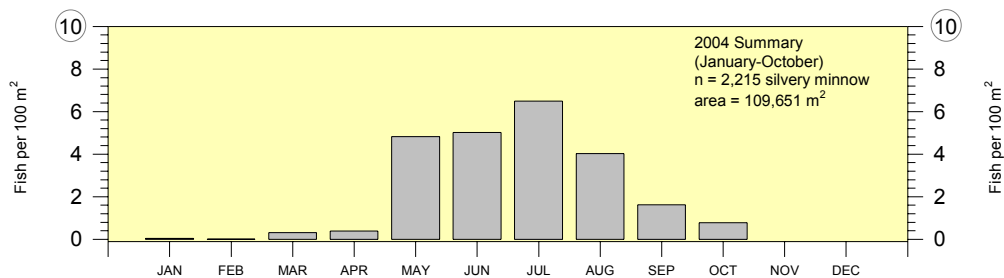
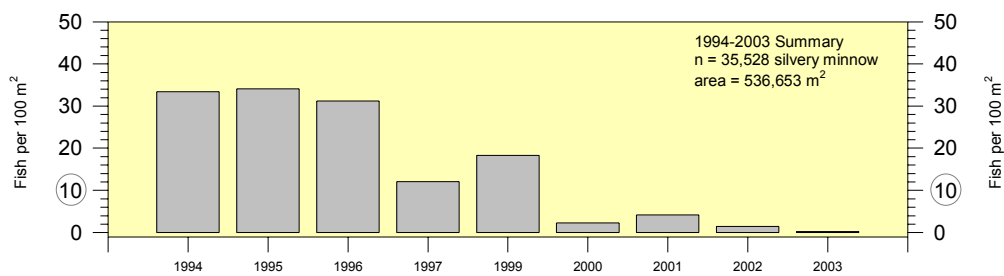


**SUMMARY OF THE RIO GRANDE SILVERY MINNOW  
POPULATION MONITORING PROGRAM RESULTS FROM OCTOBER 2004**  
(25 October - 29 October 2004)

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



Robert K. Dudley, Steven P. Platania, and Sara J. Gottlieb  
American Southwest Ichthyological Research Foundation  
4205 Hannett Avenue, NE  
Albuquerque, NM 87110-4941

8 November 2004

---

**SUMMARY OF THE RIO GRANDE SILVERY MINNOW  
POPULATION MONITORING PROGRAM RESULTS FROM OCTOBER 2004**  
(25 October - 29 October 2004)

prepared for:

**MIDDLE RIO GRANDE ENDANGERED SPECIES ACT COLLABORATIVE PROGRAM**

under USBR contract:

**Number 03CR408029**

U.S. Bureau of Reclamation  
Upper Colorado Regional Office  
125 South State Street, Room 6107  
Salt Lake City, UT 84138-1102

prepared by:

Robert K. Dudley, Steven P. Platania, and Sara J. Gottlieb  
American Southwest Ichthyological Research Foundation  
4205 Hannett Avenue, NE  
Albuquerque, NM 87110-4941

submitted to:

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

8 November 2004

---

---

## SUMMARY OF OVERALL OCTOBER 2004 POPULATION MONITORING EFFORTS

The tenth sampling effort of the 2004 Rio Grande silvery minnow population monitoring program was conducted between 25 October and 29 October 2004 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 (5 mm) seine through discrete mesohabitats. Fish were identified in the field, counted, and released at the site of capture. Rio Grande silvery minnow were also counted, identified to age-class, and released at the site of capture. No young-of-year fish (that could not be field identified) were collected during the October 2004 sampling. Figures illustrating catch rates (number of fish per 100 m<sup>2</sup> sampled) were prepared for the ten focal species, including Rio Grande silvery minnow, for the purpose of comparisons between reaches.

During October 2004, a total of 5,075 fish were taken in the 10,014 m<sup>2</sup> (surface area) of water sampled. Red shiner, *Cyprinella lutrensis*, was the most abundant taxon (N=3,436) and comprised about 68% of the total catch. Rio Grande silvery minnow, *Hybognathus amarus*, (N=78) was present in 8.5% of all seine hauls. Fish were collected in 255 of the 341 seine hauls (74.8%) made during the October 2004 sampling effort yielding a cumulative catch rate of 50.6 fish per 100 m<sup>2</sup> sampled.

## SUMMARY OF OCTOBER 2004 POPULATION MONITORING EFFORT BY RIVER REACH

### Angostura Reach

The Angostura Reach was sampled on 27, 28, and 29 October 2004. Water levels were similar to September and allowed for full access to all portions of the study site including the deepest portions of the thalweg. All areas of the site were sampled including the skirt of Angostura Diversion Dam. Water clarity was high at this site (Secchi depth=31 cm) and the river bottom was visible in most areas. Aquatic vegetation and algae was visible and thick in shallow water habitats. Discharge was relatively constant throughout most of October with the exception of a few rainstorm events that briefly resulted in higher flows. Water temperatures recorded at the different sampling sites ranged from 11°C to 15°C and were about 2°C cooler compared with temperatures in September. Fish were occupying areas along the shoreline and in low velocity habitats. The most frequently collected taxon in the Angostura Reach during October was red shiner (N=427). Rio Grande silvery minnow were the fourth-most abundant species (N=44) and were primarily found in the upper portion of the Angostura Reach (e.g., Sites #0-2). The majority of Rio Grande silvery minnow were between 40-60 mm SL. However, some Age-0 individuals were quite small (<30 mm SL). It is possible that many of the smallest individuals will have an increased rate of mortality compared to larger individuals during winter. The number of Rio Grande silvery minnow collected during October 2004 (N=44) in the Angostura Reach was markedly lower than during August 2004 (N=366). The natural decline in populations following spawning will likely result in even lower densities by October. Fish collected later in the year have a much higher likelihood of surviving through the winter and producing young during the 2005 spawning season. Overall spawning and recruitment success of Rio Grande silvery minnow appears to be higher in 2004 compared to 2003.

### Isleta Reach

October discharge varied little as a result of low base flows that resulted in several small channels throughout a large portion of the Isleta Reach. The water of the Rio Grande was being diverted at Isleta Diversion Dam leaving areas with minimal discharge. However, no sampling sites were dry (one site was dry in September) and discharge had increased slightly compared to last month. In October, return flow from irrigation ditches seemed to increase perhaps as a result of

decreased irrigation. Mid-day water temperatures in the Isleta Reach were generally about 15°C. Water clarity was high at most sampling sites because of low discharge and no input from sediment rich tributaries (e.g., Rios Salado or Puerco). Most of the flow in the Rio Grande was confined within a few shallow channels. The Isleta Reach had the highest catch rate (99.0 fish/100 m<sup>2</sup>) of any of the sampling reaches in the Middle Rio Grande and was more than double than that recorded in the Angostura Reach (27.0 fish/100 m<sup>2</sup>). The most commonly collected taxa were red shiner, *Cyprinella lutrensis* (N=1,533), western mosquitofish, *Gambusia affinis* (N=651), and fathead minnow, *Pimephales promelas* (N=281). Young-of-year Rio Grande silvery minnow (N=4) were collected from multiple seine hauls (N=4) in the Isleta Reach during October 2004. Excessively low flows and river drying were no longer a threat to the remaining population of Rio Grande silvery minnow in the Isleta Reach in October 2004 and irrigation was scheduled to cease by the end of the month (i.e., October 31).

