DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AB31

Endangered and Threatened Wildlife and Plants; Determination of Endangered or Threatened Status for Five Plants from the Southern San Joaquin Valley

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 (Act), as amended, for four plants: *Caulanthus californicus* (California jewelflower), *Eremalche kernensis* (Kern mallow), *Lembertia congdonii* (San Joaquin wooly-threads), and *Opuntia treleasei* (Bakersfield cactus). The Service also determines threatened status for one plant, *Eriastrum hooveri* (Hoover's wooly-star). These species are restricted to grassland and adjacent plant communities (valley sink scrub, valley saltbush scrub, and juniper woodland) in the southern San Joaquin Valley, California, and neighboring foothills and

valleys. The five plants have been variously affected and are threatened by one or more of the following: urbanization, conversion of native habitat for agriculture (ag-land conversion) and related water development, oil and gas development and exploration, livestock grazing, competition from alien plants, utilization of habitat for groundwater recharge basins or for disposal of agricultural effluent or runoff, flood control projects, off-road vehicle use, mining, telecommunication and electrical line construction, alteration of the natural fire regime, poor air quality, and stochastic extinction by virtue of the small isolated nature of the remaining populations. This rule implements the protection and recovery provisions afforded by the Act for these plants.

EFFECTIVE DATE: August 20, 1990.

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, Sacramento Field Office, 2800 Cottage Way, Room E–1823, Sacramento, California 95825.

FOR FURTHER INFORMATION CONTACT: Mr. Jim A. Bartel, at the above address (916/978–4866 or FTS 460–4866).

SUPPLEMENTARY INFORMATION:

Background

Caulanthus californicus, Eremalche kernensis, Eriastrum hooveri, Lembertia congdonii, and *Opuntia treleasei* are endemic to grassland and adjacent plant communities (valley sink scrub, valley saltbush scrub, and juniper woodland (cf. Holland 1986)) of the southern San Joaquin Valley and neighboring foothills and valleys of California. This portion of the San Joaquin Valley, often referred to as the Tulare Lake Basin, contains roughly 2.5 million acres of nearly flat, valley floor. If the neighboring valleys (i.e., Carrizo Plain, Cuyama Valley) and foothills are included with the Tulare Lake Basin, prehistoric grassland and adjacent plant communities likely totalled over 6 million acres. However, 96 percent of the native habitats of the valley floor has been lost principally to urbanization and ag-land conversion (Richard Anderson, California Energy Commission, pers. comm. July 21, 1987). The remaining non-urbanized or non-converted lands have been subject to livestock grazing, water development, oil and gas development and exploration, off-road vehicle use, mining, and/or other anthropogenic actions.

The prehistoric composition of the native grasslands and adjoining plant communities likely will remain a mystery (Brown 1982), although numerous authors have speculated as to the composition of the "pristine" flora of the Central Valley, inclusive of the San Joaquin Valley and Tulare Lake Basin (Clements 1934, Munz and Keck 1950, Biswell 1956, Twisselmann 1956, White 1967, McNaughton 1968, Bakker 1971, Ornduff 1974, Heady 1977, Bartolome and Gemmill 1981, and Wester 1981). Alien, annual grasses and forbs invaded the low-elevation, plant communities of California during the days of the Franciscan missionaries. Today, these grasses, which account for 50 to 90 percent of the vegetative cover (Heady 1956) and can stand up to a meter in height (Holland 1986), dominate most grasslands in California. Alien grasses have outcompeted the native flora throughout much of California because these exotics germinate in late fall prior to the germination of the native forbs, including the four herbaceous species listed herein (*Caulanthus californicus, Eremalche kernensis, Eriastrum hooveri,* and *Lembertia congdonii*). Consequently, these four herbs generally occupy sites with reduced grass cover. Although the stem succulent listed herein (*Opuntia treleasei*) persists in areas largely dominated by alien plants (mostly annual grasses), the cactus does not necessarily prefer such "grassy" sites. The invasion of grasses has been quite thorough throughout much of the lower elevation portions of California. These exotics likely compete for nutrients and water, and may further threaten *Opuntia treleasei* by providing abundant fine (slender) fuels, which probably increase the frequency and intensity of wildfires affecting the species' habitat.

The five plant taxa largely persist today in three native plant communities adjoining the non-native annual grasslands; valley sink scrub, valley saltbush scrub, or juniper woodland. However, these plant communities too have been affected somewhat by the presence of alien grasses. Valley sink scrub is an open to dense shrubland dominated by alkali-tolerant plants of the goosefoot family (Chenopodiaceae, so called "chenopods"), like iodinebush (*Allenrolfea occidentalis*) and sea-blight (*Suaeda* spp.). This plant community, which generally lacks or produces a sparse understory of herbs, occurs about the margins of playas and on the heavy clays of the valley floor. Valley sink scrub essentially has been lost due to ag-land conversion, flood control projects, and ground-water pumping (Holland 1986). Valley saltbush scrub, a scrubland of chenopods over a low understory of annual herbs, typically occurs on the gentle, rolling hills surrounding the Tulare Lake Basin on sandy to loamy soils. Similar activities, including oil and gas exploration and development, have adversely affected and threaten this plant community (Holland 1986). Juniper woodland, a compact woodland of California juniper (*Juniperus californica*), often adjoins grassland sites immediately above the valley floor on gentle sloping terraces. Livestock grazing is the predominant activity influencing this community.

