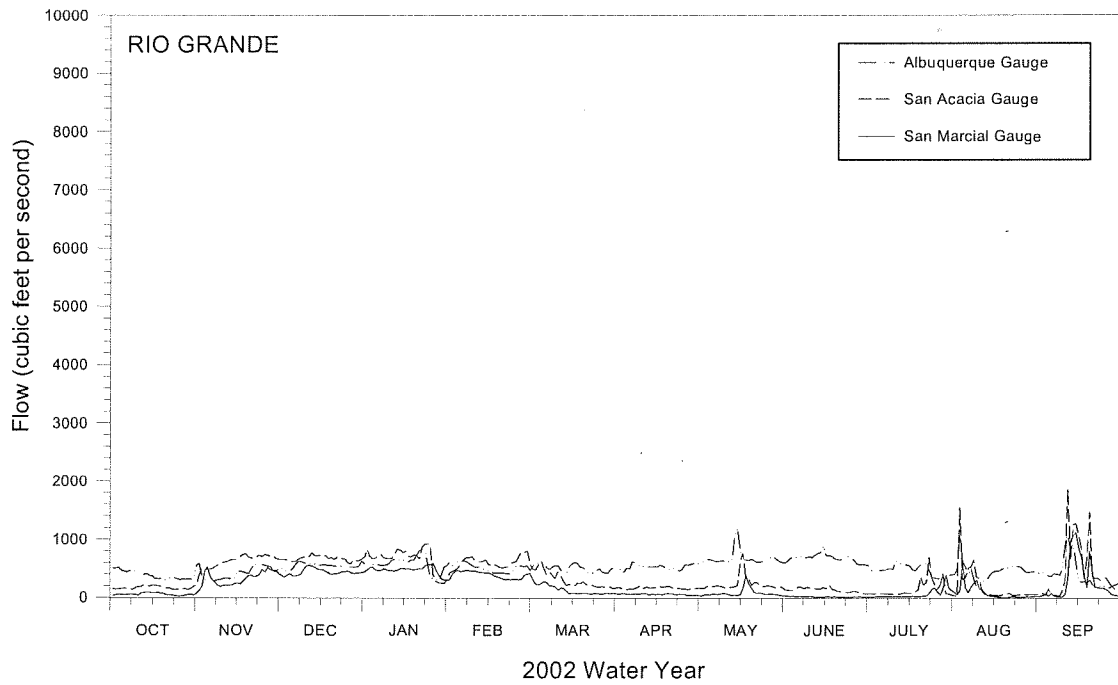


2002 POPULATION MONITORING OF RIO GRANDE SILVERY MINNOW,
HYBOGNATHUS AMARUS

Final Report



Robert K. Dudley, Sara J. Gottlieb,
and Steven P. Platania

American Southwest Ichthyological Research Foundation

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Under U. S. Bureau of Reclamation Grant:
98-FC-40-0500

Submitted to:

U. S. Bureau of Reclamation
Albuquerque Area Office
555 Broadway, NE
Suite 100
Albuquerque, New Mexico 87102-2352

10 June 2003

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EXECUTIVE SUMMARY

Rio Grande silvery minnow, *Hybognathus amarus*, has been declining in distribution and abundance in the Rio Grande during the past fifty years. The remaining population of the endemic cyprinid resides in a 280 km reach of river between Cochiti Dam and Elephant Butte Reservoir in the Middle Rio Grande of New Mexico. The remnant population of this once widespread species has been steadily declining in abundance since its listing as a federal endangered species in 1994. Multiple pronounced river drying events over the past decade have eroded the ability of this species to recover in its current range. In addition, fragmentation of its remaining range into four segments (35.9, 65.2, 85.5, and 90.4 km long) by diversion dam structures (Angostura, Isleta, and San Acacia) pose continued threats to the long-term persistence of this species.

Population monitoring efforts of the fish community in the Middle Rio Grande show that Rio Grande silvery minnow catch rates declined significantly ($p < 0.01$) from 1993 to 2002. The number of Rio Grande silvery minnow taken in 2002 was not only very low in each of the three reaches, but had declined to the lowest levels ever recorded (< 1 individual/1,000 m²) by October 2002. In 2002, the San Acacia Reach yielded the most silvery minnow, followed by the Isleta Reach, and the Angostura Reach. Monthly catch rates of this endangered cyprinid decreased significantly ($p < 0.01$) in each of the reaches during 2002.

Analysis of Rio Grande silvery minnow catch rates revealed a significant interaction ($p < 0.01$) between mean catch rate and locality. The highest catch rates of Rio Grande silvery minnow were generally recorded at upstream sampling localities in each of the respective reach (i.e., close to diversion dams). This spatial distribution of individuals was most pronounced in the Isleta and San Acacia reaches.

River discharge during 2002 was artificially elevated through a short duration reservoir release during May 2002 to induce spawning by Rio Grande silvery minnow. Although a large number of Rio Grande silvery minnow eggs were released as a result of the flow spike, the production of propagules ultimately failed to result in recruitment of many silvery minnow to the 2002 year-class. In fact, young-of-year individuals comprised an unusually small percentage of the total Rio Grande silvery minnow catch following spawning in May and their abundance had rapidly declined by June 2002.

The cumulative effects of years of river drying, downstream displacement, and habitat degradation continue to be manifested by the decline of Rio Grande silvery minnow. The marked and alarming declines in abundance of Rio Grande silvery minnow recorded in 2002 during this population monitoring study provide the strongest evidence that the problems that led to the precipitous decline of this species have not been remedied. A renewed focus on issues that directly affect the immediate survival of this species in the wild is essential. Removal of instream barriers that prevent Rio Grande silvery minnow from repopulating upstream reaches, the need to maintain increased and variable flow throughout downstream reaches, and restoration and reconnection of the historical floodplain are paramount issues that need to be resolved to assure the continued persistence of this species.