Dated: January 31, 1994.

Mollie H. Beattie,

Director, Fish and Wildlife Service.

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

29-94

RIN 1018—AB73

Endangered and Threatened Wildlife and Plants; Endangered Status for Three Plants and Threatened Status for One Plant From Sandy and Sedimentary Soils of Central Coastal California

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 three plants: *Chorizanthe pungens* var. *hartwegiana* (Ben Lomond spineflower (also previously known as Hartweg's spineflower)), *Chorizanthe robusta* (inclusive of var. *hartwegii* and var. *robusta*) (robust spineflower), and *Erysimum teretifolium* (Ben Lomond wallflower). The Service also determines threatened status for one plant: *Chorizanthe pungens* var. *pungens* (Monterey spineflower). These four taxa occur in coastal habitats of southern Santa Cruz and northern Monterey Counties and are imperiled by one or more of the following factors: Habitat destruction due to residential and golf course development, agricultural land conversion, sand mining, military activities, and encroachment by alien plant species. This rule implements the protection and recovery provisions afforded by the Act for these plants.

EFFECTIVE DATE: March 7, 1994.

ADDRESSES: The complete file for this rule is available for public inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Ventura Field Office, 2140 Eastman Avenue, Suite 100, Ventura, California 93003.

FOR FURTHER INFORMATION CONTACT: Connie Rutherford at the above address (805/644–1766).

SUPPLEMENTARY INFORMATION:

Background

Chorizanthe pungens Benth. var. *hartwegiana* Reveal & Hardham, *Chorizanthe robusta* Parry var. *hartwegii* (Benth. in A. DC), and *Erysimum teretifolium* Eastwood are endemic to sandstone and mudstone deposits in the Santa Cruz Mountains in Santa Cruz County, California. *Chorizanthe pungens* Benth var. *pungens* and *Chorizanthe robusta* Parry var. *robusta* are endemic to sandy soils of coastal habitats in southern Santa Cruz and northern Monterey Counties.

The Santa Cruz Mountains are a relatively young range composed of igneous and metamorphic rocks overlain by thick layers of sedimentary material uplifted from the ocean floor and ancient shoreline zone (Caughman and Ginsberg 1987). These ancient marine terraces persist as pockets of sandstones and limestones that are geologically distinct from the volcanic origins of the range. Soils that form from these sandstone and limestone deposits tend to be coarse and, at least surficially, lose soil moisture rapidly. The more mesic slopes of the Santa Cruz Mountains are covered primarily by redwood forest (Zinke 1988) and mixed evergreen forest (Sawyer *et al.* 1988).

In contrast, the drier pockets of sandstone and limestone, referred to as the "Ben Lomond sandhills" (Thomas 1961), support two unique communities—maritime coast range ponderosa pine forest and northern maritime chaparral (Griffin 1964, Holland 1986). The ponderosa pine forest, locally referred to as "ponderosa pine sandhill" or "ponderosa pine sand parkland" (California Native Plant Society 1986, Marangio and Morgan 1987), consists of an open park-like forest of scattered ponderosa pine (*Pinus ponderosa*) with knobcone pine (*Pinus attenuata*), coast live oak (*Quercus agrifolia*), and at a few sites, the federally endangered Santa Cruz cypress (*Cupressus abramsii*). These stands intergrade with another unique community, northern maritime chaparral, locally referred to as silver-leaf manzanita mixed chaparral (Marangio 1985, Marangio and Morgan 1987), and are dominated by the endemic silver-leaved manzanita (*Arctostaphylos silvicola*).

As uplift of the Santa Cruz Mountains proceeded, some of the raised marine terraces of sandstone and limestone were buried beneath layers of sedimentary material deposited by flowing water. Pockets of this alluvial material, referred to as Santa Cruz mudstone, persisted during this process of mountain uplifting and alluvial movement. In the Scotts Valley area, mudstone outcrops support annual grasses and herbaceous species. These communities were referred to as annual grasslands and wildflower fields by Holland (1986).

Discussion of the Four Species

In California, the spineflower genus (*Chorizanthe*) in the buckwheat family (Polygonaceae) comprises species of wiry annual herbs that inhabit dry sandy soils along the coast and inland. Because of the patchy and limited distribution of such soils, many species of *Chorizanthe* tend to be highly localized in their distribution.

One subsection of the genus referred to as *Pungentes* consists of seven species distinguished by the following features: The inner and outer tepals (petal-like sepals) are of equal length and are entire or lobed but not fringed, filaments are free, involucres (whorl of bracts subtending the flowers) are 6-toothed with the alternating three shorter and the anterior one slightly long-awned, involucral margins are not continuously membranaceous across the sinuses, the number of stamens are variable (3–9), and plants are decumbent to erect with spreading pubescence and are distributed mainly on or near the coast from Santa Barbara County northward to Mendocino (Reveal and Hardham 1989).

Although three of the seven species in the section *Pungentes* are still thought to be common, the remaining four species are becoming increasingly rare. Two of these species (*Chorizanthe howellii* and *C. valida*) were listed as endangered on June 22, 1992 (57 FR 27848). The remaining two species, *C. pungens* and *C. robusta*, inclusive of their varieties, are subjects of this rule.

Chorizanthe pungens was first described by George Bentham in 1836 based on a specimen collected in Monterey. This taxon was recognized by George Goodman in 1934 as the type species in describing the *Pungentes* section of the genus. At that time, Goodman also recognized *C. pungens* var. *hartwegii*, previously described and identified as *C. douglasii* var. *hartwegii* by Bentham in 1856. It was named after Karl Hartweg who collected the type from "dry mountain pastures near Santa Cruz" in 1847 (Reveal and Hardham 1989).

Chorizanthe pungens var. *hartwegiana* was distinguished from *C. pungens* var. *pungens* by James Reveal and Clare Hardham (1989) after they noticed a difference between the coastal form and an inland form found "in the Ben Lomond sand hills area." The name

Chorizanthe pungens var. *pungens* was retained to represent the coastal form of the plant. Reveal and Hardham noted that the type for *C. pungens* var. *hartwegiana* was dissimilar to the plant that was called *C. pungens* var. *hartwegii*.

The recent article describing *Chorizanthe* (Reveal and Hardham 1989) treats *C. pungens* var. *pungens* and *C. pungens* var. *hartwegiana* as distinct varieties. Though Hickman (1993) did not treat *Chorizanthe pungens* var. *hartwegiana* separately in The Jepson Manual, he did state that plants with "more erect petals with pink to purple involucral margins have been called var. *hartwegiana* Rev. & Hardham." For the purposes of this final rule, the Service lists *C. pungens* var. *pungens* and *C. pungens* var. *hartwegiana* separately because the former variety qualifies for threatened status and the latter qualifies for endangered status under the Act. Even if the conservative Hickman (1993) treatment were used, *C. pungens* (inclusive of vars. *pungens* and *hartwegiana*) faces the same threats as described under the section entitled "Summary of Factors Affecting the Species" and would qualify for listing under the Act.

Chorizanthe robusta was first described by Charles Parry in 1889 based on a collection he made 6 years earlier "north of Aptos along Monterey Bay" (Parry 1889). Willis Jepson considered it to be a variety of *C. pungens* and thus combined the taxon under the name *C. pungens* var. *robusta* in his Flora of California in 1914 (Jepson 1914). In their revision of the genus in 1989, Reveal and Hardham (1989) recognized Parry's treatment and retained the taxon as *C. robusta*. Although they placed in this synonymy the type of *C. pungens* var. *hartwegii*, Reveal and Hardham noted that the definition of the taxon was still not settled with their review.

