Fish and Wildlife Service, Ecological Services, Endangered Species Permits, 911 N.E. 11th Avenue, Portland, Oregon 97232–4181 (telephone 503/231–2063; facsimile 503/231–6243).

Public Comments Solicited

The Service intends that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule are hereby solicited. Comments particularly are sought concerning:

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to *Sibara filifolia, Lithophragma maximum*, and *Cercocarpus traskiae;*

(2) The location of any additional populations of these species and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;

(3) Additional information concerning the range, distribution, and population size of these species; and

(4) Current or planned activities in the subject area and their possible impacts on these species.

Final promulgation of the regulations on these species will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final regulation that differs from this proposal.

The Endangered Species Act provides for one or more public hearings on this proposal, if requested. Requests must be received by September 25, 1995. Such requests must be made in writing and addressed to the Field Supervisor of the Carlsbad Field Office (see **ADDRESSES** section).

National Environmental Policy Act

The Fish and Wildlife Service has determined that Environmental Assessments or Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references cited herein is available upon request from the U.S. Fish and Wildlife Service, Carlsbad Field Office (see **ADDRESSES** section).

Author. The primary author of this document is Debra Kinsinger, Carlsbad Field Office (see **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Proposed Regulation Promulgation

Accordingly, the Service hereby proposes to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500, unless otherwise noted.

2. Section 17.12(h) is amended by adding the following, in alphabetical order under FLOWERING PLANTS, to the List of Endangered and Threatened Plants, to read as follows:

§ 17.12 Endangered and threatened plants.

* * * * *

(h) * * *

Species		Historic range	Family name	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
FLOWERING PLANTS							
*	*	*	*	*	*	*	
Cercocarpus traskiae.	Catalina Island mountain-mahogany.	U.S.A. (CA)	Rosaceae	E		NA	NA
*	*	*	*	*	*	*	
Lithophragma maximum.	San Clemente Island woodlandstar.	U.S.A. (CA)	Saxifragaceae	E		NA	NA
*	*	*	*	*	*	*	
Sibara filifolia	Santa Cruz Island rockcress.	U.S.A. (CA)	Brassicaceae	E		NA	NA
*	*	*	*	*	*	*	

Dated: July 5, 1995.

Mollie H. Beattie,

Director, Fish and Wildlife Service.

[FR Doc. 95–18241 Filed 7–24–95; 8:45 am]

BILLING CODE 4310–55–P

50 CFR Part 17

RIN 1018–AD39

Endangered and Threatened Wildlife and Plants; Proposed Rule for 16 Plant Taxa From the Northern Channel Islands, California

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) proposes endangered status pursuant to the Endangered Species Act of 1973, as amended (Act), for 16 plant taxa from the northern Channel Islands, California: *Arabis hoffmannii* (Hoffmann's rock-cress), *Arctostaphylos confertiflora* (Santa Rosa Island manzanita), *Berberis pinnata* ssp. *insularis* (island barberry), *Castilleja mollis* (soft-leaved paintbrush), *Dudleya*

blochmaniae ssp. *insularis* (Santa Rosa Island dudleya), *Dudleya* sp. nov. ''East Point'' (munchkin dudleya), *Dudleya nesiotica* (Santa Cruz Island dudleya), *Galium buxifolium* (island bedstraw), *Gilia tenuiflora* ssp. *hoffmannii* (Hoffmann's slender-flowered gilia), *Helianthemum greenei* (island rush-rose), *Heuchera maxima* (island alumroot), *Malacothamnus fasciculatus* ssp. *nesioticus* (Santa Cruz Island bushmallow), *Malacothrix indecora* (Santa Cruz Island malacothrix), *Malacothrix squalida* (island malacothrix), *Phacelia insularis* ssp. *insularis* (island phacelia), and *Thysanocarpus conchuliferus* (Santa Cruz Island fringepod). The 16 plant taxa and their habitats have been variously affected or are currently threatened by one or more of the following: soil loss; habitat alteration by mammals alien to the Channel Islands (pigs, goats, sheep, donkeys, cattle, deer, elk, bison); direct predation by these same alien mammals; habitat alteration by native seabirds; habitat alteration due to vehicular traffic; overcollection for scientific or recreational purposes; competition with alien plant taxa; reduced genetic viability; depressed reproductive vigor; and the chance of stochastic extinction resulting from small numbers of individuals and populations.

DATES: Comments from all interested parties must be received by October 9, 1995. Public hearing requests must be received by September 25, 1995.

ADDRESSES: Comments and materials should be sent to the Field Supervisor, Ventura Field Office, U.S. Fish and Wildlife Service, 2493 Portola Road, Suite B, Ventura, California 93003. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Carl Benz, Assistant Field Supervisor, Ventura Field Office (see **ADDRESSES** section) (telephone number 805/644–1766; facsimile 805/644–3958).

SUPPLEMENTARY INFORMATION:

Background

Arabis hoffmanii (Hoffmann's rock-cress), *Arctostaphylos confertiflora* (Santa Rosa Island manzanita), *Berberis pinnata* ssp. *insularis* (island barberry), *Castilleja mollis* (soft-leaved paintbrush), *Dudleya blochmaniae* ssp. *insularis* (Santa Rosa Island dudleya), *Dudleya* sp. nov. ''East Point'' (munchkin dudleya), *Dudleya nesiotica* (Santa Cruz Island dudleya), *Galium buxifolium* (island bedstraw), *Gilia tenuiflora* ssp. *hoffmannii* (Hoffmann's slender-flowered gilia), *Helianthemum greenei* (island rush-rose), *Heuchera maxima* (island alumroot), *Malacothamnus fasciculatus* ssp. *nesioticus* (Santa Cruz Island bushmallow), *Malacothrix indecora* (island malacothrix), *Malacothrix squalida* (Santa Cruz Island malacothrix), *Phacelia insularis* ssp. *insularis* (island phacelia), and *Thysanocarpus conchuliferus* (Santa Cruz Island fringepod) are California Channel Island endemics. The only species in this group that is not exclusive to the northern island group is the island rush-rose, with one population known from Santa Catalina Island.

Located offshore and south of Santa Barbara County, the four northern islands (from west to east: San Miguel, Santa Rosa, Santa Cruz, and Anacapa) are the highest points on a 130 kilometer (km) (80 mile (mi)) long seamount (Dibblee 1982). They are included within the boundaries of the Channel Islands National Park (CINP). Anacapa Island is the smallest of the four northern islands and is divided into east, middle, and west islands totalling 2.9 square km (1.1 square mi); it is the closest island to the mainland at a distance of 20 km (13 mi). East and Middle Anacapa islands are flat-topped, wave-cut terraces largely surrounded by steep cliffs. West Anacapa is the highest of the three, reaching 283 meters (m) (930 feet (ft)) above sea level. Santa Cruz Island is the largest of the California Channel Islands at 249 square km (96 square mi) with the highest point being 753 m (2,470 ft) above sea level and has a fault-controlled central valley that creates a dry interior condition. Santa Rosa Island is 217 square km (84 square mi) in area and 475 m (1,560 ft) at its highest point. San Miguel Island, the westernmost of the northern group, is 37 square km (14 square mi) in area and 253 m (830 ft) in height. Santa Catalina Island (south Los Angeles County) is 194 square km (75 square mi) in area and its highest elevation is 648 m (2,125 ft) above sea level (Power 1980).

Much of the northern Channel Islands are managed by Federal agencies. San Miguel Island is under the jurisdiction of the U.S. Department of the Navy (Navy), but the National Park Service (NPS) has operational jurisdiction through a Memorandum of Agreement. Anacapa Island is managed by the NPS with an inholding for the U.S. Coast Guard lighthouse. The western 90 percent of Santa Cruz Island is owned and managed by The Nature Conservancy (TNC). Almost all of the remaining 10 percent of the island is under the jurisdiction of the NPS. Except for the City of Avalon, Santa Catalina Island is privately owned and managed by the Catalina Island Conservancy.

Anacapa and Santa Barbara islands were set aside as a National Monument in 1938. In 1980 the U.S. Congress abolished the National Monument and incorporated those lands, waters and interests into National Park status, adding Santa Cruz Island and Santa Rosa Island (at that time privately owned) within the boundaries. The NPS acquisition of Santa Rosa Island in 1986 was accomplished by outright fee purchase from the Vail and Vickers Ranching Company. This acquisition included the potential option for a 25-year continuation of cattle ranching and a subleased commercial deer and elk hunting operation, of which 18 years remain, as long as the Secretary of the Interior determines that the property is being used for purposes compatible with the administration of the park or with the preservation of its resources.

In 1769 in San Diego, the establishment of the mission system began. Attempts to remove the native Chumash Indian populations from Santa Cruz Island to the mainland were completed by 1814 (Hobbs 1983). Subsequent land use practices on the islands focused on the introduction of a variety of livestock (sheep (*Ovis domesticus*), goats (*Capra hircus*), cattle (*Bos taurus*), burros (*Equus asinus*), and horses (*E. caballus*)) and game species (pigs (*Sus scrofa*), deer (*Odocoilius hemionus*), elk (*Cervus canadensis roosevelti*), rabbits (*Oryctolagus cuniculus*), wild turkey (*Melegris gallopavo*), California quail (*Callipepla californica*), and chukar (*Alectoris chuckar*)) for ranching and hunting purposes (Hochberg *et al.* 1980a, Minnich 1980, Jones *et al.* 1989).

The introduction of domestic animals to island ecosystems has had catastrophic effects on the vegetation. Because of the absence of natural population controls such as disease and predation, livestock overpopulated the islands. The ultimate control on population sizes for livestock on islands has been starvation (Sauer 1988). Records for Santa Cruz Island indicate that sheep had been introduced in the early 1830's; by 1875, sheep stocking was around 50,000 head (Hobbs 1983). In 1890, perhaps as many as 100,000 sheep grazed on Santa Cruz Island (Hochberg *et al.* 1980a). Pigs had been released on Santa Cruz Island by 1854 (Hobbs 1983). Conditions of overgrazing combined with drought occurred in 1864, 1870–72, 1877, 1893–1904, 1923–24, 1935, 1946–48, 1964, (Dunkle 1950, Johnson 1980) and most recently 1986–

91 (Halvorson 1993). These episodes resulted in livestock losses to starvation (Johnson 1980). Manipulation of the vegetation by over 150 years of intensive grazing and browsing has resulted in the replacement of native plant communities with non-native grasslands (Minnich 1980, Hobbs 1983).

Several non-native weedy plant species have invaded the disturbed habitats of the islands. One of the most obvious problem species is fennel (*Foeniculum vulgare*) on Santa Cruz Island. Fennel and other aggressive non-native weed species displace native species and further threaten the insular ecosystems (Smith 1989, Simberloff 1990). Research methods and results to date for the control of fennel were the topics of many presentations at the fourth Channel Islands symposium held in March 1994 (Brenton and Klinger 1994, Dash and Gliessman 1994, Gliessman 1994).

Some progress has been made toward eliminating alien animals from the islands. TNC has eliminated the sheep from the western portion of Santa Cruz Island; however, sheep from the eastern portion of the island are reinvading westward. The NPS has recently removed all the pigs from Santa Rosa Island. A program to control goats and pigs is being implemented on western Santa Catalina Island. However, no action has been taken to eliminate deer and elk from Santa Rosa Island, or pigs and the remaining sheep from Santa Cruz Island, or bison from Santa Catalina Island.

The main habitat types on the islands include coastal dune, coastal bluff, grasslands, coastal sage scrub, chaparral, oak and ironwood woodlands, riparian woodlands, and conifer forest; various subdivisions of these types have been described by Dunkle (1950), Philbrick and Haller (1977), Minnich (1980), and Clark *et al.* (1990). The floristics of the islands are composed of elements that have a variety of origins. Relictual species (wide ranging paleobotanic fossil records) such as the endemic island ironwoods (*Lyonothamnus floribundus*) and species with disjunct distributions with the mainland such as the Torrey pine (*Pinus torreyana*) occur in canyons and slopes that provide higher moisture levels than the surrounding areas. Unique insular endemics, including all of the species in this proposed rule, have been discussed by Raven (1967), Philbrick (1980), and Wallace (1985).

Coastal beach and associated dune habitats occur in the windiest sandy locations on the three westernmost islands. These coastal habitats appear to be relatively undisturbed compared to mainland sites where development and recreation have largely eliminated them. Coastal bluff habitat has provided a refugium from habitat elimination that accompanies grazing by non-native animals (Minnich 1980, Halvorson *et al.* 1992). The upland habitat was largely shrubland; many of the representative species are now found only on bluff sites (D'Antonio *et al.* 1992). The grasslands are largely composed of non-native annual species and have greatly expanded at the expense of most other habitat types (Hobbs 1983, Cole 1994). Historic photographs reveal the loss of woody vegetation from the islands during the last 100 years (Hobbs 1980, Minnich 1980). The coastal sage scrub habitat has increased in importance on Anacapa and San Miguel Islands where grazing effects have been removed (Johnson 1980). There, the controlling effects of grazing on the elimination of shrubs and the artificial maintenance of grasslands have been reversed. The coastal sage habitat is composed of soft-leaved, soft-stemmed plants that are palatable to browsers and grazers. The original coastal sage scrub habitat has been reduced by overgrazing to the extent that it persists only in locations that are inaccessible to grazing and browsing animals, as in patches of cactus and on bluffs (Minnich 1980, Hobbs 1983).

The pre-grazing importance of cactus in the island communities will never be known. Overgrazing results in the spread of cactus to areas that have been denuded by livestock. Overgrazing on Santa Cruz Island greatly facilitated the spread of cactus to the point that over 40 percent of the ''rangeland'' was rendered useless (Hochberg *et al.* 1980a). Cactus habitats on Santa Cruz and Santa Rosa Islands have been dramatically reduced to improve cattle operations by the introduction of biological controls (Hochberg *et al.* 1980a).