### San Acacia Reach

Population monitoring was conducted in the San Acacia Reach (9 sites) of the Middle Rio Grande from 25-27 October 2004. Discharge had remained low throughout the month but there was no drying in the reach (unlike extensive drying in September). Several of the sampling sites that had dried completely in September (Sites #12-15) produced little or no fish. The water throughout the San Acacia Reach was relatively turbid and instream visibility was <10 cm at all sampling sites (as measured by Secchi Disk). Increased water turbidity was likely a result of several minor rainstorms and occasional input from upstream tributaries. This was in contrast to the high volume of sediment input that originated from the Rio Puerco during August. Water temperatures ranged from 11-16°C during the day and were notably cooler (ca. 10°C) compared to temperatures in September. A small amount of water was being released from San Acacia Diversion Dam and a large amount of water was contained within irrigation ditches that ran parallel to the river. The most commonly collected taxon during October 2004 in the San Acacia Reach was red shiner (N=1,476). The majority of red shiner (N=871) were collected from the upper two sampling sites (Sites #10-11) in the San Acacia Reach. Rio Grande silvery minnow individuals (N=30) were present in a variety of habitats, but all were collected from the three upper-most sites in the San Acacia Reach. The San Acacia Reach catch rate was intermediate between the catch rates of the Angostura and San Acacia reaches. Western mosquitofish was much less common in this reach (0.8 fish/100 m<sup>2</sup>) compared to the Isleta Reach (25.6 fish/100 m<sup>2</sup>).

### Conclusion

The four most numerically dominant taxa collected during the October 2004 monitoring effort were, in order of abundance, red shiner (N=3,436), western mosquitofish (N=781), fathead minnow (N=447), and flathead chub, *Platygobio gracilis* (N=194). These taxa collectively comprised about 96% of the total catch of fish in the Middle Rio Grande study area. The abundance of Rio Grande silvery minnow during October 2004 declined compared to August or September 2004, but there was evidence of recruitment in all three river reaches. Although the abundance of Rio Grande silvery minnow was highest in the Angostura Reach, there were many individuals collected in the San Acacia Reach. This possibly indicates that young from upper reaches emigrated to downstream reaches or that survivorship of young is higher in lower reaches compared to upper reaches. This late October sampling effort indicates that the overall population of Rio Grande silvery minnow has increased compared with last year. Possible causes for this increase include more favorable spring flow conditions and the stocking of adults in the Angostura Reach prior to the spawning period.

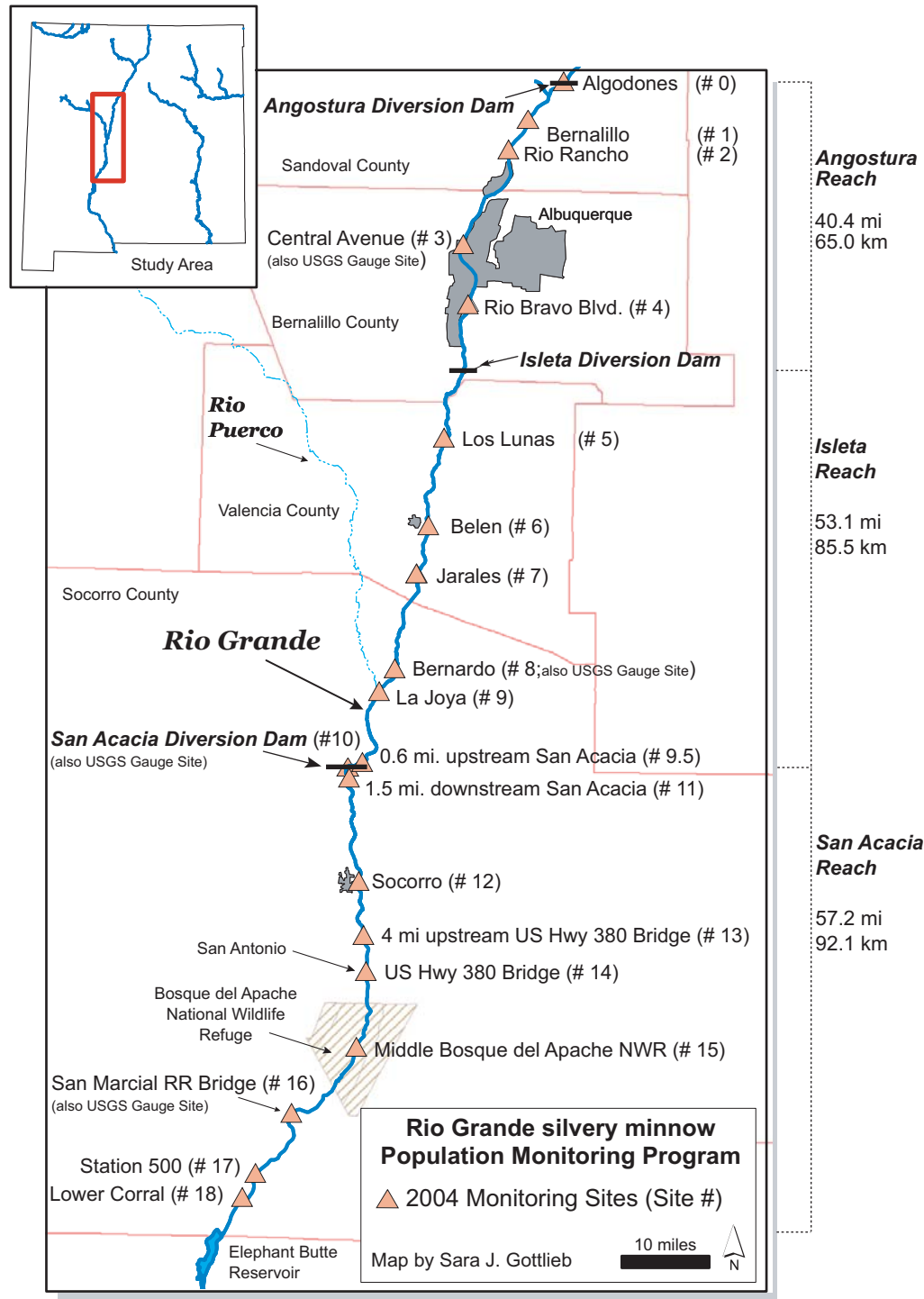


Figure 1. Map of the study area and sampling localities (numbered) for the 2004 Rio Grande silvery minnow population monitoring program. Sampling locality information that correspond with the numbered localities are provided in Appendix A (Table A-1).

