

subcontract resulting from the change order or modification is proposed to exceed \$100,000 or is one of a number of subcontracts with a single subcontractor for the same or related supplies or services that are expected cumulatively to exceed \$100,000.

(iv) In addition, any subcontract under a cost type prime contract shall be identified for special surveillance if consent was not provided at the time of contract award and cost or pricing data would be required in accordance with FAR 15.404-3(c).

1844.201-2 [Removed]

5. Section 1844.201-2 is removed.

[FR Doc. 98-21617 Filed 8-11-98; 8:45 am]

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AD09

Endangered and Threatened Wildlife and Plants; Final Rule Listing Five Plants From Monterey County, CA, as Endangered or Threatened

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) determines endangered status pursuant to the Endangered Species Act of 1973, as amended (Act), for four plants: *Astragalus tener* var. *titi* (coastal dunes milk-vetch), *Piperia yadonii* (Yadon's piperia), *Potentilla hickmanii* (Hickman's potentilla), and *Trifolium trichocalyx* (Monterey clover); and threatened status for *Cupressus goveniana* ssp. *goveniana* (Gowen cypress). The five taxa are found primarily along the coast of northern Monterey County, California, with one species also occurring in San Mateo County and historical populations of another occurring in Los Angeles and San Diego counties. The five plant taxa are threatened by one or more of the following: alteration, destruction, and fragmentation of habitat resulting from urban and golf course development; recreational activities; competition with alien species; and disruption of natural fire cycles due to fire suppression associated with increasing residential development around and within occupied habitat. *Astragalus tener* var. *titi* and *Potentilla hickmanii* are also more susceptible to extinction by random events due to their small

numbers of populations or individuals. This rule implements the Federal protection and recovery provisions afforded by the Act for these plant taxa. A notice of withdrawal of the proposal to list the black legless lizard (*Anniella pulchra nigra*), which was proposed for listing along with the five plant taxa considered in this rule, is published concurrently with this rule.

DATES: This rule is effective September 11, 1998.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, 2493 Portola Road, Suite B, Ventura, California, 93003.

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

SUPPLEMENTARY INFORMATION:

Background

The Monterey Peninsula on the central California coast has been noted for a high degree of species endemism (Axelrod 1982, Howitt 1972). Species with more northern affinities reach their southern limits on the Peninsula; species with more southern affinities reach their northern limits there as well (Howitt and Howell 1964). The Monterey Peninsula is influenced by a maritime climate that is even more pronounced due to the upwelling of cool water from the Monterey submarine canyon. Rainfall amounts to only 38 to 51 centimeters (cm) (15 to 20 inches (in)) per year, but summer fog-drip is a primary source of moisture for plants that would otherwise not be able to persist with such low rainfall. Some taxa, such as the coastal closed-cone pines and cypresses are relicts, i.e., stands of species that once had a more continuous, widespread distribution in the more mesic climate of the late Pleistocene period, but then retreated to small pockets of cooler and wetter conditions along the coast ranges during the hotter and drier xerothermic period between 8,000 and 4,000 years ago (Axelrod 1982).

In 1602, the Spanish government commissioned Sebastian Viscaino to map the coastline; he traveled as far north as the Mendocino coast. In his journal, he made note of the "pine covered headlands" and the "great pine trees, smooth and straight, suitable for the masts and yards of ships" that he saw while anchored in Monterey Bay (Larkey 1972). During the early 1900s, Willis L. Jepson characterized the

forests on the Monterey Peninsula as the "most important silva ever," and encouraged Samuel F.B. Morse of the Del Monte Properties Company to explore the possibilities of preserving the unique forest communities. Morse believed that developing recreational facilities would allow income to be derived from the property while maintaining the forest intact (Larkey 1972).

Maps compiled by the U.S. Forest Service (FS) to show plant associations that were similar in "fire-hazard characteristics and in uses or qualities of economic importance" portray the bulk of the Monterey Peninsula as Monterey pine (*Pinus radiata*) forest with a discrete stand of Bishop pine (*Pinus muricata*) in the center of the Peninsula (FS 1941). The coastline was fringed with either "barren" stretches, grassland, or "sagebrush," and a stretch of "cypress species" extending east along the coast from what is known as Cypress Point. By 1930, however, the construction of three golf courses likely resulted in the removal of some stands of Monterey pines.

Only three native Monterey pine stands remain in California, one on the Monterey Peninsula, a second near Año Nuevo Point in northern Santa Cruz and southern San Mateo counties, and a third near Cambria, in San Luis Obispo County. The Monterey Peninsula stand is not only the most extensive of the three, it is also unique in its association with *Pinus muricata*, *Cupressus goveniana* ssp. *goveniana* (Gowen cypress), and *Cupressus macrocarpa* (Monterey cypress). While *P. radiata* grows well on a variety of soils, it does not do well on the acidic, poorly-drained soils found on Huckleberry Hill centrally located on the Monterey Peninsula (Griffin 1972). Here, the less aggressive *C. goveniana* ssp. *goveniana* and *P. muricata* are spared competition from *P. radiata*. Some of the chaparral species associated with these forest stands include *Arctostaphylos hookeri* ssp. *hookeri* (Hooker's manzanita), *Arctostaphylos tomentosa* var. *tomentosa* (shaggy-barked manzanita), *Adenostema fasciculata* (chamise), and *Vaccinium ovatum* (huckleberry) (Jones and Stokes Assoc. 1994b; Vogl *et al.* 1988).

Much of what the FS mapped in 1941 as grassland or "barren" (which most likely included coastal dunes) on the peninsular coastline has been subsequently converted to golf courses. Remnant dunes support a coastal dune scrub community and the southernmost occurrences for *Erysimum menziesii* (Menzies wallflower), *Lupinus tidedromii* (Tidestrom's lupine), and

Gilia tenuiflora ssp. *arenaria* (dune gilia), all federally endangered species (U.S. Fish and Wildlife Service (USFWS) 1992). It is uncertain what species characterized the grasslands mapped by the FS. Aside from harboring small populations of several of the species that are included in this final rule, these patches of herbaceous vegetation now support a large number of alien grasses and succulents (Ferreira 1995). As for the patches mapped by the FS as "sagebrush," these most likely matched what is currently called coastal sage scrub, a community dominated by *Artemisia californica* (California sagebrush). For the most part, these patches occurred within what are now urbanized portions of the cities of Monterey and Pacific Grove and the Pacific Grove Municipal Golf Course.

Discussion of the Five Taxa

Astragalus tener var. *titi* (coastal dunes milk-vetch) was first collected by Mrs. Joseph Clemens in 1904 along 17-Mile Drive on the Monterey Peninsula "near an old hut composed of abalone shells and coal-oil cans." Alice Eastwood named the plant *Astragalus titi* in honor of Dr. F. H. Titus (Eastwood 1905). Subsequently, John Thomas Howell (1938), while comparing a specimen of *A. tener* that was collected by David Douglas near Salinas, Monterey County, remarked that although "*Astragalus titi* Eastwood has generally been regarded as the same as *Astragalus tener*, * * * the two plants are not the same and *Astragalus titi* seems worthy of varietal, if not specific recognition." Rupert Barneby published the combination *A. tener* var. *titi* in 1950, noting the difference in flower size, habitat, and geographic range between it and *A. tener* var. *tener* (Barneby 1950).

Astragalus tener var. *titi* is a diminutive annual herb of the pea family (Fabaceae). The slender, slightly pubescent stems reach 1 to 2 decimeters (dm) (4 to 8 in) in height; the pinnately compound leaves are 2 to 7 cm (0.8 to 2.7 in) long with 7 to 11 leaflets, each having a slightly bilobed tip. The tiny lavender to purple flowers are 5 to 6 millimeters (mm) (0.3 in) long and are arranged in subcapitate racemes of 2 to 12 flowers. The seed pods are straight to sickle-shaped and 7 to 14 mm (0.3 to 0.6 in) long (Barneby 1964).

Two historical locations from Los Angeles County (Hyde Park in Inglewood and Santa Monica) and two from San Diego County (Silver Strand and Soledad) were annotated by Barneby as *Astragalus tener* var. *titi* (Barneby 1950). It is unlikely that suitable habitat remains at the Los

Angeles locations, since the area has been heavily urbanized. In San Diego County, the Silver Strand area is owned by the Department of Defense (Miramar Naval Weapons Center), and a portion has been used for amphibious vehicle training exercises. Another portion of Silver Strand has been leased by the Navy to the California Department of Parks and Recreation (CDPR) for development of a campground and recreational facilities. Numerous unsuccessful searches for the plant have been made in these locations since 1980 (Ferreira 1995; Natural Diversity Database (NDDDB) 1997).

The only known extant population of *Astragalus tener* var. *titi* occurs along 17-Mile Drive on the western edge of the Monterey Peninsula on land owned by the Pebble Beach Company and the Monterey Peninsula Country Club. Colonies of the milk-vetch occur on a relatively flat coastal terrace within 30 meters (m) (100 feet (ft)) of the ocean beach and 8 m (25 ft) above sea level. The loamy fine sands that comprise a series of shallow swales on the terrace surface support standing water during wet winter and spring seasons. Individual plants are found on the bottoms or sides of the swales growing in association with other low growing grasses and herbs, including the alien *Plantago coronopus* (cut-leaf plantain). In the 1980s and early 1990s, from 15 to 1,000 individuals had been counted in this population (Ferreira 1995). In 1995, four additional colonies of this taxon were located in similarly moist habitats within 400 m (1,300 ft) of the previously known plants. A thorough survey of surrounding patches of suitable habitat was made and a total of 4000 individuals were counted in 1995 in 11 scattered colonies (Jones and Stokes Assoc. 1996).

The 11 colonies are bisected by 17-Mile Drive, and occur in remnant patches of habitat that are bounded by roads, golf greens, equestrian trails and a bank covered by the alien plant, *Carpobrotus edulis* (fig-marigold) (Ferreira 1995, Jones and Stokes Assoc. 1996). *Astragalus tener* var. *titi* is currently threatened with alteration of habitat from trampling associated with recreational activities, such as hiking, picnicking, ocean viewing, wildlife photography, equestrian use, and golfing. Due to the fragmented nature of its habitat and the human uses that surround it, the species is also more vulnerable to extinction from random events. *Astragalus tener* var. *titi* may also be threatened by competition from the alien plants, *C. edulis* and *Plantago coronopus*.

Cupressus goveniana ssp. *goveniana* was first collected by Karl Hartweg from Huckleberry Hill (Monterey Peninsula) in 1846 (Sargent 1896, Wolf and Wagener 1948). The plant was described as *Cupressus goveniana* by British horticulturalist George Gordon in 1849 who named it after fellow horticulturalist James R. Gowen (Sargent 1896). Sargent (1896) described the tree as being widely distributed "from the plains of Mendocino County to the mountains of San Diego County" as he included taxa now recognized as distinct in his definition of *C. goveniana*. John G. Lemmon published the name *C. goveniana* var. *pigmaea* in 1895 to refer to the stands found on the "White Plains" of Mendocino County, also referred to as pygmy cypress or Mendocino cypress. As a result of this segregation, the material from the Monterey area would be treated as *C. goveniana* var. *goveniana*. The taxon is currently treated as *C. goveniana* ssp. *goveniana* (Bartel 1993).

Cupressus goveniana ssp. *goveniana* (Gowen cypress) is a small coniferous tree or shrub in the cypress (Cupressaceae) family. Most of the 10 taxa in the genus *Cupressus* found in California currently have relatively small ranges (Vogl *et. al.* 1988). Of the three coastal cypresses, native stands of *C. macrocarpa* (Monterey cypress) and *C. goveniana* ssp. *goveniana* are both restricted to the Monterey Peninsula and Point Lobos in Monterey County.

