Monterey Gilia
(*Gilia tenuiflora* ssp. *arenaria*)

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
Monterey Gilia (*Gilia tenuiflora* ssp. *arenaria*)

TABLE OF CONTENTS

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1. GENERAL INFORMATION

Gilia tenuiflora ssp. *arenaria* is an annual herbaceous plant in the phlox family (Polemoniaceae). As summarized in the Recovery Plan for this subspecies (Service 1998), individual plants are less than 17 centimeters (6.7 inches) tall, with a basal rosette of leaves and white and purple funnel-shaped flowers. This subspecies is endemic to the Monterey Bay and Peninsula dune complexes. Fifteen known natural occurrences are distributed in discontinuous populations from Spanish Bay on the Monterey Peninsula north to Moss Landing. *Gilia t.* ssp. *arenaria* is typically associated with sandy soils of dune scrub, coastal sage scrub, and maritime chaparral vegetation types in the coastal dunes of Monterey County, California.

1.1. Methodology used to complete the review:

This review was carried out by staff of the Ventura Fish and Wildlife Office, U.S. Fish and Wildlife Service (Service). Information was collected from a variety of sources including the Internet, published and unpublished literature, and personal communications with experts in the field and with various private and public entities. Additionally, the California Department of Fish and Game's Natural Diversity Database (CNDDB) was used extensively to identify population occurrences.

1.2. Reviewers

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1.3. Background:

1.3.1. FR Notice citation announcing initiation of this review:

The initial Federal Register (FR) notice was published on March 22, 2006 (71 FR 14538) and initiated a 60-day request for information. A second FR notice was published on April 3, 2006 (71 FR 16584) to clarify the contact offices. No information was received as a result of these notices.

1.3.2. Listing history

Original Listing
FR notice: 57 FR 27848
Date listed: June 22, 1992
Entity listed: subspecies (*Gilia tenuiflora* ssp. *arenaria*)
Classification: endangered

1.3.3. Associated rulemakings

None

1.3.4. Review History

None

1.3.5. Species' Recovery Priority Number at start of 5-year review: 9. This denotes a subspecies that faces a moderate degree of threat and has a high potential for recovery.

1.3.6. Recovery Plan or Outline

Name of plan or outline: Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly

Date issued: September 29, 1998

Dates of previous revisions, if applicable: None

2. REVIEW ANALYSIS

2.1. Application of the 1996 Distinct Population Segment (DPS) policy

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

2.2. Recovery Criteria

2.2.1. Does the species have a final, approved recovery plan containing objective, measurable criteria?

__X__ **Yes**
_____ **No**

2.2.2. Adequacy of recovery criteria.

2.2.2.1. Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?

____ **Yes**
__X_ **No**

The recovery criteria do not take into consideration new information about seed bank, the use of fire as a management tool, and land use changes associated with the closure and re-use of lands at former Fort Ord.

2.2.2.2. Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria (and is there no new information to consider regarding existing or new threats)?

__X_ **Yes**
_____ **No**

2.2.3. List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information (for threats-related recovery criteria, please note which of the 5 listing factors are addressed by that criterion. If any of the 5-listing factors are not relevant to this species, please note that here):

Listing Factors B and C are not applicable to this taxon.

The downlisting criteria for *Gilia tenuiflora* ssp. *arenaria* from the recovery plan are as follows:

1. Habitat occupied by the taxon that is needed to allow delisting has been secured with long-term commitments and, if possible, endowments to fund conservation of the native vegetation (addresses Listing Factor A). This criterion has not been fully achieved. Some private lands have already been purchased by the Big Sur Land Trust with the primary goal of the acquisition being the preservation of open space and threatened and endangered species. Efforts to acquire other privately-owned lands have yet to be made. We consider this criterion to be appropriate with respect to the recovery of the taxon; however, it should be revised to include measurable goals and to identify important geographic areas for acquisition.

2. Management measures are being implemented to address the threats of invasive species and other problems, including grazing, pedestrians, and off-road vehicles at some sites (addresses Listing Factor A). This criterion has not been fully achieved. Much work has been done to mitigate these threats at some sites, but not enough measures have been implemented at sites throughout the range of the subspecies for this criterion to be considered met. We consider this

criterion to be generally appropriate, but it needs to be revised to provide more useful guidance related to the threats listed.

3. Monitoring indicates that management actions are successful in reducing threats of invasive non-native species (addresses Listing Factor A). This criterion has not been fully achieved. Some sites do have programs in place for control of invasive, non-native species. However, monitoring of *Gilia tenuiflora* ssp. *arenaria* itself has been inadequate at most sites, and little or no monitoring of invasive species has been undertaken that documents increases or decreases of such species. We consider this criterion to be appropriate with respect to the recovery of the taxon.

4. Additional restored habitat has been secured, with evidence of either natural or artificial long-term establishment of additional populations, and long-term commitments (and endowments, where possible) to fund conservation of the native vegetation (addresses Listing Factor A). This criterion has not been achieved. Under direction of management activities proposed in a draft Habitat Conservation Plan (HCP) for the lands to be transferred from former Fort Ord to the Bureau of Land Management (BLM), the University of California, and California State Parks, there will be protection of a large amount of additional habitat (Zander and Associates 2007). This transfer has yet to take place, and plans for restoration work must still be drafted and undertaken. This planned transfer shows promise toward at least partially satisfying this criterion in the future. We consider this criterion to be appropriate with respect to the recovery of the taxon; however, it should be revised to include measurable goals.

Delisting criteria from the recovery plan are as follows:

1. Habitat throughout this taxon's range is protected from encroachment of non-native species, recreational activity (including off-road vehicles [ORVs] and horses), and development (addresses Listing Factor A). This criterion has not been achieved (see downlisting criterion 2 above). We consider this criterion to be appropriate with respect to the recovery of the taxon; however, it should be revised to include measurable goals.

2. Habitat throughout this taxon's range is restored to native vegetation at proper densities to allow natural colonization by this plant (addresses Listing Factor A). This criterion has not been achieved. We consider this criterion to be appropriate with respect to the recovery of the taxon; however, it should be revised to include measurable goals.

3. Habitat throughout this taxon's range is monitored sufficiently to assure that local threats are spotted promptly (addresses Listing Factor A). This criterion has not been achieved. We consider this criterion to be inappropriate with respect to the recovery of the taxon. This criterion should be revised to address the implementation of management actions to respond to encountered threats rather than simply identifying them.

4. Enough plants are at enough locations throughout this taxon's range and within the protected vegetation to reasonably assure the viability of the taxon (addresses Listing Factor A). For this criterion, the recovery plan includes a detailed list of sites and recommended population sizes for each site (see Appendix 1). This criterion has not been achieved. We consider this criterion to be inappropriate with respect to the recovery of the taxon. Simple numbers of individuals are inadequate, in any one season, to describe the health or status of a species. This is especially true of annual plant species, as discussed further below.

