

main channel in response to large flow events, and recreate the mosaic of habitats necessary for the conservation of the silvery minnow); (2) conservation of the adjacent riparian zone also helps provide essential nutrient recharge and protection from sediment and pollutants, which contributes to successful spawning and recruitment of silvery minnows; and (3) vegetated lateral zones are widely recognized as providing a variety of aquatic habitat functions and values (e.g., aquatic habitat for fish and other aquatic organisms, moderation of water temperature changes, and detritus for aquatic food webs) and help improve or maintain local water quality (March 9, 2000; 65 FR 12897; Middle Rio Grande Biological Interagency Team 1993).

This critical habitat designation takes into account the naturally dynamic nature of riverine systems and recognizes that floodplains (including riparian areas) are an integral part of the stream ecosystem. For example, riparian areas are seasonally flooded habitats (i.e., wetlands) that are major contributors to a variety of vital functions within the associated stream channel (Federal Interagency Stream Restoration Working Group 1998, Brinson *et al.* 1981). They are responsible for energy and nutrient cycling, filtering runoff, absorbing and gradually releasing floodwaters, recharging groundwater, maintaining streamflows, protecting stream banks from erosion, and providing shade and cover for fish and other aquatic species. Healthy riparian areas help ensure water courses maintain the habitat components essential to aquatic species (e.g., see U.S.D.A. Forest Service 1979; Middle Rio Grande Biological Interagency Team 1993; Briggs 1996), including the silvery minnow. Habitat quality within the mainstem river channels in the historic range of the silvery minnow is intrinsically related to the character of the floodplain and the associated tributaries, side channels, and backwater habitats that contribute to the key habitat features (e.g., substrate, water quality, and water quantity) in the middle Rio Grande (Middle Rio Grande Biological Interagency Team 1993). Among other things, the floodplain provides space for natural flooding patterns and latitude for necessary natural channel adjustments to maintain channel morphology and geometry. We believe a relatively intact riparian area, along with periodic flooding in a relatively natural pattern, is important in maintaining the stream conditions

necessary for long-term conservation of the silvery minnow.

Human activities that occur outside the river channel can have a demonstrable effect on physical and biological features of aquatic habitats. However, not all of the activities that occur within a floodplain will have an adverse impact on the silvery minnow or its habitat. Thus, in determining the lateral extent of critical habitat along riverine systems, we must consider the definition of critical habitat under the Act. That is, critical habitat must be determined to be essential to a species' conservation and, within areas currently occupied by the species, must be in need of special management considerations or protection.

We do not believe that the entire floodplain is essential to the conservation of the species, and we are not proposing to designate the entire floodplain as critical habitat. However, the river channel alone is not sufficient to ensure the conservation of the silvery minnow. For the reasons discussed above, we believe that the riparian zone adjacent to the river channel provides an important function for the protection and maintenance of the primary constituent elements and is essential to the conservation of the species.

The lateral extent (width) of riparian corridors fluctuates considerably on the Rio Grande. The appropriate width for riparian protection has been the subject of several studies (Castelle *et al.* 1994). Most Federal and State agencies generally consider a zone 23 to 46 m (75.4 to 150.9 ft) wide on each side of a stream to be adequate to help improve or maintain local water quality (Natural Resource Conservation Service 1998, 2000; Lynch *et al.* 1985), although lateral widths as wide as 152 m (500 ft) have been recommended for achieving flood attenuation benefits (Corps 1999). In most instances, however, these riparian areas are primarily intended to reduce detrimental impacts to the stream (i.e., protect the stream) from sources outside the river channel such as agricultural runoff. Generally, we believe a lateral distance of 300 ft (91.4 m) on each side of the stream beyond the bankfull stage to be appropriate for the protection of riparian and wetland habitat and the natural processes involved in the maintenance and improvement of water quality (e.g., see Middle Rio Grande Biological Interagency Team 1993). We believe this lateral width will help ensure the protection of one or more primary constituent elements (e.g., water quality) of the critical habitat. Thus, within the area designated as critical habitat in the middle Rio Grande, we conclude that

the 300-ft (91.4-m) lateral width is essential to the conservation of the species.

We did not map critical habitat in sufficient detail to exclude all developed areas and other lands unlikely to contain primary constituent elements essential for silvery minnow conservation. Some developed lands within the 300-ft (91.4-m) lateral extent are not considered critical habitat because they do not contain the primary constituent elements and they are not essential to the conservation of the silvery minnow. Lands located within the exterior boundaries of the critical habitat designation, but not considered critical habitat, include: Developed flood control facilities; existing paved roads; bridges; parking lots; dikes; levees; diversion structures; railroad tracks; railroad trestles; water diversion and irrigation canals outside of natural stream channels; the low flow conveyance channel; active gravel pits; cultivated agricultural land; and residential, commercial, and industrial developments. These developed areas do not contain any of the primary constituent elements and do not provide habitat or biological features essential to the conservation of the silvery minnow. However, some activities in these areas, like activities in other areas not included within the designation (if Federally funded, authorized, or carried out), may affect the primary constituent elements of the critical habitat and, therefore, may be affected by the critical habitat designation, as discussed later in this rule.

Reach-by-Reach Analysis

We conducted a reach-by-reach analysis of the entire known historic range of the silvery minnow to evaluate and select river reaches that require special management or protection, or are essential to the conservation of the species. As identified in the Recovery Plan (see "Recovery Plan" section above), important factors we considered in determining whether areas were essential to the conservation of the species include presence of other members of the reproductive guild (e.g. pelagic spawners, species with semibuoyant eggs), habitat suitability (e.g., appropriate substrate), water quality, and presence of non-natives (e.g., competitors, predators, other species of *Hybognathus*). These important factors were evaluated in conjunction with the variable flow regime of each reach. Each of the river reaches, to some extent, has a varying flow regime. However, the fact that a river reach may at times experience a prolonged period of low or no flow as