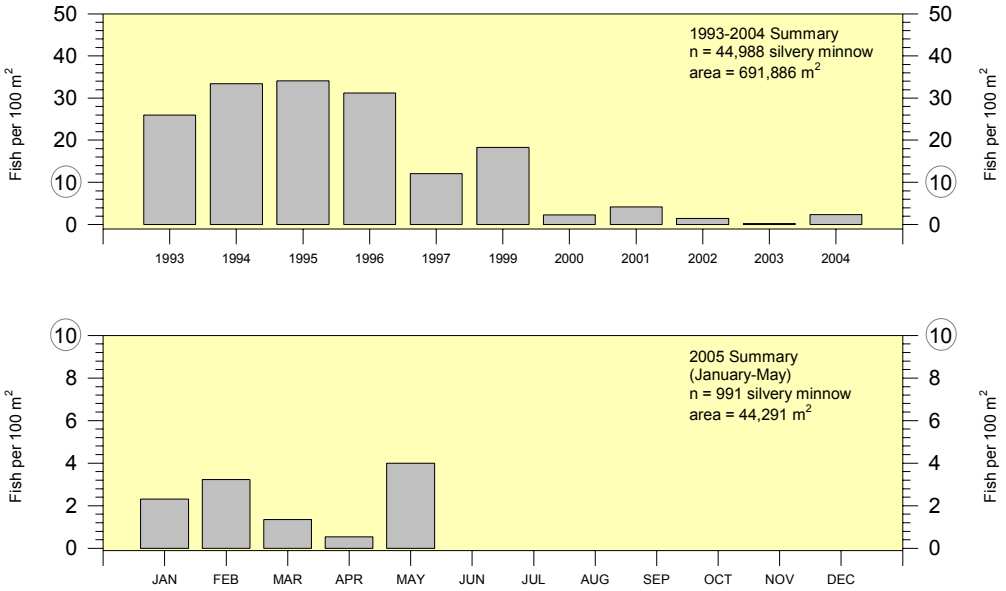
Summary of the Rio Grande silvery minnow Population Monitoring Program Results from May 2005

(23-27 May 2005)

A Middle Rio Grande Endangered Species Act Collaborative Program Funded Research Project



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8 June 2005

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Summary of Overall May 2005 Population Monitoring Efforts

The fifth sampling effort of the 2005 Rio Grande silvery minnow population monitoring program was conducted between 23-27 May 2005 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. Rio Grande silvery minnow were counted and identified to age-class. Other fishes were identified to species and enumerated, but age-class was not determined. Figures illustrating catch rates (number of fish per 100 m^2 sampled) were prepared for the ten focal species, including Rio Grande silvery minnow, for the purpose of comparisons between reaches.

During May 2005, a total of 2,867 fish were taken in the 5,868 m^2 (surface area) of water sampled. White sucker was the most abundant taxon (N=1,311) and comprised about 46% of the total catch. Rio Grande silvery minnow (N=234) was present in 13 of 152 seine hauls with fish (ca. 9%) and was abundant in specific mesohabitats such as backwaters and pools. Sampling at Site #16 produced about 76% (N=177) of all Rio Grande silvery minnow collected during May (all RGSM at Site #16 were age-0). Cumulative fish catch rate was 48.9 individuals per 100 m^2 sampled; nearly double what it was in April (22.0 individuals per 100 m^2 sampled). The overall abundance of fish (N=2,867) was comprised mostly of fish (primarily white sucker) from the Angostura Reach (N=1,706).

Summary of May 2005 Population Monitoring Effort by River Reach

Angostura Reach

Angostura Reach ichthyofaunal sampling took on 26 and 27 May 2005. Discharge in the Rio Grande had increased greatly throughout the Angostura Reach during May 2005 compared to April 2005. Water levels were rising and the total discharge was higher than it has been in nearly ten years. Discharge throughout the Angostura Reach peaked at about 6,000 cfs during May. However, the maximum discharge was much higher upstream of Cochiti Dam (ca. 9,000 cfs) as documented by the Otowi Gauge. Although the discharge was regulated and the flow peak was artificially dampened by the storage of water in Cochiti Reservoir, the increased discharge resulted in increased turbidity; erosion of banks and inundation of sand islands resulted in increased input of suspended sediments. Water clarity was highest in the uppermost portion of the Angostura Reach (Secchi depth ca. 15 cm at Site #0) but the river became more turbid downstream of the confluence with the Jemez River (Secchi depth ca. 8 cm at Site #1). In contrast, the Secchi depth reading in March 2005 at Site #0 was about 61 cm. Water temperatures recorded at the different sampling sites ranged from 16.7°C to 19.5°C and were warm enough to support rapid growth of larval fish in appropriate low velocity habitats. Several large backwaters and low velocity shoreline habitats with inundated terrestrial vegetation provided suitable nursery areas. Very few fish were collected in main channel habitats or other mesohabitats that had current velocities >0.5 m/s. Large portions of the river had higher current velocities and greater depths because of the elevated discharge. White sucker (N=1,307) was, by far, the most frequently collected taxon in the Angostura Reach during May 2005. The second most common species was red shiner (N=209). Flathead chub (N=78) and longnose dace (N=54) were surprisingly abundant and were primarily found in shoreline run habitats. Rio Grande silvery minnow (N=11) was the seventh-most abundant taxon and was present in seven seine hauls. The Angostura Diversion Dam sampling site (Site #0) and the Rio Bravo site (Site #4) produced the fewest numbers of Rio Grande silvery minnow of any of the Angostura Reach sites. White sucker had spawned successfully based on the large number of young-of-year present in shoreline and backwater habitats. As water temperatures warm in May, it is likely that several taxa (including Rio Grande silvery minnow) will reproduce in the Angostura Reach. Alternatively, it is possible that silvery minnow have already spawned in the Angostura Reach and that most of the young were displaced downstream into the Isleta and San Acacia reaches.

