# *Lessingia germanorum*
# (San Francisco lessingia)

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

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

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# 5-YEAR REVIEW

*Lessingia germanorum (*San Francisco lessingia*)*

## 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:

As summarized from the Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula (Recovery Plan) (Service 2003), *Lessingia germanorum* (San Francisco lessingia) is an annual herb in the aster family (Asteraceae). Mature plants range from 5 centimeters (cm) (2 inches (in)) to 0.3 meter (m) (1.2 feet (ft)) in height. Plants develop from unbranched basal rosettes of oblanceolate leaves (spear-shaped but tapered at the base, wide and rounded at the tip). The leaves on mature stems are 0.5 to 3 cm (0.2 to 1.2 in) long, pinnately lobed, oblanceolate and are covered with grayish, dense woolly hairs. Tubular, lemon-yellow, disc flowers with a brownish or purplish band at the throat are clustered into heads that are solitary at the end of branchlets. The seeds, which are attached to a crown of hairlike bristles, are light and easily carried by the wind. *L. germanorum* typically flowers between August and November. Historically, *L. germanorum* occurred within central dune scrub habitats throughout the San Francisco peninsula. *L. germanorum* is currently restricted to the San Francisco Presidio on the San Francisco peninsula (seven occurrences) and near Hillside Park in Daly City near the base of San Bruno Mountain (one occurrence)(referred to as the Hillside Park occurrence in this report). The Hillside Park occurrence is located on privately-owned land, on San Bruno State and County Park land, and on private property within the boundary of the San Bruno Habitat Conservation Plan. *L. germanorum* grows on remnant sand dunes and sand terraces in open areas with blowing sand at an elevation range between 24 to 91 m (80 to 300 ft).

**Methodology Used to Complete This Review:**

This review was prepared by the Sacramento Fish and Wildlife Office (SFWO), following the Region 8 guidance issued in March 2008. We used information from the Recovery Plan (Service 2003), survey information from experts who have been monitoring various localities of this species, and the California Natural Diversity Database (CNDDB) maintained by the California Department of Fish and Game (CDFG). The Recovery Plan and personal communications with experts were our primary sources of information used to update the species' status and threats. We received no information from the public in response to our Federal Notice initiating this 5-year review. 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:**

**Lead Regional Office:** Larry Rabin, Deputy Division Chief for Listing, Recovery, and Environmental Contaminants, Pacific Southwest Region; (916) 414-6464.

**Lead Field Office:** Josh Hull, Recovery Division Chief, Sacramento Fish and Wildlife Office; Josh Hull, (916) 414-6600

**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 May 21, 2010 (75 FR 28636). No reports of information were received.

**Listing History:**

**Original Listing**
**FR Notice:** 62 FR 33368
**Date of Final Listing Rule:** June 19, 1997.
**Entity Listed:** *Lessingia germanorum*, a plant species.
**Classification:** Endangered

**State Listing**
*Lessingia germanorum* (San Francisco lessingia) was listed by the State of California as endangered in January 1990.

**Review History:** No status reviews that contain a five-factor analysis are known to have been completed since the species was listed.

**Species' Recovery Priority Number at Start of 5-Year Review:** The recovery priority number for *Lessingia germanorum* is 2C according to the Service's 2011 Recovery Data Call for the SFWO, 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 threats and has a high potential for recovery. The "C" indicates conflict with construction or other development projects or other forms of economic activity.

**Recovery Plan or Outline**

> **Name of Plan or Outline:** Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula
> **Date Issued:** August 8, 2003.

## 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 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, and the application of the DPS policy to the species' listing is not addressed further in this review.

### Information on the Species and its Status

Species Biology and Life History

Spatial Distribution At the time of listing in 1997, *Lessingia germanorum* was restricted to the Presidio area of the San Francisco peninsula (five occurrences), and the Hillside Park occurrence in Daly City near the base of San Bruno Mountain (one occurrence).

Currently the species is known to occur at seven locations in the Presidio (M. Chassé, National Park Service, *in litt*., October 26, 2011, p. 1;M. Chassé *in litt*., September 29, 2011) and at one occurrence near Hillside Park in Daly City (T. Corelli, California Native Plant Society, *in litt*., September 14, 2011; P. Kobernus, Coast Ridge Ecology, *in litt*., September 28, 2011; A. Meisel, TRA Environmental Services, *in litt*., September 26 and 29, 2011**).**

Abundance At the time of listing, the total area of all known populations was less than 0.8 hectares (ha) (2 acres (ac)). The number of individuals of *Lessingia germanorum* varies from year to year, but from 1980 to 1989 the annual total on the Presidio was less than 1,500. The Hillside Park occurrence was estimated at 1,600 to 1,800 individuals.

Currently, the occurrences on the Presidio occupy 2.4 ha (6 ac) and consist of an estimated mean of 129,133 plants (M. Chassé, *in. litt*., October 18, 2011, p. 2). In any given year, however, the

area occupied and the numbers of plants will vary due to factors such as vegetation changes and levels of stewardship (M. Chassé, *in. litt*., October 18, 2011, p. 2). In 2000, the Presidio occurrences were estimated at 1.6 million plants; however, in 2001 and 2002, the number dropped to 350,000 (May and Assoc., 2005, p. 21). This pattern was seen again in 2003 when numbers of plants in the Presidio rose to 1,065,000 and dropped to less than 164,000 a year later (May and Assoc., 2005, p. 21). While occurrences on the Presidio have increased significantly overall since 1994, they are being maintained artificially by habitat restoration efforts (May and Assoc., 2005, p. 21). Although the largest population, Lobos Creek, does not require additional seeding or intensive weeding, the smaller occurrences on the Presidio need regular weeding in order to persist (M. Chasse, pers. comm., December 12, 2011). For example, the Rob Hill occurrence declined after stewardship of the site stopped (M. Chasse, pers. comm., December 12, 2011).

