SUMMARY OF POPULATION MONITORING OF RIO GRANDE SILVERY MINNOW

(18-22 November 2002)

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

The eleventh (next to last) sampling effort of the 2002 Rio Grande silvery minnow population monitoring program was conducted between 18-22 November 2002 at 20 sites throughout the Middle Rio Grande. Population monitoring sample sites have remained the same throughout 2002. 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. Fish (including young-of-year) were identified in the field, counted, and released at the site of capture. Rio Grande silvery minnow were counted, identified to age-class, and released at the site of capture.

Summary of population monitoring efforts by site

The site just downstream of Angostura Diversion Dam [RM 209.7] was sampled on 22 November 2002. Water levels were, as in October 2002, relatively low (discharge ca. 370 cfs) making it easy to access habitats at the base of the dam and habitats along the western shoreline. Species-specific catch rates were low with the exception of western mosquitofish (*Gambusia affinis*). A single seine haul in a backwater produced almost all (n=180) of the western mosquitofish taken at this site. A total of five fish species were collected and most were associated with shoreline habitats. Rio Grande silvery minnow (*Hybognathus amarus*) was not collected at this site.

The next downstream population monitoring site was near the NM State Highway 44 bridge crossing [RM 203.8] and was sampled on 22 November 2002. The river channel was very braided and water levels appeared to be slightly lower than during the October 2002 sampling effort. Fish were collected in all seine hauls and species-richness was relatively high (n=9). Red shiner (*Cyprinella lutrensis*) was the most abundant fish species followed by flathead chub (*Platygobio gracilis*) and western mosquitofish. Flathead chub was collected in 14 of 17 seine hauls. One age-0 Rio Grande silvery minnow (56 mm standard length, SL) was collected but was very thin and appeared to be in poor condition.

Water temperature at the Rio Grande silvery minnow population monitoring site (located just upstream of the Rio Rancho wastewater treatment plant [RM 200.0]), sampled on 22 November 2002, was 11°C at 12:45 h. Western mosquitofish numerically dominated the catch followed by red shiner, fathead minnow, and longnose dace (*Rhinichthys cataractae*). With the exception of channel catfish (*Ictalurus punctatus*) the same species that were collected at Bernalillo were collected at Rio Rancho. Likewise, a single Rio Grande silvery minnow (age-1; 71 mm SL) was collected at the Rio Rancho site.

The Central Avenue (U.S. Highway 66) bridge crossing [RM 183.4] site was sampled on 22 November 2002. There were a wide variety of habitats present at this site and flow was about 360 cfs during the sampling effort. Water was somewhat turbid and visibility low. Main channel habitats produced fewer fish than side channel habitats. Red shiner and channel catfish were the most commonly collected taxa. Rio Grande silvery minnow was not present in any of the 17 seine hauls taken at this site.

Fish sampling at the Rio Bravo Boulevard bridge crossing [RM 178.3] was conducted during the early morning (08:45 h) of 22 November 2002 at which time the water temperature was 5°C. The overall catch rate at this site was relatively low and half of the seine hauls failed to produce fish. Flow was low and there was extensive river braiding resulting in many

shallow side channels. Western mosquitofish, river carpsucker (*Carpiodes carpio*), and fathead minnow (*Pimephales promelas*) were, respectively, the most abundant fishes taken. Rio Grande silvery minnow was not collected at this site.

Los Lunas Bridge [RM 161.4], the most upstream site in the Isleta Reach, was sampled on 21 November 2002 and yielded more individuals (n=958) during November (2002) than any other population monitoring site. Water visibility was low in the main channel (<2 cm) but higher in backwaters (<20 cm). Some very large backwater habitats near the bridge produced the majority of the catch. Red shiner, fathead minnow, and western mosquitofish were the most abundant of the 10 species taken at this site. Ambient temperatures had warmed noticeably during the day and resulted in warmer water in shallow habitats along shorelines and in backwaters. Fish were collected in 16 of the 17 seine hauls made at this site. Two Rio Grande silvery minnow, both age-1 fish (73, 81 mm SL), were collected at this site.