The physical condition of the remnant chaparral habitats has been modified by grazing and browsing such that shrubs form arborescent (treelike) shapes. The continued browsing by deer and elk on Santa Rosa Island has created an open ''skeleton'' community reticulated by game trails that provide access to nearly 100 percent of the habitat (Hochberg *et al.* 1980a; Tim Thomas, U. S. Fish and Wildlife Service (USFWS), pers. obs., 1993). Historic reports of the conditions on the islands indicate that the brushlands were impenetrable (Hochberg *et al.* 1980a). Island woodlands are dominated by unique endemic species and heavily affected by grazing, browsing, and rooting animals seeking summer shelter and food (Clark *et al.* 1990, Halvorson 1993). The riparian habitats are heavily modified physically and structurally, and in some areas they have been completely eliminated (Hochberg *et al.* 1980a, Minnich 1980). Normally, a canyon with year-round water will have well-developed riparian vegetation that includes willows (*Salix* spp.), sycamores (*Platanus racemosa*), cottonwoods (*Populus* spp.) and oaks (*Quercus* spp.). This vegetation would typically support a rich diversity of organisms, especially neo-tropical migratory bird species (Paul Collins, Santa Barbara Museum of Natural History, pers. comm., 1994). The riparian habitat is one of the most significant on the islands. Years of livestock overutilization have considerably reduced this resource-rich habitat. The pine forests that are protected from grazing have well-developed foliar cover and pine reproduction (Hobbs 1978). In contrast, Clark *et al.* (1990) report that pine forests that are subjected to grazing lack the protective nutrient layer of ground litter and exhibit no reproduction. Pigs, cattle, deer, goats, sheep, and bison continue to threaten and further degrade whole ecosystems on the islands (Sauer 1988, Halvorson 1993).

Islands, with their many endemic species of plants and animals, have long attracted the attention of biologists and are among the world's most fragile and unique ecosystems. Fifty-four island endemic plant species are known from the northern Channel Islands; 15 species are single island endemics (Halvorson *et al.* 1987). Some of the most striking examples of extinction have occurred from islands around the world; from the Channel Islands, notable extinctions include the Santa Barbara Island song sparrow (*Melospiza melodia cooperi*) and the Santa Cruz Island monkeyflower (*Mimulus brandegei*). Twelve plant species have been extirpated from various islands within the northern island group: three from Santa Cruz (*Malacothrix incana, Mimulus brandegei,* and *Sibaria filifolia*), three from Santa Rosa (*Berberis pinnata* ssp. *insularis, Phacelia insularis* ssp. *insularis,* and *Helianthemum greenei*), and six from San Miguel (*Grindelia latifolia, Ceanothus megacarpus* ssp. *insularis, Rhamnus pirifolia, Haplopappus ericoides, Castilleja mollis,* and *Dithyrea maritima*) (Philbrick 1980, Halvorson *et al.* 1987, Clark *et al.* 1990).

Discussion of the Taxa Included in This Proposal

Table 1 summarizes the growth habit and population distribution for the 16 taxa in this proposal.

TABLE 1.—GROWTH HABIT, ESTIMATED POPULATIONS WITHIN THE LAST FIVE YEARS, AND INSULAR DISTRIBUTION OF SIXTEEN PROPOSED ENDANGERED PLANT TAXA FROM THE NORTHERN CHANNEL ISLANDS, CALIFORNIA; mA=MIDDLE ANACAPA, wA=WEST ANACAPA, CR=SANTA CRUZ, RO=SANTA ROSA, MI=SAN MIGUEL, CA=SANTA CATALINA, ( )=HISTORIC DISTRIBUTION BUT BELIEVED EXTIRPATED FROM THIS LOCATION

Scientific name	Growth habit	Est. pops.	Distribution
Arabis hoffmanii	Perennial herb	3	(RO), CR, (wA)
Arctostaphylos confertifolia	Shrub	Less than 10	RO
Berberis pinnata ssp. *insularis*	Shrub/Vine	5	(RO), CR, wA
Castilleja mollis	Perennial	2	(MI), RO
Dudleya blochmaniae ssp. *insularis*	Succulent	1	RO
Dudleya sp. nov. "East Point"	Succulent	1	RO
Dudleya nesiotica	Succulent	1	CR
Galium buxifolium	Sub-shrub	10	MI, CR
Gilia tenuiflora ssp. *hoffmannii*	Annual	1	RO
Helanthemum greenei	Sub-shrub	7	(RO), CR, CA
Heuchera maxima	Perennial	27	RO, CR, wA
Malacothamnus fasciculatus ssp. *nesioticus*	Shrub	2	CR
Malacothrix indecora	Annual	1	(MI), CR
Malacothrix squalida	Annual	3	CR, mA
Phacelia insularis ssp. *insularis*	Annual	5	MI, (RO)
Thysanocarpus conchuliferus	Annual	8	CR

Hoffmann's rock-cress (*Arabis hoffmannii*) was first described by Philip Alexander Munz as *Arabis maxima* var. *hoffmannii* in 1935 based on specimens collected by Ralph Hoffmann at the ''sea cliffs east of Dick's Harbor,'' now known as Platts Harbor, on Santa Cruz Island in 1932 (Rollins 1936). However, the first collection of this rock-cress was made by T.S. Brandegee in 1888 from an unspecified location on Santa Cruz Island. In 1936, Reed Clark Rollins elevated the taxon to species status by publishing the name *Arabis hoffmannii*. This nomenclature is upheld in the most recent treatment for the genus (Rollins 1993).

Arabis hoffmannii is a slender herbaceous perennial in the mustard (Brassicaceae) family. The one to several stems reach 0.6 m (2.0 ft) high, and have slightly toothed basal leaves. The white flowers, comprised of four petals 1 centimeter (cm) (0.4 inch (in)) long, are found at the tips of the stems. The slightly curved fruits are borne on long stalks and enclose two rows of seeds in each of two chambers. The only other rock-cress that occurs on the islands, *Arabis glabra* var. *glabra*, is a taller plant with cream colored flowers, and occurs as an alien in open meadows and slopes.

Since Brandegee's collection was made in 1888, very few collections of *Arabis hoffmannii* have been made. On Santa Cruz Island, Reid Moran made a collection from the ''Central Valley'' in 1950, and Jim McPherson collected the plant near Centinela Grade, possibly the same location, in 1967 (Steve Junak, pers. comm. 1993). It was not until 1985 that Steve Junak relocated a population at this location (Schuyler 1986). For many decades, Hoffmann's original collection site, near Platts Harbor on Santa Cruz Island, was in ''an area of intense feral animal (sheep) disturbance,'' and no plants could be found (Hochberg *et al.* 1980a). However, surveys conducted by TNC in 1985 were successful in relocating two small populations, one comprising three individual plants, near Platts Harbor (Schuyler 1986).

According to Reid Moran's field notes, he collected *Arabis hoffmannii* from Anacapa Island in 1941 ''on the slopes above Frenchy's Cove'' (S. Junak, pers. comm. 1993). However, no specimens from this collection have been found in herbaria with known collections of island species, and recent surveys by Junak have failed to relocate the plant on Anacapa Island (S. Junak, pers. comm. 1993). Ralph Hoffmann reported the plant from ''the bank above Water Canyon'' on Santa Rosa Island in 1930, but numerous recent surveys have failed to locate any plants on that island (S. Junak, pers. comm. 1993).

Arabis hoffmannii is currently known from three small populations that collectively cover less than 0.4 hectare (1 acre) on Santa Cruz Island. The two populations near Platts Harbor are located on rocky volcanic cliffs along a north-facing canyon on lands owned by TNC. Because of their inaccessibility, and the loose structure of the volcanic rock, the two cliff populations have not been thoroughly surveyed. Only a few dozen plants have been directly observed, but the cliffs may support additional individuals. The population near Centinela Grade is growing on Santa Cruz Island volcanics and is associated with giant coreopsis (*Coreopsis gigantea*), Santa Cruz Island buckwheat (*Eriogonum arborescens*), and coastal prickly pear (*Opuntia littoralis*), on lands owned and managed by TNC. When Junak relocated this population, approximately 30 individuals were seen. TNC has monitored this population since 1990, with fewer than 30 plants observed each year (Klinger 1994a). The major threats to *Arabis hoffmannii* are loss of soil, habitat degradation, and predation resulting from feral pig rooting. Because of the small numbers of populations and individuals, the taxon is also vulnerable to stochastic (random) extinction by such events as storms, drought, landslide, or fire. Small numbers of isolated populations and individuals also make the taxon vulnerable to reduced reproductive vigor.

Santa Rosa Island manzanita (*Arctostaphylos confertiflora*) was first described by Alice Eastwood as *Arctostaphylos confertiflora* in 1934 from a collection made by Hoffmann

four years earlier ''in a sheltered dell south of Black Mountain'' on Santa Rosa Island (Eastwood 1934). Abrams (1951) synonymized the taxon with *Arctostaphylos subcordata*; eight years later, Munz published the new combination *Arctostaphylos subcordata* var. *confertiflora* (Munz and Keck 1973). However, in treatments of the genus, including the most recent, Wells (1968, 1993) has continued to uphold the original taxonomy.

Arctostaphylos confertiflora is a perennial shrub in the heath (Ericaceae) family that grows 0.1 to 2.0 m (4 in to 6.5 ft) high (Wells 1993). The plant has smooth, dark red-purple bark, densely hairy branchlets, bracts, and pedicels, and light green, round-ovate leaves. The flowers are borne in numerous dense panicles that mature into flattened reddish-brown fruits (McMinn 1951). The only other manzanita that occurs on Santa Rosa Island, *Arctostaphylos tomentosa*, forms a fire-resistant burl at the base of the stems; *Arctostaphylos confertiflora* is not burl-forming and is considered an obligate seeder, requiring fire for regeneration. It occurs in prostrate and upright forms, the former most likely due to climatic and herbivorous influences (McMinn 1951).

Arctostaphylos confertiflora is known only from two areas on Santa Rosa Island. In the northeast portion of the island near, and east of, Black Mountain, individual plants have been observed at scattered sites from upper Lobos Canyon east to the Torrey pine groves along Becher's Bay, a distance of about 5 km (3 mi). The plant occurs on sedimentary substrates, which consist of Monterey shales and soft volcanoclastic sediments derived from San Miguel volcanics (Weaver *et al.* 1969). Near the southern tip of the island, a few individuals are scattered on the slopes above South Point on sandstone outcrops. The taxon occurs as a component of mixed chaparral, mixed woodland, Torrey pine woodland, and island pine woodland communities. Junak estimated that total habitat for the plant comprises only a few acres (S. Junak, pers. comm. 1994); Clark *et al.* (1990) noted that it occurs in very low numbers. The major threats to *Arctostaphylos confertiflora* are soil loss, habitat alteration and predation caused by cattle grazing and elk and deer browsing, which have resulted in reproductive failure. Because of the small numbers of isolated populations and individuals, the taxon is also vulnerable to stochastic extinction by such events as storms, drought, or fire. Small numbers of populations and individuals also make the taxon vulnerable to reduced reproductive vigor.

Island barberry (*Berberis pinnata* ssp. *insularis*) was first described by Munz and Roos (1950) as *Berberis pinnata* ssp. *insularis* based on a specimen collected by Carl B. Wolf in 1932 ''west of summit of Buena Vista Grade (also known as Centinela Grade), interior of Santa Cruz Island.'' In 1981, James Roof realigned this taxon with the genus *Mahonia* because the leaves are compound, in contrast with the simple leaves of *Berberis* (Roof 1981). However, Moran (1982) made the case that this one character was insufficient to defend *Mahonia* as a distinct natural group; subsequent treatments have included all North American taxa previously referred to *Mahonia* as *Berberis*. Therefore, this taxon has been referred to as *Berberis pinnata* ssp. *insularis* by Munz (1974), Smith (1976), and Williams (1993).

Berberis pinnata ssp. *insularis* is a perennial shrub in the barberry family (Berberidaceae). The plant has spreading stems that reach 2 to 8 m (5 to 25 ft) high, with large leaves divided into 5 to 9 glossy green leaflets. Clusters of yellow flowers at the branch tips develop into blue berries covered with a white bloom (waxy coating). Because new shoots can sprout from underground rhizomes, many stems may actually represent one genetic clone (Hochberg *et al.* 1980b, California Native Plant Society (CNPS) 1984, Williams 1993).

Berberis pinnata ssp. insularis is found in moist, shaded canyons on Santa Cruz and West Anacapa Island. Hoffmann found several individuals ''in Elder canyon that runs from west into Canada de la Casa'' on Santa Rosa Island in 1930 (California Natural Diversity Data Base (CNDDB) 1993); however, in spite of recent surveys, no plants have been found on the island since that time. Dunkle collected *Berberis pinnata* ssp. *insularis* on West Anacapa Island in 1940; the plant was not found there again until 1980. One clone is found in Summit Canyon associated with chaparral species, including poison oak (*Toxicodendron diversilobum*), monkeyflower (*Diplaucus parviflorus*), coyote bush (*Baccharis* sp.), goldenbush (*Haplopappus detonsus*), island alum-root (*Heuchera maxima*) and wild cucumber (*Marah macrocarpus*). Four populations occur on Santa Cruz Island. One population on the north slope of Diablo Peak comprises 24 large ''stems'' and 75 small ''stems'' (Klinger 1994c); this number of stems may represent one or several clonal individuals. In 1979, the two populations near Campo Raton were estimated to be less than 10 individuals; in 1985, only one plant was seen (CNDDB 1994). The size of the population at Hazard's Canyon has not been determined due to inaccessibility.

Berberis pinnata ssp. *insularis* is threatened by soil loss and habitat alteration caused by feral pig rooting. Because of the small numbers of populations and individuals, the taxon is also vulnerable to stochastic extinction by such events as storms, drought, or fire. Small numbers of isolated populations and individuals also make the taxon vulnerable to reduced reproductive vigor.

Soft-leaved paintbrush (*Castilleja mollis*) was first described by Francis W. Pennell as *Castilleja mollis* in 1947, based on material collected on Santa Rosa Island in 1939 (Ingram 1990, Heckard and Ingram 1991). Munz and Keck (1973) and Hoover (1970) included plants of coastal sand dunes of San Luis Obispo County in the description of this taxon. However, Ingram (1990) has concluded that the taxon is endemic to Santa Rosa Island.

