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SERPENTINES
OF THE
SAN FRANCISCO BAY REGION:
VEGETATION, FLORISTICS, DISTRIBUTION AND SOILS

Submitted To

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SITE SUMMARIES

CARSON RIDGE--The Mixed Serpentine Chaparral at Carson Ridge is floristically similar to that at Mt. Tamalpais. However, a recent fire has opened the vegetation allowing bunchgrasses and ephemerals to colonize which have added significantly to the plant species diversity. Four rare plants occur on Carson Ridge. This site covers approximately 150 acres and is an ecological preserve under the jurisdiction of the Marin County Water District.

MT. TAMALPAIS--Numerous soil and topographic conditions create microhabitats which support five localized vegetation types of Mixed Serpentine Chaparral, Sargent Cypress Woodland, Decumbent Manzanita Serpentine Scrub, Serpentine Seep Vegetation and Serpentine Barrens. Two rare plants occur on Mt. Tamalpais. This site covers approximately 60 acres and is under the jurisdiction of the California Department of Parks and Recreation.

TIBURON PENINSULA--The California Nature Conservancy's Ring Mountain Preserve and St. Hilary's Preserve account for over eighty percent of predominately Serpentine Bunchgrass Grasslands on the peninsula. These serpentine grasslands are floristically distinct especially with respect to rare taxa which may reflect the unique soil characteristics. Six rare plants are recorded from the Tiburon Peninsula. These serpentines cover about 225 acres.

PRESIDIO--The exposed Pacific coastline supports a distinct vegetation type of Franciscan Serpentine Coastal Scrub. At Inspiration Point Serpentine Bunchgrass Grassland exists. Eight rare plants have been recorded from the Presidio. The serpentine habitats cover about 50 acres. The National Park Service has jurisdiction over properties within the Golden Gate National Recreation Area, while the Department of Defense maintains jurisdiction over the remaining Presidio area.

EDGEWOOD PARK--Nearly three hundred acres of serpentine vegetation, most of it Serpentine Bunchgrass Grassland, occurs at Edgewood Park. Other local vegetation types include Mixed Serpentine Chaparral, Serpentine Wildflower Fields and Serpentine Barrens. This site represents the largest contiguous serpentine area remaining in San Mateo County and has an extremely high level of plant diversity due to numerous localized soil and topographic characteristics. There are five rare plants associated with the serpentines aswell as the bay checkerspot butterfly. Edgewood Park is under the jurisdiction of San Mateo County.

THE TRIANGLE--Formerly contiguous with the Edgewood Park serpentines, the Triangle now represents a 75 acre subset of the Edgewood Park Serpentine Bunchgrass Grasslands and Serpentine Wildflower Fields. There are two rare plants, neither occur in Edgewood Park, that occur in the Triangle which is a Game Refuge

of the California Department of Fish and Game, but under the jurisdiction of the San Francisco Water District.

PULGAS RIDGE--The Serpentine Bunchgrass Grassland at Pulgas Ridge is an excellent example of a true bunchgrass community with native bunchgrass species forming extensive hummocks. In addition, a well-developed Serpentine Seep Vegetation is present which contains one of the two rare plants that occur at this locality. This 300 acre site is part of the State Game Refuge system in the San Francisco watershed and under the jurisdiction of the San Francisco Water District.

CRYSTAL SPRINGS RESERVOIR--Serpentine Bunchgrass Grassland and Serpentine Seep Vegetation occur along the east side of Crystal Springs Reservoir. Four rare plant taxa have been recorded from this site in addition to the rare bay checkerspot butterfly. This site covers nearly 400 acres and is part of the State Game Refuge system in the San Francisco watershed and under the jurisdiction of the San Francisco Water District.

