

Recovery Outline for the
Arctostaphylos franciscana
(Franciscan manzanita)



Shelley Estelle, Presidio Trust 2011

Scientific Name:	<i>Arctostaphylos franciscana</i>
Common Name:	Franciscan manzanita
Listing Status:	Endangered; final rule September 5, 2012 (77 FR 54434)
Critical Habitat Designation:	Proposed rule September 5, 2012 (77 FR 54517)
Lead Agency/Region:	U.S. Fish and Wildlife Service Pacific Southwest Region
Lead Field Office:	Sacramento Fish and Wildlife Office 2800 Cottage Way, Room W-2605 (916) 414-6600
Approved:	February 2013

Purpose of the Recovery Outline: This document lays out a preliminary course of action for the survival and recovery of *Arctostaphylos franciscana*. It is meant to serve as interim guidance to direct recovery efforts and inform consultation and permitting activities until a comprehensive draft recovery plan has been completed. Recovery outlines are intended primarily for internal use by the U.S. Fish and Wildlife Service (Service) and formal public participation will be invited upon the release of the draft recovery plan. However, we will consider any new information or comments that members of the public offer in response to this outline during the recovery planning process. For more information on Federal survival and recovery efforts for *A. franciscana*, or to provide additional comments, interested parties may contact the lead field office, Sacramento Fish and Wildlife Office, for this species at the above address and telephone number.

Scope of Recovery and Available Information: The scope of this effort is single species recovery. The *Conservation Plan for Arctostaphylos franciscana (the Franciscan Manzanita)* (Chassé et al. 2009) (Conservation Plan) was written in 2009 by six agencies directly involved in the identification, translocation, propagation, and management of the plant. These agencies are National Park Service, Golden Gate Parks Conservancy, Presidio Trust, San Francisco State University, U. S. Fish and Wildlife Service, and California Department of Transportation. The available information regarding the location and numbers of existing plants of *Arctostaphylos franciscana* is well known and reliable due to public interest generated by the rarity of the species (one wild plant within a construction site was located in 2009 after the species had not been seen in the wild since the 1940s), the extensive efforts to find a site to relocate the one known wild plant, and the number of species experts who have focused on the recovery of *A. franciscana*. Our current knowledge about the species' growth and reproduction requirements is limited particularly regarding its ability to self-pollinate, whether self-pollination is necessary for seed production, and the presence or absence of appropriate pollinators. Additionally, our knowledge of suitable habitat for the species is based on herbarium records dating back to 1889 and records of the wild occurrences that were destroyed in the 1940s. The recently located plant was in a highly disturbed area which provided little additional information on suitable habitat. The distribution and types of habitat occupied by the species prior to the loss of its habitat are inferred from this information and may be incomplete. Recovery will include planting of rooted cuttings of *A. franciscana* in suitable protected areas (outplanting) to create new self-sustaining populations. Outplanting and other recovery efforts will require coordination of the agencies noted above in addition to other entities such as the City and County of San Francisco. Eventually, outplanting of *A. franciscana* cuttings in association with cuttings of *A. montana* ssp. *ravenii* (Raven's manzanita) may be considered. *Arctostaphylos montana* ssp. *ravenii* is another listed species found on the San Francisco Presidio that historically co-occurred with *A. franciscana*.

I. Recovery Status Assessment

A. BIOLOGICAL ASSESSMENT

1. Species Description and Life History

Arctostaphylos franciscana is a low evergreen shrub with horizontal or upward curving stems in the heath family (Ericaceae) that may reach 0.6 to 0.9 meters (m) (2 to 3 feet (ft)) in height when mature (Chasse *et al.* 2009, p. 5). Its leaves are about 1.5 to 2 centimeters (cm) (0.6 to 0.8 inches (in)) long, are isofacial (have the same type of surface on both sides), and are oblanceolate (longer than they are wide and wider towards the tip) (Eastwood 1905, p. 201; Chasse *et al.* 2009, p. 39). Its mahogany brown fruits are about 6 to 8 millimeters (mm) (0.24 to 0.32 in) wide, while its white to pink, urn-shaped flowers measure about 5 to 7 mm (0.2 to 0.28 in) long (Wallace 1993, p. 552; Service 2003, p. 57).