Discussion of the Five Species

Caulanthus californicus (California jewelflower) evidently was first collected by Mrs A.E. Bush near Tulare, although the date and repository of this specimen are unknown (Taylor and Davilla 1986). Serano Watson, citing the Bush collection as the type, described the plant as *Stanfordia californica* in 1880. Although E.L. Greene (1891) had placed most species of *Caulanthus* within the genus *Streptanthus,* Edwin Payson (1923) transferred the species to the former genus. Dean Taylor and William Davilla (1986) discussed in detail the appropriate generic assignment for the jewelflower and concurred with I.A. Al-Shehbaz (1973) that the monotypic genus *Stanfordia* should be submerged within *Caulanthus. C. californicus,* a rosette-forming annual herb of the mustard family (Brassicaceae), grows to about 1 foot in height and produces several flowering branches. The leaves of the species have dry, wavy margins and its non-rosette leaves clasp the stem. The flowers are translucent white with purple to green tips. Its sword-shaped siliques (narrow, many-seeded pods) attain a length of 1 inch and width of about ¼ inch. The shape and size of siliques, together with an absence of hairs and an inflated stem, separate *C. californicus* from its closest relatives: *C. coulteri* var. *coulteri, C. coulteri* var. *lemmonii* and *C. inflatus. Caulanthus californicus* historically was distributed within the general area bounded by the present-day cities or communities of Coalinga and Fresno in Fresno County, New Cuyama in Santa Barbara County, and Bakersfield in Kern County (Taylor and Davilla 1986). Previously known from 47 sites, the plant now exists as one introduced population in Kern County, a natural population in Santa Barbara County, and eight populations in San Luis Obispo County. Taylor and Davilla (1986) reported in a status survey that intensive livestock grazing, ag-land conversion, and other anthropogenic activities likely extirpated *Caulanthus californicus* from Fresno, Kings, and Tulare Counties.

Eremalche kernensis (Kern mallow) was first collected by Carl Wolf in the Temblor Valley about 7 miles northwest of McKittrick along the Lost Hills Road in Kern County in 1937. Using his collection as the type, Wolf described *E. kernensis* in 1938. Although Phillip Munz (1959) at first placed all *Eremalche* in *Malvastrum* in his flora of California, he later concurred with the use of *Eremalche* in his supplement (Munz 1968). The species, a small annual herb of the mallow family (Malvaceae), typically develops an erect (rarely decumbent to prostrate) stem about 2 to 4 inches in height. The plant produces white to rose-pink or lavender, hollyhock-like flowers (Taylor and Davilla 1986). Although other characters (i.e., flower color, shape of the calyx lobes, flower size) have been employed in the past (Wiggins 1951, Munz 1959, Leonelli 1986), differences in leaf shape, pubescence (hair type and density), color-spotting on the petal, and number of carpels (seed-bearing organs) per flower separate *E. kernensis* from other members of the genus. Contrary to Thomas Kearney (1956) and Robert Hoover (1970), Taylor and Davilla (1986) concluded that the species was valid and that morphologically similar plants often confused with *E. kernensis* were actually male-sterile *E. parryi*. Restricted to the eastern base of the Temblor Range, the species ranges from the vicinity of McKittrick to near Buttonwillow within valley saltbush scrub in Kern County (Taylor and Davilla 1986). Oil and gas development likely extirpated the species at the type locality, and ag-land conversion probably eliminated one other population of *E. kernensis*. Because the remaining four populations exist near active oil and gas fields or in the vicinity of transmission corridors (Taylor and Davilla 1986), further oil and gas development in the area or transmission line maintenance or expansion likely would threaten these sites. The species, to a lesser degree, may be affected by ag-land conversion, livestock overgrazing, exotic plant competition, telecommunication and electrical line construction, and off-road vehicle use.

Eriastrum hooveri (Hoover's wooly-star) was evidently first collected in 1935 by Gregory Lyons near Little Panoche Creek in Fresno County. However, Willis Jepson (1943), in describing the plant as *Huegelia hooveri*, cited a 1937 collection by Robert Hoover (the namesake for the specific epithet) as the type. Later Herbert Mason (1945) transferred the species along with the rest of the wooly-stars to *Eriastrum*. *E. hooveri*, an annual herb of the phlox family (Polemoniaceae), produces many wire-like branches and small (about ¼ inch across), white flowers. Standing about 2–3 inches tall, the species has grayish, fuzzy stems and is often branched (Taylor and Davilla 1986). Primarily, flower size and the ratio of corolla tube to the length of petal lobes separate the species from other *Eriastrum*, although stamen characteristics play a secondary role (Taylor and Davilla 1986). *E. hooveri* was historically distributed in the Temblor Range (Kern and San Luis Obispo Counties), Cuyama Valley (San Luis Obispo and Santa Barbara Counties) and in a discontinuous fashion within valley saltbush scrub and valley sink scrub from Fresno County south in the San Joaquin Valley (Taylor and Davilla 1986). Reportedly the species never grew around the borders of the historic Tulare Lake (Kings County). Twelve of the historical and extant populations of the species, including the type locality (7 miles south of Shafter in Kern County), have been extirpated by various habitat modifications (Taylor and Davilla 1986). Ag-land conversion, urbanization, conversion of habitat "for ground-water recharge basins or disposal of nutrient-agricultural effluent," and oil and gas development threaten 92 percent of the remaining populations of the species.

