

Status of the Presidio Native Flora – Extant, Extirpated and Reintroduced species, as of April 2003

The purpose of this document is to summarize current knowledge of the native flora diversity in the Presidio of San Francisco.

1 Presidio plant checklists:

Pete Holloran (GGNPA 2002) compiled a great plant list for the Presidio; it has interesting habitat information and can be found in the Parks Conservancy stores.

A database was recently developed at the Presidio Native Plant Nursery to compile all floristic data available for the Presidio. Today the Presidio Vascular Plant Occurrence Database contains more than 13,000 records, dating back to Chamisso's first collections in 1816 (for list of reference material see Appendix II).

In the summer of 2002, many new plant observations were added to the database as all restoration sites were surveyed by natural resources staff.

A checklist for the Presidio flora was derived from the Presidio Park Stewards 2000-2003 records compiled in the Presidio VPOD (see Appendix I). This list is very dynamic and is updated on a regular basis. A total of 299 native species are now known to grow in the park.

2 Presidio extirpated or presumed extirpated native species:

Based on historical records and more recent knowledge of the Presidio flora (2000-2003 records), a list of extirpated and presumed extirpated native species was created.

These species depend on habitats that have been highly altered by human activities. Wetlands, salt marshes and grasslands that used to be important features of the Presidio landscape are now gone, or have been altered to such extent that they cannot support these species anymore.

There are no recent records for these plants (most of them date back to the late 19th century, early 20th century) that are, for the most part, easy to identify in the field. All this leads us to believe that they are now extirpated.

- ❖ Sixty-six species are now considered extirpated or presumed extirpated.
- ❖ This list can be a good basis for future reintroductions.

Table 1. Extirpated or presumed extirpated native species of the Presidio

Species marked * are wetland associated species.

Taxon	Last recorded	Location	Habitat
<i>Myriophyllum hippuroides</i> *	1816	San Francisco, maybe in Presidio	Ponds, ditches, small streams
<i>Potamogeton nodosus</i> *	1816	Presidio	Shallow water, lakes, ponds, ditches, streams
<i>Solidago californica</i>	1816	Presidio	rocky or brushy slopes
<i>Solidago canadensis</i> ssp. <i>elongata</i>	1816	Presidio	meadows
<i>Stachys chamissonis</i> *	1816	Presidio	Wet swampy places, generally coastal
<i>Ribes malvaceum</i>	1824	In or around Presidio	Oak woodland, chaparral
<i>Hippuris vulgaris</i> *	1888	"Marine hospital", near Lobos Creek – considered extirpated in 1888	Margin on shallow ponds, marshes
<i>Hypericum anagalloides</i> *	1888	Presidio	Wet places, near streams, lakes, in seeps
<i>Lemna trisulca</i> *	1888	Presidio	streams
<i>Marsilea vestita</i> *	1888	Mountain Lake	Creek beds, vernal pools
<i>Cirsium hydrophilum</i> *	1890	Presidio	Wet soils
<i>Viola pedunculata</i>	1890	Presidio	Grassy slopes
<i>Amsinckia lycopoides</i>	1891	Near the presidio	Open, gen. disturbed areas
<i>Berula erecta</i> *	1891	Fort Point	Marshy areas, streams
<i>Collinsia bartsiiifolia</i> var. <i>b.</i>	1891	Mountain Lake	Open sandy places
<i>Hydrocotyle verticillata</i> *	1891	Mountain Lake	Swampy ground, lake margins
<i>Microseris sylvatica</i>	1891	depressions on the hillside north of Mountain Lake	Grassland, open woods
<i>Phleum alpinum</i>	1891	Near Fort Point	dry hills
<i>Trifolium gracilentum</i>	1891	Presidio	Along roads
<i>Triphysaria eriantha</i> ssp. <i>rosea</i>	1891	Presidio	In low fields, sandy flats and on bluffs
<i>Zannichellia palustris</i> *	1891	Mountain Lake	Streams, ponds, ditches, lakes
<i>Callitriche marginata</i> *	1892	Presidio	Water edge, vernal pool
<i>Castilleja franciscana</i>	1892	Fort Point	on rocky slopes in low brush
<i>Crassula aquatica</i> *	1892	Mountain Lake	Salt marshes, vernal pools, ponds
<i>Galium trifidum</i> *	1892	Swamp at head of Mountain Lake	Marshes and strands
<i>Limosella aquatica</i> *	1892	pools between Mountain Lake and Point Lobos railway	"these pools are being filled with sand in the process of grading the tract and the locality will soon be

