

# Recovery Plan for

## Franciscan Manzanita

(*Arctostaphylos franciscana*)



Photo courtesy of Shelley Estelle

**Recovery Plan for Franciscan Manzanita**  
**(*Arctostaphylos franciscana*)**

**Region 8**  
**U.S. Fish and Wildlife Service**  
**Sacramento, California**

Approved: \_\_\_\_\_



Regional Director, Pacific Southwest Region, Region 8,  
U.S. Fish and Wildlife Service

Date: \_\_\_\_\_

10/1/19

## Disclaimer

Recovery plans delineate such reasonable actions as may be necessary, based upon the best scientific and commercial data available, for the conservation and survival of listed species. Plans are published by the U.S. Fish and Wildlife Service (Service), sometimes prepared with the assistance of recovery teams, contractors, State agencies, and others. Recovery plans do not necessarily represent the view, official positions or approval of any individuals or agencies involved in the plan formulation, other than the Service. They represent the official position of the Service only after they have been signed by the Regional Director. Recovery plans are guidance and planning documents only; identification of an action to be implemented by any public or private party does not create a legal obligation beyond existing legal requirements. Nothing in this plan should be construed as a commitment or requirement that any Federal agency obligate or pay funds in any one fiscal year in excess of appropriations made by Congress for that fiscal year in contravention of the Anti-Deficiency Act, 31 U.S.C. 1341, or any other law or regulation. Approved recovery plans are subject to modification as dictated by new finding, changes in species status, and the completion of recovery actions.

### **Literature Citation Should Read as Follows:**

U.S. Fish and Wildlife Service. 2018. Recovery Plan for Franciscan manzanita. U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California.

An electronic copy of this recovery plan is available at:

<https://www.fws.gov/endangered/species/recovery-plans.html>

A notice has been published in the Federal Register indicating the availability of this recovery plan.

## Acknowledgements

The recovery planning process has benefitted from the advice and assistance of many individuals, agencies, and organizations. We thank the following individuals for their assistance and apologize to anyone whose name was omitted inadvertently from this list:

### **Lead Authors:**

Elizabeth Warne, formerly Sacramento Fish and Wildlife Office  
Michael Chasse, National Park Service, Golden Gate National Recreation Area

### **Other Contributors:**

Valary Bloom, Sacramento Fish and Wildlife Office  
Jess Gambel, Presidio Trust  
Dionisio Gamoso, Presidio Trust  
Josh Hull, Sacramento Fish and Wildlife Office  
V. Thomas Parker, San Francisco State University  
Ben Solvesky, formerly Sacramento Fish and Wildlife Office  
Lew Stringer, Presidio Trust  
Ted Swiecki, Phytosphere Research  
Kirsten Tarp, Sacramento Fish and Wildlife Service  
Terri Thomas, Presidio Trust  
Michael Vasey, San Francisco State University  
Betty Young, Golden Gate National Parks Conservancy  
David Yam, California Department of Transportation

# RECOVERY PLAN FOR FRANCISCAN MANZANITA (*ARCTOSTAPHYLOS FRANCISCANA*)

---

## Introduction

This document presents the U.S. Fish and Wildlife Service's (Service) plan for the conservation and recovery of Franciscan manzanita (*Arctostaphylos franciscana*). Pursuant to section 4(f) of the Act, a recovery plan must, to the maximum extent practicable, include (1) a description of site-specific management actions as may be necessary to achieve the plan's goals for the conservation and survival of the species; (2) objective, measurable criteria which, when met, would support a determination under section 4(a)(1) that the species should be removed from the List of Endangered and Threatened Species; and (3) estimates of the time and costs required to carry out those measures needed to achieve the plan's goal and to achieve intermediate steps toward that goal. This recovery plan is based on the Species Biological Report for Franciscan Manzanita (*Arctostaphylos franciscana*), which describes the life history and biology of the species, the current status of the species, and the threats that impact the species. The Species Biological Report is briefly summarized below. Those specific activities necessary for implementing this plan's proposed recovery actions are described in the Recovery Implementation Strategy. Both the Species Biological Report and the Recovery Implementation Strategy are available at <https://ecos.fws.gov>, and will be updated as necessary.

