

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AL88

Endangered and Threatened Wildlife and Plants; Determination of Endangered or Threatened Status for Four Southwestern California Plants from Vernal Wetlands and Clay Soils

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The Fish and Wildlife Service (Service) determines endangered status pursuant to the Endangered Species Act of 1973, as amended (Act), for two plants—*Allium munzii* (Munz's onion) and *Atriplex coronata* var. *notatior* (San Jacinto Valley crownscale), and determines threatened status for two plants—*Brodiaea filifolia* (thread-leaved brodiaea) and *Navarretia fossalis* (spreading navarretia). These four plants occur in vernal pools and other wetlands or on clay soils and moist grasslands throughout their respective ranges in southwestern California and northwestern Baja California, Mexico. These plants are variously threatened by one or more of the following: habitat destruction and fragmentation from agricultural and urban development, pipeline construction, alteration of wetland hydrology by draining or excessive flooding, channelization, off-road vehicle activity, cattle and sheep grazing, weed abatement, fire suppression practices (including discing (plowing)), and competition from alien plant species. This rule implements the Federal protection and recovery provisions afforded by the Act for these four plants.

DATES: This rule is effective on November 12, 1998.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Carlsbad Field Office, 2730 Loker Avenue West, Carlsbad, California, 92008.

FOR FURTHER INFORMATION CONTACT: Gary Wallace (see ADDRESSES above), telephone (760) 431-9440.

SUPPLEMENTARY INFORMATION:**Background**

Allium munzii (Munz's onion), *Brodiaea filifolia* (thread-leaved brodiaea), *Atriplex coronata* var. *notatior* (San Jacinto Valley crownscale), and *Navarretia fossalis*

(spreading navarretia) occur in clay soils or in vernal wetlands that have a clay hardpan or silty alkaline substrate. These habitats are restricted or unique, often associated with a specific soil type or hydrologic regime, or both. The composite range of these four plants encompasses the interior lowlands and foothills of Los Angeles, San Bernardino, Orange, and Riverside counties south into coastal San Diego County, California, and the northwestern State of Baja California, Mexico. Although some of these plants are relatively wide-ranging, all are localized in distribution within their respective ranges because of the restricted and patchy nature of the habitats in which they are found.

Allium munzii (Munz's onion), a member of the lily family (Liliaceae), was first referred to as *Allium fimbriatum* var. *munzii* by Marion Ownbey (Munz and Keck 1959). The varietal epithet was attributed to Ownbey and H. Aase. This name was not validly published because it lacked a proper description and citation, which were provided by Traub (1972), who published the name as *Allium fimbriatum* var. *munzii* Ownbey ex Traub, based on a specimen collected by Philip Munz south of Glen Ivy, Riverside County, California, in 1922. McNeal (1992) elevated this taxon to species status (*Allium munzii* (Traub) D. McNeal).

Allium munzii is a perennial herb, 15 to 35 centimeters (cm) (0.5 to 1.2 feet (ft)) tall, originating from a bulb with a papery, reddish-brown outer coat and light brown inner coat. The single leaf is teretes (cylindrical in shape) and up to 1.5 times as long as the stalk of the inflorescence (scape). The inflorescence (flower cluster) is umbellate, consisting of 10 to 35 flowers. The flowers have six perianth segments (undifferentiated petals and sepals) that are white, or white with a red midvein, becoming red with age. They are 6 to 8 millimeters (mm) (0.2 to 0.3 inches (in)) long. The ovary is crested with fine, irregularly dentate (pointed) processes and the fruit is a three-lobed capsule (Munz 1974, McNeal 1993).

Allium munzii can be distinguished from other members of the genus within its range by its solitary cylindrical leaves, elliptic to ovate perianth segments, generally white flowers, and finely and irregularly dentate ovary crests.

Allium munzii is restricted to mesic clay soils in western Riverside County, California. This species is frequently found in association with southern needlegrass grassland, mixed grassland, and grassy openings in coastal sage scrub or, occasionally, in cismontane

juniper woodlands (California Department of Fish and Game (CDFG) 1989, Orlando Mistretta, Rancho Santa Ana Botanic Garden, *in litt.* 1993). *A. munzii* is known from 13 extant populations. Only one of these populations is partially on Federal land (Roberts 1993a, California Natural Diversity Data Base (CNDDDB) 1997, Jeff Newman, U.S. Fish and Wildlife Service, pers. comm. 1996). Five populations occur in the Gavilan Hills, including one at Harford Springs County Park, and one on lands managed by the Riverside County Habitat Conservation Agency (RCHCA). One population occurs in the Temescal Valley on private land; another population may still be extant but is likely extirpated. One population occurs north of Walker Canyon on private land. Five small populations occur in or near the Paloma Valley, including near the Scott Road, Skunk Hollow, Domenigoni Hills, and Bachelor Mountain areas. These populations are on land managed by the Reserve Management Committees (Domenigoni Hills and Bachelor Mountain) for the Riverside County multispecies plans, or on private land. One population is in the Elsinore Mountains, partly on Federal land in the Cleveland National Forest and partly on private lands (Boyd and Mistretta 1991).

The Service estimates that there are about 20,000 to 70,000 individuals of *A. munzii* (Roberts 1993a, CNDDDB 1997, U.S. Fish and Wildlife Service unpublished data). In response to rainfall and other factors, perennial bulbs may not produce aerial leaves or flowers in a given year or may produce only leaves. As a result, fluctuations in numbers of observed individuals can be misleading. Five populations are large (over 2,000 individuals) and cover as much as 8 hectares (ha) (20 acres (ac)). Most populations contain fewer than 1,000 individuals and their areas range from several meters to less than 1 ha (2.5 ac).

Atriplex coronata var. *notatior* (San Jacinto Valley crownscale), a member of the goosefoot family (Chenopodiaceae), was described by Epton (1914), based on a specimen he collected in 1901 from the dried bed of San Jacinto Lake (= Mystic Lake), Riverside County, California. Hall and Clements (1923) considered this taxon a minor variant and submerged it in *A. coronata*. *Atriplex coronata* var. *notatior* has subsequently been recognized by Munz (1935, 1974) and Taylor and Wilken (1993).

Atriplex coronata var. *notatior* is an erect, gray-scurfy annual, 1 to 3 decimeters (dm) (4 to 12 in) tall. The grayish leaves are sessile, alternate, 8 to

20 mm (0.3 to 0.8 in) long and elliptic to ovate-triangular in outline. This taxon is monoecious (male and female flowers on the same plant). The female flowers are obscure and develop spherical bracts in the fruiting phase. These bracts have dense tubercles (nodule) that are roughly equal in number to the marginal teeth (Munz 1974, Taylor and Wilken 1993).

Atriplex coronata var. *notatior* can be distinguished from the more northern *A. coronata* var. *coronata* by its erect stature, the spheric shape of the bracts together in fruiting stage, and the more numerous tubercles and marginal teeth on the bracts. The distributions of the two varieties do not overlap. *Atriplex coronata* var. *coronata* is found in the Sacramento, San Joaquin, and neighboring valleys, while *A. c.* var. *notatior* is restricted to Riverside County. *A. c.* var. *notatior* occurs with eight other native and one introduced species of *Atriplex* within its range (D. Bramlet 1993b, Bramlet *in litt.* 1995, U.S. Fish and Wildlife Service, unpubl. data). It can be distinguished from these taxa by a combination of characteristics, including annual habit, the shape of the leaf, and the size and form of the bract (Munz 1974, Taylor and Wilken 1993).

Atriplex coronata var. *notatior* is restricted to highly alkaline, silty-clay soils in association with the Traver-Domino-Willows soil association (see Soil Conservation Service and Bureau of Indian Affairs 1971 for soil descriptions). Most populations are associated with the Willows soil series. It occurs in alkali sink scrub, alkali playa, vernal pools, and, to a lesser extent, in annual alkali grassland communities (Bramlet 1993a, Roberts 1993b). These areas are typically flooded by winter rains. The duration and extent of flooding are extremely variable from one year to the next. *A. coronata* var. *notatior* germinates after the water has receded. It usually flowers in April and May and sets fruit by May or June (D. Bramlet, *in litt.* 1992).

Atriplex coronata var. *notatior* is restricted to the San Jacinto, Perris, Menifee and Elsinore Valleys of western Riverside County, California. This taxon consists of 11 population centers that are primarily associated with the San Jacinto River and Old Salt Creek tributary drainages (Roberts 1993b, Roberts and McMillan 1997, CNDDDB 1997). One additional isolated and small population has recently been discovered in Willows soils near Lake Elsinore (Roberts and McMillan 1997).

The number of individuals of *Atriplex coronata* var. *notatior* in a population complex varies in any given year in response to rainfall, extent of winter

flooding, and temperature. Disturbance (discing, dryland farming, pipeline construction, out of season inundation) has become an increasingly important factor in limiting the number of individuals in a population.

Between 1990 and 1994, an estimated 78,000 *Atriplex coronata* var. *notatior* individuals were located (Metropolitan Water District (MWD) 1992, Ogden 1993, D. Bramlet, *in litt.* 1993, CNDDDB 1997, Roberts 1993b). These plants occupied about 145 ha (400 ac) of about 3,300 ha (8,200 ac) of potentially suitable habitat (alkali scrub, alkali playa, and annual alkali grassland vegetation associations). The majority of the individuals (about 75 percent) were associated with three population centers (Mystic Lake, the Nuevo-Ramona Expressway segment of the San Jacinto River, and west Hemet) (Roberts 1993b). Since 1993, the population has apparently declined significantly as a result of major flooding in the winter of 1992–1993 and the subsequent conversion or alteration of potential habitat (Roberts and McMillan 1997). Several new populations have since been discovered near historic populations (e.g., 5,200 individuals on the San Jacinto River and fewer than 200 individuals near Elsinore, California). However, new discoveries have not appreciably balanced the reduction of populations due to activities and events described above. About 45 ha (115 ac) of nearly 2,200 ha (5,500 ac) of available potentially suitable habitat are currently occupied by about 26,500 individuals of *A. coronata* var. *notatior*. About 12 ha (30 ac) of 1,000 ha (2,500 ac) of marginal habitat that has been substantially disturbed are currently occupied by about 500 individuals of this taxon (Roberts and McMillan 1997). *Atriplex coronata* var. *notatior* appears to have declined about 70 percent since 1992.

The majority of the population centers of *A. coronata* var. *notatior* are located on privately owned lands. Three populations are on State land (San Jacinto Wildlife Area), one population is partially on County lands (RCHCA along the San Jacinto River), and one population is on a private preserve managed by MWD. This plant is not known to occur on Federal lands.

Brodiaea filifolia, a member of the lily family (Liliaceae), was described by Watson (1882) based on a specimen collected by S. B. and W. F. Parish in 1880 at Arrowhead Hot Springs, San Bernardino County, California (Niehaus 1971). Greene (1887) transferred *B. filifolia* to the genus *Hookera*. However, monographic and floristic treatments accept *B. filifolia* as the name for this

taxon (Niehaus 1971, Munz 1974, Beauchamp 1986, Keator 1993). *Brodiaea orcuttii* (Greene) Baker was included as a variety of *B. filifolia* by Epson (1922) but subsequent authors have recognized this taxon as a distinct species (Niehaus 1971, Munz and Keck 1973, Munz 1974, Keator 1993).

Brodiaea filifolia is a perennial herb with dark-brown, fibrous-coated corms. The flower stalks (scapes) are 2 to 4 dm (8 to 16 in) tall with several narrow leaves that are shorter than the scape. The flowers bloom from May to June and are arranged in a loose umbel. The six perianth segments are violet, spreading, and 9 to 12 mm (0.4 to 0.5 in) long. The broad and notched anthers are 3 to 5 mm (0.1 to 0.2 in) long. The fruit is a capsule (Munz 1974, Keator 1993).

Brodiaea filifolia can be distinguished from the other species of *Brodiaea* that occur within its range (*B. orcuttii*, *B. jolonensis*, and *B. terrestris* ssp. *kernensis*) by its narrow, pointed staminodia, rotate perianth lobes (i.e., a saucer-shaped flower), and a thin perianth tube, which is split by developing fruit (Niehaus 1971, Munz 1974).

Brodiaea filifolia is known to hybridize with *B. orcuttii*, *B. terrestris*, and possibly *B. jolonensis*, where these species coexist (Sandy Morey, CDFG, *in litt.* 1995, Boyd, et al. 1992, CNDDDB 1997). Significant hybridization is evident on the Santa Rosa Plateau between *B. filifolia* and *B. orcuttii*, or *B. filifolia* and *B. terrestris* (S. Morey, *in litt.* 1995). At least one major population in the vicinity of Miller Mountain (San Diego County) in the Cleveland National Forest appears to represent a hybrid swarm between *B. orcuttii* and *B. filifolia* (Boyd et al. 1992). The Miller Mountain population alone occupies nearly 45 percent of reported occupied habitat for *B. filifolia*. Hybridization among these *Brodiaea* species is a natural phenomenon. However, these plants relied on relatively species-specific native bee species for pollination in the past and the introduction of non-native honeybees, which tend to be species-generalist, may have increased the potential for hybridization (Gary Bell, The Nature Conservancy (TNC), pers. comm. 1997, S. Morey, *in litt.* 1995).

This species typically occurs on gentle hillsides, valleys, and floodplains in mesic, southern needlegrass grassland and alkali grassland plant communities in association with clay, loamy sand, or alkaline silty-clay soils (CDFG 1981, Bramlet 1993a). Sites occupied by this species are frequently intermixed with, or near, vernal pool

complexes, such as near San Marcos (San Diego County), the Santa Rosa Plateau, and southwest of Hemet in Riverside County.

The historical range of *B. filifolia* extends from the foothills of the San Gabriel Mountains at Glendora (Los Angeles County), east to Arrowhead Hot Springs in the western foothills of the San Bernardino Mountains (San Bernardino County), and south through eastern Orange and western Riverside Counties to Carlsbad in northwestern San Diego County, California (S. Morey, *in litt.* 1995, CNDDDB 1997).

