elevation mesic to wet forests of East Molokai, where the State designated a single protected area—the Molokai Forest Reserve. One of the species in this rule is restricted to this forest reserve, which occupies about 30 percent of Molokai's land area (Baker 1961).

Substrate loss due to agriculture, grazing animals (especially goats), hikers, and alteration of vegetation results in habitat degradation and loss. This particularly affects plant populations vulnerable to landslides on cliffs or steep slopes, including all three

proposed species.

B. Overutilization for commercial, recreational, scientific, or educational purposes. Unrestricted collecting for scientific or horticultural purposes and excessive visits by individuals interested in seeing rare plants could seriously impact Cyanea dunbarii and Lysimachia maxima, both of which are known from only one population each. Collection of whole plants or reproductive parts of these two species could threaten their survival. Cyanea dunbarii and Schiedea sarmentosa have populations close to trails or roads and are, thus, easily accessible to collectors. The two species are, therefore, potentially threatened by overcollection (HHP 1993a3; HPCC 1991b, 1992; J. Lau, in litt. 1994).

C. Disease or Predation. Browsing damage by goats and/or deer is a potential threat to all three of the proposed species in the event that these ungulates, present in areas adjacent to the proposed species, invade the sites of the species (Cuddihy et al. 1982; J. Lau, in litt. 1994; E. Misaki, pers. comm. 1991).

Of the four species of rodents that have been introduced to the Hawaiian Islands, the species with the greatest impact on the native flora and fauna is probably Rattus rattus (black or roof rat), which now occurs on all the main Hawaiian Islands around human habitations, in cultivated fields, and in dry to wet forests. Black rats and to a lesser extent Mus musculus (house mouse), Rattus exulans (Polynesian rat), and R. norvegicus (Norway rat) eat the fruits of some native plants, especially those with large, fleshy fruits. Many native Hawaiian plants produce their fruit over an extended period of time, and this produces a prolonged food supply that supports rodent populations. Black rats strip bark from some native plants. Rats are known to damage the stems and eat fruit of Cyanea species and are therefore a potential threat to Cyanea dunbarii (Cuddihy and Stone 1990; Tomich 1986).

D. The inadequacy of existing regulatory mechanisms. Hawaii's Endangered Species Act states, "Any species of aquatic life, wildlife, or land plant that has been determined to be an endangered species pursuant to the [Federal] Endangered Species Act shall be deemed to be an endangered species under the provisions of this chapter...' (Hawaii Revised Statutes (HRS), sect. 195D-4(a)). Federal listing would automatically invoke listing under Hawaii State law. The State law prohibits taking of listed species on private and State lands and encourages conservation by State agencies (HRS, sect. 195-4).

None of the three proposed species are currently listed by the State. The only known populations of Lysimachia maxima and Schiedea sarmentosa occur on privately owned land. The only known population of Cyanea dunbarii occurs on State land, within Molokai Forest Reserve. All three of the proposed species are located on land classified within conservation districts and owned by the State of Hawaii, private companies, or individuals. The only known population of Lysimachia maxima occurs on TNC's Pelekunu Preserve, and one of the two known populations of Schiedea sarmentosa occurs on TNC's Kamakou Preserve. Regardless of the owner, lands in these districts, among other purposes, are regarded as necessary for the protection of endemic biological resources and the maintenance or enhancement of the conservation of natural resources. Activities permitted in conservation districts are chosen by considering how best to make multiple use of the land (HRS, sect. 205-). Some uses, such as maintaining animals for hunting, are based on policy decisions, while others, such as preservation of endangered species, are mandated by both Federal and State laws. Requests for amendments to district boundaries or variances within existing classifications can be made by government agencies and private landowners (HRS, sect. 205-4). Before decisions about these requests are made, the impact of the proposed reclassification on "preservation or maintenance of important natural systems or habitat" (HRS, sects. 205–4, 205–17) as well as the maintenance of natural resources is required to be taken into account (HRS, sects. 205-2, 205-4). Before any proposed change in land use occurs on State land, is funded in part or in whole by county or State funds, or will occur within land classified as conservation district, an environmental assessment is required to determine whether or not the environment will be

significantly affected (HRS, chapt. 343). If it is found that an action will have a significant effect, preparation of a full Environmental Impact Statement is required. Hawaii environmental policy and, thus, approval of land use, is required by law to safeguard "* * * the State's unique natural environmental characteristics * * *" (HRS, sect. 344–3(1)) and includes guidelines to "protect endangered species of individual plants and animals * * *" (HRS, sect. 344–4(3)(A)). Federal listing, because it automatically invokes State listing, would also implement these other State regulations protecting the plants.

State laws relating to the conservation of biological resources allow for the acquisition of land as well as the development and implementation of programs concerning the conservation of biological resources (HRS, sect. 195D-5(a)). The State also may enter into agreements with Federal agencies to administer and manage any area required for the conservation, management, enhancement, or protection of endangered species (HRS, sect. 195D–5(c)). If listing were to occur, funds for these activities could be made available under section 6 of the Act (State Cooperative Agreements). The Hawaii DLNR is mandated to initiate changes in conservation district boundaries to include "the habitat of rare native species of flora and fauna within the conservation district" (HRS, sect. 195D-5.1).

Despite the existence of various State laws and regulations that protect Hawaii's native plants, their enforcement is difficult due to limited funding and personnel. Listing of these three plant species will invoke the protection available under the State **Endangered Species Act and** supplement the protection available under other laws. The Federal Act would offer additional protection to these three species because, if they were to be listed as endangered or threatened, it would be a violation of the Act for any person to remove, cut, dig up, damage, or destroy any such plant in an area not under Federal jurisdiction in knowing violation of State law or regulation or in the course of any violation of a State criminal trespass law.

E. Other natural or manmade factors affecting their continued existence. Six species of introduced plants directly threaten populations of one or more of the proposed species. The original native flora of Hawaii consisted of about 1,000 species, 89 percent of which were endemic. Of the total of 1,817 species of native and naturalized Hawaiian flora, 47 percent were introduced from other parts of the world. Nearly 100 of these