SUMMARY OF POPULATION MONITORING OF RIO GRANDE SILVERY MINNOW

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Annotated field notes are based on provisional data that are subject to change

The fifth sampling effort of the 2002 Rio Grande silvery minnow population monitoring program was conducted between 21-24 May 2002. Sampling was conducted at 20 sites throughout the Middle Rio Grande. Five sites were located in the Angostura Reach, six sites in the Isleta Reach, and nine sites in the San Acacia Reach. A list of collection localities is appended (Table 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. Larval fish were captured primarily in backwaters using a 0.3 m x 0.3 m fine mesh (1.5 mm) seine. Those fish (primarily larval) that could not be identified in the field were preserved (5% buffered formalin) and returned to the lab for processing and identification. Adult Rio Grande silvery minnow were counted, identified to age-class, and released at the site of capture. Most other fishes were identified to species, counted, and released at the site of capture.

Summary of population monitoring efforts by site

The upstream-most site sampled during this collecting effort was near Angostura Diversion Dam [RM 209.7] on 24 May 2002. Water visibility was clear and flow was low. There were many anglers near the base of the diversion dam. Our fish collections were made about 50 m downstream of the diversion dam but yielded very few fish. Red shiner (*Cyprinella lutrensis*) numerically dominated the catch with the majority of specimens occurring in a single seine haul. Juvenile and larval white sucker (*Catostomus commersoni*) were present along the shoreline and in backwater habitats.

The next downstream population monitoring site was located near the NM State Highway 44 bridge crossing [RM 203.8] and was sampled on 24 May 2002. There were a wide variety of habitats present at this site with fish collected in 16 of 17 seine hauls. Red shiner was again the most abundant species followed by longnose dace (*Rhinichthys cataractae*) and flathead chub (*Platygobio gracilis*). Longnose dace were taken in shoreline habitats with moderate current. A total of three Age-1 Rio Grande silvery minnow (*Hybognathus amarus*) were collected at this site and all were in a main channel pool.

The Rio Grande silvery minnow population monitoring site located just upstream of the Rio Rancho wastewater treatment plant [RM 200.0] was sampled on 24 May 2002. Water temperature at this locality was 15°C at 10:45 h. Water level of the river was low (exposing normally inundated riffles) and water clarity was high. Substrata at this site appeared, as compared to April 2002, to continue to shift from sand to gravel. Habitat heterogeneity was very low and Rio Grande silvery minnow were absent from our collections. As at the two upstream sampling locations, red shiner numerically dominated the catch at this site.

Sampling at the Central Avenue (US Highway 66) bridge crossing [RM 183.4] was conducted on 24 May 2002. Water clarity was high and schools of fish were observed from the bank. There was moderate river braiding and numerous mesohabitats present at this location. Substrate was comprised primarily of sand and silt with limited patches of gravel/cobble. Although fish were present in 15 of 18 seine hauls, Rio Grande silvery minnow were not collected at this site. The catch was numerically dominated by four species: red shiner, longnose dace, white sucker, and river carpsucker (*Carpiodes carpio*).

The Rio Bravo Boulevard bridge crossing [RM 178.3] was sampled on 24 May 2002 and water temperatures were warm (18°C at 14:00 h). The water temperature in backwater

mesohabitats was about 5-8°C higher than that recorded in main channel habitats. The river channel at this site was highly braided, flow was low, and water clarity was high. A number of different pool/run habitats were present throughout the site but few fish were taken in any habitat. White sucker and river carpsucker were two of the most abundant species in the collections made at this site. A single adult Rio Grande silvery minnow was captured in a main channel pool.

Los Lunas Bridge [RM 161.4], the most upstream site in the Isleta Reach, was sampled on 23 May 2002. There were notably fewer adult and juvenile fish collected at this site than during the March sampling trip. The substrata at this locality consisted primarily of silt and sand. Red shiner was the most abundant species comprising over 90% of the May 2002 Los Lunas catch. Three adult Rio Grande silvery minnow were captured at this site.

