

Lupinus nipomensis
(Nipomo Lupine)

**5-Year Review:
Summary and Evaluation**



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**U.S. Fish and Wildlife Service
Ventura Fish and Wildlife Office
Ventura, California**

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5-YEAR REVIEW

Lupinus nipomensis (Nipomo Lupine)

I. GENERAL INFORMATION

Purpose of 5-Year Review:

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:

Lupinus nipomensis (Nipomo lupine) is a small annual plant in the pea family (Fabaceae). Historically and currently, the species is known only from the southwestern corner of San Luis Obispo County, California, scattered over an area of approximately 2 miles wide and 2 miles long (3.2 by 3.2 kilometers (km)) (Figure 1). It is restricted to sandy soils associated with the Callender Dune Sheet (Cooper 1967). For purposes of this review, we are considering the entire extent of the species to comprise one population; however, the California Natural Diversity Database (CNDDDB) has divided the population into approximately 10 occurrences for tracking purposes. Over the last 4 years, the total number of individuals has fluctuated between approximately 139 and 771, depending on winter and spring climatic conditions (Land Conservancy of San Luis Obispo County (Conservancy) 2009). Over time, the species' habitat has been fragmented by State Highway 1 and oil refinery facilities, and bounded on the eastern side by development and agriculture. The small size of the populations and their proximity to a variety of human activities makes it vulnerable to stochastic extinction.

Methodology Used to Complete the Review:

This review was prepared by the Ventura Fish and Wildlife Office (VFWO), following the Region 8 guidance issued in March 2008. We used survey information from experts who have been monitoring various localities of this species, and the CNDDDB maintained by the California Department of Fish and Game. The recovery plan and personal communications with experts were our primary sources of information used to update the species' status and threats. 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 or since the last 5-year review. We focus on current threats to the species that are attributable to 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 recommend a prioritized list of conservation actions to be completed or initiated within the next 5 years.

Contact Information:

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Federal Register (FR) Notice Citation Announcing Initiation of This Review: A notice announcing initiation of the 5-year review of this taxon and the opening of a 60-day period to receive information from the public was published in the Federal Register on March 25, 2009 (74 FR 12878). No information was received in relation to this species.

Listing History:

Original Listing

FR Notice: 65 FR 14888

Date of Final Listing Rule: March 20, 2000

Entity Listed: *Lupinus nipomensis* (species)

Classification: Endangered

State Listing

Lupinus nipomensis was listed as endangered by the State of California in 1987.

Associated Rulemakings: N/A

Review History: N/A

Species' Recovery Priority Number at Start of 5-Year Review: The recovery priority number for *Lupinus nipomensis* is 5 according to the Service's 2008 Recovery Data Call for the Ventura Fish and Wildlife Office, based on a 1-18 ranking system where 1 is the highest-ranked recovery priority and 18 is the lowest (Endangered and Threatened Species Listing and Recovery Priority Guidelines, 48 FR 43098, September 21, 1983). This number indicates that the taxon is a species that faces a high degree of threat and has a low potential for recovery.

Recovery Plan or Outline: None

II. REVIEW ANALYSIS

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

The Endangered Species 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 limits listing as distinct population segments to vertebrate species of fish and wildlife. Because the species under review is a plant and the DPS policy is not applicable, the application of the DPS policy to the species' listing is not addressed further in this review.

Updated Information on Current Species Status, Biology, and Habitat:

Species Biology and Life History

Lupinus nipomensis is a small annual herb in the pea family (Fabaceae). The low-spreading individuals can reach 8 inches (20 centimeters) in height (Riggins 1993). Leaves are pinnately compound into five to seven leaflets. Up to 10 pinkish-purple flowers are borne on the ends of the inflorescences (flowering stems). Each flower produces a pod that contains three to four ovules (Riggins 1993), and one healthy plant can produce up to 10 inflorescences (Walters and Walters 1988). Potentially, seed production could reach on the order of 1,000 seeds; however, based on 2 years of sampling, observed seed production per plant ranged from 1 to over 200, with most plants producing less than 30 fruits (Walters and Walters 1988). Growth is indeterminate, with individuals aborting flowers on the central stems in favor of producing additional lateral branches and inflorescences when climatic conditions, particularly the timing of spring rains, are favorable (Walters and Walters 1988). Leaves and stems are succulent, and provide prolonged moisture for seed development. Flowers are self-compatible if manipulated; however, they may require insect visitation for full complements of seeds (Center for Plant Conservation (CPC) 2009). During their four-year study, no observations of pollinators were recorded by Walters and Walters (1988). While pollination ecology has not been specifically studied for *L. nipomensis*, other lupine taxa are known to be pollinated by butterflies and a variety of bee taxa, especially from the genera *Bombus*, *Osmia*, *Synhalonia*, and *Anthidium* (Moldenke 1976).