Forty-six populations of *B. filifolia* have been reported. At least nine of these populations have been extirpated, primarily in San Diego County, California. Thirty-seven populations are presumed extant. Nearly half of these remaining populations are clustered in the growing cities of Vista, San Marcos, and Carlsbad (nine populations) and in the vicinity of the Santa Rosa Plateau in southwestern Riverside County, California (six populations). The remaining 22 populations are scattered within the counties of Orange, Los Angeles, Riverside, San Bernardino, and San Diego.

The population of *B. filifolia* reported to have the largest number of individuals is on private land in the City of San Marcos (S. Morey, *in litt.* 1995). The populations with the largest extent of potentially suitable habitat are on the Santa Rosa Plateau, where only about 15 ha (38 ac) of the plateau is reported as occupied by *B. filifolia*, but about 120 ha (300 ac) is potentially suitable habitat (MWD 1991, CNDDDB 1997). These lands are primarily managed by TNC.

The only populations of *Brodiaea filifolia* known to occur on Federal land are on Marine Corps Base, Camp Pendleton in San Diego County (CNNDDB 1997, U. S. Marine Corps 1997), where three populations were recently discovered in an abandoned weapons impact area. Six populations were recently discovered in Orange County. Most of the recently discovered populations of *Brodiaea filifolia* in Orange County are relatively small. The largest population (Forster Ranch) supports about 60 percent of the *B. filifolia* individuals and about 80 percent of the occupied habitat in Orange County. Only two of the Orange County populations (Casper's Regional Park and Aliso-Woods Canyon Regional Park), with fewer than 1,000 individuals combined, are on lands managed by the County government (Michael Brandman Associates 1996, CNDDDB 1997). *Brodiaea filifolia* has also been found on the San Jacinto Wildlife Management

Area in Riverside County, managed by the CDFG.

Brodiaea filifolia, in its entire range, occupies about 330 ha (825 ac) of suitable habitat (mesic needlegrass grassland, mixed native-non-native grassland with clay soils, or alkali annual grassland with alkaline silty clay soils). The total number of individuals of this species and the extent of occupied habitat vary on an annual basis in response to the timing and amount of rainfall, as well as temperature patterns. Fewer than 2,000 individuals have been observed at most populations. Most of these populations occupy less than 5 ha (13 ac) (CNDDDB 1997, U.S. Fish and Wildlife Service, unpubl. data). The largest extant population in Riverside County, Santa Rosa Plateau, has been estimated to contain over 30,000 observed individuals and occupies about 15 ha (38 ac) of habitat (MWD 1991, CNDDDB 1997). In San Diego County, the largest confirmed population is on an isolated 16 ha (40 ac) parcel in San Marcos, California. This population may support as many as 342,000 individual plants (S. Morey, *in litt.* 1995). The number of observed individuals often does not correlate with the number of corms present at a site. For example, at one residential development site, Taylor and Burkhart (1992) reported 20 individuals of *B. filifolia*, but more than 8,000 corms were found during the effort to transplant *B. filifolia* to another site.

Brodiaea filifolia and its suitable habitat have been significantly reduced by urbanization, agricultural conversion, and discing for fire and weed control. In Riverside County, California, most of the annual alkaline grassland near the San Jacinto River and southwest of Hemet has been urbanized or converted to dryland farming or more intensive cultivation (see discussion under *A. coronata* var. *notatior* above). Additionally, *Brodiaea filifolia* is vulnerable to deep discing or repeated discing. Thus, areas that were disced and have partially recovered after being left fallow for a period of time tend to support reduced and gradually declining populations of *B. filifolia*, if any have survived. For example, at least two *B. filifolia* populations have been reported in the San Jacinto River flood plain in the vicinity of the I-215 highway crossing. Since 1992, 80 percent of the potentially suitable habitat in this area has been disced for dryland farming (Roberts and McMillan 1997, U.S. Fish and Wildlife Service, unpubl. data). The most significant threat to this species is urbanization, conversion to farming, and discing for fire and weed control.

In San Diego County, California, the majority of the *B. filifolia* populations are concentrated within the cities of San Marcos, Vista, and Carlsbad and are highly correlated with the distribution of clay soils and soils with clay subsoils. Data available from the Soil Conservation Service and Forest Service (1973) and other sources (U.S. Fish and Wildlife Service, unpubl. data) indicate that there are about 3,300 ha (8,280 ac) of clay soils and over 1,570 ha (3,940 ac) of soils with clay subsoils in these three cities. By 1994, nearly 65 percent of the clay soils and about 75 percent of the soils with clay subsoils had been developed or urbanized in these three cities and were no longer available for *B. filifolia* or its associated habitat (U.S. Fish and Wildlife Service, unpubl. data). In the City of Carlsbad, most *B. filifolia* populations occur in association with a specific soil series: the Altamont Clay soil series. There are about 1,085 ha (2,715 ac) of this soil in Carlsbad. By 1994, about 82 percent had been cultivated or overlain by urban development and was no longer available as habitat for conservation or recovery of this species (U.S. Fish and Wildlife Service, unpubl. data).

Based on the historic and current distribution of soils within the Vista, San Marcos, and Carlsbad area, it is likely that substantial unreported populations of *B. filifolia* were extirpated in this area. Of the 16 historically-known populations within these cities, at least 5 have been extirpated. Collectively, these sites were known to support as many as 128,000 individuals over at least 9 ha (23 ac) of occupied habitat (CNDDDB 1997, Roberts and Vanderwier 1997). One additional major population was significantly reduced from about 8 ha (20 ac) to 1.6 ha (4 ac) around 1990 (WESTEC 1988, Taylor and Burkhart 1992, CNDDDB 1997).

Navarretia fossalis (spreading navarretia), a member of the phlox family (Polemoniaceae), was described by Reid Moran in 1977 based on a specimen he collected in 1969 near La Misión in northwestern Baja California, Mexico (Moran 1977). *Navarretia fossalis* is a low, mostly spreading or ascending, annual herb, 10 to 15 cm (4 to 6 in) tall. The lower portions of the stems are mostly glabrous. The leaves are soft and finely divided, 1 to 5 cm (0.4 to 2 in) long, and spine-tipped when dry. The flowers are white to lavender white with linear petals and are arranged in flat-topped, compact, leafy heads. The fruit is an ovoid, 2-chambered capsule (Moran 1977, Day 1993).

Several other species of *Navarretia* occur within the range of *N. fossalis*. Two of them, *N. intertexta* and *N. prostrata*, can occur in similar habitat. *N. fossalis* is distinguished from them by its linear or narrowly ovate corolla lobes, erect habit, cymose inflorescences, size and shape of the calyx, and the position of the corolla relative to the calyx. All *Navarretia* species can be distinguished by the appearance of the pollen grain surface (Day 1993, Steve Spencer, Rancho Santa Ana Botanical Garden, *in litt.* 1993).

The primary habitat of *N. fossalis* is vernal pools. This species occasionally occurs in ditches and other artificial depressions, which often occur in degraded vernal pool habitat (Moran 1977). In western Riverside County, *N. fossalis* has been found in relatively undisturbed and moderately disturbed vernal pools within a larger vernal wetland plain dominated by annual alkali grassland (Bramlet 1993a).

Navarretia fossalis is distributed from northwestern Los Angeles County and western Riverside County, south through coastal San Diego County, California to San Quintin in northwestern Baja California, Mexico. Fewer than 30 populations exist in the United States. Nearly 60 percent of these populations are concentrated in three locations: Otay Mesa in southern San Diego County, along the San Jacinto River in western Riverside County, and near Hemet in Riverside County (Bauder 1986, Bramlet 1993a, CNDDDB 1997). Others are scattered in southern Riverside County, Los Angeles County, and coastal San Diego County.

The number of individuals of *N. fossalis* varies annually in response to the timing and amount of rainfall and temperature. In Riverside County, one population contains 300,000 individuals. Another population contains 75,000 individuals. However, each of these populations occupies less than 3 ha (8 ac) of habitat. The majority of populations contain fewer than 1,000 individuals and occupy less than 0.5 ha (1 ac) of habitat (D. Bramlet, *in litt.* 1992, CNDDDB 1997). The Service estimates that less than 120 ha (300 ac) of habitat in the United States is occupied by this species. The most pressing threat to *Navarretia fossalis* is the ongoing degradation of vernal pools and their outright destruction due to widespread urbanization, agricultural practices, off-road vehicles, and the longer-term threats from flood control and development.

The majority of *N. fossalis* populations are on privately owned lands. At least one population occurs on the federally owned Marine Corps Base,

Camp Pendleton, and the plant occurs at three locations on Naval Air Station Miramar (J.S. Walker, Naval Base San Diego, *in litt.* 1997).

In Mexico, *N. fossalis* is known from fewer than 10 populations clustered in three areas: along the international border, on the plateaus south of the Rio Guadalupe, and on the San Quintin coastal plain (Moran 1977).

Previous Federal Action

Federal government actions on these four plants began as a result of section 12 of the Act, as amended (16 U.S.C. 1531 *et seq.*) which directed the Secretary of the Smithsonian Institution to prepare a report on those plants considered to be endangered, threatened, or extinct in the United States. This report, designated as House Document No. 94-51, and was presented to Congress on January 9, 1975, and included *B. filifolia* as endangered. The Service published a notice in the July 1, 1975, **Federal Register** (40 FR 27823), of its acceptance of the report as a petition within the context of section 4(c)(2) (petition provisions are now found in section 4(b)(3)(A) of the Act) and its intention thereby to review the status of the plant taxa named therein, including *B. filifolia*. The Service published a proposal in the June 16, 1976, **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. *Brodiaea filifolia* was included as endangered in the June 16, 1976, **Federal Register** notice.

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 more than 2 years old be withdrawn. A one-year grace period was given to those proposals already more than two years old. In the December 10, 1979, **Federal Register** (44 FR 70796), the Service published a notice of withdrawal of the June 16, 1976, proposal, along with four other proposals that had expired.

The Service published an updated notice of review of plants in the **Federal Register** on December 15, 1980 (45 FR 82480). This notice included *Brodiaea filifolia* and *Navarretia fossalis* as category 1 candidates. Category 1 species were those for which the Service

had on file substantial information on biological vulnerability and threats to support preparation of listing proposals.

On November 28, 1983, the Service published in the **Federal Register** a supplement to the Notice of Review (48 FR 53640). The plant notice of review was again revised on September 27, 1985 (50 FR 39526). *B. filifolia* and *N. fossalis* were included in the 1983 and 1985 supplements as category 2 candidates. Category 2 included taxa for which information in the possession of the Service indicated that a listing proposal was possibly appropriate, but for which sufficient data on biological vulnerability and threat were not available to support a proposed rule. *Allium munzii* (then known as *Allium fimbriatum* var. *munzii*) was included in the 1985 notice of review as a category 2 taxon. On February 21, 1990, a revised notice of review was published in the **Federal Register** (55 FR 6184) that included *A. fimbriatum* var. *munzii* and *B. filifolia* as category 1 candidate taxa, and *A. coronata* var. *notatior* as a category 2 candidate taxon; the status of *N. fossalis* remained unchanged from the 1985 notice of review. All four plant taxa were listed as category 1 candidate species in the September 30, 1993, notice of review (58 FR 51144).

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. That was the case for *Brodiaea filifolia* because the 1975 Smithsonian report had been accepted as a petition. On October 13, 1983, the Service found that the petitioned listing of these species was warranted, but precluded by other pending listing actions, in accordance with section 4(b)(3)(B)(iii) of the Act; notification of this finding was published on January 20, 1984 (49 FR 2485). Such a finding requires the petition to be recycled, pursuant to section 4(b)(3)(C)(I) of the Act. The finding was reviewed in October of 1984 through 1993.

On December 15, 1994 (59 FR 64812), the Service published a proposed rule to list *Allium munzii* and *Atriplex coronata* var. *notatior* as endangered, and *Brodiaea filifolia* and *Navarretia fossalis* as threatened. This proposed rule constituted the warranted petition finding for *Brodiaea filifolia*.

Based upon information received during public comment periods subsequent to the publication of the proposed rule, the Service now

determines *Allium munzii* and *Atriplex coronata* var. *notatior* to be endangered species, and *Brodiaea filifolia* and *Navarretia fossalis* to be threatened species.

The processing of this final rule follows the Service's fiscal years 1998 and 1999 Listing Priority Guidance published in the **Federal Register** on May 8, 1998 (63 FR 25502). The guidance establishes the order in which the Service will process rulemakings. The guidance calls for giving highest priority to handling emergency situations (Tier 1) and second highest priority (Tier 2) to resolving the listing status of outstanding proposed listings, processing new listing proposals, processing administrative petition findings, processing a limited number of delisting and reclassification actions. Processing critical habitat determinations is included in Tier 3 of the guidance. This final rule is a Tier 2 action and is being completed in accordance with the current listing priority guidance.

Summary of Comments and Recommendations

In the December 15, 1994, proposed rule (59 FR 64812) 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 first comment period closed on February 13, 1995. Appropriate State agencies, county governments, Federal agencies, and other interested parties were contacted and requested to comment. Public notices announcing the publication of the proposed rule were published in the Press Enterprise in Riverside County on January 5, 1995; the Orange County Register on January 11, 1995; and San Diego Union Tribune in San Diego County on January 13, 1995. Numerous requests for a public hearing were received. On March 7, 1995, a notice was published in the **Federal Register** announcing that a public hearing would be held on March 23, 1995, at the City of Riverside, in Riverside County, California (60 FR 12531). Copies of this notice were sent to parties that requested a public hearing. This notice also announced the reopening of the public comment period until May 20, 1995. Notices were published in the Orange County Register (March 7, 1995), San Diego Union Tribune (March 7, 1995), and Perris Progress (March 8, 1995), announcing the public hearing and extension of the public comment period.