			destroyed."
<i>Lycopus americanus</i> *	1892	Mountain Lake	marshy grounds
<i>Stellaria littoralis</i>	1892	Fort Point	Coastal marshes and bluffs
<i>Stephanomeria virgata</i>	1892	Presidio	Dry, open slopes
<i>Baccharis douglasii</i> *	1894	Presidio	Moist salt marshes, stream edges
<i>Linanthus grandiflorus</i>	1894	Near Presidio	in open grassland
<i>Potamogeton alpinus</i> ssp. <i>tenuifolius</i> *	1894	Mountain Lake	Ponds, lakes, marshes
<i>Meconella linearis</i>	1895	Mountain Lake, Lobos Creek	sandy soil of coastal hills; "extirpated" in 1888
<i>Heterocodon rariflorum</i> *	1896	Presidio	Vernally wet places, on springy slopes
<i>Glaux maritima</i>	1897	Fort Point, coastal bluffs	on coastal slopes
<i>Potamogeton pectinatus</i> *	1897	Mountain Lake	Ponds, lakes, marshes, streams
<i>Arenaria paludicola</i> *	1899	Fort Point	Marshes, swamps
<i>Nuphar luteum</i> ssp. <i>polysepalum</i> *	1899	Mountain Lake	Ponds, slow streams
<i>Eleocharis acicularis</i> *	1901	Mountain Lake	Moist places, marshes
<i>Linanthus androsaceus</i>	1902	Presidio	in grassland and sandy soil
<i>Gilia millefoliata</i>	1912	Presidio	Stabilized sand dunes
<i>Ceratophyllum demersum</i> *	1917	Mountain Lake	Ponds, ditches, slow streams
<i>Myriophyllum sibiricum</i> *	1917	Mountain Lake	submerged in water about the margins of the lakes
<i>Hydrocotyle ranunculoides</i> *	1920	Mountain Lake	Lake margins, pools
<i>Potamogeton illinoensis</i> *	1920	Mountain Lake	Lakes, ponds, streams
<i>Najas guadalupensis</i> *	1928	Mountain Lake	Ponds, lakes, ditches
<i>Elatine brachysperma</i> *	1936	Mountain Lake	Muddy shores, shallow pools
<i>Rumex maritimus</i>	1937	Mountain Lake	in wet sandy soil or on the edge of lakes
<i>Isoetes nuttallii</i> *	1958	springy slopes above golf course	Wet soil
<i>Azolla filiculoides</i> *	1958	Mountain Lake, Lobos Creek	Ponds, slow streams, wet ditches
<i>Lemna gibba</i> *	1958	Mountain Lake, quiet water near mouth of Lobos Creek	Fresh or brackish water
<i>Lemna minor</i> *	1958	Lobos Creek	In quiet water
<i>Microseris paludosa</i>	1958	Slope at east end of Presidio	open grassy slopes that are wet in the spring
<i>Platystemon californicus</i>	1958	Presidio	On serpentine; open grassland
<i>Polygonum amphibium</i> var. <i>emersum</i> *	1958	Mountain Lake	Shallow lakes, streams, shores
<i>Polygonum lapathifolium</i> *	1958	Mountain Lake	along high water mark of the lake; on moist lake bottom

Potamogeton pusillus*	1958	Mountain Lake	submerged aquatic
Rorippa curvisiliqua	1958	Mountain Lake – considered rare when recorded	Moist or wet places about lake
Sagina maxima ssp. crassicaulis	1958	Coastal bluffs	on moist bluffs and flats above the ocean; species of sand stone bluffs
Stachys bullata	1958	Presidio, Lobos Creek	in low ground and on shaded slopes ;This species reaches its northern limit in San Francisco.
Triphysaria eriantha ssp. eriantha	1958	Presidio	In low grassy fields
Zigadenus fremontii	1958	Presidio	On serpentine slopes
Gaultheria shallon	1980	Fort Point	Moist forest margins
Nemophila menziesii	1980	Presidio, Fort Point	in moist open grassland
Lasthenia minor	1994	Golf course; grew as a weed there.	Moist grasslands

Note : 1958 is the date of the publication of “ A Flora of San Francisco” by J.T. Howell, P. Rubtsoff and P. Raven in which these species are mentioned as growing in the Presidio. Until we read the exact collection dates on voucher specimens kept at the California Academy of Sciences, we will use the date of publication of the flora.

Some presumed extirpated species could come back from the old seed bank, or might be hidden in remote and seldom visited areas of the park. We should keep them in mind when working in the field.

Another list of native plants, which were once recorded in the Presidio but have not recently been seen, was created.

These plants grow in habitats that are still present in the Presidio, and therefore could still be found in the park. We need to assess their presence to maintain an accurate plant checklist.

Most of them are easy to overlook because of their inconspicuous nature, or because of their similarities with common weeds; some might be hard to key out; also, some species that were recorded to grow in the park, might have been misidentified.

3 Native species for which we need to verify presence

42 native taxa listed in the VPOD, have not recently been seen in the Presidio. These species might have been misidentified or could have been overlooked and may still be present in the Presidio.

We will tailor the revised version of the "Easy Keys manual» towards these species as much as possible.

Please, become familiar with these plants, look up the drawings in the Jepson and other floras, and keep a look out for them!

If they are still in the park, we should be able to spot them this year.

Information about sightings, habitats, blooming times and other comments about the species, is compiled in the following tables.

Table 2. Species for which presence needs to be assessed.

Taxon	Last seen	Habitat	Historic Locations	Comments
<i>Achyrachaena mollis</i>	1995	Grassland	East of Lincoln subsite, near Feral dunes	Probably misIDed; "rare in San Francisco" Howell et al. 1958
<i>Agrostis densiflora</i>	1994	Coastal bluffs, sandy soils	Coastal bluffs	
<i>Berberis pinnata</i>	1994	Rocky slopes, coniferous forest, oak woodland.	W. of J. Khan playground; under strip of trees between east Lincoln and Raven's	
<i>Calystegia occidentalis</i>	1994	Dry slopes, chaparral	Reservoir cultural plantation; see map 10E100	
<i>Camissonia strigulosa</i>	1933	Open sandy soils, dunes	Presidio	Needs botanical investigation
<i>Carex aquatilis</i>	1958	Wet places	Lobos Creek	May be <i>C. obnupta</i> . (Howell et al. 1958)
<i>Carex globosa</i>	1958	Shaded places or brushy or woody slopes	Presidio	
<i>Carex gracilior</i>	1958	On serpentine, on grassy slopes and flats that are moist in the spring.	Presidio	Look for it at Log Cabin, and Storey Av. wetland.
<i>Carex hardfordii</i>	1994	in moist or wet places on open or brushy hills	Mountain lake; Presidio Hills	Check the patches at Mtn Lake
<i>Castilleja latifolia</i>	1994	Coastal dunes, scrub	North Baker Beach/baker beach	Needs botanical investigation
<i>Castilleja subinclusa</i> ssp. <i>franciscana</i>	1892	Coastal scrub	Fort Point	Needs botanical investigation
<i>Centaurium davyi</i>	1991	Moist coastal bluffs, dunes, open forests.	IP: 3C139=between Arguello Bd. And trail leading to Parking lot.	Annual < 25 cm. April-July
<i>Centaurium muehlenbergii</i>	1994	Vernally moist slopes on serpentine.	Slope on east side of Presidio; IP ??? "in vernal wet patch of serpentine grassland SW of quarry site at IP	