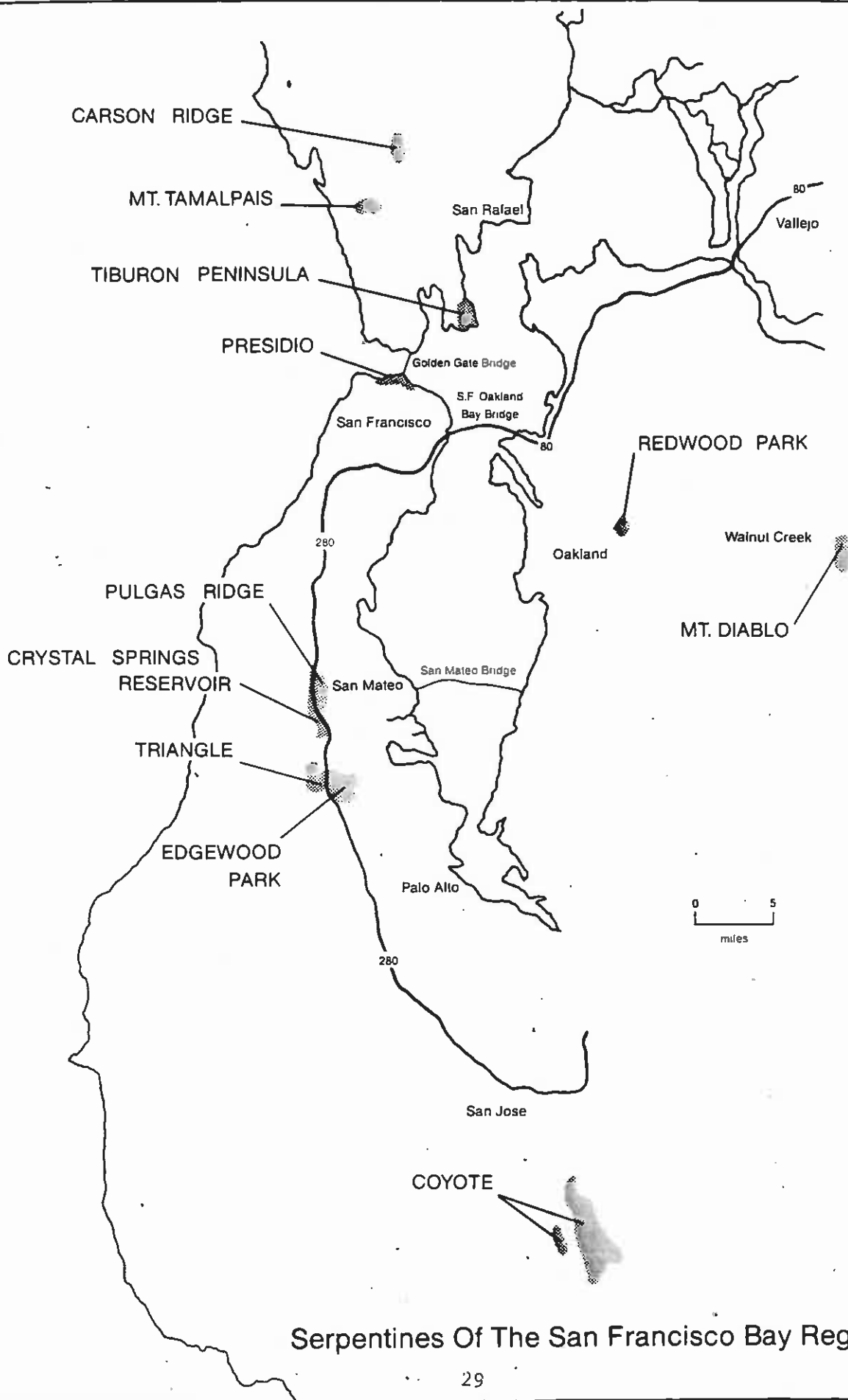
JASPER RIDGE--Stanford University's Jasper Ridge Preserve has three areas of Serpentine Bunchgrass Grasslands which are actively used for research. There are no rare plants associated with these serpentine grasslands, but it does have the bay checkerspot butterfly. The serpentines cover about 60 acres.

TULARE HILL--Serpentine Bunchgrass Grasslands under various degrees of cattle grazing pressure occur on Tulare Hill. This 80 acre site supports one rare plant and is under private ownership.

METCALF CANYON--An extensive area of Serpentine Bunchgrass Grassland perhaps covering more than 1000 acres, occurs along the east side of the Coyote Creek drainage. Metcalf Canyon is a major access point to these serpentines and includes Serpentine Seep Vegetation. Three rare plant taxa occur at this site that is under private ownership.

REDWOOD REGIONAL PARK--Approximately fifty acres of Serpentine Bunchgrass Grassland exists in the southeast end of Redwood Regional Park. One introduced rare plant occurs at this site which is under the jurisdiction of the East Bay Regional Parks.

MT. DIABLO--A Mixed Serpentine Chaparral vegetation is becoming reestablished after a 1977 fire. Openings created by the fire still support native bunchgrass species and a high diversity of ephemerals. Three rare plants occur on the serpentines at this site which covers about 150 acres and is under the jurisdiction of the California Department of Parks and Recreation.



