success were quantified, so that no correlations can be made. On Camp Pendleton, increases in *E. t. extimus* were concurrent with livestock (sheep) grazing but also with an extensive cowbird trapping program (Griffith and Griffith 1993). Finally, as discussed in this rule, examples exist of *E. t. extimus* (and other *E. traillii* subspecies) numbers and habitat increasing as a result of grazing reductions or other improvements in livestock management.

The Service recognizes that southwestern riparian ecosystems evolved with native grazing ungulates (*e.g.*, deer and elk). However, domestic livestock do not forage, herd or move in the same manner as native species. Further, elk occur at higher elevations of the Southwest, and are absent from the lowland river systems that constitute the majority of *E. t. extimus* habitat.

Issue 6: Timber harvesting is not a threat to the flycatcher's riparian habitat.

Service Response: The proposed rule noted that the petitioners claimed timber harvest caused watershed changes which could result in damage to riparian habitats through increasing intensity and frequency of floods. The petitioners presented no specific information on this claim. A number of experimental treatments on Southwestern forested watersheds have demonstrated increased peak and flood flows as a result of timber harvest (Tecle 1991). The degree to which timber harvesting has affected riparian habitats inhabited by the willow flycatcher, however, has not been quantified and is unknown. The Service did not implicate timber harvesting in the proposed rule as a major cause of riparian habitat loss. Rather, it pointed to that activity as one of many factors potentially responsible for riparian habitat loss and modification. Pending new information demonstrating otherwise, the Service still considers timber harvesting a potential threat to riparian habitat through loss and modification. However, the Service does not believe that this threat exists rangewide, nor does it believe that timber harvesting alone is responsible for riparian habitat loss or the endangered status of the southwestern willow flycatcher.

All causal factors will be addressed in the recovery planning process, and through the Act's section 7 consultation process, through which Federal agencies will be responsible for evaluating the effects of activities such as timber harvest on the flycatcher's riparian habitat.

Issue 7: Water impoundments have been beneficial, not detrimental; fluctuating flows below dams are not

detrimental, in fact have increased riparian habitat (Glen Canyon Dam resulted in creation of riparian habitat in Grand Canyon); impoundments protect habitat by preventing catastrophic floods; the proposal had inadequate discussion of water impoundments as threat.

Service Response: As discussed elsewhere in this final rule, water impoundments have a variety of effects on riparian habitats. The Service has determined that, with respect to E. t. extimus, the net effect of these influences is negative. For example, Glen Canyon Dam eliminated massive annual scouring floods in the Grand Canyon. This resulted in the development of a new riparian zone dominated by tamarisk (Carothers and Brown 1991). However, flycatchers nest there in very low numbers and with low nesting success (Brown 1991, Sogge and Tibbitts 1992, Sogge et al. 1993). In contrast, E. t. extimus was described as a common nester in Glen Canyon (Behle and Higgins 1959, Behle 1985), prior to its inundation by Lake Powell.

Issue 8: Comments concerning the ecology of cowbirds and cowbird parasitism included the following: Breeding Bird Survey (BBS) data indicate that cowbirds have declined, not increased; the claim that cowbirds are associated with livestock is not supported: cowbirds are associated with deer and elk, not cows; the cowbird threat is a natural one; there is inconclusive evidence that cowbird increases are directly connected with livestock grazing; cowbird parasitism of *E. t. extimus* is known in areas without livestock grazing (e.g., Grand Canyon, Kern River); there is no correlation between livestock grazing in riparian areas and cowbird parasitism; Taylor (1986) showed that cowbirds were most abundant in areas with long-term livestock exclusion; because flycatchers and cowbirds are positively associated (they tend to occur together), flycatchers can coexist with cowbirds; there is inconclusive evidence that cowbird parasitism is responsible for declines in nesting success; cowbirds have increased as a result of increases in bird feeders, campgrounds, etc. and increases in wintering food/habitat; the proposed rule cited no studies that documented cowbird parasitism of E. t. extimus; citations regarding parasitism of other species are irrelevant. Section 4(a)(1)(E) of the Act allows listing species because of "* * * natural or manmade factors affecting its continued existence * * *."

Service Response: Cowbird numbers appear to be declining only in the northeastern United States and southeastern Canada. Through the 27 years of the BBS, cowbird populations have remained fairly stable, with a small increase in the 1970's, small decrease in the 1980's, and slight increase in recent years; however, the West has experienced a marked population increase over the last five years (Wiedenfeld 1993).

The association of cowbirds with domestic livestock is detailed in the sources cited in this final rule. The Service has neither found nor been provided information indicating that cowbirds are associated with deer or elk. Other factors, including habitat fragmentation and urban/suburban feeding, are likely to have contributed to increases in cowbirds. These causal factors will be important to address in the section 7 consultation process and the development of recovery actions. However, it is the threat of parasitism, regardless of cause, that in part necessitates listing.

Where high parasitism rates are found in E. t. extimus nesting locations in areas with no livestock grazing at the nest site, there have been livestock nearby that provide feeding sites in close enough proximity to facilitate cowbird parasitism. Cowbirds may disperse up to 7 kilometers (km) from their daily feeding/roosting sites to areas with host species (Rothstein et al. 1984). At the Kern River Preserve, the riparian habitat supporting E. t. extimus is not grazed, but the immediately adjacent lands are. Similarly, although livestock grazing does not occur in Grand Canyon National Park, open range grazing and an introduced bison herd occur on adjacent lands. Further, cowbirds concentrate at pack animal corrals at various points within the National Park (Johnson and Sogge 1993). Thus, flycatcher habitat may be ungrazed but still be affected by cowbirds, by having livestock concentrations nearby to serve as cowbird feeding sites.

Cowbirds and E. t. extimus are positively associated because cowbirds require, and therefore associate with, prospective hosts. The Service finds that extensive information indicates cowbird parasitism negatively affects the southwestern willow flycatcher. This information includes specific examples of parasitism of E. t. extimus, cited in this rule, and examples of the effects of cowbird parasitism on other rare species of limited habitat. Recent information continues to document high parasitism rates for E. t. extimus (Sogge et al. 1993, Muiznieks et al. 1994), and increases in flycatcher reproduction or populations, concurrent with reductions in cowbird numbers (Griffith and Griffith 1993, M. Whitfield in litt.-1993).