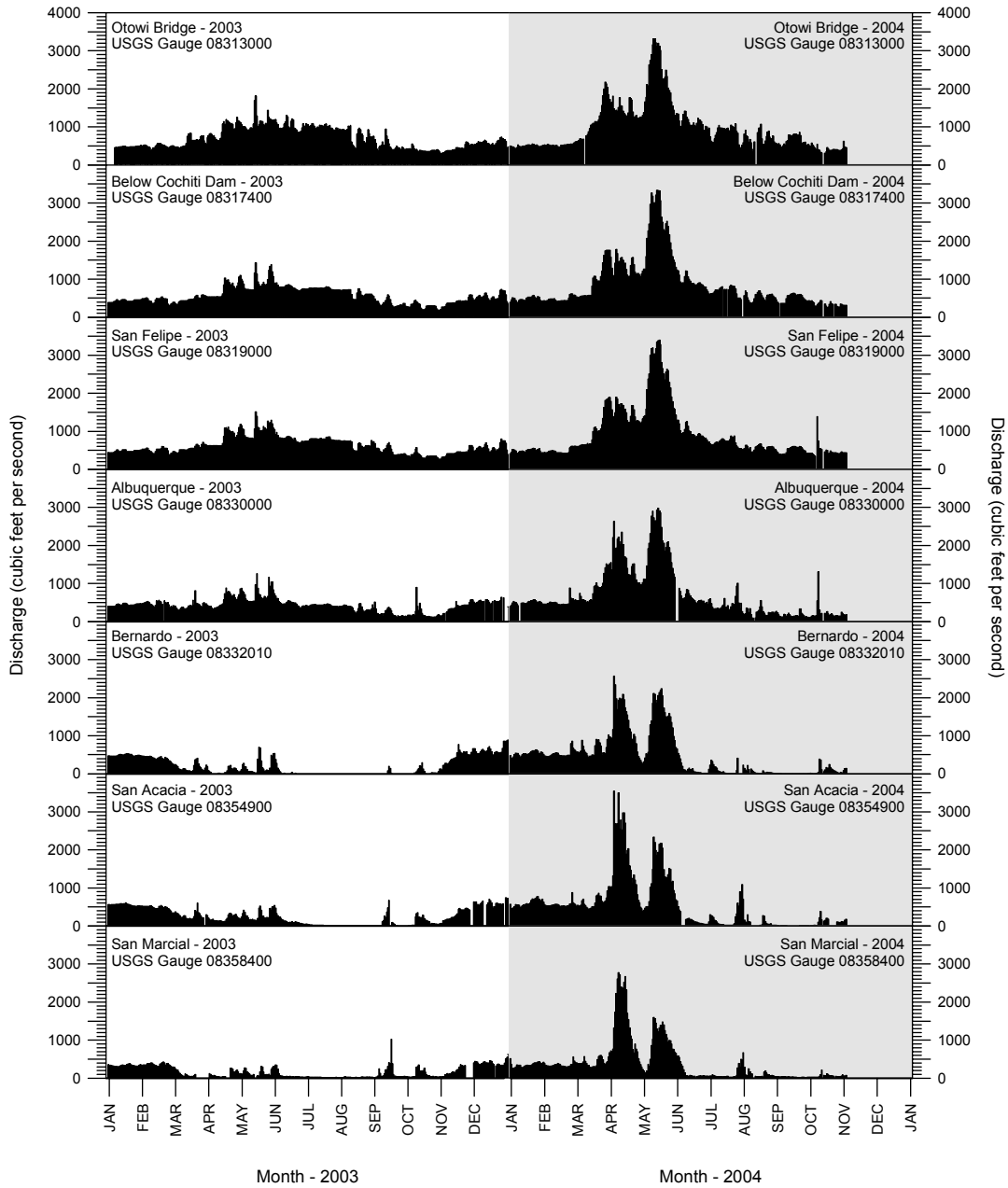


Figure 2. Discharge in the Rio Grande from January 2003 through October 2004 as recorded at seven U. S. Geological Survey (USGS) gauge stations. The Otowi Bridge gauge site is outside of the study area (ca. 25.5 river miles upstream of Cochiti Dam) and provided for reference. Discharge data are provisional and subject to change.

Table 1. Scientific and common names and species codes of fish collected in the Middle Rio Grande during the 1999-2003 Rio Grande silvery minnow population monitoring program.

Scientific Name	Common Name	Code
Order Clupeiformes		
Family Clupeidae	herrings	
<i>Dorosoma cepedianum</i> .....	gizzard shad	(GZS)
Order Cypriniformes		
Family Cyprinidae	carps and minnows	
<i>Cyprinella lutrensis</i> .....	red shiner <sup>1</sup>	(RDS)
<i>Cyprinus carpio</i> .....	common carp <sup>1</sup>	(CCA)
<i>Gila pandora</i> .....	Rio Grande chub	(RGC)
<i>Hybognathus amarus</i> .....	Rio Grande silvery minnow <sup>1</sup>	(RGM)
<i>Pimephales promelas</i> .....	fathead minnow <sup>1</sup>	(FHM)
<i>Platygobio gracilis</i> .....	flathead chub <sup>1</sup>	(FHC)
<i>Rhinichthys cataractae</i> .....	longnose dace <sup>1</sup>	(LND)
Family Catostomidae	suckers	
<i>Carpiodes carpio</i> .....	river carpsucker <sup>1</sup>	(RCS)
<i>Catostomus commersoni</i> .....	white sucker <sup>1</sup>	(WHS)
<i>Ictiobus bubalus</i> .....	smallmouth buffalo	(SMB)
Order Siluriformes		
Family Ictaluridae	bullhead catfishes	
<i>Ameiurus melas</i> .....	black bullhead	(BBH)
<i>Ameiurus natalis</i> .....	yellow bullhead	(YBH)
<i>Ictalurus punctatus</i> .....	channel catfish <sup>1</sup>	(CCT)
<i>Pylodictis olivaris</i> .....	flathead catfish	(FCT)
Order Cyprinodontiformes		
Family Poeciliidae	livebearers	
<i>Gambusia affinis</i> .....	western mosquitofish <sup>1</sup>	(MOS)
Order Perciformes		
Family Percichthyidae	temperate basses	
<i>Morone chrysops</i> .....	white bass	(WHB)

<sup>1</sup> focal taxa represent the most abundant species present in recent Middle Rio Grande collections and species illustrated in monthly plots of data.

Table 1. Scientific and common names and species codes of fish collected in the Middle Rio Grande during the 1999-2003 Rio Grande silvery minnow population monitoring program (continued).

Scientific Name	Common Name	Code
Order Perciformes		
Family Centrarchidae	sunfishes	
<i>Lepomis cyanellus</i> .....	green sunfish	(GNS)
<i>Lepomis macrochirus</i> .....	bluegill	(BGL)
<i>Micropterus salmoides</i> .....	largemouth bass	(LMB)
<i>Pomoxis annularis</i> .....	white crappie	(WCR)
<i>Pomoxis nigromaculatus</i> .....	black crappie	(BCR)
Family Percidae	perches	
<i>Perca flavescens</i> .....	yellow perch	(YWP)
<i>Stizostedion vitreum</i> .....	walleye	(WLE)



Table 2. Summary of the October 2004 Rio Grande silvery minnow population monitoring program results (species list is based on fish collected from 1999-2003).