Cupressus goveniana ssp. *goveniana* generally reaches a height between 5 and 7 m (17 to 23 ft) (Munz 1968), though Griffin noted one individual that was 10 m (33 ft) high at Huckleberry Hill (Griffin and Critchfield 1976). The sparsely branched tree forms a short, broad crown with a spread of 2 to 4 m (7 to 13 ft). The bark is smooth brown to gray, but becomes rough and fibrous on old trees. The scale-like foliage is a light rich green, with leaves 1 to 2 mm long (0.04 to 0.08 in). The female cones are subglobose (nearly spherical), 10 to 15 mm (to 0.1 in) long, and produce 90 to 110 seeds (Wolf and Wagener 1948). The cones, which typically mature in 2 years, remain closed for many years while attached to the tree. Seeds can be released upon mechanical removal from the tree or, more typically, upon death of the tree or supporting branch. *Cupressus goveniana* ssp. *goveniana* is distinguished from its close relative *C. goveniana* ssp. *pigmaea* (pygmy or Mendocino cypress) by its much taller stature, the lack of a long, whip-like terminal shoot, and light to yellow-green rather than dark dull green foliage (Bartel 1993).

Like other closed-cone cypresses, *Cupressus goveniana* ssp. *goveniana* is a fire adapted species. It possesses cones which, after seed has matured, remain sealed and attached to the trees, typically until heat from fires breaks the cones' resinous seal and allows seeds to escape. Adequate sunlight and bare mineral soils are also needed by *C. goveniana* ssp. *goveniana* for seedling establishment; in areas with herbaceous cover seedling mortality is higher due to fungal infections (Vogl *et al.* 1988).

Only two natural stands of *Cupressus goveniana* ssp. *goveniana* are known to exist, although individuals can be found locally in cultivation. *Cupressus goveniana* ssp. *goveniana* is associated with *Pinus radiata*, *Pinus muricata*, and several taxa in the heath family (Ericaceae) (e.g., *Vaccinium*, *Gaultheria*, *Arctostaphylos*) on poorly drained, acidic, soils (Griffin and Critchfield 1976). The largest stand, referred to here as the Del Monte Forest stand, is near Huckleberry Hill on the western side of the Monterey Peninsula. This stand covers approximately 40 hectares (ha) (100 acres (ac)), with individuals scattered within a kilometer (km) (0.6 mile (mi)) of the main stand. Wolf and Wagener (1948) reported that patches of crowded, poorly developed individuals, referred to as "canes," were cut for posts, making it difficult to determine the original extent of the grove.

At least three fires have burned portions of the Del Monte Forest stand in the last 100 years. A large fire burned most of the stand in 1901 (Coleman 1905, and Dunning 1906, in Vogl *et al.* 1988). The northern portion of the stand apparently burned in 1959 (NDDDB 1997). The most recent fire burned the south central portion of the population in 1987. In each case, regeneration of *C. goveniana* ssp. *goveniana* has occurred.

The Del Monte Forest stand is on lands owned by the Pebble Beach Company and the Del Monte Forest Foundation (DMFF). The purpose of the DMFF, originally established as the Del Monte Foundation in 1961 by the Pebble Beach Company, is to "acquire, accept, maintain, and manage lands in the Del Monte Forest which are dedicated to open space and greenbelt" (DMFF, *in litt.* 1992). A large portion of the Del Monte Forest stand is within a 34-ha (84-ac) area designated as the Samuel F.B. Morse Botanical Reserve (Morse Reserve) in the 1960s and donated to DMFF in 1976. In the early 1980s, development of the Poppy Hills Golf Course removed 840 trees of *C. goveniana* ssp. *goveniana* outside of the reserve and surrounded other small patches with fairways (G. Fryberger, Pebble Beach Company, pers. comm.

1992). The majority of the remaining portion of this stand is on lands owned by Pebble Beach Company that are designated as "forested open space" in the Huckleberry Hill Open Space area, through a conservation easement held by the DMFF. Scattered groups of trees that radiate out from this stand are located on Pebble Beach Company lands within their most recently proposed residential developments (EIP Associates 1995).

A second smaller stand of *Cupressus goveniana* ssp. *goveniana* 16 to 32 ha (40 to 80 ac) in size occurs 10 km (6 mi) to the south at Point Lobos State Reserve near Gibson Creek on a 60-ha (150-ac) parcel acquired by the CDPR in 1962. The very western edge of the stand is on lands recently purchased by the Big Sur Land Trust from a private owner. This parcel was to be transferred to the CDPR in 1997 (Big Sur Land Trust, *in litt.* 1997). In this stand, *C. goveniana* ssp. *goveniana* is associated with *Pinus radiata* and chaparral species (Griffin and Critchfield 1976; Vogl *et al.* 1988). Due to the physical inaccessibility of the Point Lobos stand and the Reserve's mandate to protect sensitive plant taxa, the Point Lobos stand exhibits fewer signs of human disturbance than the Del Monte Forest stand.

Despite measures taken to protect the *Cupressus goveniana* ssp. *goveniana* stand at the Del Monte Forest, such as establishing the Morse Reserve, the opportunities for maintaining a viable long-term population of this taxon may be compromised by the site's proximity to urbanization. Although the lands on which the majority of the remaining cypress grow will not be developed, the residential development that is occurring on all sides of the stand reduces the opportunity for the continuation of ecosystem processes, such as periodic fire, which are needed for stand regeneration. This species is threatened by habitat alteration due to the influence of continued urban development in Pebble Beach and to the disruption of natural fire cycles that are likely to result from fire suppression activities. In addition, stands of *Cupressus goveniana* var. *goveniana* at both locations have been invaded by aggressive alien species, including *Cortaderia jubata* (pampasgrass), *Genista monspessulana* (French broom), and *Erechtites* spp. (fireweeds) (Forest Maintenance Standard 1990; K. Gray, State Parks, pers. comm. 1997). Invasion of alien plants alters the composition of the plant community and may adversely affect *C. goveniana* ssp. *goveniana*.

Piperia yadonii (Yadon's piperia) was first collected by Leroy Abrams in 1925 in open pine forest near Pacific Grove.

At that time, it was identified as *Piperia unalascensis*, a polymorphic, wide-ranging species in the western United States (Morgan and Ackerman 1990), although at least two naturalists who collected from the Monterey region in the 1920s (George Henry Grinnel and Leroy Abrams) noted the uniqueness of the plants from the Monterey area (Morgan and Ackerman 1990, Coleman 1995). In a recent treatment of the genus *Piperia*, Ackerman (1977) segregated out several long-spurred taxa from the *P. unalascensis* complex, but attempted no analysis of the short-spurred forms. Subsequently, Morgan and Ackerman (1990) segregated out two new taxa from the *P. unalascensis* complex. One of these, *P. yadonii*, was named after Vernal Yadon, previous Director of the Museum of Natural History in Pacific Grove, Monterey County.

Piperia yadonii is a slender perennial herb in the orchid family (Orchidaceae). Mature plants typically have two or three lanceolate to oblanceolate basal leaves 10 to 15 cm (4 to 6 in) long and 2 to 3 cm (0.8 to 1.2 in) wide. The single flowering stems are up to 50 cm (20 in) tall with flowers arranged in a dense narrow-cylindrical raceme. The flowers consist of three petal-like sepals and three petals (together referred to as tepals). The upper three tepals are green and white and the lower three white. The lowermost tepal is specialized into a lip that is narrowly triangular and is strongly decurved such that the tip nearly touches the spur of the flower (Morgan and Ackerman 1990). *Piperia yadonii* may occur with *P. elegans*, *P. elongata*, *P. michaelii*, and *P. transversa*, but is distinguished from them in flower by its shorter spur length, particular pattern of green and white floral markings, and its earlier flowering time (Morgan and Ackerman 1990, Coleman 1995).

As in other orchids, germination of *P. yadonii* seeds probably involves a symbiotic relationship with a fungus. Following germination, orchid seedlings typically grow below ground for one to several years before producing their first basal leaves. Plants may produce only vegetative growth for several years, before first producing flowers (Rasmussen 1995). In mature plants of *P. yadonii* the basal leaves typically emerge sometime after fall or winter rains and wither by May or June, when the plant produces a single flowering stem. Allen (1996) has observed that only a small percentage of the *P. yadonii* plants in a population may flower in any year. This is consistent with what is known of other orchid species (James Ackermann, Universidad de Puerto Rico, *in litt.* 1997). As in some other

plant taxa, individual orchids that flower in one year may not have the necessary energy reserves to flower in the following year, so size and flowering are not necessarily age-dependent (Wells 1981, Rasmussen 1995).

Piperia yadonii is found within Monterey pine forest and maritime chaparral communities in northern coastal Monterey County. Its center of distribution is the Monterey Peninsula where plants are found throughout the larger undeveloped tracts of Monterey pine forest. To the north, the range of *P. yadonii* extends to the Los Lomas area, near the border of Santa Cruz County (Allen 1996; Vern Yadon, Pacific Grove Museum of Natural History, *in litt.* 1997). Searches north into Santa Cruz County have uncovered little suitable habitat and no *P. yadonii* (Randall Morgan, biological consultant, pers. comm. 1996; Allen 1996), nor do regional herbaria contain collections from Santa Cruz County (R. Morgan, pers. comm. 1996). Since preparation of the proposed rule, *P. yadonii* has been found at one location about 25 km (15 mi) south of the Monterey Peninsula near Palo Colorado Canyon in maritime chaparral (Jeff Norman, biological consultant, *in litt.* 1995). Maritime chaparral is uncommon along this region of the Big Sur coastline, but a few scattered patches do occur south to Pfeiffer Point, located about 40 km (25 mi) from the Peninsula (J. Norman, pers. comm. 1997). *P. yadonii* has been found only 6 to 10 km (4 to 6 mi) inland (Allen 1996; V. Yadon, *in litt.* 1997) despite searches of lands farther east (Allen 1996). Toro Regional Park, 16 km to 24 km (10 to 15 mi) inland, was searched and four unidentified *Piperia* were found, but the habitat was reported to not be similar to that favored by *P. yadonii* (Allen 1996).

Piperia yadonii has been found in Monterey pine forest with a herbaceous, sparse understory and in maritime chaparral along ridges where the shrubs, most often *Arctostaphylos hookeri* (Hooker's manzanita), are dwarfed and the soils shallow (Morgan and Ackerman 1990, Allen 1996). As in other orchid species, *P. yadonii* does not appear to be an early successional species but is able to colonize trails and roadbanks within the dwarf maritime chaparral or Monterey pine forest once a decade or more has passed and if light and moisture regimes are favorable (Allen 1996; V. Yadon, *in litt.* 1997).

The Pebble Beach Company funded intensive surveys for *Piperia yadonii*, focusing on the Monterey Peninsula in 1995, and beyond the Peninsula in western Monterey County in 1996. Approximately 84,000 *P. yadonii* plants

on about 140 ha (350 ac), were counted at all known sites throughout the range of this species since 1990 (R. Morgan, *in litt.* 1992; Uribe and Associates 1993; J. Norman, *in litt.* 1995; Allen 1996; Jones and Stokes Assoc. 1996). Plants are often densely clustered, and may reach densities of 100 to 200 plants in a few square meters (10 to 20 plants in a few square feet) (Robert Hale, *in litt.* 1997). Because size and flowering are not always age-dependent, the age structure of these populations is not known.

