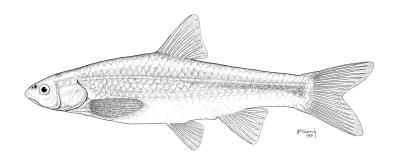
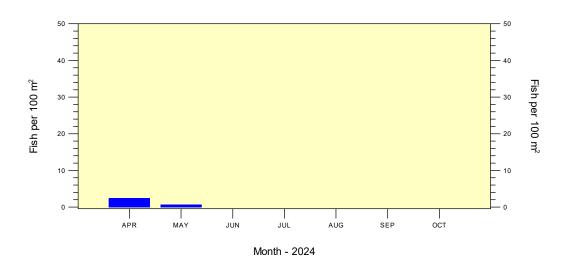
RIO GRANDE SILVERY MINNOW POPULATION MONITORING DURING MAY 2024

A U.S. BUREAU OF RECLAMATION FUNDED RESEARCH PROGRAM





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

Submitted to:

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

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SUMMARY OF MAY 2024 POPULATION MONITORING

The May 2024 population monitoring efforts were conducted at the 20 standard sites. Five sites were in the Angostura Reach, six sites were in the Isleta Reach, and nine sites were in the San Acacia Reach. For the 2024 monthly trends, data were based on all sites (i.e., standard, additional, and replacement sites) to maintain consistency across all monthly reports. A list of all collection localities is appended (Appendix A). Adult and juvenile fish were obtained by rapidly drawing a 3.0 m x 1.8 m smallmesh (ca. 5 mm) seine through discrete mesohabitats. Larval fish were collected with a 1.2 m x 1.2 m fine-mesh (ca. 1 mm) seine. All fishes were identified to species and enumerated. We used length-age relationships to assign ages (i.e., age-0, age-1, and age-2+) to all Rio Grande Silvery Minnow collected. Age-0 individuals are only present, however, after seasonal spawning events that typically first occur during spring runoff. Figures illustrating fish densities (i.e., fish per 100 m²) were prepared for the ten focal species to facilitate comparisons across reaches.

Angostura Reach

From 16 April to 15 May, provisional U.S. Geological Survey (USGS) mean daily discharge in the Angostura Reach (Albuquerque: USGS Gage-08330000) averaged 2,251 ft³/s and ranged from 873 to 3,080 ft³/s. Water temperatures ranged from 14.7 to 15.7 °C during the Angostura Reach sampling efforts (ca. 0830–1500 h). Secchi disk measurements of water clarity ranged from 19 to 27 cm.

Sampling for fishes in the Angostura Reach during May yielded 912 individuals with a cumulative fish density of 44.9 individuals per 100 m^2 sampled. The overall sampling effort in the Angostura Reach covered 2,033.2 m² (surface area) of water. Densities of all fish species combined ranged from 27.6 to 126.3 individuals per 100 m^2 at the different sampling sites. In May, there were 11 fish species collected in the Angostura Reach. White Sucker was the most abundant taxon (n = 587), followed by Red Shiner (n = 231), and Flathead Chub (n = 32). We collected Rio Grande Silvery Minnow (n = 50) in 50 of the 500 seine hauls that yielded fish, and its overall density was 0.250 (range = 0.00-0.390) individuals per 100 m^2 0.

Isleta Reach

Provisional mean daily discharge in the Isleta Reach (Bosque Farms: USGS Gage-08331160), from 16 April to 15 May, averaged 1,981 ft³/s and ranged from 516 to 2,990 ft³/s. During the Isleta Reach sampling efforts (ca. 0930–1600 h), water temperatures ranged from 15.3 to 21.5 °C. Secchi disk measurements ranged from 12 to 17 cm during sampling.

Isleta Reach population monitoring efforts produced 228 individuals in May with a cumulative fish density of 11.4 individuals per 100 m^2 sampled. The total sampling effort in the Isleta Reach during May covered 2,006.9 m² (surface area) of water. Fish densities (all species combined) at the sampling sites ranged from 1.1 to 21.4 individuals per 100 m^2 sampled. There were 8 fish species collected in the Isleta Reach during May. Red Shiner was the most abundant taxon (n = 158), followed by Common Carp (n = 39), and Rio Grande Silvery Minnow (n = 24). We collected Rio Grande Silvery Minnow (n = 24) in 18 of the 55 seine hauls that yielded fish, and its overall density was 1.20 (range = 0.00–4.05) individuals per 100 m^2 .

San Acacia Reach

From 16 April to 15 May, provisional mean daily discharge at San Acacia (USGS Gage-08354900) was generally higher (average = 1,773; range = 343–2,550 ft³/s) than at San Marcial (USGS Gage-08358400) during the same period (average = 1,486; range = 141–1,990 ft³/s). Water temperatures in May for the San Acacia Reach ranged from 15.7 to 18.4 °C (ca. 0930–1600 h). Secchi disk measurements ranged from 6 to 10 cm during sampling.

Population monitoring efforts in the San Acacia Reach during May yielded 277 individuals with a cumulative fish density of 7.9 individuals per 100 m^2 sampled. Sampling in the San Acacia Reach covered an area of 3,518.0 m^2 of water. Fish densities (all species combined) ranged from 0.6 to 28.2 individuals per 100 m^2 at sites sampled in the San Acacia Reach. In May, there were 12 fish species collected in the San Acacia Reach. Red Shiner was the most abundant taxon (n = 207), followed by Rio Grande Silvery Minnow (n = 18), and Common Carp (n = 15). We collected Rio Grande Silvery Minnow (n = 18) in 15 of the 88 seine hauls that yielded fish, and its overall density was 0.51 (range = 0.00–1.09) individuals per 100 m^2 .

All Sites (n = 20)

During May, sampling covered 7,558.0 m^2 (surface area) of water and yielded 1,417 fish. There were no dry sampling sites. Cumulative fish density during May was 18.75 individuals per 100 m^2 sampled. The three most common species were Red Shiner (n = 596), White Sucker (n = 589), and Common Carp (n = 56). The sampling sites yielded a total of 15 fish species.

Rio Grande Silvery Minnow was present in 38 of the 199 seine hauls that yielded fish and at 17 of the 20 sampling sites. Densities of unmarked and marked individuals were 0.62 (n = 47) and 0.00 (n = 0) individuals per 100 m^2 sampled, respectively. Densities of age-0, age-1, and age-2+ individuals were 0.00 (n = 0), 0.60 (n = 45), and 0.03 (n = 2) individuals per 100 m^2 sampled, respectively. Based on all May surveys since 1993, the overall density of Rio Grande Silvery Minnow averaged 5.48 (range = 0.05– 86.28) individuals per 100 m^2 sampled. During May 2024, its overall density was 0.62 (n = 47) individuals per 100 m^2 sampled.

