DOWNLOAD PDF RECOVERY PLAN FOR FOUR SPECIES OF HAWAIIAN FERNS

Chapter 1 : Native Plants Hawaii - Viewing Plant : Marsilea villosa

This recovery plan covers four Hawaiian ferns that were added to the Federal list of endangered and threatened species by a final rule published on September 26, (U.S. Fish and Wildlife Service [USFWS] a).

Dense covering of tan-colored scaleson its fronds. Habitat Forest understory at elevations of 1,, ft m. Threats Habitat degradation by feral pigs, goats, and axis deer; competition with alien plants. Range Hawaii Description The pauoa, Ctenitis squamigera, a member of the wood fern family Dryopteridaceae , has a rhizome 0. This horizontal stem creeps above the ground and is densely covered with scales similar to those on the lower part of the leaf stalk. The leaf stalks are in The leafy part of the frond is deltoid to ovate-oblong, dark green, thin, and twice-pinnate to thrice pinnatifid leaflet sections. The sori, tan-colored when mature, are in a single row one-third of the distance from the margin to the midrib of the ultimate segments. The indusium is whitish before wrinkling, thin, suborbicular with a narrow sinus extending about half way, and glabrous except for a circular margin that is ciliolate with simple several-celled glandular and nonglandular hairs arising directly from the margin or from the deltoid base. Habitat This species is found in the forest understory at elevations of 1,, ft Associated native plants include Myrsine kolea , Psychotria kopiko , and Xylosma hawaiiense maua. The Molokai population is in Wawaia Gulch. The ten populations on Federal, state, and private land totaled approximately individuals in Threats The primary threats to C. Habitat degradation caused by axis deer is now considered a major threat to the forests of Lanai. All three of the Lanai populations of C. Conservation and Recovery The U. Army has prepared Endangered Species Management Plans for training areas on the island of Oahu, highlighting specific threats to endangered plants and recommending actions to promote recovery. On Lanai, building exclosures around some of the most intact portions of native forest in conjunction with hunting would provide good protection for endangered species , including C. Oahu populations of C.

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Chapter 2 : Technical/agency draft recovery plan for four species of Hawaiian ferns. - CORE

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Among the shrubs, 7 of the 11 species were completely buried in year 1. The buried shrub species were five natives Vaccinium reticulatum, Dubautia scabra, Styphelia tameiameiae, Coprosma ernodeoides, and Osteomeles anthyllidifolia and two exotics Fuchsia magellanica var. Among the other native shrubs Dubautia ciliolata, Vaccinium calycinum, Wikstroemia sandwicensis, and Dodonaea viscosa were completely buried individuals that resprouted after the first examination in year 1. Thus, in contrast to the trees, all shrub species of habitat 5 were capable of resprouting after their shoot systems had been buried to the top or were broken off and buried by ash. This was not observed in the tree fern Cibotium, but instead it was observed in a few individuals of Sadleria. The reason why vegetative resprouting was not observed from fully buried trunks of Cibotium was probably because of rarity in the study area rather than its lack of capability. Among the herbaceous survivors, nearly all shoots of the geophyte species had disappeared under the ash. Their new shoots surfaced in year 2. Several individuals of buried caespitose hemicryptophytes Deschampsia australis, Machaerina angustifolia also resprouted after year 1. In the thin fallout area habitat 6 , 14 species were found to survive under the cm-deep pumice blanket. This smaller number of survivors in comparison to the 23 surviving species in habitat 5 is not related to the disturbance factor, but to the original edaphic and climatic difference. Here in habitat 6, the number of species was smaller to begin with. The original substrate under the new pumice blanket was a hard-crusted ash layer that had been deposited in association with moisture during an earlier explosion. The former surface resembled a pavement with fissures. The taller perennial plants were more or less restricted to growing in these fissures, while small annuals, such as the sedge Bulbostylis capillaris, and lichens grew on small, shallow, loose aeolian ash pockets on the pavement surfaces. These lichens and annuals had disappeared under the new thin fallout surface, but probably all perennial species survived. These included the tree Metrosideros polymorpha, five native shrubs including a new species not originally found in any of the other habitats, Rumex giganteus , five fern species, two sedges, and one forb see Table 5. In addition to the original edaphic peculiarity, the floristic difference of habitat 6 in comparison to habitat 5 was related to the lower annual rainfall, longer dry season, decreased cloud cover, and increased frequency of drying winds characteristic of the upper Kau Desert habitat 6. The surviving species were remarkable for their capacity to reproduce vegetatively. However, several of the surviving woody species also showed increased sexual reproduction. The success of their increased flowering, fruiting, and spore formation activity is reflected in the seedling frequency recorded in Table 6. These woody plant seedlings became established in most cases near surviving individuals so that a contagious pattern developed. Vaccinium reticulatum and Styphelia tameiameiae survivors produced abundant berries only in habitat 6. This is reflected in the seedling presence in this habitat. Abundant flowering occurred on nearly all recovered Metrosideros individuals in habitats 5 and 6 in year 1. The outcome was the successful establishment of Metrosideros seedlings in both habitats years after the eruption Table 6.

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Current Species Status: This second draft revised recovery plan addresses four species of Hawaiian waterbirds: the Hawaiian duck or koloa maoli (Anas wyvilliana), Hawaiian coot or `alae ke`oke`o (Fulica alai), Hawaiian common moorhen or `alae `ula.

Chapter 7 : ePIC - Detailed results from Library Catalogue for Asplenium

Revised Hawaiian forest birds recovery plan. U.S. Fish and Wildlife Service, Portland. Final recovery plan for four species of Hawaiian ferns. U.S. Fish and.

Chapter 8 : Invasion and Recovery of Vegetation after a Volcanic Eruption in Hawaii (Chapter 6)

Stabilizing, downlisting, and delisting objectives are provided in the recovery plan for four species of Hawaiian ferns (USFWS), based on whether the species is an annual, a short-.

Chapter 9 : Recovery plan for four species of Hawaiian ferns. - CORE

It is hoped that this native fern will be used more in the landscapes as it is a federally endangered species and is easy to maintain. Additional References [1] "Recovery Plan for Marsilea villosa" by USFWS, pages 1, , ,