In the wild, *Arctostaphylos franciscana* is an obligate-seeding species (it reproduces primarily from seed rather than from burls) (Vasey 2010, p. 1). *Arctostaphylos* (manzanita) species are members of the chaparral plant community, which have a variety of triggers for seed germination including heat, smoke, and light (Keeley 1987, p. 434). *Arctostaphylos* species have germinated after being exposed to charate (ground charred wood) (Keeley 1987, pp. 435, 440) which suggests that fire or conditions that simulate fire stimulate germination of the seeds.

The establishment of successful populations of *A. franciscana* may require the presence of a pollinator community (primarily bumblebees (*Bombus* spp.) but also other insects), a fruit dispersal community (primarily rodents), and a mutually beneficial soil mycorrhizal fungi community (Parker 2011, p. 1). The seeds of *Arctostaphylos* are dispersed primarily by rodents that consume the fruits, but also by other mammals, including coyotes (*Canis latrans*) and foxes (T. Parker 2011, pers. comm.; Vasey 2011, p. 1). Animals such as coyotes and foxes eat the *Arctostaphylos* fruit and may travel long distances before depositing their scat. Any undigested fruit left in the scat can then be harvested by rodents and either eaten or buried.

2. Historical and Current Distribution and Abundance

Prior to 1947, *Arctostaphylos franciscana* was known from three locations on the San Francisco peninsula: the Masonic and Laurel Hill Cemeteries in San Francisco's Richmond district, and Mount Davidson in the south-central part of San Francisco (Service 2003, pp. 16, 62, 95; Chasse *et al.* 2009, p. 4). Unconfirmed sightings were also noted at a possible fourth location near Laguna and Haight Streets. By 1947, the Masonic and Laurel Hill Cemetery sites were removed and the grounds destroyed in preparation for commercial and urban development (Chasse *et al.* 2009, p. 7). Salvaged plants from the Laurel Hill Cemetery site were placed in botanical gardens. The Mount Davidson and the Laguna and Haight Streets locations were likely lost to urbanization as well. *Arctostaphylos franciscana* was not seen in the wild between 1947 and October

2009 (Chasse *et al.* 2009, pp. 3, 7), although no systematic surveys are known to have taken place to search for potential remaining individuals (Chasse 2010, p. 1). A single wild plant was discovered in 2009 located along Doyle Drive in San Francisco, an area that was under construction; subsequently, the plant was transplanted. The current range of the species consists of this single wild plant in the San Francisco Presidio. The plants growing in botanical gardens that were salvaged from Laurel Hill Cemetery before 1947 are also considered to be the listed entity. It is unknown how many genotypes are represented by plants in botanical gardens because, when brought into captivity, cuttings may have been taken from multiple plants or a single plant.

3. Habitat Description

Arctostaphylos franciscana is considered to be endemic to the San Francisco peninsula, and historically occurred in areas with serpentine soils, bedrock outcrops, greenstone, and mixed Franciscan rock, typically growing in mixed populations with *A. montana* ssp. *ravenii* (Service 2003, pp. 95, 96; Chasse *et al.* 2009, p. 6). The Doyle Drive *A. franciscana* site consisted of disturbed soil over serpentinite (Chasse *et al.* 2009, p. 3). Serpentine soil restricts the growth of many plants due to its high nickel and magnesium concentrations, and thus tends to support unique plant communities (Brooks 1987, pp. 19, 53; Service 2003, p. 16) because relatively few plant species can tolerate such soil conditions. These conditions generally result in semibarren soil and a lack of competing plants, which benefits serpentine-tolerant plants (Bakker 1984, p. 79) such as *A. franciscana*. The wild plant is located on the portion of the San Francisco Presidio that is federally-owned and managed by the Presidio Trust. Currently, habitat for *A. franciscana* is considered to include all areas of serpentine soils, serpentine bedrock outcrops, and greenstone on the San Francisco peninsula that are occupied by the species or are unoccupied and may be suitable for outplanting the species. The locations of these areas are described in the Service's proposed rule to designate critical habitat for *A. franciscana* (77 FR 54517).

4. Summary Biological Assessment

The species consists of a single wild plant. The primary recovery needs of the species are the establishment of new populations from cuttings of the wild plant within areas that support the necessary components of its habitat including appropriate soils, pollinators, seed dispersers, and soil mycorrhizal fungi.