Approximately 300 plants were found in a portion of the Hillside Park occurrence in 2011 (T. Corelli, *in litt*., September 14, 2011). This site is likely a part of an occurrence that in previous years occupied a larger area (P. Kobernus, *in litt*., September 28, 2011). Recently, the majority of this occurrence was surveyed and mapped (K. McIntire, *in litt*., December 11, 2011). Therefore, the Hillside Park occurrence is known to be still extant; however, the total number of plants and area occupied has not been estimated.

Habitat or Ecosystem Most populations are found in vegetation gaps in stabilized old sand dunes or sandy soils derived from ancient sandy coastal deposits. Dune shrubs such as *Ericameria ericoides* (goldenbush or mock heather) and *Lupinus chamissonis* (lupine) displace most dune annuals, such as *Lessingia germanorum,* over time in the absence of disturbance. *Lessingia germanorum* can grow in beach sands that are mechanically transported to back dune areas; however, the species cannot grow in the foredune/coastal strand habitat (M. Chassé, *in. litt*., October 18, 2011, p. 2).

Changes in Taxonomic Classification or Nomenclature No changes in classification or nomenclature have occurred since the time of listing.

Genetics No information on genetic variation, such as genetic drift or inbreeding, was reported for the species at the time of listing. Since that time, research by Markos and Baldwin (2002) indicates that there is distinct genetic variation between the Presidio populations and the Hillside Park population. Markos found that the amount of genetic variation between the two locations was equivalent to the amount found between other distinct species of *Lessingia*, for example between *L. germanorum* collected from the Presidio and *L. glandulifera* var. *glandulifera* (S. Markos, University of California, Berkeley, pers. comm., September 16, 2011; S. Markos, *in litt*., April 23, 2002). Although there is diversity in the genome of plants from the two locations, they are morphologically identical; the differences are not sufficient to elevate the Hillside Park plants to a separate species (S. Markos, pers. comm., December 6, 2011). No additional genetic research on this species is known to have been conducted since 2002.

Species-specific Research and/or Grant-supported Activities No research beyond the genetics studies noted above and two studies of pollinators in the San Francisco Presidio (Wood *et al*., 2005, Van Den Berg *et al*., 2010) have been done since the listing (M. Chassé, *in. litt*., October

18, 2011, p. 2). The latter two studies sampled several sites in the Presidio and were not focused on pollinators of *Lessingia germanorum* although one of study sites, Lobos Creek, is the location of one occurrence of the species.

**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.

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

*Factor A threats noted at the time of listing.*

Threats facing *Lessingia germanorum* occurrences on the Presidio at the time of listing included invasion of alien plants, sand quarrying, bulldozing, trampling and habitat damage by pedestrians and police horses. *Carpobrotus* sp. (fig-marigold) covered extensive dune areas on the Presidio and stabilized the dune system where it occurred. Stabilization of the dune system adversely affected *L. germanorum.* Native and introduced shrubs and trees, including *Pinus radiata* (Monterey pine), were planted on the Presidio in the late 1800's. These trees adversely altered the habitat of *L. germanorum* by increasing the amount of shade. In January 1989, most of the habitat for one population of *L. germanorum* on the Presidio was destroyed when sand was removed to repair a tee on the base golf course. Sand quarrying was an ongoing threat at this site.

At the Hillside Park occurrence, threats to the species at the time of listing included trampling by pedestrians and bicycles, and soil compaction by off-road vehicles that also promoted the establishment of invasive nonnative plants. In addition to *Carpobrotus* sp., other nonnative plants competing with *Lessingia germanorum* included *Cortaderia* sp. (pampas grass), *Bromus diandrus* (ripgut brome), *Avena barbata* (slender oat), *Rumex* sp. (dock), *Raphanus* sp. (radish), and *Sonchus* sp. (sow thistle). Weeds were removed from populations of *L. germanorum* by volunteers from the California Native Plant Society. About 4 ha (10 ac) of potential *L. germanorum* habitat remained on San Bruno Mountain (the Hillside Park occurrence). Urban development, including the construction of seven additional dwellings within a few hundred yards of the Hillside Park population, potentially threatened this occurrence. Fragmentation of the coastal scrub dune habitat caused by past urban development also threatened the species by altering the physical environment, changing the amount of incoming solar radiation, water, wind, or nutrients where the remnant vegetation occurs and, secondly, by reducing the size and distribution of the population, increasing the risk of extinction due to natural events. Bulldozing and sand quarrying adversely affected *L. germanorum*. Bulldozing to stabilize a slope on the Hillside Park occurrence destroyed about one-eighth of the *L. germanorum* population.

*Current status of Factor A threats*

Currently, nonnative annual grasses and forbs are still a threat to *Lessingia germanorum* on the Presidio; the most dominant nonnative grass within *L. germanorum* habitat is *Bromus diandrus*

(M. Chassé, *in. litt*., October 18, 2011, p. 2). The threats to *L. germanorum* from pedestrians, and hikers are considered to be low; digging dogs are a moderate threat; and soil compaction from police horses is not considered to be a threat (M. Chassé, *in. litt*., October 18, 2011, p. 2). Sand quarrying within the Presidio has not occurred within the last 25 years and is not considered to be a threat (M. Chassé, *in. litt*., October 18, 2011, p. 2).

Since the time of listing, 0.3 acre of *Lessingia germanorum* habitat on the Presidio in the Lobos Dunes occurrence was adversely affected at the base of Landfill 10. Landfill 10 was in the process of remediation by the Presidio Trust when heavy rain storms in late 2009 and early 2010, eroded loose soil from the landfill, burying *L. germanorum* plants and habitat downslope. A joint memo dated May 6, 2010, from the Presidio Trust and NPS (T. Thomas, Presidio Trust and S. Fritzke, NPS, *in litt*., May 6, 2010) summarized the damage to the *L. germanorum* habitat from the erosion and the completed or proposed habitat restoration actions. These actions included nonnative tree removal, duff removal, overlying silt removal, removal of woodpiles, and creation of the Baker Beach Corridor (a wind corridor through the forest with appropriate aspect and sand substrate for *L. germanorum*). Nonnative tree removal and silt removal have been completed (T. Thomas and S. Fritzke, *in litt*., May 6, 2010, p. 3). Proposed seeding of the remediated area with *L. germanorum* seed by NPS staff was part of an earlier consultation between the Service and Presidio Trust and NPS (T. Thomas and S. Fritzke, *in litt*., May 6, 2010, p. 2). *L. germanorum* seed will be collected from the Lobos Creek Valley occurrence on the Presidio in late 2011 or 2012 to reseed the damaged habitat at Landfill 10 (M. Chassé, *in. litt*., October 18, 2011, p. 1).

