# CANDIDATE CONSERVATION AGREEMENT

# FOR

*Phacelia stellaris*
(Brand's phacelia)

Photo courtesy of K. O'Connor

Brand's phacelia (*Phacelia stellaris*) at Naval Base Coronado

U.S. Navy, Naval Base Coronado, San Diego

U.S. Marine Corps, USMC Base Camp Pendleton

U.S. Customs and Border Protection, Laguna Niguel

California State Parks, San Diego Coast District

U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office

July 2013

CANDIDATE CONSERVATION
AGREEMENT

FOR

*Phacelia stellaris*
(Brand's phacelia)

CAPN Gary Mayes — Date
Commanding Officer
Naval Base Coronado

NAME — Date
TITLE
USMCB Camp Pendleton

NAME
TITLE
Department of Homeland Security

Clay Phillips — Date
Superintendent
San Diego Coast District
California State Parks

Jim A. Bartel — Date
Field Supervisor
Carlsbad Fish and Wildlife Office

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*Phacelia stellaris*
(Brand's phacelia)

Gary Mayes
Captain, U.S. Navy
Commanding Officer
Naval Base Coronado

Date

D. J. Gerando
Chief of Staff, U.S. Marine Corps
Marine Corps Installations West-Marine Corps Base
Camp Pendleton

30 JUL 2013
Date

Karl Calvo
Executive Director
Facilities Management and Engineering
U.S. Customs and Border Protection

Date

Clay Phillips
Superintendent
San Diego Coast District
California State Parks

Date

Jim A. Bartel
Field Supervisor
U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office

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Brigadier General, U.S. Marine Corps
Commanding General
Marine Corps Installations West-Marine Corps Base
Camp Pendleton

Date

Karl Calvo
Executive Director
Facilities Management and Engineering Directorate
U.S. Customs and Border Protection

8/1/2013
Date

Clay Phillips
Superintendent
San Diego Coast District
California State Parks

Date

Jim A. Bartel
Field Supervisor
U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office

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Clay Phillips
Superintendent
San Diego Coast District
California State Parks

7/22/13
Date

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Jim A. Bartel
Field Supervisor
U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office

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Jim A. Bartel
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U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office

July 19, 2013
Date

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## EXECUTIVE SUMMARY

The U.S. Navy, U.S. Marine Corps, U.S. Customs & Border Protection, and California State Parks have entered into this Candidate Conservation Agreement (CCA) with the U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office (CFWO) as a means to address those threats identified as negatively affecting the distribution and abundance of Brand's phacelia and help ensure the long-term viability of this species.

Although Brand's phacelia was previously more widely distributed, its currently known distribution within the U.S. is restricted to the following locations: Riverside County Regional Park (Hidden Valley Wildlife Area) in Western Riverside County; City of Rancho Cucamonga in San Bernardino County; and USMC Base Camp Pendleton, Naval Base Coronado, Silver Strand State Beach, and Lichty Mesa in San Diego County (Consortium of California Herbaria 2012). The occurrence of Brand's phacelia in the Riverside County Park is protected under the Western Riverside County Multiple Species Habitat Conservation Plan and therefore, Riverside County Regional Parks and Open-Space District is not a participant in this CCA. The occurrence in the City of Rancho Cucamonga is in a drainage swale adjacent to the Interstate-15/Foothill Boulevard interchange. The City is not a participant in this agreement.

The purpose of this agreement is to ensure the long-term conservation of Brand's phacelia through implementation of Conservation Action Items described herein and the minimization of threats to its persistence through adaptive management. Participating agencies are committing to continuing existing and/or undertaking new management activities that would remove or reduce certain threats under their control.

The participants in this CCA anticipate that successful and continued implementation of conservation actions herein will be sufficient to improve the status of this species thereby precluding the need to list it within the foreseeable future as threatened or endangered under the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*)

## 1. GOALS AND OBJECTIVES

The goal of this CCA is to assist in the long-term conservation of Brand's phacelia through proactive management of the species and the habitat upon which it depends and implementation of protective measures as necessary. The primary conservation and management objectives for Brands' phacelia are:

1. Protect Brand's phacelia and its habitat to the extent feasible and within the authorities of the Cooperating Agencies and to maintain its current geographic range;

2. Manage all populations within the authorities of the Cooperating Agencies to maintain the biological and ecological integrity and promote the long-term viability of the six Brand's phacelia populations at the four locations addressed in this document which constitute the majority of the populations of this species within the U.S.;

3. Gain additional biological and ecological information pertaining to Brand's phacelia through monitoring and research to assess the effects of the proposed Conservation Action Items on population trends and species persistence;

4. Survey high-potential habitat areas for additional occurrences of Brand's phacelia; and

5. Work with the Cooperating Agencies to implement measures that would reduce or eliminate impacts to newly discovered occurrences of Brand's phacelia.

## II. SPECIES INVOLVED

Brand's phacelia (*Phacelia stellaris*) is an herbaceous annual plant in the Boraginaceae (borage family). The vegetative portion of the plant is a small-diameter rosette of deeply lobed to compound leaves, 5 to 70 millimeters (0.2 to 3 inches) in length, which produces a curving inflorescence supporting bell-shaped, violet or pale blue flowers; fruits typically produce between 8 and 20 seeds approximately 0.5-1 millimeter in size (Wilken *et al.* 1993, p. 705). The fruit is a capsule which propels seeds upon ripening. When flowering, plants grow to a height of 6-25 centimeters (2.5-10 inches) (Wilken *et al.* 1993, p. 705).

While Brand's phacelia is not federally listed under the Act, this species was considered a candidate species on May 4, 2004 (69 FR 24880) and is a continuing candidate for listing (76 FR 66370). The Service has not been petitioned to consider listing of this species as threatened or endangered or to propose critical habitat for it. The May 2011 settlement agreement with the Center for Biological Diversity and WildEarth Guardians stipulated that no later than the end of September 2013, the Service would submit a proposed rule to list Brand's phacelia to the *Federal Register* or withdraw candidate status for this species.

This species is not listed as threatened or endangered by the State of California. However, Brand's phacelia is categorized by the California Native Plant Society (CNPS) as 1.B.1 or rare, threatened, or endangered in California and elsewhere, and seriously endangered in California (CNPS 2013).

## III. COOPERATING AGENCIES

U.S. Navy
Naval Base Coronado
P.O. Box 7033
San Diego, California 92132

U.S. Marine Corps
Marine Corps Base Camp Pendleton
Box 555008
Camp Pendleton, California 92055-5010

U.S. Customs and Border Protection
24000 Avila Road, Room 5020
Laguna Niguel, California 92677

California State Parks
4477 Pacific Highway
San Diego, California 92102

U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

## IV. AUTHORITIES

*U.S. Navy and U.S. Marine Corps*
Conservation responsibilities for natural resources on all U.S. Department of Defense installations are required by the Sikes Act Improvement Act of 1997 (SAIA) (16 U.S.C. 670a *et seq*.). The SAIA requires that all military installations prepare an Integrated Natural Resources Management Plan (INRMP) to address management of natural resources in the context of installation mission. INRMPs are prepared in cooperation with the Service and State natural resource agencies [in this case, the California Department of Fish and Wildlife (CDFW)] to ensure proper consideration of fish, wildlife, and habitat needs. Sensitive and listed species management is an important component of INRMPs. Staffs from these installations and the natural resource agencies meet annually to assess the effectiveness of the INRMPs and develop strategies for future management of sensitive species as needed to ensure that the INRMP directs lands and species management effectively.

The 2002 Naval Base Coronado (NBC) INRMP has been revised and subsequently reviewed by the Service and CDFW. The revision has been circulated for public review (T. Shepherd 2013, pers. comm.) and hence, is expected to be finalized soon. The USMC revised their 2007 INRMP for USMC Base Camp Pendleton (MCB Camp Pendleton) in 2012.

*California State Parks*
California State Park's (CSP) natural resource responsibility is to acquire, protect, restore, maintain and sustain outstanding and representative examples of California's natural and scenic values for the benefit of present and future generations [California State Parks Department Operations Manual (DOM) 0303]. It is the policy of CSP to protect rare plants and their habitats in fulfillment of its mission to help preserve the State's extraordinary biological diversity, and in accordance with the California Endangered Species Act and the California Native Plant Protection Act. These taxa and habitats will be protected in the context of the native environmental complexes in which they evolved, when feasible (DOM 0310.5.1). Silver Strand State Beach (SSSB) is classified as a State Beach. State Beaches [PRC § 5019.56 (c)] consist of areas with frontage on the ocean or bays and managed to provide swimming, boating, fishing, and other beach-oriented recreational activities. CSP's management strategy is to support these activities while ensuring the long-term conservation of Brand's phacelia, and other sensitive

plants, animals, and habitats. The General Plan for the SSB includes management for various uses, as well as establishment of a Nature Preserve intended to protect beach and dune habitat.

*U.S. Customs & Border Protection*
U.S. Customs & Border Protection (CBP) promotes the conservation of natural resources and protects and enhances the quality of the environment, to include carrying out programs for the conservation of endangered, threatened, and candidate species such as Brand's phacelia, pursuant to the following authorities: the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*.); the National Environmental Policy Act of 1969 as amended (42 U.S.C. 4321-4347); Executive Order 11514 – Protection and Enhancement of Environmental Quality; and Department of Homeland Security Directive 023-01 – Environmental Planning Program.

*U.S. Fish and Wildlife Service*
The U.S. Fish and Wildlife Service (Service) participates in the regulation and/or management of the federally listed and other species pursuant to the following authorities: the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq*.); Fish and Wildlife Coordination Act of 1934, as amended (16 U.S.C. 661-667e *et seq*.); Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712 *et seq*.) and their attendant regulations.

## V. STATUS AND DISTRIBUTION

*Historic and Current Known Distribution*
The known, historical distribution of Brand's phacelia in southern California covered portions of Los Angeles, San Bernardino, Riverside, and San Diego counties and continued into coastal northern Baja California, Mexico (Consortium of California Herbaria 2012). In California, these sites were all near major river systems that drain into the Pacific Ocean; i.e., the San Gabriel, Los Angeles, Santa Ana, Santa Margarita, San Diego, Sweetwater, and Tijuana rivers (Figure 1).

The current geographic range of Brand's phacelia encompasses 12 known or presumed extant occurrences (7 in the United States and 5 in Mexico). Results from surveys conducted in 2013 in southern California at known historic occurrences are incorporated into this assessment (O'Brien and Fraga, 2013). No range-wide surveys have been conducted to detect the presence of Brand's phacelia at additional locations in Baja California, Mexico.

