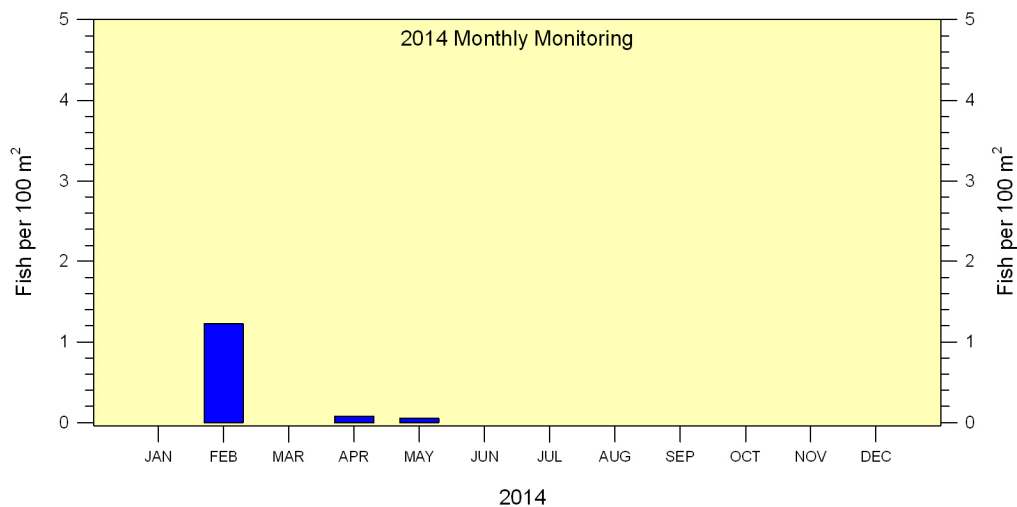
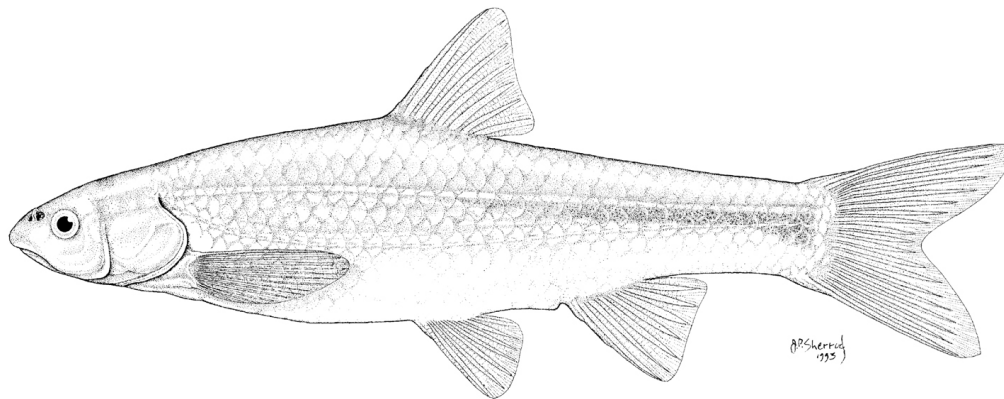


**SUMMARY OF THE RIO GRANDE SILVERY MINNOW
POPULATION MONITORING PROGRAM RESULTS FROM MAY 2014**

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



Robert K. Dudley and Steven P. Platania
American Southwest Ichthyological Researchers, L.L.C.
800 Encino Place, NE Albuquerque, NM 87102-2606

20 June 2014

***SUMMARY OF THE RIO GRANDE SILVERY MINNOW
POPULATION MONITORING PROGRAM RESULTS FROM MAY 2014***

prepared for:

MIDDLE RIO GRANDE ENDANGERED SPECIES COLLABORATIVE PROGRAM

under Contract GS-10F-0249X:

Order R14PD00314

U.S. Bureau of Reclamation
Albuquerque Area Office
555 Broadway NE, Suite 100
Albuquerque, NM 87102-2352

prepared by:

Robert K. Dudley and Steven P. Platania
American Southwest Ichthyological Researchers, L.L.C.
800 Encino Place, NE Albuquerque, NM 87102-2606

submitted to:

U. S. Bureau of Reclamation
555 Broadway NE, Suite 100
Albuquerque, NM 87102-2352

20 June 2014

SUMMARY OF OVERALL MAY 2014 POPULATION MONITORING EFFORTS

The May population monitoring efforts were 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. From April through October, larval fish were also 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 fish densities (i.e., fish per 100 m²) were prepared for the ten focal species, including Rio Grande Silvery Minnow, to facilitate comparisons among reaches.

During May, sampling covered 10,332.7 m² (surface area) of water and yielded 4,135 fish. Cumulative fish density during May was 40.0 individuals/100 m² sampled. The three most common species were Red Shiner (n = 3,471), White Sucker (n = 310), and Flathead Chub (n = 109). A total of 13 fish species was collected from the 20 sampling sites. Rio Grande Silvery Minnow was present in 5 of the 282 seine hauls that yielded fish during May, as compared with 8 of the 209 seine hauls that yielded fish during April. The density of Rio Grande Silvery Minnow was 0.05 individuals/100 m² sampled (n = 5 {100% stocked}) and this species composed 0.1% of the total number of fish collected during May.

SUMMARY OF MAY 2014 POPULATION MONITORING EFFORT BY RIVER REACH

Angostura Reach

Mean daily discharge in the Angostura Reach (Rio Grande at Albuquerque, NM; USGS Gauge 8330000) averaged 1,336.6 and ranged from 884 to 2,210 cfs from 16 April to 15 May. Water temperatures were modest and stable (range = 12.6–14.6 °C) during the Angostura Reach sampling efforts (ca. 0830–1430 h). The water clarity was low throughout the reach; Secchi disk measurements ranged from 16 to 39 cm.

Sampling for fishes in the Angostura Reach during May yielded 531 individuals with a cumulative fish density of 20.4 individuals/100 m² sampled. The overall sampling effort in the Angostura Reach covered 2,596.9 m² (surface area) of water. Densities in the Angostura Reach, for all fish species combined, ranged from 3.0 to 40.4 individuals per 100 m² at the five sampling sites. In May, species richness (n = 7) was modest in the Angostura Reach. White Sucker was the most abundant taxon (n = 258), followed by Red Shiner (n = 106), and Flathead Chub (n = 68). Rio Grande Silvery Minnow was present in 0 of the 48 seine hauls that yielded fish during May. Densities of Rio Grande Silvery Minnow ranged from 0.0 to 0.0 individuals per 100 m² at the five sampling sites.

