3740839 N 327055 E
16	New Mexico, Socorro County, Rio Grande, at the San Marcial railroad crossing, San Marcial. River Mile 68.6 SAN MARCIAL QUADRANGLE 3728347 N 315284 E
17	New Mexico, Socorro County, Rio Grande, at its former confluence with the Low Flow Conveyance Channel and 16 miles downstream of the southern end of the Bosque del Apache National Wildlife Refuge, San Marcial. River Mile 60.5 PARAJE WELL QUADRANGLE 3718178 N 309487 E
18	New Mexico, Socorro County, Rio Grande, ca. 10 miles downstream of the San Marcial Railroad Bridge crossing, San Marcial. River Mile 58.8 PARAJE WELL QUADRANGLE 3716150 N 307846 E

APPENDIX B.

Ichthyofaunal composition of the May 2012
Rio Grande silvery minnow population monitoring efforts

** Data are provisional and should be verified by direct inspection of field data whenever possible **

**Rio Grande silvery minnow Population Monitoring
May 2012**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage
Rio Grande, directly below Angostura Diversion Dam, Algodones.
02 May 2012 **RKD12-058**

Site Number: 0
River Mile: 209.7

UTM Easting: 363811 UTM Northing: 3916006 Zone: Quad: San Felipe Pueblo
R.K. Dudley, M.A. Farrington, A.M. Snyder, L.M. Strickland

Effort: 529.7 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	42
76	<i>Pimephales promelas</i>	2
76	<i>Rhinichthys cataractae</i>	7
81	<i>Catostomus commersoni</i>	4
212	<i>Gambusia affinis</i>	1

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage
Rio Grande, at US HWY 550 (formerly NM State HWY 44) bridge crossing, Bernalillo.
02 May 2012 **RKD12-059**

Site Number: 1
River Mile: 203.8

UTM Easting: 358543 UTM Northing: 3909722 Zone: Quad: Bernalillo
R.K. Dudley, M.A. Farrington, A.M. Snyder, L.M. Strickland

Effort: 604.8 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	176
76	<i>Platygobio gracilis</i>	8
76	<i>Rhinichthys cataractae</i>	1
81	<i>Catostomus commersoni</i>	9

**Rio Grande silvery minnow Population Monitoring
May 2012**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, ca. 4.0 miles downstream of US HWY 550 (formerly NM State HWY 44)
bridge crossing, at Rio Rancho Wastewater Treatment Plant, Rio Rancho.

Site Number: 2

River Mile: 200.0

02 May 2012

RKD12-060

UTM Easting: 354772 UTM Northing: 3905355 Zone: Quad: Bernalillo

R.K. Dudley, M.A. Farrington, A.M. Snyder, L.M. Strickland

Effort: 474.6 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	90
76	<i>Hybognathus amarus*</i>	1
76	<i>Pimephales promelas</i>	1
76	<i>Platygobio gracilis</i>	17
76	<i>Rhinichthys cataractae</i>	12
81	<i>Catostomus commersoni</i>	30
212	<i>Gambusia affinis</i>	3

*** Hybognathus amarus by age class:**

age-0:

age-1: 1

age-2:

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, at Central Avenue bridge crossing (US HWY 66), Albuquerque.

Site Number: 3

02 May 2012

RKD12-057

River Mile: 183.4

UTM Easting: 346840 UTM Northing: 3884094 Zone: Quad: Albuquerque West

R.K. Dudley, M.A. Farrington, A.M. Snyder, L.M. Strickland

Effort: 446.6 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	47
76	<i>Hybognathus amarus*</i>	2
76	<i>Platygobio gracilis</i>	26
81	<i>Catostomus commersoni</i>	11
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	8

*** Hybognathus amarus by age class:**

age-0:

age-1: 2

age-2:

**Rio Grande silvery minnow Population Monitoring
May 2012**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, at Rio Bravo Blvd. Bridge crossing (NM State HWY 500) crossing,
Albuquerque.

Site Number: 4

River Mile: 178.3

02 May 2012

RKD12-056

UTM Easting: 347554 UTM Northing: 3877163 Zone: Quad: Albuquerque West

R.K. Dudley, M.A. Farrington, A.M. Snyder, L.M. Strickland

Effort: 527.4 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	34
76	<i>Platygobio gracilis</i>	4
212	<i>Gambusia affinis</i>	4

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, at Los Lunas Bridge crossing (NM State HWY 49), Los Lunas.