During these surveys, the greatest concentrations of *Piperia yadonii*, approximately 57,000 plants or 67 percent of all known plants were found scattered throughout much of the remaining Monterey pine forest owned by the Pebble Beach Company and the Del Monte Forest Foundation on the Monterey Peninsula (Allen 1996). About 8,500 of these plants are in open space areas there (Allen 1996). Another 2,000 plants (2 percent of all known) occur on remnant patches of Monterey pine forest in parks and open space areas of Pacific Grove and Monterey (Allen 1996; Department of the Army, *in litt.* 1996; Jones and Stokes Assoc. 1996). Inland to the north, about 18,000 *P. yadonii* plants, (21 percent of all known plants) have been found on the chaparral covered ridges north of Prunedale (Allen 1996). About 8,000 of these are on lands that receive some protection at Manzanita County Park and The Nature Conservancy's Blohm Ranch; the remainder are on private lands that are not protected. South of the Peninsula about 7,500 plants have been found on CDPR properties at Pt. Lobos Ranch, on surrounding lands that are to be turned over to CDPR in the future (Big Sur Land Trust, *in litt.* 1997) and in a smaller parcel that is in private ownership.

Considering the current abundance of *Piperia yadonii* in the remaining large tracts of Monterey Forest, this species probably occurred throughout the Peninsula when Monterey pine forests were much more extensive. Many historic collections were made from the Pacific Grove area (R. Morgan, *in litt.* 1992), which has since been urbanized. Continued fragmentation and destruction of habitat due to urban and golf course development are currently the greatest threats to *P. yadonii*. Other threats include exclusion by alien species, roadside mowing, and potentially an increase in deer grazing of flowering stems.

Potentilla hickmanii (Hickman's potentilla) was originally collected by Alice E. Eastwood (1902) in 1900 "near the reservoir which supplies Pacific Grove, [Monterey County] California,

along the road to Cypress Point." The reference to a reservoir could refer to Forest Lake in Pebble Beach but more likely refers to the Pacific Grove reservoir (Ferreira 1995). Eastwood (1902) described the species 2 years later, naming it after J. B. Hickman who was her guide on that collecting trip.

Potentilla hickmanii is a small perennial herb in the rose family (Rosaceae) that annually dies back to a woody taproot. The leaves are pinnately compound into generally six paired, palmately cleft leaflets each 2 to 8 mm (0.1 to 0.3 in) long and 1 to 3 mm (to 0.1 in) wide. Several reclining stems 5 to 45 cm (2 to 16 in) long support two to four branched cymes (flowering stems) each of which has fewer than 10 flowers. The flowers consist of 5 yellow obovate petals 6 to 10 mm (0.2 to 1.0 in) long and 5 mm (0.2 in) wide, with typically 20 stamens and about 10 styles (Abrams 1944, Ertter 1993). *Potentilla hickmanii* is separated from two other potentillas that occur on the Monterey Peninsula (*P. anserina* var. *pacifica* and *P. glandulosa*) by a combination of its small stature, size and shape of leaflets, and color of the petals.

Only three historical locations for the plant are known, two in Monterey County and one in San Mateo County (NDDB 1997c). A collection was made by Ethel K. Crum in 1932, apparently in the vicinity of Eastwood's original collection on the Monterey Peninsula. Ferreira (1995) surveyed the area surrounding the Pacific Grove reservoir in 1992, but found no *Potentilla hickmanii* plants or suitable habitat for the species. An extant population is known from the western edge of the Monterey Peninsula on lands owned by Pebble Beach Company. This species was collected from one other location, at "Moss Beach" near Half Moon Bay, San Mateo County in 1905 by Katherine Brandegee and in 1933 by Mrs. E. C. Sutcliffe (Ertter 1993). At the time the proposed rule was written this population was presumed extirpated, but it was rediscovered in 1995 by biologists from the California Department of Transportation (Caltrans) surveying for a highway project (R. Vonarb, Caltrans, *in litt.* 1995).

Potentilla hickmanii is currently known to be extant at one location in San Mateo County and one in Monterey County. On the Monterey Peninsula, *P. hickmanii* grows in an opening within Monterey pine forest. Loamy fine sandy soils support a meadow community of alien grasses and several introduced and native herbs. Twenty-four individuals of *P. hickmanii* were located during 1992 surveys (Ferreira 1995). In 1995, the site was surveyed on two occasions and no

more than 21 plants were found (Jones and Stokes Assoc. 1996). Sampling in a portion of this occurrence indicated that neither recruitment of new individuals nor mortality of existing individuals had occurred in the sampled area in the past 2 years (T. Morosco, University of California Berkeley, *in litt.* 1997). The San Mateo County population grows on grassland slopes on private lands. It was estimated to have between 2000 and 3000 individuals in 1995 and 1996 (R. Vonarb, *in litt.* 1995; T. Morosco *in litt.* 1997).

The Pebble Beach Company has maintained management responsibilities for the Monterey population, located in an open space area called Indian Village, although ownership of the land has been transferred to the Del Monte Forest Foundation. Indian Village is available for use by residents and has been developed as an outdoor recreation area. Although a fence was constructed in the 1970s to limit access by recreationists, the fenced area contained only a portion of the population, and recreation impacts continued through the mid 1990s (Ferreira 1995, Jones and Stokes Assoc. 1996). In 1996, the Pebble Beach Company installed additional fencing to protect this population from recreational activities (M. Zander, Zander and Associates, *in litt.* 1996). *Potentilla hickmanii* is currently threatened by a proposed residential development in the Del Monte Forest which could alter hydrology at the Monterey site (EIP Associates 1995). At both the Monterey and San Mateo sites invasive alien species may be competing with *P. hickmanii* (Ferreira 1995; Jones and Stokes Assoc. 1996; B. Ertter *in litt.* 1997). The extremely small number of individual plants remaining at the Monterey site also make *P. hickmanii* vulnerable to extirpation from random events, such as genetic drift, poor years of reproduction and tree fall.

Trifolium trichocalyx (Monterey clover) is a member of the pea family (Fabaceae). The genus *Trifolium* is well-represented in North America, with approximately 50 species recognized in California (Munz 1959). Members of this herbaceous genus are characterized by their palmately three-foliolate leaves (hence the name *Trifolium*) and flowers in spheroid or oblong heads.

Trifolium trichocalyx was first collected by Amos A. Heller "in sandy pine woods about Pacific Grove" in 1903, and described by him the following year (Heller 1904). Laura F. McDermott (1910) considered the taxon a variety of *T. oliganthum* in her treatment of the genus, but this was not recognized in subsequent floras. Axelrod (1982) deferred to Gillett's

suggestion that *T. trichocalyx* is a sporadic hybrid between *T. microcephalum* and *T. variegatum* and recommended removing it from the list of taxa considered Monterey endemics. This view was challenged by Vernal Yadon (*in litt.* 1983) who had grown *T. trichocalyx* and observed that it consistently produces up to seven seeds per pod, while both purported parents were two-seeded taxa. *Trifolium trichocalyx* has continued to be recognized as a distinct taxon by Abrams (1944), Munz (1959), Howitt and Howell (1964) and, most recently, Isely (1993).

Trifolium trichocalyx is a much-branched prostrate annual herb with leaflets that are obovate-cuneate, 0.4 to 1.2 cm (0.2 to 0.5 in) long, truncate or shallowly notched at the ends. The numerous flowers are clustered into heads subtended by a lacinate-toothed involucre. The calyces are 7 mm (0.3 in) long, toothed, and conspicuously pilose; the purple corollas scarcely equal the length of the calyx; the deciduous seed pods enclose up to seven seeds. The plant can be quite inconspicuous, as the prostrate branches may be only 3 to 4 cm (1.2 to 1.6 in) long. With favorable conditions, however, branches may reach a length of 20 to 30 cm (8 to 12 in) (Abrams 1944; V. Yadon, *in litt.* 1983). Branches from one large plant may spread through the forest litter and give the appearance of many plants. Of the four species of *Trifolium* growing on Huckleberry Hill, all except *T. trichocalyx* contain two seeds per pod.

Trifolium trichocalyx is known from only one area, Huckleberry Hill, covering approximately 16 ha (40 ac) (Ferreira 1995) on the Monterey Peninsula. The plant occurs in openings within Monterey pine forest on poorly drained soils consisting of coarse loamy sands. *Trifolium trichocalyx* appears to be a fire-follower, taking advantage of the reduced forest cover for the first few years after a fire, and then becoming scarce, persisting primarily as a seedbank in the soil, as shade and competition increase during recovery of the forest community. Heller's collection in 1903 was made 2 years after a fire in the area. Only scattered individuals were reported by Theodore Niehaus in 1973 and 1979 and by Yadon in 1980 in forest openings or edges (NDDDB 1997d). One of these sites is presumed to have been extirpated when Poppy Hills Golf Course was developed in 1980; the other two are within the boundaries of the Morse Reserve.

Surveys for *Trifolium trichocalyx* were conducted in 1988. No plants were found at the three sites reported earlier by Niehaus and Yadon. However,

several hundred to 1,000 plants were scattered in an 80-ha (200-ac) area that had burned in 1987, near Huckleberry Hill (M. Griggs, *in litt.* 1988; V. Yadon, *in litt.* 1992). During surveys conducted in 1996 of this burned area, two sites were located with a total of 22 plants (Jones and Stokes Assoc. 1996). A seedbank is expected to occur in the soil in those locations where the plants were found in 1988 (Forest Maintenance Standard 1990, Jones and Stokes Assoc. 1996).

Threats to the continued existence of *Trifolium trichocalyx* include alteration of natural fire cycles and a proposed development within the largest area known to support clover in 1988. It is also vulnerable to random events due to the small amount of its remaining habitat and the ephemeral nature of the plant's reappearance after fires.

Previous Federal Action

Federal government action on the five plants began as a result of section 12 of the 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. That report, designated as House Document No. 94-51, was presented to Congress on January 9, 1975. In that report, *Astragalus tener* var. *titi*, *Potentilla hickmanii*, and *Trifolium trichocalyx* were recommended for endangered status. On July 1, 1975, the Service published a notice in the **Federal Register** (40 FR 27823) of its acceptance of the report as a petition within the context of section 4(c)(2) (now section 4(b)(3)(A)) of the Act, and of its intention to review the status of the plant taxa named therein. The above three taxa were included in the July 1, 1975, notice. On June 16, 1976, the Service published a proposal in the **Federal Register** (41 FR 24523) to determine approximately 1,700 vascular plant species to be endangered species pursuant to section 4 of the Act. The list of 1,700 plant taxa was assembled on the basis of comments and data received by the Smithsonian Institution and the Service in response to House Document No. 94-51 and the July 1, 1975, **Federal Register** document. *Astragalus tener* var. *titi*, *Potentilla hickmanii*, and *Trifolium trichocalyx* were included in the June 16, 1976, **Federal Register** proposal.

General comments received in relation to the 1976 proposal were summarized in an April 26, 1978, **Federal Register** publication (43 FR 17909). The 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 *Astragalus tener* var. *titi*, *Potentilla hickmanii*, and *Trifolium trichocalyx* as category-1 species. Category-1 species were taxa for which data in the Service's possession was sufficient to support proposals for listing. On November 28, 1983, the Service published in the **Federal Register** a supplement to the Notice of Review (48 FR 53640); the plant notice was again revised September 27, 1985 (50 FR 39526). In both of these notices, *Astragalus tener* var. *titi*, *Potentilla hickmanii*, and *Trifolium trichocalyx* were included as category-2 species. Category-2 species were taxa for which data in the Service's possession indicated listing may be appropriate, but for which additional data on biological vulnerability and threats were needed to support a proposed rule. In the 1985 notice, *Cupressus goveniana* ssp. *goveniana* (as *Cupressus goveniana*) also was included for the first time as a category-2 species. On February 21, 1990 (55 FR 6184), the plant notice was again revised, and *Astragalus tener* var. *titi*, *Potentilla hickmanii*, and *Trifolium trichocalyx* were included as category-1 species, primarily because of additional survey information supplied by the NDDB, which indicated that the extremely limited populations of these taxa made them particularly vulnerable to impacts from a number of human activities and natural random events. Those three species also appeared as category-1 species in the 1993 notice of review (58 FR 51144). *Cupressus goveniana* ssp. *goveniana* was retained as a category-2 species in the 1990 and 1993 notices of review. On February 28, 1996, the Service published a Notice of Review in the **Federal Register** (61 FR 7596) that discontinued the designation of category-2 species as candidates.