<i>Cerastium arvense</i>	1958-1999?	Hills in brush or grassland	Mountain Lake; I.P.	<i>C. glomeratum</i> misIDed.?
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	1994	Disturbed areas, damp woods, marshy ground.	Former New dunes (Vasey's polygon 648)	Probably <i>C. glomeratum</i> mis IDed
<i>Cuscuta californica</i>	1958	Dune scrub	North Baker Beach; Lobos	Check East of Lincoln
<i>Deschampsia elongata</i>	1994	Wet sites, meadows, lakeshores	Battery Dynamite area; Middle Fork Tennessee Hollow; Central magazine	No voucher at CalAcademy
<i>Elymus glaucus</i> ssp. <i>virescens</i>	1958	Grassy or shrubby slopes	Presidio	Key to ssp.
<i>Eremocarpus setigerus</i>	1980	Open, often disturbed areas	Fort Point	It was at Crissy plant where it was pulled out
<i>Euphorbia crenulata</i>	1936	Grassy or shrubby slopes	Marine Hospital	
<i>Hemizonia pungens</i>	1941	Grassland, depressions, marshes	Directly above highway tunnel leading to Golden gate Bridge	
<i>Juncus mexicanus</i>	1994	Wet clay soils	Presidio Hills, I.P.; Mtn Lake	Probably misIDed. Species not common in SF. Only one collection known in San Francisco
<i>Lepidium strictum</i>	1958	in beaten ground and waste places	Presidio	Looks a lot like <i>L. pinnatifidum</i> ,
<i>Ligusticum apiifolium</i>	1994	Coastal meadows, scrubs	Understory between feral dunes and East Lincoln Scrub; Insp. Point	
<i>Lupinus albifrons</i> var. <i>collinus</i>	1994		Lower Lobos, coastal bluffs, Golf course west	Probably <i>L. variicolor</i> misIDed
<i>Minuartia pusilla</i>	1958	On serpentine slopes	Above Baker Beach	Small annual
<i>Orobancha uniflora</i>	1992		Presidio	Needs ID confirmation
<i>Oxalis albicans</i> ssp. <i>pilosa</i>	1958	on brushy or grassy hillsides	Presidio	Looks like <i>O. corniculata</i>
<i>Phacelia ramosissima</i>	1994		Presidio Hills	Looks like <i>P. malvifolia</i> . Per./biennial v.s. annual
<i>Plagiobothrys chorisianus</i>	1958	In moist places	"Along a streamlet on oceanic bluffs"	
<i>Plagiobothrys torreyi</i> var. <i>diffusus</i>	1934	Moist grasslands	slopes above the Marine Hospital and Mountain Lake; on clay slopes above Mountain Lake	
<i>Polypodium calirhiza</i>	1999	Rocky cliffs or outcrops, rarely dunes	Presidio	Leaves summer-deciduous Like <i>P. californicus</i>
<i>Polypodium glycyrrhiza</i>	1999	On plants, moist rocky banks, rocks	under conifers at North Baker beach	Leaves alive until new ones form
<i>Polypodium scolieri</i>	1999		In the fork of a mature Cypress at Rob Hill; Ft Point, with toyons near woodwardia.	Evergreen leathery leaves; <i>P. californicum</i> leaves are summer deciduous.
<i>Rafinesquia californica</i>	1958	loose rocky or clayey soil of steep grassy or brushy slopes	Lobos Creek	Looks like <i>Lactuca</i> sp. See Easy Keys
<i>Sagina decumbens</i> ssp. <i>occidentalis</i>	1958	grassy or brushy slopes and flats and marine bluffs	Presidio	Very tiny – looks like <i>Sagina apetala</i>
<i>Symphoricarpos mollis</i>	1994		Battery Caulfield	

<i>Thalictrum fendleri</i> var. <i>fendleri</i>	1999		Mountain Lake	<i>Fumaria</i> misIDed ?
<i>Trifolium microcephalum</i>	1958	grasslands	Presidio, on serpentine	Check at IP. Similar to <i>T. microdon</i>
<i>Triglochin maritima</i>	1816		Presidio	Reintroduced at Crissy; still there ? ID both <i>Triglochin</i>
<i>Vulpia octoflora</i> var. <i>hirtella</i>	1958	Sandy slopes	Sandy slopes above Baker Beach	Awn smaller than <i>V. myuros</i> and <i>V. bromoides</i> . Could not find voucher at CalAcademy.
<i>Yabea microcarpa</i>	1958	Brushy slopes	Presidio	Looks like 2 common weeds : <i>Torilis arvensis</i> and <i>Anthriscus caucalis</i> . see Easy Keys

Table 3. Blooming calendar for target species, with historic locations.