5. In addition to the specific criteria listed for *Gilia tenuiflora* ssp. *arenaria* in the recovery plan, an overarching narrative statement addressing delisting criteria for all the plants included in the plan is also applicable. Only two items in this narrative section differ significantly from the criteria mentioned above.

a. (Re)introduced populations should be naturally reproducing in vegetation that also appears to be persisting without excessive maintenance or "gardening" (addresses Listing Factor E). This criterion has not been fully achieved. Control of non-native species is necessary at all *Gilia tenuiflora* ssp. *arenaria* reintroduction sites for which information is available. Native vegetation is out-competed at some of these sites and persists only due to intensive maintenance. We consider this criterion to be appropriate with respect to recovery of this subspecies.

b. The determination that delisting is possible must be based on at least 15 years of monitoring for the endangered taxa, to include wet and drought years (addresses Listing Factor E). This criterion has not been fully achieved. No occurrence of *Gilia tenuiflora* ssp. *arenaria* has been monitored for 15 years. We consider this criterion to be appropriate with respect to recovery of this subspecies.

2.3. Updated Information and Current Species Status

Gilia tenuiflora ssp. *arenaria* inhabits a relatively small geographic area in western Monterey County, California. It is found within two distinct geographic habitat types, coastal dune habitats and an inland maritime chaparral habitat (all of the latter occurs at former Fort Ord). We have summarized generalized trends for the taxon throughout its range in this section; more detailed information and discussion on the status of the taxon in the coastal dune habitats and the inland maritime chaparral habitat is included in Appendix 1. Of the coastal occurrences, three of the 17 that are listed in the California Natural Diversity Data Base (CNDDB) are likely extirpated. Approximately half of the potentially extant coastal occurrences occur on State, Federal, and local agency lands, and half occur on private lands.

2.3.1. Biology and Habitat

Aside from one publication on a seed bank study, most of the new information regarding *Gilia tenuiflora* ssp. *arenaria* contained herein has been gleaned from unpublished reports and assessments, and discussions with biologists and managers that have made anecdotal observations in the field. In the following discussion, individual population records are referred to as Element Occurrences (EO's), in accordance with the tracking system used by the California Natural Diversity Data Base (CNDDB).

Distribution

Gilia tenuiflora ssp. *arenaria* is a small annual plant that is endemic to the coastal portion of Monterey County between the Salinas River in the north and the Monterey Peninsula in the south (see map, next page). It is found on sandy soils exhibiting limited soil development and is associated with two dune complexes along the immediate coast – the Monterey Bay dune complex and the Monterey Peninsula dune complex – that span approximately 22 miles of coastline. These dune complexes are on young dunes from the Holocene era. The overall range of the taxon along the coast has not been reduced over the time it has been tracked by botanists. However, given the distribution of sandy soils along this stretch of coastline, it is likely that populations within this stretch have been extirpated over the past 100 years with the conversion of coastal vegetation to agriculture, commercial and residential development, military training, and recreation (Service 1992).

Three coastal populations have likely been extirpated since the time of listing (see Table 1) and attempts to establish two mitigation populations have been undertaken. One population (EO #6) was extirpated during the development of Spanish Bay Golf Course (CNDDB 2006). A second population (EO #11) extirpated was a transplanted population established as mitigation for the destruction of the Spanish Bay Golf Course population (EO #6) mentioned previously (CNDDB 2006). The third population (EO #24) was likely extirpated also as a result of development (J. Dorrell-Canepa, pers. comm. 2006). Another population (EO #30) has not been observed since 1994 due to habitat type conversion; however, plantings of *G. t.* ssp. *arenaria*, conducted as part of mitigation, established the taxon in neighboring areas (more details are available in Appendix 1 – 4.a.) (P. Slattery, pers. comm. 2006). While these extirpations are not on the boundary of the known range of this subspecies, and so do not represent a reduction in overall range, they do constitute a further fragmentation of the overall range. Additionally, EO's #6 and #11 were 2 of a cluster of 4 isolated occurrences which make up the southernmost extent of the subspecies' range. The loss of these increases the chance of range reduction in the future.

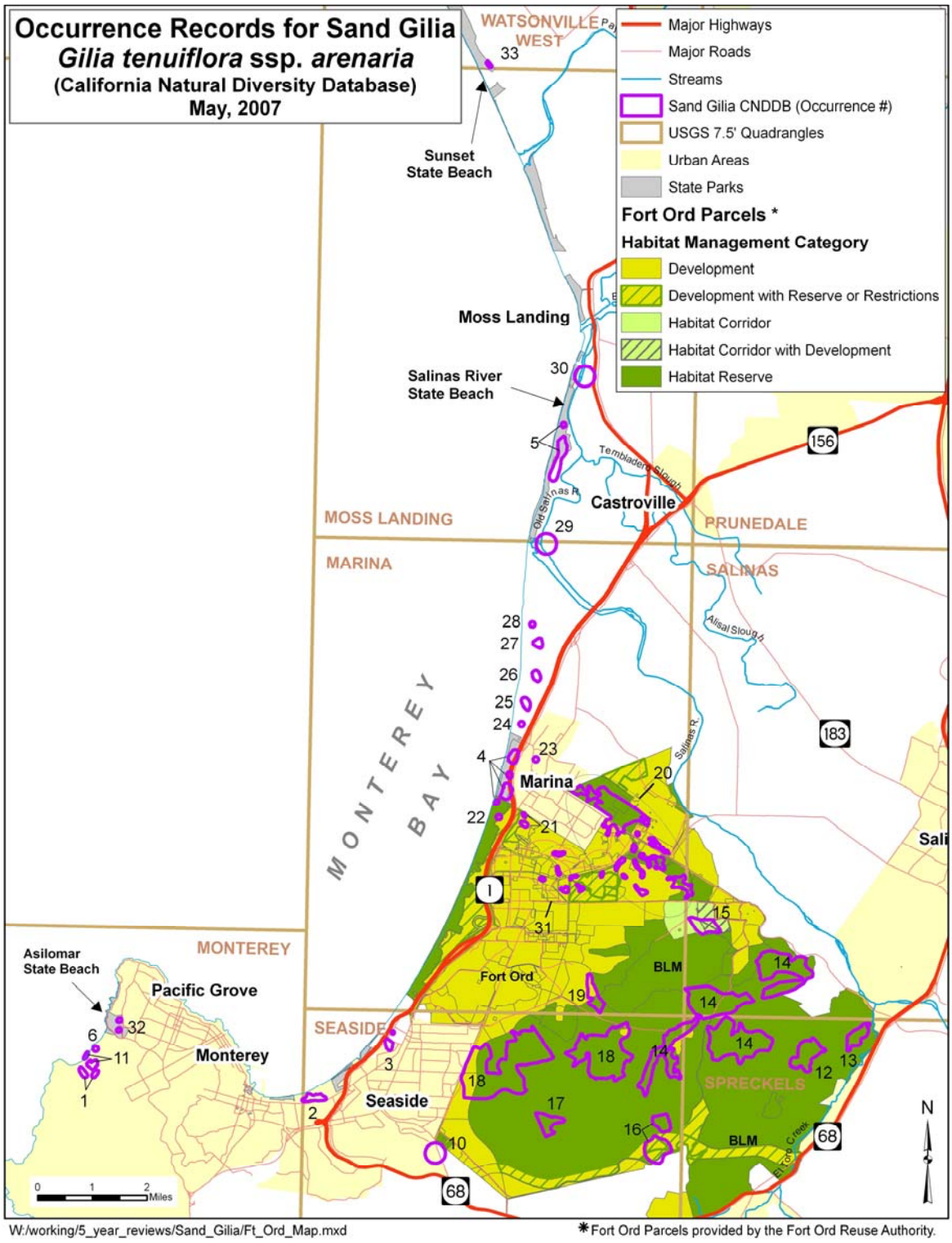

Figure 1. Occurrence records for *Gilia tenuiflora arenaria* and future land use designations on former Fort Ord (derived from CNDDB 2007 and the Fort Ord Reuse Authority).

