50 CFR Part 17
RIN 1018-AC00 167-93

Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for Four Plants and Proposed Threatened Status for Four Plants From Vernal Pools in the Central Valley of California

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: The Fish and Wildlife Service (Service) proposes to list *Orcuttia inaequalis* (San Joaquin Valley Orcutt grass), *Orcuttia pilosa* (hairy Orcutt grass), *Orcuttia viscida* (Sacramento Orcutt grass), and *Tuctoria greenei* (Green's tuctoria) as endangered and *Castilleja campestris* ssp. *succulenta* (fleshy owl's-clover), *Chamaesyce hooveri* (Hoover's spurge), *Neostapfia colusana* (Colusa grass), and *Orcuttia tenuis* (slender Orcutt grass) as threatened pursuant to the Endangered Species Act of 1973, as amended (Act). These species grow in the basins and margins of vernal pools of the Central Valley of California. Habitat loss and degradation due to urbanization, agricultural land conversion, livestock overgrazing, off-highway vehicle use, flood control projects, highway projects, landfills, and competition from weedy nonnative plants imperil the continued existence of these species. This proposal, if made final, would extend the Act's protection to these plants. The Service seeks data and comments from the public on this proposal.

DATES: Comments from all interested parties must be received by November 3, 1993. Public hearing requests must be received by September 20, 1993.

ADDRESSES: Comments and materials concerning this proposal should be sent to the Field Supervisor, U.S. Fish and Wildlife Service, Sacramento Field Office, 2800 Cottage Way, room E-1803, Sacramento, California 95825-1846. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Ken Fuller at the above address or at 916-978-4866.

SUPPLEMENTARY INFORMATION:

Background

Vernal pools in the Central Valley of California were a common and widespread feature in pre-European times (Holland and Jain 1977). Holland (1978 and *in litt.*, September 18, 1992) estimated that urbanization and other factors have eliminated up to 90 percent of the vernal pools in the Central Valley. Since the plants discussed herein grow only in vernal pools in California, they have experienced minor to major population reductions via the loss of vernal pool habitat throughout their respective ranges. California vernal pools are generally small, seasonally aquatic ecosystems that are inundated in the winter and dry slowly in the spring and summer. Cyclical wetting and drying create an unusual ecological situation supporting a unique biota. Many plants and animals are specifically adapted to this environment and cannot survive outside these temporary pools.

The Central Valley of California consists of the Sacramento Valley in the north and the San Joaquin Valley in the southern half of the State. Within the Central Valley, vernal pools are found in four physiographic settings, each possessing an impervious soil layer relatively close to the surface. These four settings include high terraces with iron-silicate or volcanic substrates, old alluvial terraces, basin rims with claypan soils, and low valley terraces supporting silica-carbonate hardpans. Vernal pool habitats and the eight plants discussed herein are found over a very limited, discontinuous, fragmented area within the Central Valley.

Orcuttia, *Neostapfia*, and *Tuctoria* are the three genera of the grass tribe Orcuttieae, within the subfamily Chloridoidae, in the grass family (Poaceae). All three genera consist of small-statured annual grasses that produces a viscid (sticky), odoriferous, acid-tasting exudate and are covered with small glandular hairs. Plants typically have few to many slender stems terminating in a spike-like inflorescence. The leaves lack ligules (small membranous flaps at the base of the leaf blade), and little or no distinction exists between the leaf blade and the leaf sheath. Members of *Orcuttia* have long, thin, floating, juvenile leaves, two vertical rows of ranks of spikelets on the axis of the inflorescence, and five-toothed lemmas (the lower bract enclosing the grass floret). Spikelets are retained when the plants mature. Members of *Neostapfia* lack the ribbon-like, juvenile leaves of the *Orcuttia* species. In addition, spikelets are spirally arranged on the axis of the

inflorescence and have entire (undivided) lemmas. These plants do not retain their spikelets when mature. Members of *Tuctoria* also lack ribbon-like, juvenile leaves. Spikelets are spirally arranged on the axis of the inflorescence, and lemmas are entire or finely toothed. *Tuctoria* retains its spikelets when mature.

Neostapfia colusana, (Colusa grass) is a robust, tufted annual that grows 7 to 30 centimeters (cm) (3-to 12 inches (in)) in height. The stems are decumbent toward the base with the upper portion erect and terminating in spike-like inflorescences that are cylindrical, dense, and resemble small ears of corn. Because of its unique inflorescence, this species is not easily confused with any others.

Burtt-Davy (1898) collected and first described *Neostapfia colusana* as a member of the genus *Stapfia*. However, since the name *Stapfia* was already used pending subsequent revisions, Burtt-Davy (1899) later renamed this genus *Neostapfia*. Shortly thereafter, Scribner (1899) submerged *Neostapfia* within the genus *Anthochloa*. Hoover (1940) placed this species in the resurrected monotypic genus *Neostaphia*. *Neostaphia colusana* has been extirpated from its type locality in Colusa County. Five occurrences in Merced and Stanislaus Counties have been lost as well. The 36 remaining occurrences are concentrated along a 200-kilometer (km) (98-mile) stretch of the eastern edge of the San Joaquin Valley in Stanislaus and Merced Counties. One disjunct population exists in Solano County in the Sacramento Valley. All populations exist on private lands. In addition to the population on The Nature Conservancy's (TNC) Jepson Prairie Preserve in Solano County, this plant is afforded some protection via a 970-hectare (ha) (2,400-acre) conservation easement purchased by TNC at the Flying M Ranch in Merced County.

