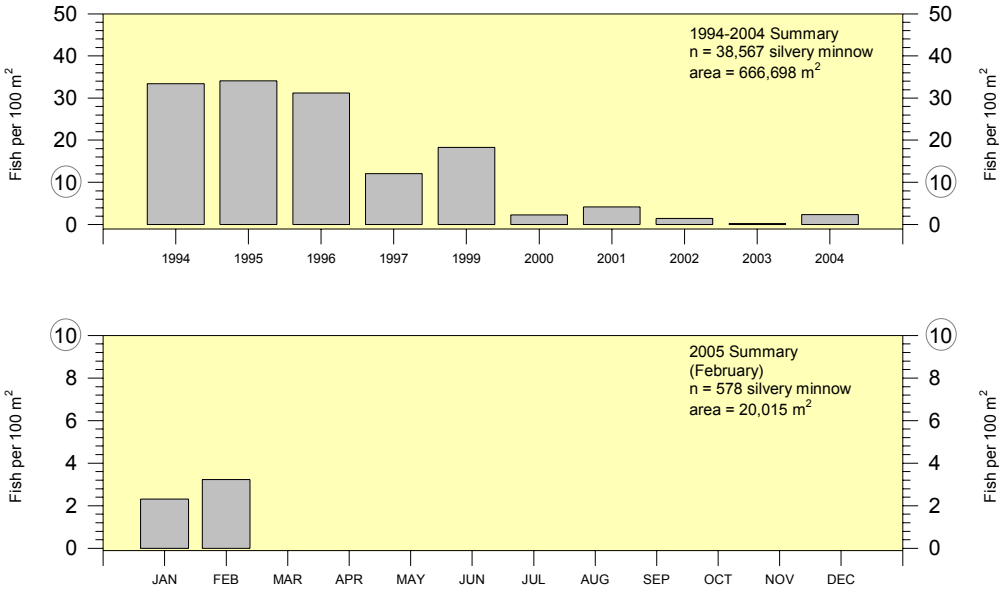
Summary of the Rio Grande silvery minnow Population Monitoring Program Results from February 2005

(21-25 February 2005)

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



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23 March 2005

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prepared for:

Middle Rio Grande Endangered Species Act Collaborative Program

under USBR contract:

Number 03CR408029
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23 March 2005

Summary of Overall February 2005 Population Monitoring Efforts

The second sampling effort of the 2005 Rio Grande silvery minnow population monitoring program was conducted between 21-25 February 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. No young-of-year fish (that could not be field identified) were collected during the February 2005 sampling. 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 February 2005, a total of 1,891 fish were taken in the 9,706 m^2 (surface area) of water sampled. Red shiner was the most abundant taxon (N=935) and comprised about 49% of the total catch. Rio Grande silvery minnow (N=330) was present in 52 of 166 seine hauls with fish (ca. 31%) and was abundant in specific mesohabitats such as backwaters and pools. Sampling at Site #2 produced slightly less than half (N=137) of all Rio Grande silvery minnow collected during February. Cumulative fish catch rate was 19.5 individuals per 100 m^2 sampled; nearly half of what it was in January (33.3 individuals per 100 m^2 sampled). The overall abundance of fish (N=1,891) was equal to what it was in December 2004 (N=1,727).

Summary of February 2005 Population Monitoring Effort by River Reach

Angostura Reach

Ichthyofaunal sampling in the Angostura Reach took place between 24-25 February 2005. Discharge in the Rio Grande had increased slightly throughout the Angostura Reach during February 2005 compared to January 2005. Water levels were relatively steady and there were no flow pulses during February 2005; there was a general increase in flow at the end of the month likely caused by local precipitation. Discharge throughout the Angostura Reach ranged from about 700-1,400 cfs for most of February 2005. The Angostura Diversion Dam sampling site (Site #0) and the Rio Bravo site (Site #4) produced the fewest numbers of fish of any of the Angostura Reach sites. A total of only seven fish were collected at Site #0. Water clarity was highest in the uppermost portion of the Angostura Reach (Secchi depth ca. 25 cm at Site #0) but the river bottom was not clearly visible as it was in January 2005. Water temperatures recorded at the different sampling sites ranged from 6.1°C to 7.3°C; the stability of water temperatures was likely a result of overcast skies during sampling. Fish were occupying areas along the shoreline and in low or no velocity habitats; debris piles frequently produced relatively high numbers of fish. The most frequently collected taxon in the Angostura Reach during February was Rio Grande silvery minnow (N=288). Red shiner (N=248) was only slightly less abundant than Rio Grande silvery minnow. The elevated abundance of Rio Grande silvery minnow was largely caused by a large collection of individuals from Site #2 (N=137). Rio Grande silvery minnow was collected in 14 of 17 seine hauls made at this sampling site. The majority of Rio Grande silvery minnow were between 40-60 mm SL. However, some Age-0 individuals were quite small (ca. 35 mm SL). This small size-class of silvery minnow was present throughout the autumn of 2004 and winter of 2004/2005. It is possible that many of the smallest individuals will have an increased rate of mortality compared to larger individuals during winter; it appears unlikely that these small individuals will be capable of reproducing by May 2005. The number of Rio Grande silvery minnow collected during February 2005 was higher compared to the amount collected during January 2005 (N=178). Fish were concentrated into small mesohabitats likely because of elevated water levels and reduced water temperatures.