The Service received a total of 65 written comments. Ten commenters supported the listing of these taxa. Five

commenters neither supported nor opposed the proposed listing. Forty-four commenters opposed the proposed listing. During the public hearing, 21 commenters spoke, most of whom also sent written comments. Information from a number of these comments has been incorporated into the final rule. Seventeen issues were raised in these comments. The Service's response to each is as follows:

Issue 1: Concerns about taxonomy and identification. Several commenters questioned the taxonomic status of *Atriplex coronata* var. *notatior*. One commenter supported listing *A. coronata* var. *notatior* but doubted that it was taxonomically distinct from *A. c.* var. *coronata* of central California. The commenter noted that *A. c.* var. *coronata* appeared at least as uncommon as *A. c.* var. *notatior*, and suggested that the entire species should be listed. Other commenters stated that *A. coronata* var. *notatior* is a discrete entity. At least one commenter objected to the Service proposing to list a taxon of lower rank than a full species. Another commenter questioned the validity of the identification of reports of *Navarretia* in Riverside County, California, and suggested that *N. fossalis* may be more common than currently believed.

Service Response: The Service is required to make listing determinations based on the best available scientific and commercial data according to Section 4 (b)(1)(A) of the Act, as amended. Section 3(16) defines the term "species" to include any species or subspecies of fish or wildlife or plants. In plant nomenclature, a taxon recognized as a variety can alternatively be recognized as a subspecies, so varieties qualify for listing. *Atriplex coronata* var. *notatior* has been recognized as a distinct taxon from *A. coronata* var. *coronata* in floristic treatments since 1935 (Munz 1935, 1971, 1974) as well as in the most recent statewide systematic treatment of the genus (Taylor and Wilken 1993). While the status of *A. c.* var. *coronata* is also declining, this taxon is not the subject of this rule.

All available collections of *Navarretia* similar to *N. fossalis* in Riverside County have been reviewed by an expert on the genus. *Navarretia fossalis* is the primary wetlands dependent species in Riverside County. No new populations of *N. fossalis* from Riverside County have been reported recently (S. Spencer, *in litt.* 1993, S. Spencer, pers. comm. 1997).

Issue 2: One commenter noted that in the years before the proposed listing, an extreme drought had taken place within

Riverside County, California. The commenter suggested that these species were represented by low numbers and isolated populations as a direct result of the drought and that the taxa would likely not be rare in wetter years.

Service Response: The Service agrees that wetland plants generally are both more widely distributed and more numerous in wet years than in dry years. However, wetlands plants are at their greatest risk of extinction or endangerment during dry years. *Navarretia fossalis* and *A. coronata* var. *notatior* populations have declined significantly since the proposed rule was published, irrespective of climatic conditions. Both species have been affected by increased farming activity and other threats that have resulted in continuing habitat disturbance and degradation.

Issue 3: Several commenters stated that the Service closed the public comment period before additional surveys could be performed and that these surveys were necessary for a final listing determination. Another commenter noted that letters originating from the Service in 1991 indicated that *A. coronata* var. *notatior* was a category 2 candidate for listing as threatened or endangered, thus indicating that there was not enough data to determine if listing was warranted. Then, 3 years later, the Service proposed to list *A. coronata* var. *notatior*. Other commenters suggested that the Service should postpone listing of this species until citizen concerns were addressed.

Service Response: The Service utilizes the best available scientific information in determining whether a species qualifies for Federal protection. Although the Service acknowledges that private landowners have legitimate economic and land use concerns, the Service reviews only the biological data in determining whether a species qualifies for Federal protection (See also Issues 2 and 13). Although additional surveys could be useful, they are unnecessary to make a final determination because the majority of the suitable habitat for these species remains threatened. The Service has continued to monitor habitat for these taxa since the proposed rule was published. Analyses of the relevant data reveal that three of the four species have declined considerably since the proposed rule was published in 1994. Although additional localities of *B. filifolia* have been reported in Orange County and in San Diego County, few of these populations are protected and several are threatened by urbanization.

Atriplex coronata var. *notatior* appeared in the 1990 Plant notice of

review (55 FR 6184) as a category 2 candidate. Category 2 candidates were taxa that the Service considered potentially at risk of extinction but did not have data to support a listing proposal. Information newly acquired by the Service between 1992 and 1993 indicated that the species qualified for Federal protection. In the September 30, 1993 plant notice of review (58 FR 51144), the Service elevated the status of this taxon to category 1, indicating that the Service possessed enough data in its files to support a listing proposal.

Issue 4: One commenter indicated that the Service failed to consider populations of *A. coronata* var. *notatior* at Mystic Lake and the extensive suitable habitat in the area.

Service Response: The known populations of *A. coronata* var. *notatior* in the vicinity of Mystic Lake were considered in this determination. The Mystic Lake bed and surrounding shoreline areas potentially support over 400 ha (1,000 ac) of suitable habitat for *A. coronata* var. *notatior*. In fact, the largest known population was reported in this area in 1992. However, prior to 1992, a significant portion of the lake bottom was under cultivation. In 1993, major flooding filled the lake and this population and several others were inundated. The lake did not recede enough to expose the former population until 1996. Few plants have been reported where 20,000 were once reported. Most of the Mystic Lake area is not within the San Jacinto Wildlife Area and has no formal protection. It has been proposed that reclaimed water be piped into Mystic Lake. The addition of water outside the normal rainy season will undoubtedly slow recovery of suitable habitat for *Atriplex coronata* var. *notatior* in this area.

Issue 5: Several commenters questioned the reliability of the data the Service used in preparation of the proposed rule. Several commenters noted that the Service did not incorporate existing reports that contained important data necessary to the decision making process. Several commenters specifically noted that the San Jacinto River Improvement Project Biological Assessment (Tierra Madre Consultants 1991) was not cited in the proposed rule. Another commenter indicated that the results from a number of other reports, such as a floral survey of March Air Force Base (James 1992), imply that these species are more widespread than the Service has indicated.

Another commenter noted that the soils which species like *Atriplex coronata* var. *notatior* appear to rely upon are not restricted to Riverside

County. Similar soils occur from Solano to Santa Clara Counties in central California, and the Service did not indicate that surveys for this taxon were conducted in this area. By contrast, another commenter noted that the presence of similar soils outside the known range of *A. coronata* var. *notatior* does not necessarily indicate that the plant occurs there; such areas are likely to be occupied by a different variety, *A. coronata* var. *coronata*, which is also declining in central California habitat that has been largely converted to cultivation.

Service Response: The Service has used the best available scientific information upon which to make its findings. Although several of the commenters mentioned that the distribution and abundance of populations of these four species may be greater than indicated in the proposed rule, only two provided data to support their assertion. The Service acknowledges that the San Jacinto River Improvement Project Biological Assessment (Tierra Madre Consultants 1991) was not cited in the proposed rule. The Service incorporated the results of this report into this final determination. The Service notes that this report, in discussing *A. coronata* var. *notatior* states: "[i]mpacts to the San Jacinto saltbush on lands to be reclaimed and subsequently developed as residential, commercial, and industrial areas, are direct. Populations of this species that have been reported in this document to occur on natural lands in the 100-year floodplain will suffer local extirpations if valley saltbush scrub habitat is destroyed. Proposed project developments in the 100-year floodplain that impact these remaining parcels of natural habitat should be reviewed by the Riverside County and the City of Perris planning departments on a case-by-case basis and substantial portions of these areas should be designated as 'open space' (not parks), or be included as part of the Habitat Conservation Plan for Riverside County."

Information from several of the other documents, when appropriate, also has been incorporated into this determination. However, the Service notes that several other documents cited by commenters, such as a floral survey of March Air Force Base (James 1992), indicated only that subject species were known from a given general area, and not necessarily found within the study site.

The general distribution of the four plants addressed herein is well documented (Munz and Keck 1973, Munz 1974, Taylor and Wilken 1993,

Skinner and Pavlik 1994). Several researchers (e.g., Boyd, Bramlet, and Sanders) have conducted directed surveys in Riverside County for these plants over several to many years. In the process, these researchers have verified the plants' habitat-specificity and have documented fluctuations in abundance. Although the Service acknowledges that additional populations of these plant taxa may be identified, it is unlikely, given the fairly specific habitat requirements of these taxa, that significant populations remain undiscovered. If so, it is likely that they would be subject to the same threats that currently place known populations at risk. The Service acknowledges that similar soils that could potentially be suitable habitat for these species occur in central California. However, there is no evidence that two of these species (*Navarretia fossalis* and *Brodiaea filifolia*) have ever been documented in central California and in the case of *Atriplex coronata*, these soils are occupied by a related but distinct taxon (*A. c.* var. *coronata*).

Issue 6: Several commenters stated that the Service did not adequately consider the conservation benefits that will result from regional Natural Communities Conservation Planning (NCCP).

Service Response: Two of the proposed taxa, *Brodiaea filifolia* and *Navarretia fossalis*, are covered species under the Multiple Species Conservation Plan (MSCP) in San Diego County. However, significant populations of both species are found outside of the MSCP boundary. Large populations of both taxa also occur in the Multiple Habitat Conservation Plan (MHCP) area of northern San Diego County. This plan is still in the data analysis stage, and species coverage for these two taxa has yet to be determined. Populations of *Brodiaea filifolia* and *Navarretia fossalis* are also found, along with *Atriplex coronata* var. *notatior* and *Allium munzii*, in western Riverside County, where a multiple species planning program is being initiated but conservation levels have not yet been determined.

Populations of *Brodiaea filifolia* also occur in Orange, Los Angeles, and San Bernardino Counties. In these counties, planning efforts for areas with these plants are either not yet complete or lacking (See discussion under Factor D). Significant populations of *Navarretia fossalis* occur in areas such as western Los Angeles County and western Riverside County where protection is still limited to existing land-use and regulatory mechanisms that have not

proven adequate in the past to conserve the species effectively.

Issue 7: Several commenters indicated that *Brodiaea filifolia* should be listed as endangered and not threatened.

Service Response: *Brodiaea filifolia* has one of the widest distributions of the four plants, being found in Los Angeles, Orange, western Riverside, southwestern San Bernardino, and San Diego Counties. The population with the largest area of potentially suitable habitat is protected in TNC's Santa Rosa Plateau Preserve. Other populations are protected at the CDFG's San Jacinto Wildlife Area. Several new populations have also recently been discovered in Orange County and San Diego County. As such, *B. filifolia* does not meet the definition of an endangered species under the Act and listing as threatened is appropriate.

Issue 8: Two respondents stated that the Service's notification to the public on this proposal was inadequate. One of these commenters stated specifically that the Service failed to give notice of the proposal to the County of Riverside, Riverside County Flood Control, and that the Service failed to publish notice of the proposed rule in a newspaper of general circulation within Riverside County. Two commenters stated that a single public hearing was inadequate to obtain full public input on the proposal. These same commenters requested that public hearings be held in more than one location. Additionally, several commenters also stated that the Service had not provided enough opportunity for the public to respond.

Service Response: The Service is obligated to hold one public hearing on a listing proposal if requested to do so within 45 days of publication of the proposal (16 U.S.C. 1533(b)(5)(E)). Considering the limited geographic distribution of the species, the Service determined that holding a single public hearing was not an impediment or undue inconvenience to those wishing to attend. In addition, the Service went through an extensive notification process to make the public aware of this proposal. This process, which is described in detail above, fully satisfied the requirements of the Act.

As was indicated above, newspaper notices were published in the Orange County Register, San Diego Union Tribune, and the Press Enterprise. All three papers are widely available in western Riverside County. A large number of interested parties, including the County of Riverside Planning Department and the Riverside County Flood Control District, were sent copies of the proposed rule on December 27, 1994.

The Service is obligated to allow 60 days for the public to respond to a proposed rule. The Service extended the comment period for an additional 60 days to allow for additional public response.

Issue 9: One commenter stated that the intention of the signed Memorandum of Understanding for the San Jacinto River Corridor Plan (MOU) was to "avoid the need to list the saltbush" and to cooperate in the development of a plan to protect the saltbush. Thus, although a plan was developed in accordance with the criteria delineated in the MOU, "the Service has failed to approve this plan in blatant disregard of its commitments established in the MOU."

Service Response: The intent of the MOU was to reduce the threats to the San Jacinto Valley crownscale (saltbush), *Atriplex coronata* var. *notator*, by developing a conservation plan that accommodates channelization of the San Jacinto River while protecting saltbush habitat along the river. The MOU does not cover the entire range of the saltbush; approximately two-thirds of the range of the species is outside of the MOU area. Therefore, the proposal to list the saltbush does not violate the terms of the MOU. The MOU is still in effect, and the Service stands by its signatory responsibilities. However, to date, the Service has not received a plan that provides adequate protection and conservation measures for the species. The Service pledges to continue working with all interested parties to develop a conservation plan for the saltbush along the San Jacinto River that adequately and simultaneously meets the conservation needs of the species and the needs of the stakeholders.

Issue 10: Several commenters have stated that the Service has not appropriately taken into account the planning and preservation efforts by local jurisdictions. One commenter noted that "the City of Hemet has undertaken a separate proactive planning effort which the Service also failed to consider when preparing this rule."

Service Response: The Service has considered planning and preservation efforts by local jurisdictions in preparation of this determination. For example, although the City of Hemet initiated a conservation plan for the vernal pools and vernal wetlands along the western edge of the city in 1994, the plan apparently has not yet resulted in significant conservation of any of the taxa in this final rule.

Issue 11: One commenter stated that the proposed rule discloses inconsistencies in the Service's

mitigation recommendations or requirements for various projects that could impact the species addressed herein.

Service Response: The commenter apparently is referring to the disparity between the mitigation accepted for pipeline projects versus that accepted for flood control projects. Pipeline projects involve temporary impacts and have fewer indirect effects than channelization projects, which permanently alter the habitat and prevent natural habitat recovery within the natural flood plan.

Issue 12: Four commenters stated that personal letters and informal correspondence should not be considered a legitimate source of information. They felt that the Service had not accounted for bias on the part of these parties.

Service Response: The Act requires the Service to use the best available scientific information as the sole basis for its listing decision. This information may take the form of published papers, peer review by acknowledged experts on a given subject, scientific reports, letters, and personal communications. The Service considers professional judgment and expert opinion by knowledgeable biologists in making decisions. All such information is subject to peer review during the listing process.