Isleta Reach

Flows in the Rio Grande were substantially higher during May 2005 than they had been in the past several years. The large volume of water had covered many of the vegetated islands that were slowly becoming established since 2002. The erosive action of the water had also displace large amounts of vegetation and sediment downstream. Elevated discharge resulted in the persistence of many small side channels and extensive areas of inundation on islands and along the shoreline. Some islands were completely inundated while backwaters formed mostly along the shoreline in other areas. Water temperatures in the Isleta Reach generally ranged from 19.1-23.1°C from morning (0900 h) to afternoon (1300 h); this was about a 7°C increase compared with April 2005. Water temperatures were warm enough to trigger spawning by many taxa, including Rio Grande silvery minnow. Water clarity was low (Secchi depth <5 cm) at most sampling sites because of increased discharge and erosion of accumulated material in the formerly dry portions of the river channel. The Isleta Reach had the lowest catch rate (14.9 fish/100 m^2) of any of the sampling reaches in the Middle Rio Grande and was much lower than what was recorded during March 2005 (26.5 fish/100 m^2). Overall ichthyofaunal catch rates in the Angostura Reach (104.9 fish/100 m^2) were higher compared to the Isleta Reach and had increased markedly in the last month, primarily because of the addition of white sucker. The most commonly collected taxa in the Isleta Reach were red shiner (N=63), Rio Grande silvery minnow (N=43), western mosquitofish (N=41), and fathead minnow (N=32).

San Acacia Reach

Population monitoring was conducted in the San Acacia Reach (9 sites) of the Middle Rio Grande from 23-25 May 2005. Water levels had increased markedly since the beginning of the month but didn't peak until the third week of May. The elevated flow combined with moderate ambient temperatures resulted in relatively warmer water temperatures in the San Acacia Reach (range=21.2-25.9°C) compared to April 2005; temperatures were nearly 10°C warmer in May. Many of the formerly dry side channels throughout the reach had been re-wetted and were flowing. The river had eroded away the access road to the lowermost site (Site #19) and to the San Marcial area (Site #16). However, flooded bosque habitats that resulted from the elevated discharge created ideal nursery habitats for larval fishes. While the habitat was dominated by main channel runs that were deep and swift, flooded bosque areas were extensive in some areas. The turbidity levels in the San Acacia Reach were elevated and most sampling sites has a Secchi depth reading of <7 cm. The most commonly collected taxon during May 2005 in the San Acacia Reach was red shiner (N=446). Rio Grande silvery minnow (N=180) were present at several sampling sites; the age-class structure was dominated by young-of-year. The larval silvery minnow collected were in excellent condition and were likely to grow quickly in flooded bosque habitats. The San Acacia Reach catch rate (33.4 fish/100 m^2) was higher than the catch rates in either the Angostura or Isleta reaches.

Conclusion

White sucker (N=1,311) temporarily displaced red shiner as the most numerically dominant taxon collected in the Rio Grande. Based on past data, the successful spawn of white sucker is likely to indicate that Rio Grande silvery minnow will also increase in abundance this year. The high number of young-of-year silvery minnow in the San Acacia Reach (N=180) is a good indication that environmental conditions are adequate for successful recruitment. Common taxa included red shiner (N=718), Rio Grande silvery minnow (N=234), river carpsucker (N=148), flathead chub (N=136), and western mosquitofish (N=109). These six taxa collectively comprised 93% of the total catch of fish in the Middle Rio Grande study area. The abundance of Rio Grande silvery minnow during the early part of 2005, including May, indicates that the status of this species has improved markedly compared to spring of 2004. Higher than average spring runoff (peak magnitude and duration) is expected for 2005 which may increase the likelihood of recruitment success by creating more favorable nursery habitats. The duration and magnitude of the spring runoff for 2005 appears to be similar to 1993-1995 and 1997.