Distribution

According to records available through the CNDDDB (2009) and the Consortium of California Herbaria (Consortium) (2009), all historical collections and unvouchered observations of *Lupinus nipomensis* are from one area in the southwestern corner of San Luis Obispo County. We estimate the total amount of potentially suitable habitat for *L. nipomensis* in contiguous portions of San Luis Obispo County is on the order of 1,000 acres (405 hectares (ha)), while the current footprint of the populations is on the order of 100 acres (40.5 ha).

At this time, *Lupinus nipomensis* is still known to be extant at one location in San Luis Obispo County, California (Appendix 1, figure 1). We consider all individuals at this site to comprise one population of approximately six occurrences (CNDDDB 2009) or colonies scattered across a 2-mile (3.2-km) stretch of backdune habitat west of Highway 1 and between Black Lake Canyon to the north and Oso Flaco Lake to the south. All of the habitat for the species is privately

owned, most by Conoco-Phillips Oil Company (CPOC), and smaller portions are owned by Pacific Gas and Electric Company, the Conservancy, and other private landowners. A portion of the habitat is within a California Department of Transportation right-of-way.

Abundance, Population Trends

Early survey data from the 1980s is incomplete. The first effort to conduct an annual census was initiated in 1984 and focused on the three colonies that comprise the “Callender” occurrences (CNDDDB #2 in Table 2 below); 273 *Lupinus nipomensis* individuals were counted in that year. A large number of individuals (886) were counted during 1985; this number included 83 individuals located near Jack Lake (CNDDDB #1 in Table 2 below). A small number of individuals (77) were located in 1986; however, the latter did not represent a complete census of the Jack Lake occurrence (Walters and Walters 1988). By 1987, four additional occurrences had also been located.

No complete surveys or censuses were conducted between 1987 and 2004. Census data taken since 2004 is more complete, but difficult to reconcile with earlier census efforts due to differing mapping methods. In 2003, annual surveys were resumed by the Conservancy. Census data for 2004 and 2005 are considered to be inaccurate due to confusion in differentiating between *Lupinus nipomensis* and another small annual lupine that occurs in the area (Daniel Bohlman, restoration ecologist, Conservancy, pers. comm. 2009). The most accurate census data are from years 2006 through 2009 (See Figure 2). During this 4-year time period, the number of individuals ranged between a high of 771 and a low of 139, prior to mortality due to pocket gopher damage (Conservancy in litt. 2009). For the 3 years from 2007 through 2009, between 28 to 31 percent of *L. nipomensis* individuals were consumed by pocket gophers on Conoco-Phillips property (Conservancy in litt. 2009). Relative to numbers of individuals for other annual plant species, these numbers are extremely low (Keith 1998).

Figure 2: Conservancy census results for *Lupinus nipomensis* at selected locations.