Site Number: 5

River Mile: 161.4

03 May 2012

RKD12-055

UTM Easting: 342898 UTM Northing: 3852531 Zone: Quad: Los Lunas

M.A. Farrington, S.A. Zipper, S.J. Sasek

Effort: 499.1 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	194
76	<i>Hybognathus amarus*</i>	4
81	<i>Carpoides carpio</i>	2
93	<i>Ictalurus punctatus</i>	3
212	<i>Gambusia affinis</i>	4

*** *Hybognathus amarus* by age class:**

age-0:

age-1: 4

age-2:

**Rio Grande silvery minnow Population Monitoring
May 2012**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, ca. 1.0 miles upstream of NM State HWY 309/6 bridge crossing, Belen.

03 May 2012

RKD12-054

UTM Easting: 339972 UTM Northing: 3837061 Zone: Quad: Tome

M.A. Farrington, S.A. Zipper, S.J. Sasek

Site Number: 6

River Mile: 151.5

Effort: 463.5 sq. m

FAMILY		N
69	<i>Dorosoma cepedianum</i>	1
76	<i>Cyprinella lutrensis</i>	499
76	<i>Cyprinus carpio</i>	1
76	<i>Hybognathus amarus*</i>	7
76	<i>Pimephales promelas</i>	10
81	<i>Carpiodes carpio</i>	78
212	<i>Gambusia affinis</i>	26

*** Hybognathus amarus by age class:**

age-0:

age-1: 7

age-2:

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, ca. 2.2 miles upstream of NM State HWY 346 bridge crossing, Jarales.

03 May 2012

RKD12-053

UTM Easting: 338136 UTM Northing: 3827329 Zone: Quad: Veguita

M.A. Farrington, S.A. Zipper, S.J. Sasek

Site Number: 7

River Mile: 143.2

Effort: 420.1 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	978
76	<i>Hybognathus amarus*</i>	2
76	<i>Pimephales promelas</i>	5
81	<i>Carpiodes carpio</i>	2
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	12

*** Hybognathus amarus by age class:**

age-0:

age-1: 2

age-2:

**Rio Grande silvery minnow Population Monitoring
May 2012**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, at US HWY 60 bridge crossing, Bernardo.

Site Number: 8

03 May 2012

RKD12-052

River Mile: 130.6

UTM Easting: 334604 UTM Northing: 3809726 Zone: Quad: Abeytas

M.A. Farrington, S.A. Zipper, S.J. Sasek

Effort: 406.1 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	948
76	<i>Cyprinus carpio</i>	1
76	<i>Pimephales promelas</i>	19
212	<i>Gambusia affinis</i>	30
294	<i>Pomoxis annularis</i>	2

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, ca. 3.5 miles downstream of the US HWY 60 bridge crossing, Bernardo.

Site Number: 9

03 May 2012

RKD12-051

River Mile: 127.0

UTM Easting: 331094 UTM Northing: 3805229 Zone: Quad: Abeytas

M.A. Farrington, S.A. Zipper, S.J. Sasek

Effort: 491.0 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	1032
76	<i>Hybognathus amarus*</i>	3
76	<i>Pimephales promelas</i>	1
81	<i>Carpoides carpio</i>	7
212	<i>Gambusia affinis</i>	16

***Hybognathus amarus by age class:**

age-0:

age-1: 3

age-2:

**Rio Grande silvery minnow Population Monitoring
May 2012**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, ca. 0.6 miles upstream of San Acacia Diversion Dam, San Acacia

Site Number: 9.5

02 May 2012

RKD12-050

River Mile: 116.8

UTM Easting: 327902 UTM Northing: 3792603 Zone: Quad: La Joya

W.H. Brandenburg, S.A. Zipper, S.J. Sasek

Effort: 510.6 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	120
76	<i>Pimephales promelas</i>	55
76	<i>Platygobio gracilis</i>	16
81	<i>Catostomus commersoni</i>	17
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	14

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, directly below San Acacia Diversion Dam, San Acacia.

Site Number: 10

02 May 2012

RKD12-049

River Mile: 116.2

UTM Easting: 326162 UTM Northing: 3791977 Zone: Quad: San Acacia

W.H. Brandenburg, S.A. Zipper, S.J. Sasek

Effort: 563.2 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	21
76	<i>Hybognathus amarus*</i>	71
76	<i>Platygobio gracilis</i>	46
81	<i>Catostomus commersoni</i>	1
81	<i>Ictiobus bubalus</i>	1
212	<i>Gambusia affinis</i>	8

*** *Hybognathus amarus* by age class:**

age-0:

age-1: 71

age-2:

**Rio Grande silvery minnow Population Monitoring
May 2012**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia.

02 May 2012

RKD12-048

UTM Easting: 325263 UTM Northing: 3790442 Zone: Quad: Lemitar

W.H. Brandenburg, S.A. Zipper, S.J. Sasek

Site Number: 11

River Mile: 114.6

Effort: 495.4 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	109
76	<i>Hybognathus amarus*</i>	8
76	<i>Platygobio gracilis</i>	17
81	<i>Catostomus commersoni</i>	1
93	<i>Ictalurus furcatus</i>	2
93	<i>Ictalurus punctatus</i>	2

*** *Hybognathus amarus* by age class:**

age-0:

age-1: 8

age-2:

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, east of Socorro, 0.5 miles upstream of Socorro Low Flow Conveyance

Channel bridge and east just upstream of Socorro Wastewater Treatment Plant,
Socorro.