Isleta Reach

Discharge in the Rio Grande was relatively stable during January 2005 and the first half of February 2005. However, flows increased notably during the latter half of February 2005 and resulted in flows of nearly 1,500 cfs. February discharge resulted in the persistence of many small side channels and some areas of inundation on islands and along the shoreline. Some islands were completely inundated while backwaters formed in other areas. Higher 2004/2005 winter flows resulted in a much higher area of the river channel with flowing water compared to summer of 2004. Water temperatures in the Isleta Reach generally ranged from about 9-13°C from morning (0900 h) to afternoon (1300 h); this was about a 2°C increase compared with January 2005. Water clarity was low (Secchi depth<10 cm) at most sampling sites because of increased discharge and minor input from sediment rich tributaries (e.g., Rios Salado and Puerco). The Isleta Reach had the lowest catch rate (13.3 fish/100 m^2) of any of the sampling reaches in the Middle Rio Grande and was much lower than what was recorded during January 2005 (70.8 fish/100 m^2). Overall ichthyofaunal catch rates in the Angostura Reach (32.0 fish/100 m^2) were higher compared to the Isleta Reach and had changed little since November 2004 (26.6 fish/100 m^2). The most commonly collected taxa in the Isleta Reach were red shiner (N=134), western mosquitofish (N=131), flathead chub (N=49), fathead minnow (N=46), and Rio Grande silvery minnow (N=18). Most of the Rio Grande silvery minnow utilized backwater or pool mesohabitats.

San Acacia Reach

Population monitoring was conducted in the San Acacia Reach (9 sites) of the Middle Rio Grande on 21-23 February 2005. The discharge had increased steadily during the latter half of February, similar to the pattern observed in the Angostura and Isleta reaches, and ranged between about 1,000-1,200 cfs by the end of the February. The elevated flow combined with low ambient temperatures resulted in relatively low water temperatures throughout the San Acacia Reach (range=9.6-12.0°C) during this sampling period. However, water temperatures were about 4°C warmer in February than January. Water throughout the San Acacia Reach was relatively turbid and instream visibility was about 2 cm (as measured by Secchi Disk) at most sampling sites and <1 cm at several sites. Water turbidity was likely a result of increased flow and movement of sediment from formerly dry side channels and from instream erosion of banks and islands. The most commonly collected taxon during February 2005 in the San Acacia Reach was red shiner (N=553; 73.9% of total). Rio Grande silvery minnow individuals (N=24) were present in low velocity habitats and were most common (N=15) at Site #11 in the San Acacia Reach. The San Acacia Reach catch rate (16.9 fish/100 m^2) was intermediate between the catch rates of Angostura and Isleta reaches.

Conclusion

Red shiner continued to be the most numerically dominant taxon collected in the Rio Grande (N=935); other common taxa included Rio Grande silvery minnow (N=330), flathead chub (N=187), fathead minnow (N=144), and western mosquitofish (N=146). These five taxa collectively comprised 92.1% of the total catch of fish in the Middle Rio Grande study area. The abundance of Rio Grande silvery minnow during February 2005 indicates that the status of this species has improved markedly compared to February 2004. Several of the largest female Rio Grande silvery minnow appeared to be slightly gravid but spawning is not expected to occur until late April / early May. The abundance of Rio Grande silvery minnow was highest in the Angostura Reach, but about 1/5 of all individuals were collected in either the Isleta and San Acacia Reach. Many of the Rio Grande silvery minnow collected in the Angostura Reach (likely a result of spawning by hatchery fish) appeared to be stunted and some were likely too small (ca. 30-40 mm SL) to spawn effectively in the spring of 2005. Higher than average spring runoff is expected for 2005 so this may ameliorate potential low spawning output by increasing the likelihood of higher recruitment success.