Orcuttia inaequalis, (San Joaquin Valley Orcutt grass) is a tufted annual that reaches 5 to 15 cm (2 to 6 in) in height. The grayish, pilose (bearing soft, straight hairs) plants have several spreading to erect stems, each terminating in a spike-like inflorescence. At maturity, the spikelets of the plant are aggregated into a dense, hat-shaped cluster, which separates them from other members of the genus *Orcuttia*. Additionally, the lemmas are deeply cleft into five prominent teeth, which may be sharp-pointed or have awns that are up to 0.5 millimeter (mm) (0.2 in) long. The middle tooth is conspicuously longer than the four laterals. *Orcuttia inadequalis* does not occur with any other species of *Ocruttia*. The species most closely resembles *O. californica* and *O. viscida*. The former does not have the long central lemma tooth and lacks the grayish appearance; whereas, the spikelets of the latter are more congested toward the apex of the inflorescence, but not as much as in *O. inaequalis*. *Orcuttia inaequalis* also has smaller lemmas, noncurving lemma teeth, and smaller seeds. *Orcuttia inaequalis* grows with *Neostapfia colusana* at five sites in the San Joaquin Valley.

Klyver first collected and identified *O. inaequalis* as *Orcuttia californica* near Lane's Bridge in Fresno County in 1927 (Klyver 1931). Hoover (1936a) described *O. inadqualis* as a distinct species, but reduced it to varietal status under *O. californica* in 1941 (Hoover 1941). Reeder (1982) determined *O. inaequalis* to be a distinct species based on seed proteins, chromosome numbers, and other morphological characteristics. *Orcuttia inaequalis* has 12 occurrences, mostly in the southeastern San Joaquin Valley in Fresno, Merced, and Madera Counties, over a 79-km (36-mile) range. Only one population is on Federal land, managed by the Bureau of Land Management (Bureau), while the remaining 11 populations are found on private lands. Three populations of *O. inaequalis* are protected by a conservation easement with TNC at the Flying M Ranch in Merced County.

Orcuttia pilosa (hairy Orcutt grass) is a densely-tufted, usually densely-pilose annual reaching about 5 to 20 cm (2 to 8 in) in height. The stems are erect or decumbent at the base. The inflorescence is spike-like and rather elognate, with the spiklets remote on the axis below and usually strongly congested above. The equal-length lemmas are deeply cleft into fine teeth that are sharp-pointed or short-awned. *Orcuttia pilosa* and *O. tenuis* grow together over a portion of their respective ranges but are readily distinguished, as the stems of *O. pilosa* are simple, tiller freely from the base and never branch from the upper nodes. Additionally, the spikelets of *O. pilosa* are strongly congested at the apex of the inflorescence and the stems and leaves are larger. *Orcuttia pilosa* occurs infrequently with *Tuctoria greenei* but these two grasses can be readily distinguished.

Hoover collected *O. pilosa* in 1938 from a single locality in eastern Stanislaus County, et the time considering this material to be a more robust form of *O. tenuis*. He used one of these specimens as the type for a new species, *O. pilosa*, which he described after examining additional collections from Merced and Madera Counties (Hoover 1941). *Orcuttia pilosa* occurs along a 490-km (223-mile) stretch on the eastern margin of the San Joaquin and Sacramento Valleys from Tehama County south to Stanislaus County and through Merced and Mariposa Counties. Previously, 30 occurrences of O. pilosa were known, although this number has been reduced to 19 extant populations, all occurring on private lands. Of these 19 extant populations, only 6 occurrences are considered to be stable (Stone *et al.* 1988). In recent years, the once widespread plant has become extirpated in Merced County, and has been reduced to only four populations in Stanislaus and Madera Counties. Ten populations occur in Tehama County, four of which are located on TNC's Vina Plains Preserve. However, only one of these sites is excluded from an agreement allowing continued cattle grazing by the previous landowner (Stone *et al.* 1988).

Orcuttia viscida (Sacramento Orcutt grass) is a densely tufted, pilose annual that reaches 2 to 10 cm (1 to 4 in) in height. The erect stems terminate in spike-like inflorescences that are congested at the apex. The plants are viscid even when young and more so at maturity. *Orcuttia viscida* develops five-toothed lemmas 6 to 7 mm (0.24 to 0.28 in) long with the middle tooth conspicuously longer than the four laterals. The lemma teeth curve outward at maturity, giving the inflorescence a distinct bristly appearance. Although *O. viscida* is geographically isolated from all other congeners, it most closely resembles *O. inaequalis*, but can be separated as described above under the discussion of *O. inaequalis*.

Hoover collected *O. viscida* in 1941 from a vernal pool near Folsom in Sacramento County and described it as a variety of *O. Californica* (Hoover 1941). Reeder (1980) elevated *O. viscida* to specific status based on differences in chromosome number, seed size, and other morphological characteristics (Reeder 1982). *Orcuttia viscida* has the narrowest range of the eight species proposed for listing herein. It occurs within a 350 square Km (135 square mi) area in eastern Sacramento County. Only 40 km (18 mi) separates the northern from the southernmost population. Two of the nine known populations of *O. viscida* have been extirpated. Presently, three populations are found on private lands and four are located on non-Federal public lands (one area owned by a public municipality, one owned by the Country, one by the City of Fair Oaks,

and one by the California Department of Fish and Game).