Issue 13: Two commenters stated the proposed rule failed to consider the protections provided by State and local statutes to the species listed herein. One commenter stated that listing of these species would not provide them with additional protection.

Service response: The Service considered all the existing applicable regulatory mechanisms that deal with the species listed herein on private, State, and Federal lands throughout their range. These issues are discussed in the Summary of Factors section, Factor D. The Service has concluded that existing regulatory mechanisms do not currently provide adequate protection for these plants. The listing of these species will protect them from a variety of unauthorized activities including removal or reduction to possession from areas under Federal jurisdiction or in violation of a State law, including criminal trespass, and will allow review of projects with a Federal nexus to determine whether such actions may affect the listed species.

Issue 14: Numerous commenters stated that critical habitat would impose an unnecessary economic burden on property owners or requested that the

boundaries of proposed critical habitat be modified to exclude their properties.
Service Response: Because critical habitat is not being designated in this rule, comments regarding critical habitat have not been addressed.

Issue 15: One commenter stated that existing regulatory mechanisms are adequate but regulatory agencies have failed to enforce these regulations.

Service Response: The adequacy of existing regulatory mechanisms is discussed under "D." The Service acknowledges that not all regulatory mechanisms are strictly enforced.

Issue 16: Eight commenters expressed concern about adverse economic effects of the listing.

Service Response: Under section 4(b)(1)(A) of the Act, a listing determination must be based solely on the best scientific and commercial data available. The legislative history of this provision clearly states the intent of Congress to "ensure" that listing decisions are "based solely on biological criteria and to prevent nonbiological considerations from

affecting such decisions " * * *," (H.R. Rep. No. 97-835, 97th Cong. 2nd Sess. 19 (9182)). As further stated in the legislative history, " * * * economic considerations have no relevance to determinations regarding the status of the species * * * " (*Id.* at 20). Because the Service is specifically precluded from considering economic impacts, either positive or negative, in making listing decisions, the Service does not evaluate or consider the economic impacts of listing species.

Peer Review

In accordance with interagency policy published in the **Federal Register** on July 1, 1994 (59 FR 34270), the Service solicited the expert opinions of three independent specialists regarding pertinent scientific or commercial data and assumptions relating to the taxonomy, population models, and supportive biological and ecological information for the taxa under consideration for listing. The purpose of such review is to ensure listing decisions are based on scientifically

sound data, assumptions, and analyses, including input from appropriate experts and specialists. One of the three specialists sent a supportive letter during the public comment period. No additional comments were received from the other specialists.

Summary of Factors Affecting the Species

Section 4 of the Act and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act, set forth the procedures for adding species to the Federal lists. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). These factors and their application to *Allium munzii* (Traub) D. McNeal (Munz's onion), *Atriplex coronata* S. Watson var. *notatior* Jeps. (San Jacinto Valley crownscale), *Brodiaea filifolia* S. Watson (thread-leaved brodiaea), and *Navarretia fossalis* Moran (spreading navarretia) are as follows and summarized in Table 1.

TABLE 1.—SUMMARY OF THREATS

Species	Agriculture/urbanization	ORV use ¹	Mining	Alteration of hydrology	Trampling/grazing	Alien species
<i>Allium munzii</i>	X	X	X	.....	X	X
<i>Atriplex coronata</i> var. <i>notatior</i>	X	X	.....	X	X	X
<i>Brodiaea filifolia</i>	X	.....	.....	.....	X	X
<i>Navarretia fossalis</i>	X	X	.....	X	X	X

¹ ORV=off road vehicle.

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

The natural plant communities of coastal Orange and San Diego counties, western Riverside and southwestern San Bernardino counties, California, and northwestern Baja California, Mexico, have undergone significant changes as a result of both direct and indirect human-caused activities. The rapid urbanization of this region (which currently harbors over 17 million people) has already eliminated a significant portion of the habitat for these four plants. The remaining patches of habitat are frequently isolated and have been, or are being, degraded and/or fragmented by agricultural practices, streambed channelization and other hydrological alterations, weed abatement, fire suppression practices, and grazing.

Allium munzii occurs in grassy openings in coastal sage scrub and mesic native perennial grasslands. The majority of *B. filifolia* populations are known to occur in mesic native

perennial grasslands. The extent of these plant communities has undergone significant reduction due to urban and agricultural development (U.S. Fish and Wildlife Service 1993, Oberbauer and Vanderwier 1991). Approximately 59 percent of the coastal sage scrub in Riverside County has been destroyed since 1945, and as much as 71 percent has been destroyed since 1930 (U.S. Fish and Wildlife Service 1993). In San Diego County, 95 percent of the native perennial grasslands and 72 percent of the coastal sage scrub have been destroyed (Oberbauer and Vanderwier 1991). Native perennial grasslands continue to be at risk and are threatened by urbanization and agricultural conversion throughout the range of *Allium munzii* and *Brodiaea filifolia*.

Little is known concerning the historical distribution of *A. munzii*. However, as much as 80 to 90 percent of the clay soils in western Riverside County that may have supported habitat for *A. munzii* have been adversely modified through extensive agriculture,

urbanization, and clay mining (CDFG 1989).

Allium munzii has recently been extirpated from at least two sites as a result of agricultural development, clay mining, and highway construction. Other populations of this species have been impacted by reduction of available habitat and numbers of individuals. One population of *A. munzii* was partially eliminated in 1982 by the realignment of the Interstate 15 freeway corridor in the Temescal Valley of Riverside County (Roberts 1993a). Another population was reduced when part of its habitat was inundated for a reservoir (CDFG 1989).

Two of the remaining 13 populations of *Allium munzii* are within the boundaries of proposed development (Roberts 1993a, Royce Rigging and Associates, *in litt.* March 1998, Brenda McMillan, U.S. Fish and Wildlife Service, pers. comm. 1998). Combined these projects contain over 470 ha (1,175 ac) of which a substantial area is potential habitat for *A. munzii*. Discing for the weed abatement or dry land

farming may destroy habitat and cause population declines of *A. munzii*. These activities, or off-road vehicle activity, are affecting six of the thirteen known sites of *A. munzii* (CNDDDB 1997, Steve Boyd, Rancho Santa Ana Botanical Garden and D. Bramlet, pers. comm. 1993). One site, for example, that has been persistently disced for dryland farming since it was reported as supporting 1,000 individuals in 1992, was found to contain fewer than 10 individuals in 1998 (B. McMillan, pers. comm. 1998). Altogether 7 of the 13 populations (over 50 percent) supporting about 20 percent of the individuals are threatened by loss of habitat through development, discing, and off-road vehicle activity.

Over 25 percent of *B. filifolia* populations have been eliminated by urbanization and agricultural conversion (Roberts and Vanderwier 1997). Over the last 15 years, nearly 60 ha (150 ac) of occupied habitat containing over 80,000 plants have been eliminated in the cities of San Marcos and Vista (CNDDDB 1997, Taylor and Burkhart 1992, Wayne Armstrong, Palomar College, pers. comm. 1993, Roberts and Vanderwier 1997). Urbanization continues to be the most significant threat to this species. About 20 percent (about 8) of the remaining populations of *B. filifolia* in San Diego and Riverside counties are currently within proposed or approved development projects. Another 10 percent (4) of the populations are zoned for urbanization or threatened by discing for fire suppression activities or dryland farming. Suitable habitat is at even greater risk. For example, *Brodiaea filifolia* is associated with clay soils and soils with clay subsoils. In 1994, about 1,595 ha (3,990 ac) of these soils (about 30 percent of the historical figure) remained available in the cities of San Marcos, Vista, and Carlsbad. In 1996 and 1997, at least 120 ha (300 ac) of clay soils and soils with clay subsoils, in part occupied by *B. filifolia*, was graded in the City of Carlsbad alone. Two approved projects in the City of Carlsbad are likely to reduce these available appropriate soils by at least 400 ha (1,000 ac) (Soil Conservation Service and Forest Service, et. al. 1973, City of Carlsbad and Fieldstone/La Costa Associates 1994, Sweetwater Environmental Biologists 1994).

It is probable that the only known population of *B. filifolia* reported for San Bernardino County in nearly 70 years will be removed by a major pipeline project (Robert Thorne, Rancho Santa Ana Botanical Garden, pers. comm. 1993, Edna Rey, U.S. Fish and Wildlife Service, pers. comm. 1993).

Most of the recently discovered populations of *Brodiaea filifolia* in Orange County, California are relatively small and are not at immediate risk (2 are on protected land). However, the largest population known in Orange County is within the proposed grading footprint of a 1,600-unit residential development (City of San Clemente 1997). This population occupies about 6 ha (15 ac) and supports about 60 percent of the reported *B. filifolia* individuals and about 80 percent of the habitat occupied by this species in Orange County. As currently proposed, nearly the entire native population at this site would be impacted.

The largest reported population of *B. filifolia* occurs on 16 ha (40 ac) of habitat located near downtown San Marcos in San Diego County, which is zoned for industrial development (Kutz 1997). Other populations in San Marcos, although not as extensive, are also threatened. For example, a 9 ha (20 ac) parcel near the largest site is proposed for recreational development (San Diego Union Tribune, January 29, 1998).

The only populations of *Brodiaea filifolia* known to occur on Federal land are on Marine Corps Base, Camp Pendleton in San Diego County (CNDDDB 1997, U.S. Marine Corps 1997). Several populations have recently been discovered in an abandoned weapons impact area. While no populations are currently reported as directly threatened by development on the base, a recently-proposed project may alter up to 54 ha (134 ac) of highly suitable habitat that is immediately adjacent to known occupied habitat (U.S. Marine Corps 1997).

As discussed below (vernal wetlands discussion), habitat that supports 5 of 6 populations of *Brodiaea filifolia* within the San Jacinto River flood plain and Old Salt Creek near Hemet is threatened by alteration of hydrology (duck ponds), channelization, discing for dry land farming and fire suppression practices, and urbanization (Roberts and Vanderwier 1997). These populations represent about one third of the populations and over 40 percent of the potential habitat for this species in Riverside County.

At least 12 of the remaining 37 populations of *Brodiaea filifolia* within San Bernardino, Orange, Riverside, and San Diego County are threatened by the destruction of habitat that will result from urbanization, discing for dry land farming or fire suppression. These populations include a significant portion of the occupied habitat and the largest populations of *Brodiaea filifolia* within San Diego and Orange Counties. The reduction of these populations will

result in a significant decline in the species.

Vernal pools have undergone an extraordinary reduction in number and have nearly been eliminated in Los Angeles, Orange, and San Diego counties, and have been greatly reduced in Riverside County. In San Diego County, over 97 percent of vernal pool habitat occupied, in part, by *Navarretia fossalis*, had been lost by 1990 (Bauder 1986, Oberbauer and Vanderweir 1991).

Loss estimates for vernal pools and vernal wetlands in Riverside County are less certain and are based on the status of soil types that support these kinds of habitat. The Service estimates that about 12,800 ha (32,000 ac) in the Perris, western San Jacinto, and Menifee Valleys were historically dominated by alkali scrub, alkali playa, alkali grassland, or vernal pool plant communities that contained significant populations of *B. filifolia*, *A. coronata* var. *notatior*, and *N. fossalis*. About 75 percent of the 12,800 ha (32,000 ac) has been impacted by a combination of intensive cultivation, urbanization, or watercourse channelization; being filled; or otherwise being highly disturbed and, therefore, unlikely to return to supporting these native plants. A significant portion of the remaining 3,300 ha (8,200 ac) of alkali and vernal pool habitat suitable for these plants has been disturbed, predominantly by dryland farming activities (Tierra Madre Consultants 1992, Roberts 1993b, Roberts and McMillan 1997).

About 95 percent of the populations of *A. coronata* var. *notatior*, about 15 percent of the populations of *B. filifolia*, and about 50 percent of the populations of *N. fossalis* are associated with the San Jacinto River and a tributary of Old Salt Creek just west of the city of Hemet. Much of this area has been subject to dry land farming or irrigated farming at some time during the last 100 years. However, a 5-year drought contributed significantly to a reduction in agricultural activity, particularly along the San Jacinto River. Conversely, in some areas, the soils have routinely been too wet and too alkaline for dry land farming. Both factors have contributed to the continued existence of these taxa in this area.

Major commercial and urban development, transportation, and flood control projects have been proposed in General and Specific Plans for both the San Jacinto River Valley and the area west of Hemet. According to documents on file with the County of Riverside and the City of Perris in 1994, these proposals could result in over 19,000 new residential units, as well as hotel and commercial developments

encompassing over 3,200 ha (8,000 ac) (Riverside County Planning Department 1991, Louis Massey, Department of Planning, City of Perris, pers. comm. 1993, Mark Goldberg, City of Hemet, pers. comm. 1993). Although not all of these projects may move forward, potential habitat for *A. coronata* var. *notatior*, *N. fossalis*, and *B. filifolia* could be reduced by over 1,400 ha (3,500 ac) (Roberts 1993b). And, although the urbanization that could result from these major projects and others associated with the cities of San Jacinto and Hemet may not occur for up to five years, these same areas are more imminently threatened by a recent increase in pipeline construction, dry land farming, and weed abatement activities.

Three pipeline projects have recently destroyed vernal pool, alkali grassland, and alkali playa habitat and directly impacted 5 of 11 populations of *A. coronata* var. *notatior*, *N. fossalis*, and at least one historical site for *B. filifolia* in the San Jacinto River flood plain (Roger Turner, Eastern Municipal Water District, pers. comm. 1992, 1993, Tierra Madre Consultants 1992). At least one additional pipeline project will further reduce one population of *A. coronata* var. *notatior* and *N. fossalis* (Roberts and McMillan 1997).

In 1993, more than 200 ha (500 ac) of occupied or potential habitat for *A. coronata* var. *notatior*, *B. filifolia*, and *N. fossalis* were disced for weed abatement or fire suppression purposes (Roberts 1993b). In June 1993, an additional 80 ha (200 ac) of habitat containing *A. coronata* var. *notatior* and *N. fossalis* were disced and seeded for dry land farming (Bill Sweeney, landowner, pers. comm. 1993). Additional discing along the San Jacinto River has been reported since 1993. At least 42 stands of *A. coronata* var. *notatior*, including 4 of the largest, have been adversely modified since 1990. This has resulted in the decline in total numbers of *A. coronata* var. *notatior* plants, throughout its range, of nearly 70 percent since 1992 (Roberts and McMillan 1997).