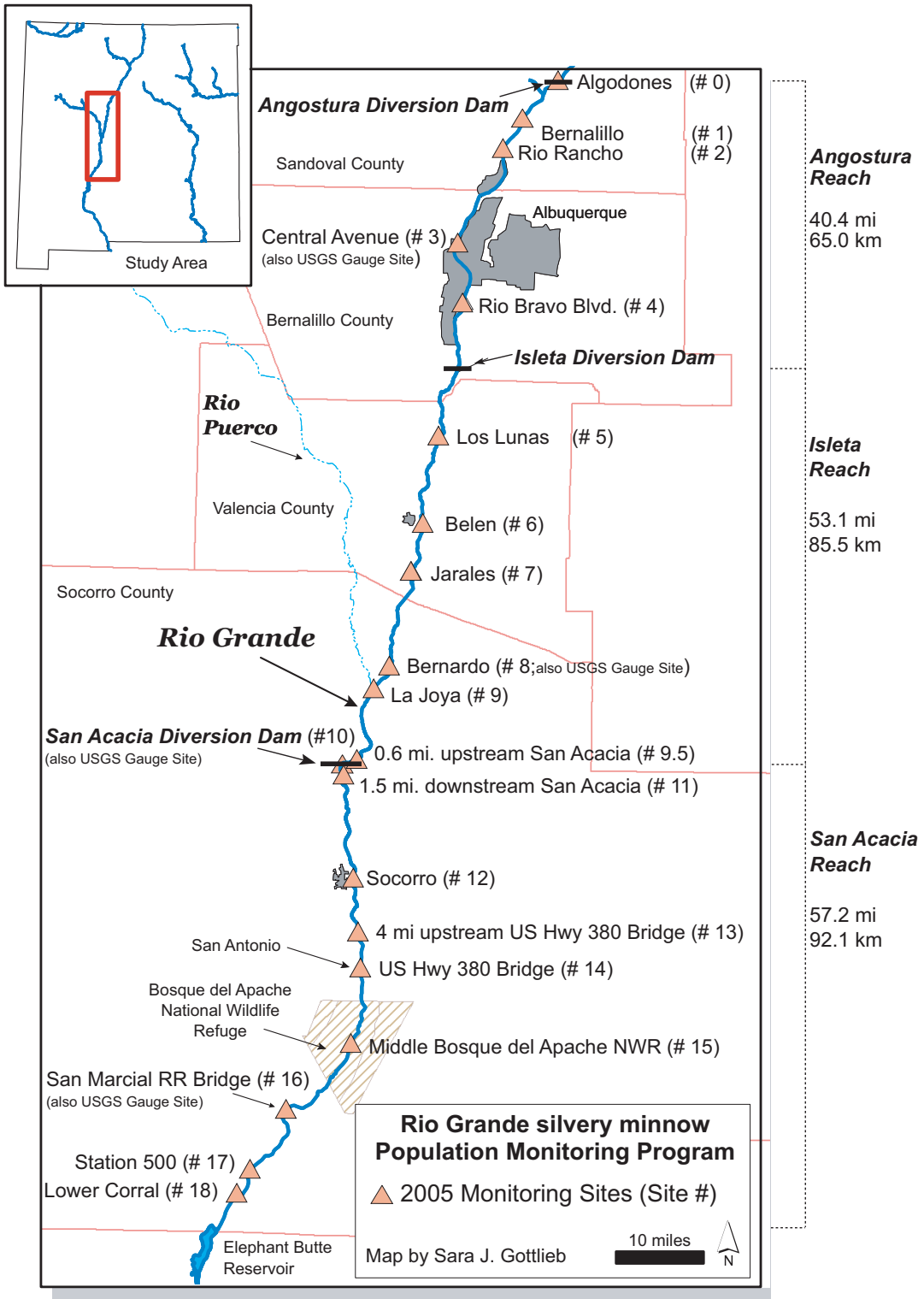

Figure 1. Map of the study area and sampling localities (numbered) for the 2005 Rio Grande silvery minnow population monitoring program. Sampling locality information that correspond with the numbered localities are provided in Appendix A (Table A-1).