*Life History Traits*
Brands' phacelia typically germinates in late winter and is generally flowers starting in March and continuing through June (CNPS 2012, p. 248). However, germination of Brands' phacelia has been observed as early as October and November at Marine Corps Base (MCB) Camp Pendleton, with flowering observed in January and February (Bieber *et al.* 2013, p. 6). Flowering plants have also been found in December at Lichty Mesa (North 2010, pers. obs.). Flowering also occurs in January at NAS North Island (B. Munson 2013a, pers. comm.) and peak flowering has been observed in early March (O'Connor 2009, pers. comm.). During the 2012 surveys at SSSB, only 29 percent of the population was observed to be flowering during March (Landis 2012, p. 9) suggesting that phenology may be quite variable for this species and that peak blooming may well occur prior to March. Seed set appears to occur within weeks of blooming (Bieber *et al.* 2013, p. 12).

The yearly germination and number of plants surviving from germination to flowering appear to be largely driven by timing of seasonal precipitation more than total rainfall (SERG 2012, p. 33) and most likely, other location-specific environmental factors (e.g., soil moisture-retention, associated plant community). Because seeds do not germinate synchronously, plants develop at different times during the growing season, flowering and setting seed at intervals that may be missed during any given survey. It is likely that not all plants that germinate survive to flower and produce seed. Hence, the number of Brand's phacelia plants observed during any given year is determined both by temporal environmental conditions and the timing and frequency of surveys. High inter-annual variation in the number of plants observed is typical for annual plants and the proportion of the population of an annual plant in the dormant phase vastly exceeds that in the growing phase (Harper 1997, p. 83).

The population of an annual plant is represented by growing plants, viable seeds on parent plants, and dormant seeds in the soil (Harper 1997, p. 517). Such seeds that accumulate in the soil are called a seed bank. Persistent seed banks (i.e., those with seeds that remain viable in the soil for long periods of time) are characteristic of annual plants growing in unpredictable environments (Thompson and Grime 1979, pp. 915-916) and contain a multitude of genotypes produced under differing environmental conditions (Barbour *et al.* 1987, p. 90). This accumulation of genotypes allows seeds to germinate when the appropriate environmental conditions (i.e., those in which the seed was produced) occur (Templeton and Levin 1978, pp. 232-233), and ensures that even in the absence of seed production, a reservoir of viable, un-germinated seeds persists (Harper 1977, p. 240).

As noted, the seeds of Brand's phacelia are quite small and small seeds tend persist in the soil over long periods of time (i.e., 50-100 years) (Thompson and Grime 1979, p. 899). Hence, both field observations and studies support the empirical evidence that Brand's phacelia likely has a long-live seed bank.

An important demographic factor is the number of seed actually produced in any given year and field surveys for the presence of germinated plants alone do not provide information about the number of viable seeds actually produced. Research on other annual forbs has shown that seed production can vary tremendously as survivorship to the reproductive phase is highly variable (Harper 1977, pp. 530-531, 651). Annual weather patterns (precipitation pattern and ambient temperature) can also affect seed production by favoring or inhibiting flower production and ovule development (Ferguson 1999, p. 24).

The seed dispersal mechanisms are unknown; however, the species' historical distribution along floodplains and coastal areas suggests that long-distance seed-dispersal may occur in flowing water or wind-driven sand. The aggregated or concentrated distribution of Brand's phacelia plants suggest that absent an external mechanism to disperse seed, most seed falls in close proximity to the parent plant. This pattern is typical of small dune and desert annual plant species (Harper 1977, p. 520).

Although studies to identify specific pollinators have not been done, native bees are considered a likely pollinator (Calflora 2012). Native bees (unidentified as to taxa) and small beetles were observed on Brand's phacelia flowers at NASNI in May 2009 (SERG 2012, p. 36). Brand's

phacelia flowers have no specialized structures suggesting that this plant likely attracts a generalist rather than a specialist pollinator. Because the flowers are so inconspicuous, they likely do not attract an abundance of pollinators; hence, they are likely pollinated by generalist pollinators attracted to co-occurring vegetation in their plant community. Because Brand's phacelia flowers contain both male and female reproductive structures, fertilization could occur within a single flower, between flowers of a single plant, or between flowers on different plants. Observations of receptive stigmas in direct contact with dehiscing anthers suggest that self-pollination (i.e., pollination absent a pollinator) likely occurs (O'Brien and Fraga 2013, p. 14).

We consider that the important factors in tracking the status of Brand's phacelia are: 1) detecting the occurrence (or population) repeatedly over time, even if in some years, few or no plants are observed; 2) detecting a high number of plants in some years (i.e., when annual conditions favor germination and survival of individual plants); and 3) determining that apparently viable seed (i.e., seed that is 'typical' in appearance and not desiccated or only partially developed) is produced. CSP is currently attempting to propagate plants (please see the Research section of this document).

## VI. EXISTING CONDITIONS

This species occurs on loose, semi-stabilized, sandy soils of recent geologic (Quaternary) origin and is not found in very loose coastal fore-dune or middle-dune environments with the exception of the population on Lichty Mesa which occurs on Pleistocene Marine and Marine Terrace deposits (O'Brien and Fraga 2013, p. 11). None of the areas where this species occurs are subject to regular inundation.

Certain native and nonnative plants co-occur with Brand's phacelia at all locations considered in this CCA. The following are native annual plants common to these sites: *Acmispon prostratus* (Nuttall's lotus), *Camissoniopsis lewisii* (Lewis's evening-primrose), *Camissoniopsis cheiranthifolia* subsp. *suffructicosa* (beach evening-primrose), *Crassula connata* (sand pygmyweed), *Croton californicus* (California croton) and *Heterotheca sessiliflora* subsp. *sessiliflora* (sessileflower golden aster), *Lepidium lasiocarpum* subsp. *lasiocarpum* (pepperweed) and *Nemacaulis denudata* var. *denudata* (coast woolly-heads) (O'Brien and Fraga 2013, pp. 27-35).

The plant species most commonly associated with Brand's phacelia at all sites is the nonnative annual *Erodium cicutarium* (red-stemmed filaree); but *E. botrys* (broad-leaf filaree) was also found at many of these sites (O'Brien and Fraga 2013, p. 12). Other weedy, nonnative plants found at all sites considered in this CCA include *Cakile maritima* (European searocket), crown daisy (*Glebionis (Chrysanthemum) coronaria*), red brome (*Bromus madritensis* subsp. *rubens*), sweet-clover (*Melilotus indica*), and *Emex spinosa* (devil's thorn) (O'Brien and Fraga 2013, pp. 27-32).

*Carpobrotus edulis* (hottentot fig) and/or *C. chilensis* (sea fig), (commonly called iceplant), occur at all coastal sites except Lichty Mesa; rather another species of iceplant which is common on upland coastal bluffs is found there: *Mesembryanthemum crystallinum* (crystalline iceplant) (O'Brien and Fraga 2013, p. 31). Grasses do not occur in dense concentrations at any sites:

*Schismus barbatus* (Mediterranean grass) was found in low numbers at all sites (O'Brien and Fraga 2013, p. 13) but *Bromus madritensis* ssp. *rubens* (red brome) may comprise a greater proportion of plant cover at some sites (SERG 2012, p. 25).

*MCB Camp Pendleton*

MCB Camp Pendleton is a military installation in northern San Diego County; approximately 17 miles of its coastline borders the Pacific Ocean. Brand's phacelia occurs within a roughly 0.33-acre backdune area in a large dune system north of the mouth of the Santa Margarita River (Bieber *et al.* 2013, p. 5) (Figure 2). The backdune is a largely stabilized landward dune characterized by wind-blown sand accumulations and sparsely covered by annual and perennial, native and nonnative vegetation (Bieber *et al.* 2013, p. 8).

This plant was first documented at MCB Camp Pendleton in 1993; at that time, 88 plants were found within a 484-square foot area of this backdune north of the Santa Margarita River outflow (Dudek 2006, pp. 2, 4). Subsequent surveys documented between 45-50 plants in 1994-1996; a few plants (i.e., 1-3) in 1999, 2007, 2012; 655 plants in 2011; and 3,187 plants in February 2013 (Bieber *et al.* 2013, p. 11). The distribution of Brand's phacelia has expanded from 1-3 patches to 7 in 2013, occupying an estimated 0.158 acre (0.06 hectare) of the 0.33-acre backdune (Bieber *et al.* 2013, p. 13). This increase in distribution is most likely the result of recent dune restoration (please see Habitat Management, Section VII of this document).

The beach is within a larger military training area, though Brand's phacelia is growing within an area protected and fenced for the State- and federally endangered California least tern (*Sternula (Sterna) antillarum browni*) (Service 1995, USMC 2007). The foredune is the area occupied by nesting least terns, and the backdune supports Brand's phacelia. At this time, Brand's phacelia is growing exclusively within the fenced area.

*NAS North Island*

Naval Air Station North Island (NASNI) is located on Coronado Island, roughly 40 miles (64.4 kilometers) south of the beach at MCB Camp Pendleton where Brand's phacelia occurs. The plant occurs at the western-most edge of NASNI adjacent to a runway and a weapons storage area (Figure 3).

Brand's phacelia has been found in four discrete areas in the general vicinity of the runway at NASNI: West Point Site, SE Runway 36 Site, West Runway Field Site, and Weapon Depot Site.

1. West Point Site is a 3.2-acre area in the southwest corner of NASNI, at the base of the Zuniga jetty. The site is ruderal, without dune habitat, and surrounded by roads and riprap. The plants grow across the road from the Weapons facility, so access to this area is limited to official Navy business. Brand's phacelia are patchily distributed in this area.

2. SE Runway 36 Site is a 7.13-acre remnant dune that is contiguous with the protected western snowy plover (*Charadrius alexandrinus nivosus*) nesting area; this area supports the largest occurrence of Brand's phacelia at NASNI.

3. West Runway Field Site is adjacent to the SE Runway 36 site, but lacks dune habitat; the site is a ruderal area at the end of the runway.

4. Brand's phacelia is scattered in a small occurrences within the Weapon Depot Site in an open sandy area which is mowed, but receives no other disturbances.

Approximately 5,000 Brand's phacelia plants were documented at NASNI in 2005 (RECON 2006, p. 54). An estimated 12,971 plants were documented in the spring of 2007 (NBC 2011, p. 1). The 2007 surveys were based on quadrat sampling over a small area with the total population size extrapolated therefrom. Subsequent surveys were done using a census method to estimate population size. An estimated 26,675 plants were found in 2009; 354,606 in 2010; and 29,594 in 2011 (SERG 2012, p. 23). The Brand's phacelia population at NASNI occupies approximately 7.1 acres (2.9 hectares) (SERG 2012, p. 4).

Prior to 2007, the co-occurring plant species at this site were principally nonnative grasses and iceplant (RECON 2006, p. 45). However, consistent removal of iceplant initiated in 2007 has improved site conditions so that the area is no longer dominated by iceplant (SERG 2012, pp. 6, 14).