The City of Daly City Planning and Zoning records do not show the development of seven houses in the area surrounding the Hillside Park occurrence of *Lessingia germanorum* noted in the listing (T. Mothershead, City of Daly City, Planning and Zoning Department, Planning Manager, pers. comm., October 26, 2011). However, the owner of two parcels that support part of the Hillside Park occurrence recently submitted plans to the City of Daly City for development of a nine-lot subdivision, known as the Hillside Park Court Subdivision, on these parcels (J. Naughton, City of Daly City Planning and Zoning Department, pers. comm., December 6, 2011; K. McIntire, San Bruno Mountain Watch, *in litt*., November 29, 2011). The applicant has proposed to maintain one lot that supports *L. germanorum* as open space; however, details of this plan have not yet been submitted to the City of Daly City Planning and Zoning Department (J. Naughton, pers. comm., December 6, 2011). The owner of the parcels had two surveys for *L. germanorum* and other special status but non-listed plant species conducted in 2010 on their property (A. Meisel, *in litt*., September 26, 28, and 29, 2011, p. 1). The results of the surveys have not yet been submitted to the City of Daly City (J. Naughton, pers. comm., December 6, 2011). In addition, a road to access the development is proposed to be constructed through a third parcel that is part of Hillside Park and is also occupied by *L. germanorum* (K. McIntire, *in litt*., November 29, 2011).

Children sliding down the *Lessingia germanorum* dune habitat on pieces of cardboard and people walking their dogs are occasional disturbances at this site; however, public access has been limited to the site by a fence downslope of the plants which is stabilizing the sand (K. McIntire, *in litt*., October 25, 2011, p. 1; K. McIntire, *in litt*., October 27, 2011, p. 3). Weed removal has been conducted in this occurrence in recent years by volunteers from the City of

Daly City Department of Parks and Recreation, the California Native Plant Society (D. Bray, City of Daly City, Public Works Department, pers. comm., September 21, 2011), the Wilderness School (Ed Lopez, Wilderness School, pers. comm., October 24, 2011), and the San Bruno Mountain Watch (K. McIntire, *in litt*., October 25, 2011, p. 1). No weeding activities by the City of Daly City have occurred since January 2011 (D. Bray, pers. comm., September 21, 2011). Portions of the occurrence were surveyed in 2003 (P. Kobernus, *in litt*., September 28, 2011), 2010 (A. Meisel, *in litt*., September 26, 28 and 29, 2011), and 2011 (T. Corelli, *in litt*., September 14, 2011). Invasive plant species observed on the site in 2011 included *Bromus diandrus*, *Carpobrotus* sp., and *Rumex* sp., which were noted in the listing, as well as *Conyza canadensis* (horseweed) (T. Corelli, *in litt*., September 14, 2011, p.1). Despite the presence of invasive plants and disturbance from human activity such as trails and past terracing of the slope, Ms. Corelli estimated that a small portion of the site continued to support a vigorous population of 300 *L. germanorum* plants (T. Corelli, *in litt*., September 14, 2011). Therefore the occurrence is persisting in generally the same location known at the time of listing although its current size, condition, and threats are unknown.

In summary, loss and modification of occupied and suitable habitat and competition with nonnative annual grasses and forbs continue to be the primary threats to *Lessingia germanorum*. Even on the Presidio where habitat is protected, past development and planting of nonnative trees has resulted in habitat fragmentation and reduction of plant dispersal within and between populations. Remnant habitat that has been protected in small parcels is often subject to invasion by nonnative plants, changes in soil, and other conditions that serve to make the habitat less suitable for the species.

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

At the time of listing, overutilization was not known to be a threat to *Lessingia germanorum;* however, overcollection by researchers, rare plant collectors, or curiosity seekers could potentially result from the increased publicity following publication of the final rule to list this species. Overutilization for any purpose is not currently known to be a threat to the species.

**FACTOR C: Disease or Predation**

Disease or predation were not known to be a threat to the species at the time of listing and are not currently reported to be threats.

**FACTOR D: Inadequacy of Existing Regulatory Mechanisms**

*Factor D threats noted at the time of listing*

At the time of listing, regulatory mechanisms thought to have some potential to protect *Lessingia germanorum* included: (1) listing under the California Endangered Species Act (CESA); (2) the California Environmental Quality Act (CEQA) and the National Environmental Quality Act (NEPA); and (3) the Federal Endangered Species Act in those cases where *L. germanorum* occurs and is incidentally protected in habitat occupied by a listed wildlife species. The listing