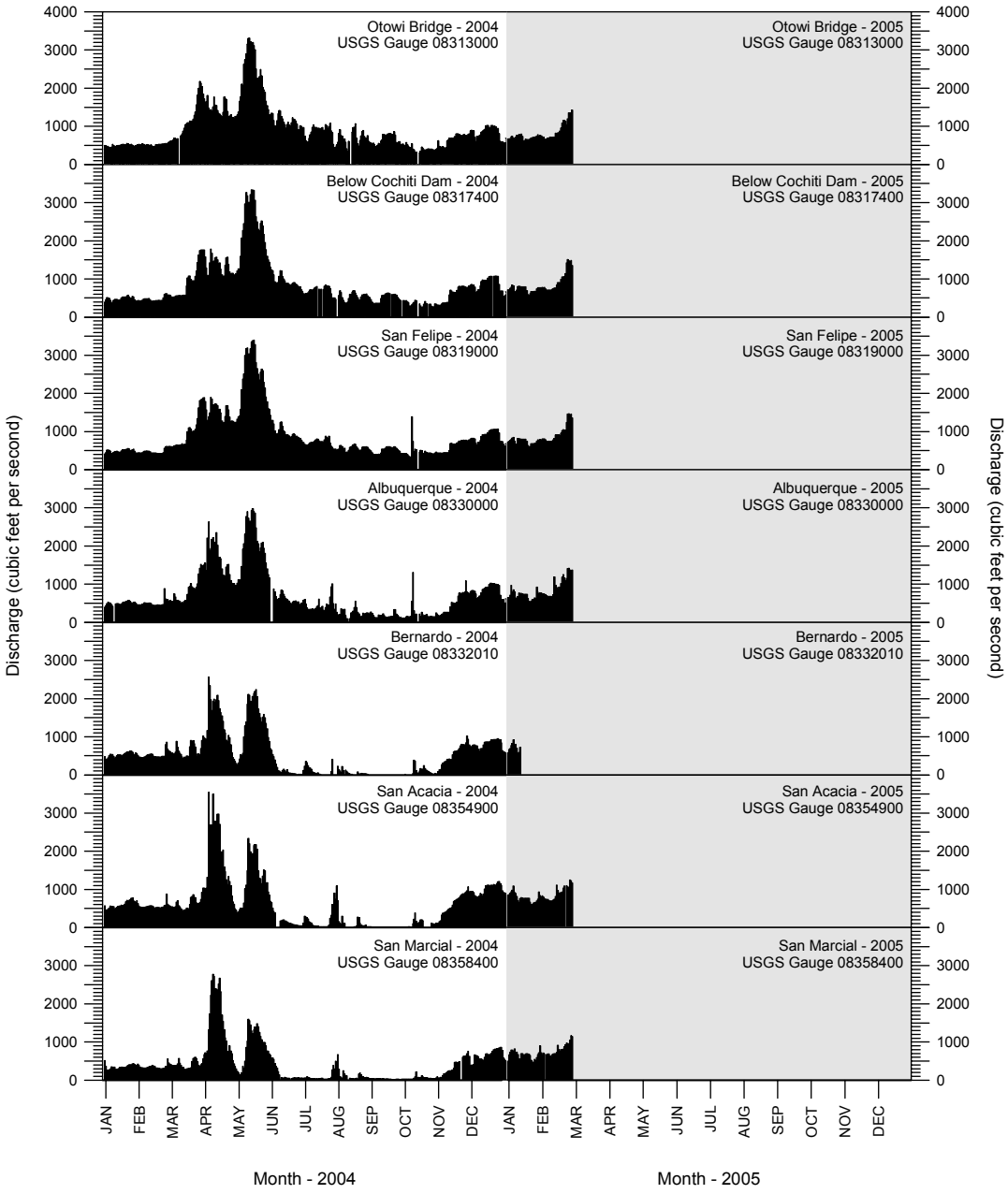

Figure 2. Discharge in the Rio Grande from January 2004 through February 2005 as recorded at seven U. S. Geological Survey (USGS) gauge stations. The Otowi Bridge gauge site is outside of the study area (ca. 25.5 river miles upstream of Cochiti Dam) and provided for reference. Discharge data are provisional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

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 commersoni	white sucker [1]	(WHS)
Ictiobus bubalus	smallmouth buffalo	(SMB)
Order Siluriformes		
Family Ictaluridae	bullhead 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	
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)
Stizostedion vitreum	walleye	(WLE)

Table 2. Summary of the February 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	—	—	—	—
CARPS AND MINNOWS					
red shiner	N	935	49.44	17	85
common carp	I	3	0.16	3	15
Rio Grande silvery minnow	N	330	17.45	11	55
Rio Grande chub	N	—	—	—	—
fathead minnow	N	144	7.62	10	50
bullhead minnow	I	1	0.05	1	5
flathead chub	N	187	9.89	9	45
longnose dace	N	14	0.74	5	25
SUCKERS					
river carpsucker	N	20	1.06	5	25
white sucker	I	59	3.12	4	20
smallmouth buffalo	N	—	—	—	—
BULLHEAD CATFISHES					
black bullhead	I	—	—	—	—
yellow bullhead	I	2	0.11	2	10
channel catfish	I	49	2.59	10	50
flathead catfish	I	—	—	—	—
TROUTS					
brown trout	I	—	—	—	—
LIVEBEARERS					
western mosquitofish	I	146	7.72	9	45
TEMPERATE BASSES					
white bass	I	—	—	—	—
SUNFISHES					
green sunfish	I	—	—	—	—
bluegill	N	—	—	—	—
largemouth bass	I	1	0.05	1	5
white crappie	I	—	—	—	—
black crappie	I	—	—	—	—
PERCHES					
yellow perch	I	—	—	—	—
walleye	I	—	—	—	—
TOTAL		1,891			

[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	—	—											—
CARPS AND MINNOWS													
red shiner	2,760	935											3,695
common carp	3	3											6
Rio Grande silvery minnow	248	330											578
Rio Grande chub	—	—											—
fathead minnow	356	144											500
bullhead minnow	—	1											1
flathead chub	112	187											299
longnose dace	1	14											15
SUCKERS													
river carpsucker	19	20											39
white sucker	16	59											75
smallmouth buffalo	—	—											—
BULLHEAD CATFISHES													
black bullhead	—	—											—
yellow bullhead	—	2											2
channel catfish	6	49											55
flathead catfish	—	—											—
TROUTS													
brown trout	—	—											—
LIVEBEARERS													
western mosquitofish	64	146											210
TEMPERATE BASSES													
white bass	—	—											—
SUNFISHES													
green sunfish	—	—											—
bluegill	—	—											—
largemouth bass	—	1											1
white crappie	1	—											1
black crappie	—	—											—
PERCHES													
yellow perch	—	—											—
walleye	—	—											—
TOTAL	3,586	1,891											5,477

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	**—**	**0**											**—**
1 Bernalillo	**20**	**68**											**88**
2 Rio Rancho	**147(4)**	**137(8)**											**284**
3 Central Ave (Abq)	**7**	**64(17)**											**71**
4 Rio Bravo (Abq)	**4(1)**	**19(7)**											**23**
Angostura Reach Total	***178***	***288***											***466***
ISLETA REACH													
5 Los Lunas	**3**	**11**											**14**
6 Belen	**1**	**4**											**5**
7 Jarales	**30**	**0**											**30**
8 US Hwy 60 Bernardo	**8**	**1**											**9**
9 South of Bernardo	**5**	**2**											**7**
9.5 North of San Acacia	**1**	**0**											**1**
Isleta Reach Total	***48***	***18***											***66***
SAN ACACIA REACH													
10 San Acacia Dam	**3**	**0**											**3**
11 S of San Acacia	**13**	**15**											**28**
12 Socorro	**3**	**0**											**3**
13 North of US Hwy 380	**—**	**6**											**6**
14 US Hwy 380	**1**	**0**											**1**
15 Bosque del Apache	**2**	**—**											**2**
16 San Marcial	**—**	**—**											**—**
17 South of San Marcial	**—**	**—**											**—**
18 South of San Marcial	**—**	**3**											**3**
San Acacia Reach Total	***22***	***24***											***46***
MONTHLY TOTALS	**248**	**330**											**578**

