Dodecahema leptoceras
(slender-horned spineflower)

5-Year Review:
Summary and Evaluation

Dodecahema leptoceras (slender-horned spineflower).
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U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
Carlsbad, California

October 1, 2010

5-YEAR REVIEW
Dodecahema (Centrostegia) leptoceras
(slender-horned spineflower)

I. GENERAL INFORMATION

Purpose of 5-Year Reviews:

The U.S. Fish and Wildlife Service (Service) is required by section 4(c)(2) of the Endangered Species Act (Act) to conduct a status review of each listed species at least once every 5 years. The purpose of a 5-year review is to evaluate whether or not the species' status has changed since it was listed (or since the most recent 5-year review). Based on the 5-year review, we recommend whether the species should be removed from the list of endangered and threatened species, be changed in status from endangered to threatened, or be changed in status from threatened to endangered. Our original listing of a species as endangered or threatened is based on the existence of threats attributable to one or more of the five threat factors described in section 4(a)(1) of the Act, and we must consider these same five factors in any subsequent consideration of reclassification or delisting of a species. In the 5-year review, we consider the best available scientific and commercial data on the species, and focus on new information available since the species was listed or last reviewed. If we recommend a change in listing status based on the results of the 5-year review, we must propose to do so through a separate rule-making process defined in the Act that includes public review and comment.

Species Overview:

Dodecahema leptoceras (slender-horned spineflower) is a small annual plant in the Polygonaceae (buckwheat family). It has been federally and State listed as endangered since the 1980s. The species is usually found in drought prone alluvial benches subject to only rare flood events. At the time *Dodecahema leptoceras* was listed (as *Centrostegia leptoceras)* it was only known to be extant at 5 locations representing 6 element occurrences (EOs). More intensive surveys and resurveys of historical occurrence sites have detected additional extant occurrences since listing for a total of 20 extant occurrences. At listing, development, mining activities, off-road vehicles, proposed flood control measures, and trash dumping were among the threats cited. Occurrences of *Dodecahema leptoceras* are currently threatened by development, mining activities, flood control measures, and trash dumping.

Methodology Used to Complete This Review:

This review was conducted by Gary D. Wallace and staff at the Carlsbad Fish and Wildlife Office (CFWO), following the Region 8 guidance issued in March 2008. We used information in the 1987 listing rule, available literature, and reports and information in our files. We also relied upon information provided by experts familiar with the species, its habitat, and the associated processes. This 5-year review contains updated information on the species' biology and threats, and an assessment of that information compared to that known at the time of listing, since the last 5-year review, or since the last document containing a five-factor analysis. We

focus on current threats to the species that are attributable to any of the Act's five listing factors. The review synthesizes all this information to evaluate the listing status of the species and provide an indication of its progress towards recovery. Finally, based on this synthesis and the threats identified in the five-factor analysis, we include a prioritized list of conservation actions recommended to be completed or initiated within the next five years. These actions are designed to alleviate persisting threats to the taxon.

Contact Information:

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Federal Register (FR) Notice Citation Announcing Initiation of This Review:

The notice announcing the initiation of this 5-year review and opening a 60 day period to receive information was published on March 22, 2006 (USFWS 2006a, p. 14538). A notice announcing corrections to the March 22, 2006 notice was published on April 3, 2006 (USFWS 2006b, p. 16584). We received one letter providing information on *Dodecahema leptoceras.* Information received will be discussed in the relevant sections of this review.

Listing History:

Original Listing
FR Notice: 52 FR 36265
Date of Final Listing Rule: September 28, 1987
Entity Listed: *Dodecahema* (*Centrostegia*) *leptoceras* (slender-horned spineflower), a plant species. Refer to section on Taxonomy and Nomenclatural changes.
Classification: Endangered

State Listing
Dodecahema leptoceras was listed (as *Centrostegia leptoceras*) (slender-horned spineflower) as an endangered species under the California Native Plant Protection Act (NPPA) in 1982, and under the California Endangered Species Act (CESA) in 1987.

Associated Rulemakings: None.

Review History:

A notice initiating a status review of *Dodecahema leptoceras* was published on November 9, 1991 (USFWS 1991, p. 56882). The results of this review were not published; however, our

recommendation was no change in status (USFWS 1992, p. 1). No subsequent 5-year review for *D. leptoceras* was initiated since that time until this current 5-year review.

Species' Recovery Priority Number at Start of 5-Year Review:

The Recovery Priority Number for *Dodecahema leptoceras* was reported as 1C in the 2010 Recovery Data Call for the CFWO. This number indicates that the species is in a monotypic genus (i.e., a genus with a single recognized species) has a high degree of threat and a high potential for recovery. The recovery priority number is based on a 1-18 ranking system where 1 is the highest-ranked recovery priority and 18 is the lowest (USFWS 1983, p. 43098). The "C" indicates conflict with construction or other development projects or other forms of economic activity.

Recovery Plan or Outline:

No recovery plan has been developed for this species.

II. REVIEW ANALYSIS

Application of the 1996 Distinct Population Segment (DPS) Policy:

The Act defines species as including any subspecies of fish or wildlife or plants, and any distinct population segment (DPS) of any species of vertebrate wildlife. This definition of species under the Act limits listing as distinct population segments to species of vertebrate fish or wildlife. Because the species under review is a plant the DPS policy is not applicable to the species' listing is not addressed further in this review.

Information on the Species and its Status:

Little background information was provided in the final listing rule. Therefore, the following sections on species description, biology and life history, distribution, abundance and population trends, genetics, and habitat conditions include information available at the time of listing as well as more recent information.

Species Description

Dodecahema leptoceras is an annual plant in the Polygonaceae (buckwheat family). Plants have a distinctive basal rosette of leaves ranging from 3 to 8 centimeters (cm) (1.2 to 3.1 inch (in)) in diameter. The leaves frequently become reddish at maturity. The flower stalks are branched and erect 3 to 10 cm (1.2 to 4 in) tall (Reveal and Hardham 1989, p. 87). Flowers are arranged in clusters along the flower stalks and each cluster is surrounded by an involucre (a ring of modified leaves beneath a flower cluster). Characteristic of this species, each of the 6 involucre segments has an awn at its base as well as at its apex. This feature distinguished this genus from the closely related genera *Chorizanthe* and *Centrostegia* (Reveal and Hardham 1989, p. 86). The flowers are white to pink, 1.2 to 2 millimeters (mm) (0.5 to 0.8 in) long, each producing a single achene (a dry single-seeded fruit), 1.7 to 2 mm (0.06 to 0.08 in) long.

Dodecahema leptoceras plants are difficult to identify with certainty, especially in the field, and may be confused with similar-looking, often co-occurring, related taxa (e.g., *Chorizanthe leptotheca* (peninsular spineflower). For these reasons, reports of occurrences that lack voucher collections or reference data may not be reliable.

Species Biology and Life History

Dodecahema leptoceras is found in drought prone habitats where germination is likely related to rainfall. Individual plants are difficult to detect because they are small and occur in relatively small, isolated patches across often extensive floodplain habitat. Additionally, plant densities may be low during drought conditions. At the time of listing, little was known about the species' biology and life history. Information developed since the species was listed is described below.

Dodecahema leptoceras germinated by late February at several study sites in 1995 and 1996 (Ferguson *et al*. 1996, p. 10). Survival to flowering was highly variable (Ferguson *et al.* 1996, p. 11). The greatest number of plants survived to flowering stage (about 60 percent of the study sample) during unusually cool and wet seasonal conditions and the least (about 6 percent) survived during drought conditions. The number of seeds produced per plant ranges from three to 507 (Ferguson 1999, p. 28) and is likely related to annual environmental conditions. *Plenoculus davisii*, a native wasp, was identified as a potential pollinator (Ferguson *et al.* 1996, p. 14). The involucres (united bracts), each containing three flowers, are armed with small spines and hooks that are likely effective for dispersal by small animals. The individual achenes lack any apparent specialized dispersal structures, but they may be locally dispersed by sheet flows during heavy rains.

There was no correlation between the numbers of seeds dispersed to the soil and the number of flowering plants the next year, indicating the likely presence of a seed bank (Ferguson *et al*. 1996, p. 10). Both demographic and genetic diversity studies indicate that the seed bank is long-lived although the length of time that individual seeds can remain viable in the ground is unknown (Ferguson and Ellstrand 1999, p. 19). Some level of surface disturbance (e.g., sheet flows or soil disturbances during and following fire) may enhance germination in years following the disturbance.

Spatial Distribution and Abundance

Dodecahema leptoceras is endemic to southwestern California, from northern Los Angeles County east to San Bernardino County, and south to southwest Riverside County in the foothills of the Transverse and Peninsular ranges at elevations ranging from 200 to 700 meters (m) (656 to 2,296 feet (ft)) (Hickman 1993, p. 860). The range of the species, based on herbarium specimens and CNDDB EO reports (CNDDB 2010) is depicted in Figure 1 and described in Appendix 1 (36 extant and extirpated occurrences are arranged geographically from north to south).