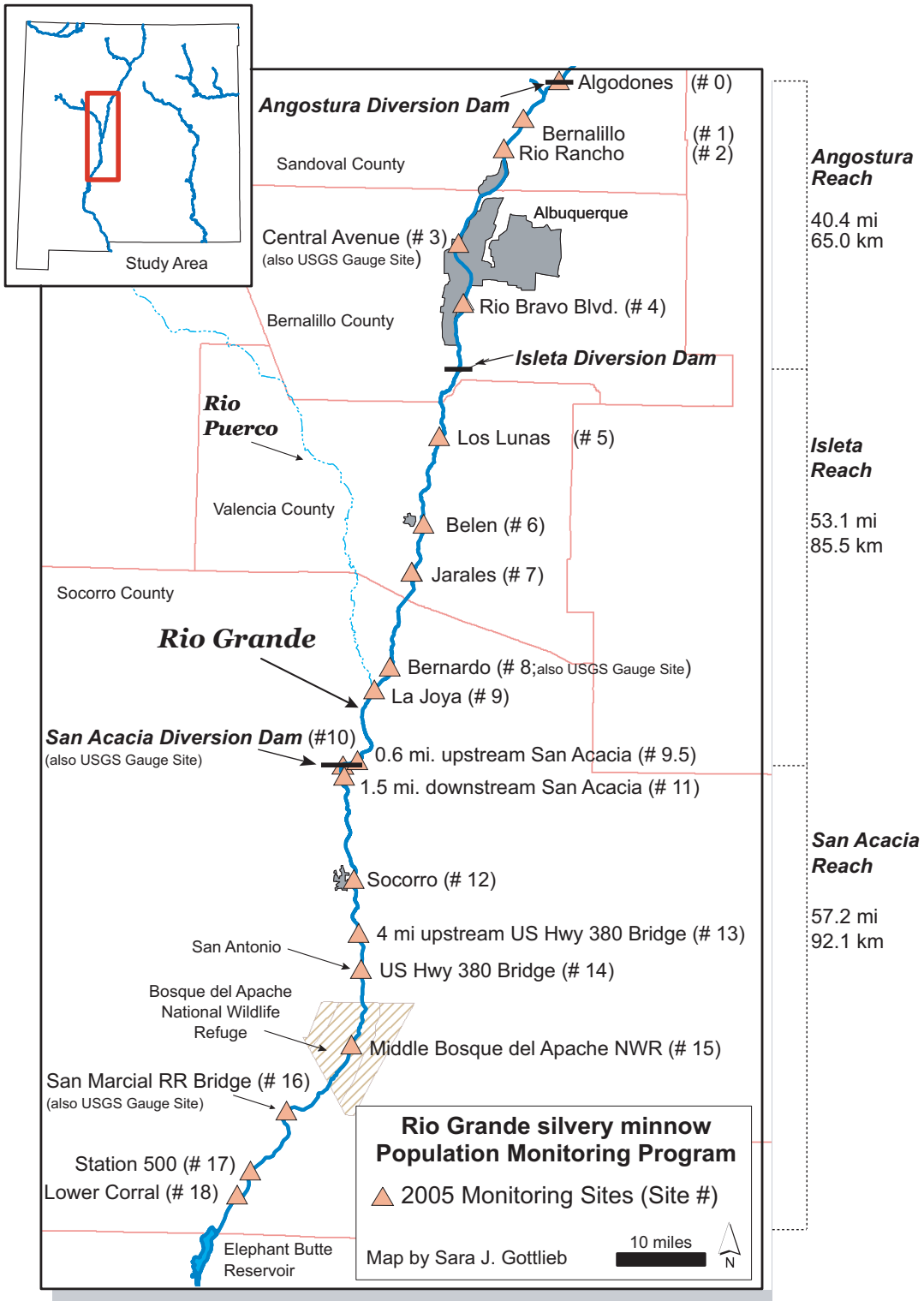

Figure 1. Map of the study area and sampling localities (numbered) for the 2005 Rio Grande silvery minnow population monitoring program. Sampling locality information that correspond with the numbered localities are provided in Appendix A (Table A-1).

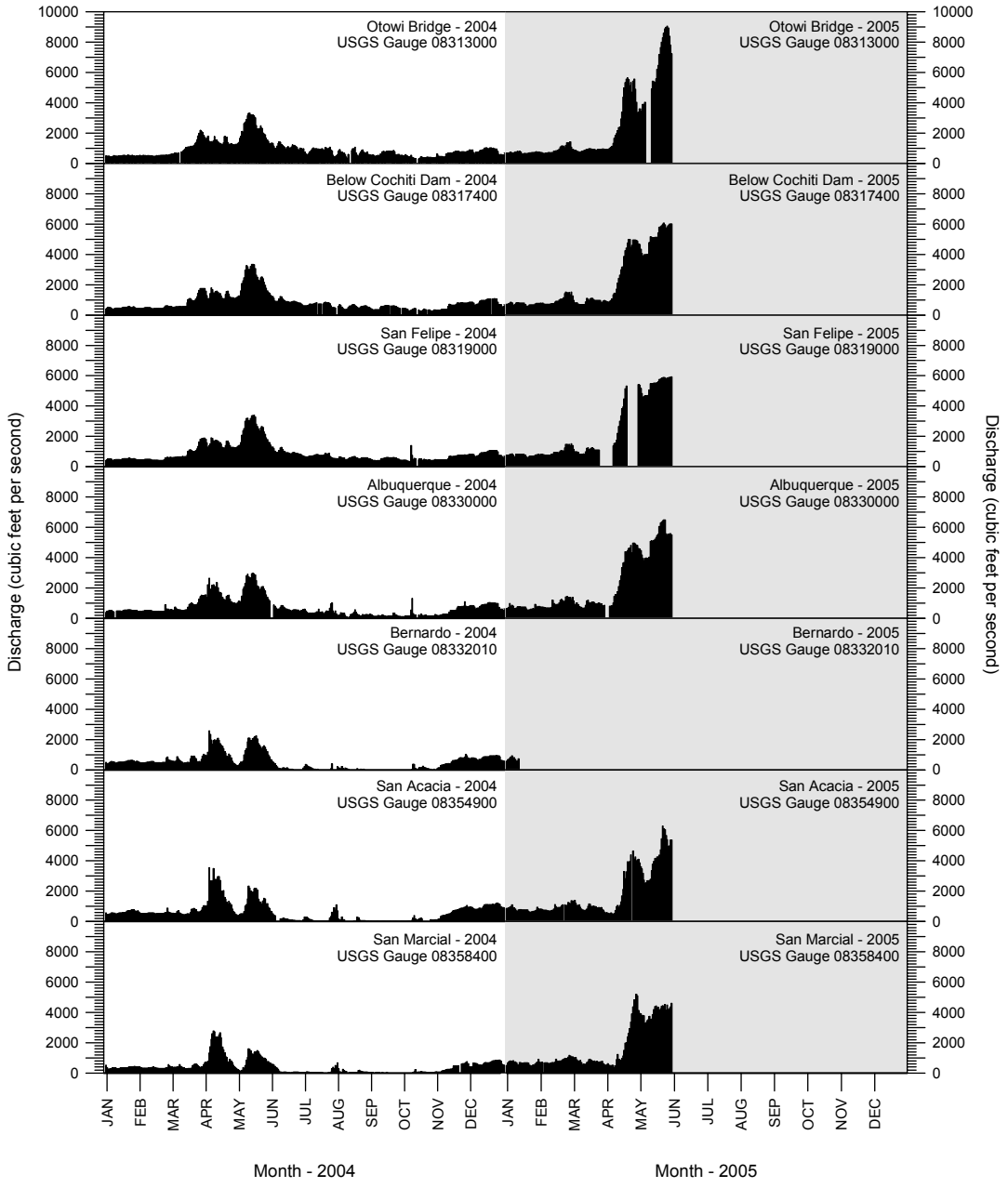

Figure 2. Discharge in the Rio Grande from January 2004 through May 2005 as recorded at seven U. S. Geological Survey (USGS) gauge stations. The Otowi Bridge gauge site is outside of the study area (ca. 25.5 river miles upstream of Cochiti Dam) and provided for reference. Discharge data are provisional and subject to change. *Note: Bernardo discharge data (USGS 08332010) became temporarily unavailable on 13 January 2005 and data collection is now discontinued at that gauge.

Table 1. Scientific and common names and species codes of fish collected in the Middle Rio Grande during the 1999-2004 Rio Grande silvery minnow population monitoring program.