Section 4(b)(3)(B) of the Act requires the Secretary to make findings on certain 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 *Astragalus tener* var. *titi*, *Potentilla hickmanii*, and *Trifolium trichocalyx* because the 1975 Smithsonian report was 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. Annually, in October of 1984 through 1992, the Service found that the petitioned listing of *Astragalus tener* var. *titi*, *Potentilla hickmanii*, and *Trifolium trichocalyx* was warranted, but that the listing of these species was precluded by other pending proposals of higher priority. *Piperia yadonii* did not appear in earlier notices of review. *Piperia yadonii* first appeared as a candidate in the 1993 notice of review (58 FR 51144) in category-1. A reevaluation of the existing data on the status of *Cupressus goveniana* ssp. *goveniana* and threats to its continued existence provided sufficient information to propose to list this species as threatened.

A proposed rule to list *Astragalus tener* var. *titi*, *Piperia yadonii*, *Potentilla hickmanii* and *Trifolium trichocalyx* as endangered and *Cupressus goveniana* ssp. *goveniana* as threatened was published in the **Federal Register** on August 2, 1995 (60 FR 39326). Also included in this proposed rule was a proposal to list the black legless lizard (*Aniella pulchra nigra*) as endangered. Based upon new information received since publishing the proposed rule, the proposed listing of the black legless lizard has been withdrawn by the Service as announced in a separate **Federal Register** notice published concurrently with this final rule.

The Service published Listing Priority Guidance for Fiscal Years 1998 and 1999 on May 8, 1998 (63 FR 25502). The guidance clarifies the order in which the Service will process rulemakings giving highest priority (Tier 1) to processing emergency rules to add species to the Lists of Endangered and Threatened Wildlife and Plants (Lists); second priority (Tier 2) to processing final determinations on proposals to add species to the Lists, processing new proposals to add species to the Lists, processing administrative findings on petitions (to add species to the Lists, delist species, or reclassify listed species), and processing a limited number of proposed or final rules to delist or reclassify species; and third priority (Tier 3) to processing proposed or final rules designating critical habitat. Processing of this final rule is a Tier 2 action.

Summary of Comments and Recommendations

In the August 2, 1995, proposed rule and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to a final listing decision. Appropriate Federal and State agencies, County and local governments, scientific organizations, and other interested parties were contacted and requested to comment. During that comment period the Service received a request to hold a public hearing on the proposal. Due to the Federal moratorium on final listing actions, imposed on April 10, 1995, the public hearing could not be scheduled during the initial comment period, which closed on October 9, 1995. Once the moratorium was lifted on April 26, 1996, listing actions were prioritized and the public hearing was scheduled. The public hearing was held on August 20, 1996, and its associated public comment period ran from June 26, 1996 to August 30, 1996. During the hearing and public comment period substantial new information was submitted on the abundance of *Piperia yadonii*. To allow the public to comment on this new information and to permit submission of any new information that had become available on the other taxa in the package, the comment period was reopened for 30 days from April 2, 1997, to May 2, 1997. Newspaper notifications were published in the *Monterey Herald* and the *Santa Cruz Sentinel* during the initial comment period, and in the *Monterey Herald*, *Half Moon Bay Review*, and *Pacifica Tribune* for the 1997 comment period.

During the public comment periods and public hearing 20 agencies, groups, and individuals commented on the plant taxa included in the proposed rule, some of them multiple times. The majority of comments received concerned the proposal to list the black legless lizard; these comments are addressed in the concurrently published withdrawal for that taxon. Only those issues relevant to the listing of the five plant taxa are included in this final rule. Several comments contained significant data and information concerning the biology, ecology, range, and distribution of the subject taxa. This information was evaluated and incorporated into the final determination as appropriate. The 12 issues raised by the commenters that are relevant to the listing of the plant taxa and the Service's response to each are summarized as follows:

Issue 1: One commenter concluded that the Service had not provided a thorough rationale for why the potential

loss of habitat threatens the viability of the species. Specifically, the commenter suggested that insufficient evidence was presented on the effects of alteration of natural fire frequencies and of alien species on the proposed taxa.

Service Response: The Service has discussed the role of fire in the life history of *Cupressus goveniana* ssp. *goveniana* and *Trifolium trichocalyx* within this rule under the "Background" section and under Factor E of the "Summary of Factors Affecting the Species" section. With a large human population residing on the Peninsula, wildfires have been and will necessarily be suppressed to protect human life and property. Prescribed burns have been suggested as a management tool to replace wildfires at the Morse Reserve and Pt. Lobos State Reserve which support these taxa (Forest Maintenance Standard 1990; Jones and Stokes Assoc. 1996). While fire is desirable from a land management perspective, prescribed burns on Huckleberry Hill present a risk that is not currently accepted by surrounding residents and entities who authorize such activities (Forest Maintenance Standard 1990; R. Andrews, Pebble Beach Community Services District, pers. comm. 1997). With increased development close to the *Cupressus* groves, homeowner opposition to prescribed burns is likely to increase. The proximity of, and risk to, adjacent residences also will influence the manner in which burns would be implemented. For example, to facilitate control, vegetation may be crushed or chipped prior to burning or burns may be conducted in early spring, when moisture levels are high (Greenlee 1977, Green 1982). These methods, which may not mimic the fire regime under which the taxa evolved, can alter the ability of the vegetation community to regenerate. For example, cool season burns may not provide sufficient heat to crack seed coats and promote germination of some species, or conversely, early spring burns may be detrimental to herbaceous species if the seeds in the soil have already imbibed water when the fire occurs. The Service concludes that increasing urban development reduces the likelihood that fire will occur in a manner sufficient to ensure the continued viability of these taxa.

The invasive nature and competitive ability of the alien species, *Genista monspessulana*, *Cortaderia jubata*, *Carpobrotus edulis*, and alien grasses such as *Phalaris aquatica* (Harding grass) and *Lolium multiflorum* (Italian ryegrass) which threaten the taxa in this rule are well-documented (Mooney et

al. 1986, Zedler and Scheid 1988). Documented links between encroachment by alien plant taxa and the disappearance of native California taxa in wildlands are also well-established in the literature. This issue is discussed in greater detail under factors A and E in the "Summary of Factors Affecting the Species" section.

Issue 2: Several commenters suggested that the Service has not given sufficient consideration to the regulatory mechanisms already in place to protect the proposed plants; one suggested that the Coastal Act already provides substantial protection for the taxa included in the rule that occur on Pebble Beach Company lands.

Service Response: The Service has analyzed available information and concluded that existing regulatory mechanisms, including the Coastal Act, have not been sufficient to adequately protect the taxa included in this rule. The discussion of existing regulatory mechanisms has been expanded since the proposed rule and is included under Factor D in the "Summary of Factors Affecting the Species" section.

Issue 3: Several commenters stated that the information the Service used in the proposed rule for *Piperia yadonii* was dated and incomplete and that the Service, therefore, was not relying on the best scientific information available. Two commenters suggested that the better our search methods and understanding of this species, the more of it we are likely to find; they concluded that the current population sizes for this species indicate that it is not in danger of extinction throughout a significant portion of its range.

Service Response: In preparing the proposed rule, the Service used the best information available on the distribution and abundance of *Piperia yadonii*. The information supplied by the Pebble Beach Company in 1992, when the preparation of the proposed rule began, estimated the population of *P. yadonii* in the Del Monte Forest to be about 400 plants (G. Fryberger, *in litt.* 1992). The 1995 surveys, funded by the Pebble Beach Company, were not completed and made available to the Service before publication of the proposed rule in August 1995.

Data from the surveys in 1995 and 1996 support the range as stated in the proposed rule with the exception of the Lobos Ranch and Palo Colorado populations which represent a range extension south of the Monterey Peninsula. Regions to the north and east of the known range of this species have been searched without success and the appropriate dwarf maritime chaparral and Monterey pine forest habitats are

absent or uncommon there (R. Morgan, pers. comm. 1996; Allen 1996). Additional colonies within the range of this species may be discovered on private lands, but large expanses of unsurveyed habitat with protected status and appropriate habitat do not exist. Those portions of Fort Ord identified for protection of natural resources are the largest protected tracts of land within the range of *P. yadonii*. Surveys have been conducted at Fort Ord and have located and identified *P. yadonii* in only one location with fewer than 50 plants (Jones and Stokes Assoc. 1996; Allen 1996). Fort Ord appears to have little of the stunted maritime chaparral habitat in which this species is found (D. Allen, Biological Consultant, pers. comm. 1997).

The 1995 and 1996 surveys revealed that population sizes in the proposed rule had been vastly underestimated because they were based on counts of flowering specimens. Although *P. yadonii* is now known to be more abundant than stated in the proposed rule, the Service's decision to list this species is based on significant threats from direct loss and fragmentation of its remaining habitat in the foreseeable future. The Service has considered all new information received during public comment periods in making this final determination and has incorporated it into this final rule.

Issue 4: Several commenters suggested that *Piperia yadonii* plants can be distinguished from other *Piperia* species with which it may occur only by their flowers; therefore, those population estimates based on counts of basal leaves may have overestimated the true population sizes of *P. yadonii* by including colonies of other *Piperia* species.

Service Response: The Service agrees that flowers are needed for a positive identification of *Piperia yadonii*. The surveys conducted in 1995 and 1996 relied primarily on counts of basal leaves for population estimates. In most populations, however, the surveyors caged plants when making initial counts of basal leaves and noted leaf characteristics if they appeared to differ from those of *P. yadonii*. Populations were revisited during June and July when *P. yadonii* is in flower to confirm identification. In the few cases where no flowering plants were found, the plants were not assigned to species; in cases where a mix of species was found the estimates were based on leaf characteristics and, in some cases, habitat type (Allen 1996). The principle surveyor was noted to be a careful observer (V Yadon, *in litt.* 1997). While acknowledging the potential for

overestimates, the Service has accepted the information and focused on comparative population size and status, rather than specific counts.

Issue 5: One commenter submitted the results of experimental transplantation of *Piperia yadonii*. The commenter suggested that there existed suitable habitat for *P. yadonii* that was not at carrying capacity and that transplantation and the dispersal of seeds to unoccupied sites “. . . offers a means of reducing the threat posed by development.”

Service Response: The commenter submitted 1 year of data on the results of transplantation experiments on *Piperia yadonii*. Survival on four sites 10 months after early April transplanting ranged from 11 percent to 69 percent and averaged less than 50 percent. The proportion of transplanted plants flowering on these sites ranged from 0 to 7 percent. Of the 113 plants transplanted in October, 73 percent survived to the following February's monitoring date. Of these plants, 20 percent formed floral spikes (Allen 1997; M. Zander, *in litt.* 1997).