Isleta Reach

In the Isleta Reach, mean daily discharge (Rio Grande at Isleta Lakes near Isleta, NM; USGS Gauge 08354900) averaged 795.7 and ranged from 504 to 1,570 cfs from 16 April to 15 May. Water temperatures ranged from 15.7 to 23.2 °C throughout the sampling localities during the day (ca. 0930–1600 h). The water was turbid throughout portions of the reach; Secchi disk readings ranged from 10 to 14 cm during sampling.

Isleta Reach population monitoring efforts produced 2,207 individuals in May with a cumulative fish density of 71.8 individuals/100 m² sampled. The total sampling effort in the Isleta Reach during May

covered 3,074.4 m² (surface area) of water. Fish densities (all species combined) at the six sites ranged from 4.2 to 124.5 individuals per 100 m² sampled. In May, species richness (n = 10) was modest in the Isleta Reach. Red Shiner was the most abundant taxon (n = 2,143), followed by Western Mosquitofish (n = 22), and Fathead Minnow (n = 12). Rio Grande Silvery Minnow was present in 2 of the 102 seine hauls that yielded fish during May. Densities of Rio Grande Silvery Minnow ranged from 0.0 to 0.4 individuals per 100 m² at the six sampling sites.

San Acacia Reach

Mean daily discharge at San Acacia (Rio Grande Floodway at San Acacia, NM; USGS Gauge 08354900) from 16 April to 15 May was generally higher (average = 365.9; range = 174 to 1,140 cfs) as compared to San Marcial (Rio Grande Floodway at San Marcial, NM; USGS Gauge 08358400) during the same period (average = 165.4; range = 51 to 906 cfs). Water temperatures in May for the San Acacia Reach ranged from 17.9 to 25.6 °C (ca. 0930–1500 h). Water turbidity was elevated throughout the reach (Secchi disk range = 8 to 10 cm).

Population monitoring efforts in the San Acacia Reach during May yielded 1,397 individuals with a cumulative fish density of 30.0 individuals/100 m² sampled. Sampling in the San Acacia Reach covered an area of 4,661.4 m² of water during May. Fish densities (all species combined) ranged from 1.6 to 56.6 individuals per 100 m² at the nine sites sampled in the San Acacia Reach. In May, species richness (n = 12) was modest in the Isleta Reach. Red Shiner was the most abundant taxon (n = 1,222), followed by Channel Catfish (n = 50), and White Sucker (n = 41). Rio Grande Silvery Minnow was present in 3 of the 132 seine hauls that yielded fish during May. Densities of Rio Grande Silvery Minnow ranged from 0.0 to 0.4 individuals per 100 m² at the nine sampling sites.

CONCLUSIONS

The addition of large numbers of hatchery-reared Rio Grande Silvery Minnow in the autumn of 2013 (ca. 290,000; Thomas P. Archdeacon, New Mexico Fish and Wildlife Conservation Office, pers. comm.) resulted in relatively high densities of this species during February 2014. However, Rio Grande Silvery Minnow was notably less common by April 2014. During the May sampling effort, Rio Grande Silvery Minnow was present at 3 of the 20 sampling sites in the Middle Rio Grande, New Mexico. No wild Rio Grande Silvery Minnow were collected during May. With the addition of large numbers of hatchery-reared Rio Grande silvery minnow in 2013, there should have presumably been adequate numbers of individuals for spawning in 2014. However, the total overwinter mortality for the current population of Rio Grande Silvery Minnow, which seems to be composed mostly of hatchery-reared individuals, appears to have resulted in substantial losses of individuals. It is uncertain how well Rio Grande Silvery Minnow will rebound following spawning this year. However, managed flow increases during May could result in more favorable conditions for spawning and early recruitment of Rio Grande Silvery Minnow in 2014 as compared to other recent years (e.g., 2011–2013).