Tuctoria greenei (Greene's tuctoria) is a tufted, more or less pilose, annual grass that grows 5 to 15 cm (2 to 6 in) tall. The plant develops several to many erect stems, the outermost decumbent to spreading at the base, each terminating in a spike-like inflorescence that may be partially enveloped by the uppermost leaf. The lemmas are strongly curved and more or less truncate at the apex.

Vasey (1891) described *Tuctoria greenei* as *Orcuttia greenei* from specimens collected by Greene near Chico in Butte County in 1890. It remained in the genus *Orcuttia* until Reeder (1982) described the genus *Tuctoria* and placed the former *O. greenei* into the new genus *Tuctoria*. The 17 remaining occurrences of *T. greenei* occur in Merced, Stanislaus, Butte, Tehama, and Shasta Counties. The plant has been extirpated in Fresno, Madera, and Tulare Counties. The range of this species extends 567 km (258 miles). All populations are on private lands, including four on TNC's Vina Plains Preserve.

Orcuttia tenuis (slender Orcutt grass) is a weekly-tufted and sparsely-pilose annual grass. It grows about 5 to 15 cm (2 to 6 in) in height, producing one to several erect stems that often branch from the upper nodes. The inflorescence of this plant is elongate, with the spikelets usually remote along the axis and slightly, if at all, congested toward the apex. The lemmas are deeply cleft into fine, equal-length, prominent teeth that are sharp-pointed or short-awned. *Orcuttia tenuis* and *O. pilosa* are found growing together over a portion of their respective ranges but are readily distinguished as described in the discussion of *O. pilosa*.

Eastwood first collected *Orcuttia tenuis* in 1912 in Shasta County. These specimens were considered to be *O. californica* prior to the designation of *O. tenuis* as a new species in 1934, based upon spikelet arrangement as well as lemma tooth morphology (Hitchcock 1934). *Orcuttia tenuis* has been extirpated from its type locality in Shasta County and four other sites in the vicinity of the Redding Municipal Airport. Disjunct populations occur in vernal pools on remant alluvial fans and high stream terraces and recent basalt flows across 440 km (220 miles) (Stone et al. 1988). *Orcuttia tenuis* is restricted to northern California, with one population in Sacramento County, two in Lake County, 27 in Tehama County, 13 in Shasta County, and 2 in Siskiyou County. The Forest Service and the Bureau have jointly prepared a management guide for the eight populations on lands administered by the Bureau and the four populations on those lands administrated by the Lassen National Forest. All other populations are on private lands. In addition to the populations on TNC's Vina Plains Preserve in Tehama County, The Trust for Public Lands has purchased a conservation easement on the Inks Creek Ranch in Shasta County to protect one population of this plant.

Castilleja campestris ssp. *succulenta* (fleshy owl's-clover) is a glabrous (hairless), hemiparasitic (partly parasitic) annual herb belonging to the snapdragon family (Scrophulariaceae). The stems are simple or branched, generally 5 to 25 cm (2 to 10 in) tall with brittle-succulent, entire, alternate leaves. The branches end in dense, short, green inflorescences with bracts equaling or exceeding the bright yellow to white flowers that appear in May. *Castilleja campestris* ssp. *succelenta* occurs with *C. campestris* ssp. *campestris* in Stanislaus County, but the latter can be distinguished by its usually more brittle leaves, shorter bracts, larger corollas, and longer stigmata. Hoover (1936b) described the plant as *Orthocarpus campestris* var. *succulentus*. He subsequently elevated it to a full species, *O. succulentus*, distinguishing it from *O. campestris* on the basis of leaf and bract shape and flexibility, corolla color and morphology, and anther cell length (Hoover 1968). Chuang and Heckard (1991) significantly revised the concept of *Orthocarpus*, subsuming most of what had been called *Orthocarpus* into the genus *Castilleja*. They also proposed the new combination *C. campestris* ssp. *succulenta*. This small annual plant was formerly more widespread in the Central Valley and is now extirpated from its type locality near Ryer in Merced County. It occurs in the San Joaquin Valley over a range of 145 km (66 miles) extending through eastern Merced, southeastern Stanislaus, Madera, and northern Fresno Counties. One population occurs on lands managed by the Bureau of Reclamation, and one population on land managed by the Bureau of Land Management. The remaining 31 populations occur on private lands. Of these 31 populations, 7 occur at the Flying M Ranch, where TNC has a conservation easement.

Chamaesyce hooveri (Hoover's spurge), a member of the spurge family (Euphorbiaceae), is a prostrate, glabrous annual herb. The leaves are gray-green, asymmetric at the base, rounded to kidney-shaped and have small, narrow white teeth around the margins. The small flowers occur singly in the leaf axils. *Chamaesyce ocellata* can occur with *C. hooveri* but is readily distinguished by its spreading rather than prostrate habit, yellowish-green color, and entire leaf margins. *Chamaesyce serpyllifolia* can occur with *C. hooveri* in San Joaquin County. Both species have a gray-green color and may be prostrate, but *C. serpyllifolia* has less rounded leaves, and the marginal teeth are shorter and are usually limited to the leaf apex.