Castilleja mollis is a presumably partially parasitic perennial herb in the figwort (Scrophulariaceae) family. The plant has semi-prostrate branches that reach 40 cm (16 in) in length, with bracts and upper leaves that are grayish, fleshy, broad and rounded and crowded at the apex, and the bract and calyx are yellow to yellowish green above (Heckard and Ingram 1991). Ingram's studies outlined a number of morphological differences between *Castilleja mollis* and the similar *Castilleja affinis*, including the indument (covering) of distinctive branched hairs and rounded stem leaves in the former taxon.

Two collections of *Castilleja mollis* were also made by F.H. Elmore from Point Bennett on San Miguel Island in 1938 (Heckard and Ingram 1991); despite recent searches, the taxon has not been seen on the island since then (S. Junak, pers. comm. 1994). *Castilleja mollis* is known from two areas on Santa Rosa Island: Carrington Point in the northeast corner of the island, and west of Jaw Gulch and Orr's Camp (this location also referred to as Pocket Field) along the north shore of the island. At Carrington Point, the plant is associated with stabilized dune scrub vegetation that is dominated by goldenbush (*Isocoma venetus* var. *sedoides*), lupine (*Lupinus albifrons*), and Pacific ryegrass (*Leymus pacificus*). At the Pocket Field location, the paintbrush is associated with the non-native iceplant (*Carpobrotus* spp. and *Mesembryanthemum* spp.), native milkvetch (*Astragalus miguelensis*), and alien grasses.

In 1993, the Jaw Gulch population was estimated to comprise up to 1,000 individuals covering an area of less than 2 hectares (5 acres) (C. Rutherford and T. Thomas, USFWS, pers. obs. 1993). During Ingram's field studies in 1990, the Carrington Point population consisted of only 20 individuals (Ingram 1990); more favorable climatic conditions in the past few years may have resulted in higher numbers of plants, perhaps as many as several hundred. The Jaw Gulch population was also used as a bedding area for deer during the fall of 1993 (Dan Richards, CINP, pers. comm. 1994). Threats to *Castilleja mollis* are soil loss, habitat alteration and predation caused by cattle grazing, deer and elk browsing, deer bedding, and competition with alien plant taxa. Because of the small numbers of isolated populations and individuals, the taxon is also vulnerable to stochastic extinction by such events as storms, drought, or fire. Small numbers of populations and individuals also make the taxon vulnerable to reduced reproductive vigor.

Santa Rosa Island dudleya (*Dudleya blochmaniae* ssp. *insularis*) was first described as *Hasseanthus blochmaniae* ssp. *insularis* by Reid Moran (1950a) based on a collection made at ''Old Ranch Point'' on Santa Rosa Island in 1950. Moran (1953) combined the genus *Hasseanthus* as a subgenus of *Dudleya*; *Hasseanthus* had previously been segregated from *Dudleya* on the basis of stem characteristics and the presence of vernal (withering) leaves. In so doing, he published the new combination *Dudleya blochmaniae* ssp. *insularis* (Moran 1953). A recent attempt was made by Thompson (1993) to resegregate *Hasseanthus* from *Dudleya;* however, because rules of nomenclature were not followed and the morphological differences between these two groups do not appear to merit recognition at the genus level, the taxon will be recognized in this proposed rule under the name *Dudleya blochmaniae* ssp. insularis.

Dudleya blochmaniae ssp. *insularis* is a small succulent perennial in the stonecrop family (Crassulaceae). The plant has a corm-like root structure, and 15 to 30 oblanceolate leaves in a basal rosette, from which several flowering stems 3 to 7 cm (1.2 to 2.8 in) long arise. The white, five-petaled flowers and the resulting fruits are fused at the base and wide-spreading distally. This subspecies is distinguished from two other mainland subspecies of *Dudleya blochmaniae* on the basis of the more numerous rosette leaves, shorter floral stems, more pronounced glaucousness of young floral stems and their leaves, and the size and shape of the lower bracts (Moran 1950a, Bartel 1993).

Dudleya blochmaniae ssp. *insularis* is only known from the type locality near Old Ranch Point, also known as Marsh Point, on the east end of the island. The taxon occupies an area of less than 1 hectare (2 acres) of an ancient marine terrace with a cobbly surface, and associated with owl's clover (*Castilleja exserta*), goldfields (*Lasthenia californica*), and alien annual grasses. The number of individuals is estimated to be 2,000 (Rutherford and Thomas, pers. obs. 1993). Threats to *Dudleya blochmaniae* ssp. *insularis* are soil loss; habitat alteration caused by cattle, elk, and deer trampling; vehicle access; and collecting. Because this taxon is restricted to one population, the plant is also vulnerable to stochastic extinction by such events as storms, drought, or fire. The single population and restricted number of individuals also make the taxon vulnerable to reduced reproductive vigor.

Munchkin dudleya (*Dudleya* sp. nov. ''East Point'' (S. McCabe, pers. comm. 1994)) was first collected by Reid Moran in 1950. In his dissertation on the genus *Dudleya,* he included it in the description of *Dudleya greenei,* but remarked upon how it differed, and described it as ''forma nana.'' Subsequent floras treated the form in synonymy with *Dudleya greenei* (Munz and Keck 1973, Smith 1976). In 1993, Paul H. Thomson illegitimately published the name *Dudleya nana,* based on the description of forma nana in Moran's dissertation. Stephen McCabe has submitted an article describing a new species of *Dudleya* to the journal Madroño (S. McCabe, pers. comm. 1994).

Like *Dudleya blochmaniae* ssp. *insularis* described above, this plant is a small succulent perennial in the stonecrop family (Crassulaceae). The plant has a short caudex-like stem, and small, gray, ovate to oblanceolate leaves in a cluster of up to 20 basal rosettes, from which several flowering stems 2.5 to 7 cm (1 to 2.75 in) long arise. The pale yellow, five-petaled flowers are fused at the base and spread only at the tips.

Dudleya sp. nov. ''East Point'' is known only from one population comprising three colonies near East Point on Santa Rosa Island. The total number of individuals in the three colonies has been estimated to be 3,200 (S. McCabe, pers. comm. 1994). The colonies occur on a low windswept ridge with a cobbly soil surface, which is bereft of any other vegetation save scattered alien annual grasses. Several hundred plants were observed uprooted with roots exposed during the spring of 1993, most likely a result of cattle grazing and trampling (S. Chaney, CINP, pers. comm. 1993). Threats to *Dudleya* sp. nov. ''East Point'' are soil loss, habitat alteration, and predation caused by cattle and deer trampling and grazing. Because it is restricted to one population, the taxon is vulnerable to stochastic extinction by such events as storms, drought, or fire. The single population and limited number of individuals also make the taxon vulnerable to reduced reproductive vigor.

Santa Cruz Island dudleya (*Dudleya nesiotica*) was first described by Reid Moran (1950b) as *Hasseanthus nesioticus* based on a specimen collected from ''flat area near edge of sea bluff, Fraser Point,'' on the west end of Santa Cruz Island in 1950. Three years later, Moran (1953) transferred the species to the genus *Dudleya,* thereby forming the new combination *Dudleya* nesiotica.

Like the two previously described dudleyas, *Dudleya nesiotica* is a succulent perennial in the stonecrop family (Crassulaceae). The plant has a corm-like stem with 8 to 16 oblanceolate leaves in a basal rosette from which several flowering stems 3 to 10 cm (1.2 to 4.0 in) tall arise. The five white-petaled flowers and resulting fruits are erect to ascending.

Dudleya nesiotica is known only from one population comprising two colonies within 1.6 km (1 mi) of the type locality at Fraser Point on the west end of Santa Cruz Island. Approximately 1,000 plants occupy less than 10 acres of habitat. The colonies are situated on the lowest marine terrace in association with iceplant (*Mesembryanthemum crystallinum* and *M. nodiflorum*), alkali heath (*Frankenia salina*), goldfields, and pickleweed (*Salicornia virginica*). Threats to *Dudleya nesiotica* are soil loss, habitat alteration, and predation caused by pig rooting. Like many dudleyas, *Dudleya nesiotica* is also threatened by collecting for botanical or horticultural use (Moran 1979). Because the taxon is restricted to only one population, it is also vulnerable to stochastic extinction by such events as storms, drought, or fire. The single population and limited number of individuals also make the taxon vulnerable to reduced reproductive vigor.

Island bedstraw (*Galium buxifolium*) was first described by E.L. Greene as *Galium buxifolium* in 1886 based on specimens collected on Santa Cruz Island (Ferris 1960). In 1958, Lauramay Dempster (1958) described the taxon as a variety of *Galium catalinense.* Ferris

(1960) suggested that the taxon was subspecifically distinct, but still synonymized the taxon with *Galium catalinense*. Thirteen years later, Dempster (1973) reestablished the taxon as a separate species based on differences in the nutlet hairs between it and *Galium catalinense*.

Galium buxifolium is a small, stout woody shrub in the bedstraw (Rubiaceae) family. The plant grows to 12 decimeters (dm) (4 ft) in height, and has swollen nodes bearing numerous leafy branches. The leaves are larger than those of most other *Galium* taxa, and have conspicuous lateral veins with stout hairs on the lower surface (Dempster 1973). The relatively broad leaves and the tiny upward-curved hairs that cover the fruits are unique characteristics that distinguish it from the six other species of *Galium* that occur on the islands (Hochberg *et al.* 1980b).

A putative collection of *Galium buxifolium* was made from the ''Torrey Pine grove, Santa Rosa Island,'' in 1941 by Reid Moran; apparently this was a misidentified collection of *Galium nuttallii* (York, in litt. 1987). Therefore no known collections of this taxon are known from Santa Rosa Island. *Galium buxifolium* is currently known from Santa Cruz and San Miguel Islands where it occurs on north-facing sea cliffs. Eight populations occur on TNC lands on Santa Cruz Island. In 1980, Hochberg *et al.* (1980b) noted that 2 of these populations comprised fewer than 50 individuals each, and the remaining populations comprised less than 6 individuals each. Two populations were located on San Miguel Island in 1993, 1 comprising about 200 individuals, and 1 comprising fewer than 10. Five other historical collections have been made from the island, but none have been seen for almost 30 years.

The plant occurs on ''bluffs and rocky slopes'' (Dempster 1973) in coastal sage scrub and island pine forest. Threats to *Galium buxifolium* are soil loss, habitat alteration, and predation caused by feral pig rooting and sheep grazing. Because of the small numbers of isolated populations and individuals, the taxon is also vulnerable to stochastic extinction by such events as storms, drought, or fire. Small numbers of populations and individuals also make the taxon vulnerable to reduced reproductive vigor.

Hoffmann's slender-flowered gilia (*Gilia tenuiflora* var. *hoffmannii*) was first described as *Gilia hoffmannii* by Alice Eastwood in 1940 based on collections made by Ralph Hoffmann ''in sandy soil at East Point'' on Santa Rosa Island ten years earlier (Eastwood 1940). Eastwood remarked that, although the taxon is related to *Gilia tenuiflora*, no variation of the latter included the leafy stems and terminal congested inflorescence of *Gilia hoffmannii* (Eastwood 1940). Nevertheless, Jepson (1943) included the taxon in the description of *Gilia tenuiflora* var. *tenuiflora* in his flora of California, as did Abrams (1951) in his flora of the Pacific states. In 1959, Munz renamed the varieties of *tenuiflora* as subspecies, including ssp. *hoffmannii* (Munz and Keck 1973). This nomenclature has been upheld in the latest treatment of the genus (Day 1993). Of the four subspecies of *Gilia tenuiflora*, the subspecies *hoffmannii* is the only one that occurs in southern California. Two other *Gilia* species occur on Santa Rosa Island; *Gilia tenuiflora* ssp. *hoffmannii* is distinguished from them by the presence of arachnoid woolly pubescence at the base of the stem.

Gilia tenuiflora ssp. *hoffmannii* is a small, erect annual herb in the phlox (Polemoniaceae) family. The central stem grows 6 to 12 cm (2.4 to 4.7 in) tall, arising from a rosette of densely hairy, strap-shaped, short-lobed leaves. The flowers are purplish and funnel-shaped below, widening to five pinkish corolla lobes.

Gilia tenuiflora ssp. *hoffmannii* has only been collected from two locations on Santa Rosa Island. A collection was made by Reid Moran from the ''arroyo between Ranch and Carrington Point'' in 1941 (Rutherford and Thomas 1994); however, numerous surveys conducted in recent years have failed to relocate the plant at this location. This location most likely falls within the parcel of property, adjacent to the ranchhouse, that has been heavily disturbed by cattle ranching operations. The only currently extant population occurs at the type locality near East Point on Santa Rosa Island. Here, it occurs as a component of dune scrub vegetation with sand verbena (*Abronia maritima*), silver beach-weed (*Ambrosia chamissonis*), saltgrass (*Distichlis spicata*), miniature lupine (*Lupinus bicolor*), plantain (*Plantago erecta*), and sand-dune bluegrass (*Poa douglasii*) (T. Thomas, in litt. 1993). The population consists of several hundred individuals and occupies an area of not more than 0.8 hectares (2 acres). Threats to *Gilia tenuiflora* ssp. *hoffmannii* are soil loss, habitat alteration and predation caused by cattle grazing, and elk and deer browsing. A sandy service road used by NPS and ranchers bisects the population. Because the taxon is restricted to one population, it is also vulnerable to stochastic extinction by such events as storms, drought, or fire. The single population and limited number of individuals also make the taxon vulnerable to reduced reproductive vigor.

Island rush-rose (*Helianthemum greenei*) was first described by Robinson as *Helianthemum greenei* in 1895 (Abrams 1951). The type locality is described as ''a dry summit near the central part of the island of Santa Cruz'' (Abrams 1951). This nomenclature has been upheld in the most recent treatment for the genus (McClintock 1993).

Helianthemum greenei is a small shrub in the rock-rose (Cistaceae) family. The plant grows to 0.5 m (18 in) tall and has alternate leaves covered with star-shaped hairs. The reddish, glandular stalks support yellow-petalled flowers to 2.5 cm (1 in) wide. The fruit is a pointed capsule 0.6 cm (0.25 in) long. A more abundant species found on the islands, *Helianthemum scoparium*, is similar in appearance, but is not glandular-hairy and has greenish stalks and smaller fruits (Hochberg 1980b).