Scientific Name	Common Name	Code
Order Clupeiformes		
Family Clupeidae	herrings	
Dorosoma cepedianum	gizzard shad	(GZS)
Order Cypriniformes		
Family Cyprinidae	carps and minnows	
Cyprinella lutrensis	red shiner [1]	(RDS)
Cyprinus carpio	common carp [1]	(CCA)
Gila pandora	Rio Grande chub	(RGC)
Hybognathus amarus	Rio Grande silvery minnow [1]	(RGM)
Pimephales promelas	fathead minnow [1]	(FHM)
Pimephales vigilax	bullhead minnow	(BHM)
Platygobio gracilis	flathead chub [1]	(FHC)
Rhinichthys cataractae	longnose dace [1]	(LND)
Family Catostomidae	suckers	
Carpiodes carpio	river carpsucker [1]	(RCS)
Catostomus commersonii	white sucker [1]	(WHS)
Ictiobus bubalus	smallmouth buffalo	(SMB)
Order Siluriformes		
Family Ictaluridae	North American catfishes	
Ameiurus melas	black bullhead	(BBH)
Ameiurus natalis	yellow bullhead	(YBH)
Ictalurus punctatus	channel catfish [1]	(CCT)
Pylodictis olivaris	flathead catfish	(FCT)
Order Salmoniformes		
Family Salmonidae	trouts and salmons	
Salmo trutta	brown trout	(BNT)
Order Cyprinodontiformes		
Family Poeciliidae	livebearers	
Gambusia affinis	western mosquitofish [1]	(MOS)

[1] 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 1999-2004 Rio Grande silvery minnow population monitoring program (continued).

Scientific Name	Common Name	Code
Order Perciformes		
Family Percichthyidae	temperate basses	
Morone chrysops	white bass	(WHB)
Order Perciformes		
Family Centrarchidae	sunfishes	
Lepomis cyanellus	green sunfish	(GNS)
Lepomis macrochirus	bluegill	(BGL)
Micropterus salmoides	largemouth bass	(LMB)
Pomoxis annularis	white crappie	(WCR)
Pomoxis nigromaculatus	black crappie	(BCR)
Family Percidae	perches	
Perca flavescens	yellow perch	(YWP)
Sander vitreus	walleye	(WLE)

Table 2. Summary of the May 2005 Rio Grande silvery minnow population monitoring program results (species list is based on fish collected from 1999-2004).

SPECIES	RESIDENCE STATUS[1]	TOTAL NUMBER OF SPECIMENS	PERCENT (%) OF TOTAL	FREQUENCY OF OCCURRENCE[2]	% FREQUENCY OCCURRENCE[2]
HERRINGS					
gizzard shad	I	1	0.03	1	5
CARPS AND MINNOWS					
red shiner	N	718	25.04	16	80
common carp	I	80	2.79	9	45
Rio Grande chub	N	—	0.00	—	—
Rio Grande silvery minnow	N	234	8.16	9	45
fathead minnow	N	67	2.34	8	40
bullhead minnow	I	—	0.00	—	—
flathead chub	N	136	4.74	8	40
longnose dace	N	54	1.88	2	10
SUCKERS					
river carpsucker	N	148	5.16	5	25
white sucker	I	1,311	45.73	7	35
smallmouth buffalo	N	—	0.00	—	—
BULLHEAD CATFISHES					
black bullhead	I	—	0.00	—	—
yellow bullhead	I	—	0.00	—	—
channel catfish	I	8	0.28	6	30
flathead catfish	I	—	0.00	—	—
TROUTS					
brown trout	I	—	0.00	—	—
LIVEBEARERS					
western mosquitofish	I	109	3.80	12	60
TEMPERATE BASSES					
white bass	I	—	0.00	—	—
SUNFISHES					
green sunfish	I	—	0.00	—	—
bluegill	N	—	0.00	—	—
largemouth bass	I	—	0.00	—	—
white crappie	I	—	0.00	—	—
black crappie	I	—	0.00	—	—
PERCHES					
yellow perch	I	—	0.00	—	—
walleye	I	1	0.03	1	5
TOTAL		2,867			

[1] N = native; I = introduced

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

Table 3. Summary of the monthly 2005 Rio Grande silvery minnow population monitoring program results (species list based on fish collected from 1999-2004).

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
HERRINGS													
gizzard shad	—	—	—	—	1								1
CARPS AND MINNOWS													
red shiner	2,760	935	2,243	1,344	718								8,000
common carp	3	3	3	6	80								95
Rio Grande chub	—	—	—	—	—								—
Rio Grande silvery minnow	248	330	133	46	234								991
fathead minnow	356	144	171	53	67								791
bullhead minnow	—	1	4	—	—								5
flathead chub	112	187	181	181	136								797
longnose dace	1	14	20	83	54								172
SUCKERS													
river carpsucker	19	20	41	4	148								232
white sucker	16	59	43	30	1,311								1,459
smallmouth buffalo	—	—	—	—	—								—
BULLHEAD CATFISHES													
black bullhead	—	—	—	—	—								—
yellow bullhead	—	2	—	1	—								3
channel catfish	6	49	35	70	8								168
flathead catfish	—	—	—	—	—								—
TROUTS													
brown trout	—	—	—	—	—								—
LIVEBEARERS													
western mosquitofish	64	146	60	62	109								441
TEMPERATE BASSES													
white bass	—	—	—	—	—								—
SUNFISHES													
green sunfish	—	—	—	—	—								—
bluegill	—	—	—	—	—								—
largemouth bass	—	1	1	—	—								2
white crappie	1	—	—	—	—								1
black crappie	—	—	—	—	—								—
PERCHES													
yellow perch	—	—	—	—	—								—
walleye	—	—	—	—	1								1
TOTAL	3,586	1,891	2,935	1,880	2,867								13,159

Table 4. Summary of the monthly catch or Rio Grande silvery minnow, by site and reach, during the 2005 Rio Grande silvery minnow population monitoring program. Numerals in pararenthesis are the number of silvery minnow in a site collection that were marked (subset of the total).