rule (62 FR 333768) provides an analysis of the level of protection that was anticipated from those regulatory mechanisms. This analysis appears to remain currently valid. All but one remaining occurrence of *L. germanorum* are located on the Presidio which is managed as a National Recreation Area by the National Park Service. However, National Park Service ownership and management had not removed all of the threats to the species. In addition, a Memorandum of Understanding, established in 1987 between the Service, the National Park Service, Department of Defense, and CDFG for the purpose of mutual cooperation for management of sensitive native plant communities on the Presidio, does not address *L. germanorum* specifically (CDFG 1989). The State of California Fish and Game Commission listed *L. germanorum* as an endangered species under the California Endangered Species Act (chapter 1.5 section 2050 *et seq.* of the California Fish and Game Code) and the California Native Plant Protection Act (Chapter 10 section 1900 *et seq.* of the California Fish and Game Code). Though both statutes prohibit the "take" of State-listed plants (California Native Plant Protection Act, Chapter 10 section 1908 and California Endangered Species Act, Chapter 1.5 section 2080), State law exempts the taking of such plants via habitat modification or land use changes by the owner. After CDFG notifies a landowner that a State-listed plant grows on his or her property, State law only requires that the land owner notify the agency "at least 10 days in advance of changing the land use to allow salvage of such a plant" (California Native Plant Protection Act, Chapter 10 section 1913). The California Environmental Quality Act (CEQA) requires a full disclosure of the potential environmental impacts of proposed projects. The public agency with primary authority or jurisdiction over the project is designated as the lead agency, and is responsible for conducting a review of the project and consulting with the other agencies concerned with the resources affected by the project. Section 15065 of the CEQA Guidelines requires a finding of significance if a project has the potential to "reduce the number or restrict the range of a rare or endangered plant or animal." Species that are eligible for listing as rare, threatened, or endangered but are not so listed are given the same protection as those species that are officially listed with the State or Federal governments. Once significant effects are identified, the lead agency has the option to require mitigation for effects through changes in the project or to decide that overriding considerations make mitigation infeasible. In the latter case, projects that cause significant environmental damage, such as destruction of endangered species, may be approved. Protection of listed species through CEQA is, therefore, dependent upon the discretion of the lead agency. The CEQA pertains to projects that occur on lands other than Federal land. The National Environmental Policy Act (NEPA) requires disclosure of the environmental effects of projects on Federal lands. Certain actions can be categorically excluded from the NEPA process when (a) the action or group of actions would have no significant effect on the quality of the human environment, and (b) the actions or group of actions would not involve unresolved conflicts concerning alternative uses of available resources. Exceptions to the categorical exclusions exist. One of these exceptions is when the action would affect a species listed or proposed to be listed on the List of Endangered or Threatened Species. Until a species is federally listed or proposed for listing, this exception to the categorical exclusion would not be applied regardless of the State listing status.

*Current status of Factor D threats*

The San Bruno Mountain Habitat Conservation Plan (HCP), developed under section 10(a)(1)(B) of the Act, preserves most of San Bruno Mountain and provides for management and monitoring

of a variety of rare plants and animals. In 2003, a portion of the Hillside Park occurrence of *Lessingia germanorum* was found within the San Bruno Mountain HCP boundary (P. Kobernus, *in litt*., September 28, 2011; County of San Mateo, 2004, p. 55). Because the amount of habitat located within the HCP boundary is small, the HCP has not been amended to include this species and *L. germanorum* receives no protection from the HCP (M. Thomas, Fish and Wildlife Service, pers. comm., September 30, 2011).

The current General Plan of the City of Daly City has no protective measures specifically for the *Lessingia germanorum* at the Hillside Park site to restrict development on the private parcels that support listed species (T. Mothershead, City of Daly City, Planning and Zoning Planning Manager, pers. comm., October 24, 2011). In instances where a landowner proposes to develop land supporting *L. germanorum*, the City of Daly City Department of Planning and Zoning would coordinate with both the landowner and the Service to minimize effects to the species (T. Mothershead, pers. comm., October 24, 2011). The General Plan is undergoing revision; however, it is not yet known how listed species will be addressed in the new plan (T. Mothershead, pers. comm., October 24, 2011). The San Bruno Mountain Watch has written several letters to the City of Daly City with recommendations for revisions in the plan (K. McIntire, pers. comm., October 26, 2011).

In summary, the Endangered Species Act is the primary Federal law that provides protection for this species since its listing as endangered in 1997. Other Federal, State, and local 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 Endangered Species Act.

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

*Factor E threats noted at the time of listing*

On the San Francisco Presidio, the species was threatened at the time of listing by trampling and disturbance from pedestrians, bicycles, and off-road vehicles that degraded the habitat of *Lessingia germanorum.* Plants were damaged or destroyed when trail users wandered off the established trails and into populations of *L. germanorum.* The habitats of all Presidio populations of *L. germanorum* were subject to occasional disturbance by unauthorized vehicle use. This disturbance directly destroyed the plants and encourages establishment of invasive alien plants. An environmental education camp existed near the location of one occurrence of *L. germanorum.* This occurrence was inadequately fenced, leaving the habitat vulnerable to degradation and the plants vulnerable to trampling. In addition, the park is patrolled by police on horseback. Horses can trample the plants directly and compact the soil. Garbage dumping had degraded the habitat at one site on the Presidio where *L. germanorum* occurred. Digging by pets also adversely affected *L. germanorum* at all sites on the Presidio by destroying individual plants.

At the Hillside Park occurrence, fertilizer-contaminated run-off from a housing development above the slope supporting this occurrence of *Lessingia germanorum* threatened the site. The

nitrogen in fertilizers promotes invasion by weedy species that compete with *L. germanorum*. The final rule noted that by reducing the size and distribution of an occurrence, habitat fragmentation increased the risk that a natural event such as a pest or disease outbreak or reproductive failure could cause extinction of the species, particularly because it is an annual species. A natural event, such as a flood, pest or disease outbreak, extended drought, landslide, or combination of several such events, could destroy part of a single occurrence or entire occurrences. The risk of extirpation due to genetic problems associated with small occurrences could increase with fragmentation or reduction of an occurrence into small, isolated units.

*Current status of Factor E threats*

As noted under Factor A discussion of current threats, trampling and disturbance by pedestrians and bicycles in the Presidio are considered a low threat; off-road vehicles are not considered a threat (M. Chassé, *in. litt*., October 18, 2011, p. 3). Disturbance by digging dogs is considered a moderate threat (M. Chassé, *in. litt*., October 18, 2011, p. 3). The environmental camp discussed in the listing, which is likely the Rob Hill Campground adjacent to the Rob Hill *Lessingia germanorum* occurrence, does not present a threat to the species. The recent renovation of the campground has increased the stewardship of this occurrence due to volunteer programs based out of the campground to remove nonnative grasses from *L. germanorum* habitat (M. Chassé, *in. litt*., October 18, 2011, p 3).