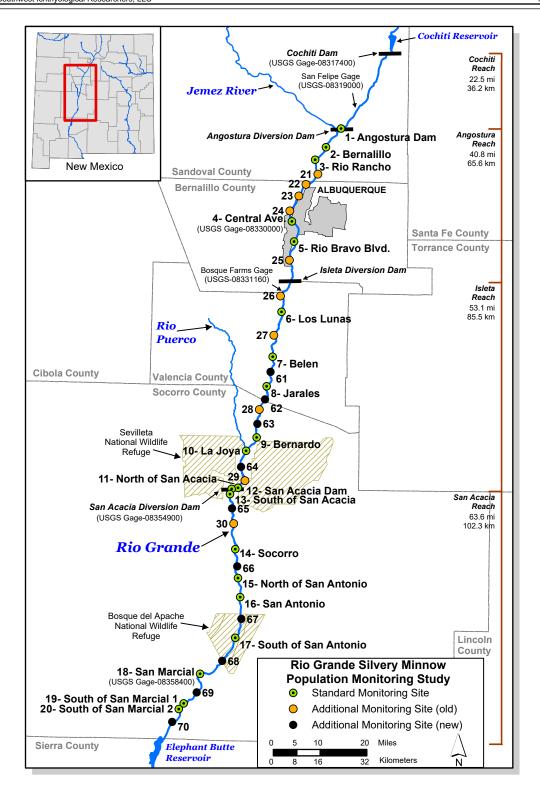


Figure 1. Map of the study area, standard sites, and additional sites (old and new) for the Rio Grande Silvery Minnow population monitoring study. Sampling site descriptions are provided in Appendix A.

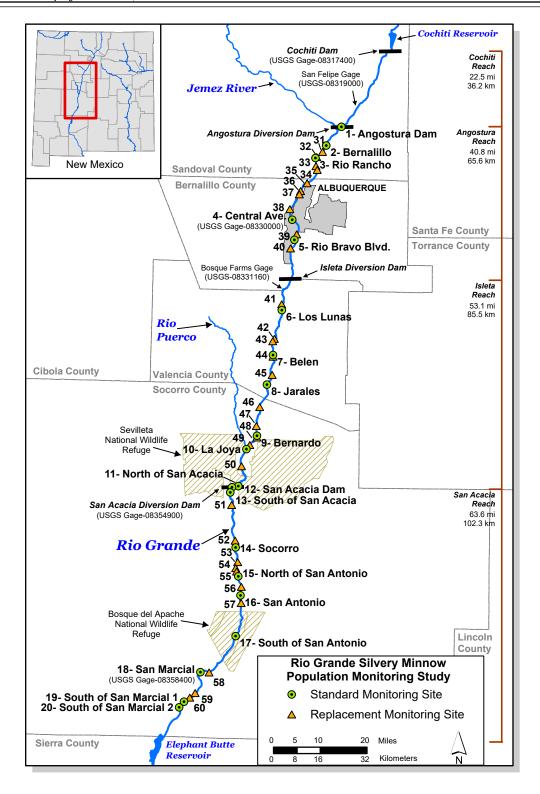


Figure 2. Map of the study area, standard sites, and replacement sites for the Rio Grande Silvery Minnow population monitoring study. Sampling site descriptions are provided in Appendix A.

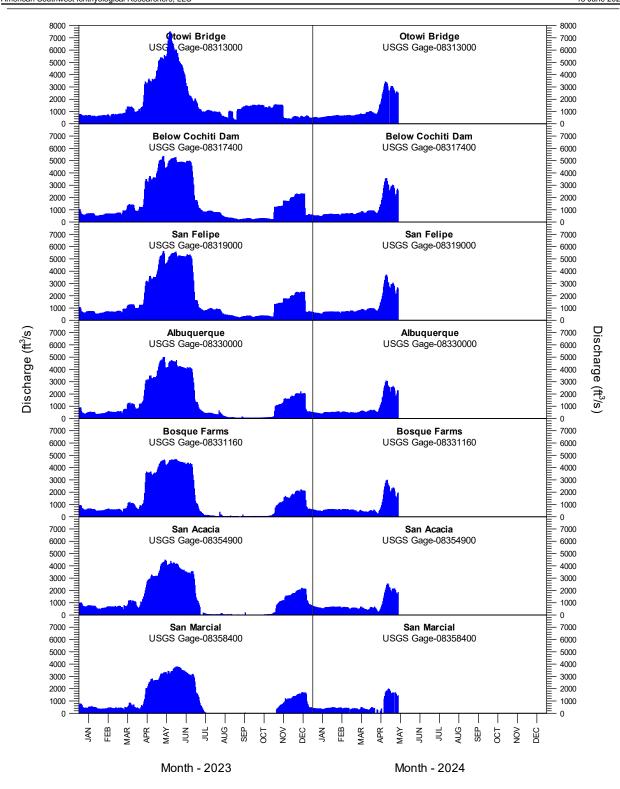


Figure 3. Rio Grande mean-daily discharge, by USGS gaging station, from 1 January 2023 to 15 May 2024. All discharge data are provisional and subject to change.

Table 1. Scientific names, common names, and species codes of fishes collected in the Middle Rio Grande since 1993.

Scientific Name	Common Name	Species Code
Order Clupeiformes		
Family Dorosomatidae	thread herrings	
Dorosoma cepedianum	Gizzard Shad	(DORCEP)
Dorosoma petenense	Threadfin Shad	(DORPET)
Order Cypriniformes		
Family Catostomidae	suckers	
Carpiodes carpio	River Carpsucker ¹	(CARCAR)
Catostomus commersonii	White Sucker ¹	(CATCOM)
Ictiobus bubalus	Smallmouth Buffalo	(ICTBUB)
Family Cyprinidae	carps	
Carassius auratus	Goldfish	(CARAUR)
Cyprinus carpio	Common Carp ¹	(CYPCAR)
Family Leuciscidae	minnows	
Campostoma anomalum		(CAMANO)
Cyprinella lutrensis	Red Shiner ¹	(CYPLUT)
Gila pandora	Rio Grande Chub	(GILPAN)
Hybognathus amarus	Rio Grande Silvery Minnow ¹	(HYBAMA)
Notemigonus crysoleucas	Golden Shiner	(NOTCRY)
Pimephales promelas	Fathead Minnow ¹	(PIMPRO)
Pimephales vigilax	Bullhead Minnow	(PIMVIG)
Platygobio gracilis	Flathead Chub ¹	(PLAGRA)
Rhinichthys cataractae	Longnose Dace ¹	(RHICAT)
Order Siluriformes		
Family Ictaluridae	North American catfishes	
Ameiurus melas	Black Bullhead	(AMEMEL)
Ameiurus natalis	Yellow Bullhead	(AMENAT)
Ictalurus furcatus	Blue Catfish	(ICTFUR)
Ictalurus punctatus	Channel Catfish1	(ICTPUN)
Pylodictis olivaris	Flathead Catfish	(PYLOLI)
Family Loricariidae	suckermouth armored catfishes	
Pterygoplichthys disjunctivus	Vermiculated Sailfin Catfish	(PTEDIS)