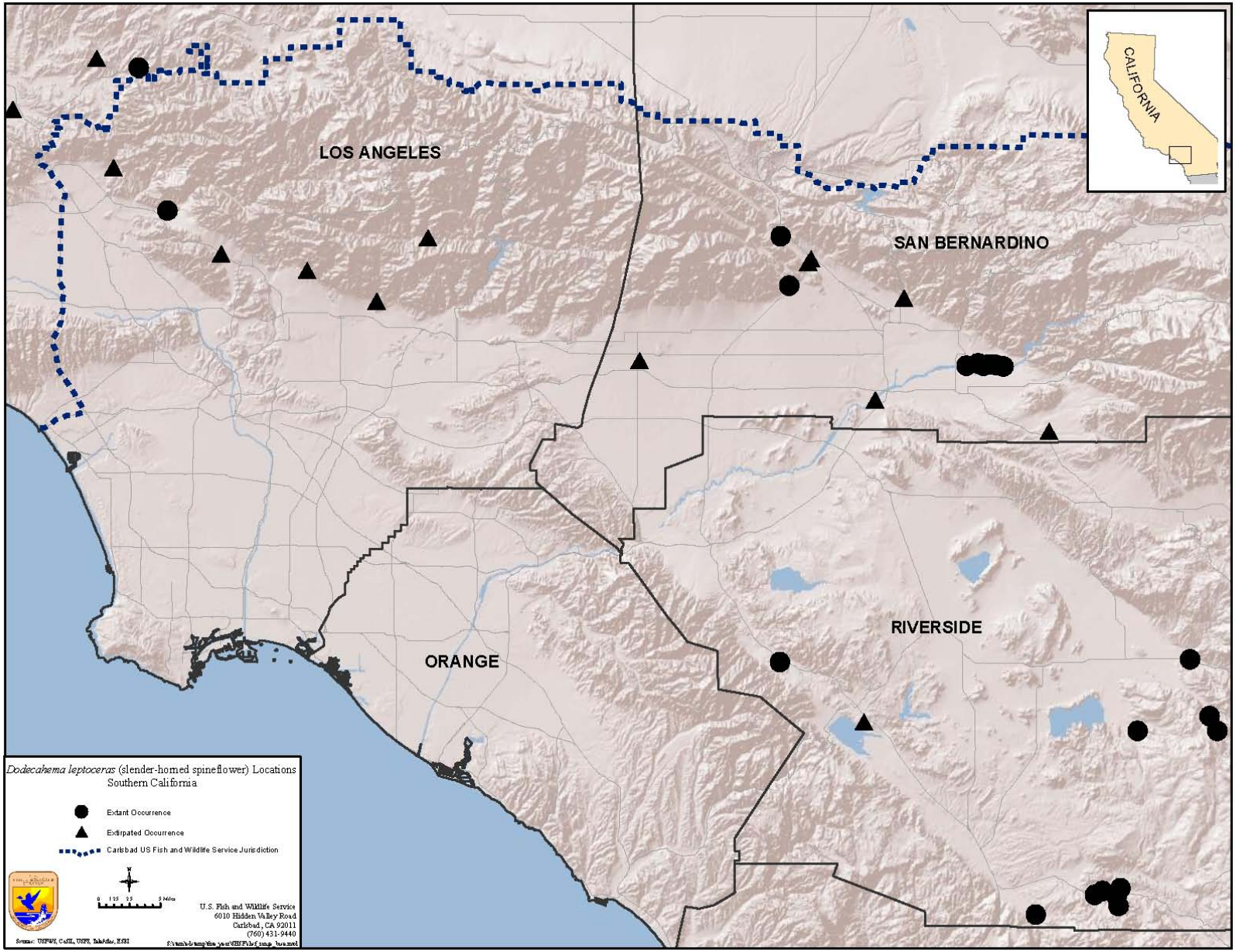

Figure 1: Distribution of *Dodecahema leptoceras* (slender-horned spineflower) occurrences; prepared for FY2010 5-year review.

At the time it was listed, *Dodecahema leptoceras* was reported to be extant at 5 localities, representing 6 occurrences, each associated with a separate watershed, where the species had been collected since 1950. The localities included, Cajon Creek (EO 3) (mistakenly cited as Lytle Creek in the listing rule) and the Santa Ana River near Highland (EO 2) in San Bernardino County, near the San Jacinto River (EO 1), Temescal Creek (EO 16), and Bautista Creek (now treated as EO 17 and EO 21) in Riverside County (USFWS 1987, p. 36268). The extent of occupied habitat was estimated at less than 4 hectares (ha) (10 acres (ac)) (USFWS 1987, p. 36266). Krantz (1984, pp. 5-8) cites four locations where the species was collected since 1950, Cajon Creek (not Lytle Creek as stated in the final rule), Highland, San Jacinto River, and Indian Creek. Krantz considered the Highland occurrence to have been extirpated by a flood control project in 1983. The basis for the Bautista Creek occurrence cited in the listing rule was a 1987 survey conducted for the San Bernardino National Forest (CNDDB 2010, EO 17).

Herbarium specimens are permanent vouchers of current and historical plant occurrences and distribution. Specimens are verifiable and may be the only record that the plant ever existed at a place where it has subsequently been extirpated since the specimens were collected. Herbarium vouchers for occurrences are shown in Appendix 1. Herbarium specimen records and references available at the time of listing indicate that the species was thought to be extirpated from all 9 historically known occurrences in Los Angeles County (Krantz 1984, p. 3; USFWS 1987, p. 36266; Appendix 1). These occurrences were distributed across multiple drainages within the San Gabriel and Liebre Mountains. The species was also considered extirpated from 6 of the 9 occurrences in San Bernardino County and 2 of the 5 (now considered 6) occurrences in Riverside County known at the time of listing (CCH 2010; Munz 1974, p. 673; Appendix 1). Lack of recent sightings or vouchers may indicate lack of adequate surveys or that the species is extirpated at the site. As shown in Appendix 1, *Dodecahema leptoceras* has likely been extirpated or possibly extirpated from 8 of the 10 known occurrences in Los Angeles County, 6 of the 14 known occurrences in San Bernardino County, and 1 of the 14 known occurrences in Riverside County.

The EO tracking system was initiated by The Nature Conservancy to identify specific locations and track site changes for rare taxa. This system, now embodied in the California Natural Diversity Data Base (CNDDB), was initiated in 1979. Sources for the range given in the final listing rule were not all cited but were likely derived from accumulated herbarium records, published literature, available reports, and personal accounts. Information from these same sources was likely used to populate the original CNDDB data fields for the EO. Early reports often had limited precision for locality data often indicated on hand drawn on maps and submitted to CNDDB. Current locations determined by GPS data are difficult to compare to these earlier data. Commonly CNDDB assigns different EO numbers to occurrences that are more than 400 m (0.25 mile) apart. EOs are assigned consecutive numbers as they are reported. Numbers are permanent and not reused and an occurrence is not given a new number for any reason; some EOs have also been merged subsequent to analysis. Therefore, Appendix 1 includes an EO 40, though there are not 40 recognized occurrences.

Since *Dodecahema leptoceras* was listed additional herbarium voucher specimens have been collected and additional data have been reported to the California Department of Fish and Game (CDFG) for inclusion in the CNDDB. Data reported to the CNDDB includes information on the

location and the status of the plants and occurrences for over 20 years. The CNDDB currently recognizes 40 separate EOs for this plant (CNDDB 2010, EOs 1-40; Appendix 1). Data submitted to the CNDDB that are referable to previously identified occurrences are added chronologically to existing EO reports. Some EOs have subsequently been merged because of proximity to an existing occurrence (e.g., EO 2 that includes former EO 20 and EO 32 that includes former EO 33) or deleted because of reinterpretation of specimens or locations upon which the record was based. In both of these cases, the associated EO numbers are not used again for the species. Additionally, at least 1 extirpated occurrence included in Appendix 1 was not reported to the CNDDB and consequently has not yet been assigned an EO number (e.g., Sun Valley in Los Angeles County).

There are currently 20 extant *Dodecahema leptoceras* occurrences distributed among Los Angeles County, San Bernardino County, and Riverside County. Since listing, one occurrence has been extirpated (EO 3). Additional surveys have detected two occurrences of the species previously thought to have been extirpated (e.g., EOs 7 and 39) and detected 13 previously unknown occurrences (e.g., EO 27, 22, 30, 31, 32, 34, 35, 23, 24, 25, 28, 29, and 38) (Appendix 1). A description of these occurrences and their distribution is discussed below for each county.

Los Angeles County

No extant *Dodecahema leptoceras* occurrences were identified in Los Angeles County at listing. Since listing, *D. leptoceras* was detected in 1988 in an area of Big Tujunga Wash (CNDDB 2010, EO 7) in Sunland adjacent to the Angeles National Golf Club's golf course. Prior to this rediscovery, the last documentation of the species in the area was in 1949 (Appendix 1, EO 7). Severe flooding occurred in Big Tujunga Wash in the winter of 2004 to 2005. Fortunately, the occupied habitat was not eroded by the flooding or by emergency actions to protect the adjacent golf course. At this time we presume that the occurrence in Big Tujunga Wash is extant.

A previously undetected occurrence supporting about 500 *Dodecahema leptoceras* plants was found in 1991 in Bee Canyon in the Sierra Pelona just north of the San Gabriel Mountains (CNDDB 2010, EO 27). More than 1,000 plants were found when the area was resurveyed in 1993 (CNDDB 2010, EO 27). In addition since listing, a voucher specimen documenting an extirpated historical occurrence in Sun Valley was located (CCH 2010, Appendix 1).

Since listing, *Dodecahema leptoceras*, considered extirpated from Los Angeles County has been relocated in Big Tujunga Wash and found for the first time in another watershed in Bee Canyon. These occurrences extend the known extant range of the species. Currently we consider *D. leptoceras* to be extant at two occurrences, in separate watersheds, of the 10 known historical occurrences in Los Angeles County (Appendix 1, Figure 1). The known range for the species in Los Angeles County and for the species as a whole has been extended to the northwest since listing.

San Bernardino County

At listing, two occurrences of *Dodecahema leptoceras* were identified in San Bernardino County within the upper Santa Ana River floodplain and near Cajon Creek (erroneously noted as Lytle

Creek in the final rule) (USFWS 1987, p. 36268). The Santa Ana River Wash Area of Critical Environmental Concern (ACEC) was established for *D. leptoceras*, and other federally listed species, by the Bureau of Land Management (BLM) pursuant to the South Coast Resource Management Plan (BLM 1994, p. 104). Since listing, intensive surveys for this species have been conducted within the upper Santa Ana River alluvial fan, and five more occurrences unknown at the time of listing have been detected (CNDDB 2010, EOs 22, 30, 31, 32, and 34; Appendix 1). In 1994, *D. leptoceras* also was detected in the Lytle Creek drainage (CNDDB 2010, EO 35). The occurrence in Cajon Canyon considered extant at listing, is now considered extirpated (CNDDB 2010, EO3). However, another occurrence below Blue Cut also in Cajon Canyon and thought to be extirpated at the time of listing was rediscovered and is now considered extant (CNDDB 2010, EO 39). In 1998, a small population of *D. leptoceras* was reported from City Creek in the City of Highland, San Bernardino County (R. McKernan pers. comm. 1998). City Creek is a tributary of the Santa Ana River; however, no voucher specimens were collected at that time and no subsequent documentation on the status of this occurrence is known. Therefore, this location is not included in any further discussion.