Franciscan manzanita (*Arctostaphylos franciscana*) was federally-listed as endangered under the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*) (Act) in 2012 and has a recovery priority number of 5, indicating the taxon is a species, faces a high degree of threat, and has a low potential for recovery (Service 2012). The Service designated critical habitat for the species in 2013 (Service 2013)(Figure 1). Franciscan manzanita was considered extirpated from the wild until 2009, when a single plant was discovered. The species has been known to occur only on the San Francisco peninsula in areas with serpentine soils, bedrock outcrops, greenstone, and mixed Franciscan rock. In addition to these soils, cool air temperatures and summer fog are the primary habitat requirements for the species. Though considered a serpentine endemic by most, plants will grow well in other soils as long as the stands are within the maritime climate influence (Parker *in litt* 2019). In addition to the single wild plant, there are cuttings and rooted specimens collected from Laurel Hill Cemetery prior to the species being extirpated that are managed in various botanical gardens and specimens propagated from cuttings and layers taken from the wild plant in 2010. In total, all extant Franciscan manzanita in the wild and in cultivation represent between one and six genetically distinct plants.

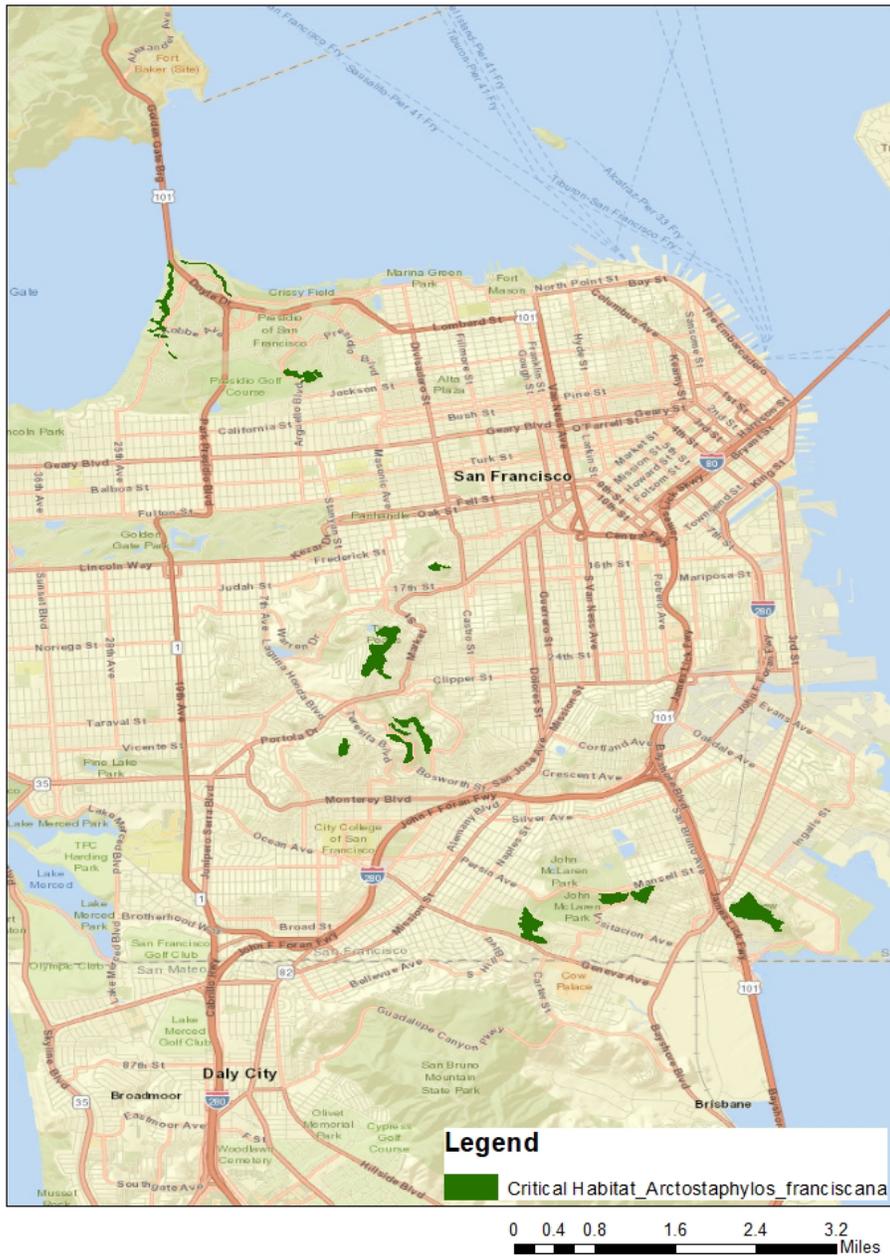


Figure 1. Designated Critical Habitat for Franciscan manzanita (2013).

The most significant threat to Franciscan manzanita is habitat loss from urbanization, which continues to impact remnant suitable habitat. Other threats include competition from invasive native and nonnative plants, potential infestation by *Phytophthora* species, damage from herbivores such as the California vole, climate change, visitor use, vandalism, stochastic events and the effects of small population size, potential loss of pollinators, water stress, and possibly hybridization with closely related ornamental manzanita cultivars.

## Recovery Strategy

The known historical range of Franciscan manzanita is limited and is further constrained by inhabiting naturally rare habitat within that geographic range. The main cause of the decline of the species is the loss and degradation of its habitat; therefore, the recovery strategy focuses upon this threat. Additional threats such as disease, herbivory, drought, and climate change also threaten the wild plant and actions to ameliorate those threats are included in the recovery strategy.