While *Atriplex coronata* var. *notatior* has displayed some ability to persist despite dryland farming in its habitat, its severe decline since 1992, combined with extensive plans for flood control and further urban development in its habitat show that this plant is in danger of extinction in much of its remaining habitat. The existing protected areas, as discussed below, do not appear to offer adequate area or management to prevent endangerment. Nearly half of the known populations of *Navarretia fossalis* occur within the same habitat that is occupied

by *A. coronata* var. *notatior*. However, the distribution of *N. fossalis* is even more restricted in that it can only persist in the wettest areas of the San Jacinto River flood plain and the vernal pools at Hemet. The loss of these populations will result in a significant decline in the species.

Navarretia fossalis also occurred historically in the vicinity of Murrieta Hot Springs in Riverside County during the 1920's (Spencer, *in litt.* 1993). Much of the Murrieta Hot Spring area has been urbanized or converted to agriculture resulting in a significant reduction and fragmentation of potential *N. fossalis* habitat (U.S. Fish and Wildlife Service, unpublished data). While there are no additional confirmed populations of *N. fossalis* occurring in the Murrieta area, the continued and rapid urbanization of this area reduces the opportunities to conserve potential habitat for species recovery.

The larger of two recently discovered occurrences of *Navarretia fossalis* in northwestern Los Angeles has apparently been partially graded, (Tim Thomas, U.S. Fish and Wildlife Service, pers. comm. 1998), leading to the ongoing deposition of fill material into the vernal pool.

In San Diego County, *N. fossalis* occurs within vernal pool complexes (Bauder 1986, CNDDDB 1997). These areas have been and continue to be impacted by urbanization and agricultural conversion (Bauder 1986, Nancy Gilbert and Ellen Berryman, U.S. Fish and Wildlife Service, pers. comm. 1993).

One of the largest concentrations of *N. fossalis* occurs on Otay Mesa in San Diego County. At least 37 proposed Precise Plans and Tentative Maps for development have been filed pursuant to the California Environmental Quality Act for this area. These plans encompass about 80 percent of the undeveloped portion of the mesa within the jurisdiction of the City of San Diego and all but four of the remaining vernal pool complexes. Several of these projects will impact *N. fossalis*. In addition, at least one major transportation project has been proposed for Otay Mesa and could potentially affect vernal pools occupied by *N. fossalis* (California Department of Transportation 1993).

Navarretia fossalis and *Brodiaea filifolia* are found on Federal lands managed by the Navy at Naval Air Station, Miramar and Marine Corps Base, Camp Pendleton. These lands are used, in part, for military training activities that involve off-road vehicle maneuvers that adversely affect these species (D. Hogan, San Diego

Biodiversity Project, and D. Belk, The Lady of the Lake University, *in litt.* 1992, CNDDDB 1997).

Trash dumping has also degraded vernal pools in San Diego County. Chunks of concrete, tires, refrigerators, furniture, and other pieces of garbage or debris have been found in pools containing *N. fossalis*. This trash crushes or shades vernal pool plants, disrupts the hydrologic functions of the pool, and, in some cases, may release toxic substances. Trash dumping continues to threaten vernal pools that support this species (S. Wynn, U.S. Fish and Wildlife Service, pers. comm. 1998).

Vernal pools in Riverside and San Diego counties and, to a lesser extent, the alkali wetland habitats of Riverside County, have also been degraded by off-road vehicles. These vehicles compact soils, crush plants when water is present, cause turbidity, and leave deep ruts. This type of damage may alter the microhydrology of the pools by creating drainage channels or by disrupting the pool's water-retaining hardpan. Dirt roads that go through or adjacent to pools are widened as motorists try to avoid mud puddles, resulting in destruction of pool margins inhabited by *N. fossalis* and *B. filifolia*. Pools are incrementally destroyed, both as a result of destruction of vegetation and alteration of hydrology.

For *Navarretia fossalis*, whose 30 known populations in the United States are concentrated in Otay Mesa in southern San Diego County, along the San Jacinto River in western Riverside County, and near Hemet in Riverside County, the ongoing degradation of vernal pools and their outright destruction due to widespread urbanization in Otay Mesa is the most pressing threat, followed by agricultural practices and the longer-term threats from flood control and development in the San Jacinto-Hemet areas of Riverside County.

The vernal pool, alkali grassland, alkali playa, and alkali sink habitats upon which *N. fossalis*, *A. coronata* var. *notatior*, and, to a lesser extent, *B. filifolia* depend are also vulnerable to indirect destruction due to an alteration of the supporting watershed. An increase in water due to urban run-off leads to increased inundation, which makes pools vulnerable to invasion by plants characteristic of perennial wetlands, which results in decreased abundance of obligate vernal pool plants. At the other extreme, some pools and alkali wetlands have been drained or blocked from their source of water and have shown an increased domination by upland plant species. Of

the species covered by this rule, *N. fossalis* is the most vulnerable to alterations in hydrology because it is the most dependent on vernal pools. The other species in the plan occur in microhabitats that are more variable in wetness.

Agricultural and/or urban development adjacent to vernal pools and alkali wetlands may cause adverse alterations in drainage and adverse hydrological alterations to vernal pools. Drainage of wetlands for agricultural purposes may render land suitable for urban development. Wetland drainage is exemplified by recent activities near Hemet in Riverside County, California. In 1989, drainage structures were built in alkali grassland and vernal pools west of Hemet in association with an Auto Mall (M. Goldberg, pers. comm. 1993). These structures have significantly reduced standing water and are responsible for the gradual drying of wetland vegetation as evidenced by relic stands of *Eleocharis palustris* and other obligate wetland species (Wayne Ferren, University of California, Santa Barbara, pers. comm. 1993). In another example, a vernal pool supporting a large population of *N. fossalis* in 1994 was identified along the San Jacinto River. By 1997, the field had been disced and there was no evidence of the vernal pool nor *N. fossalis*.

Because *Navarretia fossalis* is an obligate wetland species, drainage of the wetlands it inhabits will destroy it. The generally small sizes of vernal pool wetlands render them highly vulnerable to deliberate drainage, as discussed above, as well as to more or less unintentional alteration through changes in drainage that occur during development, and from the physical effects of off-road vehicles and trash dumping. The loss of over 97 percent of vernal pool habitat in San Diego County occupied, in part, by *Navarretia fossalis*, by 1990, shows the intensity of economic and other pressures to develop clay-soil areas with vernal pools. To judge from recent development proposals, the remaining three percent of vernal pool habitat is likely to be lost. On the more extensive alkali wetlands of Riverside County, the effects of agricultural activities, drainage of wetlands, alteration of drainage (from diking and rerouting of drainage) likewise mean that the wetlands remaining available to this plant are much smaller and much more vulnerable to the effects of surrounding development than they were earlier in the century.

Livestock grazing typically changes the composition of native plant communities by reducing or eliminating

plants that cannot withstand grazing and trampling and by enabling more resistant (usually non-native) species to increase in abundance. Non-native plants often are introduced and flourish under a grazing regime and may reduce or replace native species. Plants in vernal pools or adjacent alkali grasslands, playa, or scrub habitats may be trampled and killed or grazed prior to seed production. For example, sheep are imported to graze along the San Jacinto River and at Old Salt Creek annually, and they frequently trample habitat occupied by *Atriplex coronata* var. *notatior*, *Navarretia fossalis*, and *Brodiaea filifolia* (F. Roberts, pers. obs.). At least two populations of *Allium munzii* are within areas grazed by cattle (CNDDDB 1997). Grazing also continues to impact vernal pool habitat in San Diego County, which, in part, is occupied by *Navarretia fossalis*, and on Otay Mesa where some of the most important populations are found, or at Ramona (S. Wynn, pers. comm. 1998).

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

Overutilization is not currently known to be a factor for these four plants, but unrestricted collecting for scientific or horticultural purposes or excessive visits by individuals interested in seeing rare plants could result from increased publicity as a result of this final rule.

C. Disease or Predation

Neither disease nor natural predation are known to be a factor for the four plants. Cattle grazing occurs on Otay Mesa in areas where several vernal pool complexes contain *N. fossalis*. Intensive sheep grazing occurs west of Hemet and along the San Jacinto River in habitat occupied by *N. fossalis*, *A. coronata* var. *notatior*, and *B. filifolia*. It is not anticipated that any of the four species are regular forage for grazing animals, and thus effects from grazing are more likely to be from trampling rather than predation.

D. The Inadequacy of Existing Regulatory Mechanisms

Existing regulatory mechanisms that could provide some protection for these species include: (1) listing under the California Endangered Species Act (CESA); (2) the California Environmental Quality Act (CEQA); (3) implementation of conservation plans pursuant to the California NCCP program; (4) conservation provisions under the Federal Clean Water Act; (5) the Act in cases where these species occur in habitat occupied by a listed

species; (6) land acquisition and management by Federal, State, or local agencies, or by private groups and organizations; (7) local laws and regulations; and (8) enforcement of Mexican laws.

State Laws and Regulations

The California Fish and Game Commission has listed *B. filifolia* as endangered and *A. munzii* (= *A. fimbriatum* var. *munzii*) as threatened under the Native Plant Protection Act (NPPA) (Div. 2, chapter 10, section 1900 *et seq.* of the California Fish and Game Code) and CESA (chapter 1.5, section 2050 *et seq.*). *A. coronata* var. *notatior* and *N. fossalis* are included on Lists 1B of the California Native Plant Society's Inventory (Skinner and Pavlik 1994), which, in accordance with section 1901, chapter 10 of the California Department of Fish and Game Code, makes them eligible for State listing. Although both statutes prohibit the "take" of State-listed plants (chapter 10 section 1908 and chapter 1.5 section 2080), populations of three of the four species have continued to decline. For example, development proposals in Carlsbad (San Diego County) and in the Gavilan Hills (Riverside County) that involve direct impacts to *A. munzii* and *B. filifolia* have proceeded without notification to the Department (Roberts 1993a, Jim Dice, CDFG, pers. comm. 1993). In another case, a landowner disced a stand of *N. fossalis* growing with the State-listed *Orcuttia californica* for fire control without notifying the CDFG (Howard Windsor, Riverside County Fire Department, pers. comm. 1993).

California Senate Bill 879, passed in 1997 and effective January 1, 1998, requires individuals and entities to obtain 2081(b) incidental take permits to take listed species; however, the draft of proposed regulations to implement Senate Bill 879 would except the prohibition of take of listed plant species from major categories of activities, including take incidental to agricultural operations, approved timber harvest operations, mining assessment work, public works projects, and removal or destruction of plants from building sites on private lands. The extent to which the amended State Statute will afford protection to State-listed plant species is uncertain at this time.

The majority of the known populations of the four plants considered herein occur on privately owned land. Local lead agencies empowered to uphold and enforce the regulations of the California Environmental Quality Act (CEQA) have made determinations that have or will

adversely affect *A. munzii*, *A. coronata* var. *notatior*, *B. filifolia*, and *N. fossalis*. Required biological surveys are often inadequate, and project proponents may ignore the results of surveys if occurrences of sensitive species are viewed as a constraint on project design. Mitigation measures used to condition project approvals are essentially experimental and fail to adequately guarantee long-term protection of sustainable populations. In addition, relocation attempts often fail. Project designs have also failed to provide an adequate buffer zone around sensitive plant populations to protect their long-term viability (WESTEC 1988, D. Bramlet, *in litt.* 1992, D. Hogan and D. Belk, *in litt.* 1992, and O. Mistretta, *in litt.* 1993).

The CEQA requires that a project proponent publicly disclose the potential environmental impacts of proposed projects. The public agency with the primary authority or jurisdiction over the project is designated as the lead agency and is responsible for conducting review of the project and consulting with other agencies concerned with resources affected by the project. Required biological surveys are sometimes inadequate and mitigation measures used to condition project approvals are sometimes experimental and do not always adequately guarantee protection of sustainable populations of the species considered in this rule. Section 15065 of the CEQA guidelines requires a finding of significance if a project has the potential to "reduce the number or restrict the range of a rare or endangered plant or animal." CEQA decisions are also subject to overriding social and economic considerations, which allows the CEQA lead agency to approve a project with significant adverse effects on a listed plant species where the agency concludes that overriding considerations justify approval of the project.

Even though impacts to rare plant taxa including *N. fossalis*, *B. filifolia*, and *A. coronata* var. *notatior* were considered significant under CEQA when several pipeline projects and Specific Plans were proposed in Riverside County, California, only *A. coronata* var. *notatior* was consistently considered in the environmental impact analyses. These projects proposed either no or inadequate mitigation for impacts to sensitive plant taxa (D. Bramlet, *in litt.* 1992, Roberts 1993b). In another case, a major development in San Marcos (San Diego County) resulted in a 70 percent reduction in *B. filifolia* habitat. Although 5 ha (12 ac) were set aside for preservation of this species,

the preserve is surrounded by residential development, has inadequate buffers, and is poorly configured (WESTEC 1988).

Regional Planning Efforts

In 1991, the State of California established the NCCP Program to address conservation needs of natural ecosystems throughout the State. The focus of the current planning program is the coastal sage scrub community in southern California, although other vegetation communities are being addressed in an ecosystem-level approach. *Brodiaea filifolia* and *Navarretia fossalis* are currently being considered under the MSCP, MHCP, Central/Coastal Subregional NCCP/Habitat Conservation Plan (Central/Coastal) or the Southern Subregional NCCP/Habitat Conservation Plan of Orange County, California. All of these habitat conservation plans are being conducted under the procedures of section 10(a)(1)(B) of the Act, which allows incidental take permits for federally listed animals in return for effective conservation plans.