The known range of *Dodecahema leptoceras* in San Bernardino County has not changed appreciably since it was listed. However, additional extant occurrences have been identified. Eight of the 14 known occurrences in San Bernardino County occurring in 3 drainages are extant (Appendix 1, Figure 1). At listing, only two of eight occurrences in two drainages were known to be extant.

Riverside County

At listing, 4 extant *Dodecahema leptoceras* occurrences were known to occur in Riverside County. Since listing, six additional occurrences of were located near Vail Lake in western Riverside County (CNDDB 2010, EOs 23, 24, 25, 28, 29, 38; Appendix 1). Available information on the status of these populations is described below.

The occurrence of *Dodecahema leptoceras* in the Temescal Wash is presumed extant although the site was impacted by vandalism in 1989 and freeway construction (CNDDB 2010, EO 16). *Dodecahema leptoceras* occurs along Bautista Creek on private land and within the San Bernardino National Forest (CNDDB 2010, EOs 17 and 21). Plants are distributed within an approximate 1.5-mile reach of Bautista Creek in two subpopulations; one completely within the San Bernardino National Forest (EO 21) and the second downstream at the Forest boundary extending onto private property (EO 17).

Since *Dodecahema leptoceras* was listed, 6 additional occurrences have been detected in Riverside County near Vail Lake (CNDDB 2010, EOs 23, 24, 25, 28, 29, and 38). Most of the occurrences follow the drainage patterns of Kolb and the Arroyo Seco creeks that originate within the Cleveland National Forest and flow to the north under State Route 76 (SR 76) and into Vail Lake. These are treated here as one watershed. Plants are found upstream and downstream of the undercrossing culverts of SR 76. Of the Vail Lake occurrences, 3 are on private property on the south side of Vail Lake north of SR 76 (CNDDB 2010, EOs 24, 28, and 29 Appendix 1); one population occurs south of SR 76 on private property and adjacent United States Forest Service (USFS) lands near Dripping Springs (CNDDB 2010, EO 25), one population occurs

south of SR 76 near Dripping Springs on the Cleveland National Forest (CNDDB 2010, EO 23), and one occurrence is on the Pechanga Reservation (CNDDB 2010, EO 38). An occurrence from south of Hemet considered extirpated (CNDDB 2010, EO 13) is based on a specimen available but not mentioned in the listing rule (Appendix 1). Surveys conducted since listing have extended the occurrence along the San Jacinto River (EO 1). The area may be deemed a separate occurrence by the CNDDB in the future.

Since listing, we received a data set in conjunction with the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) that included point locations for *Dodecahema leptoceras.* Some of these locations are coincident with CNDDB occurrences or appear to be positioned close enough to a CNDDB occurrence to be considered within acceptable mapping errors. However, there are no available records or specimens or subsequent confirmation to verify several of these data points (Dudek and Associates, Inc. 2003, p. 388). There have been no reports supporting the presence of *D. leptoceras* plants or habitat at these locations. Therefore, these locations will not be discussed further here.

The three watersheds known to be occupied by *Dodecahema leptoceras* at the time of listing are currently considered to be occupied. On Bautista Creek, two separate occurrences are now recognized. The six occurrences detected since listing in a fourth watershed near Vail Lake extend the known range of the species to the southwest and were unknown at the time of listing. These occurrences are currently presumed extant. Currently, 10 of 12 known occurrences are considered to be extant, compared to 3 of 4 known at the time of listing (Appendix 1, Figure 1).

In summary, the known range of *Dodecahema leptoceras* is larger than it was at the time of listing. As a result of focused surveys conducted since it was listed, *D. leptoceras* has been detected in two additional watersheds in Los Angeles County, 1 watershed in San Bernardino County, and 1 watershed area near Vail Lake in Riverside County (Figure 1). These occurrences extend the known range by about 96 kilometers (km) (60 miles) to the west and 24 km (15 miles) to the south. Since listing, 1 occurrence has been extirpated, 15 additional occurrences have been detected, including rediscoveries of 2 occurrences thought to have been extirpated. One occurrence considered extant at listing is now considered extirpated; however, the species was rediscovered at another occurrence so the watershed (Cajon Creek) is still considered occupied. *Dodecahema leptoceras* is currently thought to occur in 10 watersheds (extant at 20 of the 36 known occurrences), compared to 5 watersheds (extant at 6 occurrences) at the time of listing (Appendix 1, Figure1).

Abundance

The fluctuations in annual abundance of *Dodecahema leptoceras* are typical for annual plants, but make estimations of population trends difficult. In a 3-year study, of demography (e.g., germination, survivorship, seed production), environmental conditions such as total precipitation and the duration of Santa Ana conditions (i.e., hot, dry, windy conditions typical of this area of southern California), rather than seed production in the preceding year, appeared to determine the size of the standing reproductive population in any given study year (Ferguson *et al*. 1996, p. 10). Eleven years of data collected for the occurrence in Big Tujunga Wash (EO 7) shows little direct correlation of numbers of standing plants with rainfall (Sapphos Environmental, Inc. 2008,

p. 4). The CNDDB cumulative data reports for this species reflect the annual differences in numbers of standing plants at some of the sites. An annual population census has been conducted at this site since 1992 with the four subpopulations exhibiting a range of census numbers as follows through 2004: subpopulation 1): 0 to 1,920 plants; subpopulation 2: 0 to 409 plants; subpopulation 3: 0 to 30 plants, and subpopulation 4: 0 to 473 plants. The greatest number of plants was observed at subpopulations 1, 2, and 4 during the spring of 2003 following the year with the least amount of recorded rainfall (Sapphos Environmental, Inc. 2009, p. 4). No plants have been seen from subpopulation 3 since 2006.

The occurrence of *Dodecahema leptoceras* in the San Jacinto River Wash is on private land on an elevated terrace (CNDDB 2010, EO 1; Appendix 1). This population is distributed in patches over approximately 7.2 ha (18 ac) (CNDDB 2010, EO 1). Krantz (1984, p. 7) included by reference a collection from north of Hemet in his San Jacinto River occurrence. The numbers of plants observed during surveys of this site range from 50 plants in 1986 to over 3,000 in 1998 (CNDDB 2010 EO 1). Most recently about 500 plants were found in 11 separate colonies each ranging from 30 to 200 plants (CNDDB 2010, EO 1).

The number and distribution of occurrences are likely a better reflection of overall abundance of *Dodecahema leptoceras* than a random often incomplete census of standing plants at any one occurrence.

Habitat Description and Conditions

The habitat that supports most occurrences of *Dodecahema leptoceras* has generally been categorized as alluvial scrub (Hanes *et al.*1989; Smith 1980; Barbour and Wirka 1997; Rey-Vizgirdas 1994). This shrub habitat is found on sandy and gravelly soils in sandy wash systems where intermittent, scouring flood events occur (Boyd *et al*. 1989, p. A-6). Alluvial scrub in the foothill areas of southern California often supports an indicator plant, *Lepidospartum squamatum* (scalebroom). Alluvial scrub is often a self-replacing transient vegetation whose long term existence and short term demise depends upon the associated fluvial systems. This vegetation type is identified as *Lepidospartum squamatum* Shrubland Alliance (Scale broom scrub) (Sawyer *et al.* 2008, p. 573). Scale broom scrub is characterized by densities of the indicator shrub *Lepidospartum squamatum* of less that 1 percent cover in alluvial environments, occurring in intermittently or rarely flooded, low gradient alluvial deposits along streams, washes, and fans (Sawyer *et al.* 2008, p. 573). Scale broom scrub extends across several southern California counties and to the north; however, in the southern California mountains and foothills where *D. leptoceras* occurs little of this habitat remains. Management considerations raised specify the interruption of fluvial processes by development, mining, and stream channelization (Sawyer *et al.* 2008, p. 574).

Dodecahema leptoceras plants are typically found in alluvial fan scrub on benches and terraces away from active channels in areas receiving little surface disturbance from flooding, but subject to sheet or overland flows (Boyd *et al.* 1989, p. 18; Rey-Vizgirdas 1994, p. 26; Wood and Wells 1997 p. 45). The association of the species with older alluvial benches and terraces indicates the need or tolerance of infrequent flood events to maintain suitable habitat conditions. A few occurrences of this species are found on low alluvial benches or braids within active channels.

Associated species in this habitat near Vail Lake in Riverside County include *Eriastrum sapphirinum, Mimulus fremontii, and Chaenactis glabriuscula*. However, the species also occurs in openings in chaparral or with Coast live-oak or western sycamore woodlands (CNDDB 2010, EOs 23 and 25) on sedimentary soils often associated with a crust of lichens and mosses (cryptobiotic soil). In the long term absence of flooding and scouring events the oldest stands are replaces by denser covers of chaparral, sage scrub, or oak woodland less suitable for *D. leptoceras* (Boyd *et al*. 1989, p. A-6). There is no known measure of the duration and occupancy of suitable habitat for *D. leptoceras* in relation to the age of scale broom scrub habitat. Because *D. leptoceras* is also found in openings in chaparral (Boyd *et al.* 1989, p. A-6), it is possible that suitable habitat for the species is present as long as the stand of scale broom scrub lasts.

Since listing, habitat for *Dodecahema leptoceras* has locally become more fragmented, and the floodplain that supports alluvial scrub has been further isolated from natural, although rare, scouring flood events (CFWO GIS internal database 2010). Instream sand mining, dams, concrete-lined channels, levees, groins, and fill at road crossings significantly degrade bed elevation through downcutting or headcutting. Hydrology at most locations supporting *D. leptoceras* is markedly changed by upstream dams (e.g., Big Tujunga Dam, Seven Oaks Dam), and all sites supporting this species are subjected to increased bed and bank scour and erosion as a result of past instream excavation, cross-wash roadways, and flood control facilities.