Serpentines Of The San Francisco Bay Region

TABLE 4

Rare Plant Distributions

Location	Species	Element Occurrence*
Carson Ridge		
	<u>Arctostaphylos montana</u>	003
	<u>Hesperolinon congestum</u>	028
	<u>Streptanthus batrachopus</u>	003
	<u>Streptanthus glandulosus</u> var. <u>pulchellus</u>	003
Mt. Tamalpais		
	<u>Arctostaphylos montana</u>	008, 010, 011
	<u>Streptanthus glandulosus</u> var. <u>pulchellus</u>	---
Presidio		
	<u>Arctostaphylos hookeri</u> ssp. <u>ravenii</u>	004
	<u>Clarkia franciscana</u>	002, 003
	<u>Grindelia maritima</u>	005, 015
	<u>Hesperolinon congestum</u>	020
	<u>Lessingia germanorum</u> var. <u>germanorum</u>	001
	<u>Orthocarpus floribundus</u>	019
	<u>Plagiobothrys diffusus</u>	002
	<u>Silene verecunda</u> ssp. <u>verecunda</u>	009
Tiburon Peninsula (Ring Mtn. & St. Hilary's)		
	<u>Calochortus tiburonensis</u>	001
	<u>Castilleja neglecta</u>	001 - 004
	<u>Hemizonia multicaulis</u> ssp. <u>vernalis</u>	---
	<u>Hesperolinon congestum</u>	006 - 010
	<u>Streptanthus niger</u>	001, 002
	<u>Trifolium amoenum</u>	022
Mt. Diablo		
	<u>Cordylanthus nidularius</u>	001
	<u>Hesperolinon breweri</u>	002 - 006, 021, 022
	<u>Streptanthus hispidus</u>	001 - 004, 006, 007
Redwood Regional Park		
	<u>Clarkia franciscana</u>	004
Portrero Hill		
	<u>Sanicula maritima</u>	005
Pulgas Ridge		
	<u>Cirsium fontinale</u> var. <u>fontinale</u>	002
	<u>Fritillaria liliacea</u>	019

TABLE 4 continued

Location	Species	Element Occurrence*
Crystal Springs Reservoir		
	<u>Acanthomintha obovata</u> ssp. <u>duttonii</u>	004
	<u>Cirsium campylon</u>	029
	<u>Hesperolinon congestum</u>	001, 003, 019
	<u>Pentachaeta bellidiflora</u>	007
Edgewood Park		
	<u>Acanthomintha obovata</u> ssp. <u>duttonii</u>	003, 005
	<u>Fritillaria liliacea</u>	--
	<u>Hesperolinon congestum</u>	004, 017
	<u>Pedicularis dudleyi</u>	009
	<u>Silene verecunda</u> ssp. <u>verecunda</u>	010
Triangle		
	<u>Cirsium fontinale</u> var. <u>fontinale</u>	004
	<u>Pentachaeta bellidiflora</u>	001
Tulare Hill		
	<u>Dudleya setchellii</u> (sensu Bartel)	--
Metcalf Canyon		
	<u>Cirsium campylon</u>	007 - 016
	<u>Dudleya setchellii</u> (sensu Bartel)	--
	<u>Streptanthus albidus</u> ssp. <u>albidus</u>	002, 004
Redwood Regional Park		
	<u>Gutierrezia californica</u>	---

* These occurrences do not necessarily represent extant populations.

APPENDIX I

PLANT SPECIES INVENTORY

FOR THE

SERPENTINES IN THE SAN FRANCISCO BAY REGION

INVENTORY INFORMATION

This inventory includes 402 taxa which are known to grow on serpentine soil at the locations marked by an "X". Introduced exotic species included in this list are limited to those that have become well established and form distinct populations. Thus, a few exotic species that were only represented by a single plant and may be removed for management reasons have been excluded.

The inventory is based on a number of plant species checklists and floras, Cahill 1975, Culligan 1982, Howell 1970, Howell et al. 1958, Porter 1962 and Sommers 1986, plus species lists for the Ring Mountain Preserve supplied by Greg Wolley of The California Nature Conservancy and field notes for Mt. Diablo supplied by Mary Ann Showers. Some of these plant species sources include plants not growing on serpentine soils and therefore have been edited to reflect only serpentine species. The determination of serpentine plant taxa at these sites is further based on numerous field surveys during 1986 specifically for this study.

The thirteen localities have been roughly divided into two groupings with Mt. Diablo, Mt. Tamalpais and Carson Ridge designated as Serpentine Chaparral and the remaining sites as Serpentine Grassland. However, Serpentine Chaparral and a variety of shrub species does occur, to a limited extent, in Edgewood Park and a couple other localities.

LOCALITY DESIGNATIONS

The following are the sites corresponding to the four-letter codes in the columns of the inventory.