Table 1. Scientific names, common names, and species codes of fishes collected in the Middle Rio Grande since 1993 (continued).

entific Name	Common Name	Species Code
Order Esociformes		
Family Esocidae	pikes and mudminnows	
Esox lucius	Northern Pike	(ESOLUC)
Order Salmoniformes		
Family Salmonidae	trouts and salmons	
Oncorhynchus mykiss	Rainbow Trout	(ONCMYK)
Salmo trutta	Brown Trout	(SALTRU)
Order Cyprinodontiformes		
Family Poeciliidae	livebearers	
Gambusia affinis	Western Mosquitofish ¹	(GAMAFF)
Order Centrarchiformes		
Family Centrarchidae	sunfishes	
Lepomis cyanellus	Green Sunfish	(LEPCYA)
Lepomis macrochirus	Bluegill	(LEPMAC)
Lepomis megalotis	Longear Sunfish	(LEPMEG)
Micropterus dolomieu		(MICDOL)
Micropterus salmoides		(MICSAL)
Pomoxis annularis		(POMANN)
Pomoxis nigromaculatus	• •	(POMNIG)
Order Perciformes		
Family Moronidae	temperate basses	
Morone chrysops	White Bass	(MORCHR)
Morone saxatilis	Striped Bass	(MORSAX)
Family Percidae	perches and darters	
Perca flavescens	Yellow Perch	(PERFLA)
Percina macrolepida	Bigscale Logperch	(PERMAC)
Sander vitreus		(SANVIT)
Family Sciaenidae	drums and croakers	
Aplodinotus grunniens	Freshwater Drum	(APLGRU)

¹ = Focal taxa were typically the 10 most abundant species collected during October.

Table 2. Rio Grande Silvery Minnow abundance, by reach, site, and mesohabitat, during May 2024. Marked and unmarked individuals were included. Blank cells indicate site-specific mesohabitats that were unavailable for sampling.

Reach	Site	Locality	BW	PO	RU	SHPO	SHRU	Total
Angostura	1	Angostura Dam				0	0	0
Angostura	2	Bernalillo				0	1	1
Angostura	3	Rio Rancho	0			0	1	1
Angostura	4	Central Ave.		1	0	0	0	1
Angostura	5	Rio Bravo Blvd.	0	0	0	0	2	2
Angostura Total	's		0	1	0	0	4	5
Isleta	6	Los Lunas		3		2	8	13
Isleta	7	Belen	0			2	0	2
Isleta	8	Jarales		0		5	0	5
Isleta	9	Bernardo		2		1	0	3
Isleta	10	La Joya				0	0	0
Isleta	11	North of San Acacia			0	0	1	1
Isleta Totals			0	5	0	10	9	24
San Acacia	12	San Acacia Dam		0	0	1		1
San Acacia	13	South of San Acacia				0	1	1
San Acacia	14	Socorro				0	0	0
San Acacia	15	North of San Antonio			0	0	1	1
San Acacia	16	San Antonio				0	3	3
San Acacia	17	South of San Antonio				1	3	4
San Acacia	18	San Marcial		0	0	0	2	2
San Acacia	19	South of San Marcial 1		1	0	3	1	5
San Acacia	20	South of San Marcial 2				1	0	1
San Acacia Tota	als		0	1	0	6	11	18
Monthly Totals			0	7	0	16	24	47

Table 3. Rio Grande Silvery Minnow abundance, by reach, site, and month, during 2024. Marked individuals are shown in parentheses, as a subset of the site-specific total. Blank cells indicate months when a site was not visited or will not be visited.

Reach	Site	Locality	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
Angostura	1	Angostura Dam	0	0	0	0	0	0	0	0
Angostura	2	Bernalillo	15(0)	1(0)	0	0	0	0	0	16
Angostura	3	Rio Rancho	15(0)	1(0)	0	0	0	0	0	16
Angostura	21	Site 21	8(0)	.(-)					0	8
Angostura	22	Site 22	12(0)						0	12
Angostura	23	Site 23	2(0)						0	2
Angostura	24	Site 24	19(0)						0	19
Angostura	4	Central Ave.	0	1(0)	0	0	0	0	0	1
Angostura	5	Rio Bravo Blvd.	1(0)	2(0)	0	0	0	0	0	3
Angostura	25	Site 25	0	2(0)	Ü	Ü	Ü	· ·	0	0
Angostura Totals			72	5	0	0	0	0	0	77
Isleta	26	Site 26	52(0)						0	52
Isleta	6	Los Lunas	14(0)	13(0)	0	0	0	0	0	27
Isleta	27	Site 27	8(0)						0	8
Isleta	7	Belen	0	2(0)	0	0	0	0	0	2
Isleta	61	Site 61	9(0)						0	9
Isleta	8	Jarales	5(0)	5(0)	0	0	0	0	0	10
Isleta	62	Site 62	1(0)						0	1
Isleta	28	Site 28	3(0)						0	3
Isleta	63	Site 63	6(0)						0	6
Isleta	9	Bernardo	14(0)	3(0)	0	0	0	0	0	17
Isleta	10	La Joya	3(0)	Ó	0	0	0	0	0	3
Isleta	64	Site 64	0						0	0
Isleta	29	Site 29	4(0)						0	4
Isleta	11	North of San Acacia	0	1(0)	0	0	0	0	0	1
Isleta Totals			119	24	0	0	0	0	0	143
San Acacia	12	San Acacia Dam	9(0)	1(0)	0	0	0	0	0	10
San Acacia	13	South of San Acacia	11(0)	1(0)	0	0	0	0	0	12
San Acacia	65	Site 65	24(0)						0	24
San Acacia	30	Site 30	35(0)						0	35
San Acacia	14	Socorro	21(0)	0	0	0	0	0	0	21
San Acacia	66	Site 66	28(0)						0	28
San Acacia	15	North of San Antonio	73(0)	1(0)	0	0	0	0	0	74
San Acacia	16	San Antonio	5(0)	3(0)	0	0	0	0	0	8
San Acacia	67	Site 67	15(1)						0	15
San Acacia	17	South of San Antonio	7(0)	4(0)	0	0	0	0	0	11
San Acacia	68	Site 68	3(0)						0	3
San Acacia	18	San Marcial	16(0)	2(0)	0	0	0	0	0	18
San Acacia	69	Site 69	4(0)						0	4
San Acacia	19	South of San Marcial 1	22(2)	5(0)	0	0	0	0	0	27
San Acacia	20	South of San Marcial 2	3(0)	1(0)	0	0	0	0	0	4
San Acacia	70	Site 70	8(1)						0	8
San Acacia Totals			284	18	0	0	0	0	0	302
Monthly Totals			475	47	0	0	0	0	0	522