Lembertia congdonii (San Joaquin wooly-threads) was first collected by J.W. Congdon near Deer Creek in Tulare County. Using the Deer Creek collection as the type, Asa Gray described the species in 1883. Greene placed the plant in his newly-created, monotypic genus *Lembertia* in 1897. Although subsequent floras (i.e., Munz 1959, Abrams and Ferris 1960) included this species in the genus *Eatonella*, Taylor (1987) maintained that the species is sufficiently different from *Eatonella* and other relatives to warrant placement within a monotypic genus. This annual herb, a member of the sunflower family (Asteraceae), produces several, frequently branching stems arising from the base. These white-wooly stems grow to about 10 inches in length and often trail on the ground. Aside from differences in growth habit, disk and ray flowers, and other minor characters, the presence of dimorphic achenes (one-seeded, indehiscent fruit) separate *L. congdonii* from its closest relative, *Eatonella nivea* from the Great Basin (Taylor 1987). Associated with valley saltbush scrub, only 12 populations of *L. congdonii* remain in the San Joaquin Valley and adjoining foothills from the vicinity of Panoche Pass (San Benito County) southeasterly to Caliente Creek, east of Bakersfield (Kern County) (Taylor 1987). Another seven populations occur to the southwest in the Cuyama Valley (San Luis Obispo and Santa Barbara Counties) and Carrizo Plain (San Luis Obispo County). Primarily as a result of ag-land conversion, 33 populations or 63 percent of the 52 historical populations of the species have been lost (Taylor 1987). Ag-land conversion, urbanization, gravel and sand extraction, oil and gas development, continued overgrazing, and off-road vehicle use threaten the remaining stands of *L. congdonii*.

Opuntia treleasei (Bakersfield cactus) evidently was first collected east of the community of Caliente in Kern County by William Trelease in 1892. After cultivating this collection in the Missouri Botanical Garden, John Coulter (1896) described the species using this garden material as the type. James Toumey (1901) treated the species as a variety of the widespread *O. basilaris* in Bailey's Cyclopedia of Horticulture. David Griffiths and Raleigh Hare (1906) described the long-spiny form of the species from along the Kern River bluffs as *O. treleasei* var. *kernii*. Although Munz (1959) and Lyman Benson (1969 and 1982) continued to treat the Bakersfield cactus as *O. basilaris* var. *treleasei*, Charlotte Chamberlain (U.S. Corps of Engineers 1986) concluded that the *O treleasei* is morphologically distinct from *O. basilaris*. *O. treleasei*, a low-growing cactus (Cactaceae) that typically spreads to form extensive thickets, generally develops beavertail-like pads (flattened stems) 3 to 4 inches wide by 5–7 inches long. The areoles (eye-spots) are never depressed but flush with the pad surface or somewhat raised. All areoles have spines, although they vary in number and length. Unlike *O. basilaris*, the surface of the pads, which are nearly cylindrical at the base, is not papillate (covered with numerous small protuberances). Although the large magenta flowers of *O. treleasei* appear identical to *O. basilaris*, the characters cited above clearly separate these two taxa as species. Found chiefly within annual grassland on sandy to sandy-loam soils, the species historically grew atop the low hills northeast of Oildale southeasterly along the valley floor to the low foothills of the Tehachapi Mountains southeast and south-southwest of Arvin in Kern County. Charles Preuss (1844), John C. Fremont's cartographer, wrote of this area, that "(t)he, hilly country is bleak, without any vegetation except a beautiful species of cactus whose magnificent red blossoms grace this sad, sandy desert in a strange manner." Ernest Twisselmann

(1969) claimed the species "once grew in dense almost impenetrable colonies on the mesas east of Bakersfield." A photograph in a book by Britton and Rose (1920) attests to the species' former abundance. As late as 1937, biologists noted that the species produced a "thick growth" along Caliente Creek (Piemeisel and Lawson 1937). However, ag-land conversion (primarily for the production of potatoes and cotton), oil development, sand mining, urbanization, and perhaps wildfire have reduced this formerly widespread species to numerous, small isolated colonies. These colonies can be divided into five general population areas: The oilfields northeast of Oildale, Kern River Bluffs northeast of Bakersfield, the bluffs and rolling hills west and north of Caliente Creek east of Bakersfield, Comanche Point on the Tejon Ranch southeast of Arvin, and northwest of the community of Wheeler Ridge. Off-road vehicle use, proposed flood control basins, telecommunication and electrical line construction, and the activities cited above continue to threaten the remaining sites.

Federal government actions on these five 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, *Opuntia basilaris* var. *treleasei* was listed as an endangered species. On July 1, 1975 (40 FR 27823), the Service published a notice in the **Federal Register** of its acceptance of the report as a petition within the context of section 4(c)(2), now section 4(b)(3) of the Act, and of the Service's intention thereby to review the status of the plant taxa named within. *Opuntia basilaris* var. *treleasei* was included in that notice. On June 16, 1976, the Service published a proposed rule 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** publication. *Opuntia basilaris* var. *treleasei* was included in the proposed rule. General comments received in relation to the 1976 proposal were summarized in an April 26, 1978, **Federal Register** publication, which also determined 13 plant species to be endangered or threatened (43 FR 17909). On December 10, 1979, the Service published a notice of withdrawal of that portion of the June 16, 1976, proposal that had expired due to a procedural requirement of the 1978 Amendments. On December 15, 1980, the Service published a revised notice of review of native plants in the **Federal Register** (45 FR 82480); *Opuntia basilaris* var. *treleasei* was included as a category 1 species (species for which data in the Service's possession indicate proposed listing is warranted). On November 28, 1983, the Service published in the **Federal Register** (48 FR 53640) a supplement to the 1980 notice of review. This supplement added *Caulanthus californicus* as a category 2 species (species for which data in the Service's possession indicate listing is probably appropriate, but for which additional biological information is needed to support a proposed rule). Along with *Opuntia basilaris* var. *treleasei* in category 1, *Eremalche kernensis* and *Eriastrum hooveri* were included with *Caulanthus californicus* in category 2 in the September 27, 1985, revised notice of review for plants (50 FR 39526).

Section 4(b)(3)(B) of the Endangered Species Act, as amended, 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 one of the southern San Joaquin Valley plants, *Opuntia treleasei*, because the 1975 Smithsonian report was accepted as a petition. In October 1983, 1984, 1985, 1986, 1987, and 1988, the Service found that proposed listing of *Opuntia treleasei* was warranted, but that the listing of this species was precluded due to other higher priority listing actions.