The Central/Coastal NCCP of Orange County was approved in July of 1996. Only one of the four plants (*Brodiaea filifolia*) occurs within the Central/Coastal NCCP. It is not considered a covered species because of its recent discovery within the subregion. Covered species are those species that have been adequately considered in terms of long-term preservation within a Habitat Conservation Planning Area or NCCP subregion. Under an agreement with participants, CDFG, and the Service, future potential impacts for covered species are considered adequately addressed through proposed preservation, mitigation, and management. The single population of *B. filifolia* within the Central/Coastal NCCP is situated on land preserved under the regional park system of the County of Orange.

Five populations of *B. filifolia* are within the Southern Subregion of the Orange County NCCP. Preserve design in the Southern Subregion is still preliminary, and it is uncertain to what degree it will conserve the four populations of this taxon. However, the largest of the four populations (Forster Ranch) is within a proposed residential development site and is unlikely to benefit from any future preserve (City of San Clemente 1997).

Since the publication of the proposed rule, the MSCP, a regional planning effort in southwestern San Diego County, has been finalized and submitted to the Service as part of an application for a section 10(a)(1)(B)

incidental take permit for 85 species, including *Brodiaea filifolia* and *Navarretia fossalis*. The Service and the City of San Diego have jointly prepared a Recirculated Environmental Impact Statement, "Issuance of Take Authorizations for Threatened and Endangered Species due to urban Growth within the Multiple Species Conservation Program (MSCP) Planning Area." This document, released on August 30, 1996, and finalized in December 1996, assesses the effects of land-use decisions that will be made by local jurisdictions to implement the plan and the effects of the issuance of the incidental take permit for the 85 species. A permit was issued to the City of San Diego in July 1997 and for the County of San Diego in March 1998. A permit is expected for Chula Vista in 1999.

The MSCP sets aside preserve areas and provides for monitoring and management for the 85 "covered species" addressed in the permit application, including *Brodiaea filifolia* and *Navarretia fossalis*. "Covered species" are taxa that will be adequately conserved by the plan's proposed preservation and management. Project proponents in areas outside the MSCP subregion will be required to coordinate with the Service on these taxa where applicable.

About 20 percent of the known populations of *N. fossalis* in the United States are in the MSCP subregion. The majority of these populations will be conserved by the MSCP. In addition the species is on the list of narrow endemics, which requires jurisdictions to specify and implement measures in their subarea plan to avoid or minimize impacts to all populations. However, significant populations of *N. fossalis* remain outside the MSCP subregion. Only a single recently reported population of *B. filifolia* occurs within the MSCP.

The MHCP area in northwestern San Diego County contains several significant populations of *N. fossalis* and about half of the *B. filifolia* populations. The MHCP, which will include the Carlsbad Habitat Management Plan (HMP) program, is still in the early developmental phase, and thus it is uncertain to what degree it will be successful in providing protection for *Brodiaea filifolia* and *Navarretia fossalis*.

About 50 percent of the populations of *Navarretia fossalis* occur in western Riverside County, along the San Jacinto River and southwest of Hemet. Riverside County is in the process of developing a multiple species plan. However, the plan will not be finalized

this year. *B. filifolia*, *A. coronata* var. *notatior*, and *Allium munzii* are also expected to benefit from the Riverside County plan when it is finalized. Five of the six populations of *B. filifolia* in southern Orange County are within multiple species planning areas in southern Orange County and most of these are expected to be conserved through the Southern Subregional NCCP. However, the largest and most significant population (Forster Ranch) will not have substantial conservation as a result of this planning effort. Small populations of *N. fossalis* and *B. filifolia* are also known from Los Angeles and San Bernardino County. These populations are generally in jurisdictions that have not developed or implemented regional multispecies planning programs.

Conservation Provisions Under the Clean Water Act

Atriplex coronata var. *notatior* and *N. fossalis* could potentially be affected by projects requiring a permit from the Corps under section 404 of the Clean Water Act. In Riverside County, the Corps has not required a permit or mitigation for filling of wetland habitat occupied by *A. coronata* var. *notatior*, *N. fossalis*, or *B. filifolia* in instances where the land had previously been used for agriculture or where the wetland was determined not to be within the jurisdiction of the Corps. The Corps has indicated a lack of certainty over whether hydric soils existed on a particular site, even though hydric vegetation and hydrologic features were present (U.S. Fish and Wildlife Service, *in litt.* 1993). Even if the Corps establishes jurisdiction under the Clean Water Act over vernal pools, this does not ensure their protection. At least two vernal pool complexes that represented suitable habitat for *Navarretia fossalis* that were under Corps jurisdiction in San Diego County have been destroyed or degraded without a section 404 permit (J. Dice, pers. comm. 1993, Carrie Phillips, U.S. Fish and Wildlife Service, pers. comm. 1993).

A permit was issued by the Corps for channelizing the San Jacinto River in 1996. As a condition of approval, the permit was tied to a plan that would be designed to conserve *A. coronata* var. *notatior* habitat along a portion of the San Jacinto River. This plan is still in the development stage. It is anticipated that this conservation plan, when finalized, will provide adequate habitat for *A. coronata* var. *notatior* and other rare plant species, including *N. fossalis*. It will cover about one-third of the range of *A. coronata* var. *notatior*. This conservation plan is intended to

adequately conserve *A. coronata* var. *notatior* (but not *N. fossalis*) in the covered area and to allow for its full recovery once similar conservation measures are undertaken elsewhere in its range.

Federal Endangered Species Act

The Act may afford protection to sensitive species if they co-exist with species already listed as threatened or endangered under the Act. *Pogogyne abramsii* (San Diego mesa mint), *P. nudiuscula* (Otay Mesa mint), *Orcuttia californica* (California Orcutt grass), *Eryngium aristulatum* var. *parishii* (San Diego button-celery), San Diego fairy shrimp (*Branchinecta sandiegoensis*), and the Riverside fairy shrimp (*Streptocephalus wootoni*) are listed as endangered under the Act and occur in the same kinds of habitat type as several of the taxa listed herein. However, these species are often not found in the same vernal pool complexes as the taxa considered in this proposal. *N. fossalis* co-exists with other listed species in only seven vernal pool complexes (one in Riverside County, six in San Diego County).

The Stephens' kangaroo rat (*Dipodomys stephensi*) and the Quino checkerspot (*Euphydryas editha quino*) are listed as endangered, and the coastal California gnatcatcher (*Poliophtila californica*) is listed as threatened under the Act. These species occur in coastal sage scrub (gnatcatcher) and grassland (kangaroo rat) habitats. Although *A. munzii* is known from similar habitats, there is less than 30 percent overlap between its populations and populations of these listed animals. Where overlap does occur, the *A. munzii* populations are either already preserved or potentially protected from development by other regulations. However, in these cases, *A. munzii* is still threatened by off-road vehicle activity and non-native plant species. *Brodiaea filifolia* occurs in the vicinity of California gnatcatcher populations in northern San Diego County but primarily inhabits a different habitat type (mesic grasslands). *Brodiaea filifolia* is known to co-exist with the Stephen's kangaroo rat at only one locality in Riverside County. The Quino checkerspot, an extremely rare species, is not known to occur with either species.

Land Acquisition and Management

Land acquisition and management by Federal, State, or local agencies or by private groups and organizations has contributed to the protection of some localities inhabited by the taxa under consideration in this proposal.

However, as discussed below, these efforts are often directed at other species and are inadequate to assure the long-term survival of the taxa considered in this proposal.

Allium munzii and *Brodiaea filifolia* are found in the Cleveland National Forest and are recognized by the U.S. Forest Service (Forest Service) as sensitive species (U.S. Forest Service 1992, Boyd, et. al., 1992). The Forest Service has policies to protect sensitive plant taxa and attempts to establish these species in suitable or historic habitat. The Forest Service also encourages land ownership adjustments to acquire and protect sensitive plant habitat. To this end, the Forest Service (1992) has released a Management Guide for *A. munzii*. However, only a portion of a single population actually occurs within the Cleveland National Forest, and it continues to be threatened by off-road vehicle activity. The population of *B. filifolia* on National Forest lands, although one of the largest, is evidently a hybrid swarm (Boyd, et. al., 1992, S. Morey, *in litt.* 1995).

In 1993, the Service entered into a Memorandum of Understanding (MOU) with local jurisdictions in Riverside County and the CDFG concerning channelization of the San Jacinto River and protection of *A. coronata* var. *notatior* habitat along the river. The purpose of this MOU is to reconcile conflicts between the conservation of this floodplain species and proposed flood control measures associated with major urban development plans. The MOU does not address the conservation of *N. fossalis*, *B. filifolia*, or other rare plants in the project area. The proposed flood control project could result in significant urban development and hydrological alterations that will contribute to the decline of all these taxa. Since 1993, over 400 ha (1,000 ac) of suitable *A. coronata* var. *notatior* habitat within the jurisdiction of the MOU was disced for purposes of dryland farming and weed abatement (Roberts 1993b, Roberts and McMillan 1997). Some of this altered habitat is in areas that could potentially be preserved as habitat for *A. coronata* var. *notatior*.

Recently, local property owners have been contributing significantly to the conservation process. The goal is to allow channelization of the San Jacinto River and to protect adequate habitat south of the Ramona Expressway for local conservation of *A. coronata* var. *notatior*. In so doing, it is anticipated that the habitat set aside will be adequate for the conservation of other rare plant taxa, including *N. fossalis*. However, this conservation plan, which is under development, will protect only

part of the habitat occupied by the four plants listed herein. Potentially suitable conservation lands have been identified, but a mechanism to acquire them is still lacking.

At least two of the plants listed in this rule occur in the San Jacinto Wildlife Area (SJWA), which is managed by the State of California. Although this preserve provides protection from urbanization and agriculture, it was originally established to mitigate impacts of State water projects. The SJWA's mission is to address multiple impacts such as loss of wetlands and to maintain waterfowl hunting along the San Jacinto River. In meeting this objective, a significant area of habitat for the plants listed in this rule has been converted into habitat for migrating waterfowl. Protection of rare plant habitat is only one of many potentially conflicting goals. Although there are rare plant management goals, duck ponds are inundated in regimes not necessarily conducive to the establishment of *N. fossalis*, *A. coronata* var. *notatior*, or *B. filifolia*, and significant portions of the SJWA support non-native grasses such as *Phalaris minor* and *Crypsis schoenoides* (swamp timothy) that feed migratory waterfowl but compete with native vegetation. Habitat within the preserve is also threatened, in part, with destruction from construction of utility lines (MWD 1992).

The Santa Rosa Plateau Preserve is managed by TNC and contains one of the largest remaining population complexes of *B. filifolia* and a single, small population of *N. fossalis*. Although these populations are managed for long-term protection and viability and are very important for the recovery of these plants, they represent a fraction of the range of either species. Other protected areas will be needed to adequately ensure their continued existence.

The RCHCA has initiated the preparation of a Multi-Species Habitat Conservation Plan (MSHCP). Although the intent of this plan is to identify and acquire areas with high biological diversity and sensitive species, the program is in the early development stage and it is uncertain to what degree it will be successful in providing protection for these taxa. In 1996, one land owner donated about 25 ha (60 ac) of land along the San Jacinto River to the RCHCA. This parcel supports small populations of *A. coronata* var. *notatior* and *N. fossalis*. This land will likely become part of a potential MSHCP preserve system.

Navarretia fossalis is present at 3 sites on Marine Corps Air Station Miramar,

and both it and *Brodiaea filifolia* are present on Marine Corps Base Camp Pendleton. These two facilities comprise some 90 percent of the remaining vernal pool habitat in San Diego County, so they are essential to the conservation of *Navarretia fossalis*. *Navarretia fossalis* is fully protected at the Marine Corps Air Station at Miramar in vernal pool management zones through the Integrated Natural Resource Management Plan (IRMP). This plan is a good example of the permanent protective measures promoted by that the Endangered Species Act. Marine Corps Base, Camp Pendleton has a Draft Isolated Ephemeral Wetlands Management Plan that did not prevent the unauthorized filling of a vernal pool in April 1998 (Lt. Col. Quigley, U.S. Marine Corps, Environmental Security, Camp Pendleton, *in litt.* June 1998), and the Service has not been able to review the plan (J. Bartel, U.S. Fish and Wildlife Service, *in litt.* 1998).

Local Laws and Regulations

Local laws and regulations potentially offer some protection to species considered within this proposal but these laws and regulations are subject to overriding considerations, are seldom enforced, and, in some cases, are conflicting. For example, the City of Hemet General Plan requires that biological surveys be conducted at sites that may contain sensitive plants before alteration of a site for development. However, the City has also adopted an ordinance that requires vacant land to be cleared for weed abatement (Ron Wrench, City of Hemet, Fire Department, pers. comm. 1993). This activity has contributed to the decline of *A. coronata* var. *notatior*, *N. fossalis* and other sensitive plant species for which the City general plan requires surveys.

Habitat in Riverside County for *A. coronata* var. *notatior*, *N. fossalis*, and *B. filifolia* has been degraded by discing for weed abatement and fire management purposes. County ordinances require that parcels smaller than 2 ha (5 ac) and up to 30 meters (100 feet) adjacent to roads be cleared to reduce the potential for fire (Howard Windsor, Riverside County Fire Abatement, pers. comm. 1993). These activities have contributed to the decline of *N. fossalis* and the federally-listed, endangered *Orcuttia californica*. In some cases, landowners have exceeded the clearing requirements, which has resulted in additional reduction of sensitive plant populations and the destruction or perturbation (disturbance) of their habitat.

Mexican Laws

Navarretia fossalis also occurs in northwestern Baja California, Mexico. The Service is not aware of any existing regulatory mechanisms in Mexico that would protect this plant or its habitat. Although Mexico has laws that could provide protection to rare plants, they are not easily enforced. At this time there is no specific protections for vernal pools or *N. fossalis* in Mexico. If specific protections were available to this species in Mexico, the portion of the species range in Mexico alone would not be adequate to assure long-term conservation of this species.

E. Other Natural or Manmade Factors Affecting Their Continued Existence

Non-native species of grasses and forbs have invaded many of southern California's plant communities. Their presence and abundance are often an indirect result of habitat disturbance from grazing, development, mining, discing, and alteration of hydrology. All four plant taxa in this final rule are subject to displacement by such non-native plant species.