Hoover first collected this plant in Tulare County in 1937. Wheeler (1940) described it as *Euphorbia hooveri*. Koutnik (1985) places this species in the genus *Chamaesyce* based on the presence of a sheath around the vascular bundle, its sympodial (lateral branching) growth habit, and its photosynthetic pathway. *Chamaesyce hooveri* is found in vernal pools on remnant alluvial fans and related depositional stream terraces for a stretch of 528 km (240 miles) along the eastern margin of the Central Valley. Of the 23 extant occurrences, four populations are known from Stanislaus and Tulare Counties. Two populations occur at the northern end of Butte County, and the remainder are located in Tehama County. Four of the Tehama County populations occur on TNC's Vina Plains Preserve. All populations are on privately owned lands.

Previous Federal Action

Federal actions on seven of these eight species 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 species considered to be endangered, threatened, or extinct in the United States. This report, designated as House Document No. 94–51, was presented to Congress on January 9, 1975, and included *Castilleja campestris* ssp. *succulenta* (as *Orthocarpus succulentis* [sic]), *Neostapfia colusana*, *Orcuttia inaequalis* (as *O. californica* var. *inaegualis*), *O. pilosa*, *O. tenuis*, and *O. viscia* (as *O. californica* var. *viscida*) as endangered, and *Chamaesyce hooveri* (as *Euphorbia hooveri*) as threatened. The Service published a notice in the July 1, 1975, **Federal Register** (40 FR 27823) of its acceptance of the report of the Smithsonian Institution as a petition within the context of section 4(c)(2) (petition provisions are now found in section 4(b)(3) of the Act) and its intention to review the status of the species named therein. The seven plants above were included in the July 1, 1975, notice. On June 16, 1976, the Service published a proposal in the **Federal Register** (42 FR 24523) to determine approximately 1,700 vascular plant

species to be endangered species pursuant to section 4 of the Act. This 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. *Castilleja campestris* ssp. *succulenta, Chamaesyce hooveri, Neostapfia colusana, Orcuttia inaequalis, O. pilosa, O. tenuis,* and *O. viscida,* were included in the June 16, 1976, **Federal Register** document.

General comments received in relation to the 1976 proposal were summarized in an April 26, 1978, **Federal Register** publication (43 FR 17909). The Endangered Species Act Amendments of 1978 required that all proposals over 2 years old be withdrawn. A 1-year grace period was given to those proposals already more than 2 years old. On December 10, 1979, the Service published a notice in the **Federal Register** (44 FR 70796) of the withdrawal of the June 16, 1976, proposal, along with four other proposals that had expired.

The Service published an updated notice of review for plants on December 15, 1980 (45 FR 82480). This notice included *Castilleja campestris* ssp. *succulenta, Chamaesyce hooveri, Neostapfia colusana, Orcuttia inaequalis, O. pilosa, O. tenuis, O. viscida,* and *Tuctoria greenei* as Category 1 candidates. Category 1 candidates are those for which the Service has on file substantial information on biological vulnerability and threats to support a proposal to list. On November 28, 1983, the Service published in the **Federal Register** a supplemental to the notice of review (48 FR 53640), which changed *Castilleja campestris* ssp. *succulentus* and *Neostapfia colusana* to Category 2 candidates. Category 2 species are those for which data in the Service's possession indicate that listing is possibly appropriate, but for which substantial data on biological vulnerability and threats are not currently known or on file to support proposed rules. The plant notice was again revised on September 27, 1985 (50 FR 39526), and the status of the eight plants remained unchanged from the 1983 supplement. In the revision of the plant notice published on February 21, 1990 (55 FR 6184), *Neostapfia colusana* was returned to Category 1 status. In 1991 and 1992, the Service received additional information regarding the status and threats to *Castilleja campestris* ssp. *succulenta,* and has therefore returned this species to Category 1 status.

Section 4(b)(3)(B) of the Act requires the Secretary to make certain findings on pending petitions within 12 months of their receipt. Section 2(b)(1) of the 1982 amendments further requires that all petitions pending on October 13, 1982, be treated as having been newly submitted on that date. This was the case for *Castilleja campestris* ssp. *succulenta, Chamaesyce hooveri,* Neostapfia colusana, Orcuttia inaequalis, O. pilosa, O. tenuis, and *O. viscida,* because the 1975 Smithsonian report had been accepted as a petition. In October of 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, and 1991, the Service found that the petitioned listing of the above seven plant taxa was warranted but precluded by other higher priority listing actions. Publication of this proposal constitutes the final finding for the petitioned action.

Summary of Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533) and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act set forth the procedures for adding species to the Federal Lists. A species may be determined to be an endangered or threatened species due to one of more of the five factors described in section 4(a)(1). These factors and their application to *Castilleja campestris* (Benth.) Chueng and Heckard ssp. *succulenta* (Hoover) Chuang and Heckard, *Chamaesyce hooveri* (Wheeler) Koutnik, *Neostapfia colusana* (Davy) Davy. *Orcuttia inaequalis* Hoover, *Orcuttia pilosa* Hoover, *Orcuttia tenuis* Hitch., *Orcuttia viscida* (Hoover) J. Reeder, and *Tuctoria greenei* (Vasey) J. Reeder are as follows:

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

The habitat of these eight species has been reduced and fragmented throughout their respective ranges as vernal pools continue to be eliminated by urbanization, flood control projects, landfill projects, overgrazing, highway development, and agricultural conversion. Lands on the floor of the Central Valley are closer to existing, expanding cities and farms than the valley rim, which is steeper, less fertile, and more removed from cities. As a result, valley floor vernal pools, along with open rangeland, have been and continue to be favored for urban and agricultural development. Within the last 20 years, agricultural land conversion is known to have extirpated one population of *Chamaesyce hooveri* in Tulare County; four populations of *Neostapfia colusana* in Stanislaus County and one in Merced County; five populations of *Orcuttia inaequalis* in Stanislaus County, four in Madera County, three in Merced County, and one in Fresno County; four populations of *O. pilosa* in Stanislaus County and one in Merced County; one population of *O. tenuis* in Shasta County; and one population of *Tuctoria greenei* in Tulare County, three in Fresno County, one in Madera County, and four in San Joaquin County (Stone et al. 1988). Agricultural conversion threatens 8 extant populations of *O. pilosa* in Madera and Stanislaus Counties, 2 populations of *Chamaesyce hooveri* in Stanislaus County, 1 population of *castilleja campestris* ssp. *succulenta* in Madera County and 1 in Fresno County, 14 populations of *Neostapfia colusana* in southeastern Stanislaus County, 7 populations of *T. greenei* in Merced County, and 2 populations of *O. inaequalis* in Madera County (Stone et al. 1988).

Additionally, numerous activities associated with agricultural development have caused habitat degradation severe enough that many populations of the species proposed for listing herein have not been seen for 2 consecutive years and are presumed to be extirpated (Stone et al. 1988). For example, livestock pond construction has inundated one population of *Neostaphia colusana* in Merced County. Irrigated agriculture and associated run-off have likely eliminated one population of *N. colusana* in Merced County, and one population each of *Orcuttia inaequalis* and *Tuctoria greenei* in Madera County. Overgrazing and hay production likely have destroyed one population of *O. inaequalis* in Tehama County. Discing combined with grazing presumably has destroyed one population of *t. greenei* in Merced County. Discing also has destroyed one population of *N. colusana* in Tulare County. Discing has likely eliminated one population of *Castilleja campestris* ssp. *succulenta* in Fresno County (Stone et al. 1988, RareFind 1992). In addition, five of the eight remaining populations of *Orcuttia pilosa* in Stanislaus, Merced, and Madera Counties have been damaged by discing or discing combined with grazing (Stone et al. 1988).

Human activities that alter the hydrology of vernal pools, including changes in the amount of water or the length of inundation, directly and indirectly affect vernal pool plants. for example, a vernal pool known to contain *Orcuttia tenuis* was channelized for mosquito abatement. It is likely that the population was extirpated as a result

(Stone et al. 1988, RareFind 1992). Pond construction for recreational waterfowl hunting in Colusa County presumably has eliminated one population of *Neostapfia colusana*. Additionally, hydrological modifications have destroyed two Merced County and one Fresno County population of *O. inaequalis*, and three populations of *O. tenuis* in Shasta County (Stone et al. 1988). The Merced County Stream Channel Project of the U.S. Army Corps of Engineers (Corps) threatens three populations of *O. inaequalis*, and four populations each of *N. colusana* and *Castilleja campestris* ssp. *succulenta* in Merced County (R. Keck, U.S. Fish and Wildlife Service, pers. comm., 1992).

Because the human population of the Central Valley is rapidly expanding, numerous populations of these eight vernal pool plants have been extirpated and continue to be threatened by urban development projects. For example, two major proposed urban developments are likely to adversely affect significant amounts of vernal pool habitat in the Central Valley, one of 80,000 people in southwest Placer County and one of 40,000 people in southeastern Yolo County. In El Dorado County, a 728-ha (1,800-acre) community near Georgetown is proposed as the first of 15 more large-scale urban developments. Four new cities, projected to house 142,000 people, are proposed for Sutter County in the Sacramento Valley (Weigand 1991). Urbanization has extirpated one population of *Orcuttia inaeqaualis* in Fresno County, three populations of *o. pilosa* in Madera County, and one population of *Tuctoria greenei* in Tehama County (Stone et al. 1988). In the Sacramento Valley, eight populations of *o. tenuis* are considered threatened by urbanization around Redding in Shasta County (Stone et al. 1988). Numerous proposed housing developments in Sacramento County threaten vernal pool areas that may provide habitat for *o. tenuis* and *o. viscida*, including Aspen VI, County Creek Estates, Granite, Laguna Commons, Laguna Creek, Laguna Palms, Laguna Springs, Laguna Vista, Roseville 150, and Strawberry Creek (M. Littlefield, U.S. Fish and Wildlife Service, pers. comm., 1992).

In addition to the numerous housing developments discussed above, increasing urbanization of the Central Valley can affect vernal pool habitats via landfills, highway projects, and recreational and industrial developments. For example, of the seven Sacramento County populations of *Orcuttia viscida*, one population is threatened by a public landfill expansion, one by an industrial park development, and one by a frisbee golf course (Stone *et al.* 1988). A proposed expansion of State Highway 168, housing tract developments, and a proposed landfill imperil four populations of *Castilleja campestris* ssp. *succulenta* in Fresno County (RareFind 1992). An additional population is threatened by proposed expansion of State Highway 41 in Madera County.

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

Overutilization is not currently known to be a factor for these species, although some taxa have become vulnerable to collecting by curiosity seekers as a result of increased publicity following publication of a listing proposal.