The flow in the river at the Belen collecting site [RM 151.5] on 21 November 2002 was moderate-high compared with October 2002. The large amount of debris noted in the water column was probably the result of recently increased flows. This site consisted of two large flowing channels and extensive inundated habitats. The newly inundated grass covered islands provided extensive low velocity habitats. The November 2002 Belen fish fauna was represented by only six species and numerically dominated by red shiner, fathead minnow, and western mosquitofish. Rio Grande silvery minnow was not collected at this site.

On 21 November, the Transwestern Pipeline Crossing [RM 143.2] site was sampled for the 11th time during 2002. Backwater and low velocity habitats dominated the site and water temperature was generally cold (8°C at 12:00 h). The substantial growth of vegetation on and along instream islands noted during the October 2002 sampling effort had been inundated by the recent increase in flow. Red shiner was present in nearly all seine hauls and numerically dominated the sample. Fathead minnow and western mosquitofish were, of the other six species, the only fish represented by more than eight individuals. The three Rio Grande silvery minnow (n=2 age-1, 68, 77 mm SL; n=1 age-0, 50 mm SL) collected at this site were the largest number taken in a single collection upstream of the San Acacia Reach.

Although water levels of the Rio Grande at the U.S. Highway 60 Bridge site [RM 130.6] have been intermittent throughout the summer of 2002, they were moderate on 21 November 2002. Flow during sampling was 430 cfs as recorded at the USGS gauge (#08332010) compared with 20 cfs during October 2002 sampling. Water temperature was cold (7°C in the main channel at 09:45 h) during the November 2002 sampling effort. Few fish were taken at this site with fathead minnow and red shiner collectively comprising almost 98% of the sample. Rio Grande silvery minnow was not taken at this site.

The population monitoring locality 3.5 miles downstream of Bernardo [RM 127.0] was also sampled on 21 November 2002. The river level at this site was moderate (ca. 400 cfs) and there were many recently inundated habitats. Water clarity was low making it impossible to see to the bottom of the river except in shallow backwaters. Fish were collected in 13 of the 17 seine hauls with red shiner being by far the most numerous taxon collected. Two age-1 Rio Grande silvery minnow (71, 79 mm SL) were collected in main channel shoreline runs.

The population monitoring site just upstream of the San Acacia Diversion Dam [RM 116.8] was sampled on 19 November 2002. The increase in water level noted between the October and November sampling effort had inundated many previously exposed sandbars and few islands remained. Aquatic habitats were relatively homogenous throughout the site. Fish

were taken in 14 of 17 seine hauls but overall fish catch rate was low. Western mosquitofish, red shiner, and flathead chub were the most commonly collected taxa. A single uncharacteristically small age-0 Rio Grande silvery minnow (27 mm SL) was collected at this site. The size (length) of the aforementioned individual was noteworthy as most age-0 Rio Grande silvery minnow collected in autumn of 2002 were >50 mm SL. While the majority of Rio Grande silvery minnow spawning likely occurred during May 2002, USFWS reported collecting eggs in late July 2002 (Jude Smith, personal communication). It is likely that this and other small age-0 Rio Grande silvery minnow individuals collected during the November 2002 sampling effort were produced as part of late summer spawning (i.e., July-August).

The Rio Grande silvery minnow population monitoring site located immediately downstream of San Acacia Diversion Dam [RM 116.2] was sampled on 19 November 2002. Red shiner, fathead minnow, and flathead chub comprised the majority of the catch at this site. Most fish were collected in runs with the largest number of individuals taken in side channel habitats and backwaters. Fish were taken in 14 of 17 seine hauls made at this site and a total of nine species were collected. Flow immediately downstream of the dam (ca. 500 cfs) wetted most riverine habitats. Three age-0 Rio Grande silvery minnow (25-44 mm SL) were collected in deep pool and run habitats near the lower portion of the sampling site. Given their relatively small size (length), these three age-0 individuals are presumed to have resulted from the late-summer spawn.

Fish sampling at the population monitoring site 1.5 miles downstream of San Acacia Diversion Dam [RM 114.6] was conducted on 19 November 2002. Fish were taken in 14 of 16 seine hauls with red shiner comprising over 80% of the total catch. Eight age-0 Rio Grande silvery minnow and five age-1 individuals were collected at this site. All but one individual silvery minnow was collected in a single backwater. Of the eight age-0 specimens, five were from the putative July 2002 spawn (28-35 mm SL).