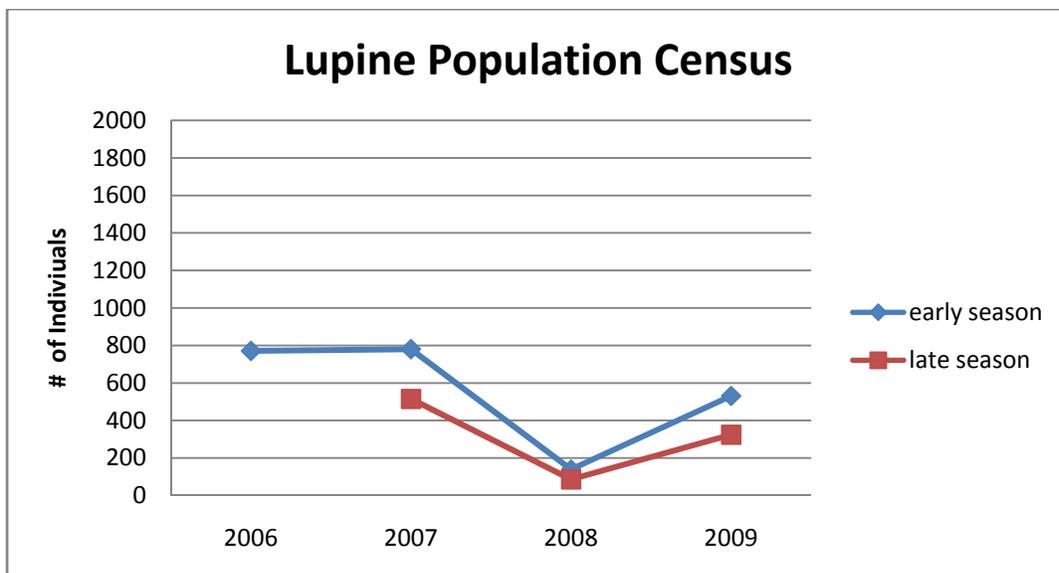


Table 1 below summarizes occurrence data from CNDDDB; due to a difference in survey methodology, survey results from the Conservancy efforts (see Table 1) cannot be reconciled with CNDDDB data, and therefore is not included in Table 1 below.

Table 1: Occurrence Records for *Lupinus nipomensis* Collated from the CNDDDB (2009).

CNDDB #	Name (owner)	CNDDB Current trend	Year collected/observed	Pop size/Year surveyed	Reference
1	Southeast of Jack Lake (private)	presumed extant	Hoover #9365 (1965)	17 (1983) 83 (1985) 177 (1987) 276 (1988) 149 (1998)	CNDDDB 2009
2	Callender switching station (CPOC and PG&E)	Presumed extant	Riggins #87204 (1987)	273 (1984) 803 (1985) 77 (1986) 317 (1987) 1035 (1988) 140 (2004)	CNDDDB 2009
3	Near Black Lake and Highway 1 (Type locality) (Conservancy)	Presumed extirpated	Eastwood # 18929 (1940)	0 (1980) 0 (1981) 0 (1988)	CNDDDB 2009
4	Southeast of main entrance of Unocal Oil Refinery (CPOC)	Presumed extant	--	50 (1987) 44 (1987) 636 (1988)	CNDDDB 2009
7	0.8 mi SSW of jct of Highway 1 and Willow Rd (private unknown)	Presumed extant	--	1300 (1988)	CNDDDB 2009
8	Callender Dunes NE of Jack Lake (CPOC)	Presumed extant	--	80 (1998)	CNDDDB 2009
9	Callender Dunes, 0.6 mi N of Jack Lake (CPOC)	Presumed extant	--	12 (1998)	CNDDDB 2009

CNDDDB identification # = element occurrence number assigned by the California Natural Diversity Database (CNDDDB 2009).

Habitat or Ecosystem Conditions (e.g., amount and suitability)

Habitat for *Lupinus nipomensis* is comprised of stabilized back dunes supporting a central coastal dune scrub community. Dominant species include mock heather (*Ericameria ericoides*) and silver lupine (*Lupinus chamissonis*). Other frequent associated species include buckwheat (*Eriogonum parvifolium*), deerweed (*Lotus scoparius*), and horkelia (*Horkelia cuneata*), as well as a large variety of annual herbs interspersed in open areas between the shrubs (Howald 1988).

Walters and Walters (1988) described habitat for the species as either being of degraded quality due to disturbance (type 1) or better quality habitat that was less disturbed and more closely fits the description of coastal dune scrub above (type 2). The sites with disturbed or type 1 habitat are characterized by a lower diversity of species overall, a lower cover of shrubs, a higher percentage of bare sand, a higher cover of nonnative species, and, in most years, a lower density of *Lupinus nipomensis*. At some type 1 sites, the nonnative veldt grass (*Ehrharta calycina*) has become abundant and is crowding out native species.