Taxon	March	April	May	June	July	Aug.	Sep	Oct.	Historic Locations
<i>Achyrrachaena mollis</i>		X	X						East of Lincoln subsite, near Feral dunes
<i>Agrostis densiflora</i>									Coastal bluffs
<i>Berberis pinnata</i>	X	X	X						W. of J. Khan playground; under strip of trees between east Lincoln and Raven's
<i>Calystegia occidentalis</i>		X	X	X	X				Reservoir cultural plantation; see map 10E100
<i>Camissonia strigulosa</i>		X	X	X					Presidio
<i>Carex aquatilis</i>									Lobos Creek
<i>Carex globosa</i>			X	X	X	X			Presidio
<i>Carex gracilior</i>	X	X	X	X					Presidio; check at Log Cabin
<i>Carex hardfordii</i>			X	X	X	X			Mountain Lake; Presidio Hills
<i>Castilleja latifolia</i>	X	X	X	X	X	X	X		
<i>Castilleja subinclusa</i> ssp. <i>franciscana</i>	X	X	X	X	X	X	X		Fort Point
<i>Centaurium davyi</i>		X	X	X					3C139=between Arguello Bd. and trail leading to steps to Parking lot.
<i>Centaurium muehlenbergii</i>			X	X	X				Slope on east side of Presidio; IP ??? "in vernal wet patch of serpentine grassland SW of quarry site at IP
<i>Cerastium arvense</i>	X	X	X						Mountain Lake, Ins. Pt
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>									Former New dunes (Vasey's polygon 648)
<i>Cirsium quercetorum</i>		X	X	X	X				Open grassland in Presidio ; Yerba Buena and south rock garden
<i>Cuscuta californica</i>			X	X	X	X			North Baker beach/Lobos creek/ check east of Lincoln
<i>Deschampsia elongata</i>			X	X	X				Battery Dynamite area; Middle Fork Tennessee Hollow; Central magazine
<i>Elymus glaucus</i> ssp. <i>virescens</i>				X	X	X			Presidio
<i>Eremocarpus setigerus</i>				X	X	X	X	X	Fort Point
<i>Euphorbia crenulata</i>	X	X	X	X	X	X	X	X	Marine Hospital
<i>Galium trifidum</i>	X	X	X	X	X	X			Coastal Bluffs, Oak study area
<i>Hemizonia pungens</i>			X	X	X	X	X	X	Directly above highway tunnel leading to Golden gate Bridge
<i>Lepidium strictum</i>	X	X	X						Presidio
<i>Ligusticum apiifolium</i>	X	X	X						Understory between feral dunes and East Lincoln Scrub; Insp. Point
<i>Lupinus albifrons</i> var. <i>collinus</i>	X	X	X						Lower Lobos, Coastal bluffs, Golf course west.
<i>Minuartia pusilla</i>		X	X						Above Baker Beach
<i>Orobanche uniflora</i>	X	X							Presidio
<i>Oxalis albicans</i> ssp.		X	X	X	X	X	X	X	Presidio

<i>pilosa</i>									
<i>Phacelia ramosissima</i>			X	X	X	X	X		Presidio Hills
<i>Plagiobothrys chorisianus</i>	X	X	X	X					Near Lobos Creek
<i>Plagiobothrys torreyi</i> var. <i>diffusus</i>		X	X	X					slopes above the Marine Hospital and Mountain Lake; on clay slopes above Mountain Lake
<i>Polypodium calirhiza</i>	X	X	X	X	X	X	X		Presidio
<i>Polypodium glycyrrhiza</i>	X	X	X	X	X	X	X		under conifers at North Baker beach
<i>Polypodium scolieri</i>	X	X	X	X	X	X	X	X	In the fork of a mature Cypress at Rob Hill; Ft Point, with toyons near woodwardia.
<i>Rafinesquia californica</i>			X	X					Lobos Creek
<i>Sagina decumbens</i> ssp. <i>occidentalis</i>	X	X							Presidio
<i>Symphoricarpos mollis</i>		X	X	X					Battery Caulfield
<i>Thalictrum fendleri</i> var. <i>fendleri</i>	X	X	X						Mountain Lake
<i>Trifolium microcephalum</i>		X	X	X					Presidio, on serpentine
<i>Triglochin maritima</i>		X	X	X	X	X	X	X	Presidio; reintroduced at Crissy. May still be there.
<i>Vulpia octoflora</i> var. <i>hirtella</i>	X	X	X						Sandy slopes above Baker Beach
<i>Yabea microcarpa</i>		X	X	X					Presidio

4 Presidio reintroductions:

Several species were brought into the Presidio during ecological restoration efforts as historical, ecological or salt marsh ecotypes reintroductions, or because remnant populations in the Presidio could not provide requested amounts of propagules. Seeds and other types of propagules of these species were collected in similar habitats in the Bay Area.

4.1 Historical reintroductions

Nine known extirpated species were reintroduced to the Presidio, mainly in the dune-salt marsh complex restored at Crissy Field.

Table 4. Presidio historical reintroductions.

Taxon	Date of reintroduction	Last recorded in Presidio in:	Reintroduction location
<i>Atragalus nuttallii</i> var. <i>virgatus</i>	2000	1900	Crissy and North Baker Beach
<i>Calystegia soldanella</i>	2000	1892	Foredunes at Crissy and Baker Beach
<i>Frankenia salina</i>	2000	1892	Crissy Wetland
<i>Garrya elliptica</i>	2002	1892	Mountain lake
<i>Heliotropium curassavicum</i>	2000	1892 ?	Crissy wetland
<i>Jaumea carnosa</i>	2000	1892	Crissy wetland
<i>Limonium californicum</i>	2000	1892	Crissy wetland
<i>Triglochin maritima</i>	2000	1816	Crissy wetland
<i>Sisyrinchium californicum</i>	2003	1958	Mountain Lake

4.2 Ecological reintroductions

Fourteen other native plants, including four special status species, were reintroduced to the park, as restoration sites were able to provide critical habitat for them.

Although there are no historical records for these species in the Presidio, they were likely to occur there, as they grow in similar coastal habitats in San Francisco County and the Bay Area.

Table 5. Presidio ecological reintroductions.