McMinn (1951) and later Thorne (1967) report seeing *Helianthemum greenei* on San Miguel Island, but there are no collections in island herbaria (Hochberg *et al.* 1980b, Wallace n.d.). Two collections of the plant were made from Santa Rosa Island by Epling and Erickson and Dunn in the 1930's (Wallace 1985); however, no collections on Santa Rosa Island have been made since that time, despite recent surveys. *Helianthemum greenei* was reported from the northeast side of Black Jack Mountain on Santa Catalina Island by Thorne (1967) in 1966; no collections have been made since then, but a population of three individuals was recently reported from this location (Janet Takara, Catalina Island Conservancy, pers. comm. 1994). Habitat for the plant on Santa Catalina Island is being grazed by goats, mule deer, and bison, and is being rooted by pigs.

In addition to the one population on Santa Catalina Island, *Helianthemum greenei* is currently known from ten populations on Santa Cruz Island. The taxon is found in open, exposed areas in chaparral, coastal sage scrub, and island pine forest. In 1980, prior to sheep removal from TNC lands on Santa Cruz Island, Hochberg *et al.* (1980b) found that, of ten populations, only two comprised several dozen individuals, and six others comprised less than six individuals. Hochberg *et al.* (1980b) indicated that the plant is eliminated by intense feral animal disturbance, and noted that the population recorded by Abrams and Wiggins in 1930 at Pelican

Bay has not been relocated. The major threats to *Helianthemum greenei* are soil loss, altered fire frequencies and intensities, rooting by feral pigs, sheep grazing, and competition with other shrubs that have increased in cover due to a release in grazing pressure. Because of the small numbers of isolated populations and individuals, the taxon is also vulnerable to stochastic extinction by such events as storms, drought, or fire.

Island alumroot (*Heuchera maxima*) was first described by E.L. Greene (1886a) as *Heuchera maxima* based on collections from the ''northward slope of Santa Cruz Island.'' This nomenclature has been upheld in the most recent treatment of the genus (Elvander 1993). *Heuchera maxima* is a perennial herb in the saxifrage (Saxifragaceae) family. The round basal leaves are up to 7 cm (2.8 in) broad on long petioles up to 25 cm (10 in) in length. The flowering stalks are up to 6.1 dm (2 ft) long and scattered with small white-petaled flowers (Hochberg 1980b). No other *Heuchera* species occurs on the islands; however, young plants of *Heuchera maxima* could resemble species of *Jepsonia, Lithophragma,* or *Saxifraga* that occurs on the islands. *Heuchera maxima* can be distinguished from these other taxa by its larger size at maturity, and flowers with ten stamens rather than five.

Heuchera maxima grows primarily on moist, shady, north-facing canyon bottoms, walls, and seacliffs, but occurs in a few interior localities as well. Collections of *Heuchera maxima* were made from Santa Rosa Island by Hoffmann in 1929 and Dunkle in 1939; however, locality information for these collections is vague. More recently, the plant has been collected from four locations on Santa Rosa Island (Cherry, Lobos, Ranch, and Windmill Canyons) (Rutherford and Thomas 1994). *Heuchera maxima* is also known from 11 locations on West Anacapa Island (Rutherford and Thomas 1994; S. Junak, in litt. 1984). On Santa Cruz Island, 12 populations occur along the west half of the north shore. All populations observed by Hochberg *et al.* (1980b) on Santa Cruz Island comprised less than 50 individuals each, and in some cases comprised less than 6 individuals each. Threats to *Heuchera maxima* are soil loss, habitat alteration and predation resulting from cattle grazing, feral pig rooting, and elk and deer browsing. Because of the small numbers of populations and individuals, the taxon is also vulnerable to stochastic extinction by such events as storms, drought, or fire.

Santa Cruz Island bushmallow (*Malacothamnus fasciculatus* var. *nesioticus*) was first described by James W. Robinson as *Malvastrum nesioticum* in Asa Gray's Flora of North America in 1897, based on material collected by E.L. Greene in 1886 (Abrams 1951). Over the next four decades, the taxon was placed in several different genera, as *Malacothamnus nesioticus* by Abrams, *Sphaeralcea nesiotica* and later *Sphaeralcea fasciculata* var. *nesiotica* by Jepson, and *Malvastrum fasciculatum* var. *nesioticum* by McMinn (Kearney 1951). Kearney (1951) published the new combination *Malacothamnus fasciculatus* var. *nesioticus.* In 1993, David Bates synonymized var. *nesioticus,* as well as seven other taxa, with *Malacothamnus fasciculatus,* a highly variable species ''with many indistinct and intergrading local forms'' (Bates 1993). Of var. *nesioticus,* he notes that the taxon is essentially indistinguishable from the mainland ''var. *nuttallii.*'' However, recent studies on the genetics of *Malacothamnus* have determined that var. *nesioticus* is a distinct variety (Swenson *et al.* in prep.).

Malacothamnus fasciculatus var. *nesioticus* is a small soft-woody shrub in the mallow (Malvaceae) family. The plant reaches up to 2 m (6 ft) tall, and has slender branches covered with star-shaped hairs. The palmately shaped leaves are dark green on the upper surface and gray on the lower surface. The rose-colored flowers are up to 3.75 cm (1.5 in) broad and scattered along the ends of the branches (Hochberg *et al.* 1980b). It is differentiated from the mainland var. *nuttallii* by its bicolored leaves and genetic distinction (Swenson *et al.* in prep.).

Malacothamnus fasciculatus var. *nesioticus* is known from only two small populations on Santa Cruz Island where it occurs within a coastal sage scrub community. One population of less than 50 individuals (10 clones) is located on the west shore of the island near the historic Christi Ranch. A second population was discovered in 1993 in the Central Valley near the University of California Field Station (Swensen *et al.* in prep.). Recent genetic analyses of the Central Valley population indicated that, although there are 19 individual shrubs, they comprise only 3 genotypes, or 3 clones. Threats to *Malacothamnus fasciculatus* var. *nesioticus* are soil loss, habitat alteration and predation resulting from past sheep grazing and current feral pig rooting. Because of the small numbers of populations and individuals, the plant is also vulnerable to stochastic extinction by such events as storms, drought, or fire. The small numbers of isolated populations and restricted number of individuals also make the taxon vulnerable to reduced reproductive vigor.

Santa Cruz Island malacothrix (*Malacothrix indecora*) was first described by E.L. Greene (1886) as *Malacothrix indecora* based on specimens collected from ''islets close to the northern shore'' of Santa Cruz Island (Smith 1976). In 1957, E. Williams published the combination *Malacothrix foliosa* var. *indecora* (Ferris 1960); Munz (1974) subsequently synonymized the taxon with *Malcothrix foliosa.* However, Ferris (1960) and others (Smith 1976, Davis 1980) continued to recognize the taxon as a separate species with the name *Malacothrix indecora.* This nomenclature is upheld in the most recent treatment of the genus (Davis 1993).

Malacothrix indecora is an annual herb in the aster (Asteraceae) family. The 20 to 40 cm (8 to 16 in) tall stems support numerous broadly lobed fleshy leaves with blunt tips. The greenish yellow flowers are in hemispheric heads surrounded by linear bracts (Hochberg 1980b; Scott in Junak *et al.*, in prep.). Two other annual species of *Malacothrix* occur on the same islands as *Malacothrix indecora*; however, the achenes (seeds) of *Malacothrix similis* are topped with 18 teeth and 1 bristle and *Malacothrix squalida* is topped with irregular teeth and no bristle, whereas *Malacothrix indecora* has neither of these features (Scott in Junak *et al.*, in prep.).

Collections of *Malacothrix indecora* were made from several locations along the northeast shore of San Miguel Island and on Prince Island by Greene, and later by Hoffmann (Hochberg *et al.* 1979; Davis 1987). In 1978, Hochberg *et al.* (1979) observed three populations; Halvorson *et al.* (1992) reported finding this species at one location during surveys in 1988 and 1989, but no collections were made to confirm identification of the taxon. On Santa Cruz Island, *Malacothrix indecora* was first collected near Twin Harbor by Williams in 1939 (Davis 1987); this population has not been relocated.

Malacothrix indecora is currently known from only one population discovered by Junak in 1980 at Black Point on the west end of Santa Cruz Island. Several hundred individuals were observed there by Junak in 1985 in exposed coastal flats and associated with Santa Cruz Island buckwheat (*Eriogonum grande* var. *rubescens*) and iceplant (*Mesembryanthemum nudiflorum*) (CNDDB 1991). On a subsequent trip in 1989, only 50 plants

were observed in the same location (S. Junak, pers. comm. 1994). Threats to *Malacothrix indecora* are soil loss, habitat alteration and predation resulting from feral pig rooting and seabird activity. Historic habitat for *Malacothrix indecora* on San Miguel Island and Prince Island has been altered by seabird nesting activity. Because of the small numbers of populations and individuals, the taxon is also vulnerable to stochastic extinction by such events as storms, drought, or fire. The small numbers of populations and restricted number of individuals also make the taxon vulnerable to reduced reproductive vigor.

Island malacothrix (*Malacothrix squalida*) was first described by E.L. Greene in 1886 from specimens collected above Prisoner's Harbor on Santa Cruz Island (Davis, in litt. 1987). In 1957, E. Williams published the combination *Malacothrix foliosa* var. *squalida*; a year later, Roxana Ferris (1960) published the combination *Malacothrix insularis* var. *squalida*. In 1959, Munz recognized the taxon as *Malacothrix squalida;* however, 14 years later, he synonymized it with *M. foliosa* (Munz 1974). In a review of insular species of *Malacothrix*, Davis (1980) recognized the taxon as *Malacothrix squalida*.

Like *Malacothrix indecora*, *Malacothrix squalida* is an annual herb in the aster family. However, the plant only reaches 9 cm (3.5 in) tall, and has linear to widely lanceolate leaves that are irregularly toothed or lobed. The light yellow flowers are clustered in hemispheric heads 12 to 15 millimeters (mm) (0.5 to 0.6 in) long. *Malacothrix indecora* is the only other annual *Malacothrix* that occurs on the same island as *M. squalida*; however, the latter is a much larger species, and also differs in the achene characteristics previously mentioned (Scott in Junak *et al.*, in prep.).

Malacothrix squalida has been collected from two locations along the north shore of Santa Cruz Island; Greene collected it near Prisoner's Harbor in 1886, but the species was not seen on the island again until Philbrick and Benedict collected it in 1968 near Potato Harbor (Rutherford and Thomas 1994). On Middle Anacapa Island, the plant was first collected by Martin Piehl in 1963, and more recently in 1978 and 1986. The plant is known from several small colonies atop coastal bluffs on the east end of the island. Surveys by Junak and Davis in 1989 failed to find any individuals; however, this may have been the result of a drought year (S. Junak, pers. comm. 1994). Threats to *Malacothrix squalida* are soil loss, habitat alteration and predation resulting from sheep grazing, feral pig rooting, and seabird nesting. Because of the small numbers of isolated populations and individuals, the taxon is also vulnerable to stochastic extinction by such events as storms, drought, or fire. The small numbers of isolated populations and restricted number of individuals also make the taxon vulnerable to reduced reproductive vigor.

Island phacelia (*Phacelia insularis* ssp. *insularis*) was first described by Munz as *Phacelia insularis* in 1932 based on plants growing ''on sand dunes at northeastern part of Santa Rosa Island'' (Munz 1932). Jepson published the new combination *Phacelia curvipes* var. *insularis* in 1943. After examining specimens from coastal northern California and determining their affinity to the island plants, John Thomas Howell re-elevated the taxon to specific level, separating out the northern California plants as *Phacelia insularis* var. *continentalis,* leaving *Phacelia insularis* var. *insularis* to refer to the island plants (Howell 1945). In 1951, Abrams, who did not have access to collections of *Phacelia* from northern California, included the taxon in the description of *Phacelia divaricata,* a taxon common in southern California. In 1959, Munz published the new combination *Phacelia divaricata* var. *insularis* (Constance 1979). Lincoln Constance agreed with Howell's interpretation and has referred to the taxon as *Phacelia insularis* var. *insularis* (Constance 1979). This nomenclature has been upheld in the latest treatment of the genus (Wilken *et al.* 1993).

Phacelia insularis ssp. *insularis* is a decumbent (reclining), branched annual of the waterleaf (Hydrophyllaceae) family. The short-hairy and glandular stems grow to 1.5 dm (6 in) high from a basal rosette of leaves. The small lavender to violet, bell-shaped flowers are borne in loose cymes. The other variety of *Phacelia insularis,* the variety *continentalis,* is found on the mainland of northern California. *Phacelia insularis* var. *insularis* can be distinguished from the other species of *Phacelia* on the islands based on the hastate leaf shape with basal lobes. The other *Phacelia* have pinnately divided or undivided but ovate leaves.

Phacelia insularis ssp. *insularis* occurs on Santa Rosa Island and San Miguel Island. However, the last collections from Santa Rosa Island were made by Clifton Smith at Carrington Point in 1973; the plant has not been observed on the island since then despite recent searches. On San Miguel Island, *Phacelia insularis* ssp. *insularis* was collected by Hoffmann in 1930 and by Munz in 1932. It was not collected again until 1978, when four populations were found (Hochberg *et al.* 1979). A fifth population was discovered by Charles Drost on a bluff above Cuyler Harbor in 1984 (Halvorson *et al.* 1992). *Phacelia insularis* ssp. *insularis* is found within the island grassland community which is dominated by alien grasses, including slender wild oat (*Avena barbata*), wild oat (*Avena fatua*), ripgut (*Bromus diandrus*), and soft chess (*Bromus hordeaceus*), with scattered occurrences of native bunchgrasses, shrubs, and herbs (Hochberg *et al.* 1979). Threats to *Phacelia insularis* ssp. *insularis* are soil loss, habitat alteration caused by cattle grazing and elk and deer browsing. Because of the small numbers of populations and individuals, the plant is also vulnerable to stochastic extinction by such events as storms, drought, or fire. The small numbers of populations and restricted number of individuals also make the taxon vulnerable to reduced reproductive vigor.