The recovery strategy includes: 1) representation of the genetic diversity of the species, 2) resiliency by establishment of sufficiently large populations to withstand stochastic events, and 3) redundancy by establishment of a sufficiently large *number* of populations to provide a safety margin to withstand catastrophic events.

To downlist the species to threatened status will require the establishment of several self-sustaining populations throughout the historical range on the San Francisco peninsula and in the Presidio in areas with appropriate habitat. The increase in numbers of populations is essential to protect the species against local extirpation. It will be challenging to remove or ameliorate all threats to the species (many of the threats, particularly climate change, loss of genetic diversity, vandalism, and disease, are difficult to reduce or control). The threat of additional loss of habitat on the San Francisco peninsula that supports potential outplanting sites must also be eliminated to achieve recovery. The downlisting recovery criteria consist of a combination of conditions that, when met, indicate Franciscan manzanita may warrant downlisting. These criteria are described in detail in the Downlisting Criteria section of this document. Full recovery of the species to the point that protections of the Act are no longer necessary (delisting) is likely not currently possible to envision for Franciscan manzanita due to the size of the remaining wild population (a single plant and its clones planted on the Presidio and in various botanic gardens), the scarcity of potential habitat for establishing new occurrences, and the difficulty of successfully transplanting Franciscan manzanita clones.

### Management Units

Management units are a type of geographic area that can be designated to help guide recovery plan implementation. Management units are areas that might require different management (perhaps due to different threats in different geographic areas that might be managed by different entities or that might encompass different populations). A management unit is not necessarily essential to the conservation of the species and not all management units need to meet a given recovery criterion. The three main areas within the peninsula that were or currently are occupied by the species constitute management units. These three units are geographically isolated from each other and are under separate ownership and management. These management units are: 1) the Presidio which is jointly owned and managed by the National Park Service and the Presidio Trust, 2) Mount Davidson, which is privately owned and largely converted to urban development, and 3) southeast of Mount Davidson on either side of Highway 101.