On July 27, 1989, the Service published in the **Federal Register** (54 FR 31201) a proposal to list *Caulanthus californicus, Eremalche kernensis, Lembertia congdonii,* and *Opuntia treleasei* as endangered, and *Eriastrum hooveri* as threatened. This proposal was primarily based on status surveys by Taylor and Davilla (1986) and Taylor (1987), and field work carried out by Chamberlain (U.S. Army Corps of Engineers 1986) and Mike Foster (botanist, California Energy Commission, pers. comm., November 24, 1987, January 22, 1988). The Service now determines *Caulanthus californicus, Eremalche kernensis, Lembertia congdonii,* and *Opuntia treleasei* to be endangered species, and *Eriastrum hooveri* to be a threatened species with the publication of this rule.

Summary of Comments and Recommendations

In the July 27, 1989, proposed rule and associated notifications, all interested parties were requested to submit factual reports or information that might contribute to the development of a final rule. The public comment period ended on September 25, 1989. Appropriate State agencies, county and city governments, Federal agencies, scientific organizations, and other interested parties were contacted and requested to comment. Newspaper notices were published in the Bakersfield Californian on August 18, Fresno Bee on August 22, Porterville Recorder on August 17, Taft Midway Driller on August 21, Tulare Advance-Register on August 19, and Visalia Times Delta on August 19, 1989, which invited general public comment. No public hearing was requested or held.

Of the 19 comments received, the Service received nine comments during the comment period. Of the timely comments, the California Department of Fish and Game and California Native Plant Society were among three commentors expressing support for the listing proposal. Five letters were neutral and non-substantive, although these commentors generally requested locality data on known populations or inquired as to the possible effects of listing on their activities. One comment from the consultant to the Department of Energy opposed the listing of one of the five plants, *Eriastrum hooveri*. Three specific issues were raised in this letter and these comments are responded to below. None of the comments received after the close of the comment period opposed the listing of the five plants or contained critical information.

Comment 1: The loss of eleven historical populations does not suggest that the existence of *Eriastrum hooveri* is threatened.

Service response: According to Taylor and Davilla (1986), eleven of 39 populations known at the time of their study were lost primarily as a result of ag-land conversion and urbanization. At least one additional population has been lost since the publication of the study. Of the remaining 27 populations known to Taylor and Davilla (1986), they reported that oil and gas development, ag-land conversion, and/or urbanization threatened 20 populations. Of the additional ten populations reported by the Service in the proposed rule, eight are threatened by ag-land conversion or reservoir construction. Since the publication of the proposed rule, EG&G Energy Measurements (1988) released a

report on the distribution and status of Hoover's wooly-star and other "sensitive" species occurring on public land within the Elk Hills on the Naval Petroleum Reserve (NPR-1). EG&G (1988) located 28 populations on NPR-1, although two of these populations duplicated localities reported by Taylor and Davilla (1986). These additional 26 populations on NPR-1 are all subject to oil and gas development. Moreover, five of these populations are likely imminently threatened because they occur within a quarter-mile of existing well pads and accompanying sumps. Russ Lewis, a biologist with the Bureau of Land Management, surveyed the petroleum-rich lands bordering NPR-1, including the Buena Vista Valley and Buena Vista Hills in 1989. He reported (pers. comm., September 26, 1989) 79 populations harboring *E. hooveri*, all of which are threatened by oil and gas development. Because 24 of these populations had been previously located by EG&G (1988) on NPR-1, 55 of the populations reported by Lewis represent new sites. In light of these new data, 109 of the remaining 118 populations of *Eriastrum hooveri* are threatened by ag-land conversion, oil and gas development, urbanization, or reservoir construction.

Comment 2: Eriastrum hooveri grows on disturbed sites on NPR-1 and the species continues to persist in grazed areas and amid active oil and gas development. This observation suggests that *E. hooveri* will not become endangered within the foreseeable future throughout all or a significant portion of its range.

Service response: According to EG&G (1988), *Eriastrum hooveri* grows in areas free of dense annual herbs or grasses at NPR-1. Similarly, Taylor and Davilla (1986) reported that the species grew "where competing annuals are somewhat reduced in cover." The mechanism for reducing the grass cover varies within the range of *E. hooveri*. Where valley populations are restricted to patches of "cryptogamic crust" (Taylor and Davilla 1986), the largest populations within the Elk Hills on NPR-1 occur primarily in "formerly disturbed sites, particularly on or adjacent to abandoned or little-used roadways (EG&G 1988)." Because these dirt roads are rarely used, native shrubs and herbs, including *E. hooveri*, have recolonized many of these areas. The severe disturbance associated with overgrazed habitats or active oil field development is not analogous to the moderate and infrequent disturbance common to the rarely used roads on NPR-1. The apparent absence of the species from areas affected by such severe disturbance suggests that *E. hooveri* does not persist in heavily grazed areas or amid active oil and gas development, but in historically or lightly disturbed to undisturbed habitats interspersed within lands modified by overgrazing and petroleum development. Though the response of *E. hooveri* to disturbance has not been determined experimentally (EG&G 1988), the available data indicate that the species would be threatened by increased grazing and expanded oil field development. Given the primary threats facing the valley (i.e., ag-land conversion, urbanization) and lower foothill populations (i.e., oil and gas development, overgrazing), *E hooveri* likely will become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Comment 3: In light of the 28 populations of *Eriastrum hooveri* known from NPR-1 and the Department of Energy's long-term active role in protecting listed wildlife on their lands, intensive oil and gas development on NPR-1 does not appear to have adversely affected the species over the past decade.