In addition to populations along the immediate coast, the taxon is found in 13 occurrences on sandy soils remaining from Pleistocene-era dunes, which form a dune sheet that extends from the immediate coast into the interior in the vicinity of former Fort Ord over a distance of eight miles (Service 1998) (Figure 1). Few of these interior populations were known to the Service before the final rule was published, and therefore represent an expansion inland of the populations that were previously known; although these interior populations appear to be large in areal extent based on mapped polygons, they tend to be much less dense than the coastal populations. One of these occurrences (EO #10) has been extirpated due to development of a roadway since listing, and another (EO #23) was extirpated as the result of development; plantings of *Gilia tenuiflora* ssp. *arenaria* were undertaken nearby as mitigation (more details are available in Appendix 1 – 4.a.) (J. Felton, *in litt.* 2006). Information regarding the success of the associated mitigation site was not available for this review. Although the newly discovered occurrences constitute a range extension from what was known at the time of listing, the overall range of the taxon is still extremely limited.

Table 1. Relationship between ownership of lands and location and status of *Gilia tenuiflora* ssp. *arenaria* occurrences (derived from CNDDB 2006; B. Delgado, pers. comm. 2006; J. Dorrell-Canepa, pers. comm. 2006; and P. Slattery, pers. comm. 2006.)

	Coastal occurrences discovered relative to listing in 1992		Inland occurrences discovered relative to listing in 1992		Status of occurrences at the time of this review		
	1992 and before	After 1992	1992 and before	After 1992	Extant	Extirpated	Unknown
Private lands	7	3	2	0	1	5	6
Public lands	3	4	0	11	14	0	4

Changes in Land Ownership:

One of the largest factors affecting the long-term persistence of *Gilia tenuiflora* ssp. *arenaria* is the transfer of lands from the Department of the Army's former Fort Ord to other Federal, State, and local agencies. The Ford Ord Re-Use Authority will oversee the transfer of these lands, as dictated in the Fort Ord draft HCP, to mitigate take of listed species associated with the transfer and future development of Army properties at former Fort Ord (Zander and Associates 2007). This process is ongoing and will likely take several years to complete. Under the Fort Ord draft HCP, several occurrences along the western edge of former Fort Ord (EO's #21 and #31 and a relatively large geographic area of EO #20) are in parcels that are identified for transfer (Zander and Associates 2007). These areas, surrounding the City of Marina, are designated for development and while relatively small in acreage contain high quality habitat and a high density of individuals (S. Worcester,

pers. com. 2006). Development of these lands will constitute the loss of some of the most productive and high density occupied inland habitat known for this subspecies (S. Worcester, pers. com. 2006).

Most of the remaining occurrences in the central and eastern portion of former Fort Ord are identified for transfer to BLM, which intends to manage these lands for the conservation of *Gilia tenuiflora* ssp. *arenaria* and a suite of other sensitive taxa that occur there, and for limited recreational use. However, the density of *G. t.* ssp. *arenaria* individuals within these occurrences appears to be low (U.S. Army Corps of Engineers [ACOE] 1992; BLM 2003). In addition, a significant part of this area is still being cleared of unexploded ordnance (ACOE 2006). Observations suggest that the use of prescribed burns in areas supporting low-density occurrences of *G. t.* ssp. *arenaria* may reduce competition from other native plants and increase the density of *G. t.* ssp. *arenaria* by allowing establishment of individuals from persisting seed banks and by allowing colonization of unoccupied habitat. The effectiveness of prescribed burns will need to be assessed as part of an adaptive management program prior to the formulation of long-term management guidelines for the preservation lands.

Along the coast, the non-profit Big Sur Land Trust has acquired a private parcel that otherwise might have been subject to development. While some land transfers will benefit the long-term conservation of the subspecies, other transfers will result in the loss of some populations and an increase in the fragmentation of habitat, particularly in the area that provides connectivity between coastal and interior populations. The net result of all land transfers is therefore uncertain.

Population Dynamics:

As an annual plant, *Gilia tenuiflora* ssp. *arenaria* can go through large changes in number of individuals from year to year, and late-season rainfall can markedly affect germination and growth (Dorrell-Canepa 1994; Fox et al. 2005). Population censuses that span at least 10 years have been conducted at only a few locations. The number of individuals at Marina State Beach has fluctuated from a low of 5,000 individuals in 1987 to a high of 25,000 individuals in 1993; the number of individuals at Salinas River State Beach has fluctuated from a low of 1,665 individuals in 1987 to a high of 13,500 individuals in 1993 (CNDDB 2006).

The annual fluctuation in numbers can make analysis of recovery and management techniques difficult. For instance, the prescribed burn regimen called for in the current Fort Ord draft HCP may result in an increase in population numbers, spatial distribution, and extent within this geographic area. However, long-term monitoring is necessary to generate data useful in determining population trend or causality.

Seed Bank Ecology:

A recent study has shown that *Gilia tenuiflora* ssp. *arenaria* may have long-lived seeds which create a relatively persistent soil seed bank (Fox et al. 2005). This indicates a subspecies adapted to variable climatic conditions where successful germination events, which have the potential to recharge seed banks, may only occur in years with very specific conditions (Fox et al. 2005). After a large burn on former Fort Ord property during ordnance clearing, *G. t.* ssp. *arenaria* emerged even in areas where it had not been observed pre-burn (B. Collins, pers. comm. 2006). It is likely that the seed bank persisted from a time when the habitat conditions were conducive to the existence of *G. t.* ssp. *arenaria* populations at this location, and the clearing of competing species by the prescribed burn created more favorable conditions. Furthermore, in burned areas with observed populations pre-burn, density of individuals increased and overall plant size was larger for at least two years after the burn (B. Collins, pers. comm. 2006). It has been shown that seed production in this subspecies is largely a function of plant size (Dorrell-Canepa 1994). Taken together, these observations suggest *G. t*. ssp *arenaria* is a subspecies which has adapted to germinate when conditions are favorable for maximal seed production.