On 19 November 2002, fish were sampled at the population monitoring site just upstream of the Socorro Wastewater Treatment Plant [RM 99.5]. The majority of the flow was along the east side of the river in a single main channel run and water temperature was 7°C (at 11:00 h). Several recently formed large backwaters were partially filled with silt. Fish were present in 11 of 17 seine hauls taken at this site with red shiner numerically dominating the catch. Of the seven other fish species taken, all except fathead minnow (n=17) were represented by less than five individuals. Two age-1 Rio Grande silvery minnow (70-79 mm SL) were collected in a side channel pool.

The site about 4 miles upstream of U.S. Highway 380 bridge crossing [RM 91.7] was sampled on 19 November 2002. There was flow on both sides of the river channel and relatively high levels of turbidity in the water resulted in low instream visibility (<2 cm). Cold overnight temperatures resulted in development of surface ice along shallow shoreline habitats. Pools produced the majority of all fishes collected at this site. Red shiner was the most commonly collected (n=266) of the five species taken at this site. Rio Grande silvery minnow was not taken at this site during the November 2002 sampling effort.

Sampling at the U.S. Highway 380 bridge crossing near San Antonio, NM [RM 87.1] occurred during the afternoon of 18 November 2002 at which time water temperature was 10 °C (14:20 h). There were several long side channels present near the upper end of the study site. The majority of the flow was in the main channel but there were also several low velocity pools and backwaters. Fish were collected in 14 of the 17 seine hauls made at this

site but overall catch rate was low. Only red shiner was represented by more than 15 specimens. Most fishes collected were occupying side channels and shoreline habitats. Two age-0 Rio Grande silvery minnow (23, 52 mm SL) and four age-1 individuals (70-78 mm SL) were collected at this site. The lengths of the two age-0 Rio Grande silvery minnow suggest that one (52 mm SL) is from the May spawn while the other is a product of the late summer spawn.

The Rio Grande silvery minnow population monitoring site located directly east of Bosque del Apache National Wildlife Refuge [RM 79.1] was sampled on 18 November 2002. As noted during September and October 2002, the river at this site was flowing but there had been extensive and repeated river drying throughout the summer; the most recent drying event occurring in October 2002. The near absence of fish at this site (n=15) was likely the result of previous river drying events. Fish were present in only four of 15 seine hauls and none of those four hauls contained more than 10 individuals. Red shiner (n=6) and western mosquitofish (n=6) were the most commonly collected taxa. A single age-1 Rio Grande silvery minnow (68 mm SL) was collected.

During the 18 November 2002 sampling effort at the San Marcial Railroad crossing site [RM 68.6] flow in the Rio Grande was about 410 cfs. Most of the flow was contained in the middle of the river channel. Recent cold weather resulted in some freezing along the shoreline and in shallow (<2 cm) habitats. Riverine habitats were relatively homogeneous and fish were collected in eight of 17 seine hauls. Overall catch rate at this site was extremely low as the five species collected were represented by relatively few individuals (n=33 total). A single age-0 Rio Grande silvery minnow (59 mm SL) was collected in a large (ca. 30 x 2 m) backwater near the lower end of the site. This individual likely was a product of the May 2002 Rio Grande silvery minnow spawn.

The site at the former confluence of the Low Flow Conveyance Channel and Rio Grande [RM 60.5] was also sampled on 18 November 2002. On that date, most of the flow was contained in a single channel. The few low velocity habitats observed at this site were along the shoreline and in small backwaters. Only four species were collected of which red shiner numerically dominated the catch (n=196). The other three taxa were represented by 10 or fewer individuals. Rio Grande silvery minnow was not collected at this site.

The downstream-most site [RM 57.7] was sampled on 18 November 2002. Water level (ca. 400 cfs) at this site was much higher than noted during most of the summer sampling period. There was a large amount of silt and debris in the water and visibility was only about 1 cm. Most of the fish collected were present in shoreline habitats. Although fish were present in nine of 16 seine hauls, only three species were taken and most samples contained <5 individuals. Catch rate of red shiner, while again the most commonly taxon, was still exceedingly low. Rio Grande silvery minnow was not taken at this site during November 2002.

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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, Algodones. 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, 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