SPECIES	RESIDENCE STATUS <sup>1</sup>	TOTAL NUMBER OF SPECIMENS	PERCENT (%) OF TOTAL	FREQUENCY OF OCCURRENCE <sup>2</sup>	% FREQUENCY OF OCCURRENCE <sup>2</sup>
<b>HERRINGS</b>					
gizzard shad	I	—	—	—	—
<b>CARPS AND MINNOWS</b>					
red shiner	N	3,436	67.70	19	95
common carp	I	7	0.14	5	25
Rio Grande silvery minnow	N	78	1.54	9	45
Rio Grande chub	N	—	—	—	—
fathead minnow	N	447	8.81	14	70
flathead chub	N	194	3.82	10	50
longnose dace	N	24	0.47	5	25
<b>SUCKERS</b>					
river carpsucker	N	42	0.83	6	30
white sucker	I	5	0.10	3	15
smallmouth buffalo	N	—	—	—	—
<b>BULLHEAD CATFISHES</b>					
black bullhead	I	—	—	—	—
yellow bullhead	I	1	0.02	1	5
channel catfish	I	60	1.18	13	65
flathead catfish	I	—	—	—	—
<b>LIVEBEARERS</b>					
western mosquitofish	I	781	15.39	15	75
<b>TEMPERATE BASSES</b>					
white bass	I	—	—	—	—
<b>SUNFISHES</b>					
green sunfish	I	—	—	—	—
bluegill	N	—	—	—	—
largemouth bass	I	—	—	—	—
white crappie	I	—	—	—	—
black crappie	I	—	—	—	—
<b>PERCHES</b>					
yellow perch	I	—	—	—	—
walleye	I	—	—	—	—
TOTAL		5,075			

<sup>1</sup> N = native; I = introduced

<sup>2</sup> Frequency and % frequency of occurrence are based on n=20 sample sites

Table 3. Summary of the monthly 2004 Rio Grande silvery minnow population monitoring program results (species list based on fish collected from 1999-2003).

SPECIES	J A N	F E B	M A R	A P R	M A Y	J U N	J U L	A U G	S E P	O C T	N O V	D E C	T O T A L
<b>HERRINGS</b>													
gizzard shad	—	—	1	—	—	3	1	3	—	—			8
<b>CARPS AND MINNOWS</b>													
red shiner	1,700	2,565	2,645	2,941	2,249	4,688	2,608	2,659	4,373	3,436			29,864
common carp	2	4	9	—	99	238	28	13	7	7			407
Rio Grande silvery minnow	7	2	45	49	517	411	574	416	116	78			2,215
Rio Grande chub	—	—	—	—	—	—	—	—	—	—			—
fathead minnow	166	193	167	95	407	1,501	896	439	776	447			5,087
flathead chub	38	30	79	61	52	105	211	158	138	194			1,066
longnose dace	2	1	26	99	9	26	91	23	11	24			312
<b>SUCKERS</b>													
river carpsucker	19	15	84	11	252	856	280	167	59	42			1,785
white sucker	4	23	128	43	896	479	106	20	2	5			1,706
smallmouth buffalo	—	—	—	—	—	—	—	2	—	—			2
<b>BULLHEAD CATFISHES</b>													
black bullhead	—	3	—	—	—	—	—	1	—	—			4
yellow bullhead	—	—	—	—	—	1	10	12	3	1			27
channel catfish	49	119	127	42	16	14	156	163	62	60			808
flathead catfish													
<b>LIVEBEARERS</b>													
western mosquitofish	68	299	282	515	191	2,523	2,281	1,335	1,105	781			9,380
<b>TEMPERATE BASSES</b>													
white bass	—	—	—	—	—	—	—	—	—	—			—
<b>SUNFISHES</b>													
green sunfish	—	1	—	1	—	—	—	—	—	—			2
bluegill	—	—	—	3	1	—	—	1	1	—			6
largemouth bass	—	—	1	—	1	1	8	—	—	—			11
white crappie	3	1	—	5	1	1	—	—	—	—			11
black crappie													
<b>PERCHES</b>													
yellow perch	—	1	1	—	2	20	—	1	—	—			25
walleye	—	—	1	—	—	—	—	—	—	—			1
<b>TOTAL</b>	<b>2,058</b>	<b>3,257</b>	<b>3,596</b>	<b>3,865</b>	<b>4,693</b>	<b>10867</b>	<b>7,250</b>	<b>5,413</b>	<b>6,653</b>	<b>5,075</b>			<b>52,727</b>

Table 4. Summary of the monthly catch of Rio Grande silvery minnow, by site and reach, during the 2004 Rio Grande silvery minnow population monitoring program. Numerals in parenthesis are the number of silvery minnow in that collection that were marked (subset of the total).

REACH	J	F	M	A	M	J	J	A	S	O	N	D	T
Site Number	A	E	A	P	A	U	U	U	E	C	O	E	O
Site Name	N	B	R	R	Y	N	L	G	P	T	V	C	A
													L
<b>ANGOSTURA REACH</b>													
0 Angostura Dam	—	—	—	—	—	—	234	100	8	8			350
1 Bernalillo	—	—	24	6	—	3	142(1)	77	28	28			308
2 Rio Rancho	—	—	17	42(22)	425	218	74	176	29	7			988
3 Central Ave (Abq)	—	—	3	—	—	12	1	7	1	1			25
4 Rio Bravo (Abq)	—	—	1	—	31	1	2	6	—	—			41
<i>Angostura Reach Total</i>	—	—	45	48(22)	456	234	453(1)	366	66	44			1,712
<b>ISLETA REACH</b>													
5 Los Lunas	1	1	—	—	46	10	12	13	—	1			84
6 Belen	2	1	—	—	—	—	6	10	3	3			25
7 Jarales	1	—	—	—	—	—	36	1	5	—			43
8 US Hwy 60 Bernardo	—	—	—	—	—	6	—	—	—	—			6
9 South of Bernardo	1	—	—	—	6	10	51	6	7	—			81
9.5 North of San Acacia	—	—	—	—	—	51	3	1	—	—			55
<i>Isleta Reach Total</i>	5	2	—	—	52	77	108	31	15	4			294
<b>SAN ACACIA REACH</b>													
10 San Acacia Dam	—	—	—	—	—	24	4	—	6	18			52
11 S of San Acacia	1	—	—	1	—	4	1	4	29	5			45
12 Socorro	—	—	—	—	—	69	5	10	—	7			91
13 North of US Hwy 380	—	—	—	—	—	—	1	4	—	—			5
14 US Hwy 380	—	—	—	—	6	—	1	—	—	—			7
15 Bosque del Apache	1	—	—	—	2	1	—	—	—	—			4
16 San Marcial	—	—	—	—	—	—	—	1	—	—			1
17 South of San Marcial	—	—	—	—	1	—	—	—	—	—			1
18 South of San Marcial	—	—	—	—	—	2	1	—	—	—			3
<i>San Acacia Reach Total</i>	2	—	—	1	9	100	13	19	35	30			209
<b>MONTHLY TOTALS</b>	<b>7</b>	<b>2</b>	<b>45</b>	<b>49(22)</b>	<b>517</b>	<b>411</b>	<b>574(1)</b>	<b>416</b>	<b>116</b>	<b>78</b>			<b>2,215</b>