Habitat Condition – Competition with Non-native Species:

Most EO's of *Gilia tenuiflora* ssp. *arenaria* either seem to have a high cover of non-native plants already established or are being encroached upon. Those with reduced cover of non-native vegetation have frequently undergone extensive eradication and/or control projects. *Gilia t.* ssp. *arenaria* requires semi-open areas of sandy soil to germinate and to thrive (L. Madison, pers. comm. 2006; B. Collins, pers. comm. 2006; B. Delgado, pers. comm. 2006). The taxon is generally found in sparse scrub communities, and does not compete well in the denser vegetation structure often exhibited by many non-native species. In addition, non-native grasses may be detrimental to the survival of this subspecies due to excessive soil stabilization and litter accumulation, both of which lead to more advanced soil development and a decline in suitability of *G. t*. ssp. *arenaria* habitat conditions (Pickart 1997, Russo et al. 1988). Extensive control of non-native plants is necessary at virtually all EO's of this subspecies. Manual removal and herbicide treatment have been successful in control of non-native plants. Prescribed burns have been used effectively to reduce vegetation density and litter accumulation. Due to the pervasive presence of non-native species throughout the geographic range of the subspecies, reinvasion is likely and management of non-native species will be required in perpetuity.

Taxonomic and Genetic Considerations:

It has been observed that in the more inland areas of its distribution, *Gilia tenuiflora* ssp. *arenaria* has morphological characteristics that intergrade with *G. t.* ssp. *tenuiflora* (Dorrell-Canepa, 1994). Baseline surveys on former Fort Ord lands in 1992 assumed that all *G. t.* ssp. *tenuiflora* plants observed were *G. t.* ssp. *arenaria*, due to the difficulty of identification in the eastern portion of the former base (BLM 2003). Later surveys by BLM personnel also followed this protocol to simplify their procedures (BLM 2003). It is important to understand the morphological and

genetic variability in *G. t.* ssp. *arenaria* in inland areas, because most of the future development on former Fort Ord is planned for the western half of the base. Preservation of populations farther north and east, including where the taxonomy is in question, is intended as mitigation for the development-associated losses in the western areas, and additional work will clarify the taxonomic identities of *Gilia* plants at Fort Ord (Porter 2007).

2.3.2. Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

2.3.2.1. Present or threatened destruction, modification or curtailment of its habitat or range:

The original listing of *Gilia tenuiflora* ssp. *arenaria* was due to degradation of suitable habitat via encroachment of non-native invasive plant species, trampling, habitat removal for development, and off-road vehicle (ORV) activity (57 FR 27848; Service 1998). Threats from trampling and ORV activity have decreased substantially as fencing, boardwalks, and signage have been installed on most lands that are accessible to the public along the coast (e.g., Salinas and Marina State Parks).

One of the greatest current threats to this subspecies is continuing destruction of habitat due to development. While future development will be precluded at some sites by virtue of being transferred to entities that will manage for their conservation (e.g., Big Sur Land Trust, University of California, and BLM at former Fort Ord), other sites are slated for future development. Specifically, six EO's (#21, #31, and portions of #15, #16, #18, and #20) occur on lands along the western margin of former Fort Ord and are under development threat. Mitigation is identified in the Fort Ord draft HCP for the management of former Fort Ord lands that are being transferred to BLM and local agencies. This mitigation will protect a large, continuous tract of former Fort Ord land in the central and eastern portions of the former base that will be transferred to BLM; however, the density of individuals within these occurrences appears to be low. The western areas of former Fort Ord that are to be developed are relatively small in acreage, but contain a high density of individuals. The effectiveness of prescribed burns will need to be assessed as part of an adaptive management program, prior to the formulation of long-term management guidelines for the preservation lands. Although the implementation of the re-use strategy currently prescribed by the Fort Ord draft HCP has the potential for increasing the suitability of habitat for *G. t.* ssp. *arenaria* in the interior portion of its range, transfer of former Fort Ord lands along the western edge of the base to other local agencies will likely increase fragmentation of suitable habitat for this taxon.

The threats to the primary occupied habitat of *Gilia tenuiflora arenaria* was examined as four distinct area types based on inland versus coastal areas and

private versus public ownership status. A more detailed examination of these area types and threats is available in Appendix 1.

Coastal occurrences on public lands (State Parks):
Five of the seven extant coastal occurrences (71%) on public lands are currently being managed to control non-native invasive plants, recreational impacts, and development. One unprotected occurrence is to be managed under a management plan currently under development.

Coastal occurrences on private lands:
One of the seven potentially extant coastal occurrences (14%) on private lands is currently being managed to control non-native, invasive plants, recreational impacts, and development.

Inland occurrences on public lands (State Parks):
Six of 11 inland occurrences (55%) on public lands are under threat of at least partial development. This threat is contingent upon mitigation and management under the Fort Ord Draft HCP still under development. Recreational impacts and control of non-native, invasive plants will also be managed under this HCP (Zander and Associates 2007).

Development also continues to result in secondary impacts to remaining populations of *Gilia tenuiflora* ssp. *arenaria.* Human activities, including the use of adjacent areas for recreation, hastens the spread of invasive non-native species (particularly iceplant (*Carpobrotus* spp.), jubata grass (*Cortaderia jubata*), and annual grasses (*Festuca* spp., *Avena* spp., and others)), alters the structure and composition of remaining habitat, and compacts loose, sandy soils, all of which decreases suitability of remaining habitat for *G. t*. ssp. *arenaria* (BLM 2003).

Habitat threats to extant populations of *Gilia tenuiflora* ssp. *arenaria* are detailed in Appendix 1.

2.3.2.2. Overutilization for commercial, recreational, scientific, or educational purposes:

Not a factor at the time of listing and not currently a factor.

2.3.2.3. Disease or predation:

Herbivory has been observed by individuals conducting surveys and research on this subspecies (L. Fox *in litt.* 2006; T. Hyland pers. com. 2006). This poses a potentially serious threat to this subspecies (Service 1998), but actual effects are currently unknown. Herbivory has been found to increase with an increase in cover for small herbivorous species such as rabbits (McGraw

2004). This could link increases of herbivory to natural fire cycle suppression and should be investigated further.

2.3.2.4. Inadequacy of existing regulatory mechanisms:

At the time of Federal listing, the final rule discussed concerns with the limited protections provided to *Gilia tenuiflora* ssp. *arenaria* by virtue of its status as a state-threatened subspecies (57 FR 27848). State-listed taxa are afforded limited protection under the California Endangered Species Act, the California Environmental Quality Act (CEQA), the Native Plant Protection Act (NPPA), and Local Coastal Programs and Land Use Plans approved by the California Coastal Commission. The final rule discusses the fact that while "take" is prohibited under state-listing protections, such protections are ineffective. Specifically, state law requires that the land owner only needs to inform the Department of Fish and Game "…at least 10 days in advance of changing the land use to allow for salvage of such plant. The failure by the department to salvage such plant within 10 days of notification shall entitle the owner of the land to proceed without regard to this chapter." (Chapter 10, section 1913, California Department of Fish and Game Code). No changes have been made to these regulatory mechanisms since listing and the associated threat to the species remains.

The Coastal Commission considers the presence of *Gilia tenuiflora* ssp. *arenaria* as a criterion in its determination of environmentally sensitive habitat. Environmentally sensitive lands are subject to Section 30240 of the Coastal Act, which requires their protection. Certain local jurisdictions have developed their own Local Coastal Programs or Land Use Plans that have been approved by the Coastal Commission. Local jurisdictions with such approved protective plans or programs in place that directly affect this taxon include the County of Santa Cruz, the County of Monterey, and the cities of Marina, Sand City, Seaside, Monterey, and Pacific Grove.