Two possible explanations exist for the absence of *Piperia yadonii* from areas of seemingly suitable habitat in the Del Monte Forest. Either a lack of seed dispersal has limited the ability of *P. yadonii* to colonize these areas or the habitat is not suitable for the establishment and maintenance of a viable population of this species. *P. yadonii* has light-weight, wind-dispersed seeds, capable of long-distance dispersal, making the former explanation less likely, although still possible. In the latter case, many habitats which may initially appear suitable may not be able to support a viable population of *Piperia yadonii* over the range of environmental conditions that can be expected to occur through time. For example, an introduced population that may persist during a period of normal rainfall may perish during an extended drought. To demonstrate that an area of currently unoccupied habitat is capable of supporting a viable self-sustaining population of *Piperia yadonii* could take several decades. The population would have to persist through the range of environmental conditions common to the region where it occurs. The Service is not aware of any evidence that demonstrates the existence of unoccupied habitat suitable for the growth and persistence of any of the species in this rule, including *P. yadonii*. The Service does not accept transplantation or manual seed dispersal as alternatives to protecting naturally occurring populations with

proven ability to persist through the environmental extremes.

Issue 6: One commenter concluded that the discovery of the population of *Potentilla hickmanii* in San Mateo County raises the potential that other populations may be discovered and that the Service's listing is therefore “. . . premature and. . . unwarranted.” The commenter also contends that the Service must now conduct further surveys for this species to determine if listing is warranted.

Service Response: The discovery of the population in San Mateo County does not substantially change the status of this species. *Potentilla hickmanii* is known from only two locations. The San Mateo County site that was recently discovered matches the general location of historical collections from the 1930s. Following the discovery of this population, intensive surveys have been conducted for this species from Pillar Point near Half Moon Bay to Mori Point near Pacifica, San Mateo County. No additional populations have been found (T. Morosco, *in litt.* 1997). In 1990, Ferreira (1995) searched the historical collection location near the Pacific Grove reservoir without success. As discussed under Factor A in the “Summary of Factors Affecting the Species” section, the Monterey population has fewer than 25 plants and is potentially threatened by hydrologic changes due to proposed development. The Service is neither required nor funded to conduct further surveys for this species, and concludes that the best available information is sufficient to support the listing of this species under the Act.

Issue 7: One commenter concluded that listing will not provide any additional protection to *Trifolium trichocalyx* because most of the seedbank of this species is located in the Huckleberry Hill Open Space area and the Morse Reserve. The commenter also concluded that the Service has ignored existing regulatory mechanisms which protect most of the seedbank of *T. trichocalyx*.

Service Response: In 1987, a wildfire on Huckleberry Hill burned the central and southern portions of the habitat of *Trifolium trichocalyx*. Following that fire, the largest colony of *T. trichocalyx* was found on lands owned by the Pebble Beach Company outside of and within the southern border of the Huckleberry Hill Open Space area (maps by M. Griggs, *in litt.* 1988; V. Yadon, *in litt.* 1988). Much of this site is now within the boundaries of one of the residential subdivisions proposed by the Pebble Beach Company (EIP Associates 1995). A comparison of the

maps of occupied habitat submitted to the California Department of Fish and Game in 1988 (maps by M. Griggs, *in litt.* 1988; V. Yadon, *in litt.* 1988) to the proposed footprint of the proposed development (EIP Associates 1995), show that existing lots and a 30-m (100-ft) setback will extend over about one-quarter of the clover habitat occupied in 1988 (Jones and Stokes Assoc. 1996). Other maps produced in 1988 and used in the environmental document, however, indicate that the lots and setback extend up to, but do not cover, habitat occupied in 1988 (EIP Associates 1995). As proposed in the environmental document, the habitat containing the seedbank outside of the lot boundaries and setback, would be designated forested open space (EIP Associates 1995). The Service believes that existing and proposed residential development either adjacent to, or partially over, the existing clover seedbank substantially diminishes the potential for the use of fire as a management tool to maintain this species. The Service discusses existing regulatory mechanisms in more detail under Factor D of the “Summary of Factors Affecting the Species” section.

Issue 8: Two commenters concluded that *Cupressus goveniana* ssp. *goveniana* is already protected due to its inclusion in the Huckleberry Hill Open Space and the Morse Botanical Reserve and is therefore unlikely to become endangered in the foreseeable future. One commenter stated that it is likely that fire would be used as a management tool in the future in Del Monte Forest.

Service Response: As discussed in the “Background” section, *Cupressus goveniana* ssp. *goveniana* is adapted to regenerate after a fire. While some regeneration following mechanical clearing has occurred along a fire road (EIP Associates 1995; Patterson *et al.* 1995), periodic fire is the most effective and efficient method of promoting forest regeneration. The lands on which most of the cypress grows are included in the Morse Botanical Reserve and, therefore, will not be developed. However, the periodic fires that create conditions necessary for regeneration of the grove, are less likely to occur as residential development encroaches on the Reserve and the Huckleberry Hill Open Space area. At least three of the subdivisions proposed for development by the Pebble Beach Company are to be located within 300 m (984 ft) of the Morse Reserve. One of these proposed subdivisions, would be directly adjacent to the *Cupressus* stands in the Morse Reserve and *C. goveniana* ssp. *goveniana* occurs within its northern boundary (EIP Associates

1995). The 1990 Forest Maintenance Standard prepared for the Huckleberry Hill Open Space stated that agencies which have the authority to permit prescribed burns in the area recommended against it. As with *Trifolium trichocalyx* (see Issue 7) the Service concludes that existing and proposed adjacent residential development substantially diminish the potential for the use of fire as a management tool to maintain this species. Existing regulatory mechanisms are discussed in more detail under Factor D of the "Summary of Factors Affecting the Species" section.

Issue 9: One commenter concluded that the Service should designate critical habitat and disputed the Service's reasoning that to do so would not be prudent due to the potential for vandalism and the lack of benefit. The commenter suggested that vandals interested in the plants' locations could get them from the Service by requesting them under the Freedom of Information Act (FOIA).

Service Response: The Service has concluded that designating critical habitat for these species is not prudent for the reasons discussed in the "Critical Habitat" section of this rule. Critical habitat designation primarily affects Federal activities on lands on which there is, or is likely to be, some involvement by a Federal agency. All but one of these plants occur only on non-Federal lands where there is no foreseeable Federal involvement. A few small populations of *Piperia yadonii* occur on Federal land at the Department of the Army's Presidio of Monterey, at the Naval Post-Graduate School in Monterey, and on the former Fort Ord. The site on the former Fort Ord is to be transferred to a local management entity, permanently protected, and managed for the conservation of plants and wildlife.

There may be some small benefit that results from public notification if critical habitat is designated, but this benefit is largely duplicative with the public notification that is part of the listing process itself. Moreover, any benefit that results from public notification must be weighed against the potential for increasing the degree of threat to the species and also against the potential for making cooperative recovery efforts more difficult. The Service also is concerned about the potential for overcollecting of *Piperia yadonii* if critical habitat descriptions and precise maps of plant locations were to be published in the **Federal Register**. An international trade exists in orchid species and the attractiveness of *P. yadonii* to horticulturalists may be

enhanced by its listing as an endangered species. At its present population size on the Peninsula, an increase in collection is not likely to substantially affect this species in itself, but combined with further expected habitat loss and fragmentation, the collection of flowering individuals could be deleterious to this species. By publishing maps identifying the precise locations of this plant species, the Service could be contributing to its decline. Although these maps may be available through a FOIA request, anyone intending to vandalize these species or their habitat is unlikely to request this information in such a public and documented way. The Service believes that any small benefit from critical habitat designation is outweighed by the increased threat to *Piperia yadonii* species from overcollection and vandalism. A more detailed discussion of all aspects of critical habitat discussion for these five taxa is provided in the "Critical Habitat" section.

Issue 10: One commenter stated that the Service has violated the Administrative Procedures Act by not notifying the County of San Mateo of the proposed rule, since a population of *Potentilla hickmanii* occurs in San Mateo County.

Service Response: At the time the proposed rule was prepared, the population of *Potentilla hickmanii* in San Mateo County had not been discovered (R. Vonarb, *in litt.* 1995). Since none of the species in the rule were known to be extant in any county other than Monterey, no additional county governments were included on the address list. The County of San Mateo was included in the notification provided during the most recent comment period.

Issue 11: One commenter requested that the Service prepare an environmental impact report (EIR) for this listing action.

Service response: Because the Service is a Federal agency its actions are regulated by the National Environmental Policy Act (NEPA), which would require preparation of an Environmental Impact Statement (EIS). This action is not regulated under the California Environmental Quality Act (CEQA) which would require preparation of an EIR. The Service has previously determined (48 FR 49244) that rules issued pursuant to section 4(a) of the Act do not require the preparation of an EIS.

Issue 12: One commenter was concerned that urban and golf course development and recreational and military activities would be curtailed by

the listing of these species because these activities were identified as threats in the proposed rule.

Service Response: In some cases, the activities described above may be modified if they are likely to adversely affect a federally listed species. Federal listing provides some protection to plant species on Federal lands, and elsewhere if a Federal permit or authorization is required for a proposed action. Federal listing also provides a significant degree of recognition by State and local agencies and private landowners which may result in increased protection. Of the activities addressed above, those of the military would require consultation with the Service to ensure that military activities would not jeopardize the continued existence of listed taxa. Greater detail on the prohibitions and protections afforded listed plant species is found in the "Available Conservation Measures" section.

Peer Review

In accordance with policy promulgated July 1, 1994 (59 FR 34270), the Service solicited the expert opinions of independent specialists regarding pertinent scientific or commercial data and assumptions relating to the population biology and supportive biological and ecological information for the species under consideration for listing. The purpose of such review is to ensure listing decisions are based on scientifically sound data, assumptions, and analyses, including input of appropriate experts and specialists.

Three peer reviewers were asked specific questions relating to the conclusions and assumptions included in the proposal for *Cupressus goveniana* ssp. *goveniana*, *Piperia yadonii*, and *Potentilla hickmanii*. Their comments have been incorporated into the final rule as appropriate and are summarized below.

One reviewer commented that most *Piperia* species are pollinated by moths. The reviewer hypothesized that the species has a mixed breeding system that involves both outcrossing and inbreeding (either through self-fertilization or breeding with neighboring plants that are likely to be related). The reviewer agreed that because *Piperia* have wind-dispersed seed, physical obstructions, such as houses, may affect seed dispersal. The reviewer suggested that the effects of development and habitat fragmentation on the pollinators of *Piperia yadonii* may be of greater concern than the effects on seed dispersal or germination, particularly if the species is primarily pollinated by insects of restricted distribution. The same reviewer also

concluded that knowledge of the partitioning of genetic variation in *Piperia yadonii* could influence the conservation strategy for this taxon. Recent research results suggest that widespread tropical orchid species have much of their genetic variation within populations and fewer differences between populations, while in outcrossing species with restricted distributions gene flow may be similarly restricted and thus the genetic variability found in one population may differ substantially from that of another. If this is true in the genus *Piperia*, then species with restricted distributions, such as *P. yadonii*, would be more likely to differ genetically between populations. Therefore, to preserve the variability found within the species, as many populations as possible would need to be preserved.

Both reviewers of the *Piperia* information agreed that the habitat information provided by Allen (1997) was consistent with what they know of the species and genus. Mowing of flowering stalks and herbivory by deer were threats discussed by one reviewer.

The reviewer who commented on *Cupressus goveniana* ssp. *goveniana* agreed with the Service's conclusion that changes in the fire cycle were a threat to this taxon. The reviewer noted that opposition to prescribed burning in the Del Monte Forest still exists, although less so than in the past. The reviewer noted that vegetation removal along fire roads in the *Cupressus* stands on the Peninsula has been a problem and that erosion has increased due to fire road construction and maintenance.

Two reviewers commented on the reproductive biology of *Potentilla hickmanii*; one reviewer concluded that the species was self-compatible while the other reviewer noted that self-pollinated plants in a recent controlled experiment did not produce seed. Very few potential pollinating insects have been noted on *P. hickmanii*, despite focused observations by one of the reviewers. One reviewer specifically noted that seed set is generally low. One reviewer responded to the Service's query about distribution of this species by providing information on recent searches that have been conducted specifically for *P. hickmanii*. No additional populations have been located, and very few unsearched areas that may have appropriate habitat remain to be searched. Both reviewers agreed that nonnative species are a threat to this species at both locations where it is known to occur.