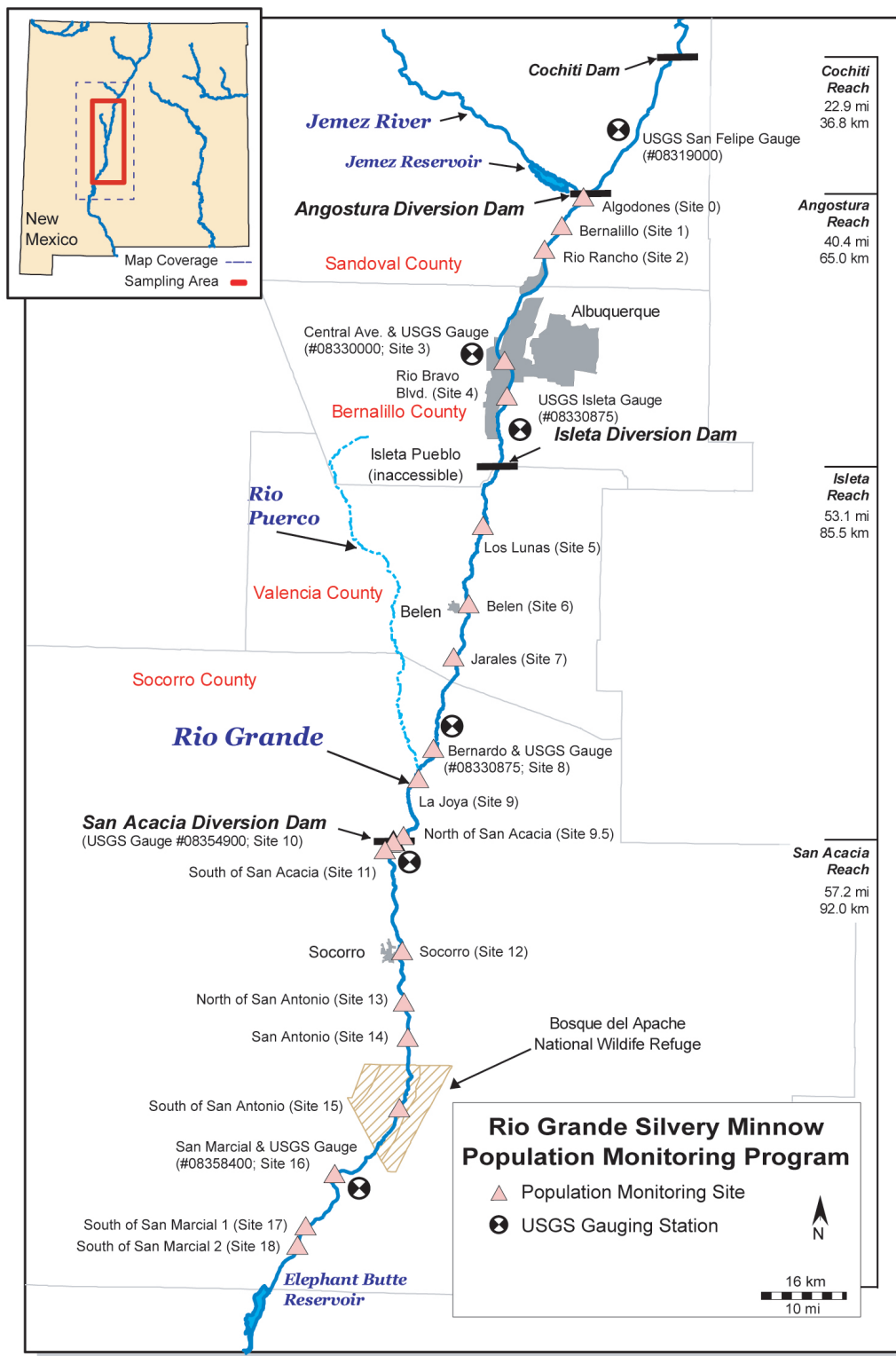


Figure 1. Map of the study area and sampling localities (numbered) for the Rio Grande Silvery Minnow population monitoring program. Sampling locality information that corresponds with the numbered localities is provided in Appendix A (Table A-1).

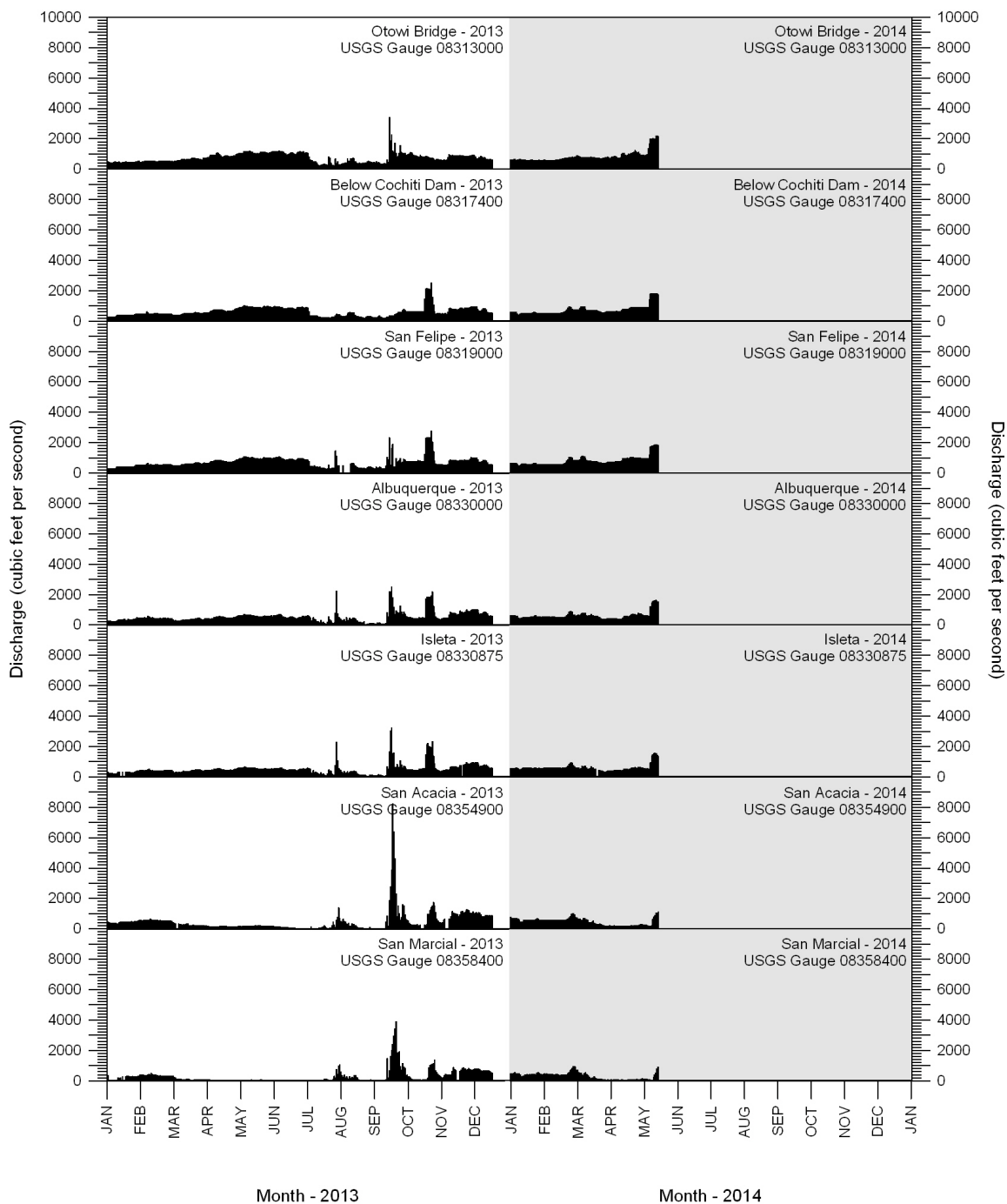


Figure 2. Discharge in the Rio Grande from 1 January 2013 through 15 May 2014 as recorded at seven U. S. Geological Survey (USGS) gauge stations. The Otowi Bridge gauge site is outside of the study area (ca. 25.5 river miles upstream of Cochiti Dam) and provided for reference. **Discharge data are provisional 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>Carpodes 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)
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 2014 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	1	0.02	1	5
Clupeidae	Threadfin Shad	I	-	-	-	-
Cyprinidae	Central Stoneroller	I	-	-	-	-
Cyprinidae	Goldfish	I	-	-	-	-
Cyprinidae	Red Shiner	N	3,471	83.94	20	100
Cyprinidae	Common Carp	I	9	0.22	7	35
Cyprinidae	Rio Grande Chub	N	-	-	-	-
Cyprinidae	Rio Grande Silvery Minnow	N	5	0.12	3	15
Cyprinidae	Golden Shiner	I	-	-	-	-
Cyprinidae	Fathead Minnow	N	52	1.26	9	45
Cyprinidae	Bullhead Minnow	I	2	0.05	1	5
Cyprinidae	Flathead Chub	N	109	2.64	13	65
Cyprinidae	Longnose Dace	N	62	1.50	4	20
Catostomidae	River Carpsucker	N	10	0.24	5	25
Catostomidae	White Sucker	I	310	7.50	12	60
Catostomidae	Smallmouth Buffalo	N	-	-	-	-
Ictaluridae	Black Bullhead	I	-	-	-	-
Ictaluridae	Yellow Bullhead	I	1	0.02	1	5
Ictaluridae	Blue Catfish	N	-	-	-	-
Ictaluridae	Channel Catfish	I	59	1.43	8	40
Ictaluridae	Flathead Catfish	N	-	-	-	-
Salmonidae	Rainbow Trout	I	-	-	-	-
Salmonidae	Brown Trout	I	-	-	-	-
Poeciliidae	Western Mosquitofish	I	44	1.06	7	35
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	-	-	-	-
Centrarchidae	Black Crappie	I	-	-	-	-
Percidae	Yellow Perch	I	-	-	-	-
Percidae	Bigscale Logperch	I	-	-	-	-
Percidae	Walleye	I	-	-	-	-