Wildfires in the Agua Tibia Wilderness/Vail Lake area have burned over occupied *Dodecahema leptoceras* habitat in the past with no apparent adverse effect; in fact, the observed number of plants increased dramatically following fire. Hence, it would appear that the short term removal of brush and forbs (primarily nonnative annual grasses) benefits germination of *D. leptoceras* (CNDDB 2010, EO 23 and 25). However, the long term response of this species to fire or a change in the fire-return interval has not been documented. Fire suppression activities reportedly caused at least short-term damage to one occurrence.

Changes in Taxonomic Classification or Nomenclature

At the time of listing, the species was classified as *Centrostegia leptoceras* A. Gray. A reassessment of the distinct morphology of the involucre and relationships to other closely related taxa resulted in a taxonomic revision. The current recognized name for slender horned spineflower is *Dodecahema leptoceras* (A. Gray) Reveal and Hardham (Reveal and Hardham 1989, p. 85). The generic distinction is supported by current phylogenetic studies (Pant 2000, pp. 1-94). The genus *Dodecahema* consists of this single species and consequently is, by definition, a monotypic genus. This has consequences related to the recovery priority number for the species that will be described elsewhere in the document.

Genetics

A single-year study using allozyme data was done to examine the level of genetic diversity in *Dodecahema leptoceras* plants collected from seven populations: Bee Canyon (EO 27), the Big Tujunga Wash (EO 7), two populations in the Santa Ana River (EOs 2 and 34), Dripping Springs (EO 23), the San Jacinto River Wash (EO 1), and Bautista Creek (EO 21) (Ferguson *et al.* 1996, p. 6; Appendix 1). The average level of genetic diversity found in this species is high relative to

other rare and endemic annual plant species indicating that the genetic effects of small population sizes and isolation such as inbreeding and a low level of gene diversity are not apparent in this species (Ferguson 1999, p. 58). Total species-level gene diversity was greater when all samples representing populations across the species' existing range were analyzed; a significant drop in total gene diversity occurred when samples from the populations of spineflower in Los Angeles County were excluded from the analysis, which suggests that should local extinctions occur, unique genetic variants found in local populations could be lost (Ferguson *et al.* 1996, p. 17). Populations of *D. leptoceras* in San Bernardino and Riverside counties were more similar genetically to each other than to populations in Los Angeles County (Ferguson 1999, p. 83).

The level of gene similarity (or homozygosity) detected in this species indicates that *Dodecahema leptoceras* has a mixed mating system (e.g., seed is produced both through pollination between flowers on a single plant and between flowers on different plants), but the latter condition, outcrossing, is more prevalent (Ferguson *et al.* 1996, p. 17).

Species-specific Research and/or Grant-supported Activities

We are aware of no ongoing species-specific research activities at this time.

Five-Factor Analysis

The following five-factor analysis describes and evaluates the threats attributable to one or more of the five listing factors outlined in section 4(a)(1) of the Act. Threats at the time of listing were seldom attributed to a specific occurrence of the *Dodecahema leptoceras*. In the following analysis we attempt to attribute threats to specific occurrences of the species.

FACTOR A: Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

At the time of listing, the primary threat to *Dodecahema leptoceras* was habitat loss resulting from urban development and sand and gravel (aggregate) mining. The relaxation of floodplain zoning restrictions was cited as a potential indirect threat from a proposed flood-control dam (Seven Oaks) on the Santa Ana River. Agricultural development in Riverside County and off-road vehicle activity and trash dumping in some areas supporting *D. leptoceras* were also cited as threats. These activities still threaten to reduce or eliminate habitat for the *D. leptoceras* and threats posed by fire and invasive nonnative plants has been identified since listing. The current threats to known occurrences are described below under the categories of development, mining, altered hydrology, off-highway vehicle (OHV) activity, trash dumping, invasive nonnative plants, and other habitat degrading activities.

Development

In the listing rule, development is cited as a cause of alluvial fan scrub habitat loss for *Dodecahema leptoceras* without reference to a particular site. Development is no longer the predominant threat, but in the form of urbanization, agricultural conversion or highway

development may directly impact *D. leptoceras* by eliminating onsite habitat or compromising the suitable habitat conditions to the point that the species dies out relatively soon. Though direct impacts to habitat are usually confined to the footprint of the development activity, development may also indirectly impact habitat by causing local or temporary impacts (e.g., a single OHV traverse) or by exacerbating other threats (e.g., introduction of invasive nonnative plants).

Development currently poses a threat to one occurrence in Los Angeles County. A mobile home park has been proposed at the occupied site in Bee Canyon (CNDDB, 2010 EO 27) as recently as 2003, and we received survey information for other listed species at this site in 2007 (C. Dellith VFWO, pers. comm. 2007). Likewise development poses a threat to two of the 11 extant occurrences in Riverside County (CNDDB 2010, EOs 1 and 16). Of these three occurrences, only the southeast portion of EO 1 is afforded some protection from development.

Associated with development, maintenance activities of a private golf course (CNDDB 2010, EO 7, Appendix) and highway realignment (CNDDB 2010, EO 27) pose threats to *Dodecahema leptoceras* and potential widening of State Route 79 (SR 79) in the Vail Lake area may directly or indirectly impact the adjacent occurrences of *D. leptoceras* (e.g., EOs 23, 24, and 29). This project will be subject to the provisions of the incidental take permit issued for the Western Riverside County MSHCP. None of these areas are currently conserved.

Mining

Sand and gravel mining were identified as a threat to *Dodecahema leptoceras* in the listing rule USFWS 1987, p. 36266). Some habitat continues to be threatened by sand and gravel mining or associated activities because of the general association of habitat suitable for *D. leptoceras* with floodplain areas. Mining activities may directly eliminate habitat as well as fragment or degrade suitable habitat, or promote the invasion of nonnative plants. There are mining activities in the area near Bee Canyon (CNDDB 2010, EO 27) that could impact the occurrence. Illegal mining is indicated as a threat to the occurrence in Big Tujunga Wash in Los Angeles County (CNDDB, 2010 EO 7, Appendix 1); however, there is no evidence that this is a current ongoing threat. Sand and gravel mining continue to pose threats to three of the seven extant occurrences in San Bernardino County (CNDDB 2010, EOs 2, 22, and 30; Appendix 1) and one occurrence in Riverside County (CNDDB 2010, EO 1; Appendix 1). A land exchange proposal between BLM and the San Bernardino Valley Water Conservation District would change land use designation for areas supporting two occurrences and part of a third occurrence to aggregate mining (BLM 2009). This would leave three occurrences and a portion of the fourth protected either by occurring in the BLM's Santa Ana River Wash ACEC or the Santa Ana River Water Conservation District Woolly Star Preserve Area, or mitigation lands. Currently one of the six occurrences is protected from mining activities (Appendix 1).

Altered Hydrology

Altered hydrology was not identified as a threat to *Dodecahema leptoceras* in the listing rule. Natural hydrological conditions necessary for the formation and maintenance of habitat suitable for the long term persistence of *D. leptoceras* may be destroyed or irreparably degraded by

natural flood events, various flood control measures, or reservoir expansion. Actions that eliminate or curtail natural fluvial processes that affect hydrological conditions may take place over a period of time as the result of a single event or series of events. High flood flows during the winter of 2005 to 2006 eroded portions of the Angeles National Golf Course in the Big Tujunga Wash (EO 7), but occupied habitat for *D. leptoceras* was not impacted during the storms or by emergency measures to protect the golf course. The reported populations within Lytle Creek (EO 35) are either on elevated terraces outside of the floodplain where hydrologic renewal of habitat will rarely occur or within the active channel where erosion during high-flows is likely to occur. Significant changes to this section of the channel occurred during large storms in late 2004 to 2005. The upstream subpopulation of *D. leptoceras* in Bautista Creek (EO 21) is located on low benches or alluvial braids largely at grade level with the active creek and large portions of the occupied bench were lost by erosion during storm flows during the winter of 1994 to 1995 (Ferguson *et al.* 1996, pp. 3, 19).

Flooding has become largely confined to large trenches in Lytle Creek and the Santa Ana and San Jacinto Rivers. Flood control structures such as steep walled concrete channels prevent water from flowing over onto adjacent banks and development has removed habitat outright. These factors combine to either isolate existing occurrences of *Dodecahema leptoceras* to high terraces outside of the active floodplain where population senescence might occur, or to increase the risk of scour in systems. Levees and dykes to divert water into spreading basins and ongoing aggregate mining operations create a patchwork of isolated benches where lack of a natural hydrological regime likely impacts *D. leptoceras*. The Oro Vista levee installed on the Big Tujunga Wash prior to construction of the golf course (CNDDB 2010, EO 7) and contributed to a reduction in the area exposed to natural flood flows, potentially threatening the long-term viability of at least one local occurrence of *Dodecahema leptoceras* (USFWS 1994, ref. 1-6-89-F-32R2, p. 13). These flood control measures continue to threaten this occurrence in Los Angeles County (CNDDB 2010, EO, 7; Appendix 1). Alteration of natural water flows is considered a threat to all of the seven extant occurrences in San Bernardino County (CNDDB 2010, EO 18) and all of the occurrences associated with the Santa Ana River since the construction and activation of the upstream Seven Oaks dam (CNDDB 2010, EOs 2, 22, 30, 31, 32, and 34). All occurrences within the Santa Ana River Wash are removed from the active floodplain, and with the construction of the Seven Oaks Dam, this occupied habitat is not likely to experience any fluvial regeneration in the future. Flood control measures, including bulldozing, that alter hydrology or destroy habitat, pose a threat to three occurrences of *D. leptoceras* in Riverside County along the San Jacinto River and Bautista Creek (CNDDB 2010, EOs 1, 17, and 21; Appendix 1), as well as four occurrences in watersheds associated with Vail Lake (CNDDB 2010, EOs 23, 24, 25, and 28). The four occurrences at Vail Lake are threatened by a proposed expansion of the Vail Lake Reservoir, though no action on this proposal has been undertaken.