Santa Cruz Island fringepod (*Thysanocarpus conchuliferus*) was first described as *Thysanocarpus conchuliferus* by E.L. Greene in 1886 based on material he and Brandegee collected where they found it ''common on mossy shelves and crevices of high rocky summits and northward slopes'' on Santa Cruz Island (Greene 1886b). Four decades later, Jepson published the new combination *Thysanocarpus laciniatus* var. *conchuliferus* as one of three varieties of *Thysanocarpus laciniatus* (Jepson 1925). Abrams re-elevated the taxon to species status in 1944. Munz, however, republished the taxon as one of six varieties of *T. laciniatus* in 1959 (Munz and Keck 1973). In the most recent treatment of the genus, Reed C. Rollins re-elevated the taxon to species status (Rollins 1993).

Thysanocarpus conchuliferus is a small delicate annual herb in the mustard (Brassicaceae) family. The one to several branches grow 5 to 12.7 cm (2 to 5 in) high. The narrow, linearly lobed leaves alternate along the stems, which terminate in a raceme of minute pink to lavender flowers. While all members of this genus have round, flattened fruits that are fringed with wings, *Thysanocarpus conchuliferus* is the only species with a bowl-shaped fruit; this taxon is also smaller in stature than *T. lacianatus,* which occurs in the same habitat (Rutherford and Thomas 1994).

In 1932, Ralph Hoffmann reported that *Thysanocarpus conchuliferus* was

''frequent. . . from the north shore to the southwest portion of the island'' (Hochberg *et al.* 1980a). A total of 14 historical locations are known from herbarium records. In 1980, eight of these populations were relocated (Hochberg *et al.* 1980b); in 1991, individuals were found at six of these locations, and none were found at five other locations (Klinger 1994b). In 1993, no individuals were found at any of the 14 known locations. Survey reports indicate that, in addition to abundant rainfall that may have increased competition from alien grasses, rooting by feral pigs was observed at all 14 locations (Klinger 1994b).

Thysanocarpus conchuliferus occurs on rocky outcrops on ridges and canyon slopes, and is associated with a variety of herbs, ferns, grasses, dudleya, and *Selaginella* (Santa Barbara Botanical Garden 1994). Threats to *Thysanocarpus conchuliferus* are soil loss, habitat alteration and predation resulting from feral pig rooting. In favorable years, competition with luxuriant alien grasses may also constitute a threat (Klinger 1994b). Because of the small numbers of isolated populations and individuals, the plant is also vulnerable to stochastic extinction by such events as storms, drought, landslide, or fire. The small numbers of populations and restricted number of individuals also make the taxon vulnerable to reduced reproductive vigor.

Previous Federal Action

Federal action on these plants began as a result of section 12 of the Endangered Species Act of 1973, which directed the Secretary of the Smithsonian Institution to prepare a report on those plants considered to be endangered, threatened, or extinct in the United States. This report, designated as House Document No. 94–51, was presented to Congress on January 9, 1975. In that document, *Arabis hoffmannii, Castilleja mollis, Dudleya blochmaniae* ssp. *insularis, Galium buxifolium, Gilia tenuiflora* ssp. *hofmannii,* and *Berberis pinnata* ssp. *insularis* were considered to be endangered, and *Dudleya nesiotica* and *Malacothamnus fasciculatus* var. *nesiotica* (as *Malacothamnus fasciculatus*) were considered to be threatened. The Service published a notice in the July 1, 1975, **Federal Register** (40 FR 27823) of its acceptance of the report of the Smithsonian Institution as a petition within the context of section 4(c)(2) (petition provisions are now found in section 4(b)(3) of the Act) and its intention thereby to review the status of the plant taxa named therein. On June 16, 1976, the Service published a proposal in the **Federal Register** (42 FR 24523) to determine approximately 1,700 vascular plant species to be endangered species pursuant to section 4 of the Act. *Dudleya nesiotica* was included in the June 16, 1976, **Federal Register** document.

General comments received in relation to the 1976 proposal were summarized in an April 26, 1978, **Federal Register** publication (43 FR 17909). The Endangered Species Act Amendments of 1978 required that all proposals over 2 years old be withdrawn. A 1-year grace period was given to those proposals already more than 2 years old. In the December 10, 1979, **Federal Register** (44 FR 70796), the Service published a notice of withdrawal of the portion of the June 6, 1976, proposal that had not been made final, along with four other proposals that had expired.

The Service published an updated notice of review for plants on December 15, 1980 (45 FR 82480). This notice included *Arabis hoffmannii, Castilleja mollis, Dudleya blochmaniae* ssp. *insularis, Dudleya nesiotica,* and *Malacothamus fasciculatus* var. *nesiotica* as Category 1 taxa. Category 1 taxa are those for which the Service has on file substantial information on biological vulnerability and threats to support preparation of listing proposals. *Arctostaphylos confertiflora* and *Galium buxifolium* were included as Category 2 taxa. Category 2 taxa are those for which data in the Service's possession indicate listing is possibly appropriate, but for which substantial data on biological vulnerability and threats are not currently known or on file to support proposed rules. On November 28, 1983, the Service published in the **Federal Register** a supplement to the Notice of Review (48 FR 53640), in which *Arabis hoffmannii* was listed as a Category 1* taxon, the asterisk indicating that the species is believed to be extinct. In the same notice, *Castilleja mollis, Dudleya blochmaniae* ssp. *insularis, Dudleya nesiotica, Helianthemum greenei, Heuchera maxima, Berberis pinnata* ssp. *insularis, Malacothamnus fasciculatus, Phacelia insularis* var. *insularis,* and *Thysanocarpus conchuliferus* were included as Category 2 candidates.

The plant notice was revised again on September 27, 1985 (50 FR 39526). In that notice, all taxa maintained their previous status. On February 21, 1990 (55 FR 6184), the plant notice was again revised. In this notice, *Arabis hoffmannii* was included as a Category 1 candidate, as individuals of this taxon had been rediscovered since the previous Notice of Review. *Arctostaphylos confertiflora, Castilleja mollis, Dudleya blochmaniae* ssp. *insularis, Dudleya nesiotica, Galium buxifolium, Gilia tenuiflora* ssp. *hoffmannii, Helianthemum greenei, Heuchera maxima, Berberis pinnata* ssp. *insularis, Malacothamnus fasciculatus, Phacelia insularis* var. *insularis,* and *Thysanocarpus conchuliferus* were included as Category 2 candidates. *Malacothrix indecora* was included in the February 21, 1990, notice for the first time as a Category 2 candidate.

The plant notice was revised on September 30, 1993 (58 FR 51144). In this notice, *Arabis hoffmannii, Arctostaphylos confertiflora, Castilleja mollis, Dudleya blochmaniae* ssp. *insularis, Galium buxifolium, Gilia tenuiflora* ssp. *hoffmannii, Berberis pinnata* ssp. *insularis, Malacothamnus fasciculatus* var. *nesioticus, Malacothrix indecora, Phacelia insularis* var. *insularis,* and *Thysanocarpus conchuliferus* were included as Category 1 candidates. *Dudleya nesiotica, Helianthemum greenei,* and *Heuchera maxima* were included as Category 2 candidates; *Malacothrix squalida* was included for the first time as a Category 2 candidate. *Dudleya nesiotica, Helianthemum greenei, Heuchera maxima,* and *Malacothrix squalida* are being included in this proposal based on a more thorough review of existing information, and additional information that was brought to the attention of the Service by Steve Junak, botanist at Santa Barbara Botanic Garden. *Dudleya* sp. nov. ''East Point'' is being included in this proposal on the basis of new published information concerning its distinctness as a taxon and a review of existing biological information that indicates the species should be elevated to Category 1 status and that listing is warranted.

Section 4(b)(3)(B) of the Act requires the Secretary to make certain findings on pending petitions within 12 months of their receipt. Section 2(b)(1) of the 1982 amendments further requires that all petitions pending on October 13, 1982, be treated as having been newly submitted on that date. This was the case for *Arabis hoffmannii, Castilleja mollis, Dudleya blochmaniae* ssp. *insularis, Dudleya nesiotica, Galium buxifolium, Gilia tenuiflora* ssp. *hoffmannii, Berberis pinnata* ssp. *insularis,* and *Malacothamnus fasciculatus* var. *nesioticus* because the 1975 Smithsonian report had been accepted as a petition. On October 13, 1983, the Service found that the petitioned listing of these species was warranted, but precluded by other

pending listing actions, in accordance with section 4(b)(3)(B)(iii) of the Act; notification of this finding was published on January 20, 1984 (49 FR 2485). Such a finding requires the petition to be recycled, pursuant to section 4(b)(3)(C)(i) of the Act. The finding was reviewed in October of 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, and 1993. Publication of this proposal constitutes the warranted finding for these species, as well as for *Arctostaphylos confertiflora, Helianthemum greenei, Heuchera maxima, Malacothrix indecora, Malacothrix squalida, Phacelia insularis* var. *insularis,* and *Thysanocarpus conchuliferus.*

Summary of Factors Affecting the Species

Section 4 of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to *Arabis hoffmannii* (Munz) Roll., *Arctostaphylos confertiflora* Eastw., *Berberis pinnata* Lag. ssp. *insularis* Munz, *Castilleja mollis* Penn., *Dudleya blochmaniae (*Eastw.) Moran ssp. *insularis* (Moran) Moran, *Dudleya nesiotica* (Moran) Moran, *Dudleya* sp. nov. ''East Point'' (S. McCabe), *Galium buxifolium* E. Greene, *Gilia tenuiflora* Benth. ssp. *hoffmannii* (Eastw.) A.& V. Grant, *Helianthemum greenei* Rob., *Heuchera maxima* E. Greene, *Malacothamnus fasciculatus* (Nutt.) E. Greene ssp. *nesioticus* (Rob.) Kearn., *Malacothrix indecora* E. Greene, *Malacothrix squalida* E. Greene, *Phacelia insularis* Munz var. *insularis,* and *Thysanocarpus conchuliferus* E. Greene are as follows:

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

The single most important loss of resources to insular ecosystems is the loss of soils, as the soils are the foundation for the unique island ecosystems and the insular endemic species found within them. This loss of soils is the result of historic grazing and browsing by sheep, goat, cattle, deer, elk, and bison, and rooting by pigs on the various islands starting in the early 1800's, and in certain cases, continuing today.

The increased loss of soils and the resulting change in vegetation have been documented from sediment and pollen records in a soil core dating back 5,200 years from the Old Ranch Canyon marsh on eastern Santa Rosa Island (Cole 1994). Rates of sedimentation prior to the introduction of livestock averaged 9 mm/year (yr) (0.35 in/yr), increasing to 58 mm/yr (2.28 in/yr) after the introduction of grazing (Cole 1994). Pollen records demonstrate that the conversion of brushland to grassland occured with the onset of ranching in the early 1800's. This change in vegetation is reflected by an increased abundance of grass pollen, a decrease in pollen from the mint and pea families, and a massive increase in sediment (Cole 1994). The potential for large sediment loads is also illustrated by the recent attempts to stabilize soils at Johnson's Lee on the south side of Santa Rosa Island; rice straw wattles placed along hillside contours trapped large volumes of sediment after only one season of rains (Sellgren 1994).

A comparison of historical descriptions of island vegetation with current conditions indicates that large-scale alteration of habitats caused by large numbers of non-native mammals on the islands resulted in significant loss of soils as well as changes in plant communities in terms of structural composition, species richness, species composition, and absolute cover. In 1883, Thompson and West described the effects of sheep grazing on Santa Cruz Island: ''The island becomes at some times overstocked, and may be said to be in that condition much of the time. The result is that the grasses, being cropped so close, die out, and allow the loosened soil to be removed by wind and rain'' (Hochberg *et al.* 1980a). However, at that time, vegetation elsewhere on the island was still relatively intact; Greene described mixed forests of large-leaved maple (*Acer macrophyllum*), live oak (*Quercus agrifolia*), black cottonwood (*Populus trichocarpa*), and willow (*Salix laevigata*) thriving in the canyons (Hochberg *et al.* 1980a). Another account was given by Delphine Adelaide Caire in 1933, who reflected on the conditions of Santa Cruz Island: ''Its present natural beauty does not come up to that of the past. The bed of the stream that skirts the Main Ranch on its way from Pacacho Diablo was much narrower than it is today; mountain slopes were heavily wooded and centuries-old oaks were numerous. In the course of years, rains have accomplished their ruinous work, carrying off a great amount of topsoil, the innumerable trails cut by sharp sheep trotters having been a contributing factor in such devastation'' (Hochberg *et al.* 1980a).

The importance of soils in maintaining habitat for the proposed taxa is found not only in their physical properties, but in their biotic properties as well. Healthy soils play host to a complex matrix of soil organisms, including fragile microbial components, that assist in such processes as water-holding capacity, soil fertility, and nutrient cycling. These processes have been adversely affected by the activities of alien mammals. For instance, the loss of leaf litter from trampling and rooting changes soil temperatures, increases the loss of moisture, reduces the humus layers, and results in a reduced soil fauna (Bennett 1993). The breakdown of organic material, transport of fungal spores, and nutrient recycling have been documented for soil mites on Santa Catalina Island (Bennett 1993). Soil mite diversity decreased with increased disturbance, creating impoverished nutrient levels in the soil (Bennett 1993). A feature of arid-land soils (typical of the island soils) is the presence of a cyanobacterial-lichen crust that facilitates stabilization of steep slopes and nutrient cycling (Belnap 1994). The crusts are extremely brittle during the dry summer months and can be eliminated by the shattering influences of trampling by non-native herbivores (Belnap 1994). The historic and current presence of non-native herbivores and pigs has reduced leaf litter and compacted and degraded the soil structure, resulting in accelerated rates of erosion (Klinger *et al.* 1994, Nishida 1994).