*Silver Strand Training Complex-North (SSTC-N)*
Brand's phacelia also occurs in an area called the Silver Strand, which is the isthmus from Coronado Island to the City of Imperial Beach in San Diego County. The Silver Strand is roughly 5 miles (8 kilometers) south of the airfield at NASNI.

Bayside
The bayside of SSTC-N is located on the east side of State Route 75 (the Silver Strand Highway) and is a flat beach known as Bravo Beach with no dune structure. The width of this beach ranges from 220-335 feet (67-102 meters) over a length of roughly 0.53 mile (850 meters); it is bounded by residential housing and an elementary school to the west and the San Diego Bay to the east.

Brand's phacelia was found here in 2009, which was the first year surveys were conducted. Plants are distributed in two large patches (the largest patch is located just east of the Silver Strand Elementary School and the other adjacent to residential housing) and scattered over roughly 1,600 linear-feet (488 meters) of the beach (Figure 4). An estimated 2,081 plants were found in 2009, 51,638 in 2010, and 1,309 in 2011 (NBC 2011, p. 1)

This area receives a moderate amount of public use and is used infrequently for military training. It is accessible from the adjacent elementary school and from the residential housing areas and there are established paths from these areas onto the beach. There are no structures on the beach apart from two large posts which delimit the width of the training beach.

Oceanside
SSTC-N Oceanside is located on the west side of State Route 75. Brand's phacelia has only recently been detected on the ocean side of SSTC-N in a back-dune area that was restored as part of a larger, ongoing dune restoration project (please see Section VII Habitat Management, below). Nonnative vegetation (primarily iceplant) was removed from the Navy's Orange II training lane in 2010 and although no phacelia seed was sown as part of the restoration, roughly

10-20 plants were found within a few square feet in 2012 (SERG 2011 p. 25). During a brief site visit in 2013, several hundred plants (an estimated 300-500) were detected within a roughly 800-square foot (74-square meter) area of the backdune (Ferguson and Munson 2013, pers. obs.).

*Silver Strand State Beach*

Brand's phacelia occurs on the bay side of the SSSB primarily on the 29-acre (11.7-hectare) property owned by CSP and, to a lesser extent, on the 44-acre (17.8-hectare) Alpha Beach (or North 40) parcel owned by the Department of the Navy, but under long-term lease to CSP (Figure 4). The northern-most section of the property (Alpha Beach) is contiguous with SSTC-N Bayside (Bravo Beach). An estimated 22 acres (8.8 hectares) of the property supports this plant in varying densities (calculated from Landis 2012, Table 3).

Approximately 936,100 Brand's phacelia plants were found at this site in 2012 (Landis 2012, p. 9). While the 2012 survey is the most systematic survey done to date, plants have been documented during previous surveys as follows: 150 plants in 2005 (CNDDB 2012, Element Occurrence 11) and between 100,000 and 1,000,000 plants in 2010 (Smith 2010, pers. comm.).

Brand's phacelia is widespread and distributed fairly broadly and in great abundance in the open sandy areas between the bay and the public facilities (restrooms, picnic tables) (Landis 2012, pp. 7-8; Ferguson 2013, pers. comm.). Plants are found in sparsely vegetated sand or growing amongst other small-statured annual plants (Landis 2009, p. 9; Ferguson 2013, pers. comm.). Far fewer Brand's phacelia plants have been found in the area known as the North 40, although a small patch of them persists in the approximately 5 acres (2 hectares) of naturally occurring dunes therein (Peregrin 2010, pers. comm.). Much of the North 40 is dominated by perennial vegetation (Landis 2012, Table 2, p. 9) which may inhibit germination. Brand's phacelia has colonized a small area covered by fill material which is used for camping and other recreation (Peregrin 2010, pers. comm.).

The SSSB Bayside has been a recreational facility for several decades. Recreational activities include the year-round operation of an aquatic center, occasional special events, and camping during summer months. With the possible exception of the volley-ball courts, the recreational areas receive little use between Labor Day (early September) and Memorial Day (May 26) (Service 2011, p. 12).

*Lichty Mesa*

This site is a nearly flat mesa roughly 0.3 mile inland from the Pacific Ocean, which is more floristically diverse that other sites in California supporting Brand's phacelia. The area of Lichty Mesa that supports Brand's phacelia is directly adjacent to the international border fence (Figure 5). Lichty Mesa was conserved within Border Field State Park and population surveys were conducted by CSP until 2009 when the site was purchased by CBP to construct the multi-tiered International Border Fence.

The vegetation community is predominantly perennial shrubs that form a rather continuous canopy with annual plants growing in open patches of ground; woody litter is found throughout (Ferguson 2013, pers. obs.). Because the vegetation community differs so much from the other sites considered in this document, we have included information about some of the associated vegetation. The native perennial vegetation is dominated by California brittlebush (*Encelia*

*californica*) but also includes California buckwheat (*Eriogonum fasciculatum*), saltbush (*Atriplex canescens*), lemonade berry (*Rhus integrifolia*), cholla (*Cylindropuntia prolifera*), and Orcutt's dudleya (*Dudleya attenuata* subsp. *attenuata*). Herbaceous plants not found at the other sites include *Leptosyne* (*Coreopsis*) *maritima* (sea dahlia), leather spineflower (*Lastarriaea coriacea*), goldfields (*Lasthenia coronaria*), and wild cucumber (*Marah macrocarpa*) (O'Brien and Fraga 2013, p. 30).

In 2002, plants were found in two patches: one estimated at 1,200 plants on top of Lichty Mesa and 345 along a trail down to the salt marsh (Burrascano 2003, pers. comm.). CSP reported approximately 4,000 plants in the 2005-2006 growing season (Smith 2010, pers. comm.). Population counts were not performed in 2010-2012, although Service biologists found a few plants in late 2010 (North 2010, pers. obs.). In 2013, Brand's phacelia were recorded in "abundance" (about 4,000 plants) at this location (O'Brien and Fraga 2013, p. 11), which the Service estimates occupies about 4 acres (1.6 hectares).

The densest concentration has been documented at the northwestern edge of the mesa in and amongst trails, while the sparsest concentration was nearest to the original border fence on the south side of the mesa (Smith 2010, pers. comm.). A similar pattern was observed during the 2013 survey: plants were increasingly more abundant towards the western extent of occupied habitat where perennial vegetation becomes less dense (O'Brien and Fraga 2013, p. 30).

## VII. HABITAT MANAGEMENT

*MCB Camp Pendleton*

The MCB Camp Pendleton's 2007 INRMP outlines beneficial measures for managing Brand's phacelia and its habitat, primarily through implementation of the Estuarine and Beach Ecosystems Conservation Plan, which has been in place since 1996. To date, roughly 80 acres (32.4 hectares) of dune habitat has been restored at MCB Camp Pendleton (Bieber 2013, pers. comm.). The USMC conducts ongoing maintenance of the coastal dunes, which includes the systematic removal of invasive exotic vegetation including *Arundo donax* (giant reed) and iceplant. These activities are fully funded as part of the USMC's INRMP (USMC 2007, Updated March 2013, Appendix M, Item 4.4.1.3).

Extensive patches of iceplant were treated with herbicide in 1996, but the thatch was left behind to reduce the potential for subsequent shifts in the dunes from wind-erosion. However, significant quantities of organic matter accumulated in the soil profile which then facilitated further encroachment of upland and weedy plants species into the backdune, reducing the extent of native dune vegetation (Bieber *et al.* 2013, p. 8). The USMC is implementing experimental management treatments to assess the effectiveness of various methods (please see Section VIII, Research and Studies, below).

As previously mentioned, the population of Brand's phacelia occurs within the permanently fenced California least tern management area. The backdune area which supports Brand's phacelia has been maintained differently from the foredune area managed for least tern. The back-dune area is managed to benefit native dune plants. These management activities are coordinated by the Environmental Security Staff at MCB Camp Pendleton.

*NAS North Island*
Habitat for Brand's phacelia and other sensitive plants has been managed by NBC Environmental Operations and Planning (SERG 2011, 2012), although it was not included in the Navy's 2002 INRMP for NBC.

Invasive plants have been removed from the areas supporting Brand's phacelia and other sensitive plant species on an annual basis since 2007 (SERG 2012, p. 6). Prior to 2007, the co-occurring plant species at this site were predominantly nonnative grasses and iceplant (RECON 2006, p. 54). However, consistent removal of iceplant has improved site conditions so that the area is no longer dominated by this plant (SERG 2012, pp. 6, 14). The number of native and nonnative plant species growing in the Brand's phacelia habitat areas was roughly the same in 2011; however, the relative cover of native plants was much greater than that of nonnative plants (i.e., 18 and 2 percent, respectively) (SERG 2012, pp. 13-14). Litter (thatch and duff) constituted 19 percent of the cover in 2011 (SERG 2012, p. 19).

All areas are mowed several times a year to comply with Federal Aviation Agency standards and to reduce vegetation growth that would attract birds and mammals that could be a BASH (Bird & Animal/Aircraft Strike Hazard) risk to aircraft. Due to security issues, the weapons complex area is mowed more frequently than the areas near the airfield. Mowing in both areas has been occurring for years.

Mowing prevents the establishment of woody, perennial plant species and likely helps maintain habitat conditions suitable for continued germination of Brand's phacelia (RECON 2006, p. 54). Mowers are rubber-tired which reduces the amount of soil compaction that could occur during mowing. Because the plants are generally prostrate or of short-stature, it is unlikely that mowing cuts inflorescences or otherwise affects seed-set and dispersal.

*Silver Strand Training Complex-North (SSTC-N)*
Oceanside
The Navy has undertaken a large dune restoration project at the ocean side of SSTC-N. Restoration of 2.32 acres (0.94 hectare) of the Orange II training lane was completed in 2011 with the results intended to guide the implementation of full project implementation. Of this restored area, 1.7 acres (0.69 hectare) is foredune and 0.62 acre (0.25 hectare) is backdune (SERG 2011, p. 5). Restoration involved removal of nonnative plants (primarily iceplant) and seeding and planting native vegetation. The cover of nonnative vegetation has been reduced to 2.2 percent relative cover and the area now supports predominantly native annual and perennial vegetation (SERG 2011 p. 23).

As described in Section IV above, Brand's phacelia did not germinate in the restoration area in the Orange II training lane during the first year following removal of iceplant. It is possible that seed was dispersed into the site at some point thereafter, accounting for the current presence of this plant in 2012 (Hillary 2013, pers. comm.). Alternatively, as more iceplant thatch died and more sand was exposed over the course of the restoration project, increased germination from the seed bank could account for the increased abundance noted in 2013.