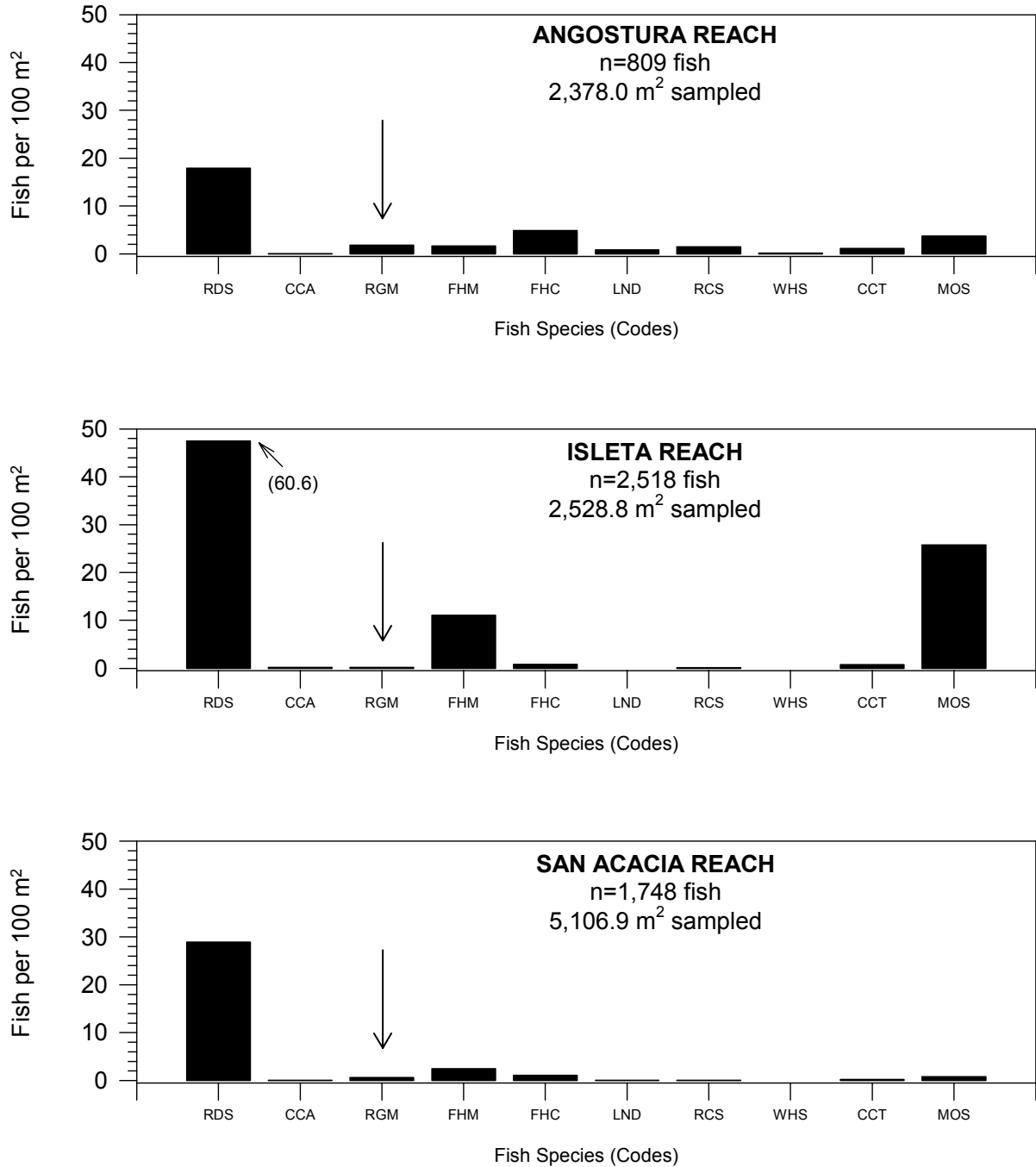


Figure 3. Catch rates, for the 10 focal species, by river reach during October 2004 at Rio Grande silvery minnow population monitoring program collection sites (see Table A-1 for fish species codes). An arrow indicates the Rio Grande silvery minnow (RGM) histogram bar.

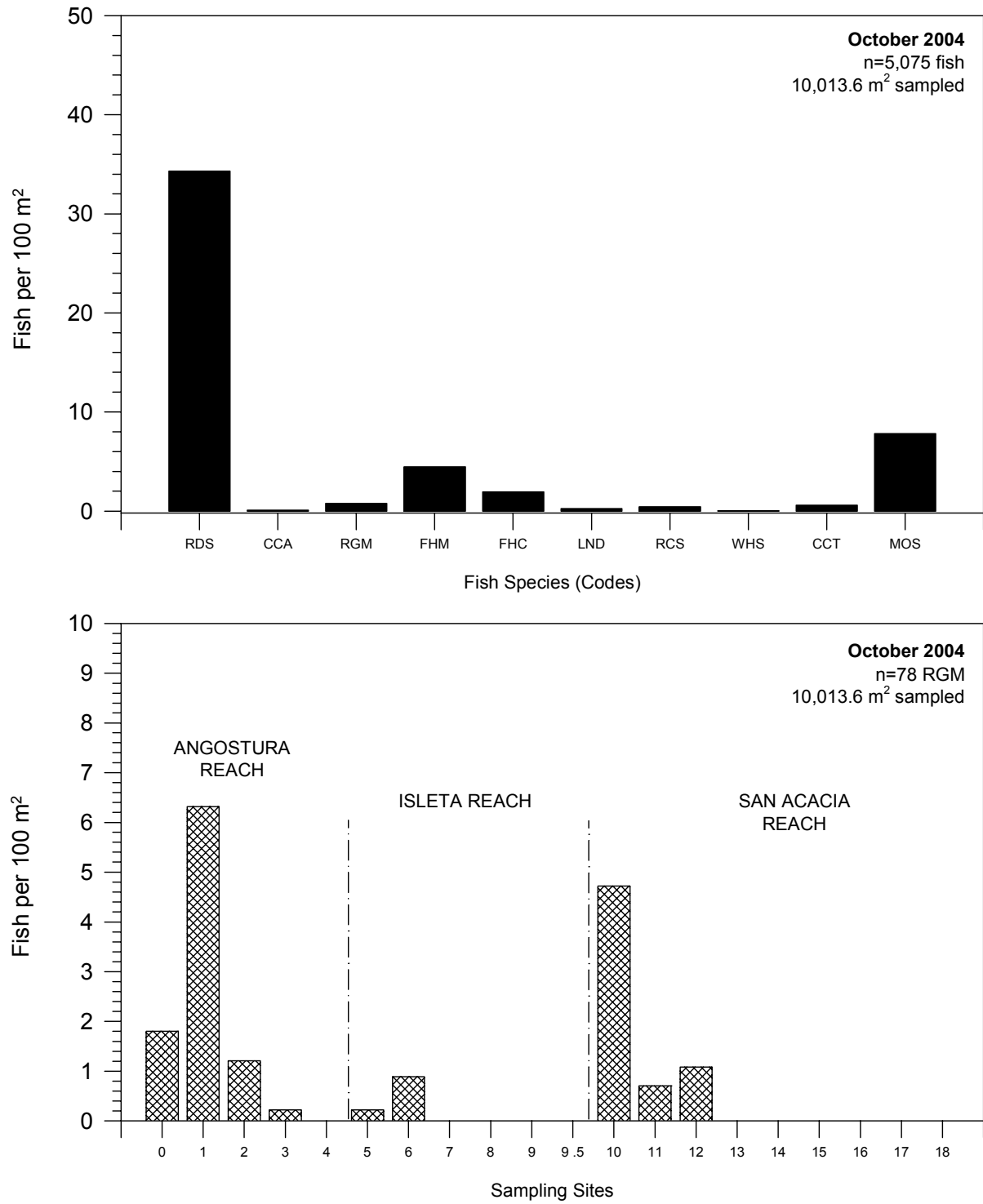


Figure 4. Catch rates for ten focal species (upper graph\*), including Rio Grande silvery minnow, (RGM; lower graph\*) during October 2004 at Rio Grande silvery minnow population monitoring program collection sites (see Table A-1 for fish species codes).