Even after the agents that initiated erosion have been removed, loss of soils continues (Clark *et al.* 1990, Halvorson 1993). Because both the biotic and physical properties of the soils have been degraded or lost altogether, the soils that remain behind provide poor conditions for seedlings to germinate and establish. On Santa Rosa Island, a grove of island oaks (*Quercus tomentella*), a Category 2 candidate for Federal listing, has shown few signs of regeneration on soils severely affected by erosion even after an exclosure was built to eliminate cattle, elk, and deer (Danielsen 1989a, 1989b). All 16 taxa in this proposed rule are threatened with habitat instability due to the loss and degradation of soils on all islands.

Several historic accounts include specific references to the abundance and distribution of several of the proposed taxa, which can be compared to current abundance and distribution information. In a letter to Hoffmann in 1932 concerning *Berberis pinnata* ssp. *insularis,* Munz remarked that,

''Brandegee says of *B. pinnata*, that it is 'common' on S.C.'' (S. Junak, in litt. 1994); *Berberis pinnata* ssp. *insularis* is currently known from three small populations. In 1890, Brandegee wrote that *Heuchera maxima* was ''not uncommon throughout Santa Cruz Island'' (Hochberg *et al.* 1980a); it is currently reduced to 12 populations on that island, and 11 populations on West Anacapa Island. Apparently, *Malacothamnus fasciculatus* var. *nesioticus* was already rare by the turn of the century; Greene wrote that the plant was ''rare; only two bushes seen, and these under the protection of large opuntias; perhaps thus kept from the sheep'' (Hochberg *et al.* 1980a).

Seabirds have altered historic habitat for *Malacothrix indecora* on San Miguel Island and Prince Island, and known sites for *Malacothrix squalida* on Anacapa Island. CINP has been monitoring certain seabirds, including the double-crested cormorant (*Phalacrocorax auritus*), the pelagic cormorant (*Phalacrocorax pelagicus*), the federally endangered brown pelican (*Pelecanus occidentalis*), the western gull (*Larus occidentalis*), and Cassin's auklet (*Ptychoramphus aleuticus*), on islands within CINP since 1985. Many of these bird species experienced severe population declines in the late 1960's and early 1970's as a result of DDT-related reproductive failures (Ingram 1994). However, monitoring results indicate that populations of most of these birds have increased over the past decade. Seabirds use local vegetation to construct nests on cliff and blufftop sites, create localized soil disturbances that facilitate establishment of alien plant species, and promote erosion of coastal bluffs. Seabird activity has been noted on Middle Anacapa Island within habitat for *Malacothrix squalida* (S. Junak, pers. comm. 1994).

In 1990, seabirds on Prince Island included 10,000 Cassin's auklets and 240 double-crested cormorants (Ingram 1994); other seabirds that nest on the island but were not monitored include the ashy storm-petrel (*Oceanodroma homochroa*), Leach's storm-petrel (*Oceanodroma lencorhoa*), Brandt's cormorant (*Phalacrocorax penicillatus*), pelagic cormorant, brown pelican, western gull, pigeon guillemot (*Cepphus columba*), and Xantus' murrelet (*Synthliboramphus hypoleuca*). Due to the degree of protection afforded this nesting activity by CINP, surveys for *Malacothrix indecora* within historic habitat have not been done since the taxon was last seen there in 1978. Given the size of the island (24 hectares (60 acres)) and the number of nesting birds, habitat for *Malacothrix indecora* has likely been affected.

Compaction of soils and crushing of plants resulting from vehicle traffic is a potential threat to three of the proposed taxa on Santa Rosa Island: *Dudleya blochmaniae* ssp. *insularis*, *Dudleya* sp. nov. ''East Point,'' and *Gilia tenuiflora* ssp. *hoffmannii*. Populations of all three taxa occur at sites where vehicles were historically or are currently used. The only known population of *Gilia tenuiflora* ssp. *hoffmannii* is bisected by a road.

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 constitutes a potential threat to certain of the taxa in this proposal. In particular, the collection of whole plants or reproductive parts of those annual or herbaceous perennial taxa with fewer than 100 individuals, including *Arabis hoffmannii*, *Berberis pinnata* ssp. *insularis*, *Malacothamnus fasciculatus* var. *nesioticus*, *Malacothrix indecora*, *Malacothrix squalida*, and *Thysanocarpus conchuliferus*, could adversely affect the genetic viability and survival of those taxa. In the horticultural trade, *Dudleya* species have, in particular, been favorite collection items. *Dudleya* sp. nov. ''East Point'' was collected and introduced into the horticultural trade long ago as ''white sprite.'' *Dudleya blochmaniae* ssp. *insularis* and *Dudleya nesiotica*, though not in the trade, have been cultivated by Dudleya enthusiasts. The limited distribution of these three taxa makes them vulnerable to such enthusiasts. *Heuchera maxima* is also found in cultivation; the threat of collection for this taxon is unknown.

C. Disease or Predation

In 1875, when sheep stocking on Santa Cruz Island was around 50,000 head, botanist J.T. Rothrock reported that the island was so overgrazed that ''it was with difficulty that I could get even a decent botanical specimen'' (Hobbs 1983). Although sheep grazing has been removed as a current threat, the decades of overgrazing by sheep have had long-term effects in reducing the reproductive capabilities and distribution of many of the taxa included in this proposal. A review of literature pertinent to effects of sheep on island vegetation is included in Hochberg *et al.* (1980a). Feral pigs, feral goats, sheep, deer, elk, horses, and bison currently occur in habitats that support populations of most of the taxa included in this proposal. In addition to modifying habitat through altering the structure and composition of plant communities, altering hydrologic and soil characteristics, and increasing the potential for erosion as discussed under Factor A, non-native mammals also affect the proposed plant taxa through direct herbivory. The effects of defoliation on plants include decreased aboveground biomass, fewer stems, less seed, reduced height of leaves and stems, decreased root biomass, reduced root length, decreased carbohydrate reserves, and reduced vigor (Heady in Willoughby 1986).

The effects of grazing animals on plants can be demonstrated by studies on oaks and pines on the Channel Islands. On Santa Cruz Island, oak groves are more numerous and in better condition than those on Santa Rosa Island, but still show no signs of recruitment due to pig rooting. A recent comparison of fenced and unfenced sites under live oak (*Quercus agrifolia*) tree canopies showed a significant number of oak seedlings within the fenced sites (Peart *et al.* 1994). On Santa Cruz Island, the removal of feral sheep has been credited with allowing the reestablishment of native woody perennials including the Bishop pine (*Pinus muricata*) (Wehtje 1994). On Santa Rosa Island, the Bishop pine continues to display low recruitment and high older-tree mortality caused by deer browsing, placing the population ''at risk'' (of extirpation) under present conditions (Viers and Halvorson 1994). The Santa Cruz Island ironwood (*Lyonothamnus floribundus* ssp. *asplenifolius*), a Category 2 candidate for Federal listing, is similarly lacking in recruitment on Santa Rosa Island.

Clark *et al.* (1990) noted that most individuals of Santa Rosa Island manzanita suffer from severe browsing by elk and deer. The shape of individual shrubs has been modified as a result of browsing. Short-statured shrubs have been hedged to the point that they do not grow above a certain height; in shrubs that attained a taller stature before browsing pressure became severe, all lower limbs and leaves have been stripped, resulting in a ''lollipop'' or tree-shaped shrub. Apparently, the browsing pressure on Santa Rosa Island manzanita has affected its ability to reproduce; Clark reported not seeing a single seedling during a survey in 1988 (Ronilee Clark, ecologist, California Park Service, pers. comm. 1994).

The widespread effects of grazing on island vegetation have been illustrated through the above examples; similar effects on the proposed taxa are inferred. However, specific examples of

browsing or grazing by alien mammals on certain proposed taxa have been observed, including *Castilleja mollis, Gilia tenuiflora* ssp. *hoffmannii, Arabis hoffmannii,* and *Thysanocarpus conchuliferus.* In 1993, perhaps as much as 20 percent of the Carrington Point populations of *Castilleja mollis* were consumed by deer. Individual plants were excavated, leaving depressions in the sandy soils where plants had been observed five months earlier (Sarah Chaney, CINP, pers. comm. 1993).

Grazing can completely eliminate plants and prevent the supplement of seed to the seed bank. Of the six collections of *Gilia* in the herbarium at the Santa Barbara Botanic Garden, only two collections made during April 1941 show no signs of browsing. The remaining four collections were made between the months of May and June between 1963 and 1978, and all show signs of having been browsed (Rutherford and Thomas, in litt. 1994). In 1993, Thomas visited the *Gilia* population twice; during the first visit in April, the *Gilia* had not been browsed, but by the second visit in May, the *Gilia* had been browsed (Thomas, in litt. 1993). In response to such browsing, the annual *Gilia* forms multiple side branches; an individual plant may produce a greater number of flowers, but this does not necessarily increase the fecundity of the plant (Painter and Belsky 1993). Flowers produced later in the season out of synchrony with pollinator activity lowers seed productivity.

The Nature Conservancy has been monitoring population sizes for *Arabis hoffmannii* on Santa Cruz Island since 1990. In 1993, only 19 individuals were observed in the Centinela population; this represented a net loss of 13 individuals from the previous year, with mortality of 9 of those plants ''directly attributed to pig rooting'' (Klinger 1994a). Pigs also ''rooted up entirely'' 6 out of 14 populations of *Thysanocarpus conchuliferus* that were monitored in 1993 (Klinger 1994b).

All of the taxa included in this proposal, with the exception of *Berberis pinnata* ssp. *insularis,* have populations that are subject to predation by one or more non-native mammals. Apparently, the roots of *Berberis* species are often toxic (Williams 1993), making consumption by feral pigs unlikely.

The response of plant communities to the removal of grazing depends in part on the degree of disturbance that has already been caused by grazing. Lightly grazed areas may return to pregrazing conditions more quickly. In areas that have been more heavily grazed, the loss of soils and their physical and biotic properties may favor the recovery of certain species over others once grazing has been eliminated. If ecosystem processes have been reduced or eliminated through heavy and/or long-term grazing, pre-grazing conditions may never be attained during the recovery process. The effects of the removal of grazing from the proposed taxa are unknown. While populations of other island taxa have increased once grazing pressure has been removed (Peart *et al.* 1994, Wehtje 1994), other taxa, such as the insular form of Torrey pine (Pinus torreyana), may decrease with a reduction in grazing pressure (Viers and Halvorson 1994). Junak observed that after sheep were removed in 1989, Helianthemum greenei populations increased in size for several years, most likely in response to the release of grazing pressure. However, with grazing pressure removed, other shrub taxa also increased in cover, leading to increased competition for resources, and a subsequent decline in *Helianthemum greenei* population sizes (S. Junak, pers. comm. 1994).

Diseases are not specifically known to threaten any of the taxa included in this proposal.

D. The Inadequacy of Existing Regulatory Mechanisms

Under the Native Plant Protection Act (sec. 1900 *et seq.* of the Fish and Game Code) and the California Endangered Species Act (sec. 2050 *et seq.*), the California Fish and Game Commission has listed *Dudleya nesiotica* and *Galium buxifolium* as rare and *Berberis pinnata* ssp. *insularis* and *Malacothamnus fasciculatus* ssp. *nesiotica* as endangered. The remaining taxa included in this listing proposal, excepting *Dudleya* sp. nov. ''East Point,'' are on List 1B of the California Native Plant Society's Inventory (Smith and Berg 1988), indicating that, in accordance with sec. 1901, chapter 10 of the California Department of Fish and Game Code, they are eligible for State listing. Though both the Native Plant Protection Act and the California Endangered Species Act prohibit the ''take'' of State-listed plants (sec. 1908 and sec. 2080 of the Fish and Game Code), State law appears to exempt the destruction of such plants via habitat modification or land use change by the landowner. After the California Department of Fish and Game notifies a landowner that a State-listed plant grows on his or her property, State law requires only that the landowner notify the agency ''at least 10 days in advance of changing the land use to allow salvage of such plant'' (sec. 1913). Privately owned lands that support populations of the taxa in this proposal include most of Santa Cruz Island, 90 percent of which is owned by TNC; the remaining 10 percent is owned jointly by NPS and a private landowner. On Santa Catalina Island, habitat for *Helianthemum greenei* occurs on land managed by the Catalina Conservancy, a private conservancy owned by the Catalina Island Company. In general, these State regulatory mechanisms would not likely be invoked, because major changes in land use, such as development projects, are not likely to be proposed on these properties. Furthermore, without such proposed changes in land use, the State is unlikely to take regulatory action over ongoing activities, such as cattle, sheep, goat, and bison grazing, and deer browsing.

The California Fish and Game Commission (Commission) also regulates hunting on private and public lands by issuing permits for the take of a specified number of animals and taking measures to manage herd sizes. The Commission issues permits for deer hunting on Santa Catalina Island. In 1993, the Commission issued 300 tags for deer hunting on the island; due to an increasing herd size, the Commission may grant a request from the Catalina Island Company to issue a larger number of tags in 1994 (Ken Mayer, California Department of Fish and Game (CDFG), pers. comm. 1994). Pigs are considered livestock if they are fenced or marked, but considered wild game if they are unfenced and unmarked. The Catalina Island Company has entered into a Memorandum of Understanding (MOU) with CDFG to allow eradication of feral pigs on Catalina Island (Mayer, pers. comm. 1994). A similar MOU between CDFG and TNC exists for the removal of pigs from Santa Cruz Island. Bison, which occur on Santa Catalina Island, are considered livestock and therefore not regulated by any agency. Apparently, the Commission has no regulatory authority over hunting or herd size of deer and elk on Santa Rosa Island, because these ungulates were originally transported there under a game breeder's permit in the early 1900's.