Concurrent with the publication of the Reveal and Hardham revision, the first collection in over 50 years was made of the inland form that matched Hartweg's original collection made in 1847. Reveal was therefore able to reconfirm its affinity with *Chorizanthe robusta*, while recognizing the distinctness of this taxon as a variety. Reveal, along with local botanist Randall Morgan, published the combination *C. robusta* var. *hartwegii* (Reveal and Morgan 1989), inclusive of the type of *C. pungens* var. *hartwegii*.

The recent article describing *Chorizanthe robusta* var. *hartwegii* (Reveal and Morgan 1989) treats *C. robusta* var. *robusta* and *C. robusta* var. *hartwegii* as distinct varieties. Though Hickman (1993) did not treat *C. robusta* var. *hartwegii* separately in The Jepson Manual, he did state that plants with "more erect petals with pink involucral margins have been called var. *hartwegii* (Benth.) Rev. & R. Morgan." For the purposes of this listing, the Service adds the entire species of *C. robusta* (inclusive of *C. robusta* var. *hartwegii* and *C. robusta* var. *robusta*) to the List of Endangered and Threatened Wildlife and Plants.

During the Service's review of a petition to list *Chorizanthe robusta* var. *hartwegii*, Dr. John Thomas questioned the taxonomic validity of *Chorizanthe robusta* var. *hartwegii* (John Thomas, Stanford University, *in litt.*, 1990). To address these concerns, the Service reviewed specimens of *Chorizanthe robusta* var. *hartwegii* and other closely related taxa in the *Pungentes* subsection of the genus with plant taxonomists at the University of California. The Service's review indicates that specimens ascribed to *C. pungens* and *C. robusta* have five morphologically recognizable phases that correspond to ecological and geographical patterns. Four of these five phases generally correspond to *C. pungens* var. *pungens*, *C. pungens* var. *hartwegiana*, *C. robusta* var. *robusta*, and *C. robusta* var. *hartwegii*. The fifth phase consists of specimens that were identified as *C. robusta* or *C. pungens* (Erter 1990). This final rule, by addressing the subject four varieties of *Chorizanthe*, includes all five phases reviewed.

Chorizanthe pungens var. *pungens* and *Chorizanthe robusta* var. *robusta* are endemic to sandy soils of coastal habitats in southern Santa Cruz and northern Monterey Counties. The inner rim of Monterey Bay is characterized by broad, sandy beaches backed by an extensive dune formation. Just inland from the immediate coast, maritime chaparral occupies areas with well-drained soils. Coastal dune and coastal scrub communities exist along the inner rim of Monterey Bay, but portions were affected by habitat modification or destruction.

Chorizanthe pungens var. *pungens* (Monterey spineflower) has white (rarely pinkish) scarious margins on the involucral lobes and a prostrate to slightly ascending habit that distinguish it from *Chorizanthe pungens* var. *hartwegiana*. The aggregate of flowers (heads) tend to be small (less than 1 centimeter (cm) (0.4 inches (in)) in diameter) and either distinctly or indistinctly aggregate. The plant is found scattered on sandy soils within coastal dune, coastal scrub, grassland, maritime chaparral, and oak woodland communities along and adjacent to the coast of southern Santa Cruz and northern Monterey Counties and inland to the coastal plain of Salinas Valley. Historically, the plant ranged along the coast from southern Santa Cruz County south to northern San Luis Obispo County and from Monterey inland to the Salinas Valley. Only one collection dating from 1842 was made from northern San Luis Obispo County; however, in recent years it was not collected south of Monterey Peninsula (Reveal and Hardham 1989).

Along the immediate coast, *Chorizanthe pungens* var. *pungens* was documented at Manresa State Beach and the dunes near Marina. The plant probably was extirpated from a number of historical locations in the Salinas Valley, primarily due to conversion of the original grasslands and valley oak woodlands to agricultural crops (Reveal and Hardham 1989). Significant populations of *Chorizanthe pungens* var. *pungens*, representing upwards of 70 percent of the range of the plant, were recently documented from Fort Ord (Army Corps of Engineers 1992). These surveys indicated that within grassland communities the plant occurs along roadsides, in firebreaks, and in other disturbed sites. In oak woodland, chaparral, and scrub communities, the plants occur in sandy openings between shrubs. In older stands with a high cover of shrubs, the plant is restricted to roadsides and firebreaks that bisect these communities. The highest densities of *C. pungens* var. *pungens* are located in the central portion of the firing range, where disturbance is the most frequent. Although studies were not conducted on factors that determine the pattern of distribution and the densities of *C. pungens* var. *pungens* on Fort Ord, a correlation exists between open conditions resulting from activities that disturb habitat and high densities of *C. pungens* var. *pungens*. Prior to onset of human use of this area, this species was possibly restricted to openings created by wildfires within these communities.

Chorizanthe robusta (robust spineflower) is comprised of two varieties: *C. robusta* var. *robusta* and *C. robusta* var. *hartwegii*. A description of the species is broken out below by variety.

Chorizanthe robusta var. *robusta* has thin white to pinkish scarious margins along the basal portions of the teeth and an erect to spreading or prostrate habit. The heads are large (1.5 to 2 cm (0.6 to 0.8 in) in diameter) and distinctly aggregate. The plant once ranged from Alameda to Monterey Counties, but is currently known only from sandy and

gravelly soils along and adjacent to the coast of southern Santa Cruz and northern Monterey Counties. Many of the areas from which collections were made in Alameda and San Mateo Counties were urbanized, and no new collections were made from there or from Monterey County for 30 years (Ertter 1990). As with *C. pungens* var. *pungens*, the coastal dune and scrub communities were affected by recreational use, urban development, and military activities, and the coastal plain vegetation of the Salinas Valley was converted to agricultural crops. The only known extant populations occur northeast of the city of Santa Cruz on property recently acquired by the city from the University of California and near Sunset and Manresa State Beaches, approximately 12 miles away. The total number of individuals of the plant was estimated to be less than 7,000 in 1990.

Specimens collected from certain populations of *Chorizanthe* in the vicinity of Sunset State Beach are "comparable to *Chorizanthe pungens*" according to Ertter (1990). The Service believes that these populations are best assigned to *Chorizanthe pungens* var. *pungens*.

Chorizanthe robusta var. *hartwegii* has rose-pink involucral margins confined to the basal portion of the teeth and an erect habit. The heads are medium in size (1 to 1.5 cm (0.4 to 0.6 in) in diameter) and distinctly aggregate. The plant is endemic to Purisima sandstone and Santa Cruz mudstone in Scotts Valley in the Santa Cruz Mountains. Where *C. robusta* var. *hartwegii* occurs on Purisima sandstone, the bedrock is overlain with a thin soil layer that supports a meadow community comprised of herbs and low-growing grasses. The presence of certain associated species, such as toad rush (*Juncus bufonis*), sand pigmyweed (*Crassula erecta*), mosses, and lichens, suggest a high seasonal moisture content. Where the plant occurs on Santa Cruz mudstone, the bedrock is variously mixed with scree or a thin soil layer that also supports a meadow community of herbs and grasses, though of somewhat different composition than those on Purisima sandstone, and with a lower frequency of toadrush, pigmyweed, and lichens (Habitat Restoration Group 1992).