On State, county, and private lands, *Gilia tenuiflora* ssp. *arenaria* receives protections of the Federal Endangered Species Act where there is a nexus to a Federal agency involved in permitting, funding, or authorizing a project on those lands. Section 10 of the Act provides for Service issuance of incidental take permits to non-Federal entities that prepare, fund, and implement a Service-approved HCP for the affected taxa. However, since the time of listing, there have been few activities on private land that have involved a Federal nexus. The Fort Ord draft HCP, for example, is being prepared to mitigate the incidental take of listed taxa associated with transfer and development of former Army lands to local entities. The only other consultation initiated for this subspecies under the Act was the East Dunes draft HCP started by a developer in Sand City (EO #3) and eventually abandoned. This draft HCP has been inactive since 2000. Though limited regulatory protections remain a concern for *G. t.* ssp. *arenaria* in certain

locations where there is no Federal nexus, overall, this poses less of a threat than other factors.

2.3.2.5. Other natural or manmade factors affecting its continued existence:

One of the main threats to this taxon is competition from invasive, non-native species (57 FR 27848). These species are typically able to colonize disturbed habitats and quickly reach high densities. In coastal areas, iceplant (*Carpobrotus* ssp.) and exotic annual grasses are the most problematic invasive species for *Gilia tenuiflora* ssp. *arenaria*. California State Parks is managing these taxa with herbicides and hand-pulling (T. Hyland, *in litt.* 2006). However, reinvasion of these taxa from adjacent, unmanaged areas makes it difficult to remove this threat. In inland areas, jubata grass (*Cortaderia jubata*), iceplant, and annual grasses (*Festuca* spp., *Avena* spp., and others) are the most problematic invasive species for *G. t.* ssp. *arenaria* (Mactec Engineering and Consulting Incorporated 2002, 2003, and 2004). Annual grasses are particularly difficult to remove once they have colonized an area. Non-native grasses decrease the suitability of habitat for *G. t.* ssp. *arenaria* due to excessive soil stabilization and litter accumulation (Pickart 1997, Russo et al. 1988).

Other human-caused factors that could affect the inland occurrences at former Fort Ord, aside from those previously mentioned, are vegetation management activities that fail to create or maintain the open, sandy conditions necessary for continued survival and colonization by *Gilia tenuiflora* ssp. *arenaria*. These include the elimination of fire from chaparral communities, poorly timed (e.g., wet season) prescribed fires, the use of pre-fire treatments that result in increases in non-native species, and the use of mechanical vegetation clearing that leaves the chipped vegetation on the soil surface (Zander and Associates 2007). These threats were not addressed in the initial listing rule, as these inland occurrences were unknown at the time of listing. Vegetation management activities on former Fort Ord are being addressed in Endangered Species Act section 7 consultations with the Army and in the Fort Ord draft HCP that will guide future management of the inland sites of *G. t.* ssp *arenaria* (Zander and Associates 2007).

2.4. Synthesis

There are likely 24 currently extant occurrences of *Gilia tenuiflora* ssp. *arenaria*; 7 occurrences were known at the time the subspecies was listed. Since listing, 11 additional inland occurrences of *G. t.* ssp. *arenaria* have been located, 12 coastal occurrences have been located, and 5 occurrences have likely been extirpated; one occurrence was extirpated prior to listing. Although these inland occurrences may constitute a range extension from what was known at the time of listing, the overall range of the taxon is still extremely limited. It is also unclear as to where the range of the subspecies *G. t.* ssp. *arenaria* ends and the range of *G. t.* ssp. *tenuiflora* begins. There is also the possibility that some cross-breeding is

occurring on the boundary between these subspecies. Genetic analyses should be undertaken to confirm the range extents within this species.

The primary threats to *Gilia tenuiflora* ssp. *arenaria* at this time relate to habitat destruction due to development and an increase in cover by invasive, non-native plant species which inhibit germination and colonization of this taxon. The interior sites are generally more at risk than coastal populations. Development is a threat primarily at Fort Ord while invasive species are a threat throughout the species' range. The coastal populations of *G. t.* ssp. *arenaria* on State Park lands are relatively more protected than interior sites at this time, although non-native plant control is required at virtually all sites and repeated out-plantings have had to be used to maintain numbers and expand population areas. Because invasive species are a concern throughout the Monterey Bay region, it is likely that they pose a threat to *G. t.* ssp. *arenaria* on private parcels in this area as well. However, little information is available regarding the status of occurrences on private lands along the coast.

In summary, the status of *Gilia tenuiflora* ssp. *arenaria* since the time of listing has likely improved at some sites by virtue of current or planned management for conservation. Along the coast, acquisition of one private parcel by Big Sur Land Trust and management activities within the State Park units have been a benefit to the long-term conservation of the taxon. At inland sites, the current and future transfer of lands from former Fort Ord to the University of California and BLM will also potentially benefit the long-term conservation of the taxon. However, planned losses of habitat along the western edge of former Fort Ord via land transfers to local agencies for development, and likely future development of other private lands along the coast, will result in direct losses of populations, secondary impacts to a portion of the remaining populations, and increased fragmentation of remaining habitat particularly between the coastal and inland populations. For all remaining populations, both coastal and inland, threats due to invasive species will persist and, as is generally the case with invasive species, will likely require management in perpetuity (Bossard et al. 2000). Such management is more likely to take place on sites that are being managed for conservation; habitat on sites not being managed for conservation is degrading over time and may not support *G. t.* ssp. *arenaria* in the future. For occurrences to be truly considered secure there must be protections in place to protect the habitat from development, unregulated recreation, and habitat conversion due to the vegetative changes induced by a disruption in natural fire cycles. At the time of this review, only 5 occurrences (EO's #1, #2, #4, # 5, and #33) are fully managed to protect them from such threats. This indicates that about 79 percent of extant occurrences are without adequate protection.

Therefore, our assessment is that threats to the continued survival of *Gilia tenuiflora* ssp. *arenaria* discussed at the time of listing persist at a major portion of the sites that support the taxon; land transfers and conservation management activities that have or will benefit the taxon at a portion of its sites do not offset continuing threats. We believe *G. t.* ssp. *arenaria* still meets the definition of endangered under the Act and recommend that no change in listing status should be made at this time.

3. RESULTS

3.1. 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
_X_ No change is needed

3.2. New Recovery Priority Number:

N/A (retain existing recovery priority number of 9)

3.3. Listing and Reclassification Priority Number, if reclassification is recommended:

N/A

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

1. A reworking of the recovery criteria listed in the recovery plan should be undertaken. The specific population sizes recommended in delisting criteria #4 are difficult to correlate with the observed distribution of occurrences in the field. Using specific numbers for annual species with persistent seed banks, as previously discussed, is not necessarily valuable as an indicator of species status. A more useful indicator should be identified to indicate the quality and status of the habitat that is supporting the various populations.