METC = METCALF CANYON

TULA = TULARE HILL

REDW = REDWOOD REGIONAL PARK

JASP = JASPER RIDGE PRESERVE

EDGE = EDGEWOOD COUNTY PARK

TRIA = THE TRIANGLE

PULG = PULGAS RIDGE

CRYS = CRYSTAL SPRINGS RESERVOIR

PRES = PRESIDIO

TIBU = TIBURON PENINSULA

TAMA = MT. TAMALPAIS

CARS = CARSON RIDGE

DIAB = MT. DIABLO

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	I
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
<i>Acacia decurrens</i>						X							
<i>Acanthomintha obovata ssp duttonii</i>					X								
<i>Achillea borealis ssp californica</i>					X					X			
<i>Achillea millefolium</i>	X	X	X		X	X	X	X	X	X	X	X	X
<i>Achyrochaena mollis</i>	X	X	X	X	X	X	X	X	X	X			
<i>Adenostoma fasciculatum</i>					X						X	X	X
<i>Adiantum jordanii</i>					X	X							
<i>Aesculus californica</i>						X							
<i>Agoseris apargioides</i>			X								X		
<i>Agoseris grandiflora</i>				X		X				X			
<i>Agoseris heterophylla</i>	X	X		X	X	X		X			X		
<i>Agropyron trachycaulum</i>										X			
<i>Agrostis exarata</i>					X								
<i>Agrostis hallii</i>										X			
<i>Agrostis microphylla</i>				X									
<i>Aira caryophyllea</i>	X	X		X	X	X			X	X			

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M E T C	T U L A	R E D W	J A S P	E D G E	T R I A	P U L G	C R Y S	P R E S	T I B U	T A M A	C A R S	D I A B
<i>Alchemilla occidentalis</i>	X	X		X	X	X		X	X	X			
<i>Allium amplectens</i>	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Allium breweri</i>				X									
<i>Allium dichlamydeum</i>					X	X							
<i>Allium falcifolium</i>					X	X		X		X	X		X
<i>Allium lacunosum</i>				X	X					X			
<i>Allium serratum</i>	X	X				X							
<i>Allium triquetrum</i>					X								
<i>Allium unifolium</i>										X			
<i>Amsinckia intermedia</i>	X	X	X	X	X	X							
<i>Anagallis arvensis</i>	X				X	X		X		X			
<i>Angelica tomentosa</i>						X							
<i>Aquilegia eximia</i>											X		
<i>Arbutus menziesii</i>						X							
<i>Arctostaphylos glauca</i>	X												
<i>Arctostaphylos hookeri ssp ravenii</i>									X				
<i>Arctostaphylos montana</i>											X	X	

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M E T C	T U L A	R E D W	J A S P	E D G E	T R I A	P U L G	C R Y S	P R E S	T I B U	T A M A	C A R S	D I A B
Arctostaphylos viscida											X	X	
Artemisia californica	X	X			X			X	X	X			
Artemisia douglasiana					X								
Asclepias fascicularis				X	X	X		X					
Aster chilensis					X					X			
Astragalus gambelians	X	X	X	X	X	X		X	X	X			X
Avena barbata	X	X	X	X	X	X	X	X	X	X	X		X
Avena fatua				X	X	X							
Avena sativa						X							
Baccharis pilularis var consanguinea	X		X		X	X	X	X	X	X			
Bellardia trixago					X	X							
Bidens laevis						X							
Bowlesia incana						X							
Brassica nigra						X							
Briza minor				X		X							
Brodiaea congesta	X	X			X	X	X	X		X			
Brodiaea coronaria	X	X		X	X	X	X			X			
Brodiaea elegans				X	X	X				X			
Brodiaea hyacinthina				X	X	X							

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	I
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
<i>Brodiaea peduncularis</i>										X	X		
<i>Brodiaea pulchella</i>	X	X	X	X	X	X	X	X	X	X			
<i>Bromus carinatus</i>				X		X	X	X					
<i>Bromus diandrus</i>					X								X
<i>Bromus madritensis</i>					X					X			
<i>Bromus mollis</i>	X	X	X	X		X	X	X			X		X
<i>Bromus rubens</i>	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Bromus tectorum</i>											X		
<i>Calamagrostis ophitidis</i>			X				X	X		X	X	X	
<i>Calandrinia ciliata var menziesii</i>	X	X		X	X	X	X	X		X			
<i>Calochortus albus</i>					X	X							
<i>Calochortus luteus</i>				X	X	X							
<i>Calochortus superbus</i>	X	X											
<i>Calochortus tiburonensis</i>										X			
<i>Calochortus umbellatus</i>										X			
<i>Calochortus venustus</i>				X	X	X							
<i>Calycadenia multiglandulosa var cephalotes</i>			X							X	X		

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M E T C	T U L A	R E D W	J A S P	E D G E	T R I A	P U L G	C R Y S	F R E S	T I B U	T A M A	C A R S	D I A B
<i>Calycadenia multiglandulosa</i> <i>ssp robusta</i>			X	X									
<i>Calystegia malacophylla</i>										X			X
<i>Calystegia subacaulis</i>	X	X	X	X	X	X	X	X	X	X	X		
<i>Cardamine oligosperma</i>					X								
<i>Carex mendocinensis</i>											X		
<i>Carex serratodens</i>	X	X			X	X		X		X			
<i>Castilleja neglecta</i>								/		X			
<i>Castilleja stenantha</i>											X		
<i>Caucalis microcarpa</i>	X	X				X	X	X					
<i>Ceanothus cuneatus</i>					X								
<i>Ceanothus jepsonii</i> var <i>albiflorus</i>											X	X	
<i>Centaurea calcitrapa</i>					X								
<i>Centaurea melitensis</i>						X							
<i>Centaurea solstitialis</i>					X								
<i>Centaureum davayi</i>					X	X							
<i>Centaureum muehlenbergii</i>										X			