¹ N = native; I = introduced

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

Table 3. Summary of the monthly catch of all fish species during 2014 (species list is based on fish collected since 1993).

FAMILY	SPECIES COMMON NAME	F E B	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	D E C	T O T A L
Clupeidae	Gizzard Shad	-	2	1	-	-	-	-	-	-	3
Clupeidae	Threadfin Shad	-	-	-	-	-	-	-	-	-	0
Cyprinidae	Central Stoneroller	-	-	-	-	-	-	-	-	-	0
Cyprinidae	Goldfish	-	-	-	-	-	-	-	-	-	0
Cyprinidae	Red Shiner	2,603	4,650	3,471	-	-	-	-	-	-	10,724
Cyprinidae	Common Carp	3	1	9	-	-	-	-	-	-	13
Cyprinidae	Rio Grande Chub	-	-	-	-	-	-	-	-	-	0
Cyprinidae	Rio Grande Silvery Minnow	142	8	5	-	-	-	-	-	-	155
Cyprinidae	Golden Shiner	-	-	-	-	-	-	-	-	-	0
Cyprinidae	Fathead Minnow	108	21	52	-	-	-	-	-	-	181
Cyprinidae	Bullhead Minnow	5	2	2	-	-	-	-	-	-	9
Cyprinidae	Flathead Chub	41	17	109	-	-	-	-	-	-	167
Cyprinidae	Longnose Dace	-	2	62	-	-	-	-	-	-	64
Catostomidae	River Carpsucker	9	5	10	-	-	-	-	-	-	24
Catostomidae	White Sucker	1	2	310	-	-	-	-	-	-	313
Catostomidae	Smallmouth Buffalo	-	-	-	-	-	-	-	-	-	0
Ictaluridae	Black Bullhead	-	-	-	-	-	-	-	-	-	0
Ictaluridae	Yellow Bullhead	-	-	1	-	-	-	-	-	-	1
Ictaluridae	Blue Catfish	-	-	-	-	-	-	-	-	-	0
Ictaluridae	Channel Catfish	7	5	59	-	-	-	-	-	-	71
Ictaluridae	Flathead Catfish	-	-	-	-	-	-	-	-	-	0
Salmonidae	Rainbow Trout	-	-	-	-	-	-	-	-	-	0
Salmonidae	Brown Trout	-	-	-	-	-	-	-	-	-	0
Poeciliidae	Western Mosquitofish	24	54	44	-	-	-	-	-	-	122
Moronidae	White Bass	5	-	-	-	-	-	-	-	-	5
Moronidae	Striped Bass	-	-	-	-	-	-	-	-	-	0
Centrarchidae	Green Sunfish	-	-	-	-	-	-	-	-	-	0
Centrarchidae	Bluegill	-	-	-	-	-	-	-	-	-	0
Centrarchidae	Longear Sunfish	-	-	-	-	-	-	-	-	-	0
Centrarchidae	Smallmouth Bass	-	-	-	-	-	-	-	-	-	0
Centrarchidae	Largemouth Bass	-	-	-	-	-	-	-	-	-	0
Centrarchidae	White Crappie	1	2	-	-	-	-	-	-	-	3
Centrarchidae	Black Crappie	-	-	-	-	-	-	-	-	-	0
Percidae	Yellow Perch	-	-	-	-	-	-	-	-	-	0
Percidae	Bigscale Logperch	1	-	-	-	-	-	-	-	-	1
Percidae	Walleye	-	-	-	-	-	-	-	-	-	0
MONTHLY TOTALS		2,950	4,771	4,135	0	0	0	0	0	0	11,856

Table 4. Summary of the monthly catch of Rio Grande Silvery Minnow, by site and reach, during 2014. All marked individuals at a site are shown in parentheses (subset of the total).

REACH	SITE #	SITE NAME	F E B	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	D E C	T O T A L
Angostura	0	Angostura Dam	-	-	-	-	-	-	-	-	-	0
Angostura	1	Bernalillo	-	-	-	-	-	-	-	-	-	0
Angostura	2	Rio Rancho	-	-	-	-	-	-	-	-	-	0
Angostura	3	Central Ave.	1(1)	-	-	-	-	-	-	-	-	1
Angostura	4	Rio Bravo Blvd.	3(3)	-	-	-	-	-	-	-	-	3
Angostura Totals			4	0	0	0	0	0	0	0	0	4
Isleta	5	Los Lunas	2(2)	-	2(2)	-	-	-	-	-	-	4
Isleta	6	Belen	9(9)	-	-	-	-	-	-	-	-	9
Isleta	7	Jarales	1(1)	-	-	-	-	-	-	-	-	1
Isleta	8	Bernardo	10(10)	1(1)	-	-	-	-	-	-	-	11
Isleta	9	La Joya	2(2)	-	-	-	-	-	-	-	-	2
Isleta	9.5	North of San Acacia	2(2)	-	-	-	-	-	-	-	-	2
Isleta Totals			26	1	2	0	0	0	0	0	0	29
San Acacia	10	San Acacia Dam	14(14)	4(2)	2(2)	-	-	-	-	-	-	20
San Acacia	11	South of San Acacia	29(28)	2(1)	1(1)	-	-	-	-	-	-	32
San Acacia	12	Socorro	27(26)	1(0)	-	-	-	-	-	-	-	28
San Acacia	13	North of San Antonio	8(8)	-	-	-	-	-	-	-	-	8
San Acacia	14	San Antonio	9(8)	-	-	-	-	-	-	-	-	9
San Acacia	15	South of San Antonio	-	-	-	-	-	-	-	-	-	0
San Acacia	16	San Marcial	1(1)	-	-	-	-	-	-	-	-	1
San Acacia	17	South of San Marcial 1	15(14)	-	-	-	-	-	-	-	-	15
San Acacia	18	South of San Marcial 2	9(8)	-	-	-	-	-	-	-	-	9
San Acacia Totals			112	7	3	0	0	0	0	0	0	122
MONTHLY TOTALS			142	8	5	0	0	0	0	0	0	155