The only known extant populations of *Chorizanthe robusta* var. *hartwegii* occur in Scotts Valley in the Santa Cruz Mountains north of the city of Santa Cruz. The plant occurs primarily on pockets of Santa Cruz mudstones and Purisima sandstones and is associated with annual grasslands and wildflower fields (Reveal and Morgan 1989). These islands of unique substrates are host to a number of rare plants. Three populations of the plant, each consisting of numerous small colonies, are scattered over an area 1 mile in diameter on three parcels in private ownership. In 1989, shortly after the taxon was rediscovered, the total number of individuals was estimated to be approximately 6,000 (California Natural Diversity Data Base (CNDDB) 1990). As a result of two proposals for development that were pending at the time, additional surveys were conducted during the next few years. Results of 1992 surveys were that the two populations on land proposed for a development named Glenwood Estates totalled between 30,000 and 100,000 individuals (Habitat Restoration Group 1992). The numbers of this annual plant are expected to fluctuate from year to year, depending on climatic conditions.

Chorizanthe pungens var. *hartwegiana* (Ben Lomond spineflower) has dark pinkish to purple scarious margins on the involucral lobes and a slightly ascending to erect habit. The heads are medium in size (1 to 1.5 cm (0.4 to 0.6 in) in diameter) and distinctly aggregate. The plant is found on sandy soils that are the basis for the Ben Lomond sandhills communities in the Santa Cruz Mountains, mostly on privately owned land. *C. pungens* var. *hartwegiana* is confined to outcrops of sandstone soils in the Santa Cruz Mountains from Big Basin State Park to the Felton area in the Santa Cruz Mountains. These sandstone soils support several unique plant communities, including the ponderosa pine-dominated Ben Lomond sandhills. The majority of occurrences of *C. pungens* var. *hartwegiana* are found on privately owned lands within the area generally bounded by the communities of Ben Lomond, Glenwood, Scotts Valley, and Felton.

Erysimum teretifolium (Ben Lomond wallflower) was first collected at Glenwood, Santa Cruz County, by Horace Davis in 1914. This plant was described by Alice Eastwood in 1938 as *E. filifolium*, not realizing that this combination was already applied to another plant (Eastwood 1938). It was therefore renamed *E. teretifolium* in the following year (Eastwood 1939). *E. teretifolium* is a biennial, or occasionally an annual, plant of the mustard family (Brassicaceae). Seedlings form a basal rosette of leaves, which then wither as the main stem develops flowers clustered in a terminal raceme. The flowers are a deep yellow with petals 1.3 to 2.5 cm (0.5 to 1.0 in) long; the slender capsule reaches 10 cm (4.0 in) in length and is covered with three-parted hairs. The leaves are simple and narrowly linear, a characteristic that separates this plant from other wallflowers.

Erysimum teretifolium is endemic to pockets of sandstone deposits in the Santa Cruz Mountains and is presently known from only a dozen scattered occurrences. These sandstone deposits support the unique ponderosa pine sandhill community, and *E. teretifolium* seems to prefer sites with loose, uncompacted sand in openings between scattered chaparral shrubs. *Chorizanthe robusta* var. *robusta* is found in close proximity with *E. teretifolium* at some locations. A dozen populations of *E. teretifolium* occur within the area generally bounded by the communities of Ben Lomond, Glenwood, Scotts Valley, and Felton, with one outlying population occurring in the Bonny Doon area, 5 miles west of Felton. One population occurs at Quail Hollow Ranch, which is jointly owned by Santa Cruz County, The Nature Conservancy, and the California Department of Fish and Game (CDFG). All other populations are on privately owned lands.

Previous Federal Action

Federal government actions for one of these four plants began as a result of section 12 of the Endangered Species Act of 1973, which directed the Secretary of the Smithsonian Institution to prepare a report on those plants considered to be endangered, threatened, or extinct. This report, designated as House Document No. 94–51, was presented to Congress on January 9, 1975. In the report, *Erysimum teretifolium* was recommended for threatened 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 the Service's intention thereby to review the status of the plant taxa named within.

The Service published an updated notice of review for plants on December 15, 1980 (45 FR 82480). This notice included *Erysimum teretifolium* as a category 1 candidate (species for which data in the Service's possession are sufficient to support proposals for listing) and *Chorizanthe pungens* var. *pungens* as a category 2 candidate (species for which data in the Service's possession indicate listing may be appropriate, but for which additional biological information is needed to support listing). In the September 27, 1985, revised notice of review for plants (50 FR 39526), *E. teretifolium* was again

included as a category 1 candidate, and *C. pungens* var. *pungens* as a category 2 candidate. In the February 21, 1990 (55 FR 6184), notice of review for plants, *E. teretifolium* was retained in category 1 and *Chorizanthe pungens* var. *pungens* and *Chorizanthe pungens* var. *hartwegiana* in category 2.

Section 4(b)(3)(B) of the Endangered Species Act, as amended in 1982, 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 newly submitted on that date. This was the case for *Erysimum teretifolium* because the 1975 Smithsonian report was accepted as a petition. In October 1983, 1984, 1985, 1986, 1987, 1988, 1989, and 1990, the Service found that the petitioned listing of *E. teretifolium* was warranted, but that the listing of this species was precluded by other pending proposals of higher priority.

On May 16, 1990, the Service received a petition from Steve McCabe, president, and Randall Morgan of the Santa Cruz Chapter of the California Native Plant Society to list *Chorizanthe robusta* var. *hartwegii* as endangered. Based on a 90-day finding that the petition presented substantial information indicating that the requested action may be warranted (55 FR 46080), the Service initiated a status review of this taxon. During that time the Service also reviewed the status of *Chorizanthe robusta* var. *robusta*. This final rule constitutes the Service's final finding that the listing of *C. robusta*, inclusive of var. *robusta* and var. *hartwegii*, as endangered, is warranted, and that the listing of *Erysimum teretifolium* as endangered is warranted.

On October 24, 1991 (56 FR 55111), the Service published a proposal to list *Chorizanthe pungens* var. *hartwegiana*, *Chorizanthe pungens* var. *pungens*, *Chorizanthe robusta* var. *hartwegii*, *Chorizanthe robusta* var. *robusta*, and *Erysimum teretifolium* as endangered species. That proposal was based, in large part, on the survey information, occurrence data, and information on pending projects that would adversely affect the five plants. *C. robusta* consisted of varieties *hartwegii* and *robusta* at the time of the publication of the proposed rule. Because the two *C. robusta* varieties, *hartwegii* and *robusta*, qualify for endangered status, this rule lists the entire species. Hence this rule lists four plants, yet discusses each of the five varieties separately. The Service now determines *C. pungens* var. *hartwegiana*, *C. robusta* (inclusive of vars. *hartwegii and robusta*), and *E. teretifolium* to be endangered species, and *C. pungens* var. *pungens* to be a threatened species, with the publication of this rule.

Summary of Comments and Recommendations

In the October 24, 1991, proposed rule (56 FR 55111) and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. A 60-day comment period closed on December 23, 1991. Appropriate State agencies, county governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. A request for a public hearing was received from Allan Butler of APC International, Inc. On May 15, 1992, and again on May 26, 1992, the Service published notices in the **Federal Register** (57 FR 20805 and 57 FR 21993) announcing the publication of the proposal, the public hearing, and the reopening of the comment period until July 15, 1992. A notice announcing the publication of the proposal and the public hearing was published in the Santa Cruz Sentinel on May 18, 1992. The Service conducted a hearing on June 4, 1992, at the Santa Cruz County Government Center in Santa Cruz. Testimony was taken from 6 p.m. to 8 p.m. Twenty-one parties presented testimony.