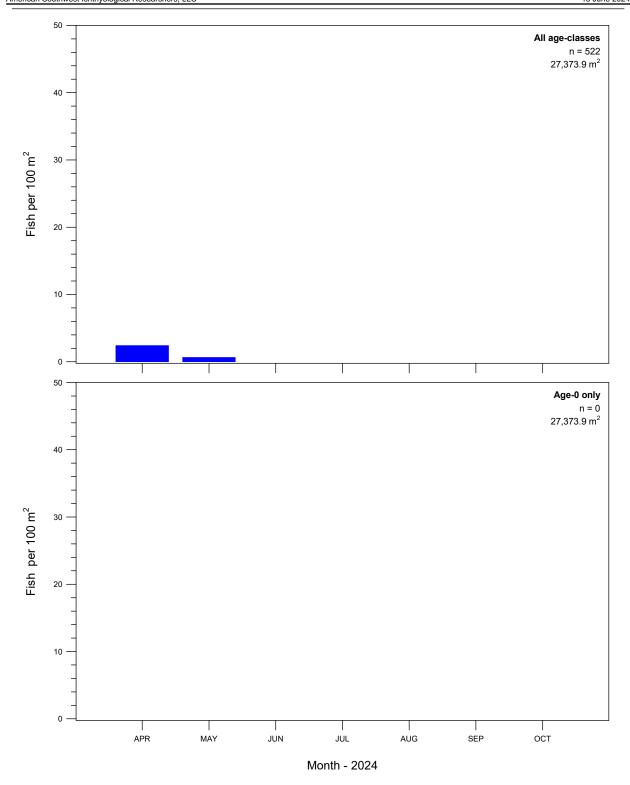


Figure 4. Rio Grande Silvery Minnow densities based on all sites, by age-class and month, during 2024. Marked and unmarked individuals were included.

Ichthyofaunal summary based on all sites, by species, during May 2024. Marked and Table 4. unmarked Rio Grande Silvery Minnow were included. Dashes (-) indicate species that were absent during sampling.

Family	Common Name	Residence Status ¹	Total Number of Individuals	Percent (%) of Total	Frequency of Occurrence ²	% Frequency of Occurrence ²
Dorosomatidae	Gizzard Shad	N	5	0.35	1	5.00
Dorosomatidae	Threadfin Shad	1	-	-	-	-
Catostomidae	River Carpsucker	N	3	0.21	1	5.00
Catostomidae	White Sucker	1	589	41.57	7	35.00
Catostomidae	Smallmouth Buffalo	N	1	0.07	1	5.00
Cyprinidae	Goldfish	1	-	-	-	-
Cyprinidae	Common Carp	I	56	3.95	9	45.00
Leuciscidae	Central Stoneroller	1	-	-	-	-
Leuciscidae	Red Shiner	N	596	42.06	18	90.00
Leuciscidae	Rio Grande Chub	N	-	-	-	-
Leuciscidae	Rio Grande Silvery Minnow	N	47	3.32	17	85.00
Leuciscidae	Golden Shiner	I	-	-	-	-
Leuciscidae	Fathead Minnow	N	2	0.14	2	10.00
Leuciscidae	Bullhead Minnow	I	-	=	-	-
Leuciscidae	Flathead Chub	N	40	2.82	9	45.00
Leuciscidae	Longnose Dace	N	32	2.26	2	10.00
Ictaluridae	Black Bullhead	1	-	-	-	-
Ictaluridae	Yellow Bullhead	I	-	-	-	-
Ictaluridae	Blue Catfish	N	-	-	-	-
Ictaluridae	Channel Catfish	I	15	1.06	6	30.00
Ictaluridae	Flathead Catfish	N	-	-	-	-
Loricariidae	Vermiculated Sailfin Catfish	1	-	-	-	-
Esocidae	Northern Pike	1	-	-	-	-
Salmonidae	Rainbow Trout	1	-	-	-	-
Salmonidae	Brown Trout	I	=	-	-	-
Poeciliidae	Western Mosquitofish	1	9	0.64	7	35.00
Centrarchidae	Green Sunfish	1	-	-	-	-
Centrarchidae	Bluegill	N	-	-	-	-
Centrarchidae	Longear Sunfish	I	-	-	-	-
Centrarchidae	Smallmouth Bass	I	-	-	-	-
Centrarchidae	Florida Bass	I	-	-	-	-
Centrarchidae	White Crappie	I	18	1.27	7	35.00
Centrarchidae	Black Crappie	I	-	-	-	-
Moronidae	White Bass	1	3	0.21	2	10.00
Moronidae	Striped Bass	1	-	-	-	-
Percidae	Yellow Perch	1	-	-	-	-
Percidae	Bigscale Logperch	I	1	0.07	1	5.00
Percidae	Walleye	1	-	-	-	-
Sciaenidae	Freshwater Drum	N	-	-	-	-

¹ = Native (N) or introduced (I) species ² = Based on all sites

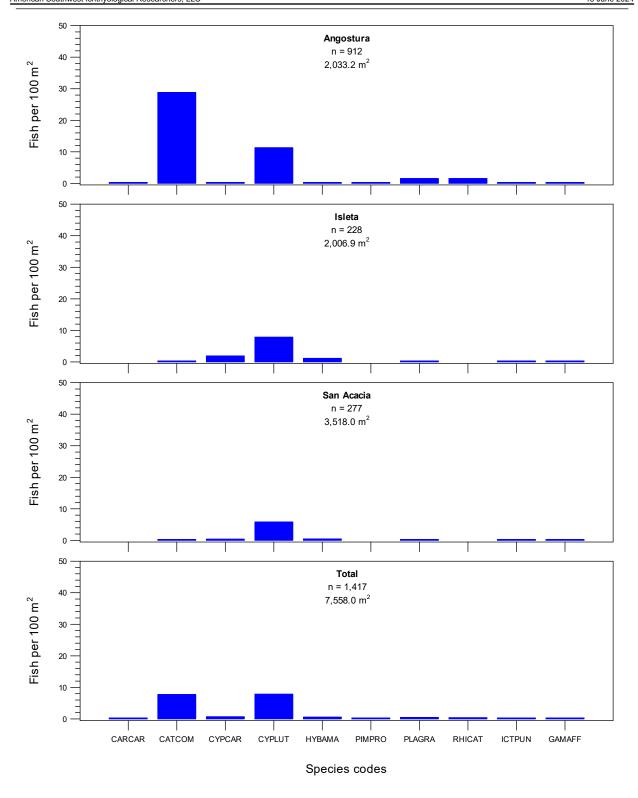


Figure 5. Fish densities based on all sites, by reach and focal taxa, during May 2024. Marked and unmarked Rio Grande Silvery Minnow were included.

APPENDIX A (Sampling Sites)

Middle Rio Grande Fish Sampling Sites

Table A1. Sampling reaches and standard sites for population monitoring of Rio Grande Silvery Minnow in the Middle Rio Grande.