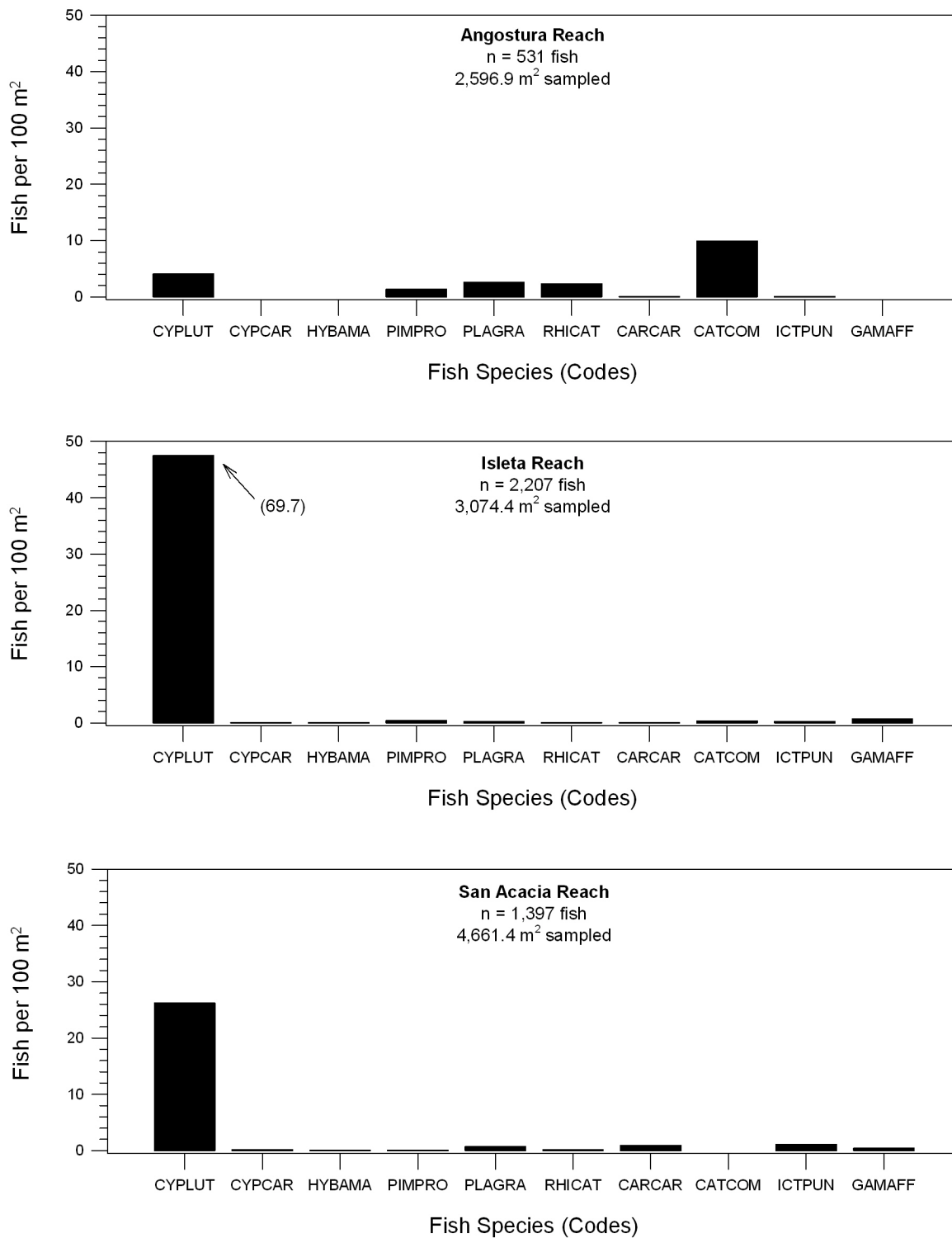


Figure 3. Fish densities from May 2014 for each focal species in the three reaches of the Middle Rio Grande (see Table 1 for fish species codes).