At the Hillside Park site, it is not known if run-off is occurring from a housing development above the site and whether it threatens the species. Habitat mapping and monitoring since the listing were done only on portions of this occurrence; therefore, it is not known if the site has been reduced in size or undergone further fragmentation since that time.

*New threats since the time of listing*

<u>Succession of habitat from openings in older dunes to stable dune scrub</u>

In the absence of disturbance, back dunes on the Presidio that are capable of supporting *Lessingia germanorum* go through a succession to stable dune scrub which does not support the species. Large scale projects that result in the removal of dune scrub will need to be considered to maintain the *L. germanorum* over time (M. Chassé, *in. litt*., October 18, 2011, p 3).

<u>Climate change</u>

A new threat since the time of listing is climate change. 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, IPCC 2007). 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 particular species, including *Lessingia germanorum*, at this time. Although there is uncertainty

on the effects of climate change on this species, the vulnerability of the species to significant shifts in climate is increased by the natural and artificial barriers to dispersal (M. Chassé, *in. litt*., October 18, 2011, p 3).

Loss of pollinators

Loss of pollinators is another potential threat that was not noted at the time of listing. Spence (1964) determined that *Lessingia* species are generally self-incompatible (infertile when restricted to self-fertilization) making the presence of appropriate pollinators necessary for seed production. Information on California pollinators which was published in 1979 (Krombein *et al*. 1979), lists five species of native bees that visit the *Lessingia germanorum*. They include *Andrena baeriae*, *Hoplitis productus gracilis*, *Anthophora urbana urbana*, *Exomalopsis nitens*, and *Ashmeadiella californica californica* (Krombein *et al*. 1979, pp. 1799, 2018, 2026, 2118, and 2164). Two recent studies of bee diversity have been conducted at several sites in the Presidio (Wood *et al*. 2005, Van Den Berg *et al*. 2010). The study conducted in 2004 (Wood *et al*, 2005) established a baseline of species and numbers of bees found at nine sites on the Presidio. The study conducted in 2008 (Van Den Berg *et al*. 2010) resampled three of these sites and added a new previously unsampled site. A comparison of the results of the two studies at the three sites in common, Thompson Reach, Lobos Dunes (the site of a *L. germanorum* occurrence), and the World War II Memorial, revealed a number of differences between the studies. Overall, the average bee species richness and abundance at the three previously samples sites were greater in 2004 with 47 species and 1,283 individuals compared to 36 species and 878 individuals in 2008 (Van Den Berg *et al*. 2010, p. 4). At the World War II Memorial site; however, a different trend was observed in 2008. Bee diversity increased from 15 species in 2004 to 26 species in 2008 although five species including the common bumblebee, *Bombus vosnesenskii*, had declined dramatically. Abundance of bees at this site more than doubled from 192 individuals in 2004 to 391 in 2008 (Van Den Berg *et al*. 2010, p. 5). The identity of the plants being visited by the pollinators monitored in these studies was not recorded.

In summary, *Lessingia germanorum* is threatened by habitat fragmentation which increases the risk at all occurrences to events such as erosion and landslides, reduced seedset from loss of pollinators, and change in climate which could result in too much or too little rainfall as well as increased barriers to dispersal.

## III. RECOVERY CRITERIA

*Lessingia germanorum* is included in the final Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula (Recovery Plan) which was published August 8, 2003. Recovery plans provide guidance to the Service, States, and other partners and interested parties on ways to minimize threats to listed species, and on criteria that may be used to determine when recovery goals are achieved. There are many paths to accomplishing the 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 downlist or delist the species. In other cases, new recovery approaches and/or opportunities unknown at the time the recovery plan was finalized may be

more appropriate ways to achieve recovery. 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.

The recovery strategy for *Lessingia germanorum* is based on protecting and expanding the existing populations within native coastal dune scrub vegetation, followed by active reintroduction and expansion of *L. germanorum* in unoccupied, restored, or enhanced habitat within its historic range. The strategy includes the identification of recovery units: the Presidio Recovery Unit, the Southern Recovery Unit, and the Satellite Recovery Unit. These units are further subdivided into areas with site-specific actions.

Interim Recovery Criteria These recovery criteria primarily address listing Factors A (present or threatened destruction, modification, or curtailment of its habitat or range) and D (inadequacy of existing regulatory mechanisms), and secondarily Factor E (other natural or manmade factors affecting its continued existence).

*Presidio Recovery Unit*:

The management goal for this unit is to achieve a self-sustaining *Lessingia germanorum* population continuous across the recovery unit by allowing the current populations to spread and join together. Total cover of nonnative plants should be less than 5 percent; however, if a thriving *L. germanorum* population is established over the full range of weather conditions with a controlled weed presence, the management target may be able to be changed.

1. Lobos Dunes Reserve: No significant net decline in numbers of plants should occur. Nonnative vegetation should be reduced to less than 5 percent maximum cumulative annual cover with annual decreases. The percentage of sand surface with bare/sparse dune surface must be at least 20 percent cover in patches greater than 3 meters over the entire Lobos Dunes site. Substrate conditions within 30 centimeters (12 inches) surface depth must match old dune sand.

2. Battery Caulfield Roadside Reserve: The population should not decline below 1,000 plants in any three consecutive years. Population should intermittently reach or exceed 5,000 plants. Nonnative vegetation must be reduced to less than 20 percent peak annual cover. Sand surface with bare/sparse dune surface must be at least 10 percent cover.

3. Wherry (Feral) Dunes Reserve: The population should not decline below 5,000 plants in any three consecutive years.

4. Rob Hill Reserve: The population should not decline below 5,000 plants in any three consecutive years, with intermittent years reaching or exceeding 10,000 plants over a precipitation cycle.

5. Public Health Services Hospital Reserve: The combined populations of the Public Health Services Hospital site and the Golf Course site should not decline below 5,000 plants in any three consecutive years. Neither population may decline below 1,000 plants in any year.