REACH Site Number Site Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
ANGOSTURA REACH													
0 Angostura Dam	—	—	—	3	—								3
1 Bernalillo	20	68	36	5(1)	6(1)								135
2 Rio Rancho	147(4)	137(8)	25	7(1)	3(2)								319
3 Central Ave (Abq)	7	64(17)	12	27	2								112
4 Rio Bravo (Abq)	4(1)	19(7)	15	—	—								38
Angostura Reach Total	178	288	88	42	11								607
ISLETA REACH													
5 Los Lunas	3	11	2	1	5								22
6 Belen	1	4	3	—	3								11
7 Jarales	30	0	0	—	—								30
8 US Hwy 60 Bernardo	8	1	1	—	35								45
9 South of Bernardo	5	2	1	—	—								8
9.5 North of San Acacia	1	0	0	—	—								1
Isleta Reach Total	48	18	7	1	43								117
SAN ACACIA REACH													
10 San Acacia Dam	3	0	16	2	—								21
11 S of San Acacia	13	15	14	1	—								43
12 Socorro	3	0	1	—	—								4
13 North of US Hwy 380	—	6	0	—	—								6
14 US Hwy 380	1	0	0	—	—								1
15 Bosque del Apache	2	—	0	—	2								4
16 San Marcial	—	—	1	—	177								178
17 South of San Marcial	—	—	0	—	1								1
18 South of San Marcial	—	3	6	—	—								9
San Acacia Reach Total	22	24	38	3	180								267
MONTHLY TOTALS	**248**	**330**	**133**	**46**	**234**								**991**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL

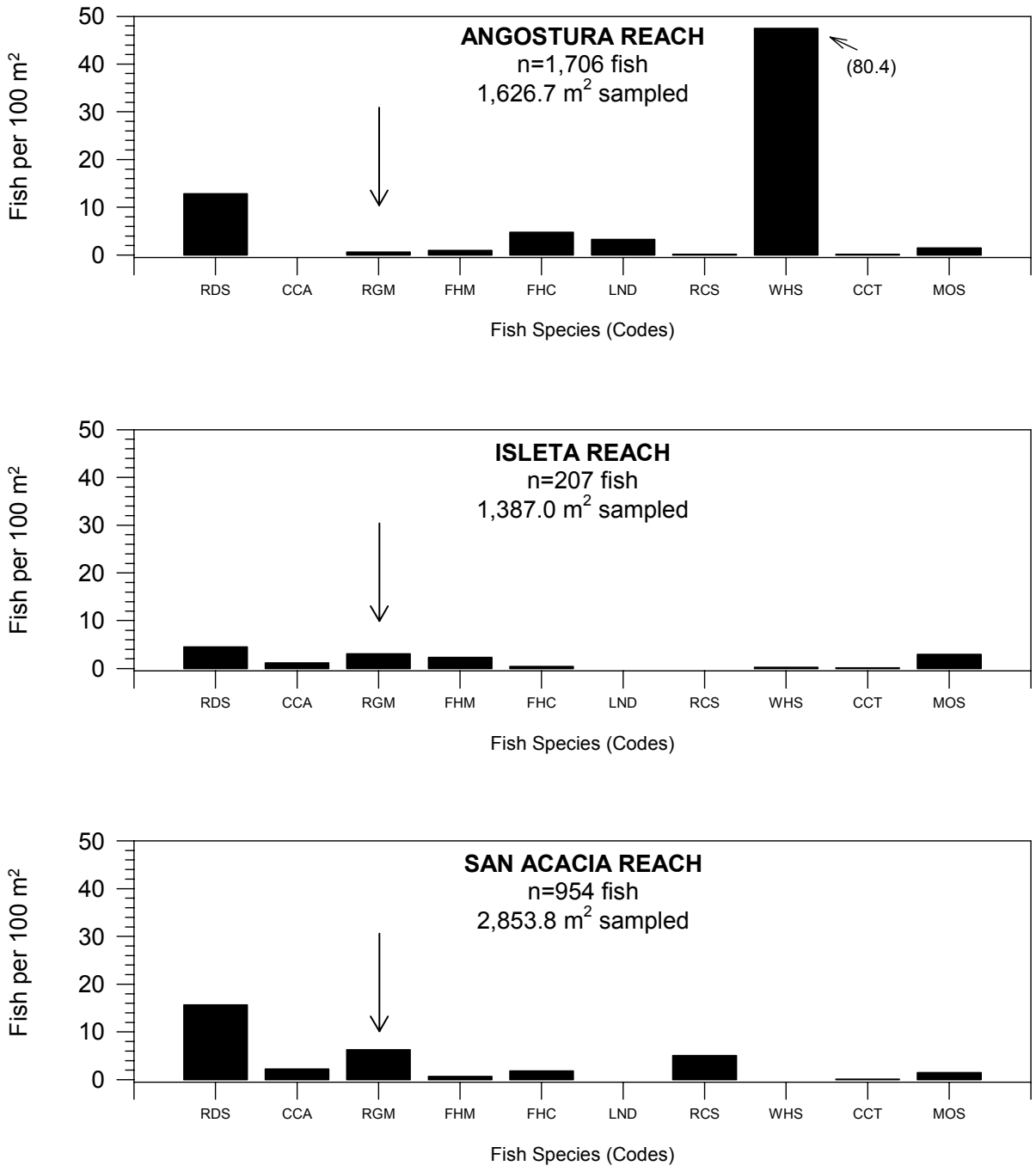

Figure 3. Catch rates, for the 10 focal species, by river reach during May 2005 at Rio Grande silvery minnow population monitoring program collection sites (see Table A-1 for fish species codes). An arrow indicates the Rio Grande silvery minnow (RGM) histogram bar.