In March of 2013, the Navy completed the remaining 16 acres (6.5 hectares) of their dune restoration project at SSTC-N. Brand's phacelia has not been detected in this area as yet, but the

primary germination time for Brand's phacelia had passed before the restoration was complete. The dunes will be managed for the long-term benefit of listed and sensitive species within this habitat type at NBC (USN 2012, p. 5).

Bayside

In 2011, San Diego State University Soil and Ecology Restoration Group (SERG) initiated some trial restoration plots at the Bayside Training Area (i.e., Bravo Beach) clearing iceplant and nonnative annuals (primarily red-stemmed filaree and Mediterranean grass) from two 269 square-feet (25 square-meter) test plots in close proximity to existing occurrences of Brand's phacelia (SERG 2012, p. 20). To date, no phacelia plants have been found within these test plots (Hillary 2013 pers. comm.), other native plants, including Nuttall's lotus, *Croton californicus* (California croton) and beach evening-primrose, have been found (SERG 2012, p. 26).

*Silver Strand State Beach*

Prior to 2000, a large portion of the area was covered with iceplant which CSP has steadily been removing, along with other nonnative, weedy plants. As a result, beach evening-primrose and an extensive community of native annual forbs has developed which includes Brand's phacelia, Nuttall's lotus, coast woolly heads, Lewis's evening-primrose, sessileflower golden aster, and *Suaeda esteroa* (estuary seablite) (Service 2011, p. 12). The CSP has been monitoring vegetation-response following restoration, planting native perennial plants in restored areas, and restricting human-use in some restored areas to facilitate the development of the native plant community.

The CSP is currently developing a management strategy to balance recreational use with the conservation of native flora and fauna and pursuant to this, has undertaken the Coastal Dune Ecosystem Management Study and Enhancement Project mentioned in Section VIII (Research and Studies) below.

*Lichty Mesa*

At this time, CBP conducts no habitat management within the property occupied by Brand's phacelia.

## VIII. RESEARCH AND STUDIES

*Silver Strand State Beach*

CSP has undertaken a Coastal Dune Ecosystem Management Study and Enhancement Project in cooperation with the Service (Service 2011). The project is being conducted on 14.3 ac (5.8 ha) of the SSSB Bayside in cooperation with the Southwest Wetlands Interpretive Association and the Tijuana River National Estuarine Research Reserve, both of which are active partners with CSP. The study, begun in spring 2012, is an experimental evaluation of the response of Brand's phacelia to human disturbance and an assessment of abiotic habitat conditions. Project goals include improving habitat for native coastal dune plant species and better-informing management decisions so as to sustain a native coastal dune ecosystem within the State Beach. Experiments will evaluate: a) the effects of annual raking, foot-traffic and weed removal on the abundance of Brand's Phacelia; b) response of Brand's phacelia to reduction or elimination of recreational use of some areas; c) response of Brand's phacelia to soil-texture and associated biomass; and d)

abundance of Brand's phacelia relative to the abundance of invasive nonnative plants (Service 2011, pp. 12-13).

*MCB Camp Pendleton*
In 2012, the USMC Land Management Section implemented the first year of experimental grass and thatch removal within a 2,400 square-foot plot of habitat occupied by Brand's phacelia to determine which methods work best to control invasive plant species. The purpose of this project is two-fold: 1) reduce the amount of organic matter in the sand and promote a pristine dune habitat; and 2) reduce competition from invasive, weedy forbs and annual grasses. Brand's phacelia will be monitored throughout the growing-season following experimental management.

## IX. EXISTING AND POTENTIAL THREATS

1. Habitat loss (development)

Habitat loss due to urban development was a significant factor in the decrease in the known historic range of Brand's phacelia in the northern coastal portion of its range in southern California. Despite the historic loss of habitat and the impacts to the population at Lichty Mesa associated with construction of the International Border Fence in 2009, we believe that the range of Brand's phacelia has not diminished since the plant was placed on the candidate list in 2004 (O'Brien and Fraga 2013, pp. 9-11).

*MCB Camp Pendleton*
As noted above, the currently occupied habitat is on a coastal beach within an area protected for the California least tern; hence, habitat loss in the currently occupied habitat is not anticipated to occur. Ongoing restoration and management as outlined in Section VII (Habitat Management) above is intended to enhance native dune habitat on MCB Camp Pendleton over the long-term, and future loss of habitat for potential expansion of Brand's phacelia is not anticipated (USMC 2007, Appendix F, p. F-16).

*NAS North Island*
Occupied habitat is within the operational areas of the airfield and a weapon storage depot. Absent significant restructuring of facilities (e.g., relocation of the airfield) or closure of the base, no further development of this area is feasible.

*Silver Strand Training Complex-North (SSTC-N)*
Bayside
No plans now exist to develop beach habitat supporting Brand's phacelia for recreational or other purposes. If future development were to be considered, any project would be subject to the National Environmental Policy Act (NEPA) process and effects to sensitive resources, including Brand's phacelia would be evaluated.

Oceanside
Development on SSTC-N Oceanside is precluded as this land is used for military training which does not include development.

*Silver Strand State Beach*
This beach supports multiple sensitive species in addition to Brand's phacelia. CSP is currently conducting research to better-understand the response of Brand's phacelia and other native annual plants to recreation-related ground-disturbance and grounds-maintenance. CSP has no current plans to develop the Bayside portions of the SSSB and current facilities management plans are designed to protect occurrences of Brand's phacelia at this location.

*Lichty Mesa*
The mesa supporting Brand's phacelia is located immediately adjacent to the International Border Fence to the south and to the north, drops precipitously to the floodplain below. No development of additional facilities is anticipated at this site nor is maintenance of the existing infrastructure (fence and parallel access roads) anticipated in occupied habitat.

2. Habitat degradation due to substrate impacts

Foot and vehicle traffic which destroys plants and/or precludes seed germination within a significant portion of a population could adversely affect that population or, depending upon the extent of the disturbance across its range, the species.

*MCB Camp Pendleton*
Habitat degradation is not considered likely in this area as it is protected for the California least tern and managed for the benefit of Brand's phacelia and other sensitive dune-plants as noted in Sections VII and VIII above. Soil disturbances in the backdune habitat areas are minimized or precluded during habitat management and monitoring implemented seasonally for California least terns (Bieber 2010, pers. comm.). Outside of the spring and summer months when California least terns occupy the site, habitat degradation is precluded by the permanent fencing and operational guidelines under which military training occurs.

*NAS North Island*
Access to the airfield and weapons storage depot is restricted due to the nature of the existing land uses and hence, areas supporting the plant are not subject to much pedestrian or any vehicle use. All non-paved areas are routinely mown to maintain vegetation according to Federal Aviation Agency guidelines, and have been for several decades. But mowing does not appear to have adversely affected Brand's phacelia and may enhance habitat for it and co-occurring native annual forbs by precluding growth of perennial plants. Guidelines to ensure that future mowing will not adversely affect Brand's phacelia are included in the Conservation Actions section below.

*Silver Strand Training Center-North (SSTC-N)*
The bayside portion of SSTC-N receives a moderate amount of public use; it is accessible from the adjacent elementary school and from the residential housing areas and there are established paths from these areas onto the beach. While no structures or fire-rings occur on the beach, this area is routinely used for passive recreation and vehicles are frequently parked on the hard-pack between the school and occupied habitat.

Oceanside

This leeward-facing backdune is immediately adjacent to State Route 75 and is not subject to any disturbance from training, recreation, or any other activities. The area will be maintained pursuant to the larger dune restoration project being undertaken by the Navy which was discussed in Section VII (Habitat Management) above.

Bayside

This area has been used for passive recreation for several decades (i.e., maps show the residential development was in place in 1971). Because of its proximity to the school and adjacent soft-ball fields, many people park off the road on the hard-packed sand adjacent to areas where Brand's phacelia occurs.

A two-lane dirt track leads from the street entrance by the school to the training beach and is used by the Navy during training and by the public (e.g., as bay access to launch kayaks). A narrow dirt trail extends the length of the beach within areas supporting Brands' phacelia and another short trail connects the residential housing to the longer trail; Brand's phacelia also occurs along these dirt trails (Ferguson 2013, pers. comm.).

Military training occurs infrequently on Bravo Beach due to the public nature of the site and when done, occurs largely outside of the occupied habitat: most training occurs in-water and at the shoreline; on-shore training is concentrated at the beach landing area; vehicles may use the existing dirt ingress/egress road between the beach and street-access by the school (Munson 2013b, pers. comm.).

The Navy is proposing additional monitoring of training and recreational impacts and protective measures to be implemented if necessary at this location (see Section X, Conservation Action items, below).

*Silver Strand State Beach*

While substrate disturbances from recreational use may exclude Brand's phacelia from some areas within the State Beach, the plant is widespread throughout the site and found in varying densities in a variety of areas: along the curbs and pathways, under and around picnic benches, in the volley-ball court, in habitat-restoration areas, and generally dispersed in open, sandy areas though which people can walk (Ferguson 2013, pers. comm.). CSP is undertaking a study to determine, if possible, what level of disturbance this plant can tolerate to better-manage the species at a public beach (Service 2011). Some areas supporting this species (and other native annual plants) have been roped off during the summer months to preclude, if possible, or just reduce the amount of substrate disturbance occurring in occupied areas. A factor to consider is that the above-ground life-span of this plant is restricted primarily to the winter months and into early spring. Most recreational activity at the SSSB occurs outside of this time-frame (Service 2011, p. 12).

*Lichty Mesa*

Prior to construction of a new border fence between the U.S. and Mexico, Brand's phacelia occurred in two small populations at Lichty Mesa that likely received some level of trampling from foot and vehicle traffic (K. Marsden 2002, pers. comm.). Since construction of the

International Border Fence was completed in 2009, little evidence of foot or vehicular traffic was observed on most of the mesa supporting Brand's phacelia (Ferguson 2013, pers. comm.). A narrow dirt access road parallels the paved road immediately adjacent to the constructed fence and cuts through the mesa; all habitat occupied by Brand's phacelia is to the north of this dirt road. At the westernmost extent of the Brand's phacelia population, a series of dirt trails lead from the dirt road to the edge of the terrace overlooking the floodplain below. This area appears to receive foot traffic on a recurring basis and is also the area where Brand's phacelia appears to be most abundant (O'Brien 2013, pers. comm.). However, we have no understanding of how the patterns of site use are actually affecting abundance and distribution of Brand's phacelia on Lichty Mesa.

3. Proliferation of invasive nonnative plants

Habitat degradation can also result from the proliferation of invasive, nonnative plants. The establishment of nonnative species within native plant communities can cause the reduction or displacement of native plants through altering the structure of the vegetation community (species diversity and composition), altering ecosystem processes (nitrogen cycling, hydrology, fire regime) (Levine *et al.* 2003, p. 779), or through altering habitat conditions such that the demographics of native plants is affected (Thomson 2005, pp. 622-623).

