

recovery of the species; (10) Monitoring of the wild, outplanted, and augmented populations; (11) Rare plant surveys; and (12) Control of human activities/access.

All five species of plants are known from Federal lands within the HINWR. Management of the HINWR has been guided by the 1986 HINWR Master Plan/Environmental Impact Statement, which places primary emphasis on protecting and enhancing refuge wildlife resources, particularly threatened and endangered species (USFWS 1986). This plan does not specifically document management actions that maintain or enhance populations of endangered plants or their habitat on the islands of the HINWR. We are aware that current management actions within HINWR for these species include monitoring of populations and potential pests, and control or eradication of some alien plants (E. Flint, pers. comm., 2000; Morin and Conant 1998; Shultz 2000; USFWS 1998d). However, funding limitations and the difficulty of travel logistics allow only a maximum of one short visit per year to Nihoa Island, and less frequent visits to Necker.

Morin and Conant's draft "Laysan Island Ecosystem Restoration Plan" (1998), a long-term planning document that was developed as an integrated approach to managing the entire biota of Laysan Island, outlines conservation management actions for the endangered plant species on Laysan. These conservation management actions include the prevention of new plant or animal introductions to the island, restoration of the Laysan Island ecosystem that was present prior to major human-caused habitat modification, control/eradication of nonnative species, reintroduction of native species which are currently extinct on the island, and establishment of periodic comprehensive ecosystem monitoring (Morin and Conant 1998). A permanent year-round camp on Laysan, staffed by paid employees and volunteers, has enabled some control of nonnative plant species, propagation and outplanting of native plants for restoration efforts, and periodic monitoring of both native and nonnative plant species (E. Flint, pers. comm., 2000; Morin and Conant 1998). In the future, the plan may serve as a guiding document for endangered plant species management on other NWHI as well. However, because the plan is not fully funded or implemented yet, and because it has not yet been adopted for the other islands on which these plants occur, we know of no areas in the HINWR at this time that do not require

special management or protection for the five species for which we have designated critical habitat.

In summary, the long-term conservation of Hawaiian plant species requires the designation of critical habitat units on one or more of the Hawaiian islands with suitable habitat in accordance with species-specific recovery goals as outlined in adopted recovery plans. Some of this designated critical habitat is currently unoccupied by these species but in order to recover the species, it is essential to conserve suitable habitat in these unoccupied units. This, in turn, will allow for the establishment of additional populations through natural recruitment or managed reintroduction. Establishment of these additional populations (colonies) will increase the likelihood that the species will survive and recover in the face of normal and stochastic events (Mangel and Tier 1994; Pimm *et al.*, 1998; Stacey and Taper 1992).

In this rule, we have defined the primary constituent elements based on the general habitat features of the areas from which the plants are reported, such as the type of plant community, the associated native plant species, the physical location (*e.g.*, steep rocky cliffs, talus slopes), and elevation. The areas we are designating as critical habitat provide some or all of the habitat components essential for the conservation of the five plant species.

Our approach to delineating critical habitat units was applied in the following manner:

(1) Critical habitat was proposed and will be designated on an island-by-island basis for ease of understanding for landowners and the public, for ease of conducting the public hearing process, and for ease of conducting public outreach. In Hawaii, landowners and the public are most interested and affected by issues centered on the island on which they reside.

(2) We focused on designating units representative of the known current and historical geographic and elevation range of each species; and

(3) Critical habitat units were designed to allow for expansion of existing wild populations and reestablishment of wild populations within the historic range, or within sites identified as conservation areas in the recovery plans for these species.

For *Amaranthus brownii*, *Mariscus pennatifolius*, *Prichardia remota*, *Schiedea verticillata*, and *Sesbania tomentosa*, currently and historically occupied habitat was examined in identifying and designating critical habitat. Critical habitat boundaries were delineated to include the entire island

on which the species are found or were historically found.

Critical habitat is not designated for *Cenchrus agrimonoides* in the NWHI for the following reasons. In the NWHI, this taxon is historically known from only Laysan and Midway Islands, and Kure Atoll. It has not been reported on Laysan and Midway for over 70 and 100 years, respectively. A permanent year-round camp on Laysan, staffed by paid employees and volunteers, conducts periodic monitoring of both native and nonnative plant species, and *Cenchrus agrimonoides* has not been seen during these monitoring efforts (Morin and Conant 1998). On Midway, *Cenchrus agrimonoides* was not seen during the most recent botanical surveys conducted in 1995 and 1999 (Chris Swenson, Service, pers. comm., 2002). *Cenchrus agrimonoides* has not been seen on Kure Atoll for over 20 years even though DOFAW conducts annual seabird surveys and a botanical survey was conducted there as recently as 2001 (DOFAW 2001). In addition, no viable genetic material of this the specific variety that occurs in the NWHI is known to exist. The rediscovery of currently unknown individual plants on these three islands and atolls is believed to be extremely unlikely because we believe this perennial plant would have been seen during these surveys. Although genetic material of the closely related *Cenchrus agrimonoides* var. *agrimonioides* exists, this variety is known only from mountainous habitat on Oahu, which is very different from the habitat on the NWHI where *Cenchrus agrimonoides* var. *laysanensis* occurred. We would not use var. *agrimonioides* for restoration purposes in the NWHI because this variety is not known from the NWHI and its preferred habitat is not available in the NWHI.

Following publication of the proposed critical habitat rules for the 245 Hawaiian plants (67 FR 3940, 67 FR 9806, 67 FR 15856, 67 FR 16492, 67 FR 34522, 67 FR 36968, 67 FR 37108), some of which were revised, we reevaluated proposed critical habitat for *Mariscus pennatifolius* and *Sesbania tomentosa*, Statewide, using the recovery guidelines to determine if we had inadvertently proposed for designation too much or not enough habitat to meet the essential recovery goals for these species distributed among the islands of its known historic range (HINHP Database 2000, 2001; Wagner *et al.* 1990, 1999). We then further evaluated areas of the proposed critical habitat for all five species for the existing quality of the primary constituent elements (*i.e.*, intact native plant communities and