Service response: Given the absence of distributional data prior to the advent of oil and gas development, it is impossible to determine whether such activities resulted in the loss of *Eriastrum hooveri* populations. Whereas the species is confined to the lower slopes or borders of the reservation, most oil and gas development on NPR-1 has taken place at higher elevations along Skyline Road. As a result, only five of the 28 populations occur within a quarter of a mile of an existing well pad or its accompanying sump. Given that *E. hooveri* does not grow on severely degraded or developed sites and that the Department of Energy did use aggressive annual grasses in its revegetation program, oil and gas development and associated vegetation programs probably adversely affected the species on NPR-1. Although the Department of Energy has modified the revegetation program and the agency now surveys future oil development sites for Hoover's wooly-star, these policies do not fully protect for *E. hooveri* or other non-listed species on NPR-1. In addition, the Department of Energy policies provide no protection for the populations on non-Department land.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, the Service has determined that *Caulanthus californicus, Eremalche kernenis, Lembertia congdonii* and *Opuntia treleasei* should be classified as endangered species; and that *Eriastrum hooveri* should be classified as a threatened species. Provisions set forth in section 4 of the Endangered Species Act and regulations promulgated to implement the listing provisions of the Act (50 CFR part 424) 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 *Caulanthus californicus* (Watson) Payson (California jewelflower); *Eremalche kernenis* C.B. Wolf (Kern mallow); *Eriastrum hooveri* (Jepson) H.L. Mason (Hoover's wooly-star); *Lembertia congdonii* (Gray) Greene (=*Eatonella congdonii* Gray) (San Joaquin wooly-threads); and *Opuntia treleasei* Coulter (=*Opuntia basilaris* Engelmann & Bigelow var. *treleasei* (Coulter) Toumey) (Bakersfield cactus) are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* All five species listed herein (*Caulanthus californicus, Eremalche kernensis, Eriastrum hooveri, Lembertia congdonii,* and *Opuntia treleasei*) are restricted to grassland and adjacent plant communities (valley sink scrub, valley saltbush scrub, and juniper woodland) in the southern San Joaquin Valley and neighboring foothills and valleys in California (see "Background" section for specific distributions). The primary threat facing these five species is the ongoing and threatened destruction and adverse modification of habitat. As discussed in the "Background" section, primarily ag-land conversion and urbanization have claimed 96 percent of the native habitats of the valley floor. The remaining non-urbanized or non-converted lands, which largely occur in the neighboring foothills and valleys (i.e., Carrizo Plain, Cuyama Valley), have been subject to livestock grazing, water development, oil and gas development and exploration, off-road vehicle use, mining, and/or other activities. These anthropogenic actions continue to threaten the native plant communities and habitats of these five species.

Caulanthus californicus was known from 47 sites in six counties (Fresno, Kern, Kings, San Luis Obispo, Santa Barbara, and Tulare), according a status survey by Taylor and Davilla (1986) and recent field work by Lewis (pers. comm., September 26, 1989). Although once

described as "abundant on the plains of the San Joaquin from Tulare southward (Greene 1891)," the species is known today from three localized areas; the mouth of Santa Barbara Canyon in Santa Barbara County, the southern portion of Carrizo Plain in San Luis Obispo County), and the Paul Paine Preserve (owned by The Nature Conservancy) in Kern County. One population grows in Santa Barbara Canyon on private land, although the landowners have entered into voluntary agreements with The Nature Conservancy to protect the site (California Nature Conservancy 1987). Though no plants were observed at this site in 1987 (Taylor, pers. comm., February 21, 1987), several thousand plants were counted in the spring of 1988. The Carrizo Plain harbored a couple thousand individuals in 1988 (Mike Foster, pers. comm., March 14, 1988). However, this area contained 400 to 600 plants at eight isolated sites in 1989 (Lewis, pers. comm., September 26, 1989). Only two of the eight sites are on public land managed by the Bureau of Land Management and, thus, receive any protection from overgrazing. Taylor noted that the Paul Paine Preserve population, which is introduced, consisted of only 24 plants, of which only four plants flowered in 1988. Rainfall patterns probably account for the variation in population size for these colonies of *C. californicus*. Ag-land conversion likely claimed most of the valley floor sites due to the species' preference for sandy soils, which are prized for viticulture (Taylor and Davilla 1986). As suggested from herbarium records, livestock grazing probably claimed the remaining extirpated sites within the last few decades (see Factor "D" for further discussion). Moreover, trampling by livestock may have contributed to the endangerment of this species and *Eremalche kernensis*. Overgrazing may also threaten the other three species listed herein. In addition, Taylor and Davilla (1986) speculated that poor air quality may have contributed to the demise of *C. caulanthus* by promoting the growth of competing, pollution-tolerant plants (i.e., *Bromus rubens)*.

Eremalche kernensis was known from six sites in western Kern County, according to herbarium and field records detailed in the status survey by Taylor and Davilla (1986). Oil and gas development likely extirpated the type locality of the species in the Temblor Valley. Another site of *E. kernensis*, 5 miles north of Lost Hills, was probably eliminated by ag-land conversion. In addition, construction of the California Aqueduct may have eliminated some unknown populations of the species. Three of the remaining four known occurrences exist on private land less than 5 miles from the South Belridge and Cymric Oil Fields and in the vicinity of transmission corridors (Taylor and Davilla 1986). Aside from maintenance or expansion of these corridors, future telecommunication and electrical line construction, and oil and gas development and exploration may threaten these remaining sites. One population north of McKittrick occurs on public land managed by the Bureau of Land Management. Though the agency has not undertaken any special management of the site, the Bureau of Land Management gives limited management consideration to candidate species. Nonetheless, this site still may be used for a variety of public uses (e.g., mineral extraction, oil and gas development, livestock grazing). All populations occur in areas grazed by sheep in the winter and spring. Taylor and Davilla (1986) concluded, "(u)ncontrolled and heavy sheep grazing would be detrimental to *E. kernensis*."