Summary of Factors Affecting the Species

Section 4 of the Endangered Species Act (16 U.S.C. 1533) 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 *Astragalus tener* Gray var. *titi* (Eastw.) Barneby (coastal dunes milk-vetch), *Cupressus goveniana* Gord. ssp. *goveniana* (Gowen cypress), *Piperia yadonii* Morgan & Ackerman (Yadon's piperia), *Potentilla hickmanii* Eastw. (Hickman's potentilla), and *Trifolium trichocalyx* Heller (Monterey clover) are as follows:

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

Two of the plant taxa, *Astragalus tener* var. *titi* and *Trifolium trichocalyx*, occur only on the Monterey Peninsula. The largest of the two *Cupressus goveniana* ssp. *goveniana* stands occurs on the Monterey Peninsula, as does one of only two populations of *Potentilla hickmanii*. The Monterey Peninsula is also the center of distribution of, and supports the largest concentration of, *Piperia yadonii*. Habitat for all five plant taxa has been altered, destroyed, or fragmented by residential development and conversion to golf courses and other recreational facilities.

Recent estimates of the loss of Monterey pine forest in California indicate that 40 percent (Huffman and Assoc. 1994) to 50 percent (Jones and Stokes Assoc. 1994a) of the Monterey pine forest once found in the Monterey region has been eliminated. On the Monterey Peninsula itself, the proportion destroyed is much greater; on those marine terraces and old dune soils that underlie most of the Peninsula, less than 20 percent of the historical Monterey pine forest is estimated to remain, much of it in fragmented and increasingly isolated stands (Jones and Stokes Assoc. 1994a). The Pebble Beach Company's lot development program includes proposed construction of 15 residential subdivisions, the Del Monte Forest's 8th 18-hole golf course, and associated recreational facilities on 277 ha (685 ac). This development would eliminate or degrade 165 ha (412 ac) of Monterey pine forest and associated maritime chaparral habitat on the Peninsula, including the Peninsula's second largest contiguous block of forest habitat (EIP

Associates 1995). Most populations of each species in this rule occur within this remnant block of forest or closely associated meadow and terrace habitats. Habitat loss, fragmentation, and alteration resulting from previous and proposed developments pose significant threats to all five plant taxa in this rule.

Habitat fragmentation, by reducing native vegetation to "islands" within a matrix of roads, residences, and golf courses, leads to population declines and extirpations in several ways. As habitats are reduced to smaller parcels, natural ecosystem processes that act over large areas, such as hydrologic or fire regimes, are altered. The edges of habitat "islands" and the species within them may experience changes in light level, wind velocity (leading to blowdown of trees), moisture availability and an increase in alien species. When the habitat fragments are small, these "edge effects" may influence the entire remnant habitat. As species composition of these remnant habitats change, pollination and herbivory may be affected (Harris and Silva-Lopez 1992). Other influences from the surrounding environments, such as drifting of pesticides, trampling by humans, dumping of yard waste, and cutting of vegetation for fire control, also can have significant deleterious effects on the survival of native species.

Astragalus tener var. *titi* is believed extirpated in San Diego and Los Angeles counties due to habitat destruction. The only known occurrence is composed of eleven colonies, bisected by two roads, a golf green, and an 8-foot wide horse trail on the Monterey Peninsula. Development of the marine terrace habitat of this species has led to actual and potential problems with invasive alien species, trampling, and potential genetic changes, discussed under Factor E.

Cupressus goveniana ssp. *goveniana* is restricted to only two sites in western Monterey County. The occurrence on the Monterey Peninsula is located in the Morse Botanical Reserve and Huckleberry Hill Open Space area. As development has surrounded this location, the edges and outlying stands of this occurrence have been eliminated or diminished. For example, portions of this occurrence were lost during construction of the Poppy Hills golf course in the 1980s (J. Vandever, California Native Plant Society (CNPS), *in litt.* 1992; G. Fryberger, pers. comm. 1992). Trees planted as mitigation for that loss and a small stand of naturally occurring *C. goveniana* ssp. *goveniana* and *Pinus muricata* were left in a 19.5-ac habitat patch of Monterey pine forest and chaparral, bounded by golf green.

As proposed for the most recent subdivision and development, this site would be converted to a 21-lot residential area, eliminating most of the naturally occurring cypress and leaving the remaining cypress in a portion of 2.8 ha (7 ac) of Forested Open Space bounded by roads, a golf green and houses (EIP Assoc. 1995). At least three of the proposed subdivisions are within 300 m (1000 ft) of the *C. goveniana* ssp. *goventiana* stands in the Morse Reserve and one proposed residential development abuts the Reserve's southwest corner (EIP Assoc. 1995). The proximity of these residential areas diminishes the opportunity to use prescribed fire as a management tool within the reserve. In addition, due to concern about potential wildfire, 12-ft wide fire roads have been maintained throughout the Reserve and Huckleberry Hill Open Space, removing individual *Cupressus* trees and causing erosion in some places (Forest Maintenance Standard 1990, V. Yadon *in litt.* 1997). These fire roads provide a suitable path for alien plants to enter and spread through the stands.

Potentilla hickmanii on the Monterey Peninsula is known from one occurrence of about 25 plants that grow in a meadow area designated as open space and used for recreation. In the 1970s, habitat occupied by *P. hickmanii* was lost and degraded by fill brought in for a ball field (Ferreira 1995); habitat trampling during recreational activities was noted as recently as 1995 (Jones and Stokes Assoc. 1996). In 1996, the Pebble Beach Company built an additional wood fence to exclude recreational activities from the remainder of the population (M. Zander, *in litt.* 1996). Currently, development of an 18-ac, 21-lot residential subdivision is proposed in Monterey pine forest within 100 m (330 ft) of the occurrence (EIP Associates 1995). This subdivision could negatively affect *P. hickmanii* both by increasing the amount of human use in the area and by altering the hydrology of the site; a small watercourse and freshwater marsh that likely influence the meadow habitat of *P. hickmanii* are located about 400 m (1300 ft) upslope from the occurrence and are within the proposed lot development area. Mitigation proposed to reduce this threat is the elimination of the three lots that cover and border the marsh and riparian areas (EIP Associates 1995). Nevertheless, runoff into the meadow may be affected by upslope development.

The Monterey Peninsula appears to be the center of distribution of *Piperia yadonii*. The Peninsula provides the greatest amount of remaining

contiguous habitat and supports about 70 percent of known plants. The Del Monte Forest includes over half (73 ha (184 ac)) of the acreage estimated to still be extant for this species (EIP Associates 1995, Allen 1996). Based on the distribution of plants found in remaining Monterey pine forest, historical collections from Pacific Grove, and the amount of Monterey Pine forest which the Peninsula historically supported, the distribution of *P. yadonii* today is likely only a fraction of the historical extent of this species on the Peninsula. In the habitat that remains, *P. yadonii* is found in 13 of the proposed subdivisions. The 245-ac site of the proposed golf course supports about 16,000 individuals of this species and is the second largest contiguous stand of Monterey pine forest left on the Peninsula. The development currently proposed by the Pebble Beach Company would result in the loss or alteration of habitat supporting about 46,000 plants of *Piperia yadonii* on about 60 ha (149 ac) (EIP Associates 1995). This is about 80 percent of known plants on the Peninsula.

Including the 7,500 plants in the Huckleberry Hill Reserve (Richard Nichols, EIP Associates, pers. comm. 1997), about 10,800 plants of *Piperia yadonii* would fall within proposed forested open space (EIP Associates 1995). Other open space areas are located at the ends or borders of the proposed subdivisions or in some cases are encircled by the proposed lots. The effects of habitat fragmentation are likely to result in the eventual extirpation of colonies in these areas. In the nearby La Mesa housing development, for example, *Genista monspessulana*, an alien shrub, has invaded and is expected to engulf remnant habitats that support *Piperia yadonii* (Uribe & Assoc. 1993). Trampling by recreationists is a noted problem in remnant habitats that support *P. yadonii* at two city parks (D. Allen, pers. comm. 1997). Mowing for roadside fire control, which shears off the flowering stalks of *P. yadonii*, thereby preventing reproduction, also occurs in remnant open space habitats on the Peninsula (V. Yadon, *in litt.* 1997).

Beyond the Monterey Peninsula, over 60 percent of the known *Piperia yadonii* plants are on privately owned lands without protection, most of these in the Prunedale area. Two residential developments of over 16 ha (40 ac), each of which support potential maritime chaparral habitat, have been approved in this area in the last 2 years (L. Osorio, Monterey County Planning and Building Inspection, pers. comm. 1997). A third

property, known to support several thousand *P. yadonii*, has been subdivided, but construction has not yet begun (M. Silberstein, Elkhorn Slough Foundation, pers. comm. 1997).

Trifolium trichocalyx is known only from Monterey pine forest on the Monterey Peninsula. Because this species appears to persist primarily as a seedbank until fire causes a flush of establishment, only a few colonies of living plants have been seen recently within and south of the Huckleberry Hill Open Space area in a region that burned in 1987 (Jones and Stokes Assoc. 1996). Of locations mapped for this species since the mid-1980s, about one-half of the area where plants have been recorded is in the Huckleberry Hill Open Space area and Morse Reserve, and approximately one-half occurs to the south and east. The mapped location of one colony is now a golf green (Ferreira 1995). The development lots and vegetation clearance zones for one of the proposed subdivisions appear to extend over a part of the largest occurrence mapped after the 1987 fire (Yadon *in litt.* 1988, Jones and Stokes Assoc. 1996), although other documents depict the lots adjacent to, but not over, previously mapped occupied habitat (EIP Associates 1995, M. Zander, *in litt.* 1996). In either case, the construction of residences over or directly adjacent to this occurrence is likely to preclude the use of fire as a management tool to promote its continued existence in the future.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Overutilization is not currently known to be a factor for the five plant taxa, but unrestricted collecting for horticultural purposes or excessive visits by individuals interested in seeing rare plants is a potential threat to these taxa. *Piperia yadonii*, like many other orchids and showy-flowered monocots, may be particularly vulnerable to collecting by amateur and professional horticulturalists due to the plant's unusual flower and its tuberous growth habit which increases the ease with which it can be moved.

Vandalism is a potential threat for *Potentilla hickmanii* and *Astragalus tener* var. *titi*. The sites that these plants inhabit could be easily vandalized, resulting in the destruction of a significant portion of the population. The sites where *A. tener* var. *titi* exist are small and easily accessible, increasing their susceptibility to destruction.

C. Disease or Predation

Disease is not known to be a factor affecting the five plant taxa being proposed as endangered. Several references discuss diseases that affect cypresses (Peterson 1967, Wagener 1948). However, diseases, such as the oak root fungus (*Armillariella mellea*) and the canker-producing strain of *Cornyeum*, primarily seem to attack cypresses planted outside of their native range and in nursery settings (Wagener 1948). No signs of disease or predation have been noted by biologists familiar with the two *Cupressus goveniana* ssp. *goveniana* groves (J. Griffin, Hastings Natural History Reservation, pers. comm. 1992; V. Yadon, pers. comm. 1992).