Taxon	CNPS and Federal Status	Date of reintroduction	Reintroduction location
<i>Castilleja ambigua</i> ssp. <i>ambigua</i>		2001	Crissy wetland
<i>Collinsia corymbosa</i>	CNPS 1B	2002	Crissy dunes
<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	CNPS 1B	2001, 2002	Crissy wetland
<i>Eryngium armatum</i>		2000	Crissy Wetland
<i>Grindelia stricta</i> var. <i>angustifolia</i>		2000	Crissy Wetland
<i>Horkelia cuneata</i> ssp. <i>sericea</i>	CNPS 1B	2000	NBB Bluffs
<i>Lathyrus littoralis</i>		2000	Crissy dunes
<i>Rubus parviflorus</i>		2002	Mountain Lake
<i>Rumex occidentalis</i>		2000	Crissy wetland
<i>Scirpus maritimus</i>		2000	Crissy wetland
<i>Solidago confinis</i>		2002	Crissy wetland
<i>Spartina foliosa</i>		2000	Crissy wetland
<i>Suaeda californica</i>	CNPS 1B/ Fed. Endangered	2001	Crissy Wetland
<i>Triglochin concinna</i>		2000	Crissy Wetland

4.3 Salt marsh ecotypes reintroductions

Nine salt-marsh ecotypes of species growing on the Presidio coastal bluffs were brought in from nearby remnant salt marshes.

These ecotypes are not distinctive varieties or subspecies of the taxa already found in the Presidio. They differ from the established coastal bluff populations by their ecological adaptation to salt marsh habitat. These species were likely to occur in the large salt marsh complex that used to cover the whole Crissy Field area.

Table 6. Presidio salt marsh ecotypes reintroductions.

Taxon	Date of introduction	Introduction locations
<i>Armeria maritima</i> var. <i>virgatus</i>	2000	Crissy and North Baker Beach
<i>Atriplex californica</i>	2000	Foredunes at Crissy and Baker Beach
<i>Distichlis spicata</i>	2000	Crissy Wetland
<i>Festuca rubra</i>	2000	Crissy wetland
<i>Juncus lesueurii</i>	2000	Crissy wetland
<i>Plantago maritima</i> var. <i>juncoides</i>	2000	Crissy wetland
<i>Potentilla anserina</i> ssp. <i>pacifica</i>	2000	Crissy wetland
<i>Spergularia macrotheca</i>	2000	Crissy wetland
<i>Trifolium wormsköldii</i>	2000	Crissy swale

4.4 Introduction of seeds and other type of propagules for species with small populations.

Although these species occur in the Presidio, seeds and other types of propagules were collected from populations found outside the park. These species are found in small numbers in the park and cannot provide sufficient amount of propagules for ecological restoration efforts.

Table 7. Species for which propagules were brought in due to limited occurrences.

Taxon	Date of introduction	Location
<i>Aesculus californica</i>	2002	Mountain Lake
<i>Prunus ilicifolius</i>	2002	Crissy Wetland
<i>Quercus agrifolia</i>	1999-2000	Mountain Lake
<i>Solidago spathulata</i> spp. <i>spathulata</i>	2000	Crissy swale
<i>Tanacetum camphoratum</i>	2002	Crissy and North Baker Beach
<i>Umbellularia californica</i>	2002	Not planted

4.5 Species brought in prior to 1994

Other species were brought in for dune restoration purposes before 1994, when Presidio Park Stewards program begun. Seed and other types of propagules for these species were not collected in the park but came from some other parts of the State. Some species unfortunately turned out to be very aggressive and need constant management.

Table 8. Species that were brought in before 1994.

Taxon	Location
<i>Camissonia cheiranthifolia</i> ssp. <i>suffruticosa</i>	Baker Beach
<i>Grindelia stricta</i> var. <i>platyphylla</i>	Baker beach/ North Baker Beach

In the last couple of years, we have added many native species to our checklist; while some were thought to be extirpated from San Francisco, a few were new records the county. There is still a lot to discover about Presidio native flora!

This year, natural resources staff can help verifying the presence of species listed in tables 2 and 3, improving our knowledge of the Presidio and San Francisco native plant diversity.

Any questions, thoughts, comments, additions, please contact us!

Marie Fontaine (561 4845 or mfontaine@parksconservancy.org),
Peter Brastow (668-4392 or Peter_Brastow@nps.gov)
or Michael Chassé (561-4868 or mchasse@parksconservancy.org).

Appendix I

Presidio plant checklist (based on 2000-2003 records)