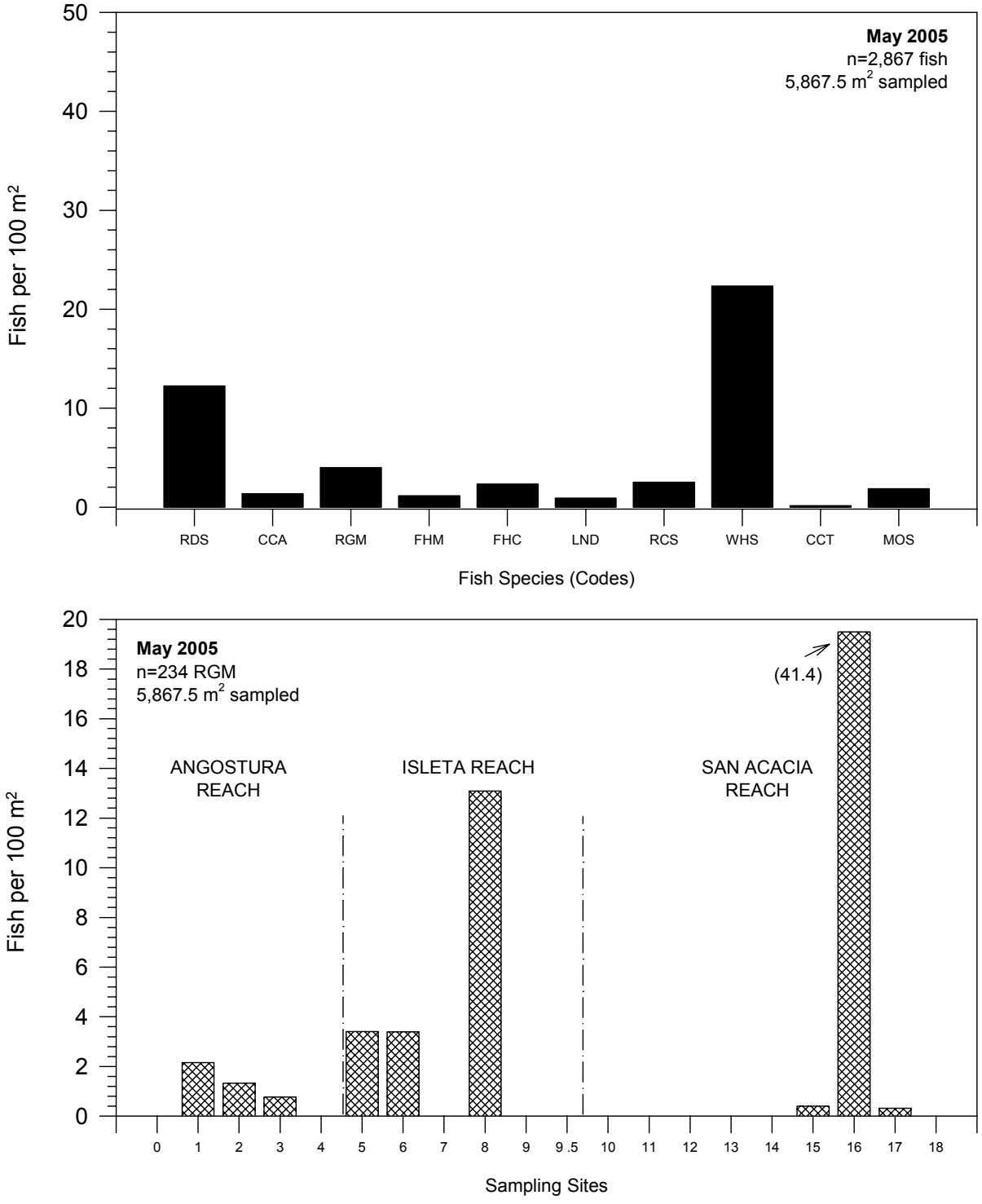

Figure 4. Catch rates for ten focal species (upper graph*), including Rio Grande silvery minnow, (RGM; lower graph*) during May 2005 at Rio Grande silvery minnow population monitoring program collection sites (see Table A-1 for fish species codes).

