plant taxa discussed herein by virtue of their small population size and limited distribution (e.g., the extant population of Fremontodendron mexicanum is fewer than 100 individuals). Genetic viability is reduced in small populations, making them more vulnerable to extinction by manmade or natural events. Because N. interrata reproduces by cloning, the status of genetic diversity in the remaining populations is unkown. In addition, Barrett and Kohn (1991) maintain that characteristics such as low reproductive success may be the result of random genetic drift. Random genetic drift is the random change in the gene frequency of a populations due to "reshuffling" of gametes from generation to generation. This effect is amplified in small isolated populations and can result in the prevalence of detrimental characteristics in a population. The potential for local extirpation owing to small population size can be exacerbated by environmental conditions such as the recent drought. A single random event occurring in a population center can decimate a species beyond recoverable numbers. In the case of Berberis nevinii, most individuals are concentrated in one locality in the Vail Lake area of Riverside County (CNDDB 1992). The species is extremely vulnerable because its low reproductive success rate (Mistretta 1989a) and disjunct distribution decrease its ability to recover from naturally occurring events.

Ceanothus ophiochilus occurs only in southwestern Riverside County. A few thousand individuals or less exist at each of three or four localities (Shaffer 1993). Hybridization with *C. crassifolius* may reduce the effective reproductive population and intensify the adverse effects of random genetic drift in the Agua Tibia populations (Barrett and Kohn 1991). Due to the very small number of individuals and the verified existence of only one U.S. population (CNNDB 1992), Fremontodendron mexicanum is subject to the same adverse genetic and naturally occurring random effects as C. ophiochilus (Barrett and Kohn 1991). One of the Dehesa Valley populations of Nolina interrata is considered to be a single female clone (Dice, pers. comm. 1995). Cloning makes N. interrata more vulnerable to extinction from naturally occurring events, particularly when most of the populations are found at only one location (Oberbauer 1979).

In summary, the decline of these species' ranges and populations are attributable to loss or adverse modification of habitat by urban development. The remaining habitat is more vulnerable to natural and human-

caused threats because it is fragmented and disjunct. Recolonization of burned or modified habitats is unlikely because of the long dispersal distance from other, if any, populations. Edaphic (soilrelated) endemism, a trait of all of these species, also limits areas suitable for colonization. Currently healthy populations are more subject to disease and disturbance because of the lack of gene flow from other populations due to isolation. The small numbers and concentrated populations of all these species also make them vulnerable to extinction from naturally occurring events. Vandalism and inadequate regulatory mechanisms exacerbate the threats arising from otherwise lawful activities. The cumulative effects of these multiple threats have placed two of these species in danger of extinction, and two in danger of potential extinction.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these species in determining to propose this rule. Based on this evaluation, the preferred action is to list *Berberis* nevinii and Fremontodendron mexicanum as endangered. Other alternatives to this action were considered but not preferred because not listing these species, or listing them as threatened would not provide adequate protection and would not be in keeping with the purposes of the Act. Both of these species exist in small isolated populations. The entire population of Fremontodendron mexicanum is estimated to contain less than 100 plants. Urbanization of surrounding areas and fire management practices threaten both of these species with extinction throughout their ranges.

The preferred action for *Nolina* interrata and Ceanothus ophiochilus is to list these taxa as threatened. While *N*. interrata and C. ophiochilus are not in danger of extinction throughout all or a significant portion of their ranges, they are likely to become endangered species within the foreseeable future. Both species are fire-dependent for successful proliferation, and disruption of the natural fire regime can prohibit future generations from establishing. Continued hybridization of \tilde{C} ophiochilus populations will impair their reproductive success and alter the genetic makeup of the species.

Critical habitat is not being proposed for these species, as discussed below.

Critical Habitat

Critical habitat, as defined by section 3 of the Act, is: (i) the specific areas within the geographical area occupied

by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or threatened. The Service finds that designation of critical habitat is not prudent for these species at this time. Service regulations (50 CFR 424.12(a)(1)) state that designation of critical habitat is not prudent when one or both of the following situations exist—(1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species.

The Service finds that designation of critical habitat for Berberis nevinii, Ceanothus ophiochilus. Fremontodendron mexicanum, and Nolina interrata is not prudent for these species at this time. The additional protection provided by the designation of critical habitat is achieved through section 7 of the Act which requires consultation with the Service on any projects or activities authorized, funded or carried out by Federal agencies. While actions by the U.S. Army Corps of Engineers, the Forest Service, or may affect some populations of these species, the majority of the populations of these species are on private land with little or no Federal involvement. Therefore, the designation of critical habitat for these taxa would not appreciably benefit the

species. In addition, the publication of precise maps and descriptions of critical habitat in the Federal Register would make these plants more vulnerable to incidents of vandalism and, therefore, could contribute to the decline of these species. The threat of potential vandalism in response to listing a species has been identified by several sources (Oberbauer 1979, Beauchamp 1993) and may be applicable to others