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

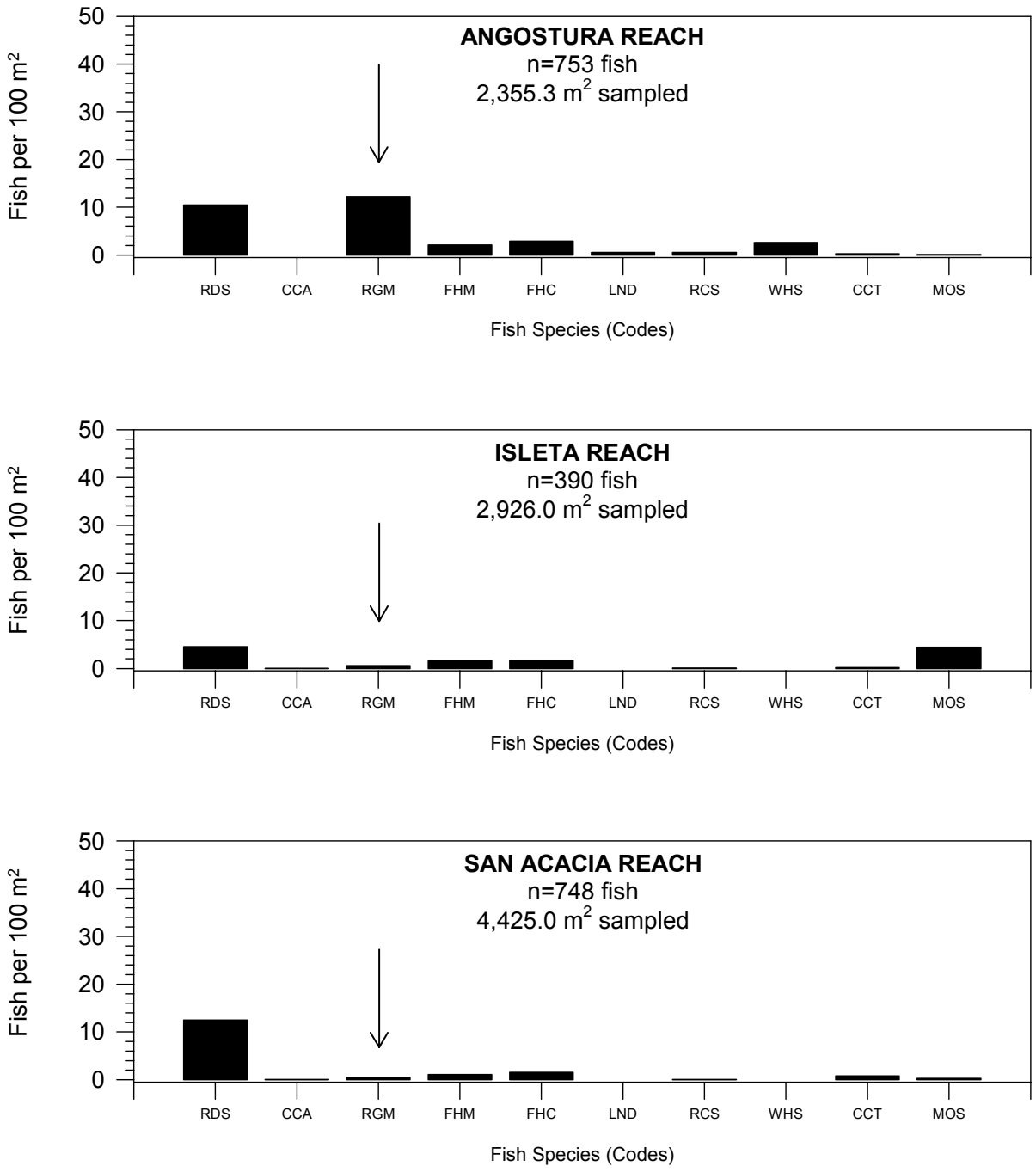

Figure 3. Catch rates, for the 10 focal species, by river reach during February 2005 at Rio Grande silvery minnow population monitoring program collection sites (see Table A-1 for fish species codes). An arrow indicates the Rio Grande silvery minnow (RGM) histogram bar.