B. THREATS ASSESSMENT

1. Listing Factors/Primary Threats to the Species

As identified in the final rule (77 FR 54434), the primary threats to the *Arctostaphylos franciscana* are loss of habitat, overcollection of cuttings and seeds, and disease and predation. Additional threats include climate change, altered fire regime, soil compaction from trampling, vandalism, loss of genetic diversity, loss of pollinators, stochastic events, effects of small population size, and hybridization. A description of these threats is

presented below; each is classified according to the five listing/delisting factors identified in section 4 of the Endangered Species Act (“Act”; 16 USC 1531 *et seq.*). Because the wild population of the species currently consists of a single plant, all the threats noted below are rangewide rather than local. The species’ response to these threats is unknown.

Factor A: The present or threatened destruction, modification, or curtailment of its habitat or range

- All areas of habitat originally known to be occupied by *Arctostaphylos franciscana* have been lost to urban development or to habitat conversion through the introduction of nonnative plant species (Chasse *et al.* 2009, pp. 4, 7; Chasse 2011c, p. 1). The loss of the plant’s native serpentine chaparral habitat to development and the curtailment of its range restrict the species’ current and future ability to naturally reproduce and expand its range. The threats of possible development and change in management of the habitat may further limit the species’ propagation and expansion, and could potentially threaten the only remaining wild plant.
- Additionally, nitrogen deposition from automobile exhaust may modify habitat by increasing soil nutrients and increasing nonnative grass cover (Weiss and Luth 2003, p. 1), thus posing a threat to remnant habitat that might otherwise be suitable for *Arctostaphylos franciscana*. The entire northern San Francisco peninsula, with the exception of the Presidio and Golden Gate Park, has been urbanized, and four major highways (Highways 1, 101, 280, and 480) and other urban roadways dissect the peninsula.
- The Presidio Trust Act contains a sunset clause that could result in the transfer of Presidio holdings to the General Services Administration (GSA) for disbursement if the Presidio Trust operations are not self-sufficient by 2013. In the unlikely event that the Presidio Trust is not self-sufficient within that timeframe, the potential that lands could be transferred and become available for development, presents a threat of additional habitat loss in the future.

Factor B: Overutilization for commercial, recreational, scientific, or educational purposes

- Overutilization of *Arctostaphylos franciscana* is possible due to its popularity for landscape use, as evidenced by the use of cultivars of this species in the commercial nursery trade. *Arctostaphylos franciscana* is specifically recommended for use in erosion control on steep slopes (Theodore Payne Foundation 2009, p. 1; Sierra Club 2011, p. 1).
- The attention and media coverage generated by the discovery of a species thought to be extirpated from the wild may result in efforts by the public to visit the plant and possibly collect cuttings or seed. Although nursery-grown *A. franciscana* are available to residents for use in private gardens, collection of the wild plant is a

threat to the species, and we expect it may be a threat in the future, particularly if the location of the plant becomes known to the public.

Factor C: Disease or predation

Disease

- A fungal infection called twig blight, usually caused by *Botryosphaeria* species in *Arctostaphylos*, is a potential concern for the *Arctostaphylos franciscana*, particularly during wet years (Service 2003, p. 69). Twig blight was observed in the wild plant during the winter of 2009–2010, but subsided during the dry summer months (Chasse 2010, p. 2). These pathogens could threaten *A. franciscana* because the wild population is limited to a single plant and infection by this group of fungi is one of the major factors leading to the decline of older *Arctostaphylos* sp. plants (Swiecki 2011, p. 1).
- *Arctostaphylos franciscana* is also threatened by various pathogens in the genus *Phytophthora*. An oak tree infected with sudden oak death disease was discovered on the Presidio in 2010 (Fimrite 2011). *Phytophthora ramorum*, the pathogen that causes sudden oak death, has so far been observed to cause only a foliar blight in species of *Arctostaphylos*, rather than the lethal bark cankers that occur on members of the black oak group (Swiecki 2012, p. 1). However, a related species, *P. cinnamomi*, has killed plants of another *Arctostaphylos* species, *A. pallida* (pallid manzanita), in the Oakland Hills of the East San Francisco Bay region and is expected to be a serious threat to *A. franciscana*.
- At least five other species of *Phytophthora* associated with the decline and death of woody plants have been found in the Crystal Springs watershed 27 to 40 kilometers (km) (17 to 25 miles (mi)) south of the Presidio.