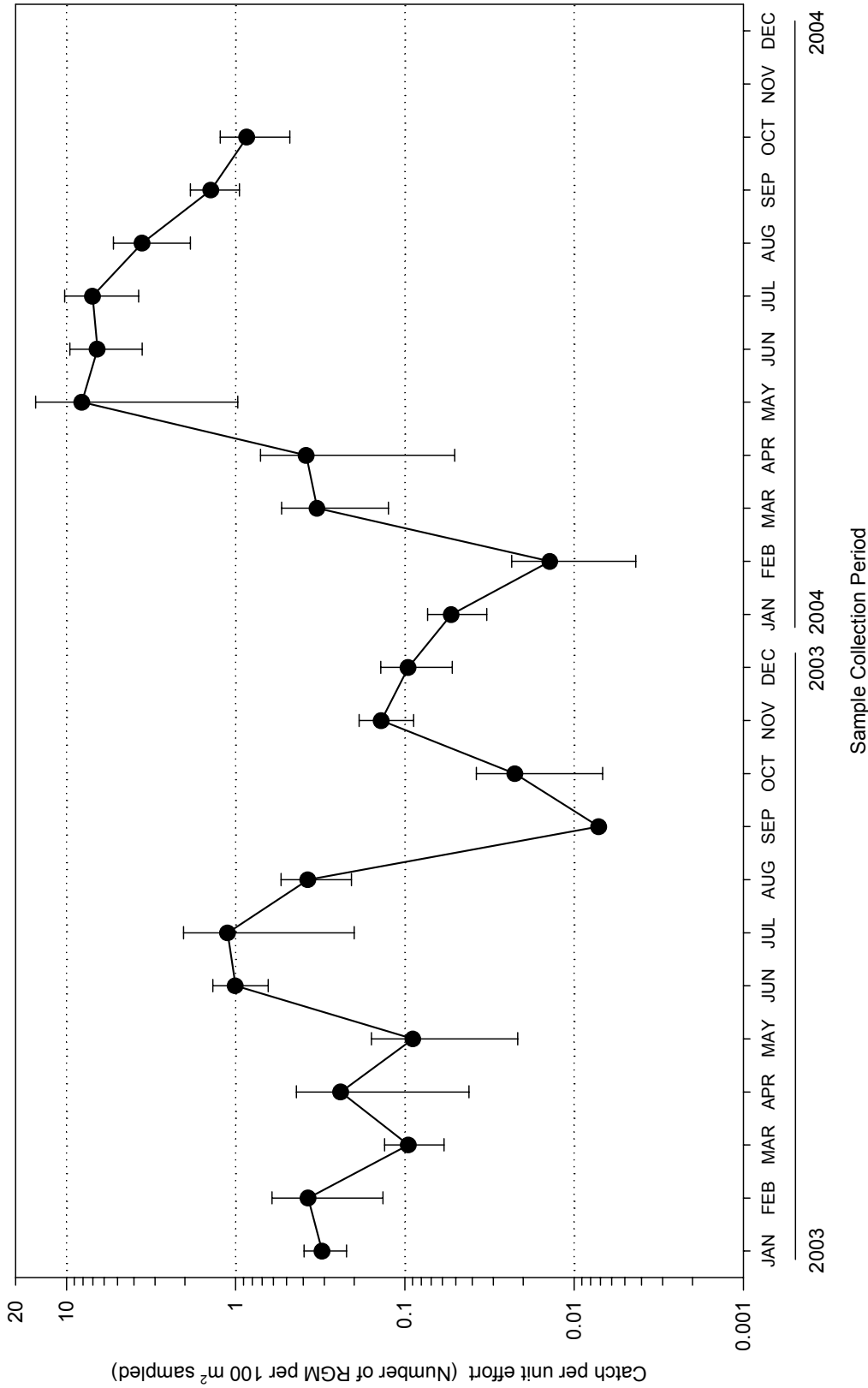


Figure 5. Month catch rates of Rio Grande silvery minnow during 2003 (January-December) and January-October 2004 at Rio Grande silvery minnow population monitoring program collection sites. Solid circles indicate monthly means (n=20 site per month) and capped-bars represent the standard error of the mean.

APPENDIX A.

Collection localities of the 2004 Rio Grande silvery minnow population monitoring program.

Table A-1. Collection localities of the 2004 Rio Grande silvery minnow population monitoring program.

Site #	Site Locality
<b>ANGOSTURA REACH SITES</b>	
<b>SITE #</b>	
0	New Mexico, Sandoval County, Rio Grande, below Angostura Diversion Dam, Algodones. River Mile 209.7            SAN FELIPE PUEBLO QUADRANGLE 3916006 N                    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            BERNALILLO QUADRANGLE 3909722 N                    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            BERNALILLO QUADRANGLE 3905355 N                    354772 E
3	New Mexico, Bernalillo County, Rio Grande, at Central Avenue (US Highway 66) bridge crossing, Albuquerque. River Mile 183.4            ALBUQUERQUE WEST QUADRANGLE 3884094 N                    346840 E
4	New Mexico, Bernalillo County, Rio Grande, at Rio Bravo Boulevard bridge crossing, Albuquerque. River Mile 178.3            ALBUQUERQUE WEST QUADRANGLE 3877163 N                    347554 E
<b>ISLETA REACH SITES</b>	
<b>SITE #</b>	
5	New Mexico, Valencia County, Rio Grande, at Los Lunas (NM State Highway 49) bridge crossing, Los Lunas. River Mile 161.4            LOS LUNAS QUADRANGLE 3852531 N                    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            TOME QUADRANGLE 3837061 N                    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            VEGUITA QUADRANGLE 3827329 N                    338136 E



Table A-1. Collection localities of the 2004 Rio Grande silvery minnow population monitoring program (continued).

Site #	Site Locality
<b>ISLETA REACH SITES (continued)</b>	
<b>SITE #</b>	
8	New Mexico, Socorro County, Rio Grande, at US Highway 60 bridge crossing, Bernardo. River Mile 130.6      ABEYTAS QUADRANGLE 3809726 N              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      ABEYTAS QUADRANGLE 3805229 N              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      LA JOYA QUADRANGLE 3792603 N              327902 E
<b>SAN ACACIA REACH SITES</b>	
<b>SITE #</b>	
10	New Mexico, Socorro County, Rio Grande, directly below San Acacia Diversion Dam, San Acacia. River Mile 116.2      SAN ACACIA QUADRANGLE 3791977 N              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      LEMITAR QUADRANGLE 3790442 N              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      LOMA DE LAS CANAS QUADRANGLE 3771043 N              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      SAN ANTONIO QUADRANGLE 3761283 N              328140 E
14	New Mexico, Socorro County, Rio Grande, at US Highway 380 bridge crossing, San Antonio. River Mile 87.1      SAN ANTONIO QUADRANGLE 3754471 N              328914 E

Table A-1. Collection localities of the 2004 Rio Grande silvery minnow population monitoring program (continued).