The Interim Recovery Criteria have been met for all areas within the Presidio Recovery Unit with the exception of the Battery Caulfield Roadside Reserve. All other subpopulations in the Presidio Recovery Unit exceed the minimum thresholds of 5,000 plants in the Recovery Plan. The Battery Caulfield site has been threatened by nonnative trees and has generally decreased in the number of *Lessingia germanorum* plants over the last 10 years. In 2011, this site had 11 plants. The mean number of plants at the Lobos Dunes Reserve has been near or over 100,000 plants within the macroplot for the last six years and an equal number of plants are estimated to exist outside the macroplot (M. Chassé, *in litt*., July 29, 2011, p. 2).

*Southern Recovery Unit*

1. Daly City Reserve: The population should not decline below 50,000 plants over any three consecutive years. Intermittent peak year population sizes should exceed 200,000 plants. Nonnative vegetation should not increase within occupied *Lessingia germanorum* habitat during more than two consecutive years.

The Hillside Park occurrence has not been surveyed in its entirety. The area occupied by the species at this site is currently unknown; therefore, it is not known whether this recovery criterion has been met. Nonnative vegetation removal on the privately-owned portion of the occurrence stopped in January 2011 (D. Bray, pers. comm., September 21, 2011). There is no weeding or management of the portion of the population within the San Bruno Mountain County Park (A. Meisel, *in litt*., September 26, 2011).

2. Fort Funston Reserve: Establish recreation management needs for maintenance of a dune scrub community at this Reserve through completion of the study identified in the Stepdown Narrative and Implementation Schedule. Reintroduce a population from founders from the Daly City population which should persist over a full precipitation cycle. This population must achieve a size of 500,000 plants within 10 years of transplantation.

This recovery criterion has not been met. No reintroduction actions have yet taken place at Fort Funston; however, GGNRA proposes to eventually pursue reintroduction of *Lessingia germanorum* at this location using seed from the Hillside Park site after the GGNRA Dog Management Plan is finalized (M. Chassé, *in. litt*., October 18, 2011, p. 4).

*Satellite Recovery Unit*

> Seed samples of 500 seeds from at least 25 parents (not clusters of siblings) must be collected randomly throughout each site annually. Each annual collection should be stored appropriately at either Golden Gate National Recreation Area nursery or local botanical gardens. Seed should also be deposited at a Center for Plant Conservation-approved botanical garden

This criterion has not been met. No seed is known to have been collected within the Presidio since the listing; however, seed is proposed to be collected from several occurrences in the Presidio in 2011 (B. Young, Golden Gate National Parks Conservancy, pers. comm., October 17, 2011; B. Young, *in litt*., October 18, 2011).

Long-Term Recovery Criteria: The Recovery Units must be permanently protected as natural area reserves with vegetation management priorities and objectives dedicated to the persistence of the *Lessingia germanorum* populations. These recovery criteria primarily address listing Factor A (present or threatened destruction, modification, or curtailment of its habitat or range) and, secondarily, Factor E (other natural and manmade factors affecting its continued existence).

*Presidio Recovery Unit*

1. Lobos-Wherry-Baker Dune Reserve

> a. Structural habitat criteria: The complex must be restored to a continuous dune field with (i) unobstructed wind fetch to the Golden Gate, (ii) locally steep dune slopes and sparse vegetation, and (iii) full solar exposure.
>
> b. Population and vegetation criteria: Nonnative vegetative cover should be maintained below five percent annual peak cover. *Lessingia germanorum* population size should not fall below 500,000 in any three consecutive years. Population peaks of several million *L. germanorum* plants should occur within 10 years.

2. Rob Hill Reserve

> a. Structural habitat criteria: Area supporting suitable habitat for *Lessingia germanorum* must be increased to 2 hectares (5 acres) by removing nonnative vegetation. The southwest slope of Rob Hill must be restored to sparse low dune scrub.
>
> b. Population and vegetation criteria: Population size should not fall below 100,000 plants following expansion of habitat for any three consecutive years. Peak population size should exceed one million plants following dune restoration. Nonnative vegetation cover should be reduced to less than five percent.

3. Public Health Service Hospital Site

a. Structural habitat criteria: The vegetation on the slope north of the Hospital should be modified to promote the necessary southwest wind influence, promoting viable *Lessingia germanorum* habitat on the upper plateau of that slope. The restored dune habitat must be at least 3 hectares (7 acres). Nonnative trees and shrubs around the local oak woodland dune remnant must be removed from the areas to be restored to dune scrub habitat.

b. Population and vegetation criteria: The population size of the plateau north of the Hospital should intermittently reach or exceed 300,000 plants within 10 years and should not fall below 50,000 in any 3 consecutive years. Nonnative vegetation should be reduced to less than 5 percent seasonal cover.

*Southern Recovery Unit*

1. Daly City

a. Structural habitat criteria: Recovery criteria do not apply.

b. Population and vegetation criteria: At least 1.2 hectares (three acres) of this site must be cleared of nonnative vegetation to establish at least 50,000 *Lessingia germanorum* plants. Minimum population size for any three consecutive years should be 50,000 plants with peaks of 200,000 plants. Nonnative vegetation should not increase within any portion occupied by *L. germanorum*.

2. Fort Funston

a. Structural habitat criteria: 30 hectares (75 acres) should be dedicated to dune restoration and management for the *Lessingia germanorum*. A 4 hectare (10 acre) area of remnant dunes should be managed for reintroduction of *L. germanorum*.

b. Population and vegetation criteria: The reintroduced Fort Funston population derived from seed obtained from the Hillside Park site must achieve a minimum of 500,000 plants within 10 years after the founder plants are transplanted.

*Satellite Recovery Unit*:

The exact location of restorable dune areas were not known at the time the recovery plan was written; however, the two general areas for restoration are Sunset Heights and Sutro Heights. Preliminary criteria for this unit are: cumulative population size among all of the remnant dunes must reach 100,000 plants within 10 years after founder plants are introduced.