*MCB Camp Pendleton*
Ongoing removal of invasive vegetation is part of the previously described habitat management and improved effectiveness is the goal of experimental vegetation management now underway. Because the USMC has taken a proactive approach to the control of invasive species, the abundance and distribution of Brand's phacelia following the first year of experimental management was far greater than previously recorded. Although the increase in observed abundance may be due in part to both survey effort and favorable environmental conditions in the winter of 2012-2013, the increased distribution is likely attributable to management. The USMC will continue control of invasive plants as part of their ongoing dune restoration programs described above in the Existing Management section of this document.

*NAS North Island*
Invasive species removal at NASNI has been outlined in Section VII (Habitat Management) above, and its continuance is both a Conservation Action Item (see Section X) of this CCA and included in the draft INRMP (DoN 2012, pp. 4-43, 44). Similarly, the recently restored dune habitat areas at SSTC-N Oceanside will be maintained into the future and this maintenance includes the removal of invasive plant species (USN 2012, p. 49). The Navy may conduct additional invasive species management at SSTC-N Bayside as part of Phase II of their Dune Enhancement and Avian Management Plan (USN 2012, p. 104). Monitoring and management of Bravo Beach at SSTC-N Bayside is included in Section X (Conservation Action Items) of this document.

*Silver Strand State Beach*
The CSP has conducted aggressive control of nonnative invasive plants at this site since 2000. Over time, Brand's phacelia has expanded into most all of the restoration areas as have other native and sensitive plant species. The CSP will maintain restored areas into the foreseeable

future and, as mentioned in Section VIII above (Research and Studies), is experimenting with vegetation management methods which will enhance the population of Brand's phacelia at SSSB Bayside.

*Lichty Mesa*
Unlike the other areas, Lichty Mesa is not invaded by iceplant (*Carpobrotus* sp.) and the vegetation community is predominantly perennial rather than annual plants. Saharan mustard (*Brassica tournefortii*) is present throughout the mesa (Smith 2010, pers. comm.), and the Service has recommended it be managed (Service 2012b). Crystalline iceplant is found at this upland site as is Pampas grass (*Cortaderia* spp.) and should be considered for management (O'Brien and Fraga 2013, p. 31).

Native species, but which are not considered part of the local native flora at this location and could be considered for removal, include sea-lavender (*Limonium perezii*), California broom (*Acmispon glaber* (*Lotus scoparius*)), saltbush (*Atriplex lentiformis*), giant coreopsis (*Leptosyne gigantea*), and purple needlegrass (*Stipa pulchra*) (O'Brien and Fraga 2013, p. 31).

The CBP is proposing to conduct weed abatement in this area supporting Brand's phacelia for a period of 5 years (see section X below).

4. Habitat loss due to sea-level rise
According to the Intergovernmental Panel on Climate Change (IPCC), there has been a general, but measured increase in global average air temperatures, global average ocean temperatures, and global average sea level since the turn of the century (IPCC 2007, p. 6). The observed annual rate of seal-level rise is attributed to thermal expansion of ocean waters and melting of glaciers and icecaps, the Greenland ice sheet, and the Antarctic ice sheet (IPCC 2007, p. 6).

In California, evidence of sea-level rise has been measured at tidal gauges along the coast, documenting a rate of approximately 7 to 8 inches (0.17 to 0.20 meter) in seal-level rise per century, which is very close to global estimates (Cayan *et al.* 2009, p. 29).

Recent modeling of seal-level rise in San Diego County used the Rahmstorf semi-empirical method whereby seal-level rise is linked to global mean temperatures; estimates of seal-level rise in southern California are the same as global estimates (Messner *et al.* 2008, p. 4). These localized seal-level rise models also considered the effects of construction of dams and reservoirs, which are expected to slow predicted seal-level rise (Messner *et al.* 2008, p. 4). Three simulation scenarios provided sea-level-rise projections of 1 to 1.5 feet (0.3 to 0.46 meter) in San Diego County by 2050 (Messner 2008, p. 14), and a State projection of 4.6 feet (1.40 meters) by 2100 (COPC 2010, p. 6); the State Coastal Conservancy and the State Lands Commission have recommended the use of these estimates. Elevation information contained in herbarium records documenting from the Consortium of California Herbaria (2012) the elevation of coastal occurrences of Brand's phacelia is detailed in Table 1.

The estimated elevation of these occurrences exceeds that of projected inundation-levels in 37 years (2050) by a minimum of 8.3 feet (2.5 meters) and in 87 years (2100) by 5.2 feet (1.6 meters). However, the wide range in potential outcomes developed through modeling indicates

Table 1. Elevation information contained in herbarium records*

| LOCATION | ELEVATION | HERBARIUM RECORD* |
|---|---|---|
| Silver Strand State Beach | 9.8 feet (3 meters) | RSA703273 |
| NAS North Island | 16 feet (5 meters) | SD188005 |
| MCB Camp Pendleton | 23 feet (7 meters) | SD191241 |
| Lichty Mesa | 52 feet (15.8 meters) | SD201779 |

* Consortium of California Herbaria 2012

that the data are too uncertain to be considered reliable in an 87-year timeframe (i.e., by 2100). For the proposed initial duration of this CCA, no changes in to sea levels or tidal influences are anticipated and no Conservation Action Items to address this are proposed.

## X. CONSERVATION ACTION ITEMS

General Conservation Action Items

1. Each landowner/manager will provide an annual update outlining the implementation of this CCA, summarizing the results thereof, and outlining any changes or improvements where needed:
   a. This report will be provided to the NBC Natural Resources staff by October 15;
   b. The NBC Natural Resources staff will consolidate these reports into one submission to the Service for review by November 15.

2. Cooperating agencies will establish and participate in a Brand's Phacelia Working Group consisting of their staff (or designated representatives), the Service, and biologists involved in conducting surveys, if available. Working Group participants will meet annually to:
   a. provide site-specific updates on the status of the plants and habitat management;
   b. evaluate ongoing management strategies for Brand's phacelia and assess the effectiveness of implementation of the Conservation Action Items to date; and
   c. discuss and develop additional management strategies that the landowners could choose to implement as part of an adaptive management approach, should management to date appear insufficient or should a different approach to management be indicated.

3. Survey protocols will include the use of GIS to delineate the extent of an occurrence and elevation will be measured for each site. Survey methods and data storage (geo-database) will be standardized so that data can be compared easily;

4. When appropriate, participants may work with the local community or other landowners to establish additional occurrences or populations of this species.

Agency-Specific Commitments

*Naval Base Coronado*

5. Management in the INRMP will be designed to avoid actions which may cause a species to become threatened or endangered. In addition to those species listed as threatened or

endangered under the Act, or that are candidates for such listing, the U.S. Navy has recognized the need to implement special management direction for other rare species on the lands it administers.

6. Fund weed control, dune restoration, and habitat enhancement on an annual basis to monitor and treat as needed any plant that poses a threat to the continued success of Brand's phacelia. Invasive species funding will be targeted for the removal of iceplant to promote the expansion of Brand's phacelia beyond the baseline population level in areas not used for training.

7. Monitor all known Brand's phacelia populations every year for the duration of this agreement and monitor for new populations in suitable habitat areas [e.g., SSTC-South and Naval Outlying Landing Field Imperial Beach (NOLF IB)]. If the distribution of Brand's phacelia expands beyond its current known distribution at NBC, additional occurrences will be managed to the extent feasible, in accordance with this CCA.

8. Ensure that mowing within occupied habitat at NAS North Island continues in a manner which minimizes effects to Brand's phacelia.

9. To the greatest extent feasible, work with the Navy operators to conduct all activities associated with military operations (including maintenance) in a manner that minimizes adverse effects to existing populations and perhaps promotes Brand's phacelia populations.

   The NBC Installation Botanist will:
   a. provide military operators and schedulers the most recent GIS layers for Brand's phacelia distribution. When possible, plant locations will be considered in conducting training events; and
   b. coordinate with military operators to reduce the risk of invasion of nonnative plants and noxious weeds in Brand's phacelia habitat areas.

10. To the greatest extent feasible, provide access and support studies/scientific research specific to the biology and ecology of Brand's phacelia at NBC or off site.

11. Continue seed collection and offsite seed storage program. Storage program will be done by an entity experienced with maintaining seed repositories.

12. Monitor Brand's phacelia occupied and adjacent habitat for invasive plants. Spraying in or near populations of Brand's phacelia will be evaluated on a site-specific and herbicide-dependent basis prior to application to alleviate negative impact to the species and its potential pollinators and non-target, native vegetation.

13. Monitor recreational impacts and the effects of public parking on the Brand's phacelia population at SSTC-N Bayside. Signs, flagging, and other strategies to minimize disturbance from parking and public recreation will be implemented as necessary.

14. Monitor Brand's phacelia at SSTC-N Bayside annually to assess whether ingress/egress of military users is affecting plants in this area.

15. If required, complete NEPA analysis for implementation of future projects in areas occupied by Brand's phacelia. The NEPA process seeks to avoid and minimize effects to sensitive resources. The Service, cooperators, and public can review projects as a part of the NEPA process.

16. Notify Cooperating Agencies and/or the Working Group of future projects with the potential to affect Brand's phacelia.

*MCB Camp Pendleton*

17. Fund weed control, dune restoration, and habitat enhancement on an annual basis to treat, as needed, any plant that poses a threat to the continued success of Brand's phacelia. Invasive species funding will targeted towards the removal of invasive nonnative forbs and invasive annual grasses and their thatch to improve habitat conditions for Brand's phacelia.

18. Monitor the known Brand's phacelia population every year for the duration of this agreement.

19. Inventory for new populations in suitable habitat areas in the lower Santa Margarita River.

*California State Parks*

20. Provide annual invasive species control within areas that support Brand's phacelia. Invasive plant control will consist of herbicide treatment or removal of iceplant. If monitoring data or data from working group suggests that Brand's phacelia occurrences are in decline relative to increases in a specific invasive plant species, then those species will be treated intensively. Species to consider include European searocket, Saharan mustard, *Oenothera laciniata* (cutleaf evening-primrose), *Emex spinosa* (devil's thorn), and annual grasses that produce heavy thatch (e.g., *Bromus diandrus, Lolium perenne*). If new occurrences of an invasive species are identified on site by CSP or by the working group they will be treated or removed as early as possible.

21. Monitor representative large and small Brand's phacelia populations every year for the duration of this agreement and monitor for new populations in suitable habitat areas (e.g., the ocean side of Silver Strand State Beach). If the distribution of Brand's phacelia expands beyond its current known distribution at NBC, additional occurrences will be managed to the extent feasible, in accordance with this CCA.