Lembertia congdonii was known from 52 sites in seven counties (Fresno, Kern, Kings, San Benito, San Luis Obispo, Santa Barbara, and Tulare), according to herbarium and field records, and a recent status survey (Taylor 1987; Foster, pers. comm., March 14, 1988). Habitat alteration, principally due to ag-land conversion, eliminated 33 of these sites, including the type locality and only known population in Tulare County. Of the remaining 19 sites, Taylor (1987) observed the species growing at six of these localities in either 1986 or 1987, and Foster (pers. comm., March 14, 1988) found an additional three populations in 1988. Population size ranged from 20 to 300 plants, the largest stand scattered over approximately 100 acres. Although no plants were located at the other ten localities, Taylor (1987) reported that these sites still have suitable habitat. Although three of the 19 sites presumably harboring *L. congdonii* are on public land managed by the Bureau of Land Management, the agency has not undertaken any special management of these localities. Although the Bureau gives limited management consideration to candidate species, these sites still may be used for a variety of public uses (e.g., mineral extraction, oil and gas development, livestock grazing). Another population presumably still persists at Sand Ridge east of Bakersfield. Although The Nature Conservancy owns a 120-acre parcel on Sand Ridge, the northern portion of this area remains in private ownership. Off-road vehicle use, sand mining, and a proposed flood control project by the U.S. Army Corps of Engineers variously threaten all of this area. Portions of two populations were acquired by The Nature Conservancy as part of their Carrizo Plain Natural Heritage Preserve in early 1988. On August 30, 1988, the California Department of Water Resources purchased lands within the largely abandoned Strand and Canal Oil Fields, as part of the Kern Water Bank Project, that harbor the three populations found by Foster. The remaining portions of three sites owned in part by The Nature Conservancy and the other ten populations are privately-owned and adjacent to lands that have been or continue to be urbanized, converted to agriculture, developed for oil and gas extraction and conveyance, or affected by off-road vehicles and grazing livestock. Similar activities are likely to continue in the near future.

Opuntia treleasei "once grew in dense almost impenetrable colonies on the mesas east of Bakersfield," according to Twisselmann (1969). However, ag-land conversion (primarily for the production of potatoes and cotton), oil development, sand mining, urbanization, and perhaps wildfire have reduced this formerly widespread species to numerous, small isolated colonies. As discussed in the "Background" section, these colonies can be divided into five general population areas. Primarily urbanization and oil and gas development threaten the colonies northeast of Oildale, the northernmost population. Though energy development affects somewhat the population along the Kern River Bluffs northeast and east of Bakersfield, this area is rapidly being converted to housing for the ever-expanding population of Bakersfield. The construction of a small hydroelectric project and its associated accidental wildfire affected a few plants within the Kern River floodplain northeast of Bakersfield and east of Lake Ming. Off-road vehicle use, sand mining, and perhaps livestock overgrazing threaten the colonies on the bluffs and rolling hills west and north of Caliente Creek, the population located within the center of the species' range. Because the cactus provides no forage for livestock and competes with the alien grasses, ranchers may undertake eradication programs that may adversely affect the species. As discussed under *Lembertia congdonii*, The Nature Conservancy owns a portion of the Sand Ridge colony along the bluffs of Caliente Creek. However, a proposed flood control project likely will

eliminate some individuals in the Sand Ridge area, including many plants on property owned by The Nature Conservancy. The Tejon Ranch, which is aware of the solitary clump of *O. treleasei* on the ranch, has not expressed any plans to eliminate the cactus at Comanche Point. This population, however, is less than 4 miles from the Comanche Point Oil Field, which suggests the site may be subject to future oil and gas exploration. Ag-land conversion, aqueduct and transmission line maintenance, off-road vehicle use, urbanization, road widening, and illegal dumping threaten the remaining isolated colonies northwest of the community of Wheeler Ridge (Foster, pers. comm., January 22, 1988), although one population grows on land owned by the State of California and administered by the California Department of Water Resources. In addition, the North Tejon Oil Field affects much of the Wheeler Ridge area.

Eriastrum hooveri was known from 130 sites in four counties (Fresno, Kern, San Luis Obispo, and Santa Barbara), as discussed in the "Summary of Comments and Recommendations" section. Primarily ag-land conversion and urbanization eliminated twelve of these sites. Of the remaining 118 sites, nine are either protected within preserves (i.e., Paul Paine Preserve, Alkali Sink Ecological Preserve) or located in undeveloped foothills (i.e., Temblor Range or Alcalde Hills). Overgrazing poses the only potential threat to the latter populations. The remaining 109 populations are threatened by various activities. For example, a proposed reservoir, as part of Arroyo Pasajero Project, threatens a large population along Warthan Creek in Fresno County (Lacey and Janeway 1987; Arthur Gooch, California Department of Water Resources, pers. comm., July 22, 1988). Future oil and gas development in the Elk Hills and adjacent areas may damage or destroy 28 populations on NPR–1, five populations on Naval Petroleum Reserve #2 (NPR–2), six sites on public land managed by the Bureau of Land Management, and 44 sites on private land. Although the Department of Energy, which manages NPR–1 and NPR–2, implemented policies to protect resources, these policies do not fully protect for *E. hooveri* or any non-listed species on the reserves. Similarly, the Bureau of Land Management gives management consideration to non-listed species. However, this policy does not necessarily prevent these sites from being used for a variety of purposes, including oil and gas development, mineral extraction, and livestock grazing. The remaining 27 sites occur predominantly on the valley floor on private property. Typically these sites are on small, irregularly shaped parcels surrounded by ag-land and/or urban areas, which are often adjacent to roads. Although some of these sites harbor substantial populations (5,000–40,000 plants), most of the remaining sites on the valley floor consist of 5–1,000 individuals and range from approximately an acre to less than 400 acres in size. Though many of these privately owned sites are perhaps too small to farm economically, parcels such as these continue to be converted to ag-land. Moreover, urbanization, conversion of habitat for ground-water recharge basins or disposal of nutrient-laden agricultural effluent, off-road vehicle use, and oil and gas development continue to threaten the privately owned populations (Taylor and Davilla 1986).