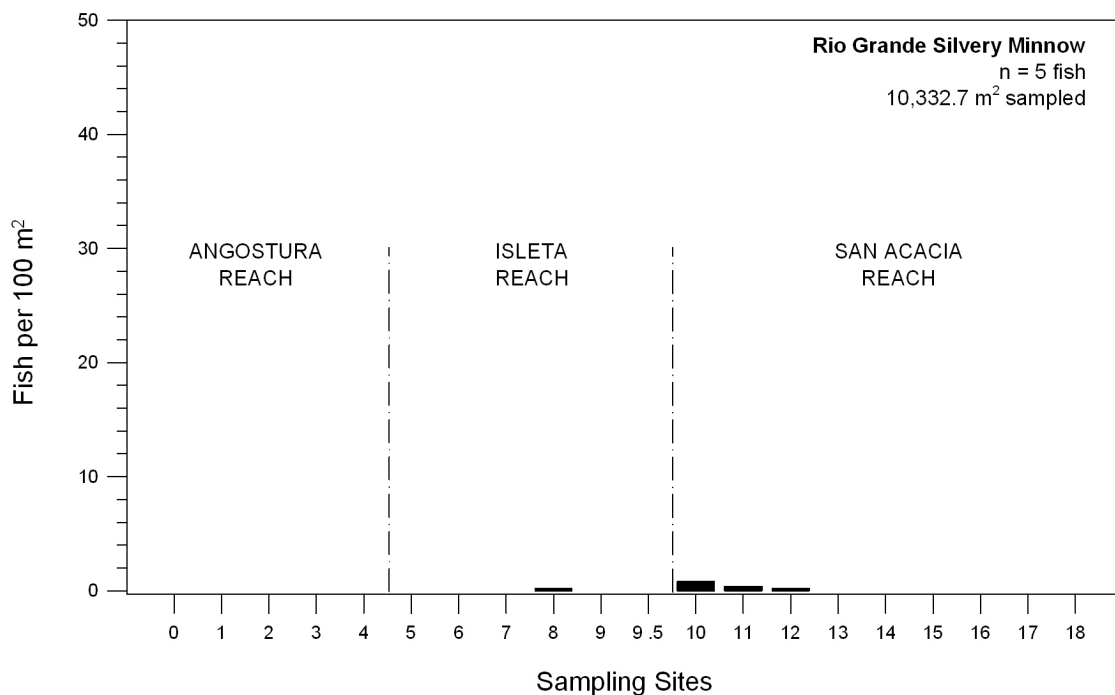
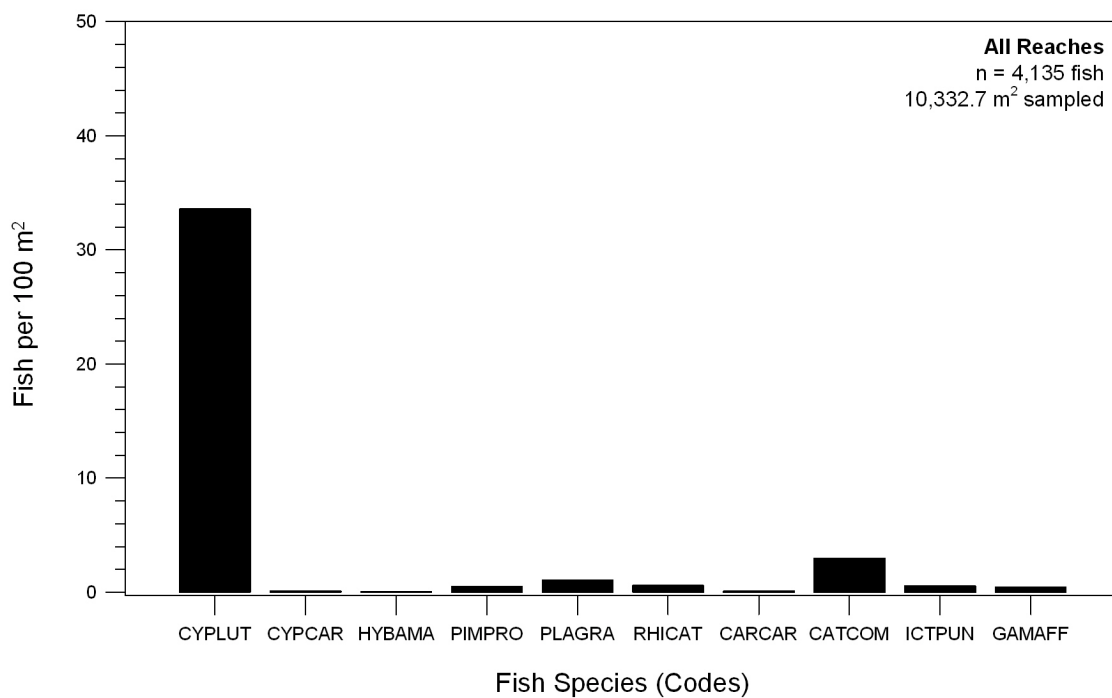


Figure 4. Catch rates for ten focal species, including Rio Grande Silvery Minnow, during May 2014 at Rio Grande Silvery Minnow population monitoring program collection sites (see Table 1 for fish species codes).

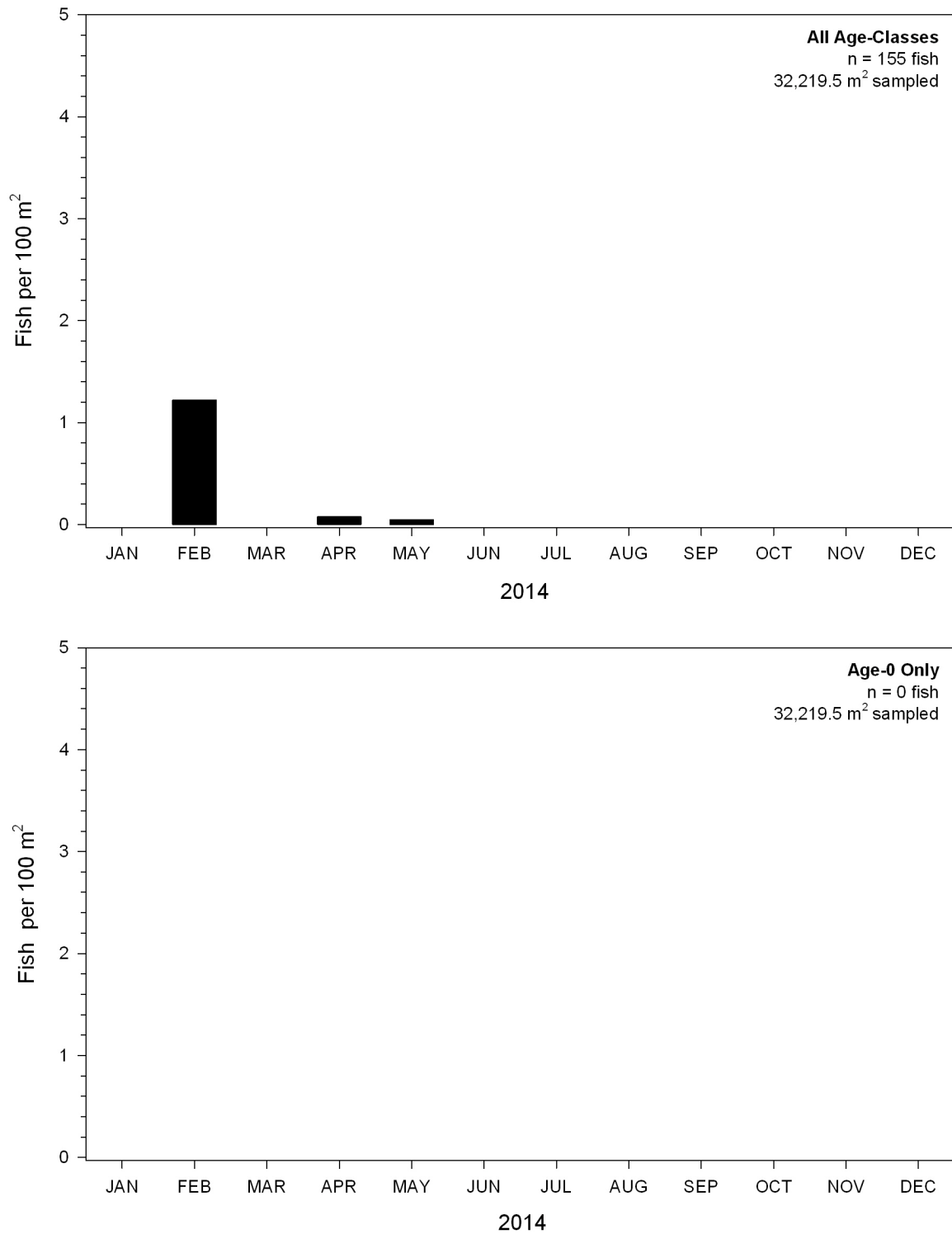


Figure 5. Inter-month fluctuations in densities of Rio Grande Silvery Minnow (all age-classes and age-0 only) during 2014.