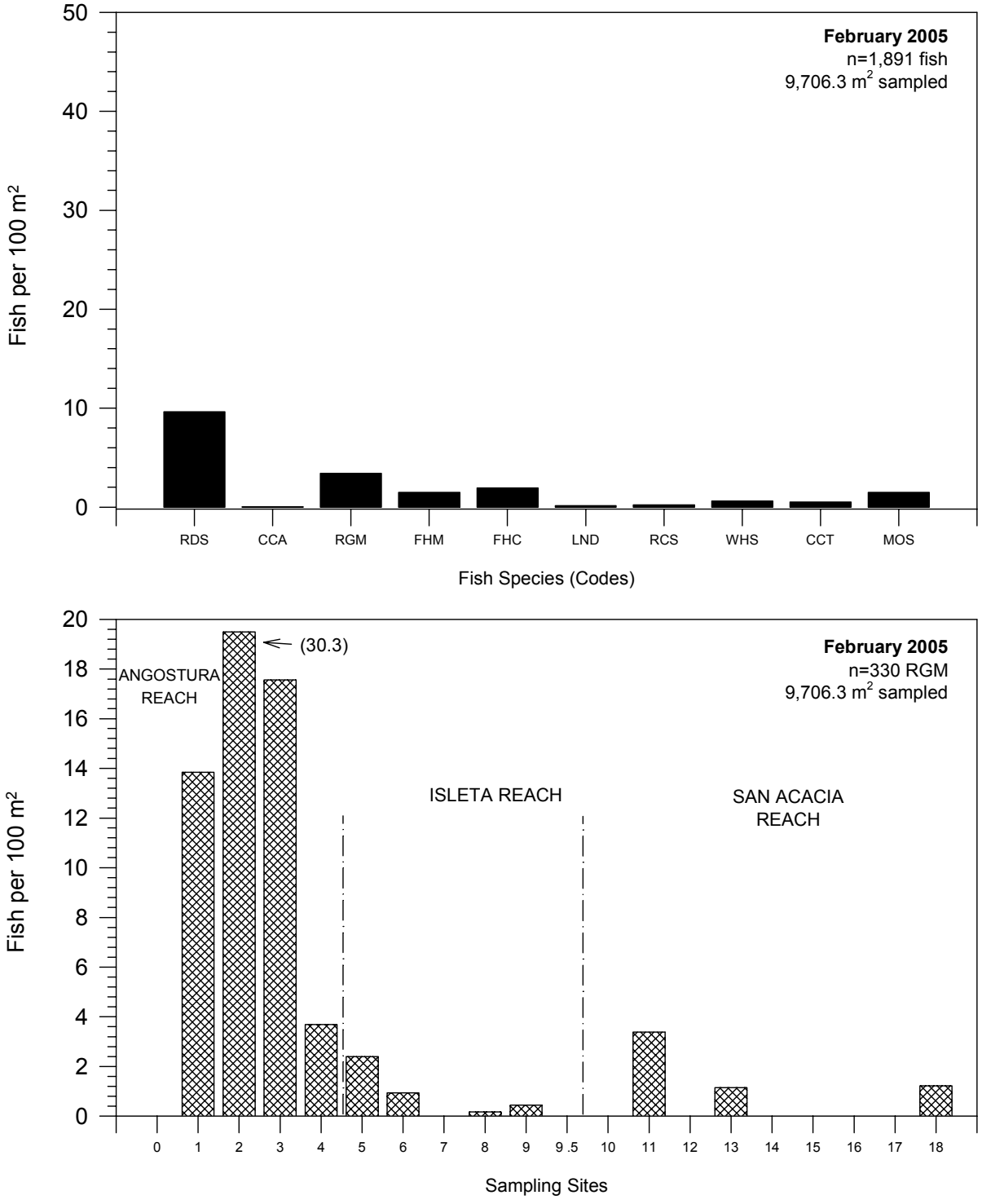

Figure 4. Catch rates for ten focal species (upper graph*), including Rio Grande silvery minnow, (RGM; lower graph*) during February 2005 at Rio Grande silvery minnow population monitoring program collection sites (see Table A-1 for fish species codes).