Native Species In the Presidio

<i>Abronia latifolia</i>	<i>Calystegia purpurata</i> ssp. <i>purpurata</i>	<i>Danthonia californica</i> var. <i>californica</i>
<i>Abronia umbellata</i>	<i>Calystegia soldanella</i>	<i>Daucus pusillus</i>
<i>Acaena pinnatifida</i> var. <i>californica</i>	<i>Calystegia subacaulis</i> ssp. <i>subacaulis</i>	<i>Deschampsia cespitosa</i>
<i>Achillea millefolium</i>	<i>Camissonia cheiranthifolia</i> ssp.	<i>Dichelostemma capitatum</i>
<i>Adiantum jordanii</i>	<i>Camissonia contorta</i>	<i>Dichondra donnelliana</i>
<i>Aesculus californica</i>	<i>Camissonia micrantha</i>	<i>Distichlis spicata</i>
<i>Agoseris apargioides</i> var. <i>apargioides</i>	<i>Camissonia ovata</i>	<i>Dodecatheon hendersonii</i>
<i>Agoseris apargioides</i> var. <i>eastwoodiae</i>	<i>Cardamine californica</i> var. <i>integrifolia</i>	<i>Dryopteris arguta</i>
<i>Agoseris grandiflora</i>	<i>Cardamine oligosperma</i>	<i>Dudleya farinosa</i>
<i>Agrostis exarata</i>	<i>Cardionema ramosissimum</i>	<i>Eleocharis macrostachya</i>
<i>Agrostis hallii</i>	<i>Carex brevicaulis</i>	<i>Elymus glaucus</i>
<i>Agrostis microphylla</i>	<i>Carex densa</i>	<i>Epilobium brachycarpum</i>
<i>Agrostis pallens</i>	<i>Carex obnupta</i>	<i>Epilobium ciliatum</i> ssp. <i>watsonii</i>
<i>Allium dichlamydeum</i>	<i>Carex subbracteata</i>	<i>Equisetum hyemale</i> ssp. <i>affinis</i>
<i>Ambrosia chamissonis</i>	<i>Carex tumulicola</i>	<i>Equisetum telmateia</i> ssp. <i>braunii</i>
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	<i>Castilleja affinis</i>	<i>Ericameria ericoides</i>
<i>Amsinckia spectabilis</i> var. <i>spectabilis</i>	<i>Castilleja ambigua</i>	<i>Erigeron glaucus</i>
<i>Anaphalis margaritacea</i>	<i>Castilleja densiflora</i>	<i>Eriogonum latifolium</i>
<i>Angelica hendersonii</i>	<i>Castilleja wightii</i>	<i>Eriophyllum confertiflorum</i>
<i>Aphanes occidentalis</i>	<i>Ceanothus thyrsiflorus</i>	<i>Eriophyllum staechadifolium</i>
<i>Arabis blepharophylla</i>	<i>Chenopodium californicum</i>	<i>Eryngium armatum</i>
<i>Arabis glabra</i>	<i>Chlorogalum pomeridianum</i> var. ? x	<i>Erysimum franciscanum</i>
<i>Arctostaphylos hookeri</i> ssp. <i>ravenii</i>	<i>Chorizanthe cuspidata</i>	<i>Eschscholzia californica</i>
<i>Armeria maritima</i>	<i>Cirsium andrewsii</i>	<i>Euphorbia spathulata</i>
<i>Artemisia californica</i>	<i>Cirsium brevistylum</i>	<i>Euthamia occidentalis</i>
<i>Artemisia pycnocephala</i>	<i>Cirsium occidentale</i> var. <i>occidentale</i>	<i>Festuca rubra</i>
<i>Aster chilensis</i>	<i>Clarkia franciscana</i>	<i>Filago californica</i>
<i>Aster radulinus</i>	<i>Claytonia exigua</i> ssp. <i>exigua</i>	<i>Fragaria chiloensis</i>
<i>Astragalus gambelii</i> var. <i>virgatus</i>	<i>Claytonia parviflora</i>	<i>Fragaria vesca</i>
<i>Astragalus nuttallii</i> var. <i>virgatus</i>	<i>Claytonia perfoliata</i>	<i>Frankenia salina</i>
<i>Athyrium filix-femina</i>	<i>Claytonia perfoliata</i> ssp. <i>perfoliata</i>	<i>Fritillaria affinis</i>
<i>Atriplex californica</i>	<i>Conyza canadensis</i>	<i>Galium aparine</i>
<i>Atriplex leucophylla</i>	<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	<i>Galium porrigens</i>
<i>Atriplex triangularis</i>	<i>Cornus sericea</i>	<i>Garrya elliptica</i>
<i>Baccharis pilularis</i>	<i>Corylus cornuta</i> var. <i>californica</i>	<i>Gilia capitata</i> ssp. <i>chamissonis</i>
<i>Barbarea orthoceras</i>	<i>Crassula connata</i>	<i>Gilia clivorum</i>
<i>Brodiaea elegans</i>	<i>Croton californicus</i>	<i>Gnaphalium purpureum</i>
<i>Brodiaea terrestris</i>	<i>Cryptantha leiocarpa</i>	<i>Gnaphalium ramosissimum</i>
<i>Bromus carinatus</i> var. <i>carinatus</i>	<i>Cuscuta salina</i>	<i>Gnaphalium stramineum</i>
<i>Bromus carinatus</i> var. <i>maritimus</i>	<i>Cyperus eragrostis</i>	<i>Grindelia hirsutula</i> var. <i>maritima</i>
<i>Calandrinia ciliata</i>	<i>Danthonia californica</i> var. <i>americana</i>	