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 2014 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 2014**

NEW MEXICO: SANDOVAL Co., RIO GRANDE Drainage
Rio Grande, directly below Angostura Diversion Dam, Algodones.

RKD14-058

Site Number: 0 River Mile: 209.7 07 May 2014
UTM Easting: 363811 UTM Northing: 3916006 Zone: 13 Quad: San Felipe Pueblo
M.A. Farrington, J.L. Kennedy, A.L. Fitzgerald Effort: 499.0 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	7
76	<i>Pimephales promelas</i>	2
76	<i>Rhinichthys cataractae</i>	3
81	<i>Catostomus commersonii</i>	3

NEW MEXICO: SANDOVAL Co., RIO GRANDE Drainage
Rio Grande, at US HWY 550 (formerly NM State HWY 44) bridge crossing, Bernalillo.

RKD14-059

Site Number: 1 River Mile: 203.8 07 May 2014
UTM Easting: 358543 UTM Northing: 3909722 Zone: 13 Quad: Bernalillo
M.A. Farrington, J.L. Kennedy, A.L. Fitzgerald Effort: 554.3 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	1
76	<i>Platygobio gracilis</i>	19
76	<i>Rhinichthys cataractae</i>	55
81	<i>Catostomus commersonii</i>	149

**Rio Grande silvery minnow Population Monitoring
May 2014**

NEW MEXICO: SANDOVAL Co., RIO GRANDE Drainage **RKD14-060**
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 07 May 2014
UTM Easting: 354772 UTM Northing: 3905355 Zone: 13 Quad: Bernalillo
M.A. Farrington, J.L. Kennedy, A.L. Fitzgerald Effort: 476.4 sq. m

<u>FAMILY</u>	<u>N</u>
76 <i>Cyprinella lutrensis</i>	20
76 <i>Pimephales promelas</i>	14
76 <i>Platygobio gracilis</i>	29
81 <i>Catostomus commersonii</i>	94
93 <i>Ictalurus punctatus</i>	1

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage **RKD14-057**
Rio Grande, at Central Avenue bridge crossing (US HWY 66), Albuquerque.

Site Number: 3 River Mile: 183.4 07 May 2014
UTM Easting: 346840 UTM Northing: 3884094 Zone: 13 Quad: Albuquerque West
M.A. Farrington, J.L. Kennedy, A.L. Fitzgerald Effort: 553.6 sq. m

<u>FAMILY</u>	<u>N</u>
76 <i>Cyprinella lutrensis</i>	60
76 <i>Pimephales promelas</i>	18
76 <i>Platygobio gracilis</i>	18
76 <i>Rhinichthys cataractae</i>	3
81 <i>Carpionodes carpio</i>	1
81 <i>Catostomus commersonii</i>	10
93 <i>Ictalurus punctatus</i>	1

**Rio Grande silvery minnow Population Monitoring
May 2014**

NEW MEXICO: BERNALILLO Co., RIO GRANDE Drainage **RKD14-056**

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

Site Number: 4 River Mile: 178.3 07 May 2014
UTM Easting: 347554 UTM Northing: 3877163 Zone: 13 Quad: Albuquerque West
M.A. Farrington, J.L. Kennedy, A.L. Fitzgerald Effort: 513.7 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	18
76	<i>Pimephales promelas</i>	1
76	<i>Platygobio gracilis</i>	2
81	<i>Catostomus commersonii</i>	2

NEW MEXICO: VALENCIA Co., RIO GRANDE Drainage **RKD14-055**

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

Site Number: 5 River Mile: 161.4 06 May 2014
UTM Easting: 342898 UTM Northing: 3852531 Zone: 13 Quad: Los Lunas
R.K. Dudley, J.L. Kennedy, A.L. Fitzgerald Effort: 519.8 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	405
76	<i>Cyprinus carpio</i>	1
76	<i>Hybognathus amarus*</i>	2
81	<i>Carpoides carpio</i>	1
212	<i>Gambusia affinis</i>	1

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

age-0:
age-1: 2
age-2:

**Rio Grande silvery minnow Population Monitoring
May 2014**

NEW MEXICO: VALENCIA Co., RIO GRANDE Drainage
Rio Grande, ca. 1.0 miles upstream of NM State HWY 309/6 bridge crossing, Belen.

RKD14-054

Site Number: 6 River Mile: 151.5
UTM Easting: 339972 UTM Northing: 3837061 Zone: 13 Quad: Tome
R.K. Dudley, J.L. Kennedy, A.L. Fitzgerald

06 May 2014

Effort: 472.2 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	565
76	<i>Pimephales promelas</i>	8
81	<i>Catostomus commersonii</i>	1
93	<i>Ictalurus punctatus</i>	3
212	<i>Gambusia affinis</i>	11

NEW MEXICO: VALENCIA Co., RIO GRANDE Drainage
Rio Grande, ca. 2.2 miles upstream of NM State HWY 346 bridge crossing, Jarales.

RKD14-053

Site Number: 7 River Mile: 143.2
UTM Easting: 338136 UTM Northing: 3827329 Zone: 13 Quad: Veguita
R.K. Dudley, J.L. Kennedy, A.L. Fitzgerald

06 May 2014

Effort: 541.3 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	384
76	<i>Cyprinus carpio</i>	1
81	<i>Catostomus commersonii</i>	3
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	1

**Rio Grande silvery minnow Population Monitoring
May 2014**

NEW MEXICO: SOCORRO Co., RIO GRANDE Drainage
Rio Grande, at US HWY 60 bridge crossing, Bernardo.

RKD14-052

Site Number: 8 River Mile: 130.6
UTM Easting: 334604 UTM Northing: 3809726 Zone: 13 Quad: Abeytas
R.K. Dudley, J.L. Kennedy, A.L. Fitzgerald

06 May 2014

Effort: 491.8 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	474
76	<i>Pimephales promelas</i>	4
212	<i>Gambusia affinis</i>	7

NEW MEXICO: SOCORRO Co., RIO GRANDE Drainage
Rio Grande, ca. 3.5 miles downstream of the US HWY 60 bridge crossing, Bernardo.