Predation

- After being transplanted, the wild plant became severely infested with the larvae of a native leaf roller moth (*Argyrotaenia franciscana*) (Estelle 2010, p. 1) which feeds on and pupates within rolled-up manzanita leaves. The moth has not been known to kill plants and does not appear to be a serious threat at this time; however, the moth species was found to have five overlapping generations in a year (Estelle 2010, p. 1).
- Damage to *Arctostaphylos franciscana* branches by California voles has been observed by Presidio Trust staff (Chasse 2011c, p. 2). Some branch dieback of *A. franciscana* has been attributed to gnawing by voles and other rodents (Chasse 2011c, p. 2).

Factor D: The inadequacy of existing regulatory mechanisms

- Future management of the Presidio, and of *Arctostaphylos franciscana* and its habitat, are uncertain because of differences in the missions of the Presidio Trust and NPS. The Presidio Trust is a new model for National Park management in that the Trust is directed to preserve the natural, scenic, cultural, and recreational resources on the Presidio, and at the same time ensure that the Presidio becomes financially self-sufficient by 2013 (Presidio Trust 2002, pp. 1, 12), which means that generation of revenue is a consideration for its activities as well as resource protection. The mission of NPS on the Presidio as stated in the Golden Gate National Recreation Area Act (16 U.S.C. 460bb), although similar to the Presidio Trust Act regarding the protection of natural, historic, scenic, and recreational values, does not include the mandate to ensure that the Presidio becomes financially self-sufficient.
- The future status of the Presidio as National Park land is uncertain, as explained in the Presidio Trust Act, Sec. 104 (o) Reversion, which states: If, at the expiration of 15 years, the Trust has not accomplished the goals and objectives of the plan required in section 105 (b) of the Presidio Trust Act, then all property under the administrative jurisdiction of the Trust pursuant to section 103 (b) of this Act shall be transferred to the Administrator of the General Services Administration to be disposed of in accordance with the procedures outlined in the Defense Authorization Act of 1990 (104 Stat. 1809) and any real property so transferred shall be deleted from the boundary of the Golden Gate National Recreation Area.
- The Presidio Trust is subject to section 7 consultation under the Act, thereby providing protections to the plant under the Act. The species is not listed under the California Endangered Species Act. The Conservation Plan and the associated Memorandum Of Agreement (MOA) are not regulatory in nature, and are not legally enforceable by third parties (Caltrans *et al.* 2009, p. 8; Chasse *et al.* 2009, p. 3), limiting their usefulness in enforcing protections for the plant.

Factor E: Other natural or manmade factors affecting its continued existence

Potential threats to the species include changes in environmental conditions resulting from climate change, trampling, or disturbance by people visiting the Presidio, change in fire frequency, loss of genetic diversity, stochastic (chance) events, small population size, and hybridization.

Climate Change

- Changes in environmental conditions resulting from climate change may cause presently suitable habitat to become unsuitable for endemic California plants in general, due to projected changes in temperature and rainfall (Loarie *et al.* 2008, pp. 1–2). Preliminary results of a U.S. Geological Survey (USGS) study in National Park lands in northern

California and Oregon show an increase in average maximum summer air temperatures at Golden Gate National Recreation Area, located near the Presidio, and a reduction statewide in fog frequency (Madej *et al.* 2010, p 24; Johnstone and Dawson, 2010, p. 4535).

- Summer fog is important to upland coastal vegetation and partly determines the distribution of coastal species (Johnstone and Dawson 2010, p. 4533). Besides serpentine soil and cool air temperatures, (Parker 2010c, p. 1), summer fog is one of the primary habitat requirements for *Arctostaphylos franciscana* (Vasey 2010, p. 1). Reduced soil moisture from loss of summer fog may result in a reduction of seed germination and seedling survival. Additionally, the ability of *A. franciscana* to track future climate changes by establishing new plants in new habitat may be limited because of its association with serpentine and greenstone bedrock outcrops (Service 2003, pp. 95, 96) and because remaining soils derived from serpentine and greenstone bedrock on the peninsula are limited in area and largely fragmented (Chasse 2010, p. 1).