<i>Grindelia stricta</i> var. <i>angustifolia</i>	<i>Lonicera involucrata</i> var. <i>ledebourii</i>	<i>Poa unilateralis</i>
<i>Guillenia lasiophylla</i>	<i>Lotus heermannii</i> var. <i>orbicularis</i>	<i>Polygonum paronychia</i>
<i>Helenium puberulum</i>	<i>Lotus scoparius</i>	<i>Polygonum punctatum</i>
<i>Heliotropium curassavicum</i>	<i>Lotus strigosus</i>	<i>Polypodium californicum</i>
<i>Hemizonia congesta</i> ssp. <i>luzulifolia</i>	<i>Lotus wrangelianus</i>	<i>Polystichum munitum</i>
<i>Heracleum lanatum</i>	<i>Lupinus arboreus</i>	<i>Potentilla anserina</i> ssp. <i>pacifica</i>
<i>Hesperevax sparsiflora</i>	<i>Lupinus bicolor</i>	<i>Potentilla glandulosa</i>
<i>Hesperocnide tenella</i>	<i>Lupinus chamissonis</i>	<i>Potentilla rivalis</i>
<i>Heteromeles arbutifolia</i>	<i>Lupinus nanus</i>	<i>Prunella vulgaris</i>
<i>Hordeum brachyantherum</i>	<i>Lupinus varicolor</i>	<i>Prunus illicifolius</i>
<i>Horkelia californica</i>	<i>Luzula comosa</i>	<i>Psilocarphus tenellus</i> var. <i>tenellus</i>
<i>Horkelia cuneata</i> var. <i>sericea</i>	<i>Madia sativa</i>	<i>Pteridium aquilinum</i> var. <i>pubescens</i>
<i>Iris douglasiana</i>	<i>Marah fabaceus</i>	<i>Pterostegia drymarioides</i>
<i>Iris longipetala</i>	<i>Melica californica</i>	<i>Quercus agrifolia</i>
<i>Isoetes orcuttii</i>	<i>Melica imperfecta</i>	<i>Ranunculus californicus</i>
<i>Jaumea carnosa</i>	<i>Melica torreyana</i>	<i>Rhamnus californica</i>
<i>Juncus balticus</i>	<i>Microseris bigelovii</i>	<i>Ribes sanguineum</i> var. <i>glutinosum</i>
<i>Juncus bufonius</i> var. <i>bufonius</i>	<i>Microseris douglasii</i>	<i>Rorippa nasturtium-aquaticum</i>
<i>Juncus bufonius</i> var. <i>congestus</i>	<i>Mimulus aurantiacus</i>	<i>Rosa californica</i>
<i>Juncus effusus</i>	<i>Mimulus guttatus</i>	<i>Rubus ursinus</i>
<i>Juncus falcatus</i>	<i>Monardella villosa</i>	<i>Rumex occidentalis</i>
<i>Juncus lesueurii</i>	<i>Montia fontana</i>	<i>Rumex salicifolius</i> var. <i>crassus</i>
<i>Juncus occidentalis</i>	<i>Myrica californica</i>	<i>Rumex salicifolius</i> var. <i>salicifolius</i>
<i>Juncus patens</i>	<i>Nassella lepida</i>	<i>Sagina apetala</i>
<i>Juncus phaeocephalus</i>	<i>Nassella pulchra</i>	<i>Sagittaria montevidensis</i> ssp. <i>calycina</i>
<i>Juncus tenuis</i>	<i>Navarretia squarrosa</i>	<i>Salicornia virginica</i>
<i>Juncus xiphioides</i>	<i>Nemophila pedunculata</i>	<i>Salix lasiolepis</i>
<i>Koeleria macrantha</i>	<i>Oemleria cerasiformis</i>	<i>Salix lucida</i> ssp. <i>lasianhra</i>
<i>Lasthenia californica</i>	<i>Oenante sarmentosa</i>	<i>Sambucus mexicana</i>
<i>Lathyrus littoralis</i>	<i>Oenothera elata</i> ssp. <i>hookeri</i>	<i>Sambucus racemosa</i>
<i>Lathyrus vestitus</i> var. <i>ochropetalus</i>	<i>Orobancha californica</i>	<i>Sanicula arctopoides</i>
<i>Lathyrus vestitus</i> var. <i>vestitus</i>	<i>Orobancha fasciculata</i>	<i>Sanicula bipinnatifida</i>
<i>Layia hieracioides</i>	<i>Osmorhiza chilensis</i>	<i>Sanicula crassicaulis</i>
<i>Layia platyglossa</i>	<i>Pentagramma triangularis</i>	<i>Sanicula tuberosa</i>
<i>Lemna minuscule</i>	<i>Perideridia kelloggii</i>	<i>Satureja douglasii</i>
<i>Lepidium nitidum</i>	<i>Phacelia californica</i>	<i>Scirpus americanus</i>
<i>Lessingia germanorum</i>	<i>Phacelia distans</i>	<i>Scirpus californicus</i>
<i>Leymus mollis</i> ssp. <i>mollis</i>	<i>Phacelia malvifolia</i>	<i>Scirpus cernuus</i>
<i>Leymus pacificus</i>	<i>Phalaris californica</i>	<i>Scirpus maritimus</i>
<i>Leymus triticoides</i>	<i>Piperia elegans</i>	<i>Scirpus microcarpus</i>
<i>Lilaea scilloides</i>	<i>Plantago elongata</i>	<i>Scirpus pungens</i>
<i>Limonium californicum</i>	<i>Plantago erecta</i>	<i>Scrophularia californica</i>
<i>Linaria canadensis</i>	<i>Plantago maritima</i>	<i>Senecio aronicoides</i>
<i>Lomatium caruifolium</i>	<i>Plantago subnuda</i>	<i>Sidalcea malvaeflora</i>
<i>Lomatium dasycarpum</i>	<i>Poa douglasii</i>	<i>Silene verecunda</i> ssp. <i>verecunda</i>
<i>Lonicera hispidula</i> var. <i>vacillans</i>	<i>Poa secunda</i>	<i>Sisyrinchium bellum</i>

<i>Sisyrinchium californicum</i>	<i>Toxicodendron diversilobum</i>	<i>Typha latifolia</i>
<i>Solanum americanum</i>	<i>Trifolium albopurpureum</i> var. ?	<i>Uropappus lindleyi</i>
<i>Solanum douglasii</i>	<i>Trifolium barbigerum</i>	<i>Urtica dioica</i> ssp. <i>holosericea</i>
<i>Solanum umbelliferum</i>	<i>Trifolium bifidum</i>	<i>Veronica americana</i>
<i>Solidago confinis</i>	<i>Trifolium depauperatum</i> var. <i>truncatum</i>	<i>Vicia americana</i>
<i>Solidago spathulata</i> ssp. <i>spathulata</i>	<i>Trifolium fucatum</i>	<i>Vicia gigantea</i>
<i>Spartina foliosa</i>	<i>Trifolium macraei</i>	<i>Viola adunca</i>
<i>Spergularia macrotheca</i>	<i>Trifolium microdon</i>	<i>Vulpia microstachys</i> var. <i>pauciflora</i>
<i>Spergularia marina</i>	<i>Trifolium willdenovii</i>	<i>Woodwardia fimbriata</i>
<i>Spiranthes romanzoffiana</i>	<i>Trifolium wormskioldii</i>	<i>Wyethia angustifolia</i>
<i>Stachys ajugoides</i>	<i>Triglochin concinna</i>	
<i>Suaeda californica</i>	<i>Triphysaria floribunda</i>	
<i>Symphoricarpos albus</i>	<i>Triphysaria pusilla</i>	
<i>Tanacetum camphoratum</i>	<i>Triteleia laxa</i>	

Total: 299 taxa.