22. Work with visitor service and facilities maintenance staff to minimize significant adverse effects from recreational activities and ongoing site maintenance to existing occurrences of Brand's phacelia and to its habitat. The CSP Environmental Scientist (ES) will provide SSSB park staff with the most recent GIS layers for Brand's phacelia.

23. To the greatest extent feasible, provide access and support studies/scientific research specific to the biology and ecology of Brand's phacelia at SSSB.

24. Continue the plant propagation program. Amplify seed for supplementation of small populations or development of new populations.

25. Monitor Brand's phacelia occupied and adjacent habitat for invasive plants. Spraying in or near populations of Brand's phacelia will be evaluated on a site-specific and herbicide-dependent basis prior to application to alleviate negative impact to the species and its potential pollinators and non-target, native vegetation.

26. Interpretive signs and public education will be provided. Fencing will be installed (either temporary or permanent) as necessary to support Brand's phacelia conservation efforts.

27. Manage special events to the extent feasible to avoid large off-pavement events on the bayside between germination of plants and seed maturity (approximately November through April). Special event leaders will be provided educational material about rare plant conservation efforts at SSSB at the beginning of the event.

28. Notify Cooperating Agencies and/or the Working Group of future projects with the potential to affect Brand's phacelia.

*U.S. Customs and Border Protection*

29. Provide invasive species control on an annual basis within the portion of Lichty Mesa supporting Brand's phacelia. Invasive species which may be selected for removal include Saharan mustard, devil's thorn, and crown daisy, smooth cat's ear, crystalline iceplant, red brome, Pampas grass, and Mediterranean grass. Native species that are not considered part of the local native flora at this location and could be considered for removal include sea-lavender, California broom, saltbush, giant coreopsis, and purple needlegrass.

30. Monitor all known Brand's phacelia populations every year for the duration of this agreement and monitor for new populations in suitable habitat areas. If the distribution of Brand's phacelia expands beyond its current known distribution at Lichty Mesa, additional occurrences will be managed to the extent feasible, in accordance with this CCA.

31. To the greatest extent feasible, work with Border Patrol agents to conduct all activities associated with border security (including patrols and pursuits) in a manner that minimizes adverse effects to existing populations. CBP will:

    a. provide Border Patrol agents the most recent GIS layers for Brand's phacelia distribution. When possible, plant locations will be considered in conducting patrols; and
    b. coordinate with Border Patrol agents to reduce the risk of invasion of non-native plants and noxious weeds in Brand's phacelia habitat areas.

32. Notify Cooperating Agencies and/or the Working Group of future projects with the potential to affect Brand's phacelia.

Summary

The goal of this CCA is assisting in the long-term conservation of Brand's phacelia through proactive management. The objectives proposed to meet this goal include maintaining this plant across its known range to the extent feasible and under the control of the Cooperating Agencies, managing these occurrences within to promote long-term viability, gaining additional biological and ecological information with which to inform and assess management, surveying other areas for the presence of Brand's phacelia, and addressing the threats to species persistence that have been identified by the Service (Service 2012).

The proposed management of invasive species at all sites under control of the Cooperating Agencies is expected to promote the long-term viability of this species (Conservation Action Items 6, 17, 20, 29). Where necessary and feasible, the Cooperating Agencies will implement additional protective measures to preclude inadvertent destruction of plants (Conservation Action Items 7, 19, 21, 31).

The proposed annual monitoring (Conservation Action Items 7, 18, 21, 30), coordinating annual site-management through participation in the annual Working Group meetings (Conservation Action Item 2); research and habitat restoration (Conservation Action Items 6, 17, 23-24); and seed banking and propagation (Conservation Action Items 4, 11, 24) are anticipated to help meet the objective of gaining biological and ecological information to better-understand population trends, manage for species persistence, and facilitate possible establishment of novel occurrences of Brand's phacelia from seed. Research and habitat restoration (Conservation Action Items 6, 17, 23-24) taken together, will help meet the overall goal to promote the long-term persistence of Brand's phacelia. This CCA also responds to the threats to species persistence that have been identified by the Service (Service 2012, pp. 8-10).

Habitat loss (development)

Further loss of occupied habitat is not expected to occur in any of the occupied areas addressed in this CCA; all areas have a designated use (i.e., military training or recreational use) that does not include site development resulting in the permanent loss of habitat. Should development be considered at some time in the future, the Cooperating Agencies will inform the Brand's Phacelia Working Group of such proposals (Conservation Action Items 2, 15-16, 28, 32).

The research into species biology and habitat preferences (e.g., disturbance regime), *ex situ* seed banking and storage, and habitat restoration which are commitments of this CCA are anticipated to provide sufficient information to better-inform habitat management in the future (Conservation Action Items 10-11, 23-24) and to provide the means and methods for establishing additional occurrences either through habitat restoration which allows natural recruitment to occur, or through establishment of novel occurrences from collected (banked) seed (Conservation Action Items 4,7, 12, 19, 21). The increased abundance and/or expanded distribution of Brand's phacelia which has occurred in recently restored habitat areas indicates that the distribution of this species may expand adjacent to managed areas at MCB Camp Pendleton and on lands managed by the U.S. Navy and CSP on the Silver Strand. Hence, we

anticipate more occurrences of Brand's phacelia may become established over time through implementation of this CCA (Conservation Action Items 4, 7, 21). The Brand's Phacelia Working Group will evaluate the results of management on an annual basis and propose and implement change to management, if indicated, to improve the status of this species over time (Conservation Action Items 1-3).

Habitat degradation due to substrate impacts

When properly managed, the exiting land uses are not anticipated to result in habitat degradation (i.e., substrate disturbance) that would preclude or reduce the persistence of Brand's phacelia. All uses appear compatible with persistence of Brand's phacelia to some extent as evidenced by the number of plants observed in recent years. A factor which likely contributes to this is the short life-cycle of individual plants: because plants appear to flower and set seed so quickly after germination (a matter of days or weeds), intermittent and localized disturbances likely affect only a small fraction of the reproductive plants in any given year.

At MCB Camp Pendleton, no training occurs within any occupied habitat area. Should the distribution of Brand's phacelia expand as a result of ongoing dune restoration, training may occur in those areas. However, we have no reason to expect that the currently occupied habitat would not continue to support a robust population of plants in light of implementation of proposed management (Conservation Action Items 17-18); hence, no loss of existing populations would occur.

Land uses at NASNI involve minimal substrate disturbance necessary to mow. Mowing is necessary in these areas to reduce the growth of perennial vegetation and some weedy plant species which would otherwise remain unchecked. Mowing will continue to be done in a manner which minimizes impacts to Brand's phacelia plants and their habitat (Conservation Action Item 8). The development of this CCA, in and of itself, is anticipated to increase awareness of the conservation status of this plant and purposes of avoiding certain disturbances (e.g., disking, grading, driving, parking) in habitat areas (Conservation Action Items 1, 5).

Systematic coordination with military cooperators during scheduling and implementation of training at SSTC-N Bayside and Oceanside is expected preclude or minimize destructive substrate disturbances (Conservation Action Item 9). If military training has an adverse effect to Brand's phacelia and/or its occupied habitat areas, this will be assessed (Conservation Action Item 14) and addressed (Conservation Action Items 1, 2, 5). Similarly, recreational use (and off-street parking) at SSTC-N Bayside will be monitored by the NBC Natural Resources staff so that any adverse effects to the species and/or its occupied habitat will be detected and addressed (Conservation Action Items 1-2, 5, 13).

CSP will reduce habitat disturbance and potentially destructive management actions during the growing season of Brand's phacelia by coordinating park management on the locations of this species (Conservation Action Item 22). CSP will also reduce unintentional recreational impacts by providing protective measures for Brand's phacelia from large-scale recreational or special events held during the months of November through April (Conservation Action Item 27) and by monitoring the effects of casual recreational use over time and adjusting park use accordingly (Conservation Action Item 26).

Proliferation of invasive nonnative plants

The exclusion of Brand's phacelia from occupied and potentially suitable habitat by invasive plant species will remain a threat to this species because the invasive plants are abundant in the area and will require consistent control to exclude over time. However, over 118 acres (47.7 hectares) of dune habitat have been restored within the few years by the Navy, USMC, and CSP in addition to ongoing management of invasive species. While much of the major dune restoration is likely completed, long-term control of invasive species in restored and other habitat areas will continue (Conservation Action Items 6, 12, 20, 25). Short-term invasive species control will be done by the CBP at Lichty Mesa (Conservation Action Item 29). Long-term invasive species control at Lichty Mesa is desirable; however, no mechanism to ensure this management would continue has yet been identified. Of the sites where Brand's phacelia now occurs, the site at Lichty Mesa has the least problem with invasive species in that the dominant invasive species is Saharan mustard, which is not as aggressive as the other weedy plant species affecting Brand's phacelia (i.e., iceplant, exotic annual grasses). Funding for long-term management may be assured at some point in the future. With the extensive management actions included in this CCA, we anticipate the long-term persistence of Brand's phacelia in currently occupied habitat and its expansion into recently restored and other suitable habitat areas in the future that may be managed for its benefit as well (Conservation Action Items 4, 7, 21, 30).

## XI. AGREEMENT TERMS

This agreement shall become effective at the date of the last signature and will remain in effect for 5 years. It may be terminated in writing at any time by U.S. Navy, U.S. Marine Corps, U.S. Customs and Border Protection, California State Parks, or U.S. Fish and Wildlife Service authorized officers/individuals when determine that it is no longer necessary. This agreement will be reviewed and amended as needed.

The cooperators shall use appropriate procedures to ensure adherence to all legal requirements in analyzing changes and establishing new management direction for habitat conservation. When appropriate, this will include amendment or revision of INRMPs or changes to the cooperators directive systems. These amendments and/or changes, in addition to a signed CCA, will provide a basis for and commitment to the new direction.

IT IS MUTALLY AGREED AND UNDERSTOOD BY ALL PARTIES THAT:

1. FREEDOM OF INFORMATION ACT (FOIA). Any information furnished to the U.S. Fish and Wildlife Service under this CCA is subject to the Freedom of Information Act (5 U.S.C. 552).

2. PARTICIPATION IN SIMILAR ACTIVITIES. This CCA in no way restricts any party from participating in similar activities with other public or private agencies, organizations and individuals.

3. RESPONSIBILITIES OF PARTIES. The U.S Navy, U.S. Marine Corps, U.S. Customs and Border Protection, California State Parks and other parties and their respective agencies and office will handle their own activities and utilize their own resources, including the

expenditure of their own funds, in pursuing this CCA. Each party will carry out its separate activities in a coordinated and mutually beneficial manner.