Alteration of the Natural Fire Regime

- Fire frequency in the San Francisco Bay area has varied substantially in the last several thousand years with changing climate, the fragmentation of remaining undeveloped lands, and changing patterns of human utilization of the landscape. In addition, fire suppression has been prevalent during the last 100 years. This altered fire regime has led to an increase in crown and surface fuels, contributing to high-intensity fires (Golden Gate National Recreation Area (GGNRA) 2005, p. 147).
- The fire return interval for the general area of *Arctostaphylos franciscana* is currently approximately 100 to 125 years (T. Parker pers. comm., 2011, Vasey 2011, p. 1). If fire continues to be excluded from these areas and the fire return interval greatly exceeds the natural return interval, the loss of fire over time may result in the loss of the mature plant and individual outplanted seedlings due to competition by plants, including nonnative plants, which could encroach upon the manzanita.

Trampling

- Trampling by visitors could impact the wild plant, and its offspring, or any herbarium-raised plants that are restored to the wild, if they are placed in areas subject to regular foot traffic. The translocated wild plant has been planted in an active native plant management area that receives heavy public use; however, it is protected by a cable and post fence from public access and is monitored (Chasse *et al.* 2009, pp. 20–28).

- Soil compaction, such as from foot traffic, reduces water infiltration rates from rainfall and reduces soil aeration by collapsing the larger pores in the soil. Reduced soil oxygen levels from loss of soil pores also can reduce root growth, which further reduces water and nutrient uptake (Hammit and Cole 1998, p. 52). Trampling has also been found to cause considerable damage to mycorrhizal fungi in seedling roots (Waltert *et al.* 2002, p. 1). Most *Arctostaphylos* species form strong symbiotic associations with soil mycorrhizal fungi, which facilitate the uptake of water and nutrients (Chasse 2009, p. 12). Damage from trampling will not only impact the wild plant by reducing its ability to take up water and nutrients, but will also reduce the ability of any seedlings germinating near the wild plant to survive.

Vandalism

- The location of the *Arctostaphylos franciscana* plant within the Presidio is near common-use trails and an area that is available for rent for private and public events. Threats to *A. franciscana* include damage from vandalism and interested visitors. Vandalism to trees was reported in the Presidio in the early 2000's (T. Thomas pers. comm. 2011). Severe vandalism was observed in Golden Gate Park, located approximately 2.4 km (1.5 mi) south of the Presidio, in summer 2010 where more than 40 trees and 30 rose bushes were killed by unknown persons for unknown reasons (King 2010, unpaginated, Gordon 2010, unpaginated). The post and cable fence protecting *A. franciscana* in the Presidio is approximately 30 ft (9.1 m) from the plant and is not constructed to completely exclude visitors.

Loss of Genetic Diversity

- Any new population starting from the single wild plant is likely to have reduced genetic variation compared to historical populations. The generation with the smallest number of individuals has the greatest effect on the genetic variation of subsequent generations. Even if the number of plants is expanded, it may not reverse the previous genetic loss known as the “bottleneck effect” (Allendorf and Luikart 2007, p. 158).
- Reduced genetic variation may result in the plant's offspring not being able to adapt to changes in habitat such as decrease in fog and increase in temperature or loss of pollinators. *Arctostaphylos franciscana* may be capable of self-pollination. In general, self-pollination results in a decrease in genetic variation in the offspring of a plant (Allendorf and Luikart, 2007, p. 123); therefore, a loss of genetic variation is expected if *A. franciscana* is dependent on self-pollination to produce seed.

Stochastic Events and Small Population Size

- Chance events constitute a serious threat to the species. Because the known population of *Arctostaphylos franciscana* in the wild is currently limited to a single plant, the species is extremely vulnerable to stochastic events—normal but damaging environmental perturbations and catastrophes such as droughts, storm damage, and fires, from which large, wide-ranging populations can generally recover, but which may lead to extirpation of small, isolated populations (Gilpin and Soule 1986, pp. 25–31). Suitable pollinators may be critical for seed production for this obligately seeding species. If pollinators are not present or are in insufficient numbers, viable seeds may not be produced to develop and maintain the seedbank.
- The wild plant is also threatened by the Allee effect, which is a decline in population growth rate due to declining plant density (Akçakaya *et al.* 1999, p. 86). For the wild plant, the Allee effect may result from a lack of other available *Arctostaphylos franciscana* plants with which to cross-pollinate and produce viable seed.