RKD14-051

Site Number: 9 River Mile: 127.0
UTM Easting: 331094 UTM Northing: 3805229 Zone: 13 Quad: Abeytas
R.K. Dudley, J.L. Kennedy, A.L. Fitzgerald

06 May 2014

Effort: 496.2 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	311

Rio Grande silvery minnow Population Monitoring May 2014

NEW MEXICO: SOCORRO Co., RIO GRANDE Drainage
 Rio Grande, ca. 0.6 miles upstream of San Acacia Diversion Dam, San Acacia

RKD14-050

Site Number: 9.5 River Mile: 116.8 05 May 2014
 UTM Easting: 327902 UTM Northing: 3792603 Zone: 13 Quad: La Joya
 R.K. Dudley, J.L. Kennedy, A.L. Barkalow Effort: 553.2 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	4
76	<i>Platygobio gracilis</i>	6
76	<i>Rhinichthys cataractae</i>	1
81	<i>Catostomus commersonii</i>	7
93	<i>Ictalurus punctatus</i>	3
212	<i>Gambusia affinis</i>	2

NEW MEXICO: SOCORRO Co., RIO GRANDE Drainage
 Rio Grande, directly below San Acacia Diversion Dam, San Acacia.

RKD14-049

Site Number: 10 River Mile: 116.2 05 May 2014
 UTM Easting: 326162 UTM Northing: 3791977 Zone: 13 Quad: San Acacia
 R.K. Dudley, J.L. Kennedy, A.L. Barkalow Effort: 497.2 sq. m

<u>FAMILY</u>		<u>N</u>
69	<i>Dorosoma cepedianum</i>	1
76	<i>Cyprinella lutrensis</i>	195
76	<i>Hybognathus amarus*</i>	2
76	<i>Pimephales promelas</i>	1
76	<i>Platygobio gracilis</i>	12
81	<i>Carpoides carpio</i>	1
81	<i>Catostomus commersonii</i>	9
93	<i>Ameiurus natalis</i>	1
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	17

* *Hybognathus amarus* by age class:

age-0:
 age-1: 2
 age-2:

**Rio Grande silvery minnow Population Monitoring
May 2014**

NEW MEXICO: SOCORRO Co., RIO GRANDE Drainage
Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia.

RKD14-048

Site Number: 11 River Mile: 114.6
UTM Easting: 325263 UTM Northing: 3790442 Zone: 13 Quad: Lemitar
R.K. Dudley, J.L. Kennedy, A.L. Barkalow

05 May 2014
Effort: 568.6 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	123
76	<i>Hybognathus amarus</i> *	1
76	<i>Pimephales promelas</i>	3
76	<i>Platygobio gracilis</i>	8
81	<i>Catostomus commersonii</i>	30
212	<i>Gambusia affinis</i>	5

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

age-0:
age-1: 1
age-2:

NEW MEXICO: SOCORRO 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.

RKD14-047

Site Number: 12 River Mile: 99.5
UTM Easting: 327097 UTM Northing: 3771043 Zone: 13 Quad: Loma de las Canas
R.K. Dudley, J.L. Kennedy, A.L. Barkalow

05 May 2014
Effort: 497.6 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	8

**Rio Grande silvery minnow Population Monitoring
May 2014**

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

RKD14-046

Site Number: 13 River Mile: 91.7 05 May 2014
UTM Easting: 328140 UTM Northing: 3761283 Zone: 13 Quad: San Antonio
R.K. Dudley, J.L. Kennedy, A.L. Barkalow Effort: 499.0 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	70
76	<i>Cyprinus carpio</i>	1
76	<i>Platygobio gracilis</i>	1

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

RKD14-045

Site Number: 14 River Mile: 87.1 05 May 2014
UTM Easting: 328914 UTM Northing: 3754471 Zone: 13 Quad: San Antonio
W.H. Brandenburg, M.A. Farrington, A.L. Fitzgerald Effort: 534.9 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	103
76	<i>Platygobio gracilis</i>	4
81	<i>Catostomus commersonii</i>	1

NEW MEXICO: SOCORRO Co., RIO GRANDE Drainage
Rio Grande, directly east of Bosque del Apache National Wildlife Refuge Headquarters.

RKD14-044

Site Number: 15 River Mile: 79.1 05 May 2014
UTM Easting: 327055 UTM Northing: 3740839 Zone: 13 Quad: San Antonio SE
W.H. Brandenburg, M.A. Farrington, A.L. Fitzgerald Effort: 509.4 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	39
76	<i>Cyprinus carpio</i>	2
76	<i>Platygobio gracilis</i>	4

**Rio Grande silvery minnow Population Monitoring
May 2014**

NEW MEXICO: SOCORRO Co., RIO GRANDE Drainage
Rio Grande, at San Marcial Railroad Bridge, San Marcial.

RKD14-043

Site Number: 16 River Mile: 68.6 05 May 2014
UTM Easting: 315284 UTM Northing: 3728347 Zone: 13 Quad: San Marcial
W.H. Brandenburg, M.A. Farrington, A.L. Fitzgerald Effort: 503.5 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	275
76	<i>Cyprinus carpio</i>	1
76	<i>Platygobio gracilis</i>	4
81	<i>Carpoides carpio</i>	5

NEW MEXICO: SOCORRO Co., RIO GRANDE Drainage
Rio Grande, ca. 8 miles downstream of the San Marcial railroad bridge crossing

RKD14-042

Site Number: 17 River Mile: 60.5 05 May 2014
UTM Easting: 309487 UTM Northing: 3718178 Zone: 13 Quad: Paraje Well
W.H. Brandenburg, M.A. Farrington, A.L. Fitzgerald Effort: 533.7 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	217
76	<i>Cyprinus carpio</i>	1
76	<i>Pimephales promelas</i>	1
76	<i>Platygobio gracilis</i>	1
81	<i>Catostomus commersonii</i>	1
93	<i>Ictalurus punctatus</i>	1

**Rio Grande silvery minnow Population Monitoring
May 2014**

NEW MEXICO: SOCORRO Co., RIO GRANDE Drainage
Rio Grande, ca. 10 mi downstream of the San Marcial railroad bridge crossing

RKD14-041

Site Number: 18 River Mile: 58.8 05 May 2014
UTM Easting: 307846 UTM Northing: 3716150 Zone: 13 Quad: Paraje Well
W.H. Brandenburg, M.A. Farrington, A.L. Fitzgerald Effort: 517.7 sq. m

<u>FAMILY</u>		<u>N</u>
76	<i>Cyprinella lutrensis</i>	192
76	<i>Cyprinus carpio</i>	2
76	<i>Pimephales vigilax</i>	2
76	<i>Platygobio gracilis</i>	1
81	<i>Carpionodes carpio</i>	2
93	<i>Ictalurus punctatus</i>	48