Lupinus nipomensis needs open habitat to persist. Sandy soils along the coast typically undergo a certain amount of natural disturbance from coastal winds and from the activity of wildlife. However, over time, natural disturbance regimes have been altered by the planting of such species as European beach grass (*Ammophila arenaria*) and eucalyptus (*Eucalyptus* spp.), and

human-caused disturbances, such as off-highway vehicle use, have increased. Although high densities of *L. nipomensis* may occur in disturbed habitat in certain years, predation of both seeds and plants is also known to be greater in areas of higher density *L. nipomensis* (Walters and Walters 1988), resulting in lower seed production or mortality. As a result, the occurrence of higher numbers of individuals in disturbed sites does not necessarily equate to a benefit to the species.

Changes in Taxonomic Classification or Nomenclature

No changes in taxonomy or nomenclature have been made since the time of listing.

Genetics

No new studies concerning the genetics of this taxon have been conducted since the time of listing.

Species-specific Research and/or Grant-supported Activities

In 2004, the Service contributed half of the funds necessary to establish a national endowment for the species through the CPC; a private donor contributed the rest of the funds. The endowment addresses activities related to seed collection, viability testing, long-term storage, and propagation if needed. The Santa Barbara Botanic Garden is a member of the CPC and has been undertaking this work (CPC 2009). Wilken (in litt. 2009) tested two batches of seed for viability. Seed that was at least 15 years old and not stored according to standard storage protocols exhibited no germination, while 1-year old seed and stored according to standard storage protocols exhibited 60 percent germination. Wilken also tested for self-compatibility and found that 100 percent (six out of six) of the individuals developed seed.

Five-Factor Analysis

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

According to the California Department of Fish and Game (2005), three historical localities had been extirpated by the late 1990s. Plants have not been seen at the type locality, near Black Lake, since 1937; the location of the other two extirpated localities is unclear. All mapped occurrences, both historic and current, are found within the same small geographic area; therefore, we do not consider that there has been a reduction in the range of the species.

At the time of listing *Lupinus nipomensis* in 2000 (Service 2000), we discussed activities related to energy extraction and refinement (e.g., maintenance activities, hazardous waste cleanup) and development as threats to the species. Since the time of listing until the time of this review, we had not been aware that these activities have contributed to the alteration or loss of any habitat. However, during the course of this review, we became aware of a Notice of Preparation to expand refinery capabilities at the Conoco-Phillips plant (County of San Luis Obispo 2008). The Service has also recently received a notice regarding a proposal to construct a telecommunications facility less than 0.25 mile (0.4 km) away from EO #7 (C. Mehlberg, Service, in litt. 2009). The project proponent notes that the site was previously developed with agricultural fields; whether above-ground plants or a seed bank of *L. nipomensis* remains is

unknown. In addition, it appears that several housing developments have been constructed within a mile of *L. nipomensis* habitat over the past 5 years (Google Earth 2009). The presence of a larger human population in the adjacent area is likely to introduce additional direct and indirect effects (such as trampling from recreational use, spread of invasive horticultural species used in landscaping, and loss of pollinator habitat) on the species as time goes on.

At the time of listing, we did not discuss under Factor A the role of sheep grazing, cattle grazing, or the spread of invasive veldt grass in the modification of habitat for *Lupinus nipomensis*. We typically discuss grazing impacts under Factor C (predation) and E (trampling), and competition with nonnative species under Factor E. However, because both these activities can play a role in modifying habitat for *L. nipomensis*, we are including them in Factor A in this review. Sheep grazing was terminated in the area sometime in the mid-1980s (Conservancy 2001). Since the time of listing, the number of cattle grazed on the Conoco-Phillips property has been reduced. In addition, the cattle are grazed between July 1 and December 1 of each year (Bohlman, pers. comm. 2009); because the timing of grazing is not during the active growing and flowering period for *L. nipomensis*, we believe that the direct impacts of grazing from trampling are less than they were at the time of listing.