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	I
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
<i>Chaetopappa alsinoides</i>				X									
<i>Cheilanthes siliquosa</i>											X		
<i>Chlorogalum pomeridianum</i>	X	X	X	X	X	X	X	X	X	X	X	X	
<i>Cirsium campylon</i>	X					X							
<i>Cirsium fontinale</i> var <i>fontinale</i>							X						
<i>Cirsium vaseyi</i>											X		
<i>Cirsium vulgare</i>					X	X							
<i>Clarkia affinis</i>			X										
<i>Clarkia franciscana</i>			X						X				
<i>Clarkia purpurea ssp purpurea</i>					X								
<i>Clarkia purpurea var quadrivulnera</i>				X						X			
<i>Clarkia purpurea ssp viminea</i>				X	X								
<i>Clarkia rubicunda</i> ssp <i>rubicunda</i>					X					X			
<i>Collinsia franciscana</i>					X								
<i>Collinsia heterophylla</i>	X	X			X	X	X	X		X			
<i>Collinsia sparsiflora</i> var <i>collina</i>					X			X					X

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M E T C	T U L A	R E D W	J A S P	E D G E	T R I A	P U L G	C R Y S	P R E S	T I B U	T A M A	C A R S	D I A B
<i>Convolvulus occidentalis</i>						X							
<i>Cordylanthus nidularius</i>													X
<i>Cordylanthus pilosus</i>				X	X								
<i>Cordylanthus rigidus</i>					X	X							
<i>Corethrogyne californica</i>								X	X				
<i>Cortaderia seloana</i>			X								X		
<i>Crassula erecta</i>	X	X		X	X	X	X	X		X			
<i>Cryptantha flaccida</i>				X	X	X				X			
<i>Cupressus sargentii</i>			X								X		X
<i>Danthonia californica</i>	X	X			X	X	X	X					
<i>Daucus pusillus</i>						X				X			
<i>Delphinium hesperium</i>				X	X	X							
<i>Delphinium variegatum</i>	X	X		X	X	X	X	X		X			
<i>Deschampsia danthonoides</i>					X					X			
<i>Dipsacus sylvestris</i>						X		X					
<i>Dodecatheon hendersonii ssp cruciatum</i>				X	X	X				X			

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E T C	U L A	E D W	A S P	D G E	R I A	U L G	R Y S	R E S	I B U	A M A	A R S	I A B
Dodecatheon hendersonii ssp hendersonii													
Dudleya farinosa									X	X			
Dudleya setchellii	X	X											
Elymus glaucus				X	X	X		X		X		X	X
Elymus triticooides										X			
Epilobium foliosum										X			
Epilobium minutum				X	X	X				X			X
Epilobium paniculatum						X				X			
Eremocarpus setigerus	X	X		X	X								
Erigeron foliosus				X									
Eriodictyon californicum					X								X
Eriogonum caninum	X	X	X	X	X	X				X	X		
Eriogonum nudum	X	X		X	X	X	X	X	X	X			
Eriogonum virgatum						X							
Eriophyllum confertiflorum	X	X		X	X	X		X		X			
Eriophyllum lanatum var achillaeoides											X		

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M E T C	T U L A	R E D W	J A S P	E D G E	T R I A	P U L G	C R Y S	P R E S	T I B U	T A M A	C A R S	D I A B
Eriophyllum staechadifolium var artemisiaefolium									X				
Erodium botrys				X						X			
Erodium cicutarium	X	X	X	X	X	X	X	X		X			
Erodium obtusiplicatum				X									
Erysimum franciscanum var franciscanum							X	X					
Eschscholtzia californica	X	X	X	X	X	X	X	X	X	X			
Eucalyptus globulus						X			X				
Euphorbia crenulata	X	X			X		X	X					
Euphorbia spathulata						X				X			
Evax sparsiflora	X	X	X	X	X	X	X	X	X	X	X		
Festuca californica													
Festuca idahoensis			X							X	X	X	
Festuca rubra			X										
Filago californica										X	X		
Foeniculum vulgare					X	X		X					
Fritillaria lanceolata					X								