02 May 2012

RKD12-047

UTM Easting: 327097 UTM Northing: 3771043 Zone: Quad: Loma de las Canas

W.H. Brandenburg, S.A. Zipper, S.J. Sasek

Site Number: 12

River Mile: 99.5

Effort: 537.5 sq. m

FAMILY		N
69	<i>Dorosoma cepedianum</i>	1
76	<i>Cyprinella lutrensis</i>	293
76	<i>Hybognathus amarus*</i>	2
76	<i>Pimephales promelas</i>	1
81	<i>Carpionodes carpio</i>	1
81	<i>Catostomus commersoni</i>	15
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	10

*** *Hybognathus amarus* by age class:**

age-0:

age-1: 2

age-2:

**Rio Grande silvery minnow Population Monitoring
May 2012**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage
Rio Grande, ca. 4.0 miles upstream of U.S. 380 bridge crossing.

Site Number: 13

02 May 2012

RKD12-046

River Mile: 91.7

UTM Easting: 328140 UTM Northing: 3761283 Zone: Quad: San Antonio

W.H. Brandenburg, S.A. Zipper, S.J. Sasek

Effort: 503.3 sq. m

FAMILY		N
69	<i>Dorosoma cepedianum</i>	1
76	<i>Cyprinella lutrensis</i>	58
76	<i>Hybognathus amarus*</i>	2
76	<i>Platygobio gracilis</i>	3
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	2

*** *Hybognathus amarus* by age class:**

age-0:

age-1: 2

age-2:

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage
Rio Grande, at US HWY 380 bridge crossing, San Antonio.

Site Number: 14

01 May 2012

RKD12-045

River Mile: 87.1

UTM Easting: 328914 UTM Northing: 3754471 Zone: Quad: San Antonio

R.K. Dudley, W.H. Brandenburg, S.J. Sasek

Effort: 512.1 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	16
76	<i>Cyprinus carpio</i>	1
76	<i>Platygobio gracilis</i>	2
93	<i>Ictalurus furcatus</i>	1

**Rio Grande silvery minnow Population Monitoring
May 2012**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, directly east of Bosque del Apache National Wildlife Refuge

Headquarters.

01 May 2012

RKD12-044

UTM Easting: 327055 UTM Northing: 3740839 Zone: Quad: San Antonio SE

R.K. Dudley, W.H. Brandenburg, S.J. Sasek

Site Number: 15

River Mile: 79.1

Effort: 475.6 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	12
76	<i>Hybognathus amarus*</i>	3
81	<i>Carpoides carpio</i>	1
212	<i>Gambusia affinis</i>	1

***Hybognathus amarus by age class:**

age-0:

age-1: 3

age-2:

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, at San Marcial Railroad Bridge, San Marcial.

01 May 2012

RKD12-043

UTM Easting: 315284 UTM Northing: 3728347 Zone: Quad: San Marcial

R.K. Dudley, W.H. Brandenburg, S.J. Sasek

Site Number: 16

River Mile: 68.6

Effort: 382.0 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	132
76	<i>Cyprinus carpio</i>	1
76	<i>Hybognathus amarus*</i>	3
93	<i>Ictalurus furcatus</i>	1
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	1

***Hybognathus amarus by age class:**

age-0:

age-1: 3

age-2:

**Rio Grande silvery minnow Population Monitoring
May 2012**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, ca. 8 miles downstream of the San Marcial railroad bridge crossing

Site Number: 17

01 May 2012

RKD12-042

River Mile: 60.5

UTM Easting: 309487 UTM Northing: 3718178 Zone: Quad: Paraje Well

R.K. Dudley, W.H. Brandenburg, S.J. Sasek

Effort: 538.7 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	57
81	<i>Carpoides carpio</i>	1
93	<i>Ictalurus punctatus</i>	5

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage

Rio Grande, ca. 10 mi downstream of the San Marcial railroad bridge crossing

Site Number: 18

01 May 2012

RKD12-041

River Mile: 58.8

UTM Easting: 307846 UTM Northing: 3716150 Zone: Quad: Paraje Well

R.K. Dudley, W.H. Brandenburg, S.J. Sasek

Effort: 520.2 sq. m

FAMILY		N
76	<i>Cyprinella lutrensis</i>	32
76	<i>Platygobio gracilis</i>	1