C. Disease or Predation

All eight taxa occur mostly on private land and some Federal rangelands managed by the Forest Service and the Bureau that are subject to livestock grazing. The intensity and, more importantly, the timing of this activity affect how livestock grazing impacts vernal pool plants (Stone *et al.* 1988). Overgrazing can occur as a result of inappropriate timing or intensity of grazing or both. Of the eight plants, overgrazing is a serious threat to *Neostapfia colusana, Orcuttia inaequalis, O. pilosa, O. tenuis, O. viscida,* and *Tuctoria greenei*. These vernal pool plants mature later in the growing season than the California upland annual grasses. When early season forage dries up, these plants are still green, making them more attractive for consumption by grazing animals. Although *N. colusana* tends to be avoided by livestock because its high exudate content decreases its palatability and it continues tillering after grazing, this species has been extirpated from two sites due to overgrazing (Stone *et al.* 1988). *Orcuttia inaequalis, O. pilosa,* and *T. greenei* are especially vulnerable to grazing impacts. One population of *O. pilosa* in Merced County and a population of *T. greenei* in San Joaquin County have been extirpated by overgrazing (Stone *et al.* 1988). One population of *O. inaequalis* in Madera County, one population of *O. pilosa* in Tehama County, and six populations of *T. greenei* (one in Stanislaus County, two in Tehama County, and three in Merced County) are presumed extirpated due to overgrazing (Stone *et al* 1988) In addition, grazing adversely affects two populations of *O. inaequalis* in Merced County and one in Madera County, two populations of *O. tenuis* in Madera County and one in Shasta County, two populations of *Castilleja campestris* ssp. *succulenta* in Fresno County and seven in Stanislaus County, and four populations of *N. colusana* in Merced County (Stone *et al.* 1988, RareFind 1992). In Tehama County on the TNC Vina Plains Preserve, three of the four populations of *Tuctoria greenei* and three of the four populations of *O. pilosa* are damaged and possibly declining due to grazing (Stone *et al.* 1988). The effects of grazing on *T. greenei* are discussed further under Factor E in this section. Grazing practices used on private lands that support the vernal pool plant populations proposed for listing herein are not known.

D. The Inadequacy of Existing Regulatory Mechanisms

Under section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (Corps) regulates the discharge of fill into waters of the United States, which includes navigable and isolated water, headwaters, and adjacent wetlands. The section 404 Regulations require that applicants obtain an individual permit to place fill for projects affecting greater than 10 acres (4 ha) of waters of the United States.

Nationwide Permit (NWP) No. 26 (33 CFR part 330) was established by the Corps to facilitate authorization of discharges of fill into isolated waters (such as vernal pools) that cause the loss of less than 10 acres (4 ha) of waters of the United States, and that cause only minimal individual and cumulative environmental impacts. Projects that qualify for authorization under NWP 26 and that affect less than 1 acre of isolated waters or headwaters may proceed without notifying the Corps. Evaluation of impacts of such projects through the section 404 permit process is thus precluded.

Corps District and Division Engineers may require that an individual section 404 permit be obtained if projects otherwise qualifying under NWP 26 would have greater than minimal individual or cumulative environmental impacts. However, the Corps has been reluctant to withhold authorization under NWP 26 unless the existence of a listed threatened or endangered species would be jeopardized, regardless of the significance of the affected wetland resources.

Regardless of the type of permit deemed necessary under section 404, candidate species receive no special consideration

Additionally and equally important, the upland watersheds of vernal pools

are not provided any protection. Disturbance or loss of watersheds have extirpated several populations of these species as discussed previously in Factor A. Thus, as a consequence of the small scale of many vernal pools (most are less than 1 acre in size) and the lack of protection of associated upland watersheds, these vernal pool plants currently receive insufficient protection under section 404 of the Clean Water Act.

The *Orcuttia tenuis* Species Management Guide written by the Lassen National Forest and the Susanville District of the Bureau (Corbin and Schoolcraft 1990a) gives long-term management direction for those Forest Service and Bureau populations in Shasta and Siskiyou Counties in northern California. However, the extent to which these management recommendations are being implemented is questionable since the sites are not fenced to exclude livestock, for example, and no enforcement exists to protect the plants.

The California Department of Fish and Game has listed *Castilleja campestris* ssp. *succulenta, Neostapfia colusana, Orcuttia inaequalis, O. pilosa, O. tenuis,* and *O. viscida* as endangered, and *Tuctoria greenei* as rare under the California Endangered Species Act (Chapter 1.5 sec. 2050 *et seq.* of the California Fish and Game Code and Title 14 California Code of Regulations 670.2). *Chamaesyce hooveri* is not State-listed. Though the "take" of State-listed plants is prohibited (California Native Plant Protection Act, Chapter 10 sec. 1908 and California Endangered Species Act, Chapter 1.5 sec. 2080), State law appears to exempt the taking of such plants via habitat modification or land use changes by the owner. After the 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 land owner notify the agency "at least 10 days in advance of changing the land use to allow salvage of such plant" (Native Plant Protection Act, Chapter 1.5 sec. 1913).

Part of the environmental review under the California Environmental Quality Act (CEQA) for projects that result in the loss of sites supporting these species sometimes includes the development of mitigation plans. Such plans usually involve the transplantation of the plant species to another existing vernal pool, or the artificial creation of vernal pool habitat. Transplantation and habitat creation efforts are experimental in nature, and are generally not successful (Fiedler 1991, Hall-Cather 1984). Following development of the transplantation plan the original site is destroyed. Therefore, when the mitigation effort fails, the resource has already been lost.