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	l
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
Fritillaria liliacea					X		X						
Galium andrewsii													X
Galium aparine	X	X				X		X		X			
Galium nuttallii		X			X	X	X			X			
Galium parisense						X							
Garrya congdoni											X		
Gastroidium ventricosum				X						X			
Geranium dissectum			X	X	X			X		X			
Geranium molle				X									
Gilia achilleaefolia ssp achilleaefolia	X		X			X				X			
Gilia capitata	X	X				X		X		X			
Gilia clivorum				X	X		X	X		X			
Gilia tricolor		X			X	X							
Gnaphalium californicum						X							
Gnaphalium purpurium				X									
Grindelia camporum var camporum			X	X									
Grindelia hirsutula			X	X						X			
Grindelia maritima									X				

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	J
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
Grossularia californica						X							
Gutierrezia californica			X										
Helenium bigelovii										X	X		
Helianthella californica				X									
Helianthus annuus						X							
Hemizonia luzulaefolia var lutescens										X			
Hemizonia luzulaefolia ssp luzulaefolia			X										
Hemizonia luzulaefolia ssp rudis			X	X	X	X							
Hemizonia multicaulis ssp vernalis										X			
Hemizonia pungens ssp maritima						X							
Hesperolinon breweri													X
Hesperolinon californicum									X			X	
Hesperolinon congestum					X			X	X	X		X	
Hesperolinon micranthum					X	X					X	X	

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M E T C	T U L A	R E D W	J A S P	E D G E	T R I A	P U L G	C R Y S	P R E S	T I B U	T A M A	C A R S	D I A B
Heterocodon rariflorum											X		
Heteromeles arbutifolia					X	X				X	X		X
Hieracium albiflorum										X			
Holocarpha virgata					X								
Hordeum brachyantherum	X	X			X	X	X	X	X	X			
Hordeum californicum										X			
Hordeum geniculatum					X								
Hordeum hystrix				X						X			
Hordeum leporinum	X	X		X	X	X		X	X				X
Hordeum vulgare						X							
Hypochoeris glabra			X	X						X	X		
Hypochoeris radicata										X			
Juncus bufonius	X	X	X	X	X	X	X	X	X	X			
Juncus effusus var brunneus										X			
Juncus effusus var pacificus										X			
Juncus patens					X	X							
Juncus phaeocephalus				X									

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	I
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	F	E	A	G	S	S	U	A	S	B
Koeleria macrantha			X		X		X	X		X	X		X
Lactuca saligna			X										
Lactuca serriola	X	X	X	X	X	X		X		X			
Lagophylla ramosissima				X	X								
Lamarckia aurea	X	X											
Lasthenia californica	X	X	X	X	X	X	X	X		X			
Lasthenia glabrata						X							
Layia platyglossa ssp campestris	X		X	X	X	X	X	X		X			
Lepidium lasiocarpum													
Lepidium nitidum	X	X	X	X	X	X	X	X	X	X			
Lessingia germanorum var tenuipes				X									
Lessingia hololeuca var hololeuca				X	X	X							
Lewisia rediviva	X	X			X								X
Linanthus ambiguus					X	X							
Linanthus androsaceus			X	X	X			X		X			
Linanthus bicolor				X	X								
Linanthus dichotomus		X		X		X							

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M E T C	T U L A	R E D W	J A S P	E D G E	T R I A	P U L G	C R Y S	P R E S	T I B U	T A M A	C A R S	D I A B
Linanthus liniflorus	X			X	X	X		X					
Linanthus pygmaeus					X								
Linaria texana				X	X								
Linum bienne										X			
Lolium multiflorum	X	X	X	X	X	X	X	X	X	X		X	X
Lolium perenne					X								
Lomatium dasycarpum	X			X	X	X				X			X
Lomatium macrocarpum			X		X					X			
Lomatium utriculatum			X	X	X	X				X			
Lonicera hispidula					X	X							
Lotus corniculatus						X							
Lotus humistratus													X
Lotus micranthus	X				X	X				X			
Lotus subpinnatus	X	X	X	X	X	X	X	X	X	X	X		
Lupinus bicolor				X	X								
Lupinus densiflorus				X						X			
Lupinus nanus				X						X			
Lupinus subvexus			X										

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M E T C	T U L A	R E D W	J A S P	E D G E	T R l A	P U L G	C R Y S	P R E S	T I B U	T A M A	C A R S	D I A B
Lupinus succulentus	X	X			X	X				X			
Madia elegans ssp densifolia						X							
Madia exigua						X							
Madia gracilis				X	X								
Madia sativa										X			
Malacothrix floccifera	X												
Malva parviflora	X												
Medicago polymorpha						X							
Melica californica					X		X	X		X			X
Melica imperfecta	X			X									
Melica torreyana			X			X				X	X	X	X
Melilotus indicus					X	X							
Mentha pulegium						X							
Microcala quadrangularis				X	X								
Micropus californicus	X	X	X	X	X	X				X			
Microseris acuminata			X										
Microseris bigelovii										X			
Microseris decipiens			X										