## Recovery Goal

The ultimate goal of this recovery plan is to outline specific actions that, when implemented, will sufficiently and permanently protect self-sustaining populations throughout the ecological, geographic, and genetic range of the species and reduce the threats to Franciscan manzanita to allow for its downlisting from endangered to threatened status.

## Recovery Objectives

To meet the recovery goal, the following objectives have been identified:

- Establish additional stands of Franciscan manzanita using cuttings and layers from the wild plant originally found on Doyle Drive.
- Establish stands of Franciscan manzanita using cuttings and layers from plants collected from the Laurel Hill Cemetery that represent other genotypes, and plant these individuals sufficiently close to the wild Franciscan manzanita clones so that outcrossing occurs among the genetically distinct individuals.
- Protect and manage habitat around extant and newly established plants (via vegetation control, irrigation supplementation, disease prevention, herbivore removal, and other means).
- Protect suitable habitat for future establishment of Franciscan manzanita populations.

## Recovery Criteria

An endangered species is defined in the Act as a species that is in danger of extinction throughout all or a significant portion of its range. A threatened species is one that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. When we evaluate whether or not a species warrants downlisting or delisting, we consider whether the species meets either of these definitions. A recovered species is one that no longer meets the Act's definitions of threatened or endangered due to amelioration of threats. Determining whether a species should be downlisted or delisted requires consideration of the same five factors that were considered when the species was listed and which are specified in section 4(a)(1) of the Act.

Recovery criteria are conditions that, when met, indicate that a species may warrant downlisting or delisting. Thus, recovery criteria are mileposts that measure progress toward recovery. Because the appropriateness of delisting is assessed by evaluating the five factors identified in the Act, the recovery criteria below pertain to and are organized by these factors. These recovery criteria are our best assessment at this time of what needs to be completed so that the species may be downlisted from endangered to threatened. Because we cannot envision the exact course that recovery may take and because our understanding of the vulnerability of a species to threats is likely to change as more is learned about the species and the threats, it is possible that a status review may indicate that downlisting is warranted although not all recovery criteria are met. Conversely, it is possible that the

recovery criteria could be met and a status review may indicate that downlisting is not warranted. For example, a new threat may emerge that is not addressed by the current recovery criteria.

## **Downlisting Criteria**

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

To downlist Franciscan manzanita, threats to the species habitat must be reduced. This reduction will be accomplished when the following have occurred:

- A/1** At least three populations of mature Franciscan manzanita plants are established in suitable habitat within the historical range of the species using clones from the wild plant.<sup>1</sup> All populations must exhibit signs of natural recruitment. For the purpose of recovery, a mature plant is defined as being 25 years of age or greater<sup>2</sup>.
- A/2** Additional populations of mature Franciscan manzanita plants are established in suitable habitat within the historical range of the species using clones of other genotypes located in botanical gardens. The source of the plants to be used is plants collected from Laurel Hill Cemetery in San Francisco and transplanted to botanical gardens in San Francisco. All populations must exhibit signs of natural recruitment.
- A/3** Each population under **A/1** and **A/2** above should be comprised of at least 50-100 plants.<sup>3</sup>
- A/4** A multi-agency management team is established to develop and implement site-specific monitoring and management plans for Franciscan manzanita.

Implementation of habitat management plans is expected to also ameliorate threats described under Factors B and E, such as altered fire regime, wildfire fuel reduction treatments, changes in environmental conditions resulting from climate change, vandalism, trampling, or removal of plant material by people visiting the Presidio, and water stress, thus resulting in improved habitat conditions for Franciscan manzanita.

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

---

<sup>1</sup> Chasse *et al.* 2009.

<sup>2</sup> Obligate seeding *Arctostaphylos* species may require 5 to 25 years before substantial seed crops are produced (Keeley 1987).