Reach and Site

Locality

Angostura Reach

- 1 New Mexico, Sandoval County, Rio Grande, just downstream of Angostura Diversion Dam, Algodones. River Mile: 209.9; UTM Easting: 363665; UTM Northing: 3916331; Zone: 13; Datum: NAD83
- New Mexico, Sandoval County, Rio Grande, at US HWY 550 bridge crossing, Bernalillo. River Mile: 203.9; UTM Easting: 358457; UTM Northing: 3909887; Zone: 13; Datum: NAD83
- 3 New Mexico, Sandoval County, Rio Grande, ca. 4.0 mi downstream of US HWY 550 bridge crossing, Rio Rancho.
 - River Mile: 199.9; UTM Easting: 354728; UTM Northing: 3905587; Zone: 13; Datum: NAD83
- 4 New Mexico, Bernalillo County, Rio Grande, at Central Ave. bridge crossing (US HWY 66), Albuquerque. River Mile: 183.4; UTM Easting: 346719; UTM Northing: 3884331; Zone: 13; Datum: NAD83
- New Mexico, Bernalillo County, Rio Grande, at Rio Bravo Blvd. bridge crossing (NM State HWY 500), Albuquerque.
 - River Mile: 178.4; UTM Easting: 347468; UTM Northing: 3877400; Zone: 13; Datum: NAD83

Isleta Reach

- 6 New Mexico, Valencia County, Rio Grande, just upstream of NM State HWY 6 bridge crossing, Los Lunas. River Mile: 161.7; UTM Easting: 343149; UTM Northing: 3853187; Zone: 13; Datum: NAD83
- 7 New Mexico, Valencia County, Rio Grande, ca. 1.0 mi upstream of NM State HWY 309 bridge crossing, Belen.
 - River Mile: 150.8; UTM Easting: 340105; UTM Northing: 3837722; Zone: 13; Datum: NAD83
- 8 New Mexico, Valencia County, Rio Grande, ca. 2.2 mi upstream of NM State HWY 346 bridge crossing, Jarales.
 - River Mile: 143.2; UTM Easting: 338020; UTM Northing: 3827545; Zone: 13; Datum: NAD83
- 9 New Mexico, Socorro County, Rio Grande, at US HWY 60 bridge crossing, Bernardo. River Mile: 130.6; UTM Easting: 334578; UTM Northing: 3809921; Zone: 13; Datum: NAD83
- 10 New Mexico, Socorro County, Rio Grande, ca. 3.7 mi downstream of US HWY 60 bridge crossing, Bernardo.
 - River Mile: 126.8; UTM Easting: 330946; UTM Northing: 3805307; Zone: 13; Datum: NAD83
- 11 New Mexico, Socorro County, Rio Grande, ca. 1.2 mi upstream of San Acacia Diversion Dam, San Acacia. River Mile: 117.3; UTM Easting: 328152; UTM Northing: 3792564; Zone: 13; Datum: NAD83

Table A1. Sampling reaches and standard sites for population monitoring of Rio Grande Silvery Minnow in the Middle Rio Grande (continued).

Reach and Site

Locality

San Acacia Reach

- 12 New Mexico, Socorro County, Rio Grande, just downstream of San Acacia Diversion Dam, San Acacia. River Mile: 115.6; UTM Easting: 325960; UTM Northing: 3792182; Zone: 13; Datum: NAD83
- 13 New Mexico, Socorro County, Rio Grande, ca. 1.5 mi downstream of San Acacia Diversion Dam, San Acacia

River Mile: 114.1; UTM Easting: 325390; UTM Northing: 3790397; Zone: 13; Datum: NAD83

14 New Mexico, Socorro County, Rio Grande, ca. 0.5 mi upstream of Socorro Low Flow Conveyance Channel bridge crossing, Socorro.

River Mile: 99.6; UTM Easting: 327231; UTM Northing: 3771432; Zone: 13; Datum: NAD83

15 New Mexico, Socorro County, Rio Grande, ca. 4.5 mi upstream of US HWY 380 bridge crossing, San Antonio.

River Mile: 92.0; UTM Easting: 328151; UTM Northing: 3761487; Zone: 13; Datum: NAD83

- 16 New Mexico, Socorro County, Rio Grande, at US HWY 380 bridge crossing, San Antonio. River Mile: 87.8; UTM Easting: 328907; UTM Northing: 3754926; Zone: 13; Datum: NAD83
- 17 New Mexico, Socorro County, Rio Grande, east of Bosque del Apache NWR headquarters, San Antonio. River Mile: 79.0; UTM Easting: 327219; UTM Northing: 3740906; Zone: 13; Datum: NAD83
- 18 New Mexico, Socorro County, Rio Grande, at San Marcial Railroad bridge crossing, San Marcial. River Mile: 68.3; UTM Easting: 315091; UTM Northing: 3728487; Zone: 13; Datum: NAD83
- 19 New Mexico, Socorro County, Rio Grande, ca. 8.0 mi downstream of San Marcial Railroad bridge crossing, San Marcial.

River Mile: 60.1; UTM Easting: 309441; UTM Northing: 3718309; Zone: 13; Datum: NAD83

20 New Mexico, Socorro County, Rio Grande, ca. 10.0 mi downstream of San Marcial Railroad bridge crossing, San Marcial.

River Mile: 58.5; UTM Easting: 307767; UTM Northing: 3716360; Zone: 13; Datum: NAD83

Table A2. Sampling reaches and additional sites (old) for population monitoring of Rio Grande Silvery Minnow in the Middle Rio Grande.

Reach and Site

Locality

Angostura Reach

- 21 New Mexico, Sandoval County, Rio Grande, ca. 4.4 miles upstream of Alameda Blvd. (NM State Hwy. 528) bridge crossing, Corrales.
 - River Mile: 196.6; UTM Easting: 355531; UTM Northing: 3900626; Zone: 13; Datum: NAD83
- 22 New Mexico, Sandoval County, Rio Grande, ca. 1.1 miles upstream of Alameda Blvd. (NM State Hwy. 528) bridge crossing, Corrales.
 - River Mile: 193.1; UTM Easting: 351562; UTM Northing: 3897190; Zone: 13; Datum: NAD83
- 23 New Mexico, Bernalillo County, Rio Grande, ca. 1.0 miles downstream of Paseo del Norte Blvd. (NM State Hwy. 423) bridge crossing Albuquerque.
 - River Mile: 190.0; UTM Easting: 349214; UTM Northing: 3893063; Zone: 13; Datum: NAD83
- 24 New Mexico, Bernalillo County, Rio Grande, ca. 1.1 miles upstream of I-40 bridge crossing, Albuquerque. River Mile: 186.1; UTM Easting: 346011; UTM Northing: 3887973; Zone: 13; Datum: NAD83
- New Mexico, Bernalillo County, Rio Grande, ca. 1.5 miles upstream of I-25 bridge crossing, Isleta. River Mile: 174.0; UTM Easting: 345900; UTM Northing: 3870990; Zone: 13; Datum: NAD83