Increased predation (herbivory) by deer due to an elevated deer population on the Peninsula is a potential threat to *Piperia yadonii*. During surveys in 1995 and 1996 a sample of plants both on and off of the Peninsula were placed under cages to protect them from large herbivores. About 13 percent of the caged plants flowered, while in unprotected plants only about 2 percent could be found with flowering stems (Allen 1996), a reduction of 85 percent. Severe herbivory of leaves, also likely from deer, has been noted as well (V. Yadon, *in litt.* 1997). Although the Service is not aware of any quantitative data on deer populations on the Peninsula, anecdotal evidence, such as sightings and reports of health, suggest that the number of deer on the Peninsula is high (T. Palmisano, California Department of Fish and Game (CDFG), pers. comm. 1997; Mary Ann Matthews, CNPS, *in litt.* 1996; D. Steeck, USFWS, pers. obs. 1996). If the loss of 85 percent of flowering stems calculated by Allen (1996) is close to actual herbivory rates on the Peninsula, predation could have a substantial effect on the reproductive success of the species, particularly as populations are reduced by large scale habitat loss and fragmentation due to development.

D. The Inadequacy of Existing Regulatory Mechanisms

Existing regulatory mechanisms that may provide some protection for taxa in this rule include—(1) the California Endangered Species Act (CESA); (2) the California Environmental Quality Act (CEQA); (3) the California Coastal Act; and (3) local land use laws, regulations, and policies.

Under the CESA (California Fish and Game Code section 2050 *et seq.*) and the Native Plant Protection Act (California Fish and Game Code section 1900 *et seq.*), the California Fish and Game

Commission has listed *Astragalus tener* var. *titi*, *Potentilla hickmanii*, and *Trifolium trichocalyx* as endangered. *Piperia yadonii* and *Cupressus goveniana* ssp. *goveniana* are on List 1B of the CNPS Inventory (Skinner and Pavlik 1994), indicating that, in accordance with section 1901 of the CDFG Code, they are eligible for State listing. Although the CESA prohibits the “take” of State-listed plants (section 1908 and section 2080) not all projects comply and the law is not always enforced. California Senate Bill 879, passed in 1997 and effective January 1, 1998, requires individuals to obtain a section 2081(b) permit from CDFG to take a listed species incidental to otherwise lawful activities, and requires that all impacts be fully mitigated and all mitigation measures be capable of successful implementation.

These requirements have not been tested and several years will be required to evaluate their effectiveness.

The CEQA requires a full public disclosure of the potential environmental impacts of proposed projects. The public agency with primary authority or jurisdiction over the project is designated as the lead agency and is responsible for conducting a review of the project and consulting with other agencies concerned with resources affected by the project. Required biological surveys are not always adequate to identify sensitive species, however. For example, in the northern portion of the range of *Piperia yadonii* a 40-acre residential development was recently approved in an area that contains maritime chaparral habitat and is located within 5 miles of a known site of *P. yadonii*. The biological survey was conducted in September 1995, when no above-ground parts of *P. yadonii* are present. When sensitive species are identified, proposed mitigation for significant impacts often involves transplantation of sensitive plants (EIP Associates 1995) which has poor success rates (Fiedler 1991, Allen 1994, M. Zander, *in litt.* 1997). Furthermore, when the effects of a proposed project cannot be mitigated to a level of insignificance, the County lead agency may still cite overriding considerations and approve the project.

All of the taxa in this rule occur, in part, in that portion of the Monterey Peninsula included in the California Coastal Zone. The Del Monte Forest Land Use Plan of 1984 (Del Monte Forest LUP) was developed to comply with the Coastal Act's requirement that all counties prepare a plan for those portions of the Coastal Zone within their jurisdiction. Once the Del Monte

Forest LUP was certified by the Coastal Commission, development permits within the Del Monte Forest Coastal Zone became the responsibility of the County of Monterey. The County planning process does not appear to be implemented in a manner that will maintain the standards developed in the Del Monte Forest LUP, in some cases. For example, the Coastal Act defines Environmentally Sensitive Habitat Areas (ESHAs) as “...any area in which plant or animal life or their habitats are either rare or especially valuable...and which could be easily disturbed or degraded by human activities and developments.” County policy identifies ESHAs as those identified in the 1984 LUP. Because *Piperia yadonii* was not recognized taxonomically in 1984, its location in the Del Monte Forest is not addressed as an ESHA in the recent County environmental impact report for the Pebble Beach Company's proposed development (EIP Associates 1995). It therefore does not receive the protections afforded by the Coastal Act (EIP Associates 1995).

Sites which support the other species in this rule, *Cupressus goveniana* ssp. *goveniana*, *Piperia hickmanii*, part of the occurrence of *Trifolium trichocalyx* and *Astragalus tener* var. *titi*, were designated ESHAs in the Del Monte Forest LUP. The LUP and appended Management Plan for Del Monte Forest Open Space Property specifies that these sites will remain in undeveloped open space and will be managed to protect the sensitive plant species which occur there. In managing these areas, the Pebble Beach Company has constructed fencing around part of the *P. hickmanni* and *A. tener* var. *titi* occurrences and has a program for control or eradication of alien species within those ESHAs under their management. The DMFF, which manages the Morse Reserve and Huckleberry Hill Open Space area, also has a control program for alien species. Despite these protections, adjacent areas identified for development have negatively affected, and likely will continue to, affect these areas. For example, the *C. goveniana* ssp. *goveniana* stands that extended outside the boundaries of the Morse Reserve were removed during the development of Poppy Hills golf course, and wetlands upslope from the *Potentilla hickmanni* occurrence are likely to be influenced by a proposed housing development (EIP Associates 1995). While the Coastal Act and resulting Del Monte Forest LUP provide some protection for the occurrences of these plant taxa located in the Coastal Zone, the Service

concludes that it is not adequate to preclude the need to list these taxa at this time.

A management plan for Point Lobos State Reserve states that the major effort within the Reserve will be "management toward the pristine state, that is, the state the ecosystem(s) would have achieved if European man had not interfered," but also to provide limited public access to the *Cupressus goveniana* ssp. *goveniana* area (CDPR 1979). The stand is currently protected from human disturbance by virtue of its isolation. With surrounding parcels to be transferred to the Reserve over the next decade, more active management of the area, particularly prescribed burning, is likely (K. Gray, pers. comm. 1997).

The Service concludes that existing regulatory mechanisms have provided some protection for these taxa, but the implementation of the regulations has not been adequate to preclude the need to list these taxa.

E. Other Natural or Manmade Factors Affecting Their Continued Existence

Alien plant taxa threaten or are a potential threat to four of the taxa included in this rule. Two of the five plant taxa occur in meadow habitat containing a high percentage of alien plants. Along 17-Mile Drive, *Astragalus tener* var. *titi* occurs with the alien *Plantago coronopus* (cut-leaf plantain) and *Carpobrotus edulis*. *Carpobrotus edulis*, in particular, spreads rapidly and competes aggressively with native species for space. The Pebble Beach Company has an active *C. edulis* eradication program in, and adjacent to, the enclosure on the ocean side of 17-Mile Drive (M. Zander, *in litt.* 1997). However, *C. edulis* has been planted and is being maintained within a few feet of the unfenced portion of the habitat of *A. tener* var. *titi* on the inland side of 17-Mile Drive owned by the Monterey Peninsula Country Club (Zander 1996). *Plantago coronopus*, a prolific seeder, appears to be crowding out native species on both sides of 17-Mile Drive (Ferreira 1995).

Both populations of *Potentilla hickmanii* may be threatened by alien species. The population on the Monterey Peninsula occurs at Indian Village where Ferreira (1995) noted four alien grass taxa associated with it: *Aira caryophylla*, *Bromus mollis*, *Festuca arundinacea*, and *Lolium multiflorum*. The *Festuca* may have been introduced in a "meadow mix" used on adjacent fairways; its stature and invasiveness appear to compete with *P. hickmanii*. *Plantago coronopus*, also an alien, is present at this site and may be

competing with *P. hickmanii*. Alien grasses, such as *Phalaris aquatica*, are also found at the San Mateo site, and *Genista monspessulana*, an invasive alien shrub, occurs there on the surrounding slopes (T. Morosco, *in litt.* 1997). At this location *P. hickmanii* is reported to occur in greatest concentrations in those areas that support the most intact native habitats with the fewest annual grasses (B. Ertter, *in litt.* 1997); whether lower densities elsewhere are due to competition from annual grasses has not yet been explored.

Cortaderia jubata (pampasgrass) and *Genista monspessulana* (French broom) are two other alien plant taxa that invade forests and meadows on the Monterey Peninsula. The Pebble Beach Company has an on-going eradication program for these two taxa in the Huckleberry Hill area adjacent to *Cupressus goveniana* ssp. *goveniana*. However, numerous fire roads provide open habitat for these invasive taxa and it is unlikely that they will ever be completely eradicated from the area. An extensive stand of *Genista* has been mapped adjacent to the grove of *C. goveniana* ssp. *goveniana* at Pt. Lobos Reserve (Patterson *et al.* 1995), where it may interfere with stand regeneration in the future (K. Gray, pers. comm. 1997).

Fire plays an important role in the regeneration of all cypress taxa (Vogl *et al.* 1988). Alteration of the natural fire cycle may negatively affect regeneration of *Cupressus goveniana* ssp. *goveniana*. Fire is essential since it opens cones that otherwise remain unopened on the trees, and it creates conditions appropriate for seedling establishment (Vogl *et al.* 1988). Prescribed burning has not been tried at the Pt. Lobos Ranch occurrence, in part due to the risks to surrounding privately owned lands (K. Gray, pers. comm. 1997).

Griffin (pers. comm. 1992) and Ferreira (1995) have noted that establishment of *Pinus radiata* (Monterey pine) seedlings after the 1987 fire has been so vigorous that the pine may be expanding its range at the expense of *Cupressus goveniana* ssp. *goveniana*. Yadon (retired Director, Pacific Grove Museum of Natural History, pers. comm. 1992) believes that the pine's preference for richer soils than those that support *C. goveniana* ssp. *goveniana* would prevent long-term establishment of pines in *C. goveniana* ssp. *goveniana* habitat.

Trifolium trichocalyx exemplifies a taxon that may persist only as a seedbank for years until released by a fire event. Maintaining habitat and certain fire management prescriptions

will be required to prevent the extinction of this species in the wild.

Alteration of habitat due to continuing recreational use of portions of Pebble Beach threaten the small populations of *Astragalus tener* var. *titi*, and *Potentilla hickmanii*. Trampling by humans and horses can affect these taxa directly, as well as alter soil compaction and erosion such that alien taxa increase at the expense of native taxa.

At least three of the five plant taxa are threatened with extinction from natural random acts by virtue of the limited number of individuals and range of the existing populations. Inbreeding may affect small or isolated populations if it results in inbreeding depression, typically characterized by lowered seed set, lowered germination rates, and lowered survival and reproduction by offspring. Small populations are also vulnerable to extinction by a single human-caused or natural event. While annual plant taxa, such as *Astragalus tener* var. *titi*, will undergo radical fluctuations in population size as a result of natural environmental conditions, the long-term survival of this taxa depends on maintaining seed production and appropriate habitat for population expansion.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these species in determining to list these species. Based on this evaluation, the preferred action is to list *Astragalus tener* var. *titi*, *Piperia yadonii*, *Potentilla hickmanii*, and *Trifolium trichocalyx*, as endangered. These taxa are in danger of extinction throughout all or a significant portion of their ranges due to habitat destruction and fragmentation from residential and recreational development; competition from alien plants; alteration of natural fire cycles; and the reduced numbers and size of populations that increase the likelihood of extinction from naturally occurring events and unanticipated human activities.