Many vernal pools on Otay Mesa and in San Marcos (San Diego County) have become dominated by *Lolium perenne*, the non-native perennial ryegrass that is very widely planted for lawns and other purposes. Ryegrass is tolerant of inundation and displaces native species such as *Navarretia fossalis* and *Brodiaea filifolia* in areas where significant populations for both species are known to occur. In Riverside County, *Crypsis schoenoides*, an aggressive non-native grass, has been seeded as a food source for migratory waterfowl along the San Jacinto River. This species is becoming widespread and has replaced, or is in the process of replacing, native vernal pool (and other) native species, including *N. fossalis*, *B. filifolia*, and *A. coronata* var. *notatior*, on the San Jacinto Wildlife Area and in other areas west of Hemet (D. Bramlet, *in litt.* 1992). The impact of this grass is extremely significant for *N. fossalis* since the majority of populations are found within this area and *Crypsis schoenoides* competes for the same habitat required by *N. fossalis*.

Non-native grass species such as *Avena barbata* and *Bromus madritensis* are dominant on the clay soils required by *A. munzii*. Crowding and competition for resources from these grasses threaten the majority of the 13 occurrences of *Allium munzii* (CNDDDB 1997). For example, one of the largest populations (Estelle Peak), has not been located recently and increased competition from alien grasses is likely

the cause of this (B. McMillan, pers. comm. 1998). In San Diego County, aggressive non-native species such as *Cynara cardunculus* (wild artichoke) and *Foeniculum vulgare* (fennel) are impacting grassland habitat supporting populations of *Brodiaea filifolia* (Roberts and Vanderwier 1997, H. Wier, Dudek and Associates, pers. comm. 1997).

The four plants in this rule rely on seasonal rainfall. Drier conditions, such as those that prevailed from 1986 to 1992, reduce the number of individuals in populations. Such climatic conditions stress species and reduce germination and survival rates. Negative effects of habitat loss and degradation from other factors including development, discing, and grazing, when combined with climatic conditions, increase the level of threat to the involved species.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by these four plants in determining to make this final rule. Much of the remaining habitat for these species is degraded. Based on this evaluation, the Service finds that *Allium munzii* and *A. coronata* var. *notatior* are in danger of extinction throughout all or a significant portion of their ranges. *Allium munzii* is extremely threatened by competition from alien grass species throughout its entire range, and urban development, dry land farming activities, and off-road vehicle activities throughout a significant portion of its range. *A. coronata* var. *notatior* is threatened by alteration of hydrology of its vernal pool and alkali vernal wetland plains habitats, urbanization, grazing, and discing associated with dry land farming and fire suppression, as exemplified by a reduction of over 50 percent of known individuals since this species was proposed for listing as an endangered species in 1994.

For reasons discussed below, the Service finds that *B. filifolia* and *N. fossalis* are likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges. Although many populations of *B. filifolia* are threatened by urbanization and agricultural development, trampling, grazing, and competition from non-native plant taxa, the Service finds that threatened status is appropriate for *B. filifolia* because, in part, one of the largest remaining populations (Santa Rosa Plateau) is protected. The Service finds that threatened status is appropriate for *N. fossalis* because although many populations are threatened by

urbanization and agricultural development, alteration of hydrology of its vernal pool habitat, trampling, and competition from exotic plant taxa, this taxon has demonstrated resilience to some forms of disturbance. In addition, both *B. filifolia* and *N. fossalis* occur in a large enough number of populations and locations that they are not in immediate danger of extinction.

Critical Habitat

Critical habitat is defined in section 3 of the Act as the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features essential to the conservation of the species and that may require special management considerations or protection; and specific areas outside the geographical area occupied by the species at the time it is listed, upon determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.

Section 4(a) (3) of the Act, as amended, and the Service's implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time a species is listed as endangered or threatened. Service regulations (50 CFR 424.12(a)(1)) state that designation of critical habitat is not prudent when: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species; and/or (2) such designation of critical habitat would not be beneficial to the species.

Section 7(a)(2) of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out by such agency, does not jeopardize the continued existence of a federally listed species or does not destroy or adversely modify designated critical habitat. The requirement that Federal agencies refrain from contributing to the destruction or adverse modification of critical habitat in any action authorized, funded or carried out by such agency (agency action) is in addition to the section 7 prohibition against jeopardizing the continued existence of a listed species; and it is the only mandatory legal consequence of a critical habitat designation. The Service's implementing regulations (50 CFR part 402) define "jeopardize the

continuing existence of" and "destruction or adverse modification of" in very similar terms. To jeopardize the continuing existence of a species means to engage in an action "that reasonably would be expected to reduce appreciably the likelihood of both the survival and recovery of a listed species." Destruction or adverse modification of habitat means an "alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." Common to both definitions is an appreciable detrimental effect to both the survival and recovery of a listed species. An action that appreciably diminishes habitat for recovery and survival may also jeopardize the continued existence of the species by reducing reproduction, numbers, or distribution because negative impacts to such habitat may reduce population numbers, decrease reproductive success, or alter species distribution through habitat fragmentation.

For a listed plant species, an analysis to determine jeopardy under section 7(a)(2) would consider loss of the species associated with habitat impacts. Such an analysis would closely parallel an analysis of habitat impacts conducted to determine adverse modification of critical habitat. As a result, an action that results in adverse modification also would almost certainly jeopardize the continued existence of the species concerned. Because habitat degradation and destruction is the primary threat to these species, listing them will ensure that section 7 consultation occurs, and potential impacts to the species and their habitat are considered, for any Federal action that may affect these species. In many cases, listing also ensures that Federal agencies consult with the Service even when Federal actions may affect unoccupied suitable habitat where such habitat is essential to the survival and recovery of the species. This is especially important for plant species where consideration must be given to the seed bank component of the species, and associated pollinators and dispersal agents, which are not necessarily visible in the habitat throughout the year. In practice, the Service consults with Federal agencies proposing projects in areas where there is potentially suitable but unoccupied habitat, particularly when the species was known to recently occur there or in similar nearby areas; or the area is known to harbor seed banks.

Apart from section 7, the Act provides no additional protection to lands designated as critical habitat. Designating critical habitat does not create a management plan for the areas where the listed species occurs; does not establish numerical population goals or prescribe specific management actions (inside or outside of critical habitat); and does not have a direct effect on areas not designated as critical habitat.

Critical habitat would provide no benefit to the species addressed in this rule on non-Federal lands (i.e., private, State, County or City lands) beyond that provided by listing. Critical habitat provides protection on non-Federal lands only if there is Federal involvement (a Federal nexus) through authorization or funding of, or participation, in a project or activity on non-Federal lands. In other words, designation of critical habitat on non-Federal lands does not compel or require the private or other non-Federal landowner to undertake active management for the species or to modify any activities in the absence of a Federal nexus. Possible Federal agency involvement or funding that could involve the species addressed in this rule on non-Federal lands include the Corps through section 404 of the Clean Water Act, the Federal Department of Housing and Urban Development, Federal Aviation Administration, the U.S. Immigration and Naturalization Service and the Federal Highway Administration. Federal involvement, if it does occur, will be addressed regardless of whether critical habitat is designated because interagency coordination requirements such as the Fish and Wildlife Coordination Act (FWCA) and section 7 of the Act are already in place. When a plant species is listed, activities occurring on all lands subject to Federal jurisdiction that may adversely affect the species would prompt the requirement for consultation under section 7(a)(2) of the Act, regardless of whether critical habitat has been designated.

While a designation of critical habitat on private lands would only affect actions where a Federal nexus is present and would not confer any additional benefit beyond that already provided by section 7 consultation because virtually any action that would result in an adverse modification determination would also likely jeopardize the species, a designation of critical habitat on private lands could result in a detriment to the species. This is because the limited effect of a critical habitat designation on private lands is often misunderstood by private landowners

whose property boundaries could be included within a general description of critical habitat for a specific species. Landowners may mistakenly believe that critical habitat designation will be an obstacle to development and impose restrictions on their use of their property. Unfortunately, inaccurate and misleading statements reported through widely popular medium available worldwide, are the types of misinformation that can and have led private landowners to believe that critical habitat designations prohibit them from making use of their private land when, in fact, they face potential constraints only if they need a Federal permit or receive Federal funding to conduct specific activities on their lands. These types of misunderstandings, and the fear and mistrust they create among potentially affected landowners, make it very difficult for the Service to cultivate meaningful working relationships with such landowners and to encourage voluntary participation in species conservation and recovery activities. Without the participation of landowners in the recovery process, the Service will find it very difficult to recover species that occur on non-Federal lands.

A designation of critical habitat on private lands could actually encourage habitat destruction by private landowners to rid themselves of the perceived endangered species problem. Listed plants have limited protection under the Act, particularly on private lands. Section 9(a)(2) of the Act, implemented by regulations at 50 CFR section 17.61 (endangered plants) and 50 CFR 17.71 (threatened plants) prohibits: (1) Removal and reduction of listed plant species to possession from areas under Federal jurisdiction, or their malicious damage or destruction on areas under Federal jurisdiction; or (2) removal, cutting, digging up, or damaging or destroying any such species in knowing violation of any State law or regulation including State criminal trespass laws. Generally, on private lands, collection of, or vandalism to, listed plants must occur in violation of State law to be a violation of section 9 of the Act. The Service is not aware of any State law in California that generally regulates or prohibits the destruction or removal of federally listed plants on private lands (see section 9 discussion under "Available Conservation Measures" section of this rule). Thus, a private landowner concerned about perceived land management conflicts resulting from a critical habitat designation covering his property would likely face no legal

consequences if the landowner removed the listed species or destroyed its habitat. For example, in the spring of 1998, a Los Angeles area developer buried one of the only three populations of the endangered *Astragalus brautonii* in defiance of efforts under the CEQA to negotiate mitigation for the species (Tim Thomas, U.S. Fish and Wildlife Service, pers. comm. 1996). The designation of critical habitat involves the publication of habitat descriptions and mapped locations of the species in the **Federal Register**, increasing the likelihood of potential search and removal activities at specific sites.

The Service acknowledges that in some situations critical habitat designation may provide some value to the species by notifying the public about areas important for the species conservation and calling attention to those areas in special need of protection. However, when this limited benefit is weighed against the detriment to plant species associated with the widespread misunderstanding about the effects of such designation on private landowners and the environment of mistrust and fear that such misunderstanding can create, the Service concludes that the detriment to the species from a critical habitat designation covering non-Federal lands outweighs the educational benefit of such designation and that such designation is, therefore, not prudent. The information and education process can more effectively be handled by working directly with landowners and communities during the recovery planning process and by the section 7 consultation and coordination where the Federal nexus exists. The use of these existing processes will impart the same knowledge to the landowners that critical habitat designation would but without the confusion and misunderstandings that may accompany a critical habitat designation.

For similar reasons, the Service also concludes that there would be no additional benefits to the species covered in this rule beyond the benefits conferred by listing from a designation of critical habitat on Federal lands. In the case of each of these plant species, the existing occurrences of the species are known by the DOD and the U.S. Forest Service and any action that would result in adverse modification would almost certainly result in likely jeopardy to the species, so that a designation of critical habitat on Federal lands would not confer any additional benefit on the species. On the other hand, particularly on National Forest System lands, a designation of critical habitat could increase the threats to

these species from vandalism and collection similar to the threats identified in response to listing a species (Oberbauer 1992, Beauchamp *in litt.* 1997). Simply listing a species can precipitate commercial or scientific interest, both legal and illegal, which can threaten the species through unauthorized and uncontrolled collection for both commercial and scientific purposes. The listing of species as endangered or threatened publicizes their rarity and may make them more susceptible to collection by researchers or curiosity seekers (Mariah Steenson pers. comm. 1997, M. Bosch, U.S. Forest Service *in litt.* 1997). For example, the Service designated critical habitat for the mountain golden heather (*Hudsonia montana*), a small shrub not previously known to be commercially valuable or particularly susceptible to collection or vandalism. After the critical habitat designation was published in the **Federal Register**, unknown persons visited a Forest Service wilderness area in North Carolina where the plants occurred and, with a recently published newspaper article and maps of the plant's critical habitat designation in hand, asked about the location of the plants. Several plants the Service had been monitoring were later found to be missing from unmarked Service study plots. (Nora Murdock, U.S. Fish and Wildlife Service, pers. comm. 1998).

The Service has weighed the lack of overall benefits of critical habitat designation beyond that provided by listing as threatened or endangered, along with the benefits of public notification against the detrimental effects of the negative public response and misunderstanding of what critical habitat designation means and the increased threats of illegal collection and vandalism, and has concluded that critical habitat designation is not prudent for *Allium munzii* (Munz's onion), *Brodiaea filifolia* (thread-leaved brodiaea), *Atriplex coronata* var. *notatior* (San Jacinto Valley crownscale), and *Navarretia fossalis* (spreading navarretia). The specific reasons why designation of critical habitat is not prudent for each of these species are addressed in the following discussion.

Atriplex coronata var. *notatior*

In the December 15, 1994, proposed rule to list these taxa (59 FR 64812), the Service proposed to designate critical habitat in Riverside County for *A. coronata* var. *notatior*. The Service has now determined to withdraw that proposal, based on the plant's continued decline, by perhaps 50 percent, since its

listing was proposed. The decline is due mostly to the end of a prolonged drought and a new source of reclaimed water, which have allowed increased barley farming. Repeated discing of significant areas of habitat occupied by this plant, including proposed critical habitat, is likely to have contributed to the decline, although the Service lacks information on the acreage involved, or the frequency of discing. This continued decline makes it less likely that *A. coronata* var. *notatior* will be found on sites that it currently does not occupy, and increases the conservation importance of remaining sites. This decline occurred despite the proposal of critical habitat, so the proposal's map evidently provided no conservation benefit with respect to notification of government agencies and others. In any case, such parties can identify potential habitat for this plant at least as easily and accurately by consulting the county soil survey as by consulting the critical habitat map.