Veldt grass was described as “rampant” in the area at least 25 years ago (McLeod and Walters 1987); its presence can cause a shift from scrub habitat to grassland habitat (Bossard et al. 2000, California Invasive Plant Council 2009). Since 2000, the Conservancy has been actively removing veldt grass from *Lupinus nipomensis* habitat. While these efforts may have slowed the conversion to a monoculture of veldt grass, it is likely that the habitat will have to be managed in perpetuity to maintain the open patches that is required by *L. nipomensis*. The Conservancy conducted grazing trials in the late 1990s to determine if cattle grazing would be useful in reducing the biomass of veldt grass in advance of treating the veldt grass with herbicides. They found that, although cattle grazing may be useful to reduce veldt grass biomass, it may not be effective in reducing the number of tufts (frequency) due to their pernicious root systems (Bossard et al. 2000, Conservancy 2001). In addition, they found that native shrubs experienced substantial damage from cattle trampling, and that veldt grass increased in areas where cattle grazing was reduced. The Conservancy concluded that the benefits of using cattle for removal of veldt grass biomass were outweighed by damage to native shrubs (Conservancy 2001). Long-term effects of cattle grazing may include altering biodiversity within the habitat and are not completely understood at this point in time.

Conservation

Conoco-Phillips is the primary landowner of habitat where *Lupinus nipomensis* remains extant. In the late 1980s, they entered into an agreement with California Department of Parks and Recreation for the latter to manage Conoco-Phillips lands that border Oceano Dunes State Vehicular Recreation Area. The designation of this land as a buffer zone decreased the amount of illegal off-highway vehicle activity in the area (R. Glick, in litt. 2009). In addition, Conoco-Phillips is working cooperatively with the Conservancy to continue veldt grass removal and to annually census *L. nipomensis* colonies on their lands (Bohlman in litt. 2009). In 1997, the Conservancy acquired a parcel that includes Black Lake and the surrounding area, which was the type locality for *L. nipomensis*. Although habitat is not currently suitable to support *L. nipomensis* due to heavy vegetation cover, it could possibly do so in the future. The

Conservancy has actively been managing for veldt grass, both on their own lands and in partnership with adjacent landowners.

In summary, oil refinery activities appear to be less of a threat than at the time of listing, but a proposal to expand refinery operations in the near future may alter or destroy suitable habitat for *Lupinus nipomensis*. Urban development activities may become more of a threat in the future with human population growth in the area. Overall, habitat is being more closely managed, and has resulted in several parcels falling under more protective management, including a reduction of illegal off-highway vehicle use, and the removal of veldt grass from *L. nipomensis* habitat. Little opportunity for population expansion is available adjacent to the existing populations because habitat has already been converted to other uses, including roads, facilities, agriculture, and housing. However, there may be some opportunity to enhance habitat at existing population sites. The presence of veldt grass continues to be the greatest long-term threat to *L. nipomensis* and its habitat.

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

Overutilization for commercial, recreational, scientific, or educational purposes was not known to be a factor in the 2000 final listing rule (65 FR 14888). Overutilization for any purpose does not appear to be a threat at this time.

FACTOR C: Disease or Predation

Disease was not considered a threat at the time of listing in 2000. At that time, we identified that pocket gophers (*Thomomys bottae*) had consumed entire colonies of *Lupinus nipomensis*, as reported by Walters and Walters (1988). While pocket gophers are known to harvest seeds of many species in general (Martin et al. 1951), it is more likely that they consume the roots, stems, and leaves of *L. nipomensis*, and that seeds die prior to full maturation. However, seed that are able to complete maturation despite being excised from the plant may find suitable germination sites in the vacated gopher mounds the following winter season (Walters and Walters 1988). In addition, our listing rule stated that the presence of veldt grass increases the food source for pocket gophers and thus potentially increases their numbers and their potential harm to *L. nipomensis* (Walters and Walters 1988). Survey results for the 3 years from 2007 through 2009 indicate that from 28 to 31 percent of *L. nipomensis* individuals are consumed by pocket gophers on Conoco-Phillips property (Conservancy in litt. 2009); therefore, we continue to believe that pocket gophers continue to be a threat to the species.

Our listing rule stated that a variety of insects were variously foraging on the seeds, stems, or leaves of *L. nipomensis* and reducing its reproductive potential; insects include an anthomyid fly (*Hylemya lupini* Coquillette), the common painted lady butterfly (*Vanessa cardui*), a noctuid moth (family Pyridae), and a lupine blue butterfly (*Plebejus lupini monticola*). No data have been gathered to determine the extent of these threats on the long-term persistence of *L. nipomensis*.