<sup>3</sup> Based on the ecology of a closely related species (*A. pallida*), a healthy population likely would be comprised of at least 1,500 mature plants. Because of the limited geographic area occupied by Franciscan manzanita and the low population numbers, it is unlikely that this target could ever be reached. In order to increase population resilience, the number of plants in each population should be between 50-100 plants. This number is based on the goal of increased demographic stability and feasibility of implementation and does not necessarily meet long term needs of the species. Future population studies will help to inform this goal.

To downlist Franciscan manzanita, threats to the species and its habitat must be reduced. This reduction will be accomplished when the following has occurred:

- B/1** No damage is observed during routine monitoring of the outplantings or the wild plant due to trampling, vandalism, and removal of cuttings or seeds in the pursuit of commercial, recreational, or scientific utilization.

Appropriate removal of cuttings or seeds in accordance with a management plan approved by USFWS is allowed and should not be considered non-attainment of this criterion.

### **Factor C: Disease or Predation**

Diseases, such as *Phytophthora* sp. and predation by mammals and insects are known to threaten Franciscan manzanita. To downlist Franciscan manzanita, the threats of disease and predation must be controlled or eliminated. This control will be accomplished when the following has occurred:

- C/1** Negative effects to the cuttings, outplantings, and the wild plant from infestation by *Phytophthora* sp., *Botryosphaeria* sp. (twig blight), and other diseases must fall below a level at which a population viability analysis indicates that the diseases are negatively affecting long-term persistence.

### **Factor D: Inadequacy of Existing Regulatory Mechanisms**

The inadequacy of existing regulatory mechanisms is not known to threaten Franciscan manzanita at this time. Therefore, no recovery criteria have been developed for this factor.

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

Other natural or manmade factors believed to affect the continued existence of Franciscan manzanita: water stress, changes in environmental conditions resulting from climate change, altered fire regime, trampling and vandalism by people visiting the Presidio, wildfire fuel reduction treatments, succession and non-native invasive species, loss of genetic diversity, stochastic (chance) events, and small population size. To downlist Franciscan manzanita, these threats must be reduced. Management plans developed and implemented in A/3 above are expected to help ameliorate several Factor E threats such as effects of altered fire regime, wildfire fuel reduction treatments, changes in environmental conditions resulting from climate change, trampling and vandalism, and water stress, thus resulting in improved conditions for Franciscan manzanita. Sufficient reduction of Factor E threats will have been accomplished when the following have occurred:

- E/1** Land managers, including the Presidio Trust, Golden Gate National Recreation Area, and the City and County of San Francisco, are committed, via the 2009 Memorandum of Understanding and the 2009 Conservation Plan to provide long-term vegetation control that will conserve resident Franciscan manzanita. Specifically, they will ensure that competing native and non-native vegetation is controlled to a level whereby the Franciscan manzanita plants are not shaded and

their vigor is not negatively affected. Attainment of this criterion may require revision to the existing Memorandum of Understanding and the Conservation Plan.

- E/2** Outcrossing (cross pollination) between wild plants and other genetically distinct individuals is accomplished. Planting of mixed groups will be performed within the historical range of the species and will include wild plants and other genetically distinct individuals planted in locations that are permanently protected and managed.
- E/3** Planting methods have resulted in an increasing trend in the number of mature Franciscan manzanita over a 25-year period<sup>4</sup> such that criterion **A/3** (50-100 plants per population) is achieved.
- E/4** Seed, representative of the breadth of the species' genetic diversity, is stored in a minimum of two Center for Plant Conservation-approved seed storage facilities. From each genet (seedling or clone), 1,500 seeds should be collected and banked, as long as seed collection does not result in adverse impacts to the wild plant or the established outplantings. This seed will be used for growing additional plants if the wild plant fails to survive, as well as for long-term conservation storage.