2. Improved coordination between State and Federal agencies and local landowners would increase information sharing and maximize conservation and recovery efforts. Aside from the work being done for the re-use of former Fort Ord properties, very little communication is currently occurring between different parties involved with the management of this subspecies. Little or no information was available for many of the privately owned parcels of land believed to support occurrences of this subspecies. Attempts to establish conservation easements or acquire properties containing coastal dune habitat that supports this and other rare and endangered species should be made. Conducting surveys of these lands to determine whether or not extant populations still exist would be valuable. Directed oversight through coordination of information, overall strategies, and implementation of uniform methodologies would allow for implementation of much more powerful adaptive management techniques.

3. Long-term monitoring programs at more known occurrences of *Gilia tenuiflora* ssp. *arenaria* should be undertaken. Due to the strong influence of annual precipitation on observable population size, this monitoring should be habitat-based or in another way address the issue of dormant soil seed banks. This monitoring should include monitoring of pre-fire vegetation and herbivory rates on portions of former Fort Ord that will be burned under the prescribed burn plan in the Fort Ord draft HCP. Information regarding control of non-native plants, community structure, herbivory, and germination of *G. t.* ssp. *arenaria* from persisting seed

banks or new colonization in cleared areas may provide invaluable information for future management efforts.

4. Initiate surveys to locate suitable habitat for out-planting sites in areas that are managed for conservation and that could support *Gilia tenuiflora* ssp. *arenaria.* For instance, out-plantings to areas such as Salinas River National Wildlife Refuge could complement recovery efforts elsewhere. If populations were to become established in such areas, they could also function as seed bank sources or reserves for other populations that are at risk of extirpation.

5. Seed collection should be initiated where populations are at risk of extirpation, including at former Fort Ord. Seeds should be stored at appropriate facilities, such as the Rancho Santa Ana Botanic Garden, for future greenhouse seed production, genetic analyses, or direct recovery plantings. In conjunction with this, genetic analyses should be initiated to determine the geographic boundaries of *Gilia tenuiflora* ssp. *arenaria* and *G. t.* ssp. *tenuiflora* and the level of interbreeding, if any, occurring in the wild populations. This should be done prior to out-plantings from questionable populations in order to maintain genetic distinctiveness and accurately assess habitat requirements for each taxon.

6. Initiate controlled burn studies on former Fort Ord to determine the recovery potential of inland populations lost to unnaturally dense shrub communities. This should be undertaken to determine the conservation value of potential reserve areas prior to the finalization of proposed HCPs.

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APPENDIX 1

Additional information and analysis pertaining to conclusions regarding delisting criteria and threats analysis. *Gilia tenuiflora* ssp. *arenaria* occupies two distinct habitat types, coastal dune and inland maritime chaparral (all of the latter occurs at former Fort Ord). Of the coastal occurrences, five that are listed in the CNDDB (EO's #6, #11, #23, #24, and #30) are likely extirpated. Since half of the extant coastal occurrences occur on State, Federal, and local agency lands, and half occur on private lands, we have further divided the following information on coastal occurrences into two categories based on land ownership.

1. Habitat throughout this taxon's range is protected from encroachment of non-native species, recreational activity (including ORVs and horses), and development (addresses Listing Factor A).

Coastal occurrences on public lands (state parks): Seven of the 30 total occurrences of *Gilia tenuiflora* ssp. *arenaria* (23 percent) are located on public lands in coastal areas.

Non-native species encroachment:
Most of the coastal occurrences on public lands have ongoing exotic plant control programs (J. Dorrell-Canepa, pers. comm. 2006; D. Dixon, pers. comm. 2006; Harlan 2006; Hyland, *in. litt.* 2006; L. Madison, pers. comm. 2006). Most commonly, herbicides are used for this control during the non-growing season for *Gilia tenuiflora* ssp. *arenaria*, with some hand-pulling of non-natives when conditions make the use of chemicals inappropriate. The most common invasive plants that threaten *G. t.* ssp. *arenaria* are iceplant (*Carpobrotus edulis*) and ripgut brome (*Bromus diandrus*). One site, Sunset State Beach, has a population of veldt grass (*Erharta calycina*) for which eradication efforts are ongoing (Hyland, *in. litt.* 2006). The original population at Watchtower Hill in Moss Landing has been lost to habitat type conversion and now only persists via mitigated out-plantings to neighboring dunes (P. Slattery, pers. comm. 2006). No information could be obtained concerning past exotic plant control at the coastal population on former Fort Ord; however, the Fort Ord draft HCP being developed will address this issue (Zander and Associates 2007).

In summary, 6 existing coastal occurrences on public lands are being managed to control non-native invasive plants and one will be managed under a conservation plan currently under development. These occurrences represent about 86 percent of the total 7 coastal occurrences on public lands. Therefore, non-native invasive plants are not a significant threat to *Gilia tenuiflora* ssp. *arenaria* in publicly owned coastal occurrences.

Recreational activity (including ORVs and horses):
Most of the coastal occurrences on public lands are relatively well protected from potential damage from recreational activities. This has been accomplished through the use of regulation, and of signage and/or fencing of sensitive areas. For example, sensitive areas at Salinas River State Beach near equestrian staging areas have been fenced with heavy-duty cables that have proven to be totally effective in preventing trampling due to equestrian traffic. The westernmost occurrence at former Fort Ord (EO

#22) will be transferred from the Army to State Parks, and is the Fort Ord draft HCP currently under development will address its management.

In summary, 6 existing coastal occurrences on public lands are managed to control recreation impacts and one will be managed under a conservation plan currently under development. These occurrences represent about 86 percent of the total 7 coastal occurrences on public lands. Therefore, trampling and ORV damage are not significant threats to *Gilia tenuiflora* ssp. *arenaria* in publicly owned coastal occurrences.

Development:
Six of the coastal occurrences on public lands are relatively well protected from potential damage from development and one will be managed under a conservation plan currently under development. The protected occurrences represent about 86 percent of the total 7 coastal occurrences on public lands. Therefore, development is not a significant threat to *Gilia tenuiflora* ssp. *arenaria* in publicly owned coastal occurrences.

Coastal occurrences on private lands: Ten of the 30 total occurrences of *Gilia tenuiflora* ssp. *arenaria* (33 percent) are located on private lands in coastal areas. However, 3 of these occurrences (30 percent) are extirpated.

Non-native species encroachment:
Relatively little protection has been given to occurrences on coastal private lands. Management of the occurrence on Pebble Beach Company property at Spanish Bay is directed under the Spanish Bay Resource Management Plan. This plan was drafted by the Pebble Beach Company as guidance for management of sensitive species and habitats in the Spanish Bay area. Under this plan, *Gilia tenuiflora* ssp. *arenaria* is considered a sensitive subspecies and the dune system it inhabits is considered sensitive habitat. Under this plan, an ongoing program for hand removal of non-native species encroaching on habitat occupied by *G. t.* ssp. *arenaria* is in place (E. Love, *in litt.* 2006; Spruance, *in. litt.* 2006). One other coastal population occurs on land owned by the Big Sur Land Trust. Currently, a long-term management plan, which should include management of non-native species, is being developed for this site (S. Danner, pers. comm. 2006).