At the time of listing, we were not aware of, and did not discuss, the potential impacts of cattle grazing on *Lupinus nipomensis*. In the early 2000s, the Conservancy worked with Conoco-Phillips to reduce the number of cattle grazed on their lands (Service in litt. 2005). In addition, the timing of grazing is such that it does not occur when *L. nipomensis* is growing and flowering. Therefore, we believe the effects of grazing due to consumption are small to none (see Factor A for a discussion of the effects of grazing on habitat).

FACTOR D: Inadequacy of Existing Regulatory Mechanisms

At the time of listing, regulatory mechanisms thought to have some potential to protect *Lupinus nipomensis* included: (1) listing under the California Endangered Species Act (CESA); (2) the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA); (3) the California Coastal Act; and (4) local land use laws, regulations, and policies. The listing rule (65 FR 14888) provides an analysis of the level of protection that was anticipated from those regulatory mechanisms. For the most part, this analysis appears to remain valid. However, there may also be future federal and state involvement through the Environmental Protection Agency, the Water Quality Control Board, and the Air Quality Control Board, due to their regulatory authority over air quality, water quality, and hazardous waste management associated with oil refinery activities. In addition, the Federal Communications Commission may have regulatory authority over the installation and permitting of telecommunications facilities.

Lupinus nipomensis was listed as endangered by the State of California in 1987. As such, projects that would affect *L. nipomensis* are subject to CESA and CEQA requirements. Protection of listed species through CEQA is dependent upon the discretion of the lead agency involved. To the best of our knowledge, no projects have evaluated impacts to the species pursuant to CESA and CEQA since the species was listed. A Notice of Preparation was recently circulated by the County of San Luis Obispo for a proposed project to increase refinery capabilities by the Conoco-Phillips refinery by 12.5 percent (County of San Luis Obispo 2008). The project may include installation of a new pipeline from the refinery north to the San Francisco Bay area; if so, the pipeline would potentially alter or destroy habitat for *L. nipomensis*. This project would likely be subject to both state and federal agency regulations.

In summary, although there are both state and federal regulatory mechanisms that would potentially apply to projects within *Lupinus nipomensis* habitat, none of them have been invoked since the time of listing. We believe that pending and future projects will be subject to available regulatory mechanisms.

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

At the time of listing, we discussed competition with nonnative species and stochastic extinction due to small size of populations and numbers as threats to *Lupinus nipomensis*. An analysis of these threats is contained in the final rule and appears to remain currently valid.

Nonnative Species

In general, invasion of this habitat by nonnative species (particularly veldt grass (see Bossard et

al. 2000)) is a threat to populations of native species because individuals cannot compete well for light, water, and resources (D'Antonio and Vitousek 1992). The expansion of veldt grass in *Lupinus nipomensis* habitat and its effects on the species were discussed in Factor A.

Stochastic Extinction

We continue to believe that the existence of less than 10 occurrences and the small number of individuals in the occurrences (Figure 1 and Table 1) place *Lupinus nipomensis* at risk of extinction from stochastic events. The conservation biology literature commonly notes the vulnerability of taxa known from one or very few locations and/or from small and highly variable populations (e.g., Shaffer 1981, 1987; Groom et al. 2006; Primack 2006). In particular, although the plants are apparently self-compatible and capable of self-fertilization, the small size of the population makes it difficult for this species to persist while sustaining the impacts of habitat alteration that favors nonnative plant species and the potential loss of pollinator habitat.

Climate Change

At the time of listing, we did not discuss the potential effects of climate change on the long-term persistence of *Lupinus nipomensis*. Current climate change predictions for terrestrial areas in the Northern Hemisphere indicate warmer air temperatures, more intense precipitation events, and increased summer continental drying (Field et al. 1999, Cayan et al. 2005, Intergovernmental Panel on Climate Change 2007). Recently, the potential impacts of climate change on the flora of California were discussed by Loarie et al. (2008). Based on modeling, they predicted that species' distributions will shift in response to climate change, specifically that the species will "move" or disperse to higher elevations and northward, depending on the ability of each species to do so. Species diversity will also shift in response to these changes with a general trend of increasing diversity shifting towards the coast and northwards with these areas becoming de facto future refugia. However, predictions of climatic conditions for smaller sub-regions such as California remain uncertain. It is unknown at this time if climate change in California will result in a warmer trend with localized drying, higher precipitation events, or other effects.