Catch at the Belen collecting site [RM 151.5] on 23 May 2002 was numerically dominated by a two species: red shiner and fathead minnow (*Pimephales promelas*). River carpsucker and western mosquitofish (*Gambusia affinis*) were also represented by several individuals. There were numerous backwaters present throughout the site with large numbers of fish being collected in low velocity habitats. Two adult Rio Grande silvery minnow were captured and released.

Aquatic habitat at the Transwestern Pipeline Crossing [RM 143.2] was more heterogenous than at most upstream sites. This site was sampled on 23 May 2002 and water temperature was 22°C at 12:00 h. Most of the fish were taken in habitats adjacent to the shoreline. Fish were present in all 17 seine hauls made at this locality with over 20 adult Rio Grande silvery minnow were collected in side channel pools.

The U.S. Highway 60 Bridge site [RM 130.6] was sampled on 23 May 2002. Water temperature was warm (19°C in the main channel at 10:15 h) and flow was low. Moderate numbers of fish were collected but most were young-of-year individuals that were retained for identification in the laboratory. Two of the female Rio Grande silvery minnow collected were still gravid despite the large spawning effort recorded during the previous week. The remaining Rio Grande silvery minnow (n=4) appeared in good condition (i.e., they were not emactiated as is often observed of post-spawning individuals).

The population monitoring locality 3.5 miles downstream of Bernardo [RM 127.0] was also sampled on 23 May 2002. There were a few deep and slow moving side channels located near the eastern edge of the site. These habitats produced the majority of the catch which was numerically dominated by red shiner. Water visibility was high and the substrate was primarily sand and silt. Three adult Rio Grande silvery minnow were captured at this site.

Aquatic habitats just upstream of the San Acacia Diversion Dam [RM 116.8] were sampled on 22 May 2002 but yielded very few fish. There were moderate numbers of recently exposed sand bars near the upper boundary of this monitoring site. Fish were taken in all 16 seine hauls that were made but catch rate of fish was generally low. Young-of-year white sucker were numerous. This species is generally absent from sites downstream of the Angostura reach. The presence of this life-stage of white sucker at this site suggests that they may have been displaced or actively drifted during the controlled flow release that had been recently made to induce Rio Grande silvery minnow spawning. No Rio Grande silvery minnow were present at this site.

The Rio Grande silvery minnow population monitoring site located immediately downstream of San Acacia Diversion Dam [RM 116.2] was sampled on 22 May 2002. Large numbers of fish, primarily red shiner, were collected and released at this site. There were several small side channel habitats created by water flowing over the top of the dam. Fish were taken in each of the 18 seine hauls made at this site and about 10 adult Rio Grande silvery minnow were collected.

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Habitat at the population monitoring site 1.5 miles downstream of San Acacia Diversion Dam [RM 114.6] was composed primarily of main and side channel runs and pools. Sampling efforts were conducted at this site on 22 May 2002. The channel was highly braided and all habitats were easily accessible. Larval white sucker were present in low velocity habitats along the shoreline as well as in pools. Eight adult Rio Grande silvery minnow were present in collections.

Fish sampling was conducted on 22 May 2002 at the population monitoring site just upstream of the Socorro Wastewater Treatment Plant [RM 99.5]. Six species were present at this site but all except red shiner were represented by five or fewer individuals. While seventeen of the18 seine hauls made at this site yielded specimens, Rio Grande silvery minnow (adult) were not collected. The larval fish collections made at this site may contain Rio Grande silvery minnow although this needs to be verified in the laboratory. Water temperature was about five degrees (°C) higher in backwaters than in the main channel. Adult or juvenile Rio Grande silvery minnow were not present.

The next downstream site (ca. 4 miles upstream of U.S. Highway 380 bridge crossing [RM 91.7]) was sampled on 22 May 2002. Flow was about equally divided between the east and west river channels. Numerous low velocity habitats such as backwaters and pools were present throughout the study area. As at most upstream sampling localities, red shiner dominated the catch. A total of four adult Rio Grande silvery minnow, collected in three of 18 seine hauls, were present in collections taken at this site.

