SUMMARY OF POPULATION MONITORING OF RIO GRANDE SILVERY MINNOW

(27-31 August 2001)

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

The fourth sampling foray for the 2001 Rio Grande silvery minnow population monitoring program was conducted between 27-31 August 2001. A total of 19 sites were sampled. Five sites were located in the Angostura Reach, five sites in the Isleta Reach, and nine sites in the San Acacia Reach. A list of collection localities is appended as Table 1.

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, identified to age-class, and released at the site of capture. Fish from each sampling effort, including a small voucher series of Rio Grande silvery minnow, were preserved in the field in 10% formalin and then returned to the Museum of Southwestern Biology - Division of Fishes for later processing and identification. Specimens are transferred from 10% formalin to water after several weeks and then, after several days, transferred to 50% alcohol prior to being sorted.

Summary of population monitoring efforts by site

The upstream-most area sampled during this collection foray was near Angostura Diversion Dam [RM 209.7] and was made on 28 August 2001. Substrate consisted primarily of sand, gravel, and cobble. Water temperature at this site was warm (20.0°C at 0815 h). Water levels were moderately low and resulted in the creation of several backwaters. No side channels were present but pools were frequently encountered near the shore. Shoreline habitats and backwaters produced the majority of individuals collected. Fish were collected in all but one seine haul and the catch was dominated by red shiner (*Cyprinella lutrensis*). Rio Grande silvery minnow (*Hybognathus amarus*) (N=3) were collected in two seine hauls at this site.

Our second collecting locality was at the NM State Highway 44 bridge crossing [RM 203.8] on 28 August 2001. Substrate consisted primarily of sand, gravel, and cobble. The river was highly braided with a multitude of low velocity instream habitats. All 18 seine hauls produced fish but no Rio Grande silvery minnow were collected. The majority of fishes captured were associated with shoreline habitats. Red shiner was the most abundant taxon collected.

The next site sampled on 28 August 2001 was just upstream of the Rio Rancho wastewater treatment plant [RM 200.0]. Water temperature at this site was 22°C at 1235 h. A total of 19 seine hauls were taken at this site and fish were collected in every haul, including main channel runs. Most of the flow in the river at this locality was being carried in a single channel. A large side channel that was present in the June 2001 population monitoring effort and produced the majority of Rio Grande silvery minnow from that sample was dry during this visit. There were some small riffles that yielded several longnose dace (*Rhinichthys cataractae*) and flathead chub (*Platygobio gracilis*). Rio Grande silvery minnow were present at this site but very rare (N=2).

Sampling at the Central Avenue (US Highway 66) bridge crossing [RM 183.4] was completed on 28 August 2001. Substrate consisted primarily of sand and silt. Some gravel bars were present in the mid-channel areas but were only rarely encountered. Most fish were collected in pools and found primarily along the shoreline. Fish were present in most seine hauls (16 of 18) and a single Rio Grande silvery minnow were collected.

The Rio Bravo Boulevard bridge crossing [RM 178.3] was the final site sampled on 28 August 2001. Water temperature was 23°C at 1315. A number of different pool/run habitats were present throughout the site. These habitats produced moderate to high numbers of fish. Most fish were collected along the shoreline and in several side channels along the east side of the river.

Fewer fish were collected at this site than at upstream sites. A single Rio Grande silvery minnow was captured.

The most upstream site in the Isleta Reach was the Los Lunas Bridge [RM 161.4] and was sampled on 30 August 2001. The substrata consisted of silt and sand at this and all remaining downstream sites. Aquatic habitats at this site were primarily main and side channel runs and pools. The river was quite braided and habitat heterogeneity was high. Water visibility was about 5 cm. Rio Grande silvery minnow (N=6) were taken in 3 of 17 seine hauls and included individuals that were larger than those collected in the San Acacia Reach.

Catch at the Belen Site [RM 151.5] on 30 August 2001 was numerically dominated by a few species including red shiner, common carp (*Cyprinus carpio*), and channel catfish (*Ictalurus punctatus*). Rio Grande silvery minnow were present in 5 of 16 seine hauls (N=16) and some individuals (Age-1) exceeded 50 mm SL. Low flow conditions resulted in a braided river channel and water temperature was 27.5°C.

Aquatic habitat at the Transwestern Pipeline Crossing [RM 143.2] was heterogenous and numerous pools and backwaters were present. Most of the fish were taken in pools or in association with shallow habitats provided by sand islands. A single Rio Grande silvery minnow was taken in a main channel shoreline run. Fish were collected in all 17 seine hauls.

The U.S. Highway 60 Bridge site [RM 130.6] was sampled on 29 August 2001. Water temperatures were extremely warm (31.5°C in the main channel) most likely because of very low flow conditions. Only about 10% of the river channel was wetted. The river meandered widely at this locality and presented a wide variety of habitats to sample. We collected a few large Rio Grande silvery minnow (N=5; 46-50 mm SL). There were a surprising amount of common carp and river carpsucker (*Carpiodes carpio*) present in the majority of the seine hauls.