*Areas adjacent to the Presidio Recovery Unit to be evaluated*:

> Evaluate whether the West Washington Housing area contributes to the continuous functional habitat necessary to reduce edge effects on the *Lessingia germanorum* population.

*Buffer areas adjacent to the Presidio Recovery Unit*:

> The Rob Hill Buffer and Public Health Services Hospital Buffer are areas which are not suitable for restoration to dune scrub habitat but their management can contribute to the long-term viability of *Lessingia germanorum* by reducing threat of invasive plants.

None of the long-term recovery criteria have been met. The exact locations of the Satellite Recovery Units have not been identified and the availability of sites capable of cumulatively supporting 100,000 plants is unknown; therefore, it is not known if this criterion is relevant and up to date. The remaining long-term recovery criteria are relevant and up to date.

## IV. SYNTHESIS

At the time of listing in 1997, five occurrences of *Lessingia germanorum w*ere known to exist on the San Francisco Presidio, a part of the National Park Service's Golden Gate National Recreation Area, in San Francisco and one occurrence on privately-owned land in Daly City near Hillside Park. Currently, there are seven known occurrences at the Presidio and one population near Hillside Park. The numbers of plants in most occurrences in the Presidio have increased significantly but only as a result of habitat restoration and ongoing maintenance. The dune habitat that supports *L. germanorum* goes through succession to dune scrub in the absence of disturbance making large-scale opening of coastal scrub habitat through projects such as removal of the Wherry Housing, tree removal in Baker Beach Corridor, and shrub removal necessary to maintain the presence of the species on the Presidio. The Hillside Park occurrence is located on privately-owned land that has received only volunteer weed management. Currently, no organization or agency is overseeing the maintenance and management of this site. The species is threatened by a low number of populations, competition from nonnative annual grasses and forbs, dune succession, changes in rainfall and limitation of range in which to disperse resulting from climate change, potential loss of pollinators with resulting reduction of seed production, and inadequate protection under Federal, State, and local regulations. Therefore, we believe *L. germanorum* still meets the definition of endangered, and recommend no status change 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:** No change is recommended.

## VI. RECOMMENDATIONS FOR ACTIONS OVER THE NEXT 5 YEARS

1. Identify a lead organization to monitor and manage the Hillside Park occurrence in Daly City. Encourage a volunteer weeding program at this site with coordination and assistance from City of Daly City, San Bruno Mountain Watch, California Native Plant Society, other environmental groups, landowners, and school groups.

2. Continue control of invasive plants, particularly annual grasses and forbs, through ongoing stewardship on the Presidio.

3. Expand *Lessingia germanorum* habitat in the Presidio through implementation of the Presidio Vegetation Management Plan objectives, particularly in the Wherry Reserve area.

4. Collect seed from all populations for accession at approved seed banking facilities and for outplanting within the Presidio and at other suitable habitat within the historic range of the species.

5. Formulate adaptive management strategies for native dune scrub succession that would mimic natural disturbance where such natural processes have been reduced or eliminated entirely.

## VII. REFERENCES CITED

[CDFG] California Department of Fish and Game. 1989. Report to the Fish and Game Commission on the status of San Francisco lessingia (Lessingia germanorum). California Department of Fish and Game, Natural Heritage Division Status Report 89-15, unpublished report. August. 15 pp.

Cayan, D., M. Dettinger, I. Stewart, and N. Knowles. 2005. Recent changes towards earlier springs: early signs of climate warming in western North America? U.S. Geological Survey, Scripps Institution of Oceanography, La Jolla, California.

Field, C.B., G.C. Daily, F.W. Davis, S. Gaines, P.A. Matson, J. Melack, and N.L. Miller. 1999. Confronting climate change in California. Ecological impacts on the Golden State. A report of the Union of Concerned Scientists, Cambridge, Massachusetts, and the Ecological Society of America, Washington, DC.

[IPCC] Intergovernmental Panel on Climate Change. 2007. Climate change 2007: the physical science basis. Summary for policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC

Secretariat, World Meteorological Organization and United Nations Environment Programme, Geneva, Switzerland.

Krombein, K. V., P.D. Hurd, and D. R. Smith. 1979. Catalog of Hymenoptera in America north of Mexico, Vol. 2. Smithsonian Institution Press, Washington, D.C. Pp. 1199-2209.

Markos, S. and B. Baldwin. 2002. Structure, molecular evolution, and phylogenetic utility of the 5' region of the external transcribed spacer of 18S-26S rDNA in *Lessingia* (Compositae, Astereae). Molecular Phylogenetics and Evolution 23(2):214-228.

May and Associates, Inc. 2005. Amendment to the Presidio of San Francisco Biological Assessment dated November 16, 2001. San Francisco, California. 42 pp.

County of San Mateo. 2004. San Bruno Mountain Habitat Conservation Plan, Year 2003 Activities Report for Endangered Species Permit PRT-2-9818. January 31. 105 pp.

[Service] U.S. Fish and Wildlife Service. 1997. Endangered and threatened wildlife and plants; Endangered status for the plant *Lessingia germanorum* (San Francisco lessingia) from California. Federal Register 62: 33368-33374.

[Service] U.S. Fish and Wildlife Service. 2003. Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula. U.S. Fish and Wildlife Service, Portland, Oregon. xvi + 304 pp.

Spence, W. L. 1964. A Biosystematic Study of the Genus *Lessingia* Cham. (Compositae). Ph.D. dissertation, University of California.

Van Den Berg, J., C. Quock, and J. Hafernik. 2010. Comparative Study of Bee Diversity in Restored Habitats in the Presidio San Francisco. Prepared for Presidio Trust. May 24. 14 pp.

Wood, H., V. Moore, C. Fenter, M. Culpepper, J. Nicolloff, and J. Hafernik. 2005. Bee Diversity in Restored Habitats in the Presidio San Francisco. Prepared for the Presidio Trust. January 31. 9 pp.