Isleta Reach

- 26 New Mexico, Valencia County, Rio Grande, ca. 4.1 miles upstream of NM State Hwy. 6 bridge crossing, Los Lunas.
 - River Mile: 165.2; UTM Easting: 342799; UTM Northing: 3858637; Zone: 13; Datum: NAD83
- 27 New Mexico, Valencia County, Rio Grande, ca. 6.2 miles upstream of NM State Hwy. 309 bridge crossing, Belen.
 - River Mile: 156.0; UTM Easting: 340647; UTM Northing: 3845146; Zone: 13; Datum: NAD83
- New Mexico, Socorro County, Rio Grande, ca. 6.3 miles upstream of US Hwy. 60 bridge crossing, Bernardo. River Mile: 137.1; UTM Easting: 335554; UTM Northing: 3819543; Zone: 13; Datum: NAD83
- 29 New Mexico, Socorro County, Rio Grande, ca. 1.5 miles upstream of confluence with the Rio Salado, San Acacia.
 - River Mile: 120.1; UTM Easting: 330498; UTM Northing: 3795053; Zone: 13; Datum: NAD83

San Acacia Reach

- 30 New Mexico, Socorro County, Rio Grande, ca. 2.6 miles upstream of Pueblitos Rd. bridge crossing, Escondida
 - River Mile: 107.1; UTM Easting: 326303; UTM Northing: 3781123; Zone: 13; Datum: NAD83

Table A3. Sampling reaches and additional sites (new) for population monitoring of Rio Grande Silvery Minnow in the Middle Rio Grande.

Reach and Site

Locality

Isleta Reach

- 61 New Mexico, Valencia County, Rio Grande, ca. 6.2 mi upstream of NM State HWY 346 bridge crossing, Jarales.
 - River Mile: 147.0; UTM Easting: 339379; UTM Northing: 3832429; Zone: 13; Datum: NAD83
- 62 New Mexico, Valencia County, Rio Grande, ca. 0.7 mi downstream of NM State HWY 346 bridge crossing, Jarales.
 - River Mile: 140.0; UTM Easting: 337520; UTM Northing: 3822964; Zone: 13; Datum: NAD83
- 63 New Mexico, Socorro County, Rio Grande, ca. 3.1 mi upstream of US HWY 60 bridge crossing, Bernardo. River Mile: 133.7; UTM Easting: 334853; UTM Northing: 3814593; Zone: 13; Datum: NAD83
- 64 New Mexico, Socorro County, Rio Grande, ca. 4.7 mi upstream of the Rio Salado confluence, San Acacia. River Mile: 123.2; UTM Easting: 329215; UTM Northing: 3799784; Zone: 13; Datum: NAD83

San Acacia Reach

- 65 New Mexico, Socorro County, Rio Grande, ca. 5.4 mi downstream of San Acacia Diversion Dam, San Acacia.
 - River Mile: 110.3; UTM Easting: 326105; UTM Northing: 3785502; Zone: 13; Datum: NAD83
- 66 New Mexico, Socorro County, Rio Grande, ca. 3.8 mi downstream of Socorro Low Flow Conveyance Channel bridge crossing, Socorro.
 - River Mile: 95.1; UTM Easting: 327905; UTM Northing: 3765463; Zone: 13; Datum: NAD83
- 67 New Mexico, Socorro County, Rio Grande, ca. 4.3 mi downstream of San Antonio bridge crossing, San Antonio.
 - River Mile: 83.3; UTM Easting: 329319; UTM Northing: 3747431; Zone: 13; Datum: NAD83
- 68 New Mexico, Socorro County, Rio Grande, ca. 5.3 mi upstream of San Marcial Railroad bridge crossing, San Marcial.
 - River Mile: 73.7; UTM Easting: 322751; UTM Northing: 3732864; Zone: 13; Datum: NAD83
- 69 New Mexico, Socorro County, Rio Grande, ca. 4.4 mi downstream of San Marcial Railroad bridge crossing, San Marcial.
 - River Mile: 63.9; UTM Easting: 313940; UTM Northing: 3722027; Zone: 13; Datum: NAD83
- 70 New Mexico, Socorro County, Rio Grande, ca. 12.9 mi downstream of San Marcial Railroad bridge crossing, San Marcial.
 - River Mile: 55.5; UTM Easting: 305502; UTM Northing: 3711951; Zone: 13; Datum: NAD83

Table A4. Sampling reaches and active replacement sites for population monitoring of Rio Grande Silvery Minnow in the Middle Rio Grande.

Reach and Site

Locality

San Acacia Reach

- 51 New Mexico, Socorro County, Rio Grande, ca. 5.0 mi downstream of San Acacia Diversion Dam, San Acacia.
 - River Mile: 110.8; UTM Easting: 325855; UTM Northing: 3786216; Zone: 13; Datum: NAD83
- 52 New Mexico, Socorro County, Rio Grande, ca. 2.2 mi. downstream of Pueblitos Rd. bridge crossing, Escondida.
 - River Mile: 101.7; UTM Easting: 327091; UTM Northing: 3773950; Zone: 13; Datum: NAD83
- 53 New Mexico, Socorro County, Rio Grande, ca. 3.1 mi downstream of the Socorro Low Flow Conveyance Channel bridge crossing, Socorro.
 - River Mile: 96.0; UTM Easting: 327928; UTM Northing: 3766570; Zone: 13; Datum: NAD83
- 54 New Mexico, Socorro County, Rio Grande, ca. 4.7 mi. downstream of Socorro LFCC bridge crossing, Socorro
 - River Mile: 94.2; UTM Easting: 327288; UTM Northing: 3764453; Zone: 13; Datum: NAD83
- 56 New Mexico, Socorro County, Rio Grande, ca. 2.1 miles upstream of San Antonio bridge crossing, San Antonio
 - River Mile: 89.3; UTM Easting: 329188; UTM Northing: 3758027; Zone: 13; Datum: NAD83
- 58 New Mexico, Socorro County, Rio Grande, ca. 1.8 mi. upstream of San Marcial Railroad bridge crossing, San Marcial.
 - River Mile: 70.1; UTM Easting: 318083; UTM Northing: 3728535; Zone: 13; Datum: NAD83
- 59 New Mexico, Socorro County, Rio Grande, ca. 5.1 mi. downstream of San Marcial Railroad bridge crossing, San Marcial.
 - River Mile: 63.3; UTM Easting: 313269; UTM Northing: 3721434; Zone: 13; Datum: NAD83
- 60 New Mexico, Socorro County, Rio Grande, ca. 6.4 mi. downstream of San Marcial Railroad bridge crossing, San Marcial.
 - River Mile: 61.8; UTM Easting: 311422; UTM Northing: 3719873; Zone: 13; Datum: NAD83

APPENDIX B (Site-Specific Population Monitoring Data)

Site-specific data, collected in May 2024, as part of the Rio Grande Silvery Minnow Population Monitoring Program (Any blanks in this database output indicate null data)

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

NEW MEXICO: SANDOVAL County, RIO GRANDE Drainage RKD24-058

Rio Grande, just downstream of Angostura Diversion Dam, Algodones.