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* Although not necessarily applicable to these species, many cacti are collected and cultivated by plant collectors, or offered for sale or trade by cactus growers. Though no data exist demonstrating such commerce in *Opuntia treleasei*, the species may still be collected and cultivated.

C. *Disease or predation.* As suggested from herbarium records and the species palatability, livestock grazing probably extirpated colonies of *Caulanthus californicus* growing in the foothills and valleys adjoining the southern San Joaquin Valley. The adverse effects associated with trampling by livestock are discussed under Factor "A". Overgrazing may also threaten the other three species proposed listed herein.

D. *The inadequacy of existing regulatory mechanisms.* Under the Native Plant Protection Act (Chapter 1.5 § 1900 *et seq.* of the Fish and Game Code) and California Endangered Species Act (Chapter 1.5 § 2050 *et seq.*), the California Fish and Game Commission has listed *Caulanthus californicus* and *Opuntia treleasei* as endangered (14 California Code of Regulations § 670.2). Though both statutes prohibit the "take" of State-listed plants (Chapter 1.5 §§ 1908 and 2080), State law appears to exempt the taking of such plants via habitat modification or land use change by the landowner. After the California Department of Fish and Game notifies a landowner that a State-listed plant grows on his or her property, State law evidently 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 1.5 § 1913)

Opuntia treleasei, like all Cactaceae from the Americas not listed separately under Appendix I, was included under Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) on July 1, 1975. Although CITES regulates the international trade of listed species, commercial trade is not currently a threat to *Opuntia treleasei*. Thus, CITES listing does not provide real protection for this species.

E. *Other natural or manmade factors affecting its continued existence.* The invasion of alien, annual grasses has adversely affected all of the remaining "natural" areas since the days of the Franciscan missionaries. These alien grasses, which account for 50 to 90 percent of the vegetative cover (Heady 1956) and can stand up to a meter in height (Holland 1986), largely dominate grasslands of California. As discussed in the "Backgroumd" section, the exotic annuals may alter the natural fire regime and these plants have either outcompeted or continue to compete with the native flora.

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 make this rule final. Based on this evaluation, the preferred action is to list *Caulanthus californicus*, *Eremalche kernensis*, *Lembertia congdonii*, and *Opuntia treleasei* as endangered, and to list *Eriostrum hooveri* as threatened.

Caulanthus californicus, *Eremalche kernensis*, *Lembertia congdonii*, and *Opuntia treleasei* have been extirpated from all but a small fraction of their historical ranges. Today these species generally persist as small, isolated populations or colonies surrounded by ag-land, urban areas, oil fields, and/or roads. Competition from alien grasses probably has and continues to adversely affect these species, especially the three annual herbs (*Caulanthus californicus*, *Eremalche kernensis*, and *Lembertia congdonii*). Although The Nature Conservancy owns an introduced population of *Caulanthus californicus* and has landowner agreements securing another site harboring the plant (California Nature Conservancy 1987), overgrazing and stochastic events affecting such extremely small populations still may result in the extinction of this species. All four remaining populations of *Eremalche kernensis* occur within a solitary township north of McKittrick, which

may be adversely affected by livestock trampling, transmission corridor maintenance or expansion, telecommunication and electrical line construction, and oil and gas development or exploration. The remaining 19 sites of *Lembertia congdonii* are variously threatened by ag-land conversion, urbanization, conversion of habitat for ground-water recharge basins or disposal of agricultural effluent, livestock overgrazing, off-road vehicle use, and/or oil and gas development and exploration. Two populations of *Caulanthus californicus*, one of *Eremalche kernensis*, and three populations of *Lembertia congdonii* are known to occur on public land managed by the Bureau of Land Management. Although the Bureau accords limited management consideration to non-listed species, this policy does not prevent the use of these sites for a variety of activities (e.g., mineral extraction, oil and gas development, livestock grazing). The relictual colonies of *Opuntia treleasei* are imminently threatened by ag-land conversion, oil development, sand mining, urbanization, off-road vehicle use, construction of flood control basins, aqueduct and transmission line maintenance, road widening, illegal dumping, and/or potential alterations in the natural fire regime. Because these four plants are in danger of extinction throughout all or a significant portion of their ranges, they fit the definition of endangered as defined in the Act.

Eriastrum hooveri has been extirpated, principally as a result of ag-land conversion and urbanization, from 12 of its 130 known sites. Of the remaining 118 sites, nine sites are in preserve status or located in the remote higher portions of the foothills (i.e., Temblor Range or the Alcalde Hills). Overgrazing poses the only tangible threat to these foothill populations. Of the remaining 109 populations, 39 occur on public land managed by either the Bureau of Land Management or Department of Energy. These sites remain vulnerable to a variety of public uses (e.g., mineral extraction, oil and gas development, and livestock grazing). The remaining 70 populations are located on privately owned parcels and are threatened by ag-land conversion, urbanization, conversion of habitat for ground-water recharge basins or disposal of agricultural effluent, off-road vehicle use, and oil and gas development and exploration (Taylor and Davilla 1986). Although the number of extant populations (118), including those located on private land, provides greater flexibility in recovery and reduces the likelihood that the species will go extinct in the immediate future, 92 percent of the extant populations of *E. hooveri* are variously threatened. Because of the limited threats facing the foothill populations of *E. hooveri* and the likelihood additional occurrences may be found in these upland areas, this species is not now in immediate danger of extinction throughout all or a significant portion of its range. However, *E. hooveri* is likely to become in danger of extinction in the near future. As a result, *E. hooveri* fits the definition of threatened species as defined in the Act.