During the comment periods, the Service received written and oral comments from 48 parties. CDFG, California Department of Parks and Recreation, The Nature Conservancy, California Native Plant Society, National Audubon Society, Sierra Club, Environmental Council of Santa Cruz County, Southridge Watershed Association, and the Resource Defense Fund were some of the 38 commenters expressing support for the listing proposal. Eight commenters opposed the listing of *Chorizanthe robusta* var. *hartwegii*. The city of Marina opposed the listing of *Chorizanthe pungens* var. *pungens*. Two commenters, one of whom offered technical comments on the proposal, were neutral. In addition, results of additional surveys for the plants (Army Corps of Engineers 1992, Habitat Restoration Group 1992) were incorporated into this final rule. Written comments and oral statements obtained during the public hearing and comment periods are combined in the following discussion. Opposing comments and other comments questioning the rule were organized into specific issues. These issues and the Service's response to each are summarized as follows:

Issue 1: Several commenters felt that there was insufficient scientific evidence to list *Chorizanthe robusta* var. *hartwegii*. Others stated that the Service used data that were skewed or selectively chosen to support the listing of this plant; "relied on the expertise of an amateur botanist whose opinion [is cited] without investigation of contrary opinions by, arguably, more qualified professionals;" and did not utilize information supplied by Dr. Thomas that challenged the appropriateness of listing *C. robusta* var. *hartwegii*.

Service Response: In preparing the proposed rule, the Service utilized information from botanical collections and observations that date from the mid-1800s, as well as data that were submitted to the Service in response to a request for information made to local and State agencies and other interested parties. The Service therefore maintains that the best available commercial and scientific information was utilized in preparation of the proposed rule. No data were submitted to support the contention that the Service skewed or selectively chose data to support the proposal. During preparation of the proposal, the Service consulted with a number of professional botanists, and other professional biologists commented during the comment period. These botanists and biologists gave biological bases that supported the listing of *Chorizanthe robusta* var. *hartwegii*. The Service, therefore, believes that this determination to list the plant as endangered under *C. robusta* is appropriate and is supported by the botanical community.

Issue 2: Several commenters pointed out that the California Fish and Game Commission rejected a proposal to State list *Chorizanthe robusta* var. *hartwegii*, and it was, therefore, inappropriate for the Service to pursue Federal listing due to the "doctrine of comity" (the informal and voluntary recognition by courts of one jurisdiction of the laws and judicial decision of another).

Service Response: The California Fish and Game Commission did not reject a proposal to State list *Chorizanthe robusta* var. *hartwegii*, rather it determined that not enough information was available to petition the plant for State listing. The opinions of the California Fish and Game Commission were not shared by CDFG, which supported the Federal listing at the public hearing and in writing (Ken Berg, CDFG, pers. comm., 1992). The Act does not require agreement among State agencies. Moreover, CDFG, in collaboration with The Nature Conservancy and the California Native Plant Society, supplied the Service with

data, through the CNDDB (1990), that supports Federal listing of the four plants.

Issue 3: A few commenters, citing Dr. John Thomas's opinions, stated that *Chorizanthe robusta* var. *hartwegii* is not a distinct taxon. Others contended that other botanical experts consulted by the Service "did not reach a conclusion which would change the above view" and that their brief reviews were not definitive and did not resolve the taxonomic questions that were raised. One commenter stated that a thorough taxonomic revision of the *Pungentes* subsection of the genus *Chorizanthe* was needed.

Service Response: The Service believes that the recognized authority for the taxonomy of the buckwheat family, Dr. James Reveal, provided sufficient data to support the taxonomic validity of *Chorizanthe robusta* var. *hartwegii*. Moreover, other botanical experts consulted by the Service did not provide any information that disputed the taxonomic validity of this plant. The species *C. robusta*, inclusive of vars. *robusta* and *hartwegii*, faces threats as described under the section entitled "Summary of Factors Affecting the Species," hence even if the conservative Hickman (1993) treatment were used as in The Jepson Manual, the entire species would qualify for listing under the Act. The Service agrees that additional taxonomic work on the *Pungentes* subsection of the genus *Chorizanthe* would be desirable, but maintains that the existing treatment is sufficient to proceed with the listing.

Issue 4: Several commenters contended that adequate regulatory mechanisms are currently in place, through the California Environmental Quality Act and the California Endangered Species Act, to protect *Chorizanthe robusta* var. *hartwegii*.

Service Response: The only protection given to State-listed species is the requirement that landowners give CDFG 10 days notice of any land use change. The California Environmental Quality Act requires mitigation for projects that adversely affect listed plants as well as those that qualify for State listing; however, many mitigation attempts do not achieve the goal of securing long-term protection for such plants (Howald 1992). The California Environmental Quality Act process allowed the city of Scotts Valley to make a statement of overriding considerations to approve the Glenwood Development Company's project even though the project will eliminate approximately two-thirds of the known habitat for *Chorizanthe robusta* var. *hartwegii* (City of Scotts Valley 1992). Furthermore, CDFG was unable to come to agreement with the Glenwood Development Company on mitigation for impacts to the plant and compensation for unavoidable losses (Brian Hunter, CDFG, *in litt.*, 1993). The failure of existing regulatory mechanisms to adequately protect the plant are further discussed under Factor D in the "Summary of Factors Affecting the Species" section.

Issue 5: One commenter claimed that the Service has no jurisdiction over *Chorizanthe robusta* var. *hartwegii* because it occurs on privately owned lands, and the plant is neither in interstate commerce nor the subject of an international treaty and, therefore, is exclusively under the jurisdiction of the State.

Service Response: Section 4 of the Act directs the Service to evaluate species for listing based on biological information only, not land jurisdiction. The five factors on which the biological vulnerability of species are evaluated are discussed in the "Summary of Factors Affecting the Species" section. Land ownership is not a factor used to determine whether or not listing is appropriate.

Issue 6: Two commenters stated that data concerning *Chorizanthe robusta* var. *hartwegii* were obtained in violation of State trespass laws on private land; therefore, such "illegal evidence" should be excluded from consideration in the listing process.

Service Response: The "trespass" issue does not involve the Service, and although the Service does not condone entering private land without permission, it is charged with using the best commercially and scientifically available information in preparation of a proposal. Moreover, information concerning the rarity of *Chorizanthe robusta* var. *hartwegii*, the threats to its continued existence, and information from surveys on private land were made part of the public record in environmental assessments that were prepared as required by the California Environmental Quality Act (City of Scotts Valley 1989, Harding Lawson Associates 1991).

Issue 7: Several commenters charged that the proposed rule for *Chorizanthe robusta* var. *hartwegii* was promulgated merely to fulfill requirements of a settlement resulting from the lawsuit filed against the Service by the California Native Plant Society. They further contended that this deprived Glenwood Development Company of its rights and is contrary to the intent and language of the Endangered Species Act.

Service Response: The California Native Plant Society lawsuit settlement requires the Service to propose for listing those plant taxa that were identified as category 1 candidates for listing in the February 21, 1990, notice of review (56 FR 58804). Of the five taxa included in the proposed rule, only *Erysimum teretifolium* was a category 1 candidate in the February 21, 1991, notice of review, and is the only one of the four taxa subject to the requirements of the lawsuit settlement. However, Federal action on all five taxa began prior to the settlement of the California Native Plant Society lawsuit (see section on "Previous Federal Action"). As stated under the Service Response to Issue 5 above, the Endangered Species Act directs the Service to list species on the basis of biological vulnerability.