Hybridization

- The cultivars of *Arctostaphylos franciscana* used in the commercial nursery trade are likely descended from some of the last wild *A. franciscana* plants known to exist in the 1940s. Since hybridization between diploid species of manzanita is well recognized (Chasse *et al.* 2009, p. 5), there is a good chance that many of these commercially available specimens have resulted from hybridization. Because of the threat of cross-pollination from hybrids or other species (Allendorf *et al.* 2001, pp. 613, 618–621), any propagation or reintroduction programs for *A. franciscana* must account for subsequent contamination and swamping of the *A. franciscana* gene pool.

2. Summary Threats Assessment

The greatest and most imminent threat to the species is the loss of the wild plant, and, therefore, extirpation of the species from the wild, due to potential disease, herbivory, trampling, or climate change.

C. CONSERVATION ASSESSMENT

1. Conservation Efforts

The Conservation Plan (Chassé *et al.* 2009) was written by six agencies and organizations directly involved in the translocation, propagation, management, and monitoring of the plant after its discovery in 2009. These agencies are National Park Service, Golden Gate

Parks Conservancy, Presidio Trust, San Francisco State University, U. S. Fish and Wildlife Service, and California Department of Transportation. Per recommendations in the Conservation Plan, the following actions have been completed or are ongoing:

1. The single wild *Arctostaphylos franciscana* plant has been removed from its original location along Doyle Drive and transplanted to a secure, monitored location on the San Francisco Presidio. Critical habitat has been proposed (77 FR 54517), but has not been finalized at the time this document was completed.

2. Cuttings were taken by Golden Gate National Parks Conservancy from the wild plant and distributed among several botanical nurseries and one commercial nursery to generate plants for starting new populations. By distributing the cuttings to multiple nurseries, the risk of loss of all the cuttings to disease or other causes was lessened. Currently, over 300 rooted cuttings are available to be transplanted.

3. A study to develop a seed germination protocol for *Arctostaphylos franciscana* using a surrogate species, *A. montana* (Mount Tamalpais manzanita), is ongoing at the Golden Gate National Parks Conservancy Nursery in San Francisco. Seeds have been collected from the wild plant and germination will be attempted using the protocol.

Additional conservation and recovery actions not outlined in the Conservation Plan are also ongoing or completed. A study to identify the primary pollinators of *A. franciscana* is being conducted at the Presidio by a Presidio Trust volunteer. Photographs of pollinators visiting the wild plant have been taken and will be identified. An infestation of the wild plant by leaf roller moths was discovered during regular monitoring by Presidio Trust staff and the moth larvae removed. Damage to the plant from California voles was also noted and the voles trapped and removed by Presidio Trust staff.

No conservation measures pursuant to section 7 or section 10 have been identified.

2. Summary Conservation Assessment

The successful propagation of over 300 cuttings from the wild plant has reduced the threat of loss of the genetic information of the wild plant. The next step of planting the rooted cuttings and growing them to maturity will be a future recovery action. The removal of leaf roller larvae and trapping and removal of the California voles has reduced the damage from these herbivores and likely protected the health of the plant.

D. SUMMARY OF RECOVERY STATUS AND NEEDS

The most imminent threat to the species is its extirpation in the wild from the potential loss of the wild plant. Other threats include loss of genetic diversity, damage from herbivores, insufficient pollinators, and potential trampling, vandalism, and over-collection of cuttings or seeds. The key survival and recovery needs of the species are to establish additional populations in areas that support the essential needs of the species including appropriate soil type, pollinators, and soil mycorrhizal fungi.

II. Preliminary Recovery Strategy

A. RECOVERY PRIORITY NUMBER

The recovery priority number for *Arctostaphylos franciscana* is 2C. This number indicates that the taxon is a species that faces a high degree of threat and has a high potential for recovery. The “C” after this number indicates conflict with construction or other development projects or other forms of economic activity (48 FR 43098).