For the reasons discussed as follows, the Service finds that *Cupressus goveniana* ssp. *goveniana* is likely to become endangered within the foreseeable future throughout all or a significant portion of its range due to habitat alteration and destruction, and/or disruption of natural fire cycles. Competition from alien plants is a potential threat. The Service has determined that threatened rather than endangered status is appropriate for *C. goveniana* ssp. *goveniana* because one of two populations (the Gibson Creek stand managed by the CDPR) has not been significantly affected by human

activities. Also, since it is long-lived, *C. goveniana* ssp. *govoniana* appears to be able to withstand several decades without fire as long as sufficient habitat is maintained. Other alternatives to this action were considered but not preferred because not listing this species would not provide adequate protection and would not be in keeping with the purposes of the Act, and listing it as endangered would not be appropriate, as the populations receive some protection in the Morse Reserve and at Pt. Lobos State Park. Therefore, the preferred action is to list *Cupressus goveniana* ssp. *govoniana* as threatened.

Critical Habitat

Critical habitat is defined in 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 consideration 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 the species to the point at which listing under the Act is no longer necessary.

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 designate critical habitat at the time the taxa are determined to be endangered or threatened. Critical habitat is not determinable when one or both of the following situations exist—(1) Information sufficient to perform required analyses of the impacts of the designation is lacking, or (2) the biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat (50 CFR 424.12(a)(2)). 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.

Critical habitat designation applies only when the taxa involved occur on Federal lands or on non-Federal lands for which there is some Federal

involvement. With the exception of *Piperia yadonii*, none of the plants in this rule occur on Federal lands, nor is there any historical record of them occurring on Federal lands. Federal lands with appropriate habitat are uncommon throughout the historical range of these species, and no potential habitat for *Potentilla hickmanii*, *Astragalus tener* var. *titi*, *Cupressus goveniana* ssp. *govoniana*, or *Trifolium trichocalyx* is known to occur on Federal lands. In addition, Federal involvement is unlikely to occur on non-Federal lands having, or likely to have, populations of these four species because the activities typically conducted in the habitat of these species do not normally require Federal permits or authorization or Federal funding.

Due to this probable lack of Federal involvement, the only potential benefit that would result from critical habitat designation would be notification to the public, private landowners, and local government agencies of the need to protect these species and their habitats. However, during the listing process, and after a species is listed, the Service conducts public outreach in affected local communities. Because this form of public notification is more targeted to specific landowners and local governments, it is more effective than the notification that is provided through the designation of critical habitat. Thus, in the case of these four plant species, there would be little or no additional benefit provided by designation beyond that which results from the listing process itself. Furthermore, designation may lead to adverse reactions by landowners whose property is designated as critical habitat, because such an action is often misconstrued as an attempt by the Federal government to confiscate private property. In fact, section 9 of the Act does not prohibit destruction of plants or their habitat on private land. Moreover, because there is no likely Federal nexus there is no means of protecting critical habitat on these lands, even if critical habitat were to be designated. The widespread misconception that critical habitat designation on private lands necessarily imposes restrictions on private landowners makes designation of critical habitat counterproductive and renders cooperative efforts with private landowners to recover species more difficult. Such cooperative efforts are essential if the Service is to recover species which, like these four taxa, only occur on private lands where there is no known Federal nexus. Designation of critical habitat for *Potentilla hickmanii*, *Astragalus tener* var. *titi*, *Cupressus*

govoniana ssp. *govoniana*, or *Trifolium trichocalyx*, therefore, is not prudent because the additional benefit, if any, that might derive from public notification duplicates those that come from the public outreach component of the listing process itself, and would be outweighed by the potential detriment to the recovery of these species due to the misconception that such designation imposes Federal restrictions on private landowners where no Federal nexus exists.

Piperia yadonii also occurs predominantly on private lands where Federal involvement is unlikely. In the case of *P. yadonii*, however, a majority of its individuals are on lands of a single private landowner, who commissioned the studies that documented the species' range and population status. This landowner, therefore, is well aware of the presence and location of the species on its property and there would be no additional benefit to the species from providing to the landowner location information that it already has. Critical habitat designation also would increase the risk of overcollection of *P. yadonii* due to the publication of precise locational maps and detailed habitat descriptions as required under critical habitat regulations (16 U.S.C. 1533(b)(5)(A)(I) and (6)(A); 50 CFR 424.12(c), 424.16(a) and 424.18(a)). The risk of increased threat to *P. yadonii* from overcollection is discussed in more detail.

Piperia yadonii also occurs on State lands. The location of these plants is known to the managing agency, the CDPR, which is committed to protecting these plants. Critical habitat designation for these lands, therefore, would not be of additional benefit to the species.

One population of *Piperia yadonii* was reported from Federal land on Fort Ord in the early 1990s, but this species has not been seen there for several years despite extensive directed surveys (Jones and Stokes Assoc. 1996). The land where it occurred is to be preserved within a development area and will be transferred to a local entity for that purpose in the near future. Should the plant reappear at this site, it is likely that the population will be small and highly vulnerable to collection. Critical habitat designation at this site, therefore, may increase the threat to *P. yadonii* from overcollection in this easily accessible area.

Three small colonies of *Piperia yadonii*, with a total of a few hundred plants, also occur on Federal lands managed by the Naval Postgraduate School and the Presidio of Monterey. The Navy is aware of the location of these plants and is committed to

protecting them. While designation of critical habitat for these populations may provide some small benefit, this benefit must be weighed against the risks associated with such designation. *Piperia yadonii* is an orchid, a plant family highly prized by collectors throughout the world. The threat that collection poses to wild orchids is considered sufficiently serious that the entire orchid family, with the exception of certain species considered at greatest risk, is included on Appendix II of the Convention on the International Trade in Endangered Species (American Orchid Society 1997). Although *P. yadonii* is not currently sought by collectors, other wild California orchids are collected (Coleman 1995). *Piperia yadonii* was previously classified as *Habenaria unalascensis*, *Habenaria* is a genus that is available commercially and for which instructions for the cultivation of its species are readily available on the Internet (Dragon Agro Products 1997). The listing of *P. yadonii* as endangered publicizes the rarity of the taxa and thus can make them attractive to researchers, curiosity seekers, or collectors of rare plants. Furthermore, if the majority of the plants on the Peninsula are lost to proposed developments, the potential for collection of flowering individuals from protected populations will increase. Several of the small populations at the Presidio of Monterey and the Naval Postgraduate School are located adjacent to roads and easily accessible. Even limited collecting from small populations could have significant negative impacts.

The publication of precise critical habitat descriptions and maps required in a proposal for critical habitat could increase the potential threat to these populations from possible overcollection and, thereby contribute to their decline. The Service believes, therefore, that the designation of critical habitat for the few populations of *Piperia yadonii* on Federal lands is not prudent because any small benefit such designation might confer is significantly outweighed by the potential for increasing the degree of threat to these populations from overcollection. In addition, the Navy is aware of the location of these plants.

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 activities. 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, as follows.

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 being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the 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.

Only one of the taxa, *Piperia yadonii*, occurs on Federal lands. Four small colonies, totaling fewer than 500 plants, have been identified at the Department of the Army's Presidio of Monterey, at the Naval Post-Graduate School in Monterey, and on Fort Ord. The site at Fort Ord was located in the early 1990s, but this species has not been identified there for several years (Jones and Stokes Assoc. 1996). The land where it occurred is to be preserved within a development area and will be transferred to a local entity for that purpose in the near future. Federal agency actions that may require consultation include military training, construction of roads, and other developments that could affect these small colonies.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered or threatened plants. With respect to the four plant taxa proposed to be listed as endangered, all trade prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR 17.61 and 17.71, would apply. These prohibitions, in part, make it illegal with respect to any endangered plant 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 these species in interstate or foreign commerce; remove and reduce to possession the species from areas under Federal jurisdiction; maliciously damage or destroy any such species on any area under Federal jurisdiction; or remove, cut, dig up, damage, or destroy any such endangered plant species on any other area in knowing violation of any State law or regulation or in the course of any violation of a State criminal trespass law. *Cupressus goveniana* ssp. *goveniana* (Gowen cypress), proposed to be listed as threatened, would be subject to similar prohibitions (16 U.S.C. 1538(a)(2)(E); 50 CFR 17.61, 17.71). Seeds from cultivated specimens of threatened plant species are exempt from these prohibitions provided that a statement of "cultivated origin" appears on their containers. Certain exceptions apply to agents of the Service and State conservation agencies.

It is the policy of the Service (59 FR 34272) to identify to the maximum extent practicable at the time a species is listed those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of the listing on proposed and ongoing activities within a species' range. Colonies of *Piperia yadonii* are known to occur on Federal lands. The Service believes that, based upon the best available information, the following actions will not result in a violation of section 9, provided these activities are carried out in accordance with existing regulations and permit requirements:

(1) Activities authorized, funded, or carried out by Federal agencies (e.g., grazing management, agricultural conversions, wetland and riparian habitat modification, flood and erosion control, residential development, recreational trail development, road construction, hazardous material containment and cleanup activities, prescribed burns, pesticide/herbicide application, pipelines or utility line crossing suitable habitat.) when such activity is conducted in accordance with any reasonable and prudent measures given by the Service according to section 7 of the Act;

(2) Casual, dispersed human activities on foot or horseback (e.g., bird watching, sightseeing, photography, camping, hiking).

(3) Activities on private lands that do not require Federal authorization and do not involve Federal funding, such as grazing management, agricultural conversions, flood and erosion control,

Dated: July 29, 1998.

Jamie Rappaport Clark,

Director, Fish and Wildlife Service.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 285

[I.D. 080498B]

Atlantic Tuna Fisheries; Atlantic Bluefin Tuna; Closure

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

ACTION: General category closure.

SUMMARY: NMFS has determined that the 1998 Atlantic bluefin tuna (BFT) June-August period General category subquota will be attained by August 8, 1998. Therefore, the General category fishery for June-August will be closed effective at 11:30 p.m. on August 8, 1998. This action is being taken to prevent overharvest of the General category June-August period subquota. **DATES:** Effective 11:30 p.m. local time on August 8, 1998, through August 31, 1998.

FOR FURTHER INFORMATION CONTACT: Pat Scida, 978-281-9260, or Sarah McLaughlin, 301-713-2347.

SUPPLEMENTARY INFORMATION: Regulations implemented under the authority of the Atlantic Tunas Convention Act (16 U.S.C. 971 *et seq.*) governing the harvest of BFT by persons and vessels subject to U.S. jurisdiction are found at 50 CFR part 285. Section 285.22 subdivides the U.S. quota recommended by the International Commission for the Conservation of Atlantic Tunas among the various domestic fishing categories.

General Category Closure

NMFS is required, under § 285.20(b)(1), to monitor the catch and landing statistics and, on the basis of these statistics, to project a date when the catch of BFT will equal the quota and publish a **Federal Register** announcement to close the applicable fishery.

Implementing regulations for the Atlantic tuna fisheries at 50 CFR 285.22 provide for a subquota of 388 mt of large medium and giant BFT to be harvested from the regulatory area by vessels permitted in the General category during the period beginning June 1 and ending August 31. Based on reported catch and effort, NMFS projects that this subquota will be reached by August 8, 1998. Therefore, fishing for, retaining, possessing, or landing large medium or

giant BFT by vessels in the General category must cease at 11:30 p.m. local time August 8, 1998. The General category will reopen September 1, 1998, with a quota of 194 mt for the September period. If necessary, the September subquota will be adjusted based on actual landings from the current period. While the General category is open, General category permit holders are restricted from all BFT fishing, including tag-and-release fishing, on restricted-fishing days. However, for the remainder of August, previously designated restricted-fishing days are waived; therefore, General category permit holders may tag and release BFT while the General category is closed, prior to the September 1 opening.

The intent of this closure is to prevent overharvest of the June-August period subquota established for the General category.

Classification

This action is taken under 50 CFR 285.20(b) and 50 CFR 285.22 and is exempt from review under E.O. 12866.

Authority: 16 U.S.C. 971 *et seq.*

Dated: August 6, 1998.

Gary C. Matlock,

Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

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