The sampling locality 3.5 miles downstream of Bernardo [RM 127.0] was sampled on 30 August 2001 and was composed of complex and diverse habitats. The water level was very low (<150 cfs) and quite clear (0.45 m). Several Rio Grande silvery minnow (N=7) were collected in backwaters or pools. Common carp, red shiner, and channel catfish were captured in nearly all seine hauls. Two largemouth bass (*Micropterus salmoides*) were collected in deep pools along the bank.

The site immediately downstream of San Acacia Diversion Dam [RM 116.2] was sampled on 29 August 2001. Recent rains resulted in heavy quantities of organic drift in the water column and highly turbid brown-red water. There were a wide variety of habitats available and fish were present in moderate to high densities in all habitats. The catch was again dominated by common carp, red shiner, and river carpsucker. The absence of Rio Grande silvery minnow at this collecting locality was surprising considering that there had been large densities present during the June sampling effort. It is possible that those individuals redistributed to areas downstream of San Acacia Diversion Dam.

Habitat at the site 1.5 miles downstream of San Acacia Diversion Dam [RM 114.6] was composed primarily of main channel runs and some side channels. Sampling efforts were conducted at this site on 29 August 2001. There was a large quantity of floating organic matter and floatsam present in the river. Water visibility was <0.5 cm. The abundance of fish was low to moderate in nearly all habitats. The catch was dominated by red shiner and channel catfish, but a few flathead chub were found in higher velocity runs. Rio Grande silvery minnow (N=2) were only collected in a single seine haul.

Sampling was also conducted on 29 August 2001 at a site just upstream of the Socorro wastewater treatment plant [RM 99.5]. There was a wide variety and quantity of aquatic habitats available at this site. Recent rains have left thick deposits of silt along the shoreline. Rio Grande silvery minnow (N=278) were present in the vast majority of seine hauls and a single seine haul in a backwater contained over 200 Age-0 individuals.

At the next downstream site (ca. 4 miles upstream of U.S. Highway 380 Bridge [RM 91.7]) water was highly turbid and extensive braiding of the river channel had recently occurred following declining stream flows. Rio Grande silvery minnow were collected in the majority of seine hauls and were especially abundant in backwaters. High densities of Rio Grande silvery minnow (N=292) within this portion of the San Acacia Reach suggest upstream movement of individuals from downstream localities (i.e., high catch rates at San Marcial in June).

Sampling at the US Highway 380 bridge crossing near San Antonio, NM [RM 87.1] was conducted on 27 August 2001. Most of the flow was confined to a single channel although some small and widely spaced backwaters and side channels were present. The majority of fish were collected in deeper pools along the shoreline. The catch of Rio Grande silvery minnow increased dramatically at this site (N=40) compared to all other downstream sites. Fishes collected at this site appeared to be in better condition than those downstream.

On 27 August 2001, we sampled the Rio Grande directly east of the Bosque del Apache National Wildlife Refuge [RM 79.1]. The river was confined to the east shoreline leaving the west bank dry. There is just enough flow to keep the main channel wet and water temperatures were 28° C. There was evidence of lateral drying but no large isolated pools were present. The few pools that were isolated contained small numbers of red shiner and western mosquitofish (*Gambusia affinis*). Rio Grande silvery minnow (N=4) were only present in a few low velocity habitats.

At the San Marcial Railroad Bridge Crossing site [RM 68.6] flows were low but there was no evidence of stream drying. Channel width was about 15 m and there were numerous side channels and backwaters present. We collected a small number of Rio Grande silvery minnow (N=16) and some occupied areas with current. Fish were collected in all seine hauls and there were quite a few channel catfish present in a variety of habitats.

The site at the former confluence of the Low Flow Conveyance Channel and Rio Grande [RM 60.5] contained a few isolated pools but there were a few fishes present in the pools. There seems to be a greater abundance of crawfish and channel catfish in samples than in past sampling efforts. There also appears to be a higher abundance of fish infected by the female adult form of a parasitic copepod (*Lernaea sp.*). Rio Grande silvery minnow (N=23) were primarily found in backwaters.

The downstream most site [RM 57.7] was sampled on 27 August 2001. All seine hauls contained fish and a wide variety of habitats were present. Rio Grande silvery minnow were collected in 4 of 17 seine hauls and were at very low densities (N=4). Some individuals were infected with *Lernaea sp.*

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Table 1. Collection localities for 2001 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 (continued.). Collection localities for 2001 population monitoring of Rio Grande silvery minnow.

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

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

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

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Table 1 (continued.). Collection localities for 2001 population monitoring of Rio Grande silvery minnow.

Site #	Site Locality
SAN ACACIA REACH SITES (continued)	
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