Issue 8: One commenter stated that the Service failed to publish the proposed rule within 1 year of having received the petition, which therefore failed to meet statutory time requirements, and requested that the proposed rule be withdrawn.

Service Response: The Service endeavors to meet statutory timeframes; however, nothing in the statute suggests that the Service is required to withdraw proposals because deadlines are missed.

Issue 9: One commenter stated that the Service failed to prepare environmental assessments as required by the National Environmental Policy Act.

Service Response: The Service is exempt from preparing environmental assessments regarding the listing of species pursuant to the National Environmental Policy Act for reasons outlined in the **Federal Register** on October 25, 1983 (48 FR 49244). This is stated in the proposed rule and this final rule under the section titled "National Environmental Policy Act."

Issue 10: One commenter stated that *Erysimum teretifolium* is a weed and that he had "seen it in many places in the county" and on "all kinds of roadbanks," presumably meaning that the species is more widespread than is indicated in the proposed rule. He also felt that the public should be encouraged to grow it as a garden plant, presumably to assist in perpetuating the species.

Service Response: No information was submitted to the Service to substantiate the locations of additional populations of *Erysimum teretifolium*. Since the time the proposal was published, no documentation has been made of additional populations of the plant found by any botanists that contribute to CNDDB (CNDDB 1993). The Service, therefore, maintains that this decision is based on the best and most current information available and that it is sufficient to warrant making a

determination on its status. With regard to the suggestion to cultivate *E. teretifolium* as a garden plant, the Service recognizes the value of maintaining cultivated collections of rare species. Such collections, however, do not replace protection for native ecosystems, which is the intent of the Endangered Species Act.

Issue 11: Two agencies (CDFG and California Department of Parks and Recreation) recommended that the Service list *Chorizanthe pungens* var. *pungens* as threatened rather than endangered.

Service Response: Since publication of the proposal, the Service has reviewed additional biological information, including surveys for *Chorizanthe pungens* var. *pungens* recently conducted on Fort Ord by an environmental consulting firm, Jones and Stokes Associates (Army Corps of Engineers 1992). Substantial new populations were located on Fort Ord, but the pending disposal of Fort Ord still places these populations at risk. The Service therefore determined that threatened status for this plant is appropriate.

Issue 12: Several commenters requested that the Service designate critical habitat for *Chorizanthe robusta* var. *hartwegii.*

Service Response: Under section 4(a)(3)(A) of the Act, the Secretary must designate critical habitat to the maximum extent prudent and determinable at the time a species is determined to be endangered or threatened. In the proposed rule, the Service found that determination of critical habitat was not prudent for these species. As discussed under the "Critical Habitat" section below, the Service finds that designation of critical habitat for *Chorizanthe robusta,* inclusive of vars. *robusta* and *hartwegii,* is prudent but not determinable at this time. For certain populations that would likely not be imperiled by the threat of vandalism, collecting, or other human activities, the Service will propose designation of critical habitat.

Issue 13: One commenter expressed concern that several specimens of *Chorizanthe* collected by Yadon from Fort Ord, Monterey County, were not discussed in the proposed rule. The specimens were originally annotated as *Chorizanthe robusta* var. *hartwegii* by Dr. James Reveal.

Service Response: The specimens that were collected from Fort Ord were among those that were reviewed by taxonomists at the University Herbarium and the Jepson Herbarium at the University of California, Berkeley, prior to preparation of the proposed rule (Ertter 1990). In their report, the taxonomists indicated that the specimens belong in *Chorizanthe douglasii* rather than *Chorizanthe robusta.* They cite the well-developed united involucral margins, a feature that separates the subsection Legnota (which includes *Chorizanthe douglasii*) from the seven other subsections of the genus *Chorizanthe* (which includes the subsection Pungentes) that do not have united involucral margins (Ertter 1990, Reveal and Hardham 1989). On the basis of this taxonomic review, the Service concludes that no confirmed collections of *Chorizanthe robusta* var. *hartwegii* exist from Fort Ord or anywhere else in Monterey County. No additional discussion concerning the specimens from Fort Ord has been included in the final rule.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that *Chorizanthe pungens* var. *hartwegiana* (Ben Lomond spineflower), *Chorizanthe robusta* (inclusive of vars. *hartwegii* and *robusta*) (robust spineflower), and *Erysimum teretifolium* (Ben Lomond wallflower) should be classified as endangered species, and *Chorizanthe pungens* var. *pungens* (Monterey spineflower) should be classified as a threatened species. Procedures found at section 4 of the Endangered Species Act (16 U.S.C. 1531 *et seq.*) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act were followed. 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 *Chorizanthe pungens* Benth. var. *hartwegiana* Reveal & Hardham (Ben Lomond spineflower), *Chorizanthe pungens* Benth. var. *pungens* (Monterey spineflower), *Chorizanthe robusta* Parry (inclusive of var. *hartwegii* (Benth. in A. DC) Reveal & Morgan and var. *robusta*) (robust spineflower), and *Erysimum teretifolium* Eastwood (Ben Lomond wallflower) are as follows:

A. The present or threatened destruction, modification, or curtailment of its habitat or range. Three taxa (*Chorizanthe pungens* var. *hartwegiana, Chorizanthe robusta* var. *hartwegii,* and *Erysimum teretifolium*) are restricted to sandstone and mudstone soils in the Santa Cruz Mountains. Two taxa (*Chorizanthe pungens* var. *pungens* and *Chorizanthe robusta* var. *robusta*) are found only on sandy soils of coastal and near coastal habitats in southern Santa Cruz and northern Monterey Counties. These species and their associated habitats are threatened by one or more of the following: residential and golf course development, agricultural land conversion, recreational use, sand mining, dune stabilization projects, and military activities.

Sand quarrying resulted in the direct removal of *Chorizanthe pungens* var. *hartwegiana* habitat, and a currently proposed expansion of operations at Quail Hollow Quarry may eliminate additional populations. Residential development on smaller parcels of privately owned lands also contributed to the elimination of *C. pungens* var. *hartwegiana* and the fragmentation of the remaining habitat. Protective management for sandhill parkland communities will be developed for one parcel recently acquired by the State of California.

In the 1870s, limestone quarries began operating in the Bonny Doon area of the Santa Cruz Mountains, as well as in other locations around the county (Caughman and Ginsberg 1987). In more recent years, sand quarrying replaced limestone mining as a viable economic activity. At least half of the habitat occupied by *Chorizanthe pungens* var. *hartwegiana* is on property owned by sand and gravel companies. Operations at a number of quarries, including Kaiser 1 and 2, Olympia, and Quail Hollow, have already extirpated populations of *Erysimum teretifolium* (Randall Morgan, botanist, Soquel, California, pers. comm., 1990). Expanded operations are currently proposed for Quail Hollow Quarry (John Gilchrist and Associates 1990, Strelow 1993). One parcel (Quail Hollow Ranch), which was recently acquired by Santa Cruz County and the State of California, supports a large population of *Chorizanthe pungens* var. *hartwegiana,* as well as other unique species of the sandhill parklands habitat. Management plans for Quail Hollow Ranch are under development by Santa Cruz County, hence proposed recreational facilities may affect populations of both *C. pungens* var. *hartwegiana* and *E. teretifolium* (County of Santa Cruz 1990). Another parcel owned by the San Lorenzo Valley Water District also supports several of the unique elements of the Ben Lomond sandhills habitat, including *Chorizanthe pungens* var. *hartwegiana.* This parcel was badly damaged by off-road vehicles despite efforts to fence off the area by the District. Small populations of *C. pungens* var. *hartwegiana* are also known to occur at the Bonny Doon Ecological Preserve, managed by The

Nature Conservancy, and at Big Basin and Henry Cowell State Parks. These parks, however, have not yet developed management plans for *C. pungens* var. *hartwegiana*.