---

Site #	Site Locality
<b>SAN ACACIA REACH SITES (continued)</b>	
<b>SITE #</b>	
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. 19 miles downstream of the southern end of the Bosque del Apache National Wildlife Refuge, San Marcial. River Mile 57.7            PARAJE WELL QUADRANGLE 3714740 N                307380 E

---

APPENDIX B.

Ichthyofaunal composition of the October 2004  
Rio Grande silvery minnow population monitoring efforts

**Rio Grande silvery minnow Population Monitoring  
October 2004**

New Mexico: Sandoval Co., Rio Grande Drainage

Rio Grande, directly below Angostura Diversion Dam, Algodones.

Site Number: 0

28 October 2004

**RKD04-197**

River Mile: 209.7

UTM Easting: 363811 UTM Northing: 3916006 Zone: 13 Quad: San Felipe Pueblo

R.K. Dudley, M.A. Farrington, and T.L. Max

Effort: 443.8 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	86
76	<i>Hybognathus amarus*</i>	8
76	<i>Pimephales promelas</i>	8
76	<i>Rhinichthys cataractae</i>	3
81	<i>Catostomus commersoni</i>	2
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	2

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

age-0 8

New Mexico: Sandoval Co., Rio Grande Drainage

Rio Grande, at US HWY 550 (formerly NM State HWY 44) bridge crossing, Bernalillo.

Site Number: 1

29 October 2004

**RKD04-198**

River Mile: 203.8

UTM Easting: 358543 UTM Northing: 3909722 Zone: 13 Quad: Bernalillo

R.K. Dudley, M.A. Farrington, and T.L. Max

Effort: 443.3 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	97
76	<i>Hybognathus amarus*</i>	28
76	<i>Pimephales promelas</i>	16
76	<i>Platygobio gracilis</i>	86
76	<i>Rhinichthys cataractae</i>	12
81	<i>Catostomus commersoni</i>	2
93	<i>Ictalurus punctatus</i>	2
212	<i>Gambusia affinis</i>	12

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

age-0 28

\*\*\* All data are provisional and should be verified by direct inspection of field data and specimens whenever possible\*\*\*

**Rio Grande silvery minnow Population Monitoring  
October 2004**

New Mexico: Sandoval 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

29 October 2004

**RKD04-199**

UTM Easting: 354772 UTM Northing: 3905355 Zone: 13 Quad: Bernalillo

R.K. Dudley, M.A. Farrington, and T.L. Max

Effort: 578.8 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	38
76	<i>Cyprinus carpio</i>	1
76	<i>Hybognathus amarus*</i>	7
76	<i>Platygobio gracilis</i>	9
76	<i>Rhinichthys cataractae</i>	3
81	<i>Catostomus commersoni</i>	1
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	29

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

age-0 7

New Mexico: Bernalillo Co., Rio Grande Drainage

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

Site Number: 3

29 October 2004

**RKD04-200**

River Mile: 183.4

UTM Easting: 346840 UTM Northing: 3884094 Zone: 13 Quad: Albuquerque West

R.K. Dudley, M.A. Farrington, and T.L. Max

Effort: 455.5 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	141
76	<i>Hybognathus amarus*</i>	1
76	<i>Pimephales promelas</i>	5
76	<i>Platygobio gracilis</i>	16
81	<i>Carpionodes carpio</i>	15
93	<i>Ictalurus punctatus</i>	21
212	<i>Gambusia affinis</i>	8

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

age-0 1

\*\*\* All data are provisional and should be verified by direct inspection of field data and specimens whenever possible\*\*\*

**Rio Grande silvery minnow Population Monitoring  
October 2004**

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

27 October 2004

**RKD04-192**

UTM Easting: 347554 UTM Northing: 3877163 Zone: 13 Quad: Albuquerque West

R.K. Dudley and M.A. Farrington

Effort: 456.8 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	65
76	<i>Pimephales promelas</i>	11
76	<i>Platygobio gracilis</i>	5
76	<i>Rhinichthys cataractae</i>	3
81	<i>Carpoides carpio</i>	22
93	<i>Ictalurus punctatus</i>	3
212	<i>Gambusia affinis</i>	39

New Mexico: Valencia Co., Rio Grande Drainage

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

Site Number: 5

27 October 2004

**RKD04-191**

River Mile: 161.4

UTM Easting: 342898 UTM Northing: 3852531 Zone: 13 Quad: Los Lunas

R.K. Dudley and M.A. Farrington

Effort: 449.0 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	9
76	<i>Hybognathus amarus</i> *	1
76	<i>Pimephales promelas</i>	21
212	<i>Gambusia affinis</i>	1

\* *Hybognathus amarus* by age class:

age-0 1

\*\*\* All data are provisional and should be verified by direct inspection of field data and specimens whenever possible\*\*\*

**Rio Grande silvery minnow Population Monitoring  
October 2004**

New Mexico: Valencia Co., Rio Grande Drainage

Rio Grande, ca. 1.0 miles upstream of NM State HWY 309/6 bridge crossing, Belen.  
27 October 2004

**RKD04-190**

Site Number: 6

River Mile: 151.5

UTM Easting: 339972 UTM Northing: 3837061 Zone: 13 Quad: Tome

R.K. Dudley and M.A. Farrington

Effort: 339.3 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	256
76	<i>Cyprinus carpio</i>	3
76	<i>Hybognathus amarus*</i>	3
76	<i>Pimephales promelas</i>	55
76	<i>Platygobio gracilis</i>	1
81	<i>Carpionodes carpio</i>	2
93	<i>Ameiurus natalis</i>	1
212	<i>Gambusia affinis</i>	173

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

age-0 3

New Mexico: Valencia Co., Rio Grande Drainage

Rio Grande, ca. 2.2 miles upstream of NM State HWY 346 bridge crossing, Jarales.  
27 October 2004

**RKD04-189**

Site Number: 7

River Mile: 143.2

UTM Easting: 338136 UTM Northing: 3827329 Zone: 13 Quad: Veguita

R.K. Dudley and M.A. Farrington

Effort: 377.0 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	444
76	<i>Pimephales promelas</i>	85
93	<i>Ictalurus punctatus</i>	3
212	<i>Gambusia affinis</i>	329

\*\*\* All data are provisional and should be verified by direct inspection of field data and specimens whenever possible\*\*\*

**Rio Grande silvery minnow Population Monitoring  
October 2004**

New Mexico: Socorro Co., Rio Grande Drainage

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

Site Number: 8

28 October 2004

**RKD04-196**

River Mile: 130.6

UTM Easting: 334604 UTM Northing: 3809726 Zone: 13 Quad: Abeytas

R.K. Dudley, M.A. Farrington, and T.L. Max

Effort: 477.0 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	350
76	<i>Pimephales promelas</i>	105
81	<i>Carpiodes carpio</i>	1
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	52