4. PRINCIPAL CONTACTS. The principle contacts for this instrument are:

| AGENCY | CONTACT | PHONE | ELECTRONIC MAIL |
|---|---|---|---|
| U.S. Navy | Bryan Munson | 619-545-7186 | bryan.munson@navy.mil |
| U.S. Marine Corps | Deborah Bieber | 760-978-7775 | Deborah.bieber@usmc.mil |
| U.S. Customs and Border Protection | John Petrilla | 949-360-2382 | john.petrilla@dhs.gov |
| California State Parks | Darren Smith | 619-952-3895 | darren.smith@parks.ca.gov |
| U.S. Fish and Wildlife Service | Nancy Ferguson | 760-431-9440 | nancy_ferguson@fws.gov |

1. NON-FUND OBLIGATING DOCUMENT. This CCA is neither a fiscal nor a funds obligation document. Any endeavor or transfer of anything of value involving reimbursement or contribution of funds between the parties to this instrument will be handled in accordance with applicable laws, regulations and procedures including those for Government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties and shall be independently authorized by appropriate statutory authority. This instrument does not provide such authority. Specifically, this instrument does not establish authority for noncompetitive award to the cooperator of any contract or other agreement. Any contract or agreement for training or other services must fully comply with all applicable requirements for competition.

2. ESTABLISHMENT OF RESPONSIBILITY. This CCA is not intended to and does not create, any right, benefit or trust responsibility, substantive or procedural, enforceable at law or equity, by a party against the United States, its agencies, its officers or any person.

3. COMMENCEMENT/EXPIRATION/TERMINATION. This CCA is executed as of the date of the last signature and will remain in effect for 5 years from the date of the last signature. This CCA may be extended or amended by mutual consent of the parties, by the issuance of a written modification, signed and dated by all parties, prior to any changes being performed. Any party, in writing, may terminate their participation in this CCA in whole, or in part, at any time before the date of expiration.

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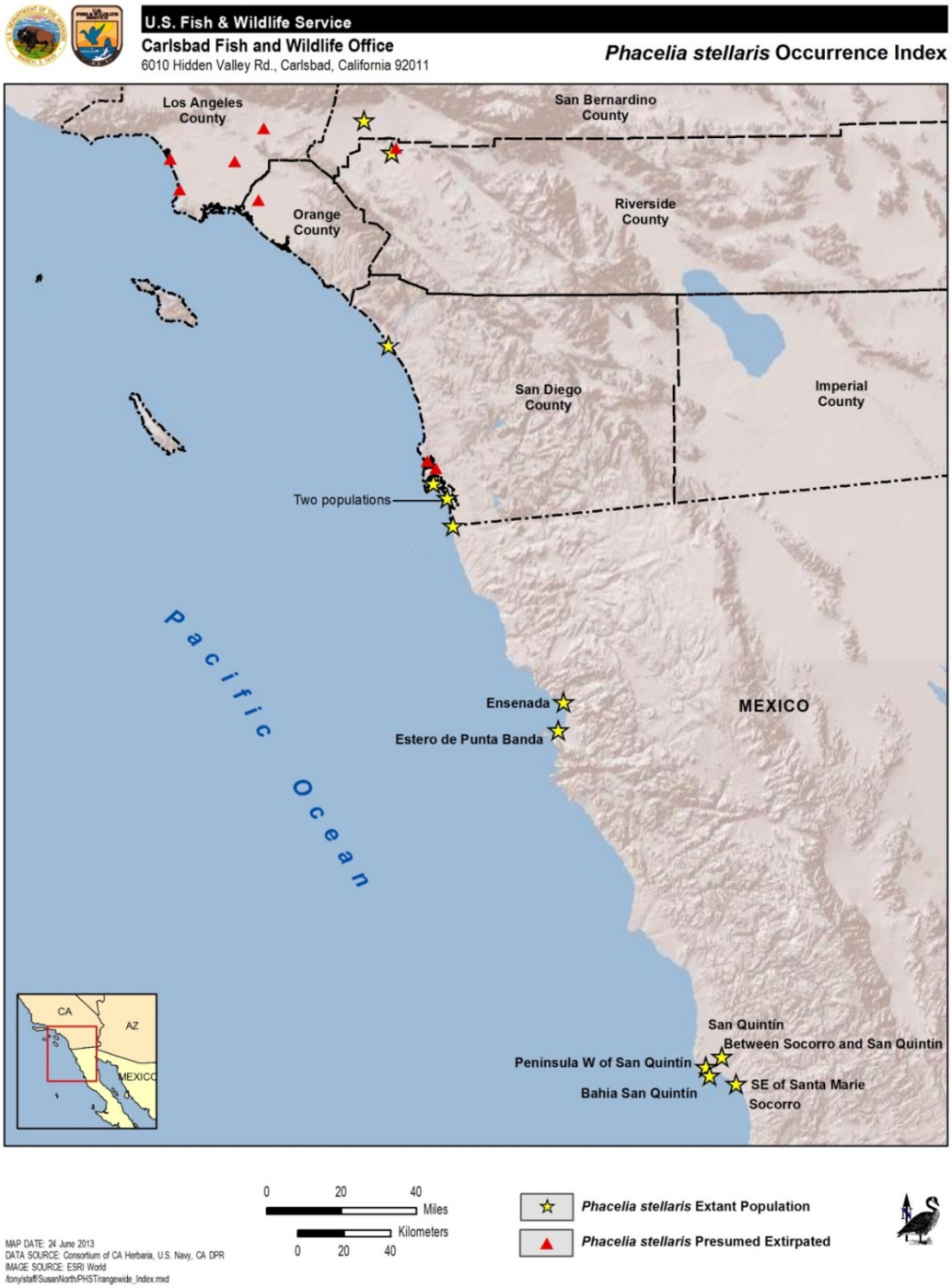


Figure 1. Occurrences of Brand's phacelia in the U.S. and Mexico.