The remaining coastal dune and coastal scrub habitats that support *Chorizanthe pungens* var. *pungens* were affected by industrial and residential development, recreational use, and dune stabilization due to the introduction of non-native species. Along the coast of the north side of Monterey Peninsula, human and equestrian use threaten scattered occurrences of *Chorizanthe pungens* var. *pungens*, and a development is planned for a parcel owned by the Pebble Beach Corporation (Vern Yadon, retired, Museum of Natural History, Pacific Grove, pers. comm., 1991). Other small scattered occurrences within maritime chaparral habitat may become affected by residential development and by a realignment of Highway 101.

Chorizanthe pungens var. *pungens* was probably extirpated from a number of historical locations in the Salinas Valley, primarily due to conversion of the original grassland and valley oak woodland habitat to agricultural crops. One occurrence at Manzanita County Park near Prunedale currently is not protected. A route realignment proposed for Highway 101 in northern Monterey County could destroy scattered occurrences (R. Morgan, pers. comm., 1991).

The Fort Ord Army Base probably supports the largest extant population of *Chorizanthe pungens* var. *pungens*. In recent years, road development and construction of an ammunition supply depot on the base eliminated some *C. pungens* var. *pungens* habitat, and fragmented the remaining habitat. As mitigation for recent construction, the Department of Defense, with the assistance of the California Native Plant Society, established a series of small preserves, ranging in size from 1 to 15 acres, for the purpose of protecting rare species, including *C. pungens* var. *pungens*. The small size of these preserves, however, is not likely to be sufficient to ensure long-term protection for the plant. Just prior to publication of the proposal to list the five taxa under discussion, the Department of Defense announced intentions to close the base at Fort Ord. The impact that base closure will have on *C. pungens* var. *pungens* is not known at this time but will largely be determined by the intended uses of the land by the agencies or entities to which the land will be transferred.

In southern Santa Cruz County, *Chorizanthe pungens* var. *pungens* is known to occur at Sunset and Manresa State Beaches, and within the past few years, scattered occurrences were found as far north as Day Valley (R. Morgan, pers. comm., 1991). Populations at Sunset State Beach possibly were inadvertently affected by trampling and the introduction of non-native species during dune stabilization projects.

Populations of *Chorizanthe robusta* var. *robusta* in coastal dune and coastal scrub habitats were affected by residential development, recreational use, and the introduction of non-native species. Management plans for *Chorizanthe robusta* var. *robusta* at Sunset State Beach are not yet developed. Sunset State Beach has the largest known population, numbering about 5,000 individuals in 1988 (CNDDB 1993). Smaller populations of a few hundred each near Manresa State Beach and on property owned by the city of Santa Cruz are not currently protected. The city will be developing a management plan to manage the property as a "low impact" park and intends to protect habitat for the plant (Ken Thomas, City of Santa Cruz, pers. comm., 1993).

A patch of 300 individuals of *Chorizanthe robusta* var. *robusta* that was reported in 1985 from Manresa State Beach could not be relocated in 1990 (CNDDB 1990). Efforts were started at Sunset State Beach to restore the native dune species by removing the introduced non- native species (Ferreira 1989). If the presence of *Chorizanthe robusta* var. *robusta* is taken into consideration in areas targeted for such restoration, impacts to the plant may be avoided.

Virtually the entire range of *Chorizanthe robusta* var. *hartwegii* occurs on three parcels, all in private ownership. Two parcels, totaling 282 acres, are currently proposed for a residential development and golf course named Glenwood Estates Development (City of Scotts Valley 1989). Surveys indicated that suitable habitat for *C. robusta* var. *hartwegii* occupied 12 acres of the 282 acres of the two Glenwood Estates parcels, and 10 percent of this suitable habitat was occupied by the *C. robusta* var. *hartwegii* (Habitat Restoration Group 1992). One other 116-acre parcel was planned for residential development, but the ownership was transferred to a software development and marketing firm that intends to establish world headquarters on the site. The firm indicated that the pending expansion of its global headquarters would affect less than 20 percent of the 116-acre parcel (Pat Welch, Borland Corporation, pers. comm., 1993). The firm expressed intention to set aside habitat for *C. robusta* var. *hartwegii*, but since no legal protection currently exists for any of the known populations of the plant, *C. robusta* var. *hartwegii* is threatened with the direct destruction of a portion of currently occupied habitat and with secondary impacts as discussed under Factor E.

Historical and continuing threats to *Erysimum teretifolium* include the direct removal of habitat by sand quarrying and residential development. Alteration of habitat may also be occurring in the form of increased canopy density within the Ben Lomond sandhills as a result of fire suppression. Currently, the only population that is potentially protected is on the recently acquired Quail Hollow Ranch site; however, development of recreational facilities is proposed for a portion of the ranch (County of Santa Cruz 1990). The suppression of wildfires within the Santa Cruz mountains caused the density of woodland within the pine sandhill community to increase, which in turn may reduce the availability of suitable habitat for the plant (California Native Plant Society 1986).

The largest population of *Erysimum teretifolium*, located at the Quail Hollow Quarry, contains about 75 percent of the total number of known individuals of this species (approximately 5,400 individuals) (Bittman 1986). This population was already reduced in size by sand quarrying, and ongoing quarrying will likely continue to reduce the size of the population. A current proposal to expand mining operations at this quarry would eliminate habitat supporting several hundred individuals of *E. teretifolium*, as well as an undetermined number of *Chorizanthe pungens* var. *hartwegiana* (Strelow 1993). Of the remaining populations, none comprise over 400 individuals, and about half total less than 100 individuals each (Bittman 1986). Aside from the largest population, several of the smaller populations were also reduced in size by quarrying, as well as by development of private lots. Occurrences of the plant were repeatedly vandalized in the Bonny Doon area (California Native Plant Society 1986), apparently by landowners intent on developing their properties. Quail Hollow Ranch, a site which supports less than 300 plants, was recently acquired as a park through the joint efforts of The Nature Conservancy, Santa Cruz County, and the State of California. However, management plans developed for the county portion of Quail Hollow Ranch may include development of recreational facilities, which may affect

E. teretifolium (County of Santa Cruz 1990).

B. Overutilization for commercial, recreational, scientific, or educational purposes. No evidence of collection for commercial, scientific, recreational, or educational purposes exists; however, acts of vandalism have impacted *Erysimum teretifolium* and *Chorizanthe pungens* var. *hartwegiana*. In addition, increased awareness of the need for protection of these species could increase the threat of vandalism to these plants and their habitats.

At least one population of *Erysimum teretifolium* was destroyed by a private landowner during and shortly after the plant was processed for endangered status by CDFG in 1981 (CNDDB 1992). Other occurrences of vandalism of this species were reported from a sand and gravel mine (Bittman 1986). A parcel of land owned by the San Lorenzo Valley Water District that supports several of the unique elements of the Ben Lomond sandhills habitat, including *Chorizanthe pungens* var. *hartwegiana*, was badly damaged by off-road vehicles despite efforts to fence off the area by the District.

C. Disease or predation. Two of three populations of *Chorizanthe robusta* var. *hartwegii* were grazed by horses in Scotts Valley. No data exist to substantiate whether grazing threatens this plant. No information exists concerning the threat of disease or predation to the other three plants.