B. RECOVERY VISION STATEMENT

Full recovery for the species to the point that protections of the Act are no longer necessary (delisting) will include the establishment of several self-sustaining populations throughout its historical range, the San Francisco peninsula, in areas that contain appropriate habitat. The increase in numbers of populations and possible increase in range is essential to protect the species against local extinction. Although it will prove challenging to remove or ameliorate all threats to the species (protection from many of the threats, particularly climate change, loss of genetic diversity, vandalism, and disease, are difficult to ameliorate or control) the threat of additional loss of habitat on the San Francisco peninsula that supports the species or potential outplanting sites must be ameliorated to achieve recovery.

C. INITIAL ACTION PLAN

The Conservation Plan (Chassé et al. 2009) identifies immediate short-term actions, mid-term monitoring and maintenance actions, and long-term restoration and recovery actions. These actions have been or will be implemented by the Presidio Trust, National Park Service, and the Golden Gate National Parks Conservancy in cooperation with the Service as described in the 2009 MOA and the Conservation Plan. Final signature of the MOA was obtained in December 2009 with the MOA to remain in effect for 15 years following this date. In general, the three sections of the Conservation Plan are as follows:

- *Short-term actions:* Actions that have already been implemented include collecting cuttings, layers, and seeds from the wild plant, germination studies using surrogate species; and growing the cuttings and layers out in various botanic gardens and nurseries.
- *Mid-term actions (November 2010 – November 2012):* Actions that are ongoing for the wild plant are irrigation as needed; monitoring for growth and seed production; and control of invasive plants, infestations of insects, and herbivory.
- *Long-term actions:* These will include:
 - Monitoring the wild plant in Spring of each year (2013-2024); continuing control of invasive vegetation around the plant; and collecting and storing seed in at least two locations.

- Outplanting clones. Planting sites should be examined for pathogen infection prior to plant installation. Appropriate planting areas will be determined by *Arctostaphylos franciscana* experts in conjunction with GGNRA, Presidio Trust, and Golden Gate Parks Conservancy using the selection criteria developed for transplanting the wild plant as described in the Conservation Plan (Chasse *et al.* 2009, p. 18). As noted in the Conservation Plan (Chasse *et al.* 2009, p. 32), plants used for reintroduction of the wild plant and other genotypes of the species should be as close in lineage to the plants of origin as possible. Plants that have been grown in captivity for several generations may have been selected for different conditions than the outplanting site and, therefore, are unsuitable. Cuttings should be taken only from the wild plant or from clones of the original genotypes that are in botanical gardens.
- Collecting pollen if distances between the wild plant and outplanted plants exceed pollinator range. Pollen will be used for long-term storage or immediate crosspollination.
- Protecting the wild plant and outplanted plants from threats including fire, vandalism, insect damage, and disease. Determine appropriate management.
- Updating and revising the Conservation Plan.

III. Preplanning Decisions

A. RECOVERY PLAN DEVELOPMENT

The Sacramento Fish and Wildlife Office will take the lead in the preparation of the draft recovery plan for *Arctostaphylos franciscana* pursuant to section 4(f) of the Act beginning in fiscal year 2018. We will seek input from all persons interested in, or potentially affected by, recovery efforts for *A. franciscana*. Public comments received on this recovery outline will be taken into consideration during the preparation of the draft recovery plan. Additionally, public comments will be solicited on the draft recovery plan.

B. INFORMATION MANAGEMENT

The administrative record will be housed at the Sacramento Fish and Wildlife Office. A Service biologist in coordination with the stakeholders will be gathering information regarding the species for the purposes of recovery planning.

C. STAKEHOLDER INVOLVEMENT

Key stakeholders:

- Presidio Trust

- Golden Gate National Recreation Area, National Park Service (Mr. Michael Chasse)
- San Francisco State University (Dr. Tom Parker, Dr. Mike Vasey)
- Golden Gate National Parks Conservancy, San Francisco, CA (Ms. Betty Young)
- California Department of Fish and Wildlife
- City of San Francisco
- County of San Francisco

These key stakeholders, with the exception of the City and County of San Francisco, were brought together during the process of writing the MOA in 2009. They have already committed to long-term actions that will lead to the recovery of the species as noted in the MOA and the Conservation Plan. The City and County of San Francisco were not part of that process but will likely play an important role as sites for establishing new populations on the peninsula are selected and outplanting and management are begun.

Approved:

Alexandra Pitts

Acting Regional Director, Pacific Southwest Region
U.S. Fish and Wildlife Service

2.13.2013

Date

Citation

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