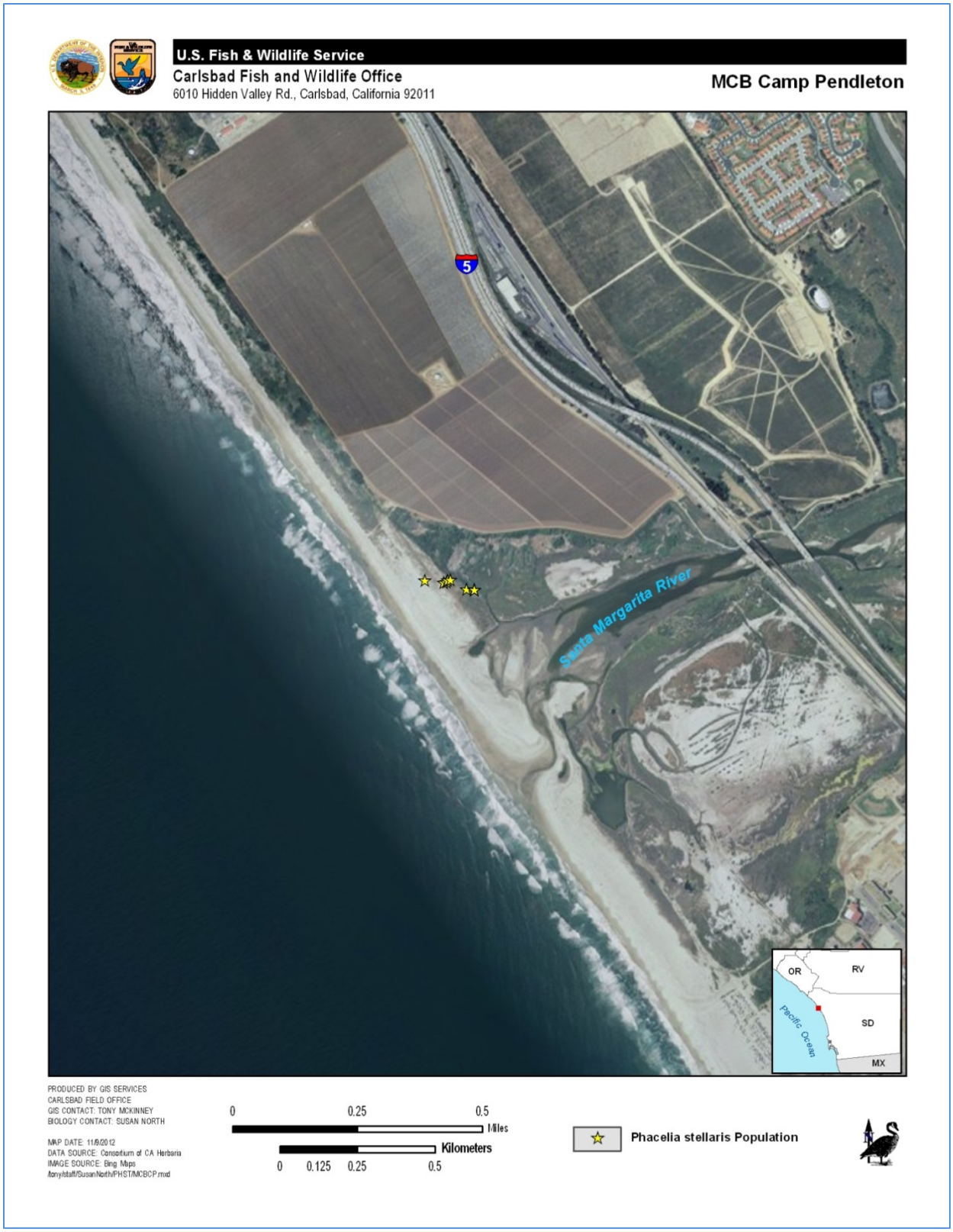


Figure 2. Distribution of Brand's phacelia at MCB Camp Pendleton

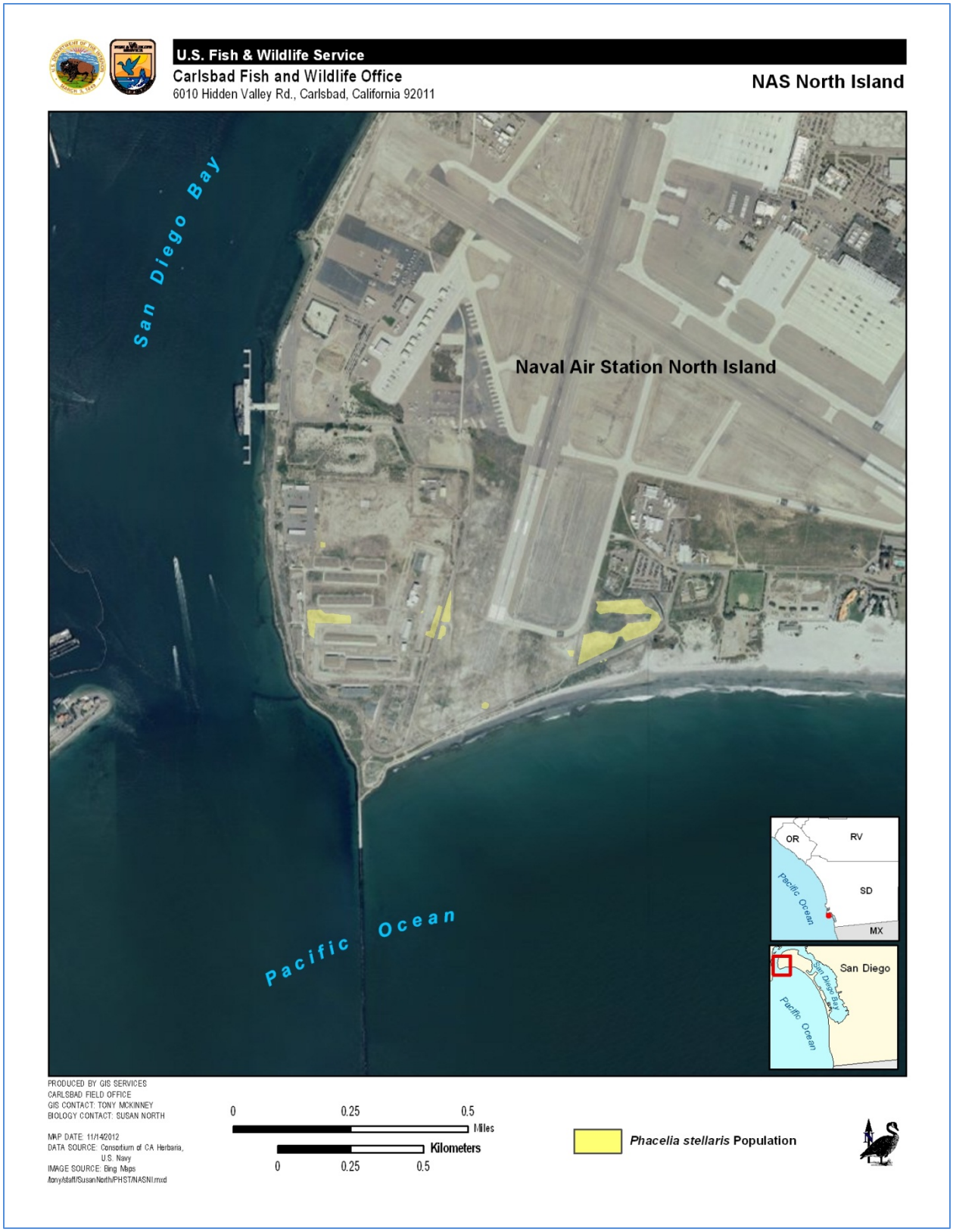


Figure 3. Distribution of Brand's phacelia at Naval Air Station North Island

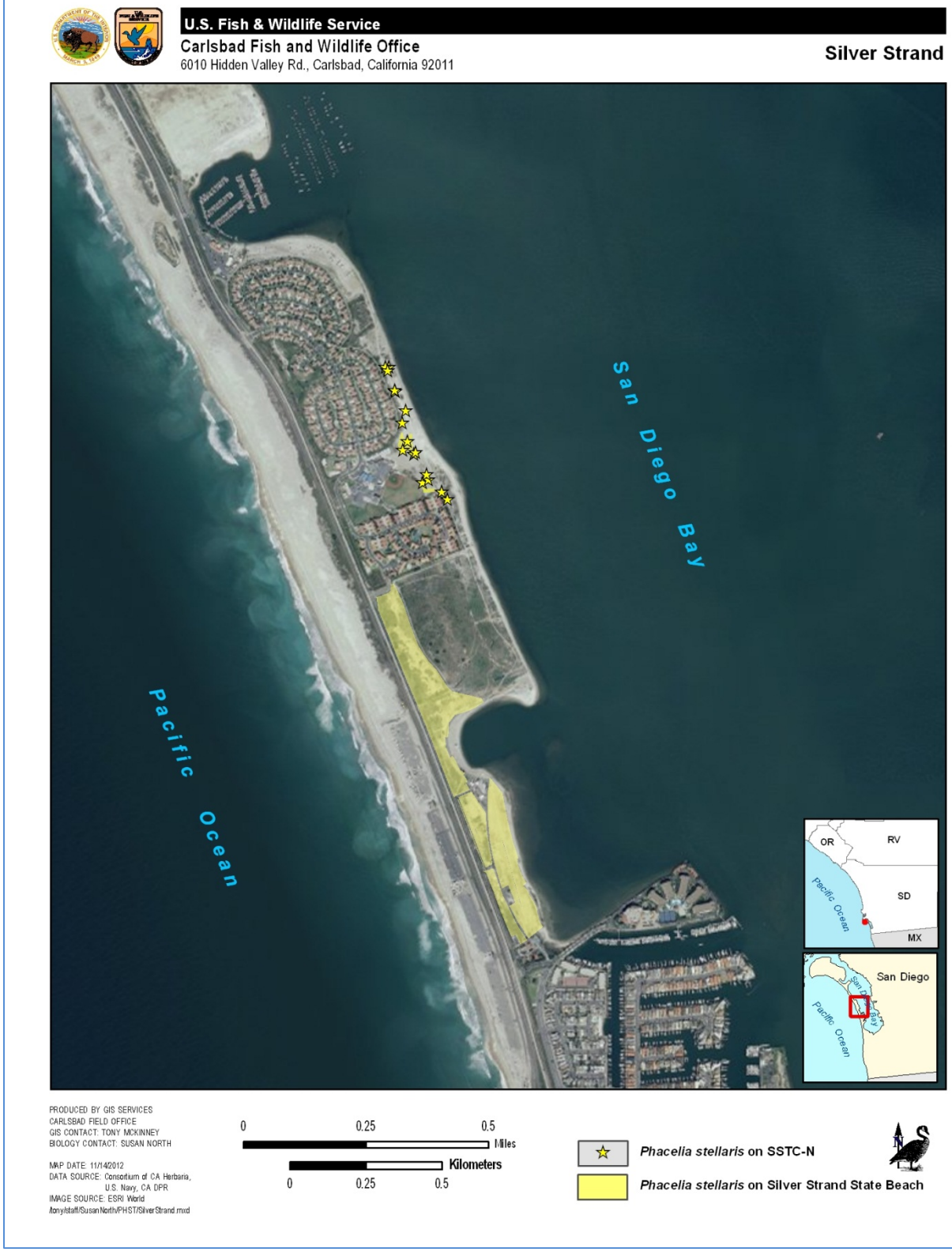


Figure 4. Distribution of Brand's phacelia on the Silver Strand, including Silver Strand State Beach and Silver Strand Training Center–North (SSTC–N) Bayside.

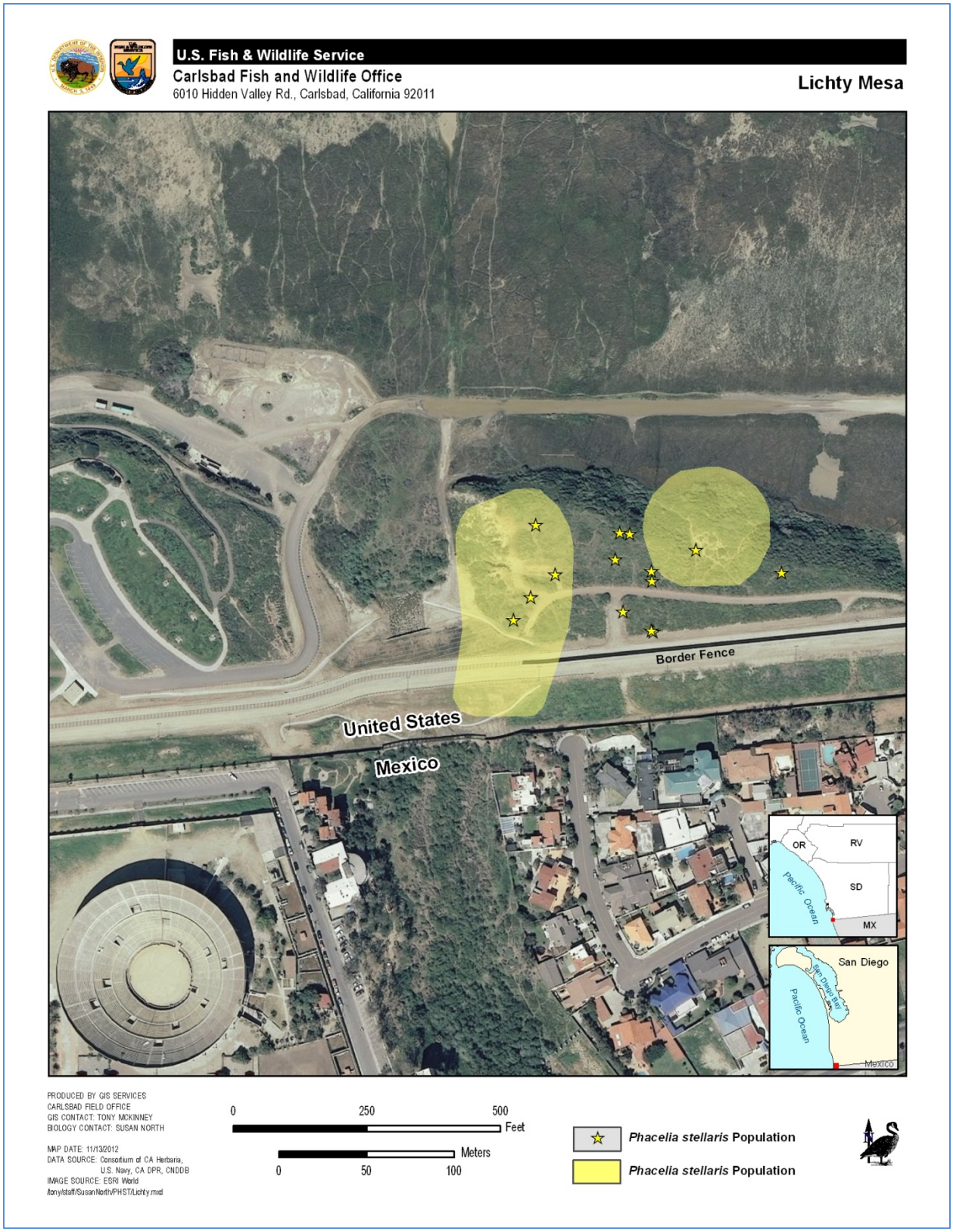


Figure 5. Distribution of Brand's phacelia at Lichty Mesa.