D. The inadequacy of existing regulatory mechanisms. Under the Native Plant Protection Act (Division 2, Chapter 10, sec. 1900 *et seq.* of the Fish and Game Code) and the California Endangered Species Act (Division 3, Chapter 1.5, sec. 2050 *et seq.*), the California Fish and Game Commission listed *Erysimum teretifolium* as endangered in 1981. Though both the Native Plant Protection Act and the California Endangered Species Act prohibit the "take" of State-listed plants (Chapter 10, sec. 1908, and Chapter 1.5, sec. 2080), State law does not protect the plants from taking via habitat modification or land use change by the landowner. After CDFG notifies a landowner that a State-listed plant grows on his or her property, State law requires only that the landowner notify the agency "at least 10 days in advance of changing the land use to allow salvage of such plant" (Chapter 10, sec. 1913). Although these State laws provide a measure of protection to the species, these laws are not adequate to protect the species in all cases. Numerous activities do not fall under the purview of this legislation, such as certain projects proposed by the Federal government and projects falling under State statutory exemptions. Where overriding social and economic considerations can be demonstrated, these laws allow project proposals to go forward, even in cases where the continued existence of the species may be jeopardized or where adverse impacts are not mitigated to the point of insignificance.

The California Environmental Quality Act requires that environmental documents disclose the full scope of impacts anticipated to sensitive resources within a project area. The initial documentation of a project in *Chorizanthe robusta* var. *hartwegii* habitat failed to include adequate information concerning the presence of and the potential impacts to this plant. A lawsuit settlement required that additional surveys of occupied and suitable but unoccupied habitat for the plant be completed (Jane Haines, Environmental Law Services, *in litt.*, 1992). However, the lawsuit failed to specify that the information was to be used in redesigning the project to provide adequate protection for the plant.

Part of the environmental review process under the California Environmental Quality Act for projects that result in the loss of sites supporting these plant species generally includes the development of mitigation plans. Such plans may involve establishing long-term protection for certain sites by designating them as "reserves," enhancing degraded sites to improve or extend suitable habitat, transplanting affected species to an off-site location, and/or creating artificial habitat. Proponents for the Glenwood Estates Development proposed a mitigation plan that calls for establishing reserves that would set aside 0.9 acre of habitat occupied by approximately 90 percent of the total number of *Chorizanthe robusta* var. *hartwegii* individuals, as well as an additional 6 acres of suitable but unoccupied habitat (APC International, Inc. 1992). Although the project proponents have the intention of setting aside the largest concentrations, and therefore the largest number of individuals of *C. robusta* var. *hartwegii*, the distribution of this plant is already so restricted that any loss would be considered biologically significant. A review of past mitigation measures applied to other species similar to *C. robusta* var. *hartwegii* in their very narrow distributions have indicated that such measures failed to adequately effect long-term protection. Frequently cited reasons include inadequate reserve size, inadequate buffer zones, and inappropriate adjacent land uses that result in the disruption of ecological processes affecting soil and water conditions and pollinator and seed disperser populations (Howald 1992). Furthermore, areas that currently support smaller concentrations of this plant or areas of suitable habitat that are currently unoccupied by the plant would not be protected from habitat alteration and would be lost for future recovery efforts.

Mitigation plans for State-listed species are typically formalized in a Mitigation Agreement between CDFG and the project proponent. Although *C. robusta* var. *hartwegii* is not currently State listed, CDFG attempted to secure a Mitigation Agreement because of its concern over the effects of the project to the plant. However, CDFG was not able to reach an agreement with the Glenwood Development Company. CDFG believes that the reserves, as delineated, will not be adequate to ensure long-term viability of the resources targeted for protection. Furthermore, no compensation was offered for the loss of resources that will not be avoided (Hunter, *in litt.*, 1993).

The city of Scotts Valley has regulatory authority over 90 percent of the lands within the proposed project area. They approved the project acknowledging that it would have unmitigable impacts to *Chorizanthe robusta* var. *hartwegii* by issuing a statement of overriding considerations. Although the California Environmental Quality Act process allows for such approval, the goal of requiring mitigation that secures long-term protection for plants that qualify for State listing has not been achieved. The Santa Cruz County Planning Commission, which has regulatory authority over the remaining 10 percent of the lands within the proposed project area, recently rejected approval of the project. This decision, however, is being appealed by the project proponent to the County Board of Supervisors.

E. Other natural or manmade factors affecting its continued existence. The introduction of non-native species to coastal dunes for the purpose of sand stabilization adversely affected native dune flora, probably including *Chorizanthe robusta* var. *robusta* and *Chorizanthe pungens* var. *pungens*. Such introduced species as European beach grass (*Ammophila arenaria*), sea-fig (*Carpobrotus* ssp.), and iceplant (*Mesembryanthemum* ssp.) invaded dune habitats and in many cases outcompeted the native flora. While public agencies are now aware of the adverse impacts of introducing non-native species, efforts to restore dune habitats with native species may also

result in further impacts to sensitive plants, if not done properly.

As currently proposed, the Glenwood Estates Development would destroy numerous small colonies of *Chorizanthe robusta* var. *hartwegii*, but would set aside several reserves for the densest concentrations of the plant. These reserves would be left as small islands within the golf course portion of the project. Grading of adjacent portions of the course may alter surface and subsurface hydrologic processes of these remaining reserves. In addition, the reserves may be affected by the application of pesticides, herbicides, and fertilizers on the adjacent course. Application of such chemicals may alter the balance of nutrients in the soil and may affect the ability of *C. robusta* var. *hartwegii* to survive, either directly or through competition with exotic species that may be favored by application of these chemicals (Edmondson 1987; Carl Wishner, botanist, pers. comm., 1993).

Typically, annuals and other monocarpic plants (individuals that die after flowering and fruiting), such as the four plants that are the subject of this final rule, are vulnerable to random fluctuations or variation (stochasticity) in annual weather patterns and other environmental factors (Huenneke *et al.* 1986). All four of the plants are restricted to habitats of limited distribution within a small geographic range. All but *Chorizanthe pungens* var. *pungens* are currently vulnerable to stochastic extinction due to their small and isolated populations. *Chorizanthe robusta* var. *hartwegii* and *Chorizanthe robusta* var. *robusta* are particularly threatened by this factor as *C. robusta* var. *hartwegii* is found on Santa Cruz mudstones and Purisima sandstones within a 1-mile diameter in Scotts Valley in the Santa Cruz Mountains and *C. robusta* var. *robusta* is found in only three locations over a 12-mile range in southern Santa Cruz County.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these taxa in determining to make this rule final. Because three of the four plants are threatened by one or more of the following factors—urban and agricultural development, recreational use, sand mining, dune stabilization projects, or extinction from stochastic events—the preferred action is to list *Chorizanthe pungens* var. *hartwegiana*, *Chorizanthe robusta* (inclusive of vars. *hartwegii* and *robusta*), and *Erysimum teretifolium* as endangered. Other alternatives to this action were considered but not preferred because not listing these species at all or listing these species as threatened would not provide adequate protection and would not be in keeping with the purposes of the Act.

Chorizanthe pungens var. *pungens* is also threatened by the same factors listed above, as well as by ongoing military activities on the Fort Ord Army Base and its pending disposal. However, the wider range and greater number of populations and individuals of this species indicate that it is not now in danger of extinction throughout a significant portion of its range, as are the other three species, but is likely to become endangered within the foreseeable future. Therefore, the preferred action is to list *C. pungens* var. *pungens* as threatened. Not listing this species would not provide adequate protection and would not be in keeping with the purposes of the Act. For reasons discussed below, the Service is not designating critical habitat for these species at this time.