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 *Lupinus nipomensis* at this time.

III. RECOVERY CRITERIA

Recovery plans provide guidance to the Service, States, and other partners on ways to minimize threats to listed species and on criteria that may be used to determine when recovery is achieved. There are many paths to accomplishing recovery of a species and recovery may be achieved without fully meeting all recovery plan criteria. For example, one or more criteria may have been exceeded while other criteria may not have been accomplished. In that instance, we may determine that, over all, the threats have been minimized sufficiently, and the species is robust enough, to reclassify the species from endangered to threatened or perhaps to delist it. In other cases, new recovery opportunities unknown at the time the recovery plan was finalized may be more appropriate. Likewise, new information may change the extent that criteria need to be met for recognizing recovery of the species. Overall, recovery is a dynamic process requiring

adaptive management, and assessing a species' degree of recovery is likewise an adaptive process that may, or may not, fully follow the guidance provided in a recovery plan. We focus our evaluation of species status in this 5-year review on progress that has been made toward recovery since the species was listed (or since the most recent 5-year review) by eliminating or reducing the threats discussed in the five-factor analysis. In that context, progress towards fulfilling recovery criteria serves to indicate the extent to which threat factors have been reduced or eliminated.

A recovery plan for *Lupinus nipomensis* has not yet been developed; therefore no recovery criteria exist.

IV. SYNTHESIS

The status of *Lupinus nipomensis* does not appear to have changed substantially since the time of listing in 2000. Conservation measures have been undertaken to improve management of the habitat on several parcels. The Conservancy in partnership with adjacent landowners has been working to reduce the amount of veldt grass within *L. nipomensis* habitat. They have also been instrumental in carrying out an annual census of the species. Nevertheless, alteration of habitat due to the presence of veldt grass is a primary continuing threat to the species.

The most reliable census information from years 2006 through 2009 indicates that the total numbers of individuals of *Lupinus nipomensis* is very low and fluctuates annually. Pocket gopher predation has removed approximately 30 percent of the plants censused between 2007 and 2009. In addition, seed studies to date indicate that viable seed is being produced; however, germination rates in the wild appear to be lower than those in greenhouse studies. The combination of low numbers of individuals and the concentration of all occurrences in a small geographic area make this species vulnerable to stochastic extinction. We conclude that this taxon continues to be in danger of extinction throughout its currently known range and therefore meets the definition of endangered under the Federal Endangered Species Act; no status change is recommended at this time.

V. RESULTS

Recommended Classification:

- Downlist to Threatened
- Uplist to Endangered
- Delist (indicate reasons for delisting per 50 CFR 424.11):
 - Extinction*
 - Recovery*
 - Original data for classification in error*
- No Change

New Recovery Priority Number and Brief Rationale: N/A

VI. RECOMMENDATIONS FOR FUTURE ACTIONS

1. Complete a Recovery Outline and Species Action Plan for *Lupinus nipomensis* as a first step in preparing a recovery plan for the species.
2. Work with Conoco-Phillips and California Department of Transportation to ensure that management of their lands and rights-of-way is consistent with the long-term persistence of *Lupinus nipomensis* at those sites. In addition, work with the County of San Luis Obispo to ensure that consideration is given to *L. nipomensis* during projects review and implementation.
3. In partnership with Santa Barbara Botanic Garden, continue with research on seed characteristics, particularly to determine the extent of the soil seed bank present, and whether there is a difference in seed viability between those produced from self-fertilization and those produced by cross-pollination to determine if lack of pollinators is a concern.
4. In partnership with Santa Barbara Botanic Garden and the Conservancy, experiment with establishment of new populations in other coastal dune scrub habitat in coastal San Luis Obispo County.