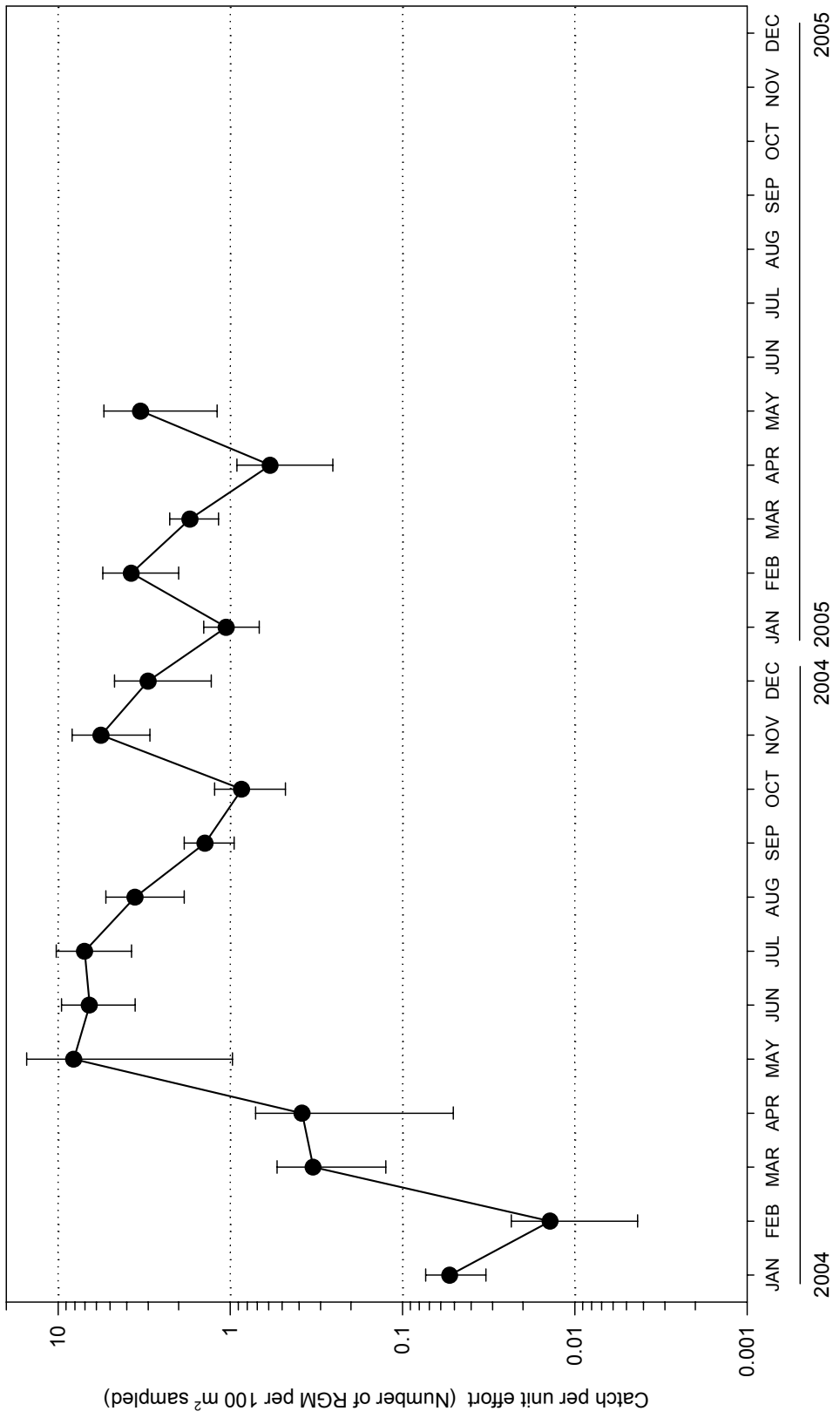

Figure 5. Month catch rates of Rio Grande silvery minnow during 2004 (January-December) and through May 2005 at Rio Grande silvery minnow population monitoring program collection sites. Solid circles indicate monthly means (n=20 site per month) and capped-bars represent the standard error of the mean.

APPENDIX A.

Collection localities of the 2005 Rio Grande silvery minnow population monitoring program.

Table A-1. Collection localities of the 2005 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 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

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 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 2005 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 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

SAN ACACIA REACH SITES
SITE #

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 2005 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. 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 May 2005
Rio Grande silvery minnow population monitoring efforts

Rio Grande silvery minnow Population Monitoring
May 2005

New Mexico: Sandoval Co., Rio Grande Drainage

Rio Grande, directly below Angostura Diversion Dam, Algodones. Site Number: 0

27 May 2005 **RKD05-103** River Mile: 209.7

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

R.K. Dudley, M.A. Farrington, W.H. Brandenburg, and L.E. Renfro Effort: 463.2 m^2

FAMILY		N
76	*Cyprinella lutrensis*	31
76	*Rhinichthys cataractae*	46
81	*Catostomus commersoni*	29

New Mexico: Sandoval Co., Rio Grande Drainage

Rio Grande, at US HWY 550 (formerly NM State HWY 44) bridge crossing, Bernalillo. Site Number: 1

27 May 2005 **RKD05-104** River Mile: 203.8

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

R.K. Dudley, M.A. Farrington, W.H. Brandenburg, and L.E. Renfro Effort: 279.2 m^2

FAMILY		N
76	*Cyprinella lutrensis*	8
76	*Hybognathus amarus**	6
76	*Pimephales promelas*	7
76	*Platygobio gracilis*	1
76	*Rhinichthys cataractae*	8
81	*Catostomus commersoni*	1260
212	*Gambusia affinis*	3

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

age-1: 6

Rio Grande silvery minnow Population Monitoring
May 2005

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
27 May 2005 **RKD05-105**
UTM Easting: 354772 UTM Northing: 3905355 Zone: 13 Quad: Bernalillo
R.K. Dudley, M.A. Farrington, W.H. Brandenburg, and L.E. Renfro
Effort: 227.3 m^2

FAMILY		N
76	*Cyprinella lutrensis*	21
76	*Hybognathus amarus**	3
76	*Pimephales promelas*	4
76	*Platygobio gracilis*	65
81	*Catostomus commersoni*	1
212	*Gambusia affinis*	14

***Hybognathus amarus* by age class:**
age-1: 3

New Mexico: Bernalillo Co., Rio Grande Drainage
Rio Grande, at Central Avenue bridge crossing (US HWY 66), Albuquerque.
Site Number: 3
26 May 2005 **RKD05-101**
River Mile: 183.4
UTM Easting: 346840 UTM Northing: 3884094 Zone: 13 Quad: Albuquerque West
R.K. Dudley, M.A. Farrington, and L.E. Renfro
Effort: 260.3 m^2

FAMILY		N
76	*Cyprinella lutrensis*	90
76	*Hybognathus amarus**	2
76	*Pimephales promelas*	5
76	*Platygobio gracilis*	9
81	*Carpiodes carpio*	3
81	*Catostomus commersoni*	15
93	*Ictalurus punctatus*	1
212	*Gambusia affinis*	2

***Hybognathus amarus* by age class:**
age-1: 2

Rio Grande silvery minnow Population Monitoring
May 2005

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

26 May 2005 **RKD05-100**

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

R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 396.8 m^2

FAMILY		N
76	*Cyprinella lutrensis*	59
76	*Platygobio gracilis*	3
81	*Catostomus commersoni*	2
93	*Ictalurus punctatus*	2
212	*Gambusia affinis*	6

New Mexico: Valencia Co., Rio Grande Drainage

Rio Grande, at Los Lunas Bridge crossing (NM State HWY 49), Los Lunas. Site Number: 5

26 May 2005 **RKD05-099** River Mile: 161.4

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

R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 147.2 m^2

FAMILY		N
76	*Cyprinella lutrensis*	1
76	*Hybognathus amarus**	5
76	*Pimephales promelas*	4
81	*Catostomus commersoni*	3
212	*Gambusia affinis*	3

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

age-0: 5

Rio Grande silvery minnow Population Monitoring
May 2005

New Mexico: Valencia Co., Rio Grande Drainage
Rio Grande, ca. 1.0 miles upstream of NM State HWY 309/6 bridge crossing, Belen. Site Number: 6
26 May 2005 **RKD05-098** River Mile: 151.5
UTM Easting: 339972 UTM Northing: 3837061 Zone: 13 Quad: Tome
R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 88.6 m^2

FAMILY		N
76	*Cyprinella lutrensis*	8
76	*Hybognathus amarus**	3
212	*Gambusia affinis*	1

***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. Site Number: 7
26 May 2005 **RKD05-097** River Mile: 143.2
UTM Easting: 338136 UTM Northing: 3827329 Zone: 13 Quad: Veguita
R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 142.8 m^2