The majority of the population centers of *A. coronata* var. *notatior* are located on privately owned lands. Three populations are on State land (San Jacinto Wildlife Area), one population is partially on County lands (RCHCA along San Jacinto River), and one population is on a private preserve managed by MWD. This plant is not known to occur on Federal lands. Federal involvement on these lands is unlikely because they do not involve wetland areas or any other activity associated with Federal agencies. If, in the future, there is Federal involvement through permitting or funding, such as through the Federal Highway Administration, then interagency coordination and consultation required by section 7 would be in effect if such actions may affect this species, once listed. As previously discussed, an analysis to determine jeopardy under section 7(a)(2) would consider loss of individual plants associated with habitat impacts. Such an analysis would closely parallel any analysis of habitat impacts conducted to determine adverse modification of critical habitat. A jeopardy finding would be equivalent to a finding of adverse modification of critical habitat. Therefore, there would be no additional conservation benefit to the species from designation of critical habitat beyond that provided by the species' listing.

Therefore, the Service finds that critical habitat is not prudent for *Atriplex coronata* var. *notatior* at this time because the Service believes no benefit over that provided by listing would result from identification of critical habitat on the non-Federal lands

where this species occurs. The identification of critical habitat would not increase management or conservation efforts on State or private lands and could impair those efforts. The Service believes that conservation of this species on private lands can best be addressed by working directly with landowners and communities during the recovery planning process and through the interagency coordination and consultation processes of section 7 should there be any future unforeseen Federal involvement.

Navarretia fossalis

The majority of *N. fossalis* populations are on privately owned lands. At least one population occurs on Federal lands owned by the Department of the Navy. The Department of the Navy is aware of the occurrences and habitat of the species on their lands. Some of the private land has Federal involvement because *Navarretia fossalis* is a covered species under the MSCP and populations occur in the MHCP area of northern San Diego County. *Navarretia fossalis* is protected at Marine Corps Air Station, Miramar in vernal pool management zones through the Integrated Natural Resource Management Plan (IRMP). This plan is an example of the permanent protective measures promoted by the Act. Marine Corps Base, Camp Pendleton has a similar Draft Isolated Ephemeral Wetlands Management Plan (Lt. Col. Quigley, U.S. Marine Corps, Environmental Security, Camp Pendleton, *in litt.* June 1998). The Department of Navy consults with the Service under section 7 for activities related to other listed species in the area and would be subject to similar requirements as a result of this listing. Designation of critical habitat would not necessarily require either military agency to increase or change their commitment or management efforts for this species, only to avoid adverse modification of such critical habitat.

The Service finds that critical habitat is not prudent for *Navarretia fossalis* at this time because such designation would provide no benefit over that provided by listing on privately owned lands where this species occurs. Landowners where the species occur are aware of its presence and status. Critical habitat designation on these private lands would not change the way those lands are managed or require specific management actions to take place, and could be detrimental because of potential landowner misunderstandings about the real effects of critical habitat designation on private lands. The species is currently known and

managed on Federal lands; no change in management would occur as a result of critical habitat designation and all activities that may affect the species on these Federal lands would be subject to section 7 consultation. The Service believes that the conservation of this species on private lands can best be addressed by working directly with landowners and communities during the recovery planning process and through the interagency coordination and consultation processes of section 7 for those activities with Federal agency involvement.

Allium munzii

A. munzii is known from 13 extant populations; only one of these populations is partially on Federal land. Five populations occur in the Gavilan Hills, including one at Harford Springs County Park, and one on lands managed by the Riverside County Habitat Conservation Agency (RCHCA). Two populations occur on private land. Five small populations occur on land managed by the Reserve Management Committees (Domenigoni Hills and Bachelor Mountain) for the Riverside County multispecies plans, or on private land. One population is in the Elsinore Mountains, partly on Federal land in the Cleveland National Forest and partly on private lands.

The Service finds that critical habitat is not prudent for *Allium munzii* at this time because such designation would provide no benefit over that provided by listing on privately owned lands where this species occurs. Landowners where the species occur are aware of its presence and status. The plant occurs on land owned by the RCHCA. Such land is likely to become part of a Multi-Species Habitat Conservation Plan preserve system. Critical habitat designation on these private lands would not change the way those lands are managed or require specific management actions to take place, and could be detrimental because of potential landowner misunderstandings about the real effects of critical habitat designation on private lands. The species is currently known and managed on Federal lands; no change in management would occur as a result of critical habitat designation and all activities that may affect the species on these Federal lands would be subject to section 7 consultation. The Service believes that the conservation of this species on private lands can best be addressed by working directly with landowners and communities during the recovery planning process and through the interagency coordination and consultation processes of section 7

for those activities with Federal agency involvement.

Brodiaea filifolia

Brodiaea filifolia occurs on private land, including lands managed by TNC. Two populations are on lands managed by the County government and also on the San Jacinto Wildlife Management Area in Riverside County, managed by the CDFG. The only populations of *Brodiaea filifolia* known to occur on Federal lands managed by the Department of Navy. *Brodiaea filifolia* is protected at Marine Corps Air Station, Miramar in vernal pool management zones through the Integrated Natural Resource Management Plan (IRMP). This plan is an example of the permanent protective measures promoted by the Act. Marine Corps Base, Camp Pendleton has a similar Draft Isolated Ephemeral Wetlands Management Plan (Lt. Col. Quigley, U.S. Marine Corps, Environmental Security, Camp Pendleton, *in litt.* June 1998). The Department of Navy consults with the Service under section 7 for activities related to other listed species in the area and would be subject to similar requirements as a result of this listing. Designation of critical habitat would not necessarily require either military agencies to increase or change their commitment or management efforts for this species, only to avoid adverse modification of such critical habitat. Some of the private land has Federal involvement because *Brodiaea filifolia* is a covered species under the MSCP and populations occur in the MHCP area of northern San Diego County. *Brodiaea filifolia* habitat managed by the CDFG (San Jacinto Wildlife Area) is not wetlands, so there is no Federal involvement that would lead to protection through designation of critical habitat.

The Service finds that critical habitat is not prudent for *Brodiaea filifolia* at this time because such designation would provide no benefit over that provided by listing on privately owned lands where this species occurs. Landowners where the species occur are aware of its presence and status. Critical habitat designation on these private lands would not change the way those lands are managed or require specific management actions to take place, and could be detrimental because of potential landowner misunderstandings about the real effects of critical habitat designation on private lands. The species is currently known and managed on Federal lands; no change in management would occur as a result of critical habitat designation and all activities that may affect the species on

these Federal lands would be subject to section 7 consultation. The Service believes that the conservation of this species on private lands can best be addressed by working directly with landowners and communities during the recovery planning process and through the interagency coordination and consultation processes of section 7 for those activities with Federal agency involvement.

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 local agencies, groups, and individuals. The Act provides for possible land acquisition from willing sellers 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, 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 with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is 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 destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with the Service.

Federal agencies expected to have involvement with *Allium munzii*, *Atriplex coronata* var. *notatior*, *Brodiaea filifolia*, and *Navarretia fossalis* include the U.S. Army Corps of Engineers and the Environmental Protection Agency due to their permit authority under section 404 of the Clean Water Act. The Federal Aviation Administration has jurisdiction over areas with vernal pools containing *N.*

fossalis near Montgomery Field within the city limits of San Diego and on Brown Field on Otay Mesa in San Diego County. This jurisdiction would also apply if any of the taxa considered in this rule are discovered at Perris Airport or Ryan Airport in Riverside County. The Federal Highways Administration may be involved through potential funding of highway construction projects near Hemet (Riverside County) and Otay Mesa (San Diego County). Because *N. fossalis* occurs on Naval Air Station, Miramar and on Marine Corps Base, Camp Pendleton, these facilities will also likely be involved through the pursuit of their respective missions or the process of excessing surplus Federal lands. The Immigration and Naturalization Service will need to evaluate the effects of its activities on *N. fossalis*, which is known to occur along the international border. The Department of Housing and Urban Development may insure housing loans in areas that support some of these species. The Forest Service has jurisdiction over at least part of one population of *A. munzii* in Cleveland National Forest.

Listing *Allium munzii*, *Atriplex coronata* var. *notatior*, *Brodiaea filifolia*, and *Navarretia fossalis* provides for the development and implementation of recovery plans for the taxa. Such plans will bring together State and Federal efforts for conservation of the species. A recovery plan will establish a framework for agencies to coordinate conservation efforts. A plan will set recovery priorities and estimate the costs of tasks necessary to accomplish the priorities. It will also describe site-specific management actions necessary to achieve conservation and survival of the species.

The Act and its implementing regulations set forth a series of prohibitions and exceptions that apply to all endangered or threatened plants. All prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR parts 17.61, (endangered plants) and 17.71 (threatened plants) apply. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to import or export, transport in interstate or foreign commerce in the course of a commercial activity, sell or offer for sale in interstate or foreign commerce, or remove and reduce to possession any such species from areas under Federal jurisdiction. In addition, for plants listed as endangered, the Act prohibits malicious damage or destruction any such species on Federal lands or to remove, cut, dig up, damage, or destroy of any such species in knowing violation of any

State law or regulation, including criminal trespass laws. Section 4(d) of the Act allows for the provision of such protection to threatened species through regulation. This protection may apply to these taxa in the future if regulations are promulgated. Seeds from cultivated specimens of threatened plant species are exempt from these regulations provided that their containers are marked "of cultivated origin." Certain exceptions apply to agents of the Service and State conservation agencies.

The Act and 50 CFR 17.62 and 17.63 for endangered plants, and 17.72 for threatened plants, provide for the issuance of permits to carry out otherwise prohibited activities involving endangered or threatened plants under certain circumstances. Such permits are available for scientific purposes or for enhancing the propagation or survival of the plants. For threatened plants, permits are also available for botanical or horticultural exhibition, educational purposes, or special purposes consistent with the Act. It is anticipated that few trade permits would ever be sought or issued for the taxa considered herein because they are not common in cultivation or in the wild. These species have specific germination and growth requirements including, in some cases, seasonal inundation that would be difficult to recreate in cultivation.

It is the policy of the Service, published in the **Federal Register** on July 1, 1994 (59 FR 34272), to increase public understanding of the prohibited acts that will apply under section 9 of the Act. *Allium munzii*, *Brodiaea filifolia*, *Atriplex coronata* var. *notatior*, and *Navarretia fossalis* are known to occur on Federal lands under the jurisdiction of the Forest Service. Collection, damage or destruction of listed species on Federal lands is prohibited, except as authorized under section 7 or section 10(a)(1)(A) of the Act. Such activities on non-Federal lands would constitute a violation of section 9 of the Act if activities were conducted in knowing violation of California State law or regulation, or in violation of California State criminal trespass law.

The Service believes that, based upon the best available information, the following actions will not result in a violation of section 9, provided these activities are carried out in accordance with existing regulations and permit requirements:

(1) Activities authorized, funded, or carried out by Federal agencies (e.g., grazing management, agricultural conversions, wetland and riparian habitat modification, flood and erosion control, residential

development, recreational trail development, road construction, hazardous material containment and cleanup activities, prescribed burns, pesticide/herbicide application, pipelines or utility lines crossing suitable habitat), when such activity is conducted in accordance with any reasonable and prudent measures given by the Service in a consultation conducted under section 7 of the Act;

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

(3) Activities on private lands that do not require Federal authorization and do not involve Federal funding, such as grazing management, agricultural conversions, flood and erosion control, residential development, road construction, and pesticide/herbicide application when consistent with label restrictions;

(4) Residential landscape maintenance, including the clearing of vegetation around one's personal residence as a fire break;

The Service believes that the following might potentially result in a violation of section 9; however, possible violations are not limited to these actions alone:

(1) Unauthorized collecting of the species on Federal lands;

(2) Application of herbicides violating label restrictions;

(3) Interstate or foreign commerce and import/export without previously obtaining an appropriate permit. Permits to conduct activities are available for purposes of scientific research and enhancement of propagation or survival of the species.

Questions regarding whether specific activities would constitute violations of section 9 should be directed to the Field Supervisor of the Service's Carlsbad Field Office (see **ADDRESSES** section). Requests for copies of the regulations concerning listed plants (50 CFR 17.61 and 17.71) and general inquiries regarding prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Ecological Services, Endangered Species Permits, 911 N.E. 11th Avenue, Portland, Oregon 97232-4181 (telephone 503/231-2063; facsimile 503/231-6243).

National Environmental Policy Act

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

Paperwork Reduction Act

This rule does not contain any information collection requirements for which the Office of Management and Budget (OMB) approval under the Paperwork reduction Act, 44 U.S.C. 3501 *et seq.* is required. An information collection related to the rule pertaining to permits for endangered and threatened species has OMB approval and is assigned clearance number 1018-0094. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. This rule does not alter that information collection requirement. For additional information concerning permits and associated requirements for threatened species, see 50 CFR 17.32.

References Cited

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

Author: This primary author of this final rule is Fred Roberts of the Carlsbad Field Office (see **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

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

Regulations Promulgation

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

PART 17—[AMENDED]

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

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

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

§ 17.12 Endangered and threatened plants.

* * * * *
(h) * * *

Species		Historic Range	Family	Status	When listed	Critical habitat	Special rules
Scientific Name	Common name						
FLOWERING PLANTS							
<i>Allium munzii</i> (= <i>A. fimbriatum</i> var. <i>munzii</i>).	Munz's onion	U.S.A. (CA)	Liliaceae—Lily	E	650	NA	NA
<i>Atriplex coronata</i> var. <i>notatior</i>	San Jacinto Valley Crownscale.	U.S.A. (CA)	Chenopodiaceae—Goosefoot.	E	650	NA	NA
<i>Brodiaea filifolia</i>	Thread-leaved brodiaea.	U.S.A. (CA)	Liliaceae—Lily	T	650	NA	NA
<i>Navarretia fossalis</i>	Spreading navarretia	U.S.A. (CA), Mexico (Baja California).	Polemoniaceae—Phlox.	T	650	NA	NA

Dated: September 29, 1998.
Jamie Rappaport Clark,
 Director, Fish and Wildlife Service.
 [FR Doc. 98–26861 Filed 10–9–98; 8:45 am]
 BILLING CODE 4310–55–U