In summary, only one coastal occurrence on private lands out of 7 potentially extant occurrences (14 percent) is currently being managed to control non-native invasive plants. Therefore, non-native invasive plants still pose a significant threat to *Gilia tenuiflora* ssp. *arenaria* in privately owned coastal occurrences.

Recreational activity (including ORVs and horses):
Relatively little formal protection has been given to occurrences on coastal private lands. Fences have been erected around *Gilia tenuiflora* ssp. *arenaria* patches on property owned by the Pebble Beach Company at Spanish Bay to prevent trampling by people using the golf course where the population occurs (E. Love, *in litt.* comm. 2006). A long-term management plan, which should include use management strategies, is being developed for the site owned by the Big Sur Land Trust (S. Danner, pers. comm. 2006).

Most of the remainder of coastal private sites are relatively remote and are not likely subject to recreational activities (J. Dorrell-Canepa, pers. comm. 2006).

In summary, only one coastal occurrence, representing 14 percent of occurrences on private lands, is currently managed to control damage associated with recreational activities. Therefore, recreation may pose a significant threat to *Gilia tenuiflora* ssp. *arenaria* in privately owned coastal occurrences.

Development:
There is little protection from development for the 7 potentially extant occurrences on coastal private lands. The occurrence on property owned by the Pebble Beach Company at Spanish Bay is on an existing golf course. This area is considered an Environmentally Sensitive Habitat under the definitions provided in the Spanish Bay Resource Management Plan and is protected from development (E. Love, *in litt.* 2006). The occurrence owned by the Big Sur Land Trust is to be designated and managed as open space land and so will eventually be protected, but it is not currently under any protection (S. Danner, pers. comm. 2006). The current protection of one occurrence constitutes 14 percent of coastal privately owned occurrences under protection from development. Therefore, development remains a significant threat to *Gilia tenuiflora* ssp. *arenaria* in most privately owned coastal occurrences.

Inland occurrences on private lands: Two of the total 30 occurrences of *Gilia tenuiflora* ssp. *arenaria* (7 percent) were located on private lands in inland areas.

Both inland occurrences of this subspecies on private lands (EO #10 and #23) have been extirpated.

Inland occurrences on public lands: Eleven of the total 30 occurrences of *Gilia tenuiflora* ssp. *arenaria* (37 percent) are located on former public lands in inland areas.

All 11 potentially extant inland occurrences were at one time contained within the boundaries of Fort Ord and owned by the United States Department of the Army. This area is currently in the process of being remediated and transferred to various government agencies for future re-use (ACOE 1997). The management of these properties is outlined in the Army's re-use documents (e.g. ACOE 1997). The Fort Ord Re-Use Authority is developing the Fort Ord draft HCP which will include more detailed management prescriptions.

Non-native species encroachment:
Of the inland occurrences, one occurrence transferred to the University of California Natural Reserve System is receiving some benefit from a non-native plant control program. The Bureau of Land Management (BLM) and the Army are also actively removing invasive non-native plant species across some of the thousands of acres of former Fort Ord. However, over 100 non-native plant species have been identified on former Fort Ord and invasive non-native plants remain a problem for the persistence of *Gilia tenuiflora* ssp. *arenaria* over most of the inland range (B. Collins, pers. comm.

2006; B. Delgado, pers. comm. 2006). Increases in density and total area of occurrences, size of *G. t.* ssp. *arenaria* individuals, and reduction of non-native species has been observed after prescribed burn events (B. Collins, pers. comm. 2006). The Fort Ord draft HCP will prescribe for control and reduction of non-native species throughout the range of inland occurrences of *G. t.* ssp. *arenaria* (D. Steeck, pers. comm. 2006).

Recreational activity (including ORVs and horses):
Most inland occurrences are on lands that traditionally have not been open to the public. The lands designated as the Fort Ord Natural Reserve will continue to be inaccessible for public recreational use in accordance with the Fort Ord draft HCP. Much of the property containing the inland occurrences of *Gilia tenuiflora* ssp. *arenaria* will eventually transfer to BLM. The majority of this land will be accessible to the public for recreational use. This use will be restricted to hiking, biking and equestrian recreation on designated trails and rerouting or closure of existing trails where protection of *G. t.* ssp. *arenaria* is a concern will be observed (B. Delgado, pers. comm. 2006).

Development:
A large amount of the area known to be occupied by *Gilia tenuiflora* ssp. *arenaria* will be transferred, managed, and protected by the BLM and the University of California under the Army's Habitat Management Plan (ACOE 1997) and the Fort Ord draft HCP (Zander and Associates 2007). This area contains about 70 percent of mapped occurrences of *G. t.* ssp. *arenaria* on the former base; however, the scale of the survey effort and mapping was very coarse, and employed simple presence/absence, polygon-based methods. These surveys did not provide information on the number of individuals or populations; therefore, some uncertainty exists as to the extent and distribution of *G. t.* ssp. *arenaria* on the former base, both as a result of coarseness of survey effort and the potential for a soil seed bank to exist where the taxon is not present above-ground.

The highest concentrations of *Gilia tenuiflora* ssp. *arenaria* are in the northern and western portions of former Fort Ord (B. Delgado, pers. comm. 2006; Worcester, *in. litt.* 2006). Several occurrences (EO's #21, #31, and parts of #18, #19, and #20) are in areas designated for development (ACOE 1997, CNDDB 2006) and will likely be extirpated in the future if these parcels are developed. The Fort Ord draft HCP being developed will address the management of *G. t.* ssp. *arenaria* in the habitat reserve areas (Zander and Associates 2007).

2. Habitat throughout this taxon's range is restored to native vegetation at proper densities to allow natural colonization by this plant (addresses Factor A).

Coastal occurrences on public (state parks) lands:

Most of the occurrences on coastal public lands are in areas of shifting dunes and naturally produce openings where this subspecies may colonize. In areas where non-native plants are introduced, often they act to stabilize the sand and can lead to habitat conversion. At Asilomar State Beach, a build-up of pine duff in pine edge areas has stabilized the soil and may allow easier establishment of pine seedlings (L. Madison,

pers. comm. 2006). A resumption of natural fire cycles or physical clearing at this site may clear this duff and allow these areas to remain open for colonization by *Gilia tenuiflora* ssp. *arenaria* (L. Madison, pers. comm. 2006); so far, however, fire management has not been implemented to manage habitat for this subspecies. At the Moss Landing, Watertower Hill site, surrounding species have encroached to the point that habitat conversion at the original site is total (P. Slattery, pers. comm. 2006).

Coastal occurrences on private lands:

Information on the densities of native vegetation on coastal private lands was not available for this review.

Inland occurrences:

With the exception of the occupied areas within the Fort Ord Natural Reserve, where limited vegetation management has been occurring, most potential habitat is too dense to allow colonization by this subspecies (B. Collins, pers. comm. 2006). Some prescribed burning has created areas suitable for colonization, and the Fort Ord draft HCP addressing this area will prescribe burning to maintain sufficient open areas and young stands of maritime chaparral more likely to support *Gilia tenuiflora* ssp. *Arenaria* (Zander and Associates 2007).

