

stable hydrologic regime between Sumner and Brantley Reservoirs, and, until summer 2001, this stretch had maintained continuous flow for about the last 10 years (D. Coleman, pers. comm. 2001). Groundwater seepage areas and base flow supplementation from Sumner Dam bypasses can offer a degree of stability for the river flow, especially during low flow periods (Hatch *et al.* 1985; Service 2001). Still, segments of this river reach were dewatered for at least 5 days during summer 2001 (D. Coleman, pers. comm. 2001). Although springs and irrigation return flows maintain water flow in the lower portions of this river reach during times when no water is being released from Sumner Dam, periods of low discharge or intermittency have the potential to impact much of the suitable habitat within portions of this reach (Service 2001).

After the construction of Sumner Dam, major channel incision (deepening) occurred during the 1949 to 1980 period, accompanied by salt cedar (*Tamarix ramosissima*) proliferation along the river banks (Hoagstrom 2000). High-velocity flows within the incised river channel can displace eggs from pelagic spawners such as the silvery minnow. This channel incision also reduced the areas of low-velocity habitat within this river reach (Hoagstrom 2000). Recently, lengthy reservoir releases such as those that occurred in 1988 (36 days) and in 1989 (56 days) have been shortened to about 10 days, which has benefitted species such as the Pecos bluntnose shiner (Service 2001). Nevertheless, historic block releases of water from Sumner Reservoir have modified river flows and habitat (e.g., the downstream river reaches have increased in depth and water velocity) (Hoagstrom 2000).

The recovery of the silvery minnow requires reestablishing populations outside of the middle Rio Grande (Service 1999). We believe that reintroduction is required outside of the area presently occupied by the species (i.e., the middle Rio Grande) to ensure the recovery of the silvery minnow (50 CFR 424.12(e)) (see "Recovery Plan" section above). We recognize that habitat within this river reach is degraded, but believe this reach within the middle Pecos River may provide one of the most promising areas for conducting recovery efforts because we believe it still contains habitat suitable for the silvery minnow (Hoagstrom 2000). The continuing presence of members of the pelagic spawning guild (e.g., speckled chub, Rio Grande shiner, Pecos bluntnose shiner) is evidence that this reach of the Pecos River contains

habitat suitable for the silvery minnow and may support reestablishment of the species (Hoagstrom 2000).

Federal agencies have not consulted with us on how their actions will affect the silvery minnow, because the species no longer occurs within the Pecos River (D. Coleman, pers. comm. 2001). Because habitat suitable for the silvery minnow is still present within this river reach, we find that this river reach is essential to the conservation of the species. Although we have determined that this reach is essential to the conservation of the silvery minnow, we have not designated this area as critical habitat (see "Exclusions Under Section 4(b)(2) of the Act" section above). Our conservation strategy is to develop, through Federal rulemaking procedures, one or more experimental populations within the historic range of the silvery minnow. We believe this river reach may provide a suitable area for an experimental population.

12. Downstream of Brantley Reservoir, Eddy County, NM to Red Bluff Reservoir, Loving and Reeves Counties, TX. This reach is short, with a highly variable flow regime that is dependent on agricultural demand. This reach is also highly segmented, with small closely placed impoundments (e.g., permanent and temporary diversion dams) that pond water, impede fish movements, and would not allow for adequate stream length (e.g., 134 to 223 mi (216 to 358.8 km)) to ensure the survival of downstream drift of eggs and larvae and recruitment of adults (Platanía and Altenbach 1998). Additionally, agricultural and oil field pollution and Permian salts (i.e., brine) are added to the river in this reach, decreasing the water quality to levels that likely would not support the silvery minnow (Campbell 1959; Larson 1994). The silvery minnow was historically uncommon within this reach; only 14 specimens from two collections are known (Bestgen and Platanía 1991). Due to the short length of this reach, fluctuations in the flow regime, degraded water quality, and the absence of suitable habitat for the silvery minnow, this reach is not considered essential to the conservation of the silvery minnow and is not designated as critical habitat.

13. Downstream of Red Bluff Reservoir to the confluence with the Rio Grande, Loving, Reeves, Pecos, Ward, Crane, Crockett, and Terrell Counties, TX. Historically silvery minnows occurred in this reach, though their exact distribution and abundance is unclear (Campbell 1958; Trevino-Robinson 1959; James and De La Cruz 1989; Linam and Kleinsasser 1996;

Garrett 1997; Service 1999). Bestgen and Platanía (1991) suggest that silvery minnows may have been uncommon within this reach because of pond habitat and high water salinity. However, this area may not have been well surveyed when the silvery minnow was still extant in the Pecos River (D. Propst, New Mexico Game and Fish, pers. comm. 2001). Sampling the middle and lower parts of this river reach has been historically difficult because of dense vegetation, steep canyon banks, and lack of public access (Campbell 1959). The upper segment of this reach can be characterized as devoid of suitable habitat, and has a highly variable flow regime from release of water from Red Bluff Reservoir for agricultural use. Indeed, many freshwater springs that historically augmented the Pecos River throughout this reach have recently diminished or gone dry (Campbell 1959; Brune 1981 cited in Hoagstrom 2000; Barker *et al.* 1994; El-Hage and Moulton 1998b). The water quality in this upper portion is also poor and dominated by high salinity (generally exceeding 5 parts per thousand) (Hiss 1970; Hubbs 1990; Linam and Kleinsasser 1996; Miyamoto *et al.* 1995; El-Hage and Moulton 1998b). Additionally, algal blooms (*Prymnesium parvum*) have essentially eliminated all the fishes throughout from Malaga, NM, to Amistad Dam, TX (James and De la Cruz 1989; Hubbs 1990; Rhodes and Hubbs 1992). The river channel is also somewhat incised and dominated by non-native vegetation in parts (Koidin 2000; Harman 1999; IBWC 2001b). Agricultural needs diminish south of Girvin, TX, and water quality conditions (e.g., salinity) generally begin to improve downstream from the confluence of Independence Creek to Amistad Dam (Hubbs 1990; Linam and Kleinsasser 1996). This improvement could result from the freshwater springs within the lower 100 mi (160 km) stretch of this reach. Nevertheless, gaging records from the lower segment indicate that there is virtually no flow during drought conditions (Texas Water Development Board 2001); further, water quality (e.g., total dissolved solids) at Shumla Bend, just upstream of Amistad Reservoir, would be expected to have a deleterious effect on aquatic life (IBWC 1994).

We did not include this reach because the current or potential suitability for the silvery minnow is unknown; detailed habitat studies have not been conducted in this reach. Moreover, it is believed that this area contains a network of steep canyons, with rock and coarse gravel substrate (Campbell 1959;