FAMILY		N
76	*Cyprinella lutrensis*	4
76	*Cyprinus carpio*	1
212	*Gambusia affinis*	35

Rio Grande silvery minnow Population Monitoring
May 2005

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, at US HWY 60 bridge crossing, Bernardo. Site Number: 8
25 May 2005 **RKD05-096** River Mile: 130.6
UTM Easting: 334604 UTM Northing: 3809726 Zone: 13 Quad: Abeytas
R.K. Dudley, W.H. Brandenburg, and M.A. Farrington Effort: 267.6 m^2

FAMILY		N
76	*Cyprinella lutrensis*	4
76	*Cyprinus carpio*	8
76	*Hybognathus amarus**	35
76	*Pimephales promelas*	28
81	*Catostomus commersoni*	1
212	*Gambusia affinis*	1

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

age-0: 35

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
25 May 2005 **RKD05-095** River Mile: 127.0
UTM Easting: 331094 UTM Northing: 3805229 Zone: 13 Quad: Abeytas
R.K. Dudley, W.H. Brandenburg, and M.A. Farrington Effort: 318.4 m^2

FAMILY		N
76	*Cyprinella lutrensis*	46
93	*Ictalurus punctatus*	2
212	*Gambusia affinis*	1

Rio Grande silvery minnow Population Monitoring
May 2005

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, ca. 0.6 miles upstream of San Acacia Diversion Dam, San Acacia — Site Number: 9.5
25 May 2005 — **RKD05-094** — River Mile: 116.8
UTM Easting: 327902 UTM Northing: 3792603 Zone: 13 Quad: La Joya
R.K. Dudley, W.H. Brandenburg, and M.A. Farrington — Effort: 422.4 m^2

FAMILY		N
76	*Cyprinus carpio*	7
76	*Platygobio gracilis*	6

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, directly below San Acacia Diversion Dam, San Acacia. — Site Number: 10
25 May 2005 — **RKD05-093** — River Mile: 116.2
UTM Easting: 326162 UTM Northing: 3791977 Zone: 13 Quad: San Acacia
R.K. Dudley, W.H. Brandenburg, and M.A. Farrington — Effort: 230.0 m^2

FAMILY		N
76	*Cyprinella lutrensis*	201
76	*Cyprinus carpio*	5
76	*Pimephales promelas*	15
76	*Platygobio gracilis*	4
93	*Ictalurus punctatus*	1
212	*Gambusia affinis*	38
295	*Stizostedion vitreum*	1

Rio Grande silvery minnow Population Monitoring
May 2005

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia. Site Number: 11
24 May 2005 **RKD05-092** River Mile: 114.6
UTM Easting: 325263 UTM Northing: 3790442 Zone: 13 Quad: Lemitar
R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 341.6 m^2

FAMILY		N
76	*Cyprinella lutrensis*	34
76	*Cyprinus carpio*	2
76	*Pimephales promelas*	3
76	*Platygobio gracilis*	44
93	*Ictalurus punctatus*	1
212	*Gambusia affinis*	3

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, east of Socorro, 0.5 miles upstream of Socorro Low Flow Conveyance Site Number: 12
Channel bridge and east just upstream of Socorro Wastewater Treatment Plant, River Mile: 99.5
24 May 2005 **RKD05-091**
UTM Easting: 327097 UTM Northing: 3771043 Zone: 13 Quad: Loma de las Canas
R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 521.1 m^2

FAMILY		N
76	*Cyprinella lutrensis*	38
93	*Ictalurus punctatus*	1

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, ca. 4.0 miles upstream of U.S. 380 bridge crossing. Site Number: 13
24 May 2005 **RKD05-090** River Mile: 91.7
UTM Easting: 328140 UTM Northing: 3761283 Zone: 13 Quad: San Antonio
R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 54.9 m^2

FAMILY		N
76	*Cyprinus carpio*	1

Rio Grande silvery minnow Population Monitoring
May 2005

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, at US HWY 380 bridge crossing, San Antonio. Site Number: 14
24 May 2005 **RKD05-089** River Mile: 87.1
UTM Easting: 328914 UTM Northing: 3754471 Zone: 13 Quad: San Antonio
R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 397.8 m^2

FAMILY		N
76	*Cyprinella lutrensis*	1

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, directly east of Bosque del Apache National Wildlife Refuge Site Number: 15
23 May 2005 **RKD05-088** River Mile: 79.1
UTM Easting: 327055 UTM Northing: 3740839 Zone: 13 Quad: San Antonio SE
R.K. Dudley, W.H. Brandenburg, and L.E. Renfro Effort: 507.6 m^2

FAMILY		N
76	*Cyprinus carpio*	27
76	*Hybognathus amarus**	2
76	*Pimephales promelas*	1
81	*Carpiodes carpio*	3
212	*Gambusia affinis*	2

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

age-0: 2

Rio Grande silvery minnow Population Monitoring
May 2005

New Mexico: Socorro Co., Rio Grande Drainage

Rio Grande, at San Marcial Railroad Bridge, San Marcial. Site Number: 16

23 May 2005 **RKD05-087** River Mile: 68.6

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

R.K. Dudley, W.H. Brandenburg, and L.E. Renfro Effort: 427.6 m^2

FAMILY		N
76	*Cyprinus carpio*	27
76	*Hybognathus amarus**	177
81	*Carpiodes carpio*	125

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

age-0: 177

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

23 May 2005 **RKD05-086**

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

R.K. Dudley, W.H. Brandenburg, and L.E. Renfro Effort: 315.3 m^2

FAMILY		N
69	*Dorosoma cepedianum*	1
76	*Cyprinella lutrensis*	168
76	*Cyprinus carpio*	2
76	*Hybognathus amarus**	1
76	*Platygobio gracilis*	4
81	*Carpiodes carpio*	16

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

age-0: 1

Rio Grande silvery minnow Population Monitoring
May 2005

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

23 May 2005 — **RKD05-085**

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

R.K. Dudley, W.H. Brandenburg, and L.E. Renfro — Effort: 57.9 m^2

FAMILY		N
76	*Cyprinella lutrensis*	4
81	*Carpiodes carpio*	1