Most occurrences of *D. leptoceras* could be considered threatened by altered hydrology because of their lack of or interrupted association with long term natural flood regimes. In addition, altered hydrology associated with flood control measures and possible expansion of a reservoir threatens 14 of the 20 extant occurrences of *D. leptoceras.* None of the extant occurrences, even those that are otherwise conserved, are protected from the threat from altered hydrology (Appendix 1).

OHV Activity

Suitable habitat for *Dodecahema leptoceras* is destroyed or degraded by OHV activity that may break down soil structure, alter local hydrological regimes, lead to erosion, and lead to the introduction of invasive nonnative plants. OHV activity was listed as a threat to some unspecified occurrences at the time of listing and continues to impact *D. leptoceras* at several known extant occurrences (Appendix 1). In Los Angeles County, OHV activity is considered a threat at Big Tujunga Wash (CNDDB 2010, EO 7; Sapphos Environmental, Inc. 2007, p. 4, and 2009, p. 5). Similarly OHV activity threatens occurrences in the Santa Ana River Wash (e.g., CNDDB 2010, EO 2) in San Bernardino County. There is protective signage present within the San Jacinto River Wash to prevent OHV activity, though impacts to the species have subsequently been reported (CNDDB 2010, EO 1). Both occurrences associated with Bautista Creek (CNDDB 2010, EOs 17 and 21) and at least one occurrence south of Vail Lake (CNDDB 2010, EO 24) are also threatened by OHV activity. A low potential for OHV impacts was also noted for the occurrence on the Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation (CNDDB 2010, EO 38). Habitat generally suitable for *D. leptoceras* usually associated with sandy and gravelly washes is often attractive to OHV recreationists. It is likely that more of the occurrences of the species are impacted to some degree by unreported OHV activity, as well as on conserved lands.

Trash Dumping

Trash dumping is a threat to *Dodecahema leptocersa* that was identified since the species was listed. Trash dumping may cover plants but more commonly affects the habitat from tire tracks and ruts, locally altered hydrology and introduction of soil altering chemicals or materials. Trash dumping has been identified as a threat to two occurrences in Los Angeles County, one in Big Tujunga Wash (CNDDB 2010, EO 7; Sapphos Environmental, Inc. 2007, p. 4 and 2009, p. 5) and the other in Bee Canyon (CNDDB 2010, EO 27). Trash dumping is considered a threat to one occurrence in San Bernardino County along the Santa Ana River (CNDDB 2010, EO 2; Appendix 1). As with OHV activity, the incidence of trash dumping along isolated suitable habitat areas of the water courses occupied by *D. leptoceras* is likely higher than that reported.

Invasive Nonnative Plants

The listing rule (USFWS 1987, p. 36266) indicated that competition from exotic plants was a threat to *Dodecahema leptoceras.* Lack of standing plants at EO 13 was attributed to the fact that much of the area was highly degraded by nonnatives (M. Wall 2005 CNDDB Field Survey form for August 5, 2005). Current considerations are that direct competition with nonnative plants is rarely measurable, but may be a threat. This will be mentioned elsewhere under Factor E. Perhaps of greater consequence is the threat posed by invasive nonnative grasses that render the otherwise more sparsely vegetated habitat more vulnerable to fire. There are likely few lowland areas of southern California not impacted to some degree by nonnative plants. Invasive nonnative plants are specifically indicated as a threat to *D. leptoceras* at four occurrences in San Bernardino County (CNDDB 2010, EOs 2, 18, 32, and 34).

Other Habitat Degrading Activities

Additional threats not identified in the listing rule have been attributed to illegal homeless camps and associated trespass (CNDDB 2010, EO 7, Sapphos Environmental, Inc. 2007, p. 4 and 2009, p. 5). These impacts, including trails are likely to have a greater impact on the habitat, thereby reducing or eliminating its ability to sustain *Dodecahema leptoceras*, rather than impacting individual plants. For that reason these activities are included here instead of under Factor E. The population of *D. leptoceras* reported to be in in City Creek is in an area subjected to heavy OHV use and it attracts many homeless people; trash accumulation, temporary encampments, and soil disturbance has seriously degraded this area.

Factor A Summary

All of the threats identified in the listing rule still impact habitat occupied by *Dodecahema leptoceras*. Current threats impacting habitat occupied by this taxon include development or related activities (5 occurrences), mining (6 occurrences), altered hydrology (14 occurrences), OHVs (7 occurrences), trash dumping (4 occurrences), invasive nonnative plants (3 occurrences), and other threats are either infrequent or of unknown extent. Habitat supporting *D. leptoceras* is subject to one or more threats in all 10 watershed areas where it occurs. Factor A threats impact 18 of the 20 extant *D. leptoceras* occurrences and 13 occurrences are impacted by multiple threats. The threat of altered hydrology is essentially rangewide and not managed.

FACTOR B: Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

At the time of listing, we did not consider any threats attributable to this factor to apply except habitat disturbance by people (USFWS 1987, p. 36268). We believe that this assessment is still valid. Overutilization for any purpose does not appear to be a threat at this time.

FACTOR C: Disease or Predation

At the time of listing disease and predation were not considered threats to areas supporting *Dodecahema leptoceras* (USFWS 1987, p. 36268). Browsing by rabbits was recently observed in San Bernardino County along the Santa Ana River (CNDDB 2010, EO 2; Appendix 1); however, we do not consider disease or predation to be major threats to *D. leptoceras*.

FACTOR D: Inadequacy of Existing Regulatory Mechanisms

The listing rule noted that *Dodecahema leptoceras* was listed as endangered by the State of California under the California Endangered Species Act (CESA). Provisions of CESA require State agencies to consult with CDFG when projects may affect State listed species (USFWS 1987, p. 36268). The listing rule noted that general prohibitions against removal of vegetation on BLM lands were ineffective in reducing habitat loss for the species.

State Protections

State laws providing protection to *Dodecahema leptoceras* include the Native Plant Protection Act (NPPA) enacted in 1977, CESA enacted in 1984, the California Environmental Quality Act (CEQA) enacted in 1970, and the Natural Communities Conservation Planning (NCCP) Act enacted in 1991.

Native Plant Protection Act (NPPA) and California Endangered Species Act (CESA)

In January of 1982, the CDFG Commission listed *Dodecahema (Centrostegia) leptoceras* as endangered under the NPPA (Division 2, chapter 10, section 1900 *et seq.* of the CDFG Code) and subsequently under the CESA (Division 3, chapter 1.5, section 2050 *et seq.* of the CDFG). Both the NPPA and CESA include prohibitions forbidding the "take" of *Dodecahema leptoceras* (Chapter 10, Section 1908 and Chapter 1.5, Section 2080, CDFG code). However, sections 2081(b) and (c) of CESA allow the CDFG to issue incidental take permits for State-listed threatened and endangered species if:

1) The authorized take is incidental to an otherwise lawful activity;
2) the impacts of the authorized take are minimized and fully mitigated;
3) the measures required to minimize and fully mitigate the impacts of the authorized take are roughly proportional in extent to the impact of the taking on the species, maintain the applicant's objectives to the greatest extent possible, and are capable of successful implementation;
4) adequate funding is provided to implement the required minimization and mitigation measures and to monitor compliance with and the effectiveness of the measures; and
5) issuance of the permit will not jeopardize the continued existence of a State-listed species.

California Environmental Quality Act (CEQA)

The CEQA is the principal statute mandating environmental assessment of projects in California. The purpose of CEQA is to evaluate whether a proposed project may have an adverse affect on the environment and, if so, to determine whether that effect can be reduced or eliminated by pursuing an alternative course of action or through mitigation. The CEQA applies to projects proposed to be undertaken or requiring approval by State and local public agencies (*http://www.ceres.ca.gov/topic/env_law/ceqa/summary.html*). The CEQA requires disclosure of potential environmental impacts and a determination of "significant" if a project has the potential to reduce the number or restrict the range of a rare or endangered plant or animal; however, projects may move forward if there is a statement of overriding consideration. If significant effects are identified, the lead agency has the option to require mitigation through changes in the project or to decide that overriding considerations make mitigation infeasible (CEQA Sec. 21002). Any protection afforded rare or sensitive species or their habitats, through CEQA, are at the discretion of the lead agency involved.

The Natural Community Conservation Planning (NCCP) Act

The NCCP program is a cooperative effort involving the State of California and numerous private and public partners to protect habitats and species. A NCCP identifies and provides for the regional or area-wide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity. The program began in 1991 under the State's NCCP Act (California Fish and Game Code 2800-2835). The primary objective of the NCCP program is to conserve natural communities at the ecosystem scale while accommodating compatible land use (*http://www.dfg.ca.gov.NCCP/*). Regional NCCPs provide protection to federally listed species, such as *Dodecahema leptoceras*, by conserving native habitats upon which the species depend. On June 22, 2004, NCCP Approval and Take Authorization was issued by CDFG for the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). *Dodecahema leptoseras* is a "Covered Species" under the MSHCP and protections afforded will be discussed below under the Act.

Federal Protections

Federal laws providing protection to *Dodecahema leptoceras* include the National Environmental Policy Act (NEPA), the Clean Water Act (CWA), and the Act. Field surveys to establish the current status of these occurrences are being undertaken in compliance with the Seven Oaks Dam Habitat Management Plan (Section 7 Consultation for Operations of Seven Oaks Dam San Bernardino County, California (1-6-02-F-1000.10)) and in support of Habitat Conservation Planning (HCP) efforts in the Upper Santa Ana River.

National Environmental Policy Act (NEPA)

NEPA (42 U.S.C. 4371 *et seq*.) provides some protection for listed species that may be affected by activities undertaken, authorized, or funded by Federal agencies. Prior to implementation of such projects with a Federal nexus, NEPA requires the agency to analyze the project for potential impacts to the human environment, including natural resources (40 CFR 1508.14). In cases where that analysis reveals significant environmental effects, the Federal agency must propose mitigations (40 CFR 1502.16) that could offset those effects (40 C.F.R. 1502.16). These mitigations usually provide some protection for listed species. The NEPA process is intended to help public officials make better decisions based on an understanding of the environmental consequences of their actions and to take actions to protect, restore, and enhance the environment (40 CFR 1500.1). However, NEPA does not require that adverse impacts be fully mitigated, only that impacts be assessed and the analysis disclosed to the public. Because *Dodecahema leptoceras* is recognized as a protected species by Federal and State law, Federal agencies considering actions within the alluvial floodplains supporting this species are mandated to comply with NEPA which may provide some consideration of impacts to *D. leptoceras* and its habitat.

