

populations throughout their evolutionary history and that the Service assumes that each population will be viable in the future when there is no guarantee of this.

*Our Response:* The recovery objectives found in recovery plans for these species state that 8 to 10 viable populations are required for recovery of most of these species. Establishing and conserving 8 to 10 viable populations on one or more islands within the historic range of the species will provide each species with a reasonable expectation of persistence and eventual recovery, even with the high potential that one or more of these populations will be eliminated by normal or random adverse events, such as fires and nonnative plant invasions. There are some specific exceptions to this general recovery goal of 8 to 10 populations for species that are believed to be very narrowly distributed on a single island (e.g., *Argyroxiphium kauense*, for which the recovery goal is 10 or more large, widespread populations of at least 2,000 individuals each), and designation of critical habitat reflects these exceptions. For the majority of the species, however, designation of adequate suitable habitat for 8 to 10 populations as critical habitat is essential to give the species a reasonable likelihood of long-term survival and recovery, based on currently available information. Each recovery plan stated that these recovery goals will be revised as more specific information becomes available for each species.

(5) *Comment:* Several peer reviewers raised the issue of genetic drift and the difficulty of measuring this phenomenon in terms of the 8 to 10 populations. One reviewer recommended that we consider the consequences of this proposed population structuring on genetic drift or inbreeding, and how this potential problem might be alleviated. One peer reviewer commented that he did not believe that defining a population on the basis of low/no gene flow would benefit the species. One reviewer cautioned that for clonal species, the number (100, 300, 500) needs to reflect genetic individuals, not ramets. Another stated that, ideally, every population should be genetically isolated from all other conspecific populations.

*Our Response:* Many of the species have been reduced to such low numbers that the recovery plans identify propagation and reintroduction as a key step. While we do not have direct evidence for most species to indicate that reduced reproductive vigor or inbreeding are problems, we believe they should be considered, based on

current conservation biology theory and practice. This is particularly important to consider when developing a propagation and reintroduction program, to ensure that recovery efforts do not cause or exacerbate genetic issues. While measures of genetic diversity do not directly measure relative fitness, it is reasonable to assume that the two are correlated. The issue of gene flow and genetic drift will be addressed through research actions identified as needed in the recovery plans.

(6) *Comment:* One peer reviewer stated that the 8 to 10 population approach should not preclude the high priority of building large populations both through population growth and the merger of multiple small populations (which will require a breeding plan to conserve and increase the genetic diversity of remnant populations).

*Our Response:* The areas designated as critical habitat in this rule allow for merging of multiple, small populations (where they exist) and the increase of population numbers as outlined in our recovery plans. Because the general use of the word "population" in the proposed rule caused some confusion, we replaced it with "occurrence" in this rule when referring to existing locations of plants, and we use "population" only in the context of recovery guidelines.

(7) *Comment:* Several commenters, including two peer reviewers, stated that the species' need for pollinators is important to consider. One peer reviewer stated that designation of critical habitat needs to consider the presence of appropriate pollinators for species that do not self-pollinate or feasible, sustainable alternatives to key pollinators that may be absent. The Service's consideration of this issue did not appear to be explicitly listed in the proposed rule.

*Our Response:* Very little is known about the life histories of many of these plant species. The species' accounts provided in the proposed rule acknowledged that loss of pollinators, through habitat loss or predation by nonnative insects, could be a factor in lack of species' regeneration. As such, we created critical habitat units that were of sufficient size to provide habitat for at least one population of the target species in which the individuals could be regularly cross-pollinated. We also recommend, as a management action, maintenance (to the extent we have data) of natural pollinators and pollination systems.

(8) *Comment:* Two commenters stated that the Service failed to demonstrate that proposed critical habitat is essential to species conservation.

*Our Response:* In order to be included in a critical habitat designation, if within range occupied by the species at time of listing, habitat must contain the biological or physical features essential to the conservation of the species and may require management. If outside the range at time of listing, it must be essential to the conservation of the species.

(9) *Comment:* Several peer reviewers and other commenters, including the Department of Land and Natural Resources, Division of Forestry and Wildlife, a State agency, expressed concern over the inclusion of degraded habitat within critical habitat. Several peer reviewers stated that as much habitat as possible, even degraded habitat, should be protected as it has potential for reintroduction. One commenter noted that while they felt that focusing conservation efforts on the most pristine, least degraded sites is a logical, efficient, and cost-effective strategy when possible, for many of the listed plant species there is not enough suitable habitat remaining, and, as a result, it is essential to include degraded areas for future restoration. One commenter specifically requested that excessively degraded areas and those dominated by nonnative plants be excluded from critical habitat as these areas would not, or only have nominal value to, support the taxa for which critical habitat is proposed.

*Our Response:* We agree that recovery of a species is more likely in designated critical habitat in the least degraded areas containing primary constituent elements. However, for some species, especially those only known from low elevation areas, only degraded habitat remains. Therefore, some units contain essential habitat that, while currently degraded, is essential to the conservation of the species. Management for the restoration of these habitats is addressed in the species' recovery plans. However, we have excluded manmade features that do not contain the primary constituent elements, and we have revised this list based on information received during the public comment periods.

(10) *Comment:* One peer reviewer commented on the omission of large areas of high quality dry forest that contain key populations of *Neraudia ovata*, *Nothocestrum brevifolium*, and *Pleomele hawaiiensis* from critical habitat. The commenter noted that hundreds of acres of the best dry forest were not proposed to be included as critical habitat; however, degraded shrublands (as low quality dry forest) were proposed for inclusion. One peer reviewer commented that some lowland