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U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Lupinus nipomensis* (Nipomo lupine)

Current Classification: Endangered

Recommendation Resulting from the 5-Year Review:

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

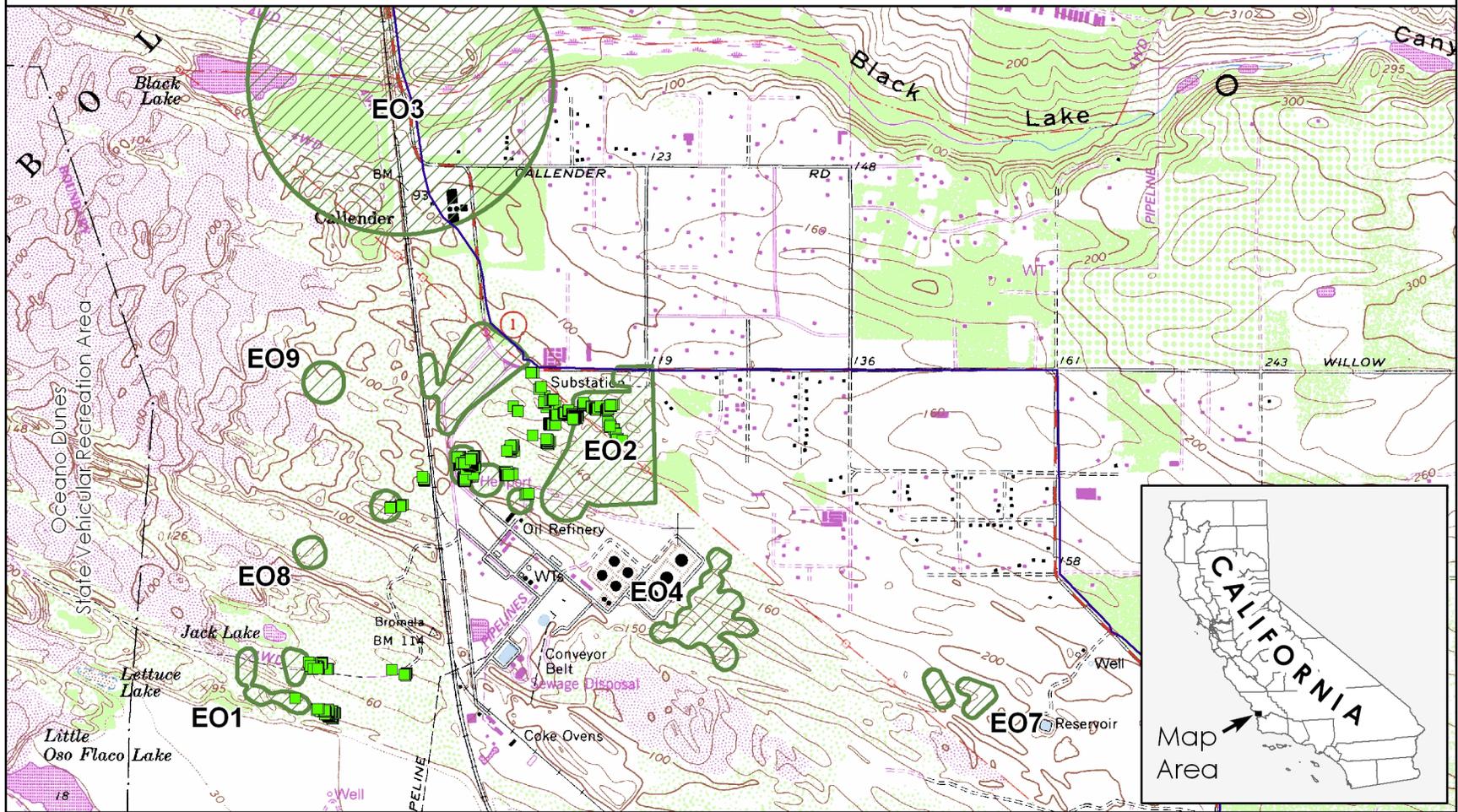
Review Conducted By: Connie Rutherford

FIELD OFFICE APPROVAL:

Field Supervisor, U.S. Fish and Wildlife Service

Approve Diane K. Wade Date 10/19/09

Appendix 1: Figure 1. Distribution of *Lupinus nipomensis* (Nipomo lupine), San Luis Obispo County, California



Nipomo Lupine Records

- Conservancy Records 2007-2009
- CNDDB 2009 records

U.S. Fish & Wildlife Service
 Ventura Fish & Wildlife Office
 September, 2009



Prepared for the 5-year Review