*In Litteris*

Chassé, Michael. 2011. Golden Gate National Recreation Area, National Park Service. Electronic message from Mr. Chassé to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding the Lobos Creek macroplot, Landfill 10, and threats. July 29. 3 pp.

Chassé, Michael. 2011. Golden Gate National Recreation Area, National Park Service. Electronic message from Mr. Chassé to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding numbers of *Lessingia germanorum* plants on the Presidio. September 29. 1 p. + 1 attachment.

Chassé, Michael. 2011. Golden Gate National Recreation Area, National Park Service. Electronic message from Mr. Chassé to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding *Lessingia germanorum* on the Presidio. October 18. 5 pp.

Chassé, Michael. 2011. Golden Gate National Recreation Area, National Park Service. Electronic message from Mr. Chassé to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding total number of *Lessingia germanorum* occurrences on the San Francisco Presidio. October 26. 1 p.

Corelli, Toni. 2001. California Native Species Field Survey Form. *Lessingia germanorum.* CNDDB Element Occurrence 7, northeast of Hillside Park, Daly City, CA. September 14, 2011. Submitted to California Natural Diversity Database. 2 pp.

Kobernus, Patrick. 2011. Electronic message from Patrick Kobernus to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding a 2003 *Lessingia germanorum* survey report for the Hillside Park occurrence. September 28.

Markos, Staci. 2002. Peer review letter to Wayne White, Field Supervisor, Sacramento Fish and Wildlife Office, regarding the Draft Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula. April 23. 2pp.

McIntire, Ken. 2011. Electronic message from Ken McIntire, San Bruno Mountain Watch, to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding weeding and management of *Lessingia germanorum* at Hillside Park site. October 25.

McIntire, Ken. 2011. Electronic message from Ken McIntire, San Bruno Mountain Watch, to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding weeding and management of *Lessingia germanorum* at Hillside Park site. October 27.

McIntire, Ken. 2011. Electronic message with attachments from Ken McIntire, San Bruno Mountain Watch, to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding proposed development on *Lessingia germanorum* occurrence at Hillside Park site. November 29.

McIntire, Ken. 2011. Electronic message with attachment from Ken McIntire, San Bruno Mountain Watch, to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding location of *Lessingia germanorum* occurrence in relation to proposed development at Hillside Park site. December 11.

Meisel, Autumn. 2011. Electronic message from Autumn Meisel to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding weeding and management of *Lessingia germanorum* at Hillside Park site. September 26.

Meisel, Autumn. 2011. Electronic message from Autumn Meisel to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding mapping of *Lessingia germanorum*. September 28.

Meisel, Autumn. 2011. Electronic message from Autumn Meisel to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding location of Hillside Park site of *Lessingia germanorum*. September 29.

Thomas, Terri and Susan Fritzke. 2010. *Lessingia germanorum germanorum* analysis for Landfill 10. Requested by Chris Nagano, Sacramento Fish and Wildlife Office. Completed by Terri Thomas (Presidio Trust) and Sue Fritzke (NPS). May 6, 2010. 3pp.

Young, Betty. Electronic message from Betty Young, Golden Gate National Parks Conservancy, to Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding seed collection on the Presidio. October 18. 2 pp. + attachment.

Personal Communications

Bray, Dennis. 2011. City of Daly City Department of Public Works. Telephone conversation with Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding management of the Hillside Park occurrence of *Lessingia germanorum.* September 21.

Chassé, Michael. 2011. Golden Gate National Recreation Area, National Park Service. Telephone conversation with Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding maintenance needed to maintain *Lessingia germanorum* occurrences on the San Francisco Presidio. December 12.

Lopez, Ed. 2011. Wilderness School. Telephone conversation with Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding weeding of Hillside Park occurrence of *Lessingia germanorum*. October 24.

Markos, Staci. 2011. Jepson Herbarium and Department of Integrative Biology, University of California, Berkeley. Telephone conversation between Staci Markos and Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding genetic variability of *Lessingia germanorum*. September 16, 2011.

Markos, Staci. 2011. Jepson Herbarium and Department of Integrative Biology, University of California, Berkeley. Telephone conversation between Staci Markos and Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding genetic variability of *Lessingia germanorum*. December 6, 2011.

McIntire, Ken. 2011. San Bruno Mountain Watch. Telephone conversation with Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding weeding and management of *Lessingia germanorum* at Hillside Park site. October 26.

Mothershead, Tatum. 2011. City of Daly City, Department of Economic and Community Development, Planning and Zoning. Telephone conversation with Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding consideration of *Lessingia germanorum* at the Hillside Park population in city planning documents. October 24.

Mothershead, Tatum. 2011. City of Daly City, Department of Economic and Community Development, Planning and Zoning. Telephone conversation with Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding proposed or past development within *Lessingia germanorum* habitat at the Hillside Park population. October 26.

Naughton, Jeannie. 2011. City of Daly City, Department of Economic and Community Development, Planning and Zoning. Telephone conversation with Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding Hillside Park Court Subdivision. December 6.

Thomas, Mike. 2011. Conservation Planning Division, Sacramento Fish and Wildlife Office. Conversation with Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding presence of *Lessingia germanorum* within the San Bruno Habitat Conservation Plan boundaries. September 30.

Young, Betty. 2011. Golden Gate National Parks Conservancy. Telephone conversation with Elizabeth Warne, Sacramento Fish and Wildlife Office, regarding seed collection on the Presidio. October 17.

**U.S. FISH AND WI LDLIFE SERVICE**
**5-YEAR REVIEW**

***Lessingia germanorum* (San Francisco lessingia)**

**Current Classification**:

**Recommendation Resulting from the 5-Year Review**:

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

**Review Conducted By**: _Elizabeth Warne, Sacramento Fish and Wildlife Office__

**Date Submitted to Region 8**: _____

**FIELD OFFICE APPROVAL**:

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

Approve _____ Date 20 June 2012