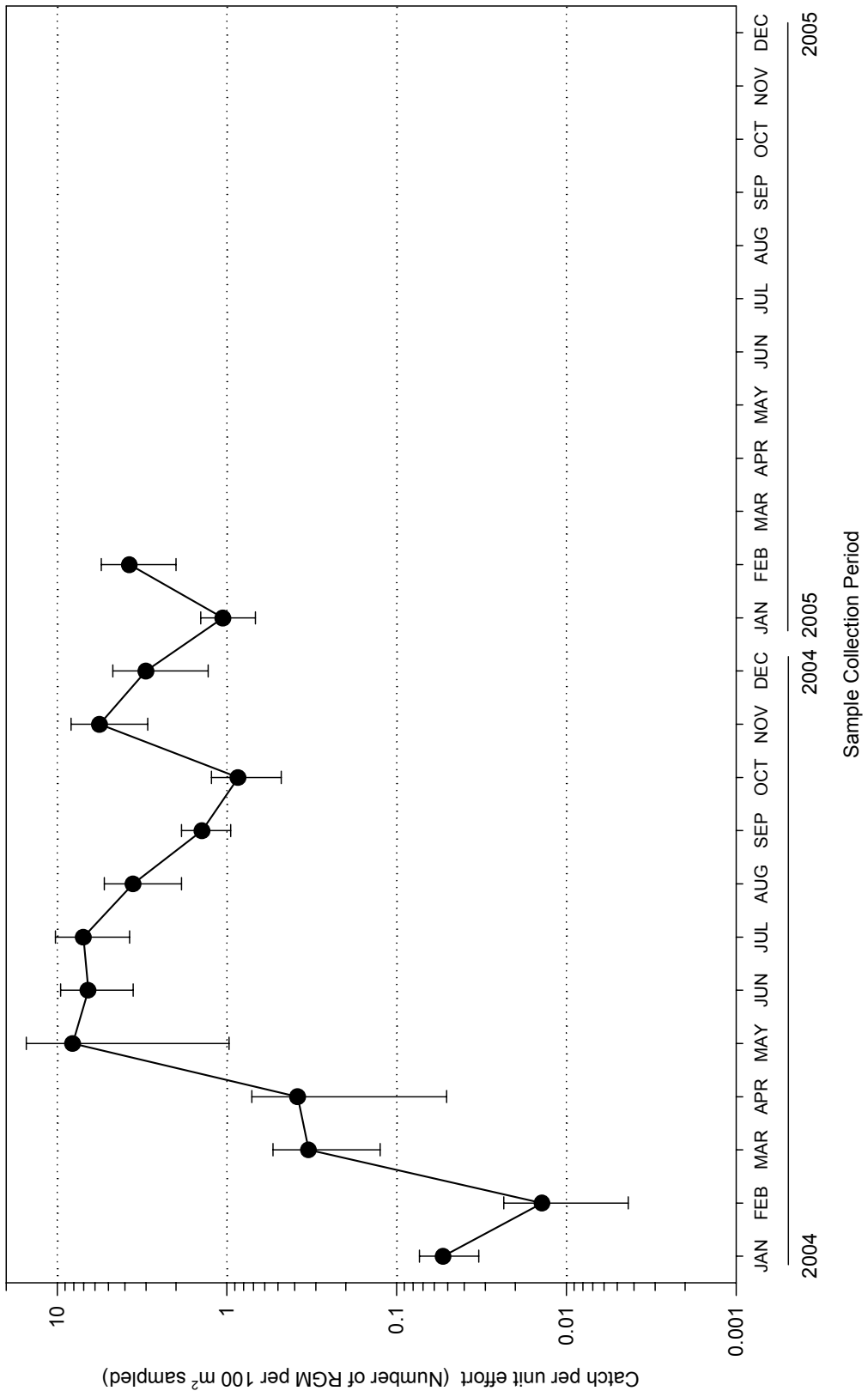

Figure 5. Month catch rates of Rio Grande silvery minnow during 2004 (January-December) and through February 2005 at Rio Grande silvery minnow population monitoring program collection sites. Solid circles indicate monthly means (n=20 site per month) and capped-bars represent the standard error of the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

Rio Grande silvery minnow Population Monitoring
February 2005

New Mexico: Sandoval Co., Rio Grande Drainage

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

25 February 2005 **RKD05-040** River Mile: 209.7

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

R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 531.8 m^2

FAMILY		N
76	*Cyprinella lutrensis*	3
76	*Rhinichthys cataractae*	3
81	*Catostomus commersoni*	1

New Mexico: Sandoval Co., Rio Grande Drainage

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

25 February 2005 **RKD05-041** River Mile: 203.8

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

R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 491.5 m^2

FAMILY		N
76	*Cyprinella lutrensis*	13
76	*Hybognathus amarus**	68
76	*Platygobio gracilis*	7
76	*Rhinichthys cataractae*	2
81	*Catostomus commersoni*	1

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

age-1: 66

age-2: 2

Rio Grande silvery minnow Population Monitoring
February 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
25 February 2005 **RKD05-042**
UTM Easting: 354772 UTM Northing: 3905355 Zone: 13 Quad: Bernalillo
R.K. Dudley, M.A. Farrington, and L.E. Renfro
Effort: 452.0 m^2

FAMILY		N
76	*Cyprinella lutrensis*	2
76	*Hybognathus amarus**	137
76	*Pimephales promelas*	2
76	*Platygobio gracilis*	13
76	*Rhinichthys cataractae*	5
93	*Ictalurus punctatus*	1

***Hybognathus amarus* by age class:**
age-1: 136
age-2: 1

New Mexico: Bernalillo Co., Rio Grande Drainage
Rio Grande, at Central Avenue bridge crossing (US HWY 66), Albuquerque.
Site Number: 3
24 February 2005 **RKD05-038**
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: 364.5 m^2

FAMILY		N
76	*Cyprinella lutrensis*	111
76	*Hybognathus amarus**	64
76	*Pimephales promelas*	16
76	*Platygobio gracilis*	41
76	*Rhinichthys cataractae*	1
81	*Carpiodes carpio*	4
81	*Catostomus commersoni*	52
93	*Ictalurus punctatus*	3
212	*Gambusia affinis*	3

***Hybognathus amarus* by age class:**
age-1: 62
age-2: 2

Rio Grande silvery minnow Population Monitoring
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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

24 February 2005 **RKD05-037**

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

R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 515.5 m^2

FAMILY		N
76	*Cyprinella lutrensis*	119
76	*Hybognathus amarus**	19
76	*Pimephales promelas*	33
76	*Platygobio gracilis*	8
76	*Rhinichthys cataractae*	3
81	*Carpiodes carpio*	10
81	*Catostomus commersoni*	5
93	*Ictalurus punctatus*	3

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

age-1: 19

New Mexico: Valencia Co., Rio Grande Drainage

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

24 February 2005 **RKD05-036** 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: 459.5 m^2

FAMILY		N
76	*Hybognathus amarus**	11
76	*Pimephales promelas*	13
93	*Ictalurus punctatus*	1

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

age-1: 11

Rio Grande silvery minnow Population Monitoring
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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