3. Habitat throughout this taxon's range is monitored sufficiently to assure that local threats are spotted promptly (addresses Listing Factors A and E).

Coastal occurrences on public (state parks) lands:

Monitoring at these occurrence sites is sufficient to assure that local threats should be spotted promptly.

Coastal occurrences on private lands:

The occurrence on property owned by the Pebble Beach Company at Spanish Bay is likely the only one on private lands where any monitoring occurs. We do not have information on the frequency and sufficiency of this monitoring.

Inland occurrences:

The occurrences of *Gilia tenuiflora* ssp. *arenaria* on lands held by the BLM and within the Fort Ord Natural Reserve are the only inland occurrences with monitoring sufficient to assure prompt identification of local threats. Monitoring regimes under the Fort Ord draft HCP of all existing inland occurrences will be frequent and sufficient to promptly identify local threats (Zander and Associates 2007).

4. Enough plants are at enough locations throughout this taxon's range and within the protected vegetation to reasonably assure the viability of the species (addresses Listing

Factor A). This criterion also contains requirements for specific population numbers. While we believe such population numbers are not the most meaningful measure of long-term population trends, we assembled this information for completeness of the review: Moreover, the most recent surveys were performed in 1993, 1998, and 2000, and likely do not reflect current conditions in some sites.

a. Occurrences on private lands are protected and managed for at least 1,000 individuals per site at Spanish Bay Golf Course (EO #1) and at the following locations within the Monterey Bay dunes complex: EO #23 (Reservation/Seaside), EO #27 (Marina Dunes), EO #29d (Mulligan Hill, Salinas River Lagoon), EO #30 (Watchtower Hill, Moss Landing); and up to 20,000 individuals at EO #3 (Tioga Avenue).

Spanish Bay Golf Course (EO #1): Most recent survey information available was from 1993, when between 700 and 1,000 plants were seen (J. Dorrell-Canepa, pers. comm. 2006).

Reservation/Seaside (EO #23): A Holiday Inn Hotel was constructed on this site and the population was extirpated around the year 2000 (Felton, *in. litt.* 2006). As part of mitigation for this construction, 1,600 seedlings were planted at Locke-Paddon Park, managed by the City of Marina (Felton, *in. litt.* 2006). Information regarding the status of this population was not available for this review.

Marina Dunes (EO #27): A survey in 1987 found three populations here containing a total of 2,295 individuals (CNDDB, 2006). In 1993 another survey found only one population at this location (CNDDB 2006). Another survey in 1998 located two new populations at this location, as well as some of the previously documented populations (Thomas Reid Associates, 1999). The current status of this site is unknown.

Mulligan Hill, Salinas River Lagoon (EO #29): The most recent survey here was in 1993 when between 3,000 and 5,000 individuals were seen (CNDDB. 2006). The current status of this site is unknown.

Watchtower Hill, Moss Landing (EO #30): The most recent survey was in 1994 when between 200 and 400 individuals were seen (Dorrell-Canepa, pers. comm. 2006). Total habitat conversion has occurred at this site and no *Gilia tenuiflora* ssp. *arenaria* have been seen on the hill for several years (Slattery, pers. comm. 2006). A population that was part of mitigation for the development of the hill location has not been surveyed (Slattery, pers. comm. 2006). This population persists on neighboring dunes from out-plantings from the hill population (Slattery, pers. comm. 2006).

Tioga Avenue (EO #3): An HCP was started for this site in 1995 and surveys were completed at that time (C. Pooler, pers. comm. 2006). These surveys were not available for this review. This project was eventually abandoned and the HCP has been inactive since 2000. The current status of this site is unknown.

b. At least four occurrences on Department of Defense (DOD) (or lands transferred from DOD ownership at Fort Ord or Naval Postgraduate School) sites are protected and managed for 1,000 individuals per site (EO #21 and #31), to 10,000 to 40,000 (EO #2 [Postgraduate School] and #20 [Fort Ord]) individuals per site,

Former Fort Ord (EO #21): 515 plants were reported to be here in 1993 (CNDDB 2006). The current status of this site is unknown.

Former Fort Ord (EO #31): 698 plants were reported to be here in 1993 (CNDDB 2006). The current status of this site is unknown.

Postgraduate School (EO #2): Recent surveys were carried out in 1998, 2003, 2004, 2005, and 2006. There was an average of 6,600 individuals at this occurrence site over these years (J. Dorrell-Canepa *in litt.*2006).

Former Fort Ord (EO #20): Surveys have been carried out annually on the Fort Ord Natural Reserve portion of this occurrence since the reserve was established in 1996; survey methods were not consistent across all years (M. Fusari, pers. comm. 2006). Counts in sample areas alone on the Fort Ord Natural Reserve during the years 1999, 2000, 2001, and 2002 averaged 59,300 individuals. These counts were not full censuses; full census totals would likely be higher (M. Fusari, pers. comm. 2006).

c. Occurrences on State Parks lands are protected and managed for 1,000 (EO #4, #32, and #33) to 10,000 (EO #5) individuals per site. (Note: the recovery plan has a typographical error on EO's here. We have corrected these below.)

Marina State Beach (EO #4): 325 plants were reported to be here in 1993 (CNDDB 2006). No recent surveys have been performed at this site.

Asilomar State Beach (EO #32): Only 2 reliable years of data are available for this site, 1989 and 1996 (L. Madison, pers. comm. 2006). The average number of individuals from these 2 years is approximately 4,000. The next survey planned is for spring 2007 (L. Madison, pers. comm. 2006).

Sunset State Beach (EO #33): Surveys in 1999, 2001, 2002, and 2003 yielded an average of 1,900 individuals; however, this may be an undercount due to herbivory (most likely rabbits) in this area (Hyland, *in. litt.* 2006). No recent surveys have been performed at this site.

Salinas River State Beach (EO #5): 13,500 plants were reported to be here in 1993 (CNDDB 2006). No recent surveys have been performed at this site.

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Gilia tenuiflora* ssp. *arenaria* (Monterey gilia)

Current Classification:

Recommendation resulting from the 5-Year Review:

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

Appropriate Listing/Reclassification Priority Number, if applicable: N/A

Review Conducted By: Chris West, Ventura Fish and Wildlife Office

FIELD OFFICE APPROVAL:

Field Supervisor, Fish and Wildlife Service

Approve _____ Date _____

REGIONAL OFFICE APPROVAL:

Regional Director, Fish and Wildlife Service

Approve _____ Date _____

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of *Gilia tenuiflora* ssp. *arenaria* (Monterey gilia)

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened

____ Uplist to Endangered

____ Delist

__X_ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: N/A

Review Conducted By: Chris West, Ventura Fish and Wildlife Office

FIELD OFFICE APPROVAL:

Field Supervisor, Fish and Wildlife Service

Approve Diane K Noda Date 3/26/08

REGIONAL OFFICE APPROVAL:

Regional Director, Fish and Wildlife Service

Approve _____ Date 3/31/08