Clean Water Act (CWA)

Under section 404, the U.S. Army Corps of Engineers (Corps) regulates the discharge of fill material into waters of the United States, which include navigable and isolated waters, headwaters, and adjacent wetlands (33 U.S.C. 1344). Any action with the potential to impact

waters of the United States must be reviewed under the CWA, NEPA, and the Act. These reviews require consideration of impacts to listed species and their habitats, and recommendations for mitigation of significant impacts. Many *Dodecahema leptoceras* occurrences are associated with major water courses (e.g., Big Tujunga Wash, Santa Ana River, and San Jacinto River), so projects with impacts to watersheds would need to be addressed if the activitity falls within the Corps jurisdictional waters.

Endangered Species Act of 1973, as amended (Act)

Since it was listed, the Act is the primary Federal law that may provide protection for *Dodecahema leptoceras*. The Service's responsibilities include administering the Act, including sections 7, 9, and 10. Section 7(a)(2) of the Act requires Federal agencies, including the Service to ensure that actions they fund, authorize, or carry out do not "jeopardize" a listed species or result in the "destruction or adverse modification" of habitat in areas designated by the Service to be "critical." Critical habitat has not been proposed for this taxon. A letter received in response to initiation of this review stated that lack of designated critical habitat for this species precludes its revovery. A jeopardy determination is made for a project that is reasonably expected, either directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of a listed species in the wild by reducing its reproduction, numbers, or distribution (50 C.F.R. § 402.02). A non-jeopardy opinion may include reasonable and prudent measures that minimize the amount or extent of incidental take of listed species associated with a project. Section 7 also encourages Federal agencies to use their authorities to carry out programs for the conservation of listed species.

Under Section 9(a)(2) or the Act, with respect to endangered plant taxa, it is unlawful to remove and reduce to possession (i.e. collect) any such taxon from areas under Federal jurisdiction; maliciously damage or destroy any such taxon on any such area; or remove, cut, dig up, or damage or destroy and such species on any other area in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law. As noted above *Dodecahema leptoceras* is listed as endangered by the State of California. Therefore, this species is afforded some protections under section 9 of the Act on non-Federal lands.

Under Section 10(a)(1)(A) of the Act there are provisions for collection of plants or plant parts for scientific purposes or to enhance the propagation and survival of the species. Under section 10(a)(1)(B) the Service may issue "incidental take" (take is defined in section 3(18) of the Act) permits for listed animal species to non-Federal applicants. Take and therefore incidental take protections are not extended to plants. "Incidental take" refers to taking of listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity by a Federal agency or applicant (50 CFR 402.02). To qualify for an incidental take permit, applicants must develop, fund, and implement a Service-approved Habitat Conservation Plan (HCP) that details measures to [avoid] minimize and mitigate the project's adverse impacts to listed species including listed plants. Issuance of an incidental take permit by the Service is subject to section 7 of the Act; thus, the Service is required to ensure that the actions proposed in the HCP are not likely to jeopardize the animal or plant species or result in the destruction or adverse modification of critical habitat. Therefore, HCPs, as discussed below, may provide an additional

layer of regulatory protection to animals as well as plants. Although Section 10(a)(1)(B) allows for exemptions to take prohibitions under section 9 for animals it does not allow for similar exemptions for plants except in cases where the State issues an incidental take permit under section 2081(b) and (c) of CESA.

Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP):

On June 22, 2004, we issued a section 10(a)(1)(B) permit for the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). The MSHCP is a large-scale, multi-jurisdictional NCCP/HCP that addresses 146 listed and unlisted ‘‘Covered Species,’’ including *Dodecahema leptoceras* within a 1,260,000-ac (510,000-ha) Plan Area in western Riverside County. The MSHCP was designed to establish a multi-species conservation program that minimizes and mitigates the expected loss of habitat and the incidental take of covered species.

Participants in the MSHCP include 14 cities in western Riverside County; the County of Riverside, the California Department of Parks and Recreation, and the California Department of Transportation (Caltrans). We granted the participating jurisdictions take authorization of listed animal species in exchange for their contribution to the assembly and management of the MSHCP Conservation Area. Approximately 347,000 ac (140,426 ha) of existing natural and open space areas (e.g., State Parks, USFS, and County Park lands known as Public/Quasi-Public (PQP) Lands) and an additional 153,000 ac (61,916 ha) of new conservation lands (Additional Reserve Lands) will form the 500,000 ac (202,343 ha) MSHCP conservation area.

The configuration of the 153,000 ac (61,916 ha) of additional reserve lands is not mapped or precisely identified in the MSHCP, but rather is based on textual descriptions within the bounds of a 310,000 ac (125,453 ha) criteria area that is interpreted as implementation of the MSHCP proceeds. Most extant occurrences of *Dodecahema leptoceras* within western Riverside County are within the plan area, and some of the largest populations and areas of greatest importance to the species at Vail Lake, Bautista Creek, and the San Jacinto River, are targeted for conservation under the MSHCP. The proposed conservation strategy in the approved Western Riverside County MSHCP will result in the conservation and management of at least 1,383 ha (3,419 ac) of modeled habitat for the species, including 11 of the 12 known occurrence of the species in Riverside County (Dudek and Associates, Inc. 2003, Volume 2, Part 2, pp. 386-387). Two of those occurrences have been subsequently merged and an occurrence on the Pechanga Reservation was not included. Additionally, as a narrow endemic species, the MSHCP requires focused surveys for *D. leptoceras* within mapped areas of suitable habitat. *Dodecahema leptoceras* is known to occur in 2 of these areas, the Vail Lake Narrow Endemic Plant Species Survey Area (NEPSSA) and the NEPSSA West. A positive finding in a NEPSSA requires 90 percent avoidance of new *D. leptoceras* occurrences located during focused surveys. One occurrence is on lands managed by Riverside County (EO 1) and 3 are totally or partly on National Forest lands (EOs 17, 21, 23), and thus protected from development. None of the other occurrences on private lands in western Riverside County are on lands conserved or managed for *D. leptoceras* (CFWO GIS data). In the Biological Opinion for the MSHCP, the Service concluded that the proposed conservation strategy would adequately conserve *D. leptoceras* within Riverside County as the MSHCP is fully implemented.

One occurrence of *Dodecahema leptoceras* (EO 32) is within the San Bernardino County Flood Control District's Woolly Star Preservation Area (WSPA) in the Santa Ana Wash. Two other occurrences are on lands owned by the San Bernardino Valley Water Conservation District (EOs 22 and 30). However, all other occurrences within this wash are within the Plan Area of the proposed Upper Santa Ana Wash Habitat Conservation Plan. Some occurrences within the plan area lie within areas proposed for aggregate mining. However, avoidance measures have been proposed to reduce the number of occurrences that would be lost and long term management for all other occurrences of *D. leptoceras* within the Santa Ana Wash has been proposed. Currently, all occurrences outside of the WSPA are not managed, though they are within protected public lands.

In 1994 the BLM as part of their South Coast Resource Management Plan designated three separate areas along the Santa Ana River as the Santa Ana River Wash ACEC specifically to provide enhanced protection of sensitive habitats and populations of *Dodecahema leptoceras* and *Eriastrum densifolium* subsp. *sanctorum* (BLM 1994, p. 104). There are three extant occurrences within the boundaries of the ACEC (EOs 2, 31, and part of 32). Under provisions of the designation, the area is unavailable for mineral material sales, OHV access, and livestock grazing (BLM 1994, p. 104). The Seven Oaks Dam was constructed between 1995 and 1999 as part of the Santa Ana River Mainstem Project (SARP). In consultation with the Service, the Corps prepared a draft Multi species habitat management plan (MSHMP). As part of the MSHMP, the Corps announced their intention to prepare a plan to implement measures to sustain federally listed species, including *D. leptoceras* within the WSPA (USACE 2008, p. 24258).

In San Bernardino County, we are working with the San Bernardino Valley Water Conservation District on an HCP to address the impacts of proposed sand and gravel mining in the upper Santa Ana River Wash on federally listed species including *Dodecahema leptoceras*. This HCP is still in the planning stages, but the conservation proposed in the draft HCP will provide protected habitat with long term management and habitat enhancement for the benefit of *D. leptoceras* (Dudek and Associates 2006).

National Forest Management Act (NFMA)

The National Forest Management Act (36 C.F.R. 219.20(b)(i)) has required USFS to incorporate standards and guidelines into Land and Resource Management Plans, including provisions to support and manage plant and animal communities for diversity and for the long term, rangewide viability of native species. Changes to NFMA may affect future management of listed species, particularly rare plant occurrences, on National Forests. On January 5, 2005, the USFS revised National Forest land management planning under NFMA (70 FR 1023). The new planning rule changed the nature of Land Management Plans so that plans generally would be strategic in nature and could be categorically excluded from NEPA analysis, and thus not subject to public review. Under this new planning rule, the primary means of sustaining ecological systems, including listed species, would be through guidance for ecosystem diversity. If needed, additional provisions for threatened and endangered species could be provided within the overall multiple-use objectives required by NFMA. The final rule did not include a requirement to provide for viable populations of plant and animal species, which had previously been included in both the 1982 and 2000 planning rules. On March 30, 2007, however, the United States

District Court in *Citizens for Better Forestry et al.* v. *USDA* (N.D. Calif.) enjoined the USDA from implementing and utilizing the 2005 rule until it complies with the court's opinion regarding the Administrative Procedure Act, the Act, and NEPA. On May 14, 2007, the Forest Service published a Notice of Intent to prepare an environmental impact statement to analyze and disclose potential environmental consequences associated with a National Forest System land management planning rule. The impact of any revisions of this rule to listed species is unknown at this time.