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	I
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
Microseris douglasii ssp douglasii				X		X				X			
Microseris lindleyi	X		X				X						
Microseris linearifolia						X							
Mimulus aurantiacus						X			X				
Mimulus douglasii			X	X	X								
Mimulus guttatus	X	X			X	X		X		X	X	X	
Minuartia douglasii	X	X	X	X		X	X	X		X	X		X
Monardella douglasii ssp douglasii			X										
Monardella villosa ssp neglecta						X		X		X	X		
Monardella villosa ssp villosa				X	X								
Montia perfoliata	X	X	X	X	X	X	X	X		X			
Montia spathulata var exigua	X		X	X	X	X				X			
Muilla maritima	X	X			X	X	X	X	X				
Navarretia heterodoxa					X	X							
Navarretia heterodoxa ssp rosulata											X		

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	I
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
Nemophila heterophylla					X								
Nemophila menziesii var atomaria				X						X			
Nemophila menziesii var menziesii				X	X								
Oenothera ovata				X	X					X			
Orobanchè fasciculata		X			X								
Orthocarpus attenuatus				X									
Orthocarpus densiflorus		X		X	X	X	X						
Orthocarpus erianthus var erianthus				X	X								
Orthocarpus floribundus									X				
Orthocarpus lithospermoides	X		X	X	X	X	X	X		X			
Orthocarpus purpurascens var purpurascens	X	X		X	X	X		x					
Orthocarpus pusillus		X		X	X								
Parnassia palustris var californica											X		
Pectocarya penicillata	X												
Pedicularis densiflora						X							

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	I
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
Pedicularis dudleyi					X								
Pellaea andromedaefolia			X										
Pellea mucronata	X	X			X						X		
Pentachaeta bellidiflora						X		X					
Perideridia kelloggii	X		X		X		X			X			
Phacelia californica					X	X	X	X					
Phacelia distans		X			X								
Phacelia divaricata								X					
Phalaris californica						X							
Photinia arbutifolia						X							
Pityrogramma triangularis	X	X			X	X				X	X		X
Plagiobothrys diffusus									X				
Plagiobothrys fulvus var campestris	X	X											
Plagiobothrys nothofulvus				X	X					X			
Plantago hookeriana var californica	X	X	X	X	X	X	X	X	X	X			
Plantago lanceolata			X		X	X			X				

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	J
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
<i>Plantago maritima</i>									X				
<i>Platystemon californicus</i>	X	X	X	X	X					X			
<i>Plectritis ciliosa</i> ssp <i>ciliosa</i>													
<i>Plectritis ciliosa</i> ssp <i>insignis</i>				X		X							
<i>Plectritis congesta</i>						X							
<i>Plectritis macrocera</i>			X	X	X								
<i>Poa annua</i>						X			X				
<i>Poa melitensis</i>													
<i>Poa scabrella</i>	X		X	X	X	X	X	X	X	X	X	X	X
<i>Pogogyne serpylloides</i>				X	X	X							
<i>Polypodium californicum</i>		X			X	X	X	X			X		X
<i>Polypogon monspeliensis</i>						X							
<i>Psilocarphus tenellus</i>				X		X				X			
<i>Pterostegia drymarioides</i>		X			X						X		X
<i>Quercus agrifolia</i>						X							
<i>Quercus douglasii</i>						X							

PLANT SPECIES	SERPENTINE GRASSLANDS											SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	F	T		T	C	D
	E	U	E	A	D	R	U	R	R	I		A	A	I
	T	L	D	S	G	I	L	Y	E	B		M	R	A
	C	A	W	P	E	A	G	S	S	U		A	S	B
<i>Quercus durata</i>	X			X	X	X		X	X			X	X	X
<i>Quercus kelloggii</i>						X								
<i>Quercus lobata</i>						X								
<i>Rafinesguia californica</i>														
<i>Ranunculus californicus</i>						X								
<i>Ranunculus occidentalis</i>	X	X		X	X	X	X	X						
<i>Raphanus sativa</i>						X								
<i>Rhamnus californica</i>	X	X			X	X		X	X			X	X	X
<i>Rigiopappus leptocladus</i>	X	X	X	X	X	X				X		X		
<i>Rosa californica</i>						X								
<i>Rubus ursinus</i>		X			X	X			X					
<i>Rumex crispus</i>			X		X	X	X							
<i>Rumex pulcher</i>						X								
<i>Sagina apetala</i> <i>var barbata</i>						X								
<i>Sagina occidentalis</i>					X									
<i>Salix lasiolepis</i>						X			X					
<i>Salvia columbariae</i>	X			X										
<i>Sambucus mexicana</i>					X									
<i>Sanicula arctopoides</i>										X				