Site Number: 1 River Mile: 209.9 03 May 2024
UTM Easting: 363665 UTM Northing: 3916331 Zone: 13 USGS Quad: San Felipe Pueblo
Collector(s): Dudley, R.K.; Farrington, M.A.; Damron, T.D. Effort: 258.9 sq. m

Family	<u>Species</u>	<u>Total</u>
2	Catostomus commersonii	313
4	Cyprinella lutrensis	1
4	Pimephales promelas	1
4	Platygobio gracilis	1
4	Rhinichthys cataractae	10
10	Pomoxis annularis	1

NEW MEXICO: SANDOVAL County, RIO GRANDE Drainage RKD24-059

Rio Grande, at US HWY 550 bridge crossing, Bernalillo.

Site Number: 2 River Mile: 203.9 03 May 2024 UTM Easting: 358457 UTM Northing: 3909887 Zone: 13 USGS Quad: Bernalillo

Collector(s): Dudley, R.K.; Farrington, M.A.; Damron, T.D. Effort: 415.9 sq. m

Family	<u>Species</u>	<u>Total</u>
2	Carpiodes carpio	3
2	Catostomus commersonii	54
3	Cyprinus carpio	2
4	Cyprinella lutrensis	16
4	Hybognathus amarus*	1
4	Platygobio gracilis	25
4	Rhinichthys cataractae	22

*Hybognathus amarus (age-classes):

age-0 age-1 1 age-2+

NEW MEXICO: SANDOVAL County, RIO GRANDE Drainage **RKD24-060**

Rio Grande, ca. 4.0 mi downstream of US HWY 550 bridge crossing, Rio Rancho.

Site Number: 3 River Mile: 199.9 03 May 2024 USGS Quad: Bernalillo UTM Easting: 354728 UTM Northing: 3905587 Zone: 13

Collector(s): Dudley, R.K.; Farrington, M.A.; Damron, T.D. Effort: 347.0 sq. m

Family	<u>Species</u>	<u>Total</u>
2	Catostomus commersonii	114
4	Cyprinella lutrensis	45
4	Hybognathus amarus*	1
9	Gambusia affinis	1
	*Hybognathus amarus (age-classes):	

age-0 age-1 1 age-2+

NEW MEXICO: BERNALILLO County, RIO GRANDE Drainage RKD24-057

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

Site Number: 4 River Mile: 183.4 03 May 2024 UTM Easting: 346719 UTM Northing: 3884331 Zone: 13 USGS Quad: Albuquerque West Effort: 493.3 sq. m

Collector(s): Dudley, R.K.; Farrington, M.A.; Damron, T.D.

Family	<u>Species</u>	<u>Total</u>
2	Catostomus commersonii	3
4	Cyprinella lutrensis	137
4	Hybognathus amarus*	1
4	Pimephales promelas	1
4	Platygobio gracilis	1
5	Ictalurus punctatus	1
9	Gambusia affinis	2
10	Pomoxis annularis	12

*Hybognathus amarus (age-classes):

age-0 age-1 1 age-2+

NEW MEXICO: BERNALILLO County, RIO GRANDE Drainage RKD24-056

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

Site Number: 5 River Mile: 178.4 03 May 2024
UTM Easting: 347468 UTM Northing: 3877400 Zone: 13 USGS Quad: Albuquerque West
Collector(s): Dudley, R.K.; Farrington, M.A.; Damron, T.D. Effort: 518.2 sq. m

Family	<u>Species</u>	<u>Total</u>
2	Catostomus commersonii	103
4	Cyprinella lutrensis	32
4	Hybognathus amarus*	2
4	Platygobio gracilis	5
10	Pomoxis annularis	1

*Hybognathus amarus (age-classes):

age-0 age-1 2 age-2+

NEW MEXICO: VALENCIA County, RIO GRANDE Drainage RKD24-055

Rio Grande, just upstream of NM State HWY 6 bridge crossing, Los Lunas.

Site Number: 6 River Mile: 161.7 01 May 2024 UTM Easting: 343149 UTM Northing: 3853187 Zone: 13 USGS Quad: Los Lunas

Collector(s): Dudley, R.K.; Farrington, M.A.; Damron, T.D. Effort: 321.0 sq. m

<u>Family</u>	<u>Species</u>	<u>Total</u>
4	Cyprinella lutrensis	8
4	Hybognathus amarus*	13

*Hybognathus amarus (age-classes):

age-0 age-1 12 age-2+ 1

NEW MEXICO: VALENCIA County, RIO GRANDE Drainage RKD24-054

Rio Grande, ca. 1.0 mi upstream of NM State HWY 309 bridge crossing, Belen.

Site Number: 7 River Mile: 150.8 01 May 2024

UTM Easting: 340105 UTM Northing: 3837722 Zone: 13 USGS Quad: Tome

Collector(s): Dudley, R.K.; Farrington, M.A.; Damron, T.D. Effort: 333.6 sg. m

Family	<u>Species</u>	<u>Total</u>
2	Catostomus commersonii	1
3	Cyprinus carpio	1
4	Cyprinella lutrensis	27
4	Hybognathus amarus*	2

*Hybognathus amarus (age-classes):

age-0 age-1 2 age-2+

NEW MEXICO: VALENCIA County, RIO GRANDE Drainage RKD24-053

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

Site Number: 8 River Mile: 143.2 01 May 2024 UTM Easting: 338020 UTM Northing: 3827545 Zone: 13 USGS Quad: Veguita

Collector(s): Dudley, R.K.; Farrington, M.A.; Damron, T.D. Effort: 254.5 sq. m

 Family
 Species
 Total

 4
 Cyprinella lutrensis
 42

 4
 Hybognathus amarus*
 5

*Hybognathus amarus (age-classes):

age-0 age-1 4 age-2+ 1

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage RKD24-052

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

Site Number: 9 River Mile: 130.6 01 May 2024 UTM Easting: 334578 UTM Northing: 3809921 Zone: 13 USGS Quad: Abeytas

Collector(s): Dudley, R.K.; Farrington, M.A.; Damron, T.D. Effort: 292.2 sq. m

 Family
 Species
 Total

 3
 Cyprinus carpio
 3

 4
 Cyprinella lutrensis
 23

 4
 Hybognathus amarus*
 3

*Hybognathus amarus (age-classes):

age-0 age-1 3 age-2+

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage RKD24-051

Rio Grande, ca. 3.7 mi downstream of US HWY 60 bridge crossing, Bernardo.

Site Number: 10 River Mile: 126.8 01 May 2024 UTM Easting: 330946 UTM Northing: 3805307 Zone: 13 USGS Quad: Abeytas

Collector(s): Dudley, R.K.; Farrington, M.A.; Damron, T.D. Effort: 356.7 sq. m

 Family
 Species
 Total

 3
 Cyprinus carpio
 1

 4
 Cyprinella lutrensis
 3

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage RKD24-050

Rio Grande, ca. 1.2 mi upstream of San Acacia Diversion Dam, San Acacia.