24 February 2005 **RKD05-035** 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: 427.8 m^2

FAMILY		N
76	*Cyprinella lutrensis*	30
76	*Hybognathus amarus**	4
76	*Pimephales promelas*	11
212	*Gambusia affinis*	113

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

age-1: 4

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

23 February 2005 **RKD05-034** 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: 493.5 m^2

FAMILY		N
76	*Cyprinella lutrensis*	54
76	*Pimephales promelas*	15
81	*Carpiodes carpio*	3
212	*Gambusia affinis*	3

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New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, at US HWY 60 bridge crossing, Bernardo. Site Number: 8
23 February 2005 **RKD05-033** River Mile: 130.6
UTM Easting: 334604 UTM Northing: 3809726 Zone: 13 Quad: Abeytas
R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 593.5 m^2

FAMILY		N
76	*Cyprinella lutrensis*	16
76	*Cyprinus carpio*	1
76	*Hybognathus amarus**	1
76	*Pimephales promelas*	1
93	*Ameiurus natalis*	1
93	*Ictalurus punctatus*	2
294	*Micropterus salmoides*	1

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

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
23 February 2005 **RKD05-032** River Mile: 127.0
UTM Easting: 331094 UTM Northing: 3805229 Zone: 13 Quad: Abeytas
R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 455.5 m^2

FAMILY		N
76	*Cyprinella lutrensis*	31
76	*Hybognathus amarus**	2
76	*Pimephales promelas*	6
212	*Gambusia affinis*	15

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

Rio Grande silvery minnow Population Monitoring
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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
23 February 2005 **RKD05-031** — River Mile: 116.8
UTM Easting: 327902 UTM Northing: 3792603 Zone: 13 Quad: La Joya
R.K. Dudley, M.A. Farrington, and L.E. Renfro — Effort: 496.3 m^2

FAMILY		N
76	*Cyprinella lutrensis*	3
76	*Platygobio gracilis*	49
93	*Ictalurus punctatus*	3

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, directly below San Acacia Diversion Dam, San Acacia. — Site Number: 10
23 February 2005 **RKD05-030** — River Mile: 116.2
UTM Easting: 326162 UTM Northing: 3791977 Zone: 13 Quad: San Acacia
R.K. Dudley, M.A. Farrington, and L.E. Renfro — Effort: 495.0 m^2

FAMILY		N
76	*Cyprinella lutrensis*	308
76	*Cyprinus carpio*	1
76	*Pimephales promelas*	46
76	*Platygobio gracilis*	42
81	*Carpiodes carpio*	1
93	*Ameiurus natalis*	1
93	*Ictalurus punctatus*	12
212	*Gambusia affinis*	6

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New Mexico: Socorro Co., Rio Grande Drainage

Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia. Site Number: 11

22 February 2005 **RKD05-029** 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: 443.5 m^2

FAMILY		N
76	*Cyprinella lutrensis*	67
76	*Hybognathus amarus**	15
76	*Platygobio gracilis*	25
81	*Carpiodes carpio*	2
93	*Ictalurus punctatus*	11
212	*Gambusia affinis*	2

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

age-1: 15

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

22 February 2005 **RKD05-028**

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

R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 535.3 m^2

FAMILY		N
76	*Cyprinella lutrensis*	42

Rio Grande silvery minnow Population Monitoring
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New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, ca. 4.0 miles upstream of U.S. 380 bridge crossing. Site Number: 13
22 February 2005 **RKD05-027** 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: 525.3 m^2

FAMILY		N
76	*Cyprinella lutrensis*	14
76	*Hybognathus amarus**	6
76	*Pimephales promelas*	1
212	*Gambusia affinis*	2

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

age-1: 6

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, at US HWY 380 bridge crossing, San Antonio. Site Number: 14
22 February 2005 **RKD05-026** 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: 541.0 m^2

FAMILY		N
212	*Gambusia affinis*	1

New Mexico: Socorro Co., Rio Grande Drainage
Rio Grande, directly east of Bosque del Apache National Wildlife Refuge Site Number: 15
21 February 2005 **RKD05-025** River Mile: 79.1
UTM Easting: 327055 UTM Northing: 3740839 Zone: 13 Quad: San Antonio SE
R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 489.8 m^2

FAMILY		N
93	*Ictalurus punctatus*	1
212	*Gambusia affinis*	1

Rio Grande silvery minnow Population Monitoring
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New Mexico: Socorro Co., Rio Grande Drainage

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

21 February 2005 **RKD05-024** River Mile: 68.6

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

R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 582.0 m^2

FAMILY		N
76	*Cyprinella lutrensis*	28
76	*Platygobio gracilis*	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

21 February 2005 **RKD05-023**

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

R.K. Dudley, M.A. Farrington, and L.E. Renfro Effort: 566.5 m^2

FAMILY		N
76	*Cyprinella lutrensis*	90
76	*Cyprinus carpio*	1
76	*Pimephales vigilax*	1
76	*Platygobio gracilis*	1
93	*Ictalurus punctatus*	12

Rio Grande silvery minnow Population Monitoring
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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

21 February 2005 **RKD05-022**

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

R.K. Dudley, M.A. Farrington, and L.E. Renfro — Effort: 246.8 m^2

FAMILY		N
76	*Cyprinella lutrensis*	4
76	*Hybognathus amarus**	3

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

age-1: 3