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M E T C	T U L A	R E D W	J A S P	E D G E	T R I A	P U L G	C R Y S	P R E S	T I B U	T A M A	C A R S	D I A B
<i>Sanicula bipinnatifida</i> var <i>bipinnatifida</i>		X	X		X	X	X	X		X			
<i>Sanicula bipinnatifida</i> ssp <i>patula</i>				X									
<i>Sanicula crassicaulis</i>					X	X				X			
<i>Sanicula tuberosa</i>			X		X					X		X	
<i>Saxifraga californica</i>			X										
<i>Scandix pecten-veneris</i>					X			X		X			
<i>Scribneria bolanderi</i>						X						X	
<i>Scrophularia californica</i>	X				X	X	X	X					
<i>Sherardia arvensis</i>					X	X							
<i>Sidalcea diploscypha</i>	X	X			X	X							
<i>Sidalcea malvaeflora</i>	X	X			X								
<i>Silene californica</i>					X	X						X	
<i>Silene gallica</i>	X	X		X				X		X			
<i>Silene verecunda</i> ssp <i>verecunda</i>					X				X				
<i>Silybum marianum</i>						X							
<i>Sisymbrium altissimum</i>		X			X	X							

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	I
	T	L	D	S	G	I	L	Y	E	B	N	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
<i>Sisyrinchium bellum</i>	X	X	X	X	X	X	X	X	X	X			
<i>Sitanion jubatum</i>	X	X	X		X	X	X	X	X	X		X	
<i>Smilacina racemosa</i> var <i>amplexicaulis</i>						X							
<i>Solanum umbelliferum</i>					X	X							
<i>Sonchus asper</i>					X	X							
<i>Spartium junceum</i>						X							
<i>Stachys arvensis</i>							X						
<i>Stachys bullata</i>						X							
<i>Stachys pycnantha</i>					X					X	X		
<i>Stachys rigida</i> ssp <i>quercetorum</i>					X	X							
<i>Stellaria media</i>					X								
<i>Stellaria nitens</i>					X	X							
<i>Stipa lepida</i>					X	X					X		X
<i>Stipa pulchra</i>	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Streptanthus albidus</i> ssp <i>albidus</i>	X												
<i>Streptanthus batrachopus</i>											X	X	
<i>Streptanthus glandulosus</i> var													X
<i>Streptanthus glandulosus</i> var <i>pulchellus</i>											X	X	

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	I
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
Streptanthus hispidus													X
Streptanthus niger										X			
Stylocline filaginea						X							X
Symphoricarpos mollis					X	X							
Tauschia kelloggii						X				X			
Thelypodium lasiophyllum					X	X							
Toxicodendron diversilobum	X	X			X	X		X	X				
Trifolium albopurpureum						X		X					
Trifolium amoenum										X			
Trifolium amplectens		X			X								
Trifolium barbigerum				X	X								
Trifolium bifidum var decipiens				X									
Trifolium ciliolatum				X			X						
Trifolium dubium										X			
Trifolium fucatum				X	X	X	X			X			
Trifolium fucatum var virescens										X			

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M E T C	T U L A	R E D W	J A S P	E D G E	T R I A	P U L G	C R Y S	P R E S	T I B U	T A M A	C A R S	D J A B
<i>Trifolium gracilentum</i>		X		X									
<i>Trifolium macraei</i>										X			
<i>Trifolium microcephalum</i>				X									
<i>Trifolium microdon</i>						X							
<i>Trifolium olivaceum</i> var <i>griseum</i>										X			
<i>Trifolium tridentatum</i>	X	X	X		X	X				X			
<i>Trifolium variegatum</i>				X		X							
<i>Trillium chloropetalum</i>						X							
<i>Triteleia laxa</i>		X		X	X	X				X			
<i>Triteleia lutea</i>					X								
<i>Umbellularia californica</i>						X				X	X		
<i>Verbena lasiotachys</i>						X							
<i>Vicia angustifolia</i>						X							
<i>Vicia angustifolia</i> var <i>segetalis</i>										X			
<i>Viola ocellata</i>											X		
<i>Vulpia microstachys</i>	X	X	X	X	X	X	X	X	X	X	X	X	X

PLANT SPECIES	SERPENTINE GRASSLANDS										SERPENTINE CHAPARRAL		
	M	T	R	J	E	T	P	C	P	T	T	C	D
	E	U	E	A	D	R	U	R	R	I	A	A	I
	T	L	D	S	G	I	L	Y	E	B	M	R	A
	C	A	W	P	E	A	G	S	S	U	A	S	B
Vulpia myuros	X	X	X					X					
Vulpia pacifica				X									
Wyethia angustifolia								X		X			
Zygadenus fremontii					X	X		X		X	X		