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. The Service finds that determination of critical habitat is not prudent for these species at this time. Because the five species face numerous anthropogenic threats (see Factor A in "Summary of Factors Affecting the Species") and occur predominantly on private land, the publication of precise maps and descriptions of critical habitat in the **Federal Register** would make these plants more vulnerable to incidents of vandalism and, therefore, could contribute to the decline of these species. The listing of these species as either endangered or threatened also publicizes the rarity of these plants and, thus, can make these plants attractive to researchers or collectors of rare plants. The proper agencies have been notified of the locations and management needs of these plants. Landowners will be notified of the location and importance of protecting habitat of these species. Protection of these species' habitats will be addressed through the recovery process and through the section 7 consultation process. The Service believes that Federal involvement in the areas where these plants occur can be identified without the designation of critical habitat. Therefore, the Service finds that designation of critical habitat for these plants is not prudent at this time. Such designation likely would increase the degree of threat from vandalism, collecting, or other human activities.

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 development and implementation of recovery plans. Such actions are initiated by the Service following listing. 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)(4) requires Federal agencies to confer informally with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is subsequently listed, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service. Two populations of *Caulanthus californicus*, one of *Eremalche kernensis*, and three populations of *Lembertia congdonii* occur on public land managed by the Bureau of Land Management. Thirty-nine populations of *Eriastrum hooveri* occur on public land managed by either the Bureau of Land Management or Department of Energy. Though some other stands occur near Federal land, all of the remaining known sites are on private land with no known Federal involvement with the following exceptions. The U.S. Army Corps of Engineers and the Bureau of Reclamation may fund or develop, at least in part, proposed flood control or water projects. Because of potential impacts to two federally listed animals, San Joaquin kit fox (*Vulpes macrotis mutica*) and blunt-nosed leopard lizard (*Gambelia silus*), the Corps has consulted formally on a proposed flood control project for Caliente Creek. However, this project probably would eliminate numerous individuals of *Opuntia treleasei* from the Sand Ridge colony, which grows on the bluffs

adjoining the creek (U.S. Army Corps of Engineers 1986). Other potential Federal actions include new allocations of water through existing Federal facilities (e.g. Bureau of Reclamation's Central Valley Project), which could increase ag-land conversion and possibly affect one or more of these five plant species. Activities involving Federal mortgage programs, including those of the U.S. Department of Agriculture (Farmers Home Administration), Veterans Administration, and U.S. Department of Housing and Urban Development (Federal Home Administration loans), may be subject to section 7 review.

The Act and its implementing regulations found at 50 CFR 17.61, 17.62, and 17.63 for endangered species and 17.71 and 17.72 for threatened species set forth a series of general trade prohibitions and exceptions that apply to all endangered and threatened plant species. With respect to the five plants from the southern San Joaquin Valley, 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 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; or to remove and reduce to possession these species from areas under Federal jurisdiction, maliciously damage or destroy the species on any such area, or remove, cut, dig up, damage or destroy the species on any other area in knowing violation of State law or regulation, or in the course of any violation of a State criminal trespass law. 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 can apply to agents of the Service and State conservation agencies. The Act and 50 CFR 17.62, 17.63, and 17.72 also provide for the issuance of permits to carry out otherwise prohibited activities involving endangered and threatened species under certain circumstances. The Service anticipates few trade permits would ever be sought or issued for the five species, with the possible exception of *Opuntia treleasei* which, like other cacti, may be in cultivation. 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 Washington, DC 20240 (703/358-2104).

As a species of the Cactaceae (Cactus family), *Opuntia treleasei* is included in Appendix II of the CITES Convention (see 50 CFR 23.23). The effect of this listing under the CITES Convention is that permits or certificates are required for exportation or importation of *Opuntia treleasei*. Such CITES Convention restrictions are intended to prevent international trade from being detrimental to the survival of listed species.

National Environmental Policy Act

The Service has determined that an Environmental Assessment, as defined by 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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Author

The primary author of this final rule is Jim A. Bartel (see **ADDRESSES** section, 916/978–4866, FTS 460–4866).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and record-keeping requirements, and Transportation.

Regulations Promulgation

PART 17—[AMENDED]

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

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

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1543; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. Amend § 17.12(h) by adding the following, in alphabetical order under the families indicated, 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					
*	*	*	*		*	
Asteraceae—Aster family:						
*	*	*	*		*	
Lembertia congdonii	San Joaquin wooly-threads	U.S.A. (CA)	E	395	NA	NA
*	*	*	*		*	
Brassicaceae—Mustard family:						
*	*	*	*		*	
Caulanthus californicus	California jewelflower	U.S.A. (CA)	E	395	NA	NA
*	*	*	*		*	
Cactaceae—Cactus family:						
*	*	*	*		*	
Opuntia treleasei	Bakersfield cactus	U.S.A. (CA)	E	395	NA	NA
*	*	*	*		*	
Malvaceae—Mallow family:						
*	*	*	*		*	
Eremalche kernensis	Kern mallow	U.S.A. (CA)	E	395	NA	NA
*	*	*	*		*	
Polemoniaceae—Phlox family:						
*	*	*	*		*	
Eriastrum hooveri	Hoover's wooly-star	U.S.A. (CA)	T	395	NA	NA
*	*	*	*		*	

Dated: June 29, 1990.

Richard N. Smith,

Acting Director, Fish and Wildlife Service.

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