The public agency with primary authority over a project (the lead agency) is responsible for conducting an environmental review and consulting with other agencies concerned with the resources affected by the project. However, the lead agency may approve projects that cause significant environmental damage, such as the destruction of State-listed endangered species, and does not always require adequate mitigation for the replacement or protection of the affected resources. The protection of listed species under CEQA is therefore dependent upon the discretion of the lead agency.

Conservation easements do not currently insure adequate protection for these vulnerable plant species. For example, although four populations of *Orcuttia pilosa* are located on TNC's Vina Plains Preserve, only one of these sites is excluded from an agreement allowing continued cattle grazing by the previous landowner, and the other populations have all been damaged by grazing (Stone *et al.* 1988). Fewer than 8 percent of the populations of these eight taxa are within existing conservation easements.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Native and exotic plant species have invaded many vernal pools of the Central Valley, thus limiting the amount of habitat available to these eight taxa. For example, at six of the seven extant sites, the distribution and abundance of *Orcuttia viscida* is significantly restricted by *Eleocharis macrostachya* (pale spike-rush), a species that inhabits ponds and marshes (Stone *et al.* 1988). At least 13 populations of *O. tenuis* are similarly affected (Stone *et al.* 1987, 1988). In the Sacramento Valley, potentially significant weed problems were observed at several sites on the Vina Plains, involving *Xanthium strumarium, Convolvulus arvensis, Proboscidea louisianica,* and *Asclepias fascicularis* in large vernal pools that provide habitat for *O. pilosa* and *Chamaesyce hooveri.*

In addition, soil disturbance from cattle grazing combined with competition from introduced species adversely affects several populations of *Tuctoria greenei* in the Sacramento and San Joaquin Valleys (Stone *et al.* 1987, 1988). Although *Neostaphia colusana* can withstand some degree of trampling associated with grazing, this species has been extirpated from two areas that were heavily grazed (Stone *et al.* 1988). *Tuctoria greenei* appears to be the most susceptible to negative grazing impacts of the eight plants in this listing proposal because its preference for marginal sites in vernal pools (e.g. along the outer edges of the pool) makes it more susceptible to livestock trampling damage and competition from nonnative weeds such as *Lolium multiflorum, Polypogon monspeliensis,* and *Phalaris paradoxa* (Stone *et al.* 1987). All populations of *T. greenei* are subject to grazing. Several populations of *T. greenei* are damaged and declining, and at least eight sites have been extirpated or are presumed extirpated from grazing impacts (Stone *et al.* 1988). It is therefore likely that all remaining populations of *T. greenei* are threatened by grazing (Stone *et al.* 1988).

Since vernal pools are fairly localized habitats in close proximity to urban and agricultural areas, uncontrolled visits by groups or individuals could result in trampling of vernal pool plants.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these eight taxa in determining to issue this rule. Based on this evaluation, the preferred action is to list *Orcuttia inaequalis, Orcuttia pilosa, Orcuttia viscida,* and *Tuctoria greenei* as endangered and to list *Castilleja campestris* ssp. *succulenta, Chamaesyce hooveri, Neostapfia colusana,* and *Orcuttia tenuis* as threatened. Large-scale human population increases and attendant urban growth, as well as agricultural land uses in adjacent areas, have destroyed significant quantities of the plants' vernal pool habitat and continue to eliminate many plant populations. As a result, all eight species have fragmented, highly restricted habitats within the Central Valley, most of which are vulnerable to on-going and future threats. Relatively few populations of these plants are afforded permanent protection.

The plants proposed for listing as endangered face numerous threats and have been reduced to fewer than 20 populations each. Of the 12 extant populations of *Orcuttia inaequalis,* 7 are threatened by overgrazing, competition with nonnative weeds, urbanization, agriculture, and a flood control project. Twelve of the 19 extant populations of *O. pilosa* are variously threatened by overgrazing, urbanization, irrigated agriculture, a highway expansion project, discing, and competition from nonnative weeds. Of the seven extant populations of *O. viscida,* five populations are threatened by one or more of the following factors: overgrazing, landfill projects, urban

developments, a frisbee golf course, off-highway vehicle use, and competition from nonnative weeds. All 17 extant populations of *Tuctoria greenei* are threatened by overgrazing and/or irrigated agriculture. Because these plants are in danger of extinction throughout all or a significant part of their ranges, they fit the definition of endangered as defined in the Act.

The four taxa proposed to be listed as threatened face fewer existing threats but are likely to become increasingly imperiled in the foreseeable future unless current trends of urban development and agricultural conversion are reversed. Of the 33 extant populations of *Castilleja campestris* ssp. *succulenta*, nearly half are threatened by one or more of the following: discing, grazing, flood control projects, urbanization, agriculture, a proposed highway expansion project, and a proposed landfill. About one-third of the 23 populations of *Chamaesyce hooveri* are threatened by a combination of irrigated agriculture, overgrazing, and competition with nonnative weeds. Of the 36 populations of *Neostapfia colusana*, 19 are damaged and declining due to one or more of the following factors: overgrazing, discing, flood control projects, competition with exotic plants, and agricultural activities. Fifteen of the 40 extant populations of *Orcuttia tenuis* are threatened either by overgrazing and competition from introduced species, or by urbanization. For the reasons discussed below, the Service is not proposing to designate critical habitat for these plant species at this time.