 Site Number:
 11
 River Mile:
 117.3
 30 April 2024

 UTM Easting:
 328152
 UTM Northing:
 3792564
 Zone:
 13
 USGS Quad:
 La Joya

Collector(s): Dudley, R.K.; Damron, T.D.; Bowers, B.S. Effort: 449.1 sq. m

<u>Family</u>	<u>Species</u>	<u>Total</u>
3	Cyprinus carpio	34
4	Cyprinella lutrensis	55
4	Hybognathus amarus*	1
4	Platygobio gracilis	1
5	Ictalurus punctatus	3
9	Gambusia affinis	1
10	Pomoxis annularis	1

*Hybognathus amarus (age-classes):

age-0 age-1 age-2+

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage RKD24-049

Rio Grande, just downstream of San Acacia Diversion Dam, San Acacia.

Site Number: 12 River Mile: 115.6 30 April 2024 UTM Easting: 325960 UTM Northing: 3792183 Zone: 13 USGS Quad: San Acacia

Collector(s): Dudley, R.K.; Damron, T.D.; Bowers, B.S. Effort: 363.3 sq. m

<u>Family</u>	<u>Species</u>	<u>Total</u>
1	Dorosoma cepedianum	5
2	Catostomus commersonii	1
4	Cyprinella lutrensis	13
4	Hybognathus amarus*	1
9	Gambusia affinis	1
10	Pomoxis annularis	1

*Hybognathus amarus (age-classes):

age-0 age-1 1 age-2+

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage RKD24-048

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

Site Number: 13 River Mile: 114.1 30 April 2024 UTM Easting: 325390 UTM Northing: 3790397 Zone: 13 USGS Quad: Lemitar

Collector(s): Dudley, R.K.; Damron, T.D.; Bowers, B.S. Effort: 277.6 sq. m

Family	<u>Species</u>	<u>Total</u>
2	Ictiobus bubalus	1
3	Cyprinus carpio	2
4	Cyprinella lutrensis	36
4	Hybognathus amarus*	1
4	Platygobio gracilis	1
9	Gambusia affinis	2
10	Pomoxis annularis	1
11	Morone chrysops	1

*Hybognathus amarus (age-classes):

age-0 age-1 1 age-2+

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage RKD24-047

Rio Grande, ca. 0.5 mi upstream of Socorro Low Flow Conveyance Channel bridge crossing, Socorro.

Site Number: 14 River Mile: 99.6 30 April 2024

UTM Easting: 327231 UTM Northing: 3771432 Zone: 13 USGS Quad: Loma de las Canas

Collector(s): Dudley, R.K.; Damron, T.D.; Bowers, B.S. Effort: 292.1 sq. m

FamilySpeciesTotal4Cyprinella lutrensis24Platygobio gracilis15Ictalurus punctatus3

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage RKD24-046

Rio Grande, ca. 4.5 mi upstream of US HWY 380 bridge crossing, San Antonio.

Site Number: 15 River Mile: 92.0 30 April 2024 UTM Easting: 328151 UTM Northing: 3761487 Zone: 13 USGS Quad: San Antonio

Collector(s): Dudley, R.K.; Damron, T.D.; Bowers, B.S. Effort: 503.8 sq. m

Family	<u>Species</u>	<u>Total</u>
4	Cyprinella lutrensis	8
4	Hybognathus amarus*	1
5	Ictalurus punctatus	4

*Hybognathus amarus (age-classes):

age-0 age-1 age-2+

Effort: 439.4 sq. m

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RKD24-045 NEW MEXICO: SOCORRO County, RIO GRANDE Drainage

Rio Grande, at US HWY 380 bridge crossing, San Antonio.

Site Number: 16 River Mile: 87.8 29 April 2024 UTM Easting: 328907 UTM Northing: 3754926 Zone: 13 USGS Quad: San Antonio

Collector(s): Dudley, R.K.; Damron, T.D.; Bowers, B.S.

Family	<u>Species</u>	<u>Total</u>
3	Cyprinus carpio	1
4	Cyprinella lutrensis	27
4	Hybognathus amarus*	3
5	lctalurus punctatus	1
11	Morone chrysops	2

*Hybognathus amarus (age-classes):

age-0 age-1 3 age-2+

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage **RKD24-044**

Rio Grande, east of Bosque del Apache NWR headquarters, San Antonio.

Site Number: 17 River Mile: 79.0 29 April 2024 UTM Easting: 327219 UTM Northing: 3740906 USGS Quad: San Antonio SE Zone: 13 Effort: 457.3 sq. m

Collector(s): Dudley, R.K.; Damron, T.D.; Bowers, B.S.

Family **Species** Total Hybognathus amarus* 4 4 10 Pomoxis annularis

*Hybognathus amarus (age-classes):

age-0 age-1 4 age-2+

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage RKD24-043

Rio Grande, at San Marcial Railroad bridge crossing, San Marcial.

Site Number: 18 River Mile: 68.3 29 April 2024 UTM Easting: 315091 UTM Northina: 3728487 Zone: 13 USGS Quad: San Marcial Effort: 361.6 sq. m

Collector(s): Dudley, R.K.; Damron, T.D.; Bowers, B.S.

Family **Species Total** 4 Hybognathus amarus*

*Hybognathus amarus (age-classes):

age-0 2 age-1 age-2+

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage RKD24-042

Rio Grande, ca. 8.0 mi downstream of San Marcial Railroad bridge crossing, San Marcial.

Site Number: 19 River Mile: 60.1 29 April 2024 UTM Easting: 309441 UTM Northing: 3718309 Zone: 13 USGS Quad: Paraje Well

Collector(s): Dudley, R.K.; Damron, T.D.; Bowers, B.S. Effort: 458.3 sq. m

<u>Family</u>	<u>Species</u>	<u>Total</u>
3	Cyprinus carpio	10
4	Cyprinella lutrensis	26
4	Hybognathus amarus*	5
4	Platygobio gracilis	1
5	Ictalurus punctatus	3
9	Gambusia affinis	1
12	Percina macrolepida	1

*Hybognathus amarus (age-classes):

age-0 age-1 5 age-2+

NEW MEXICO: SOCORRO County, RIO GRANDE Drainage RKD24-041

Rio Grande, ca. 10.0 mi downstream of San Marcial Railroad bridge crossing, San Marcial.

Site Number: 20 River Mile: 58.5 29 April 2024 UTM Easting: 307767 UTM Northing: 3716360 Zone: 13 USGS Quad: Paraje Well

Collector(s): Dudley, R.K.; Damron, T.D.; Bowers, B.S.

Effort: 364.7 sq. m

Family	<u>Species</u>	<u>Total</u>
3	Cyprinus carpio	2
4	Cyprinella lutrensis	95
4	Hybognathus amarus*	1
4	Platygobio gracilis	4
9	Gambusia affinis	1

*Hybognathus amarus (age-classes):

age-0 age-1 1 age-2+