Factor D Summary

In summary, the Act is the primary Federal law that has provided protection for this species since its listing as endangered in 1987 (USFWS 1987, pp. 36265-36270). Other Federal and State regulatory mechanisms provide discretionary protections for the species based on current management direction, but do not guarantee protection for the species absent its status under the Act. Therefore, we continue to believe other laws and regulations have limited ability to protect the species in absence of the Act. Four of the 20 occurrences, considered extant, are all or in part conserved and managed (EO 2, 31, 32, and 34). They are all in San Bernardino County and associated with the Santa Ana River Wash. The remaining 16 occurrences are not conserved or managed for *Dodecahema leptoceras* although in some instances (e.g., National Forest lands) the lands are afforded some protections.

FACTOR E: Other Natural or Manmade Factors Affecting Its Continued Existence

The only threat attributed to this listing factor in the listing rule was invasive nonnative plants (USFWS 1987, p. 36269). This was considered a rangewide threat because the rule stated that all of the known localities of the plant were near areas dominated by "weedy exotics." This assessment is probably correct, although nonnative plants have not been specifically cited as a threat to all of the CNDDB EOs (Appendix 1). As noted under Factor A, nonnative plants likely also threaten the species habitat by their presence which can increase the site susceptibility to fires. Threats associated with small population size and climate change have been identified since the species was listed.

Nonnative Plants

Threats associated with invasive nonnative plants were attributed to this listing factor in the final rule and we stated that all known localities of *Dodecahema leptoceras* were dominated by invasive nonnatives (USFWS 1987, p. 36269). An unquantified assessment was made that the species was sensitive to the invasion of taller species. Nonnative plants may compete for light, resources, and space; however, the threat to the survival and growth of individual plants of *D. leptoceras* is unknown. No relationship between the presence of *D. leptoceras* and forbs was found among eight sites sampled (Allen and Wells 1996, p. 3). Additional threats from nonnative plants are discussed under Factor A where nonnative plants likely have a greater negative impact on its habitat than individual plants.

Small Population Size

Small population size or a range encompassing a relatively few occurrences may pose a threat to this species. No standing plants or fewer than 100 plants was recorded for some of the occurrences in some years according to data contained in the CNDDB EO records for this species (CNDDB 2010). A few occurrences have been discovered to support the species after several years when no individuals were found (e.g., CNDDB 2010 EO 39; Appendix 1). Reference to the distribution of known extant occurrences depicted in Figure 1 clearly indicates the considerable distances separating most of the occurrences. Pollen and seed transport among many of the occurrences would likely be seldom if ever accomplished.

Climate Change

Rainfall and temperature both may affect the germination and successful reproduction of *Dodecahema leptoceras*. Currently, drier conditions and drought likely threaten all occurrences of *D. leptoceras* and are thought to be exacerbated by climate change. There is a broad consensus among scientists that the earth is in a warming trend caused by anthropogenic greenhouse gases such as carbon dioxide (IPCC 2007). Models are not yet powerful enough to predict what will happen in localized regions such as southern California, but many scientists believe warmer, wetter winters and warmer, drier summers will occur within the next century (Field *et al*. 1999, pp. 2-3, 20). Climate-related changes in California have been documented (Croke *et al*. 1998, pp. 2128, 2130; Breashears *et al*. 2005, p. 15144). Predictions for California indicate prolonged drought and other climate-related changes will continue in the future (Field *et al*. 1999, pp. 8-10; Lenihen *et al*. 2003, p. 1667; Hayhoe *et al*. 2004, p. 12422; Breshears *et al*. 2005, p. 15144; Seager *et al*. 2007, p. 1181; IPCC 2007, p. 9).

Five factors associated with a changing climate may affect the long term viability of the regionally isolated occurrences of *Dodecahema leptoceras*: (1) drier conditions may result in a greater frequency of smaller population numbers, fewer and less reliable recovery cycles of abundant individuals; (2) higher temperatures and dryer conditions that result in fewer individuals present over several years may disrupt pollinator services; (3) a shift in the timing of the annual rainfall may favor nonnative species; (4) the timing of pollinator life-cycles may become out-of-sync with timing of flowering *D. leptoceras*; and (5) drier conditions may result in increased fire frequency, making the ecosystems in which *D. leptoceras* currently grows more vulnerable to the threats of subsequent erosion and nonnative/native plant invasion.

While we recognize that climate change is an important issue with potential effects to listed species and their habitats, we lack adequate information to make accurate predictions regarding its effects to particular species (including *Dodecahema leptoceras*) or sites at this time. Although we cannot predict the exact effects of climate change on *D. leptoceras*, it is likely that it will exacerbate identified threats and may introduce new threats. A changing climate with associated spatial and temporal shifts in current temperature and precipitation regimes may present conditions that render this species' specific adaptations to current climatic conditions detrimental to its survival. A changed climate may also provide selective advantages to other native and nonnative plant species capable of occupying the habitat.

Sharing information between scientists, land managers, and decision makers will increase our ability to address these threats. Increasing the success with which we address current threats to *Dodecahema leptoceras* will increase our success of handling the uncertain effects of future climate change.

Factor E Summary

At listing, nonnatives were the only Factor E threat identified in the listing rule. All occurrences are becoming increasingly colonized by nonnative annual grasses and a decrease in observed *Dodecahema leptoceras* abundance has been noted in these areas. Habitat manipulations to control these grasses and increase the abundance of the *D. leptoceras* in occupied sites are proposed as part of the Seven Oaks Dam Habitat Management Plan. Since listing, potential impacts from small population size and climate change have also been recognized.

III. RECOVERY CRITERIA

There is no final approved recovery plan for this species. Therefore, no further discussion will be provided in this section.

IV. SYNTHESIS

Dodecahema leptoceras is a narrow endemic species with a known range limited to small patches of occupied habitat within a few floodplains in Los Angeles, Riverside, and San Bernardino Counties. The habitat relies on long-term natural fluvial processes for renewal. All threats identified in the listing rule remain as current threats to the survival and recovery of the species. Threats identified since listing include altered hydrology, trash dumping, impacts from homeless camps, small population size, and climate change. Threats associated with development, altered hydrology, small population size, and climate change are potentially rangewide.

Dodecahema leptoceras is currently known from 20 extant occurrences in 10 watersheds, compared to 6 occurrences in 5 watersheds at listing. However, the known extant occurrences are scattered in the watersheds, support different numbers of plants from year to year, and the majority have not been surveyed in over 10 years. The primary threats noted in the listing rule, development and mining activities are relatively diminished in their extent because of the detection of several previously unknown occurrences. The threat from altered hydrology is essentially rangewide. Because of the increase in range and number of extant occurrences since listing, the magnitude of threats to the species is reduced.

Dodecahema leptoceras could be considered for reclassification from endangered to threatened in the next 5 years if the species is documented to persist throughout its current known range, if threats are further reduced, and additional occurrences are conserved and managed. Though of moderate degree, the majority of the known occurrences face one or more additional threats. Consideration of the species' persistence should take into account an assessment of the long term impact associated with the altered hydrological conditions present at most of the known occurrences. Based on the current threats and knowledge of the species' occurrences *D.*

leptoceras remains in danger of extinction throughout its range and we recommend no change in the status at this time.

V. RESULTS

Recommended Listing Action:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist (indicate reason for delisting according to 50 CFR 424.11):
    ____ *Extinction*
    ____ *Recovery*
    ____ *Original data for classification in error*
__X_ No Change

New Recovery Priority Number and Brief Rationale: 7C

We recommend a change in the recovery priority number for *Dodecahema leptoceras* from 1C to 7C. The number of occurrences identified since listing has increased from 6 to 20 extant occurrences. Though we do not anticipate major habitat loss from current threats, the majority of known occurrences face one or more additional threats. Additionally, only four of the extant occurrences are conserved. Therefore, we recommend a change in the recovery priority number 7C to reflect a moderate degree of threat, a high recovery potential, and a conflict with development for a species that belongs to a monotypic genus.

VI. RECOMMENDATIONS FOR ACTIONS OVER THE NEXT 5 YEARS

1. Monitor known and historical occurrences as well as suitable habitat to determine presence and condition of *Dodecahema leptoceras.*

2. Identify opportunities to work with private landowners to encourage conservation actions for *Dodecahema leptoceras* on sites that are not conserved. This could be done through the Partners for Fish and Wildlife Program as well other cooperative programs.

3. Determine by experimental means and field studies the extent to which the presence of invasive nonnative plants impacts growth and persistence of *Dodecahema leptoceras.*

4. Identify pollen and seed (fruit) vectors and their habitat requirements. Incorporate these requirements into habitat management considerations for *Dodecahema leptoceras.*

5. Identify the structure and dynamics of the seed bank of *Dodecahema leptoceras.*

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Personal Communications

Chris Dellith, Ventura Fish and Wildlife Office, 2006 and 2007
Robert McKernan, San Bernardino County Natural History Museum, 1998 and 2007

Appendix 1: *Dodecahema leptoceras* (slender-horned spineflower) occurrences; prepared for FY2010 5-year review.

