and its tributaries in southeastern Utah (Behle and Higgins 1959).

Few data are available on population trends in southern Utah. However, loss and modification of habitat is likely to have reduced populations on the Virgin, Colorado, and San Juan Rivers. These losses have been due to suburban expansion and habitat changes along the Virgin River, inundation by Lake Powell on the Colorado and San Juan Rivers, and encroachment of tamarisk throughout the region (Unitt 1987, BLM unpublished data).

Nevada. Unitt (1987) reported only three records for Nevada, all made before 1962. Unitt (1987), Hubbard (1987), and Browning (1993) all considered southern Nevada (approximately south of 38° north parallel) to be within the range of *E. t. extimus.* However, no recent data are available on population levels or trends. Habitat may remain along the lower Virgin River and at the inflow of the Virgin River into Lake Mead. However, loss and modification of habitat is likely to have reduced populations on the Virgin and Colorado Rivers.

Colorado. Whether or not the southwestern willow flycatcher breeds in Colorado is unclear. Hubbard (1987) believed the subspecies ranged into extreme southwestern Colorado, Browning (1993) was noncommittal, and Unitt (1987) tentatively used the New Mexico-Colorado border as the boundary between E. t. extimus and E. t. adastus. Several specimens taken in late summer have been identified as *E.* t. extimus, but nesting was not confirmed (Bailey and Niedrach 1965). Phillips (1948) cautioned that willow flycatchers in this region displayed considerable individual variation and may represent intergrades between E. t. extimus and E. t. adastus. No recent data are available on occurrence, population levels, or trends in this area.

*Mexico.* Six specimens from Baja California del Norte and two from Sonora were discussed by Unitt (1987). He and Phillips (pers. comm., cited in Unitt 1987) believed E. t. extimus was not common in northwestern Mexico. Wilbur (1987) was skeptical of its presence as a breeder in Baja California. In the more general treatments of field guides, the willow flycatcher is described as breeding in extreme northwestern Mexico, including northern Baja California del Norte (Blake 1953, Peterson 1973). No recent data are available on current population levels or trends.

Using the most recent censuses and estimates for all areas, the estimated total of all southwestern willow flycatchers is approximately 300 to 500

nesting pairs. Unitt (1987) believed the total was "well under" 1000 pairs, more likely 500. The regional estimates and information on which these total estimates are based generally date from the late 1980's to 1993 (e.g., Hubbard 1987, T. Johnson 1989). Virtually all nesting groups monitored since that time have continued to decline (Whitfield 1990, Brown 1991, Sogge et al. 1993, Whitfield and Laymon, unpubl. data).

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The Service is unaware of threats resulting from overutilization.

## C. Disease or Predation

The Service is unaware of any disease that constitutes a significant threat to *E. t. extimus.* Boland *et al.* (1989) found only one case of larval parasites in willow flycatcher nestlings in California.

Predation of southwestern willow flycatchers may constitute a significant threat and may be increasing with habitat fragmentation. Where E. t. extimus has been extirpated in the lower Colorado River valley, Rosenberg et al. (1991) found increases in the greattailed grackle (Quiscalus mexicanus), which preys on the eggs and young of other birds (Bent 1965). Whitfield (1990) found predation on *E. t. extimus* nests to be significant. Predation increased with decreasing distance from nests to thicket edges, suggesting that habitat fragmentation may increase the threat of predation.

## D. The Inadequacy of Existing Regulatory Mechanisms

The Migratory Bird Treaty Act (MBTA)(16 U.S.C. § 703–712) is the only current Federal protection provided for the southwestern willow flycatcher. The MBTA prohibits "take" of any migratory bird, which is defined as: "\* \* \* to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect \* \* \*" However, unlike the Act, there are no provisions in the MBTA preventing habitat destruction unless direct mortality or destruction of active nests occurs.

The majority of the southwestern willow flycatcher's range lies within California, Arizona, and New Mexico (Phillips 1948, Hubbard 1987, Unitt 1987). All of those States classify the willow flycatcher as endangered (AGFD 1988, NMDGF 1988, CDFG 1992). The State listings in New Mexico and Arizona do not convey habitat protection or protection of individuals

beyond existing regulations on capture, handling, transportation, and take of native wildlife. The California Endangered Species Act (CESA) prohibits unpermitted possession, purchase, sale, or take of listed species. However, the CESA definition of take does not include harm, which under the Act can include destruction of habitat that actually kills or injures wildlife by significantly impairing essential behavioral patterns (50 CFR 17.3). However, CESA requires consultation between the CDFG and other State agencies to ensure that activities of State agencies will not jeopardize the continued existence of State-listed species (E. Toffoli, State of California, in litt. 1992). The Service believes that this and other regulatory mechanisms are inadequate to ensure the continued existence of the southwestern willow flycatcher.

## E. Other Natural or Manmade Factors Affecting Its Continued Existence

The riparian habitat of the southwestern willow flycatcher has always been rare and has become more so. Its habitat rarity and small, isolated populations make the remaining *E. t.* extimus increasingly susceptible to local extirpation through stochastic events such as floods, fire, brood parasitism, predation, depredation, and land development. In early 1993, catastrophic floods in southern California and Arizona impacted much of the remaining occupied or potential breeding habitat. Historically, these floods have always destroyed habitat but were also important events in regenerating cottonwood-willow communities. However, with little southwestern willow flycatcher habitat remaining, widespread events like those of 1993 could destroy virtually all remaining habitat throughout all or a significant portion of the subspecies' range. Further, regeneration with natural vegetation after floods may be inhibited if the area is subjected to overgrazing by domestic livestock.

The disjunct nature of habitats and small breeding populations impede the flow of genetic material and reduce the chance of demographic rescue from migration from adjacent populations. The resulting constraints on the gene pool intensify the external threats to the species.

Brood parasitism by the brownheaded cowbird also threatens the southwestern willow flycatcher. Cowbirds lay their eggs in the nests of other, usually smaller, songbirds. The cowbird often removes a number of the host's eggs and replaces them with an equal number of cowbird eggs. The host