## **Delisting Criteria**

Due to the lack of necessary biological information, we are unable to develop delisting criteria at this time. We lack demographic data needed to estimate minimum viable population size at each Franciscan manzanita site. Furthermore, we lack an understanding of the species full historical range and of its natural population fluctuations. Therefore, this recovery plan addresses an interim goal of improving the status of Franciscan manzanita to the point that it may be downlisted to threatened status. Through implementation of recovery actions we hope to learn enough about Franciscan manzanita to enable us to describe the conditions necessary for delisting the species. At such time, delisting criteria should be developed and this recovery plan revised accordingly.

## **Recovery Actions**

The actions identified in Table 1 below are those that, based on the best available science, the Service believes are necessary to move towards the recovery and downlisting of the Franciscan manzanita.

---

<sup>4</sup> Obligate seeding *Arctostaphylos* species may require 5 to 25 years before substantial seed crops are produced (Keeley 1987).

**Table 1.** Recovery actions and estimated costs.

<b>Recovery Action</b>	<b>Estimated Cost</b>
1. Establish new populations of Franciscan manzanita within the historic range of the species. New populations should be situated in areas with suitable habitat and should use both the wild plant and genetically distinct cultivated plants as source material.	\$50,800
2. Protect, monitor, and manage outplanted populations and the wild plant. This action includes demographic monitoring of Franciscan manzanita as well as monitoring for impacts from other species such as invasive plants or herbivores.	\$139,900
3. Conduct research to determine the full range of the species and to guide outplanting and management efforts and establishment of a supportive chaparral community. This research includes habitat surveys, genetic research, and investigation of potential management methods to maximize success.	\$198,600
<b>Total Estimated Cost</b>	<b>\$389,300</b>

### **Estimated time and cost of recovery actions**

The estimated cost of completing the recovery actions such that the criteria have been met and the species may be considered for reclassification from endangered to threatened is \$389,300. We estimate that these actions could be accomplished by 2066, assuming effective coordination with necessary partners and stakeholders. Several factors contribute to the long estimated time to reach the downlisting threshold. Identifying, then outplanting the additional sites could take 5 to 8 years, and stands are not considered mature until plants reach 25 years of age. Additionally, because attainment of criteria requires observation of natural recruitment, time must be allowed for cuttings to produce viable seed and ultimately future generations that are able to survive for at least 25 years. As stated above, we currently lack sufficient biological information to envision realistic conditions which would allow Franciscan manzanita to be delisted, so we have made no estimates of the time and cost necessary for delisting the species.

## Literature Cited

- Chassé, M., B. Young, M. Frey, M. Vasey, E. Warne, V.T. Parker, and D. Yam. 2009. Conservation plan for *Arctostaphylos franciscana* (the Franciscan Manzanita). December 24. 44 pp.
- Keeley, J. E. 1987. Role of fire in seed germination of woody taxa in California chaparral. *Ecology*, 68(2): 434-443.
- (Service) U.S. Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; determination of endangered status for *Arctostaphylos franciscana* (Franciscan manzanita) throughout its range. Final rule. Federal Register 77:54434.
- (Service) U.S. Fish and Wildlife Service. 2013. Endangered and threatened wildlife and plants; designation of critical habitat for *Arctostaphylos franciscana* (Franciscan Manzanita). Final Rule. Federal Register 78:77289.

## In Litteris References

- Parker, V. T. 2019. Peer review comments on Draft Recovery Plan for Franciscan Manzanita. 1 page.

**Appendix:**  
**Summary of Public Comments and Peer Review Comments**

On December 26, 2018, we released the draft recovery plan for Franciscan manzanita for public comment (83 FR 66297). We received no comments from the public in response to our Federal Register Notice announcing the publication of the draft recovery plan.

We received peer review comments from one individual, species expert Tom Parker of San Francisco State University. The reviewer suggested we lessen the emphasis that Franciscan manzanita needs serpentine soils, as it will grow on other soils as long as there exists maritime climate influence. Additionally, the reviewer suggested that plant reintroductions should occur some distance away from taxa that harbor *Phytophthora* spp. We revised the document to incorporate clarification on these two matters.

All suggested edits from partner and peer reviewers were considered and addressed.