AREA AND CNDDB ELEMENT OCCURRENCE NUMBER	STATUS AT LISTING and Herbarium specimen documentation	CURRENT STATUS AND THREATS	CURRENT OWNERSHIP and CONSERVATION
LOS ANGELES COUNTY			
Mint Canyon EO 5	Considered extirpated Eastwood & Howell 3950, April 26, 1937 (CAS).	Considered extirpated Last seen in 1937. Last survey, 1979	Private
Newhall EO 6	Considered extirpated Davidson s.n., May 20, 1893 (RSA).	Considered extirpated Last seen 1893.	Private
Big Tujunga Wash, near Sunland EO 7	Considered extirpated Eastwood 258, June 5, 1906 (CAS, GH, US). Dearing, M.&H.4359, June 9, 1940 (SBBG). Kamb 1119, June 26, 1948 (JEPS). Levine s.n., May 8, 1949 (LA). Krantz et al. s.n., May 9, 1988.	Presumed extant Last seen in 2006. A: Development (golf course maintenance), mining, altered hydrology,OHVs, trash dumping, illegal camps.	Private Not Conserved
Rubio Wash, Altadena EO 8	Extirpated Peirson 1777, s.d. (RSA).	Extirpated Last seen ca 1920.	Private
Santa Anita Wash, Arcadia EO 9	Extirpated Peirson 2113, April 26, 1920 (RSA, JEPS)	Extirpated Last seen ca 1920.	Private
Pacoima Canyon Wash, San Fernando Valley EO 10	Presumed extirpated Davidson 2978, May 1, 1914 (RSA). Munz 9384, April 19, 1923 (POM). Peirson 5776, April 19, 1925 (RSA, UC). Barneby 411/37, May 12, 1937 (K).	Considered extirpated Last seen in 1937. Last surveys1978, 1983.	Private

Bee Canyon Wash, tributary of Santa Clara River EO 27	Unknown at listing Parish 747, May 28, 2003 (SBBG).	Presumed extant Last seen in 1993, 1000 plants A: Development, (mobile home park and highway realignment), mining, trash dumping.	Private Not Conserved
La Crescenta EO 36	Considered extirpated Davidson 3163, July 1, 1916 (RSA).	Considered extirpated Last seen 1916	Private
West Fork San Gabriel River EO 37	Considered extirpated Peirson 2455, June 21, 1921 (JEPS, RSA).	Possibly extirpated Last seen in 1921.	USDA: Angeles NF
Sun Valley, San Fernando Valley No EO number	Unknown at listing Eastwood 258, June 5, 1906 (location as Roscoe) (CAS). Eastwood 258, May 11, 1913 (CAS, GH, US).	Extirpated	Private
SAN BERNARDINO COUNTY			
Santa Ana River Wash East Highlands, Hwy. 30 EO 2 (includes former EO 20)	Presumed extant Krantz s.n., May 17, 1979 (UCR). Parish s.n., June 1, 1905 (UC). Parish s.n., May 1888 (UC, POM).	Presumed extant Last seen in 1999. A: Mining, Altered hydrology, OHVs, trash dumping, invasive nonnative plants. C: Rabbits browsing.	BLM-Santa Ana River Wash ACEC Conserved
Devore, Cajon Creek Wash EO 3	Considered extant Krantz s.n., April 30, 1979 (UCR).	Considered extirpated Last seen in 1984. Negative surveys 1986, 1988, 2005.	Private

San Bernardino, vicinity EO 4	Extirpated Parish 829, May 1, 1881 (JEPS). Parish 829, June 1, 1884 (UC). Parish 3646, May 18, 1895 (CAS). Parish 5388, June 1, 1905 (LA). Davidson s.n., May 1, 1923 (RSA)	Extirpated Last seen 1923	Private
Yucaipa Valley EO 11	Considered extirpated Lemmon s.n., s.d. (UC).	Considered extirpated Last seen [1923?]	Private
Arrowhead Springs EO 15	Extirpated Feudge 15, April 18, 1923 (POM)	Extirpated Last seen in 1923.	Private
Cajon Canyon, near Devore, north of existing Glen Helen Campground EO 18	Possibly extirpated Krantz s.n., April 30, 1979 (UCR)	Possibly extirpated Last seen in 1984. Negative survey in 2005. A: Altered hydrology, nonnative plants E: Small population size.	San Bernardino County
East of Church St. Santa Ana River Wash EO 22	Unknown at listing	Presumed extant Last seen in 1992, 1100 plants. A: Mining, altered hydrology.	San Bernardino Valley Water Conservation District Not Conserved
Santa Ana River Wash, 0.9 mi ESE La Carrera Field, EO 30	Unknown at listing	Presumed extant Last seen in 1992, 102 plants. A: Mining, altered hydrology.	San Bernardino Valley Water Conservation District Not Conserved

Santa Ana River Wash, 1.3 mi E La Carrera Field, EO 31	Unknown at listing	Presumed extant Last seen in 1990, 95 plants. A: Altered hydrology	BLM Santa Ana River Wash ACEC Conserved
Santa Ana River Wash, 1.6 mi E La Carrera Field, EO 32 (incl. EO 33)	Unknown at listing	Presumed extant Last seen in 1990, 300 plants. A: Altered hydrology,invasive nonnative plants	BLM Santa Ana River Wash ACEC and SBVWCD WSPA easement Conserved
Santa Ana River Wash, 1 mi S Greenspot Rd., EO 34	Unknown at listing	Presumed extant Last seen in 1992, 1000 plants in 1990. A: Altered hydrology, invasive nonnative plants.	SBVWCD mitigation Conserved
Lytle Creek, 0.25 mi E Nealey's Corner EO 35	Unknown Jones s.n., June 20, 1994 (RSA)	Presumed extant Last seen in 1994, 92 plants. Negative survey in 2005.	San Bernardino Flood County Control District Not Conserved
Cajon Canyon. 1 mile below Blue Cut, N of Ruddell Hill EO 39	Considered extirpated Roos 4822, June 3, 1950 (RSA). Gross 2259, May 12, 2005 (RSA). Fraga & Gross 1580, June 2, 2005 (UCR).	Presumed extant Last seen in 2005.	USDA San Bernardino N.F. Not Conserved
Upland, likely Cucamonga Creek EO 40	Extirpated Parish s.n., June 1, 1905	Extirpated Last seen in 1905	unknown

RIVERSIDE COUNTY			
San Jacinto River, 1.5 mi E Valle Vista. EO 1	Presumed extant Krantz s.n., April 24, 1980 (UCR). Krantz s.n., April 22, 1982 (RSA) Reveal 6863, May 23, 1983 (RSA). Sproul s.n., June 1999 (SD). Wall 400, July 29, 2005 (RSA)	Presumed extant Last seen in 2005, 500 plants. A: Development, mining, altered hydrology, OHVs (M.Wall 2005 CNDDB Field Survey Form, July 29, 2005)	Riverside County Not Conserved
Elsinore EO 12	Extirpated J. Abrams s.n., May 1901 (DS). McClatchie s.n., May 1892 (NY). Parish s.n., June 1882 (DS).	Extirpated Last seen in 1901.	
7.4 mi S Hemet, St Johns Creek and Cactus Valley EO 13 (includes former EO 19)	Presumed extirpated Vestal s.n., May 10, 1937 (DS)	Presumed extirpated Last seen in 1937. Negative survey in 2005.	
Temescal Canyon, Indian Wash at De Palma Rd. EO 16	Presumed extant Boyd s.n., April 27, 1982 (RSA). Boyd 1692, April 19, 1986 (RSA). Boyd 1738, April 22, 1986 (RSA).	Presumed extant Last seen in 1991, 50 plants. A: Development.	Private Not conserved; proposed for conservation (Additional Reserve Lands)
Bautista Creek Canyon, San Jacinto Mtns. EO 17	Presumed extant	Presumed extant Last seen in 1999, 500 plants. A: Altered hydrology, OHVs. E: Target practice.	Private and USDA: San Bernardino N.F. Private land not conserved; proposed for conservation (Additional Reserve Lands)
Bautista Creek Canyon, 0.5 mi NW Bautista Guard Sta. EO 21	Presumed extant Ziegler 158, June 14, 1964 (UCR).	Presumed extant Last seen in 1999, 400 plants A: Altered hydrology, OHVs. E: Target practice.	USDA: San Bernardino N.F. Not Conserved

Vail Lake vicinity, Arroyo Seco Wash, S. Dripping Spr. Camp. EO 23	Unknown at listing Banks & Boyd 0250, May 3, 1995 (RSA). Banks & Boyd 0286, May 3, 1995 (RSA). Banks 0314, May 4, 1995 (RSA).	Presumed extant Last seen 1999, 512 plants. A: Altered hydrology, trampling (hiking trails).	USFS Cleveland N.F. Not Conserved
Vail Lake vicinity, Kolb Creek drainage EO 24	Unknown at listing Boyd *et al* 3619, June 4, 1989 (RSA). Reiser s.n., May 17, 1993 (SD)	Presumed extant Last seen 1993, 3635 plants in 1990. A: Altered hydrology, OHVs.	Private not conserved; proposed for conservation (Additional Reserve Lands)
Vail Lake vicinity, near Dripping Springs Guard Station EO 25 (includes former EO 26)	Unknown at listing Reiser s.n., April 24, 1993 (SD).	Presumed extant Last seen in 1993, hundreds of plants in 1991. A: Altered hydrology.	Private Not conserved; proposed for conservation (Additional Reserve Lands)
Vail Lake vicinity, S of road between Vail Lake Marina and Campground EO 28	Unknown at listing	Presumed extant Last seen 1990, two small pops of 36 and 50 plants. A: Altered hydrology.	Private Not conserved; proposed for conservation (Additional Reserve Lands)
Vail Lake vicinity, Dripping Springs, W of Aguanga EO 29	Unknown at listing	Presumed extant Last seen 1989.	Private Not conserved; proposed for conservation (Additional Reserve Lands)
Pechanga Reservation EO 38	Unknown at listing	Presumed extant Last seen 2005, 850 plants. A: OHVs (low potential).	Pechanga Indian Reservation

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW

Dodecahema (Centrostegia) leptoceras
(slender-horned spineflower)

Current Classification: **Endangered**

Recommendation Resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
_X_ No change needed

New Recovery Priority Number and Brief Rationale: 7C

We recommend a change in the recovery priority number for *Dodecahema leptoceras* from 1C to 7C. The number of occurrences identified since listing has increased from 6 to 20 extant occurrences. Though we do not anticipate major habitat loss from current threats, the majority of known occurrences face one or more additional threats. Additionally, only four of the extant occurrences are conserved. Therefore, we recommend a change in the recovery priority number 7C to reflect a moderate degree of threat, a high recovery potential, and a conflict with development for a species that belongs to a monotypic genus.

Review Conducted By: _____Carlsbad Fish and Wildlife Office_____

FIELD OFFICE APPROVAL:

Lead Field Supervisor, U.S. Fish and Wildlife Service

ACTING

Approve _____ Date OCT 01 2010

Scott A. Sobiech