Sampling at the U.S. Highway 380 bridge crossing near San Antonio, NM [RM 87.1] was conducted on 21 May 2002. Backwaters were located along the shoreline upstream of the bridge. Collections taken in a few side channels produced most of the fish taken at this locality. Fish were collected in all 16 seine hauls made at this site with red shiner comprising the majority (>95%) of identifiable fish. Numerous larval fishes were retained so that they could be subsequently identified. Two adult Rio Grande silvery minnow were present in seine hauls made at this site.

Collecting efforts in the Rio Grande directly east of the Bosque del Apache National Wildlife Refuge [RM 79.1] occurred on 21 May 2002. Flow in the river had shifted farther to the west side of the river channel and was relatively low. Low numbers (n<20) of fish were present in most mesohabitats. Water temperatures were warm and winds were very high (ca. 30-50 m.p.h.). Seven species were collected at this site but only red shiner was represented by more than four individuals. Fish were taken in all 17 seine hauls and four adult Rio Grande silvery minnow were present in main channel habitats.

The San Marcial Railroad crossing site [RM 68.6] was sampled on 21 May 2002. Most of the flow at this site was constrained to a single channel. Habitats were relatively heterogenous and fish were collected in all 16 seine hauls. Deep (ca. 1 m) backwaters were present near the downstream portion of the site but produced surprisingly few fish (larval or adult). Rio Grande silvery minnow (n=8) were taken in seven of 16 seine hauls. Female Rio Grande silvery minnow appeared to be either noticeably gravid or completely spent of eggs.

The site at the former confluence of the Low Flow Conveyance Channel and Rio Grande [RM 60.5] was also sampled on 21 May 2002. A flow release from Cochiti Reservoir during the previous week resulted in a shift in the locations of sand bars throughout the site. The majority of discharge was in the middle of the river channel; side channels that were formerly along the east side of the river had dried. There were isolated pockets of larval fish occupying shoreline and backwater habitats. A single adult Rio Grande silvery minnow was collected in a main channel run. The two

most abundant species were red shiner and channel catfish (*Ictalurus punctatus*). Noteworthy was the collection at this site of two smallmouth buffalo (*Ictiobus bubalus*) between 500-600 mm SL.

The downstream-most site [RM 57.7] was sampled on 21 May 2002. Water level in the river was very low and turbidity had dropped substantially since the large release of water during the previous week. Fish were present in 14 of 17 seine hauls however only three species were taken. Red shiner was the most abundant species in this collection and was often the only species present in a given seine haul. The catch rate of red shiner, and fish in general, was quite low at this site as compared with upstream sampling localities. Channel catfish (n=5) and Rio Grande silvery minnow (n=1) were the only other species collected at this site. The single adult Rio Grande silvery minnow collected was in poor condition.

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Table 1. Collection localities for 2002 population monitoring of Rio Grande silvery minnow.

Site #	Site Locality
ANGOSTURA REACH SITES	
0	New Mexico, Sandoval County, Rio Grande, below Angostura Diversion Dam, Angostura. River Mile 209.7 SAN FELIPE PUEBLO QUADRANGLE 3916006 N 363811 E
1	New Mexico, Sandoval County, Rio Grande, at 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 NM State Highway 44 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	
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 Pipeline crossing), Jarales. River Mile 143.2 VEGUITA QUADRANGLE 3827329 N 338136 E

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Table 1. Collection localities for 2002 population monitoring of Rio Grande silvery minnow. (continued)

Site #	Site Locality
ISLETA REACH SITES (continued)	
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 327902N
SAN ACACIA REACH SITES	
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

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Table 1. Collection localities for 2002 population monitoring of Rio Grande silvery minnow. (continued)

Site #	Site Locality
SAN ACACIA REACH SITES (continued)	
15	New Mexico, Socorro County, Rio Grande, directly east of Bosque del Apache National Wildlife Refuge headquarters. 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. 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. River Mile 57.7 PARAJE WELL QUADRANGLE 3714740 N 307380 E