Several Federal laws, Department of the Interior policies, and National Park Service policies and guidelines apply to the management of NPS lands. These laws and guidelines include the National Environmental Policy Act (NEPA), the Endangered Species Act, NPS guidelines for natural resources management (NPS 1991), and the CINP Statement for Management (NPS 1985). The 1980 Congressional legislation enabling purchase of Santa Rosa Island

as a national park from the Vail and Vickers Company stated that the owner ''may retain for himself a right of use and occupancy of all or such portion of the property as the owner may elect for a definite term of not more than twenty-five years, or ending at the death of the owner, or his spouse, whichever is later. The owner shall elect the term to be reserved. Any such right retained pursuant to this subsection with respect to any property shall be subject to termination by the Secretary upon his determination that such property is being used for any purpose which is incompatible with the administration of the park, or with the preservation of the resources therein, and it shall terminate by operation of law upon notification by the Secretary to the holder of the right of such determination and tendering to him the amount equal to the fair market value of that portion which remains unexpired'' (Public Law 96–199, 94 Stat. 67, March 5, 1980). The legislation also directed the Secretary to complete a natural resources study within two years that would supply an inventory of all terrestrial and marine species, indicating their population dynamics, and probable trends as to future numbers and welfare, and to recommend action that should be adopted to better protect the natural resources of the park.

Under this legislation, the former owners, the Vail and Vickers Company, chose to retain the rights to occupy 3.1 hectares (7.6 acres), to continue the cattle ranching operation, and to continue a commercial deer and elk hunting operation. To allow such continued use, NPS issues Special Use Permits (SUP) for five-year terms. The first SUP that was issued to Vail and Vickers Company included a condition that a range management plan be developed within five years. The plan, however, does not address protection of the proposed taxa (USFWS 1991, 1992, 1993). Due to unresolved NEPA issues (the apparent need to prepare an Environmental Impact Statement for the first SUP), the Record of Decision for the document has not been signed.

In a recent review of the range management plan, the Service found that measuring residual dry matter, the proposed means of determining appropriate stocking rates, is inadequate to monitor other indicators of ecosystem health, including composition and diversity of species, and the condition of candidate plant species (USFWS 1993). The monitoring of sensitive resources within grazed areas is commonly recommended (NPS 1991, Ruyle 1987, Willoughby 1986), but in this case has not been included in the range management plan. Currently, the condition of the vegetation on Santa Rosa Island is monitored by assessing the residual dry matter of grassland vegetation, which is composed primarily of non-native species (NPS 1993).

San Miguel Island and adjacent Prince Island (a small islet) are under the jurisdiction of the Department of the Navy (Navy), but NPS assists in the management of natural, historic, and scientific values of San Miguel Island through a Memorandum of Agreement (MOA) originally signed in 1963, an amendment signed in 1976, and a supplemental Interagency Agreement (IA) signed in 1985. The MOA states that the ''paramount use of the islands and their environs shall be for the purpose of a missile test range, and all activities conducted by or in behalf of the Department of the Interior on such islands, shall recognize the priority of such use'' (Department of the Navy 1963). In addition to San Miguel Island, four other islands including Anacapa, Santa Barbara, Santa Cruz, and Santa Rosa lie wholly within the Navy's Pacific Missile Test Center (PMTC) Sea Test Range. The 1985 IA provides for PMTC to have access and use of portions of those islands, for expeditious processing of any necessary permits by NPS, and for mitigation of damage of park resources from any such activity (Department of the Navy 1985). Should the Navy no longer require use of the islands, NPS would seek authorization for the islands to be preserved and protected as units within the NPS system (Department of the Navy 1976). To date, conflicts concerning protection of sensitive resources on San Miguel Island have not occurred; however, protection and management for the three proposed taxa that occur on the island, Galium buxifolium, Malacothrix squalida, and Phacelia insularis ssp. insularis, have not been addressed, leaving in question which agency has ultimate responsibility to do so.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Several species of non-native aggressive plant species are considered problematic invaders, including Australian fireweed (Erechtites glomerata), several species of iceplant (Carpobrotus spp., Mesembryanthemum spp.), several thistle species (Centaurea spp., Cirsium spp., Silybum sp.), German ivy (Senecio mikanoides), hoary cress (Cardaria draba), and Russian thistle (Salsola iberica). Over 180 species of non-native plant species have been documented from the northern island group (Hochberg et al. 1979, Halvorson et al. 1987). Displacement of native habitats and species has been a concern for the natural resource managers on the islands.

Fennel (Foeniculum vulgare) has apparently become widespread since the removal of sheep from Santa Cruz Island. Fennel was noticed as a pest species prior to the removal of sheep as reported in Hobbs (1983). Sheep kept the plant from growing to its full height of 2 m (6 ft); since their removal, the plant has ''appeared'' over large areas of the island. Several papers were presented at a recent (1994) symposium on techniques used to control fennel (Brenton and Klinger 1994, Dash and Gliessman 1994, Gliessman 1994), which, when left unchecked, completely dominates the habitats it occupies to the exclusion of other species. Fennel apparently contains a chemical that prevents other species from competing for occupied sites (Gliessman 1994).

Incidental introductions of seed to the Channel Islands occur constantly; sources include wind-blown seed from the mainland, introductions from restocking non-native animals, and operational equipment (vehicles and construction materials). Deliberate introductions of seed also occur; during the 1960's, one pilot recalled scattering bags of commercial wildflower and grass seed on most of the northern Channel Islands (Rutherford, in litt. 1994). When new introductions and established seed sources occur in areas with consistent disturbance resulting from grazing, browsing, and rooting by non-native mammals, the invasions can become overwhelming. These invasive species have a high probability of preventing recruitment and causing habitat displacement of all taxa in this proposed rule.

TNC acquired nine-tenths of Santa Cruz Island from the previous landowner in 1987. TNC's general goals for preserve management include the preservation, protection, restoration, and understanding of the natural resources (Rob Klinger, TNC, Santa Cruz Island, pers. comm. 1994). Although a specific management plan for the Santa Cruz Island Preserve has not been developed, certain management activities have already been undertaken. These activities include long-term monitoring of specific plant communities and rare plant populations; trial programs in feral pig removal, herbicide treatment of alien plant species, and controlled burns in grassland and island pine communities; and research on specific species, and response of plant communities to

removal of non-native mammals. A five-year trial feral pig removal program was successful in removing all but a few pigs from a 2,400-hectare (6,000-acre) exclosure on the south side of the island. The number of pigs has begun to increase. TNC also took immediate steps to remove sheep upon acquiring the property, but has been unable to manage the apparent rapid invasion of alien fennel that resulted from the release of grazing pressure. TNC is exploring options for implementing island-wide feral pig removal and other management activities; these options may include developing an agreement with NPS for that agency to manage the island.

The species that occupy insular habitats, like those found on the nearby mainland, have characteristics that enable them to recover from fire events. These characteristics include the production of seeds that respond favorably to fire temperatures and chemical products (charates) and root burls that resprout following a fire (Carroll *et al.* 1993). Tree ring histories from island Torrey pines with fire scars reveal that pre-livestock fire events occurred at 20 to 30 year intervals (Viers and Halvorson 1994). Since little evidence exists that lightning fires occur at these frequencies (Carroll *et al.* 1993), man is implicated as the principal agent of ignition (Timbrook *et al.* 1982).

Fire has been removed as a functioning ecological process on the islands for over 150 years. The absence of fire has created an imbalance in recruitment and regeneration of ecosystem components, including many of the proposed species. Therefore, the current distribution of island vegetation does not represent prehistoric conditions (Minnich 1980). Many of the brushland species will not regenerate without fire and with age will die back. Browsing and grazing animals reduce the probability of survival for these fire-adapted species by removing seed and seedlings. This could be devastating to recruitment following a fire event. Seedling consumption could effectively terminate the subsequent generation necessary to re-establish the seed bank.

The fuel load (the amount of standing and downed vegetation) has been dramatically altered from heavy (brush) to light (grass) through the agents of ranching and sport hunting management. The characteristic fire intensities and durations shifted from long duration and high intensity with brush fuels to short duration and light intensities with grass fuels. The life history requirements of most taxa in this proposed rule (*Arabis hoffmannii, Arctostaphylos confertiflora, Berberis pinnata* ssp. *insularis, Castilleja mollis, Galium buxifolium, Helianthemum greenei, Malacothamnus fasciculatus* var. *nesioticus, Malacothrix indecora, Malacothrix squalida, Phacelia insularis* ssp. *insularis,* and *Thysanocarpus conchuliferus*) are based upon the occurrence of fires to promote reproduction and reduce competition with other species.

Many of the known pollinators on the islands are ground-nesting insects (Miller 1985, Miller and Davis 1985). The habitat of these ground-nesting insects has been and is being degraded by trampling and serious loss of soils to active erosion on all of the islands.

The small numbers of isolated populations and individuals of most of these taxa increase the potential for extinction from stochastic events. Five of the proposed taxa, *Dudleya blochmaniae* ssp. *insularis, Dudleya* sp. nov. ''East Point,'' *Dudleya nesiotica, Gilia hoffmannii,* and *Malacothrix indecora,* are known from single populations. Six other proposed taxa, *Arabis hoffmannii, Berberis pinnata* ssp. *insularis, Castilleja mollis, Malacothamnus fasciculatus* ssp. *nesioticus, Malacothrix squalida,* and *Phacelia insularis* ssp. *insularis,* are known from only two to five populations.

Species with small numbers of populations and individuals are subject to the threat of stochastic extinction in several ways. First, the loss of genetic diversity may decrease the species' ability to maintain fitness within the environment, and is frequently manifested in depressed reproductive vigor. From the genetic analyses conducted for the two populations of *Malacothamnus fasciculatus* var. *nesioticus,* Swenson *et al.* (in prep.) concluded that the two genotypes represented in each of the two populations ''probably represent only a portion of the diversity once present in var. *nesioticus.*'' Elisens (1994) documented reduced levels of genetic diversity in *Galvesia speciosa,* a Channel Islands endemic plant and Category 2 candidate for Federal listing, and noted that the levels were ''likely the result of decreased population sizes initiated by human activities and herbivore introductions.''

Secondly, species with low numbers of populations or individuals may be subject to forces that affect their ability to complete their life cycle successfully. *Arctostaphylos confertiflora,* like a host of other perennial shrub and tree taxa that are candidates for Federal listing on the northern Channel Islands, provides an excellent example of this type of threat. The only remaining individuals of this species are of moderate to old age, and the establishment of new individuals is completely lacking. The effects of browsing animals on critical portions of the species' life cycle has resulted in the inability of the species to establish new individuals to replenish the population. The degree of pollination success for manzanita flowers is unknown; however, the presence of alien grazing and browsing animals has most likely depressed the number of native pollinators available to the native plants. Even if pollination occurs and results in successful fruiting, the fruits are eaten by browsing animals. Even if fruits escape predation and seeds do germinate, the seedlings are either trampled or eaten by those same animals. All of the species in this rule that occur on Santa Rosa, Santa Cruz, and Santa Catalina Islands are similarly affected.

Thirdly, catastrophic environmental events, such as storms, drought, fire, or landslides, could destroy a significant percentage of a species' individuals, or the only known extant population. *Arabis hoffmannii* and *Thysanocarpus conchuliferus* are examples of species that could sustain losses of individuals and populations through landslides and soil sloughing as a result of storm events.

In summary, stochastic events can affect species on three different levels: through loss of genetic diversity, through chance events in survival and reproduction, and through catastophic environmental events. When numbers of populations and individuals reach critically low levels, more than one of the three types of stochastic events may combine to cause extinction. For instance, a species that has had low reproductive success due to grazing or browsing pressure during a critical portion of its life cycle may subsequently be subject to a severe drought or storm event that eliminates any remaining individuals or populations. Stochastic extinction constitutes a major threat to all of the taxa being proposed.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these taxa in determining to propose this rule. Based on this evaluation, the preferred action is to propose *Arabis hoffmannii, Arctostaphylos confertiflora, Berberis pinnata* ssp. *insularis, Castilleja mollis, Dudleya blochmaniae* ssp. *insularis, Dudleya* sp. nov. ''East Point,'' *Dudleya nesiotica, Galium buxifolium, Gilia tenuiflora* ssp. *hoffmannii, Helianthemum greenei, Heuchera maxima, Malacothamnus*

fasciculatus ssp. *nesioticus, Malacothrix indecora, Malacothrix squalida, Phacelia insularis* ssp. *insularis,* and *Thysanocarpus conchuliferus* as endangered. Threats to the 16 taxa include soil loss, habitat alteration by mammals alien to the Channel Islands (pigs, goats, sheep, donkeys, cattle, deer, elk, horses, bison) and direct predation by these same alien mammals, habitat alteration by native seabirds, habitat alteration due to vehicular traffic, overcollection for scientific or horticultural purposes, and competition with alien plant taxa. The 16 taxa also have an increased vulnerability to extinction due to reduced genetic viability, depressed reproductive vigor, and stochastic environmental events resulting from small numbers of individuals and populations. Because these 16 taxa are in danger of extinction throughout all or a significant portion of their ranges, they fit the definition of endangered as defined in the Act. Critical habitat is not being proposed for these taxa for reasons discussed in the ''Critical Habitat'' section of this proposal.

Critical Habitat

Critical habitat is defined by section 3 of the Act as: (i) the specific areas within the geographical area occupied by a 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 a 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 any protected species to the point at which the measures provided pursuant to the Act are no longer necessary (50 CFR 424.02(c)).

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 specify critical habitat at the time a species is proposed for listing. The Service finds that designation of critical habitat is not prudent for *Arabis hoffmannii, Arctostaphylos confertiflora, Berberis pinnata* ssp. *insularis, Castilleja mollis, Dudleya blochmaniae* ssp. *insularis, Dudleya* sp. nov. ''East Point,'' *Dudleya nesiotica, Galium buxifolium, Gilia tenuiflora* ssp. *hoffmannii, Helianthemum greenei, Heuchera maxima, Malacothamnus fasciculatus* ssp. *nesioticus, Malacothrix indecora, Malacothrix squalida, Phacelia insularis* ssp. *insularis,* and *Thysanocarpus conchuliferus* 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 such threat to the species, or (2) such designation of critical habitat would not be beneficial to the species.