Critical Habitat

Section 4(a)(3) of the Act, as amended, requires that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time a species is determined to be endangered or threatened. Section 4(b)(6)(C) further indicates that a concurrent critical habitat designation is not required if the Service finds that a prompt determination of endangered or threatened status is essential to the conservation of the involved species or that critical habitat is not then determinable. The Service finds that designation of critical habitat for *Chorizanthe robusta* and *Chorizanthe pungens* var. *pungens* is prudent but presently not determinable and that designation of critical habitat for *Chorizanthe pungens* var. *hartwegiana* and for *Erysimum teretifolium* is not prudent.

The Service will propose designation of critical habitat for certain populations of *Chorizanthe robusta* and *Chorizanthe pungens* var. *pungens* that would likely not be imperiled by the threat of vandalism, collecting, or other human activities. Section 7(a)(2) requires Federal agencies to insure that their activities are not likely to destroy or adversely modify critical habitat of a listed species. This stipulation for Federal agencies is in addition to the requirement to insure that their actions do not jeopardize the continued existence of federally listed species. Therefore on lands where Federal actions, funding, authorizations, or licensing occurs, critical habitat would provide an added benefit to the conservation of these species. On non-Federal land, the designation of critical habitat may result in increased awareness of the need for protection. The designation of critical habitat could be useful for State landowners because they could use the designation to identify areas of special concern and to help establish priorities for their own land management.

Section 4(b)(2) of the Act requires the Service to consider economic and other impacts of designating a particular area as critical habitat. The Service must evaluate the effects of activities that occur within the ranges of these plants. The Service must gather data on precise habitat needs and ownership boundaries to be able to precisely define the critical habitat of these two plant taxa. In addition, the Service must analyze the economic impacts that could result from the designation of particular areas as critical habitat. Designation of critical habitat for *Chorizanthe robusta* and *Chorizanthe pungens* var. *pungens* is currently not determinable due to the need for this type of information. A proposal to designate critical habitat at this time would delay this final rule to list the species as threatened or endangered. The Service believes that a prompt determination of endangered or threatened status for these species is essential to ensure the benefits of conservation measures provided to species upon listing under the Act. Once the Service has gathered the necessary data, it will publish a proposal to designate critical habitat for *Chorizanthe robusta* and *Chorizanthe pungens* var. *pungens*.

Each of the four plants face anthropogenic threats (see Factor A and Factor B in "Summary of Factors Affecting the Species"), and many of the remaining populations of these species occur on privately owned property for which development is proposed or on which vandalism has already been noted. Due to the small number of populations of *C. pungens* var. *hartwegiana* and *Erysimum teretifolium* and the documented vandalism and proposed development of their habitats, the publication of precise maps and descriptions of critical habitat in the **Federal Register** would make them more vulnerable to such incidents and could contribute to their decline. In addition, no known Federal action, authorization, licensing, or funding on these lands exist, hence a designation of critical habitat would provide no additional protection under section 7 of the Act. Therefore, it would not be prudent to designate critical habitat for these two species. The appropriate agencies and landowners can be notified of the locations and management needs

of these plants. Protection of these populations will be addressed through the recovery process.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species 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 Endangered Species Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. The protection required of Federal agencies and the prohibitions against certain activities involving listed plants are discussed, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. 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 such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

Federal activities potentially impacting one or more of the four taxa include road and building construction projects and perhaps waterfowl management practices on Federal land. Populations of one of the four plants occur, at least in part, on Federal land. Fort Ord, which is managed by the Department of Defense, supports populations of *Chorizanthe pungens* var. *pungens* on the western and southern portion of the base. The Department of Defense indicated that closure and transfer of the base at Fort Ord will be phased over many years. Therefore, potential impacts to *C. pungens* var. *pungens* as a result of the land transfer cannot be determined at this time. *C. pungens* var. *pungens* is also thought to occur on the Salinas River National Wildlife Refuge, which is managed by the U.S. Fish and Wildlife Service; currently no activities occur on the Refuge that are known to affect the *C. pungens* var. *pungens*.

Activities relating to the discharge of fill materials into waters of the United States and other special aquatic sites are regulated by section 404 of the Clean Water Act and may affect *Chorizanthe pungens* var. *hartwegiana* and *Erysimum teretifolium* where they occur adjacent to sand quarry operations. The pending proposal to develop the two Glenwood Estates parcels in Scotts Valley may also involve the discharge of fill materials. The Army Corps of Engineers would be required to consult with the Service on any section 404 permitting actions that may affect these species.

The Act and its implementing regulations found at 50 CFR 17.61, 17.62, and 17.63 for endangered species and 17.71 and 17.71 for threatened species set forth a series of general prohibitions and exceptions that apply to all endangered or threatened plants. With respect to the four plant taxa that are the subject of this final rule, all trade prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR 17.61 and 17.71, apply. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to import or export, transport in interstate or foreign commerce in the course of a commercial activity, sell or offer for sale in interstate or foreign commerce, or to remove and reduce to possession any such species from areas under Federal jurisdiction. Seeds from cultivated specimens of threatened plant species, in this case *Chorizanthe pungens* var. *pungens*, are exempt from these prohibitions provided that a statement of "cultivated origin" appears on their containers. In addition, for listed plants, the Act prohibits malicious damage or destruction of any such species on any area under Federal jurisdiction, and the removal, cutting, digging up, or damaging or destroying any such 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. Certain exceptions apply to agents of the Service and State conservation agencies. The Act and 50 CFR 17.62 and 17.63 also provide for the issuance of permits to carry out otherwise prohibited activities involving endangered or threatened plant species under certain circumstances. It is anticipated that few trade permits would ever be sought or issued because the four plant species are not common in cultivation or in the wild. Requests for copies of the regulations on plants and inquiries regarding them may be addressed to the Office of Management Authority, U.S. Fish and Wildlife Service, room 420C, 4401 North Fairfax Drive, Arlington, Virginia 22203–3507 (703/358–2104).

National Environmental Policy Act

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

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List Subjects in 50 CFR Part 17

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

Regulations Promulgation

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations is amended as set forth below:

PART 17—[AMENDED]

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

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

2. Amend § 17.12(h) by adding the following, in alphabetical order under the families "Brassicaceae—Mustard family" and "Polygonaceae—Buckwheat family," to the List of Endangered and Threatened Plants:

§ 17.12 Endangered and threatened plants.

* * * * *

(h) * * *

Species		Historic range	Status	When listed	Critical habitat	Special rules
Scientific name	Common name					
*	*	*	*	*	*	
Brassicaceae—Mustard family:						
*	*	*	*	*	*	
Erysimum teretifolium	Ben Lomond wallflower	U.S.A. (CA)	E	528	NA	NA
*	*	*	*	*	*	
Polygonaceae—Buckwheat family:						
*	*	*	*	*	*	
Chorizanthe pungens var. hartwegiana	Ben Lomond spineflower	U.S.A. (CA)	E	528	NA	NA
*	*	*	*	*	*	
Chorizanthe pungens var. pungens	Monterey spineflower	U.S.A. (CA)	T	528	NA	NA
*	*	*	*	*	*	
Chorizanthe robusta	Robust spineflower	U.S.A. (CA)	E	528	NA	NA
*	*	*	*	*		

Dated: January 31, 1994.

Mollie H. Beattie,

Director, Fish and Wildlife Service.

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