Critical Habitat

Section 4(a)(3) of the Act requires that to the maximum extent prudent and determinable, the Secretary designate critical habitat concurrently with determining a species to be endangered or threatened. The Service finds that determination of critical habitat is not prudent for these species at this time. Since vernal pool habitats are small and easily identified, it is likely that the publication of precise maps and descriptions of critical habitat in the **Federal Register** would increase the vulnerability of these plant species to incidents of collection and general vandalism. The listing of these plants as endangered or threatened elevates awareness of their rarity and makes them more sought after by curiosity seekers, researchers, and rare plant collectors. Such increased visits to vernal pools could contribute to the decline of existing populations through vandalism. Protection of the habitats of the eight taxa will be addressed through the recovery process and through the section 7 consultation process. The Service believes that Federal involvement in 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 eight plants is not prudent at this time, because such designation would likely increase the degree of threat from vandalism, collecting, and other human activities.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain activities. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Act provides for possible land acquisition and cooperation with the State 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 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 provisions of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

The Corps will become involved with these species through its permitting authority under section 404 of the Clean Water Act, as well as water projects in the Central Valley such as the Merced County Streams Project. By regulation, nationwide permits may not be issued where a federally listed endangered or threatened species would be affected by the proposed project without first completing formal consultation pursuant to section 7 of the Act. The presence of a listed species would highlight the national importance of these resources. In addition, insurance of housing loans by the Department of Housing and Urban Development in areas that presently support these eight species would be subject to review by the Service under section 7 of the Act. The Bureau of Reclamation will become involved under its Friant water contract renewal program to the extent that these species may occur within the 404,700 ha (1 million acre) water delivery area (M. Kohl, U.S. Fish and Wildlife Service, pers. comm., 1992). Other future Bureau of Reclamation contract renewals will provide additional potential for section 7 involvement. The Bureau and the Forest Service will become involved as they are responsible for authorizing grazing and other land uses of areas containing vernal pools. Highway construction and maintenance projects that receive funding from the Department of Transportation (Federal Highways Administration) will be subject to review under section 7 of the Act.

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 prohibitions and exceptions that apply to all endangered or threatened plants. With respect to the eight vernal pool plants, all prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR 17.61 or 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; remove and reduce to possession such species from areas under Federal jurisdiction; maliciously damage or destroy any such species from any such area; or to remove, cut, dig, damage or destroy these plants 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; deliver, receive, carry, transport, or ship these species in interstate or foreign commerce in the course of a commercial activity; or sell or offer for sale these species in interstate or foreign commerce. Seeds from cultivated specimens of threatened plant taxa are exempt from these prohibitions provided that a statement "of cultivated origin" appears on the shipping containers. Certain exceptions 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 or threatened plant species under certain circumstances. Since none of these eight plants are common in the wild or in cultivation, trade permits likely would not be sought. 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, 4401 North Fairfax Drive, rm. 432; Arlington, Virginia 22203–3507 (703/358–2092).

Public Comments Solicited

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

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

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

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

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

Any final decision on this proposal will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final regulation that differs from this proposal.

The Act provides for a public hearing on this proposal, if requested. Requests must be received within 45 days of the date of publication of the proposal. Such requests must be made in writing and addressed to Field Supervisor, U.S. Fish and Wildlife Service, Sacramento Field Office, 2800 Cottage Way, room E–1803, Sacramento, California 95825–1846.

National Environmental Policy Act

The 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 Act. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 94244).

References Cited

A complete list of all references cited herein is available upon request from the Field Supervisor of the Sacramento Field Office (see **ADDRESSES** section).

Author

The primary author of this proposed rule is Kenneth W. Fuller, Sacramento Field Office, U.S. Fish and Wildlife Service, 2800 Cottage Way, room E–1803, Sacramento, California 95825–1846.

List of Subjects in 50 CFR Part 17

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

Proposed Regulations Promulgation

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

PART 17—[AMENDED]

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

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

2. It is proposed to 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					
*	*	*	*	*		*
Euphorbiaceae—Spurge family:						
*	*	*	*	*		*
Chamaesyce hooveri	Hoover's spurge	U.S.A. (CA)	T		NA	NA
*	*	*	*	*		*
Poaceae—Grass family:						
*	*	*	*	*		*
Neostapfia colusana	Colusa grass	U.S.A. (CA)	T		NA	NA
*	*	*	*	*		*
Orcuttia inaequalis	San Joaquin Valley Orcutt grass.	U.S.A. (CA)	E		NA	NA
*	*	*	*	*		*
Orcuttia pilosa	Hairy Orcutt grass	U.S.A. (CA)	E		NA	NA
*	*	*	*	*		*
Orcuttia tenuis	Slender Orcutt grass	U.S.A. (CA)	T		NA	NA
*	*	*	*	*		*
Orcuttia viscida	Sacramento Orcutt	U.S.A. (CA)	E		NA	NA
*	*	*	*			
Tuctoria greenei		U.S.A. (CA)	E		NA	NA

Species		Historic range	Status	When listed	Critical habitat	Special rules
Scientific name	Common name					
• •	•	•	•	•	•	•
Scrophulariaceae—Snapdragon family:						
• •	•	•	•	•	•	•
Castilleja campestris ssp. *succulenta*	Fleshy owl's-clover	U.S.A. (CA)	T	.....	NA	NA
• •	•	•	•	•	•	•

Dated: July 13, 1993.

Richard N. Smith,

Acting Director, U.S. Fish and Wildlife Service.

[FR Doc. 93-18637 Filed 8-4-93; 8:45 am]

BILLING CODE 4310-55-M