The National Park Service, the Department of Defense, The Nature Conservancy, and other pertinent parties have been notified of the location and importance of protecting these species' habitat. Because protection of these species' habitat will be addressed through the recovery process and through the section 7 consultation process as a result of listing these species, there would be little additional benefit to designating critical habitat. Therefore, the Service finds that designation of critical habitat for these plants is not prudent at this time as such designation would provide little additional benefit beyond that provided through the section 7 consultation process.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against certain activities involving listed plants are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) requires Federal agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is subsequently listed, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

The Service and NPS have recently agreed to pursue development of a Conservation Agreement under the Secretary of the Interior's directive for Federal agencies to cooperate in the conservation of species for which listing may be appropriate (U.S. Dept. of Interior 1994). The Conservation Agreement would focus on the prelisting recovery needs of the other plant and animal candidate taxa from the northern Channel Islands, such that listing for some of those taxa may be avoided, and would also serve as a template for the future development of a recovery strategy for the 16 taxa included in this proposal. In addition, if threats to these 16 taxa can be reduced or eliminated, final listing of some or all of the proposed taxa may be precluded.

Of the 16 proposed taxa, all except 3 (*Dudleya nesiotica, Malacothamnus fasciculatus* ssp. *nesioticus,* and *Thysanocarpus conchuliferus*) have populations or historical habitat located on Federal lands. Three of the taxa (*Galium buxifolium, Malacothrix indecora,* and *Phacelia insularis* ssp. *insularis*) have populations or historical habitat on San Miguel Island, which is owned by the Navy and managed by NPS through a Memorandum of Agreement and Interagency Agreement. Navy activities that could potentially affect these taxa and their habitats include military exercises and equipment testing and retrieval carried out under the Executive Order that established the Pacific Missile Test Center (PMTC) Sea Test Range, which includes Anacapa, San Miguel, Santa Barbara, Santa Cruz, and Santa Rosa Islands and their environs.

Three of the taxa (*Berberis pinnata* ssp. *insularis, Heuchera maxima,* and *Malacothrix squalida*) have populations or historical habitat on Anacapa Island, which is owned and managed by NPS. Eleven of the 16 taxa have populations or historical habitat on Santa Rosa Island, which is owned and managed by NPS. Five of those 11 taxa are single island endemics (*Arctostaphylos confertiflora, Castilleja mollis, Dudleya blochmaniae* ssp. *insularis, Dudleya* sp. nov. ''East Point,'' *Gilia tenuiflora* ssp. *hoffmannii*). NPS activities that could potentially affect these taxa and their

habitats include specific management plans, including those that address expansion of park facilities; expansion of visitor services; range management plans, including those that address cattle ranching and deer and elk hunting; alien plant removal programs; and other ecosystem restoration programs. Other activities include the issuing of permits, including Special Use Permits, that authorize continued ranching and hunting operations on Santa Rosa Island. Also included are permits that authorize activities by other agencies or organizations, including rights-of-way to the Department of Commerce to access lighthouse and communication facilities. The enabling legislation that authorized NPS purchase of Santa Rosa Island also provides a mechanism to ensure protection of the island's natural resources. Sections 202(d)(1) and 202(d)(2) of Title II, Public Law 96–199, state that if the Secretary of the Interior determines the property is being used for any purpose that is incompatible with the administration of the park or with the preservation of its resources, the Secretary shall terminate the retained right and use of occupancy by the former owner.

As mentioned above, there are four taxa that occur wholly on lands owned and managed by TNC. Future management of Santa Cruz Island may involve NPS as a cooperator, since the island is within National Park boundaries. NPS has already developed a keen interest in the conservation of the proposed taxa on Santa Cruz Island, and the Service would anticipate coordination with NPS on issues affecting those taxa.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered plants. All prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR 17.61, apply. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to import or export, transport in interstate or foreign commerce in the course of a commercial activity, sell or offer for sale in interstate or foreign commerce, or remove and reduce the species to possession from areas under Federal jurisdiction. In addition, the Act prohibits the malicious damage or destruction on areas under Federal jurisdiction and the removal, cutting, digging up, or damaging or destroying of such plants in knowing violation of any State law or regulation, including State criminal trespass law. Certain exceptions to the prohibitions apply to agents of the Service and State conservation agencies.

It is the policy of the Service, published in the **Federal Register**, (59 FR 34272) on July 1, 1994, to identify to the maximum extent practicable at the time a species is listed those activities that would or would not be likely to constitute a violation of section 9 of the Act. The intent of this policy is to clarify the potential impacts of a species' listing on proposed and ongoing activities within the species' range. Nine of the 16 taxa in this proposed rule are known to occur on lands under the jurisdiction of the National Park Service or Department of Defense; an additional 4 taxa historically occurred on these same Federal lands, and potential habitat may still exist. Collection, damage, or destruction of listed species on these lands is prohibited. However, authorization to incidentally remove or destroy such species on Federal lands may be granted by the Fish and Wildlife Service for any otherwise legal action funded, authorized, or implemented by a Federal agency through section 7 of the Act. The removal and reduction to possession of listed species on Federal lands for research activities may be authorized by the Service under section 10(a)(1)(B) of the Act.

Section 9 of the Act prohibits removal, cutting, digging up, damaging, or destroying listed species on Federal or non-Federal lands in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law. As an example, if individuals of a listed plant species were grazed or trampled by cattle while the livestock was trespassing on either Federal or non-Federal land, a violation of section 9 may exist. However, if the livestock grazing occurred under the authority of a local permit on non-Federal land or under a section 7 consultation on Federal land, section 9 would not be violated. Questions regarding whether specific activities would constitute a violation of section 9 should be directed to the Field Supervisor of the Service's Ventura Field Office (see **ADDRESSES** section).

The Act and 50 CFR 17.62 and 17.63 also provide for the issuance of permits to carry out otherwise prohibited activities involving endangered plants under certain circumstances. Such permits are available for scientific purposes and to enhance the propagation or survival of the species. Requests for copies of the regulations regarding listed species and inquiries about prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Endangered Species Permits, 911 N.E. 11th Avenue, Portland, Oregon 97232–4181 (telephone 503/231–2063, facsimile 503/231–6243).

Public Comments Solicited

The Service intends that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule are hereby solicited. Comments particularly are sought concerning:

(1) Biological, commercial trade, or other relevant data concerning any threat (or lack thereof) to these species;

(2) The location of any additional populations of these species and the reasons why any habitat should or should not be determined to be critical habitat as provided by section 4 of the Act;

(3) Additional information concerning the range, distribution, and population size of these species; and

(4) Current or planned activities in the subject area and their possible impacts on these species.

Final promulgation of the regulations on these species will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final regulation that differs from this proposal.

The Endangered Species Act provides for a public hearing on this proposal, if requested. Requests must be received by September 25, 1995. Such requests must be made in writing and addressed to the Field Office Supervisor of the Ventura Field Office (see **ADDRESSES** section).

National Environmental Policy Act

The Fish and Wildlife Service has determined that Environmental Assessments and Environmental Impact Statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

References Cited

A complete list of all references cited herein, as well as others, is available upon request from the Ventura Field Office (see **ADDRESSES** section).

Authors: The primary authors of this proposed rule are Constance Rutherford and

Tim Thomas, botanists, Ventura Field Office (see **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

Proposed Regulations Promulgation

Accordingly, the Service hereby proposes to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—[AMENDED]

1. The authority citation for Part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. Section 17.12(h) is amended by adding the following, in alphabetical order under FLOWERING PLANTS, to the List of Endangered and Threatened Plants to read as follows:

§ 17.12 Endangered and threatened plants.

* * * * *

(h) * * *

Species		Historic range	Family name	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
FLOWERING PLANTS							
*	*	*	*	*	*	*	
Arabis hoffmannii	Hoffman's rockcress	U.S.A. (CA)	Brassicaceae—Mustard.	E		NA	NA
*	*	*	*	*	*	*	
Arctostaphylos confertiflora.	Santa Rosa Island manzanita.	U.S.A. (CA)	Ericaceae—Heath	E		NA	NA
*	*	*	*	*	*	*	
Berberis pinnata ssp. *insularis.*	Island barberry	U.S.A. (CA)	Berberidaceae—Barberry.	E		NA	NA
*	*	*	*	*	*	*	
Castilleja mollis	Soft-leaved Indian paintbrush.	U.S.A. (CA)	Scrophulariaceae Figwort.	E		NA	NA
*	*	*	*	*	*	*	
Dudleya blochmaniae ssp. *insularis.*	Santa Rosa Island dudleya.	U.S.A. (CA)	Crassulaceae—Stonecrop.	E		NA	NA
*	*	*	*	*	*	*	
Dudleya sp. nov. ''East Point''.	Munchkin dudleya	U.S.A. (CA)	Crassulaceae—Stonecrop.	E		NA	NA
*	*	*	*	*	*	*	
Dudleya nesiotica	Santa Cruz Island dudleya.	U.S.A. (CA)	Crassulaceae—Stonecrop.	E		NA	NA
*	*	*	*	*	*	*	
Galium buxifolium	Island bedstraw	U.S.A. (CA)	Rubiaceae—Bedstraw.	E		NA	NA
*	*	*	*	*	*	*	
Gilia tenuiflora ssp. hoffmannii.	Hoffmann's gilia	U.S.A. (CA)	Polemoniaceae—Phlox.	E		NA	NA
*	*	*	*	*	*	*	
Helianthemum greenei.	Island rush rose	U.S.A. (CA)	Cistaceae—Rockrose.	E		NA	NA
*	*	*	*	*	*	*	
Heuchera maxima	Island alumroot	U.S.A. (CA)	Saxifragaceae—Saxifrage.	E		NA	NA
*	*	*	*	*	*	*	
Malacothamnus fasciculatus ssp. nesioticus.	Santa Cruz Island bush-mallow.	U.S.A. (CA)	Malvaceae— Mallow.	E		NA	NA

Species		Historic range	Family name	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	*
Malacothrix indecora	Santa Cruz Island malacothrix.	U.S.A. (CA)	Asteraceae—Aster	E		NA	NA
*	*	*	*	*	*	*	*
Malacothrix squalida	Island malacothrix	U.S.A. (CA)	Asteraceae—Aster	E		NA	NA
*	*	*	*	*	*	*	*
Phacelia insularis ssp. insularis.	Island phacelia	U.S.A. (CA)	Hydrophyllaceae —Waterleaf	E		NA	NA
*	*	*	*	*	*	*	*
Thysanocarpus conchuliferus.	Santa Cruz Island lacepod.	U.S.A. (CA)	Brassicaceae—Mustard.	E		NA	NA
*	*	*	*	*	*	*	*

Dated: July 7, 1995.

Mollie H. Beattie,

Director, Fish and Wildlife Service.

[FR Doc. 95–18242 Filed 7–24–95; 8:45 am]

BILLING CODE 4310–55–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 227

[Docket No. 950407093–5179–02; I.D. 012595A]

Endangered and Threatened Species; Proposed Threatened Status for Three Contiguous ESUs of Coho Salmon Ranging From Oregon Through Central California

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Proposed rule; request for comments.

SUMMARY: NMFS has completed a comprehensive status review of coho salmon (*Oncorhynchus kisutch*) populations from southern British Columbia to southern California, and has identified six evolutionarily significant units (ESUs) within this range. NMFS is now issuing a proposed rule to list three of these ESUs as threatened (Oregon coast, southern Oregon/northern California, and central California coast). NMFS is also adding two ESUs (Puget Sound/Strait of Georgia, lower Columbia River/southwest Washington coast) to the candidate species list because, while there is not sufficient information available at this time to indicate that coho salmon in either ESU warrant protection under the Endangered Species Act (ESA), NMFS has identified specific risk factors and concerns that need to be resolved prior to assessing the overall health of the ESUs.

NMFS is requesting public comments and input on the biological issues pertaining to the proposal. NMFS also is soliciting suggestions and input on integrated local/state/federal conservation measures that might best achieve the purposes of the ESA relative to recovering the health of coho salmon populations and the ecosystems upon which they depend. Should the proposed listings be made final, protective regulations under the Endangered Species Act (ESA) would be put into effect and a recovery program(s) would be implemented.

DATES: Comments must be received by October 23, 1995. NMFS will announce the dates and locations of public hearings in Washington, Oregon, and California in a separate **Federal Register** document. Requests for additional public hearings must be received by September 8, 1995.

ADDRESSES: Comments on this proposed rule and requests for public hearings should be sent to the Environmental and Technical Services Division, NMFS, Northwest Region, 525 NE Oregon Street, Suite 500, Portland, OR 97232–2737.

FOR FURTHER INFORMATION CONTACT: Garth Griffin, 503–230–5430, Craig Wingert, 310–980–4021, or Marta Nammack, 301–713–1401.

SUPPLEMENTARY INFORMATION:

Petition Background

On July 21, 1993, NMFS received a petition from Oregon Trout, Portland Audubon Society, and Siskiyou Regional Educational Project (Oregon Trout et al.) to list five or more ESUs (See Consideration as a ''Species'' under the ESA) of indigenous, naturally spawning coho salmon in Oregon and to designate critical habitat under the ESA. The five ESUs identified by the petitioners included coho salmon populations from rivers south of Cape Blanco, the Coquille and Coos Rivers, the Umpqua River, rivers between the Umpqua and Nehalem rivers, and the Columbia River. On October 27, 1993, NMFS published a notice of finding (58 FR 57770) that a listing may be warranted, soliciting information about the status of all populations of coho salmon in Washington, Oregon, and California. NMFS determined that such an expanded status review was warranted due to the general decline in many West Coast coho salmon populations.

Supplemental to the July 21, 1993, petition, on October 20, 1993, NMFS received a petition from Pacific Rivers Council and 22 co-petitioners (PRC et al.) to list under the ESA, either on an emergency basis or through normal listing procedures, all coho salmon populations in Washington, Idaho, Oregon, and California, and to designate critical habitat. On January 26, 1994, NMFS published a notice of finding (59 FR 3662) that a non-emergency listing may be warranted, soliciting information about the status of all populations of coho salmon ''coastwide'' (hereinafter defined as populations in the southern portion of the species' range inhabiting rivers south of Queen Charlotte Strait, British Columbia). The notice also announced that information submitted in response to the PRC et al. petition would be used in NMFS' coastwide review of coho salmon populations already underway (58 FR 57770, October 27, 1993).

Prior to the Oregon Trout et al. and PRC et al. petitions, NMFS received two