Non Native Species in the Presidio

<i>Acacia longifolia</i>	<i>Bromus stamineus</i>	<i>Cortaderia selloana</i>
<i>Acacia melanoxylon</i>	<i>Bromus sterilis</i>	<i>Cotoneaster franchetii</i>
<i>Acacia retinodes</i>	<i>Buddleja davidii</i>	<i>Cotoneaster pannosa</i>
<i>Acer macrophyllum</i>	<i>Cakile edentula</i>	<i>Cotula australis</i>
<i>Acer negundo</i>	<i>Cakile maritima</i>	<i>Cotula coronopifolia</i>
<i>Agrostis stolonifera</i>	<i>Camissonia cheiranthifolia</i> ssp. ? x	<i>Crocsmia x crocosmiiflora</i>
<i>Agrostis viridis</i>	<i>Capsella bursa-pastoris</i>	<i>Cupressus macrocarpa</i>
<i>Aira caryophylla</i>	<i>Carduus pycnocephalus</i>	<i>Cynodon dactylon</i>
<i>Albizia lophantha</i>	<i>Carpobrotus chilensis</i>	<i>Cynosurus echinatus</i>
<i>Allium triquetrum</i>	<i>Carpobrotus edulis</i>	<i>Cytisus scoparius</i>
<i>Amaranthus albus</i>	<i>Ceanothus griseus</i>	<i>Dactylis glomerata</i>
<i>Amaryllis belladonna</i>	<i>Centaurea melitensis</i>	<i>Delairea odorata</i>
<i>Ammophila arenaria</i>	<i>Centranthus ruber</i>	<i>Digitalis purpurea</i>
<i>Anagallis arvensis</i>	<i>Cerastium glomeratum</i>	<i>Distichlis spicata</i> 'Molate' x ?
<i>Anthriscus caucalis</i>	<i>Chamomilla suaveolens</i>	<i>Drosanthemum floribundum</i>
<i>Apium graveolens</i>	<i>Chasmanthe floribunda</i>	<i>Echinochloa crus-galli</i>
<i>Avena barbata</i>	<i>Chenopodium album</i>	<i>Ehrharta erecta</i>
<i>Avena fatua</i>	<i>Chenopodium multifidum</i>	<i>Epipactis helleborine</i>
<i>Avena sativa</i>	<i>Chenopodium murale</i>	<i>Erechtites glomerata</i>
<i>Barbarea verna</i>	<i>Cirsium vulgare</i>	<i>Erechtites minima</i>
<i>Bellis perennis</i>	<i>Conicosia pugioniformis</i>	<i>Erodium botrys</i>
<i>Brassica nigra</i>	<i>Conium maculatum</i>	<i>Erodium brachycarpum</i>
<i>Briza maxima</i>	<i>Conyza bonariensis</i>	<i>Erodium cicutarium</i>
<i>Briza minor</i>	<i>Conyza floribunda</i>	<i>Erodium moschatum</i>
<i>Bromus diandrus</i>	<i>Coronopus didymus</i>	<i>Eucalyptus globulus</i>
<i>Bromus hordeaceus</i>	<i>Cortaderia jubata</i>	<i>Euphorbia peplus</i>

Festuca arundinacea	Mentha x piperita	Sonchus asper
x ? Festuca rubra 'Molate'	Muehlenbeckia complexa	Sonchus oleraceus
Filago gallica	Myoporum laetum	Spergula arvensis ssp. arvensis
Foeniculum vulgare	Myosotis discolor	Spergularia rubra
Fumaria officinalis	Oxalis pes-caprae	Stellaria media
Fumaria parviflora	Panicum miliaceum	Taraxacum officinale
Genista monspessulana	Parapholis incurva	Tetragonia tetragonioides
Geranium dissectum	Parietaria judaica	Torilis arvensis
Geranium molle	Pennisetum clandestinum	Trifolium campestre
Geranium retrosum	Phyla nodiflora	Trifolium dubium
Gnaphalium luteo-album	Phytolacca americana	Trifolium fragiferum
Hainardia cylindrica	Picris echinoides	Trifolium glomeratum
Hedera canariensis	Pinus radiata	Trifolium hirtum
Hedera helix	Piptatherum miliaceum	Trifolium hybridum
Hedypnois cretica	Pittosporum crassifolium	Trifolium repens
Hirschfeldia incana	Pittosporum undulatum	Trifolium subterraneum
Holcus lanatus	Plantago coronopus	Tropaeolum majus
Hordeum marinum ssp. gussonéanum	Plantago lanceolata	Urtica urens
Hordeum murinum	Plantago major	Verbena bonariensis
Hordeum murinum ssp. leporinum	Poa annua	Vicia benghalensis
Hypochaeris glabra	Polycarpon tetraphyllum	Vicia sativa
Hypochaeris radicata	Polygonum arenastrum	Vicia sativa ssp. nigra
Ilex aquifolium	Polypogon interruptus	Vicia sativa ssp. Sativa
Juglans californica var. hindsii	Polypogon maritimus	Vicia villosa
Juncus capitatus	Polypogon monspeliensis	Vinca major
Kniphofia uvaria	Pyracantha angustifolia	Vulpia bromoides
Lactuca serriola	Ranunculus muricatus	Zantedeschia aethiopica
Lagurus ovatus	Raphanus sativus	Total: 200 taxa
Lavatera arborea	Rubus discolor	
Lavatera cretica	Rumex acetosella	
Leontodon taraxacoides	Rumex conglomeratus	
Leptospermum laevigatum	Rumex crispus	
Lobularia maritima	Rumex pulcher	
Lolium multiflorum	Salsola soda	
Lolium perenne	Scandix pecten-veneris	
Lotus corniculatus	Senecio elegans	
Lythrum hyssopifolium	Senecio vulgaris	
Malva nicaeensis	Sequoia sempervirens	
Malva parviflora	Sherardia arvensis	
Malva sylvestris	Silene gallica	
Medicago lupulina	Silybum marianum	
Medicago polymorpha	Sisymbrium irio	
Melilotus alba	Solanum aviculare	
Melilotus indica	Solanum furcatum	
Melilotus officinalis	Solanum nigrum	
Mentha pulegium	Soliva sessilis	

Appendix II

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California Academy of Sciences herbarium collection: manual search for selected species.