New Mexico: Socorro Co., Rio Grande Drainage

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

Site Number: 9

28 October 2004

**RKD04-195**

River Mile: 127.0

UTM Easting: 331094 UTM Northing: 3805229 Zone: 13 Quad: Abeytas

R.K. Dudley, M.A. Farrington, and T.L. Max

Effort: 440.3 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	443
76	<i>Cyprinus carpio</i>	1
76	<i>Pimephales promelas</i>	12
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	88

\*\*\* All data are provisional and should be verified by direct inspection of field data and specimens whenever possible\*\*\*



**Rio Grande silvery minnow Population Monitoring  
October 2004**

New Mexico: Socorro Co., Rio Grande Drainage

Rio Grande, ca. 0.6 miles upstream of San Acacia Diversion Dam, San Acacia  
28 October 2004 **RKD04-194**

Site Number: 9.5

River Mile: 116.8

UTM Easting: 327902 UTM Northing: 3792603 Zone: 13 Quad: La Joya

R.K. Dudley, M.A. Farrington, and T.L. Max

Effort: 460.3 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	31
76	<i>Pimephales promelas</i>	3
76	<i>Platygobio gracilis</i>	21
93	<i>Ictalurus punctatus</i>	14
212	<i>Gambusia affinis</i>	8

New Mexico: Socorro Co., Rio Grande Drainage

Rio Grande, directly below San Acacia Diversion Dam, San Acacia.  
27 October 2004 **RKD04-193**

Site Number: 10

River Mile: 116.2

UTM Easting: 326162 UTM Northing: 3791977 Zone: 13 Quad: San Acacia

R.K. Dudley and M.A. Farrington

Effort: 381.5 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	512
76	<i>Cyprinus carpio</i>	1
76	<i>Hybognathus amarus*</i>	18
76	<i>Pimephales promelas</i>	83
76	<i>Platygobio gracilis</i>	42
76	<i>Rhinichthys cataractae</i>	3
81	<i>Carpionodes carpio</i>	1
93	<i>Ictalurus punctatus</i>	5
212	<i>Gambusia affinis</i>	21

\* *Hybognathus amarus* by age class:

age-0 18

\*\*\* All data are provisional and should be verified by direct inspection of field data and specimens whenever possible\*\*\*

**Rio Grande silvery minnow Population Monitoring  
October 2004**

New Mexico: Socorro Co., Rio Grande Drainage

Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia.  
26 October 2004

**RKD04-188**

Site Number: 11  
River Mile: 114.6

UTM Easting: 325263 UTM Northing: 3790442 Zone: 13 Quad: Lemitar

R.K. Dudley, W.H. Brandenburg, and H.L. Parmeter

Effort: 713.3 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	359
76	<i>Cyprinus carpio</i>	1
76	<i>Hybognathus amarus*</i>	5
76	<i>Pimephales promelas</i>	18
76	<i>Platygobio gracilis</i>	12
212	<i>Gambusia affinis</i>	4

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

age-0 5

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,  
26 October 2004

**RKD04-187**

Site Number: 12  
River Mile: 99.5

UTM Easting: 327097 UTM Northing: 3771043 Zone: 13 Quad: Loma de las Canas

R.K. Dudley, W.H. Brandenburg, and H.L. Parmeter

Effort: 648.1 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	260
76	<i>Hybognathus amarus*</i>	7
76	<i>Pimephales promelas</i>	24
76	<i>Platygobio gracilis</i>	1
212	<i>Gambusia affinis</i>	13

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

age-0 7

\*\*\* All data are provisional and should be verified by direct inspection of field data and specimens whenever possible\*\*\*

**Rio Grande silvery minnow Population Monitoring  
October 2004**

New Mexico: Socorro Co., Rio Grande Drainage

Rio Grande, ca. 4.0 miles upstream of U.S. 380 bridge crossing.

Site Number: 13

26 October 2004

**RKD04-186**

River Mile: 91.7

UTM Easting: 328140 UTM Northing: 3761283 Zone: 13 Quad: San Antonio

R.K. Dudley, W.H. Brandenburg, and H.L. Parmeter

Effort: 700.8 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	1
81	<i>Carpoides carpio</i>	1

New Mexico: Socorro Co., Rio Grande Drainage

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

Site Number: 14

26 October 2004

**RKD04-185**

River Mile: 87.1

UTM Easting: 328914 UTM Northing: 3754471 Zone: 13 Quad: San Antonio

R.K. Dudley, W.H. Brandenburg, and H.L. Parmeter

Effort: 807.0 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
---------------	--	----------

New Mexico: Socorro Co., Rio Grande Drainage

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

Site Number: 15

25 October 2004

**RKD04-184**

River Mile: 79.1

UTM Easting: 327055 UTM Northing: 3740839 Zone: 13 Quad: San Antonio SE

R.K. Dudley, M.A. Farrington, and H.L. Parmeter

Effort: 520.3 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	3

\*\*\* All data are provisional and should be verified by direct inspection of field data and specimens whenever possible\*\*\*

**Rio Grande silvery minnow Population Monitoring  
October 2004**

New Mexico: Socorro Co., Rio Grande Drainage

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

Site Number: 16

25 October 2004

**RKD04-183**

River Mile: 68.6

UTM Easting: 315284 UTM Northing: 3728347 Zone: 13 Quad: San Marcial

R.K. Dudley, M.A. Farrington, and H.L. Parmeter

Effort: 484.3 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	171
76	<i>Pimephales promelas</i>	1
76	<i>Platygobio gracilis</i>	1
93	<i>Ictalurus punctatus</i>	1

New Mexico: Socorro Co., Rio Grande Drainage

Rio Grande, at (former) confluence with the Low Flow Conveyance Channel, 16.0 miles downstream of the southern end of Bosque del Apache National Wildlife Refuge; ca. 8 miles downstream of the San Marcial Railroad Bridge crossing.

Site Number: 17

River Mile: 60.5

25 October 2004

**RKD04-182**

UTM Easting: 309487 UTM Northing: 3718178 Zone: 13 Quad: Paraje Well

R.K. Dudley, M.A. Farrington, and H.L. Parmeter

Effort: 561.0 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	138
93	<i>Ictalurus punctatus</i>	1
212	<i>Gambusia affinis</i>	2

New Mexico: Socorro Co., Rio Grande Drainage

Rio Grande, ca. 19 miles downstream of the southern end of Bosque del Apache National Wildlife Refuge

Site Number: 18

River Mile: 57.7

25 October 2004

**RKD04-181**

UTM Easting: 307380 UTM Northing: 3714740 Zone: 13 Quad: Paraje Well

R.K. Dudley, M.A. Farrington, and H.L. Parmeter

Effort: 290.8 m<sup>2</sup>

<b>FAMILY</b>		<b>N</b>
76	<i>Cyprinella lutrensis</i>	32
93	<i>Ictalurus punctatus</i>	6

\*\*\* All data are provisional and should be verified by direct inspection of field data and specimens whenever possible\*\*\*