STAFF REPORT

CITY COUNCIL OF THE CITY OF SAUSALITO

AGENDA TITLE:

Status Update, Vegetation Management Project for Cypress Ridge Open Space Preserve

RECOMMENDED MOTION:

No action necessary, informational item

SUMMARY

With the passage of a Bond Measure in 1976, the voters of the City of Sausalito approved the acquisition of real property known as "Cypress Ridge" for open space preservation. As indicated on the attached map from Marin Map, the subject open space consists of two parcels, 064-133-05 and 064-181-40, located off of US 101 and along Rodeo Avenue. The two parcels together total almost 12 acres in area. The circular parcel in the interior (APN 064-133-06) is owned by the Marin Municipal Water District.

At Staff's request, the Marin County Forester, Dr. Kent Julin, and the California Department of Forestry and Fire Protection Bay Area Regional Urban Forester, James Scheid, visited Cypress Ridge in July, 2010. Dr. Julin concluded and recommended that: vegetation on the property is dominated by fire-prone trees including bluegum eucalyptus (*Eucalyptus globulus*), Monterey pine (*Pinus radiata*), and Monterey cypress (*Cupressus macrocarpa*), with broom (*Cytisus scoparius* and *Genista monspessulana*), cotoneaster (*Cotoneaster sp.*), and Himalaya berry (*Rubus discolor*) in the understory. Remnant native plants including coast live oak (*Quercus agrifolia*), toyon (*Heteromoles arbutifolia*) are well distributed on the property and should be preserved. Overgrown vegetation on the property has created a hazardous fire-fuel condition that can be mitigated by directed, clearing of vegetation. The proposed work is also part of a long-term plan of re-establishing a native plant community for continued passive recreation or for developing a more active recreational park on the property. The proposed work is consistent with the current draft Fire Hazard Severity Zone mapping by the State, of property within the City's jurisdiction (see attachment).

The first phase of work—primarily for fire-hazard reduction—will include pruning lower branches from large trees, thinning smaller eucalyptus and pine trees in the forest and clearing non-native flammable brush from the understory. The following prescriptions address work for trees, shrubs, and ground vegetation.

Prescription for Trees. Cut all eucalyptus with a diameter at breast height (dbh) of **less than** 10 inches. Cover each cut stump with black plastic sheeting to prevent resprouting. Use landscaping staples or piled chips to secure the sheeting. Chip eucalyptus trunks, branches, and leaves onsite. Cut all plum trees, off-haul chips, and cover stumps with plastic sheeting. Cut all pines then chip and spread materials onsite. Prune lower cypress branches to a height of 20 feet—leaving primary scaffold branches on forked trunks—and distribute chips onsite. Spread all chips to a maximum depth 6 inches. Protect all oak and bay trees from damage.

Prescription for Shrubs. Cut all broom, cotoneaster, and Himalaya berry near ground level and off-haul all material. Onsite burning of these materials is an alternative option for disposal. (Note: follow-up treatments for re-sprouting stems and germinating seeds will be necessary for long-term control of these weedy plants. This work would be most effective during the Spring following initial cutting).

Prescription for Ground Vegetation. Clear all English and Cape ivy and haul offsite. Chip all down tree branches longer than 6 feet onsite and distribute chips onsite.

As suggested, subsequent phases of work would eventually result in removal of all non-native, invasive fire-hazardous vegetation and the restoration of native plants and habitats on the preserve.

With action of May 3, 2011, Council approved the retention of a biological resource consultant (Prunuske Chatham, Inc., "PCI") to assist in preparation of an environmental assessment of the proposed project. In addition, Staff applied on June 30, 2011 for a grant from the California Fire Safe Council for wildfire prevention grant funds through the U.S. Forest Service, the Bureau of Land Management, the U.S. Fish and Wildlife Service and the National Parks Service. The Fire Safe Council announced the award of grants on Wednesday, October 19, 2011 and did not fund this project.

ISSUES

Staff has notified the Trees and Views Committee and the Parks and Recreation Commission of the proposed actions. The environmental assessment is complete, as are the recommendations for re-vegetation. Given that grant funding was not awarded, Staff will develop a scope of work for performance of some of the recommended prescription in conformance with the recommendations made by PCI – specifically:

1. Prioritize invasive plant removal near existing native vegetation.
2. Ensure that invasive plant removal efforts are overseen by staff familiar with native plants.
3. Plant or protect native species that are functionally similar to, and capable of competing with, invasive nonnative species.
4. Plant native species where natural regeneration is limited.

Once this scope is developed, we will notify residents and property owners within a 300-foot buffer of the project prior to seeking Council adoption of a California Environmental Quality Act finding and authorization to solicit bids for the work. It is anticipated that these actions will take place in coordination with the Southern Marin Fire District's vegetation management program.

FISCAL IMPACT

With action of May 3, 2011, Council appropriated $50,000 for this project. $12,117 has been encumbered for Prunuske Chatham's services. Without the grant funding the initial phase of vegetation management has approximately $38,000 available.

STAFF RECOMMENDATIONS

No action required, informational item.

ATTACHMENTS:

1. Map of Cypress Ridge from Marin Map
2. Copies of Biological Resources Evaluation and Restoration Recommendations prepared by Prunuske Chatham, Inc.

PREPARED BY:

Jonathon Goldman
Director of Public Works

REVIEWED BY:

Fred Hilliard
Fire Prevention Specialist
Southern Marin Fire Protection District

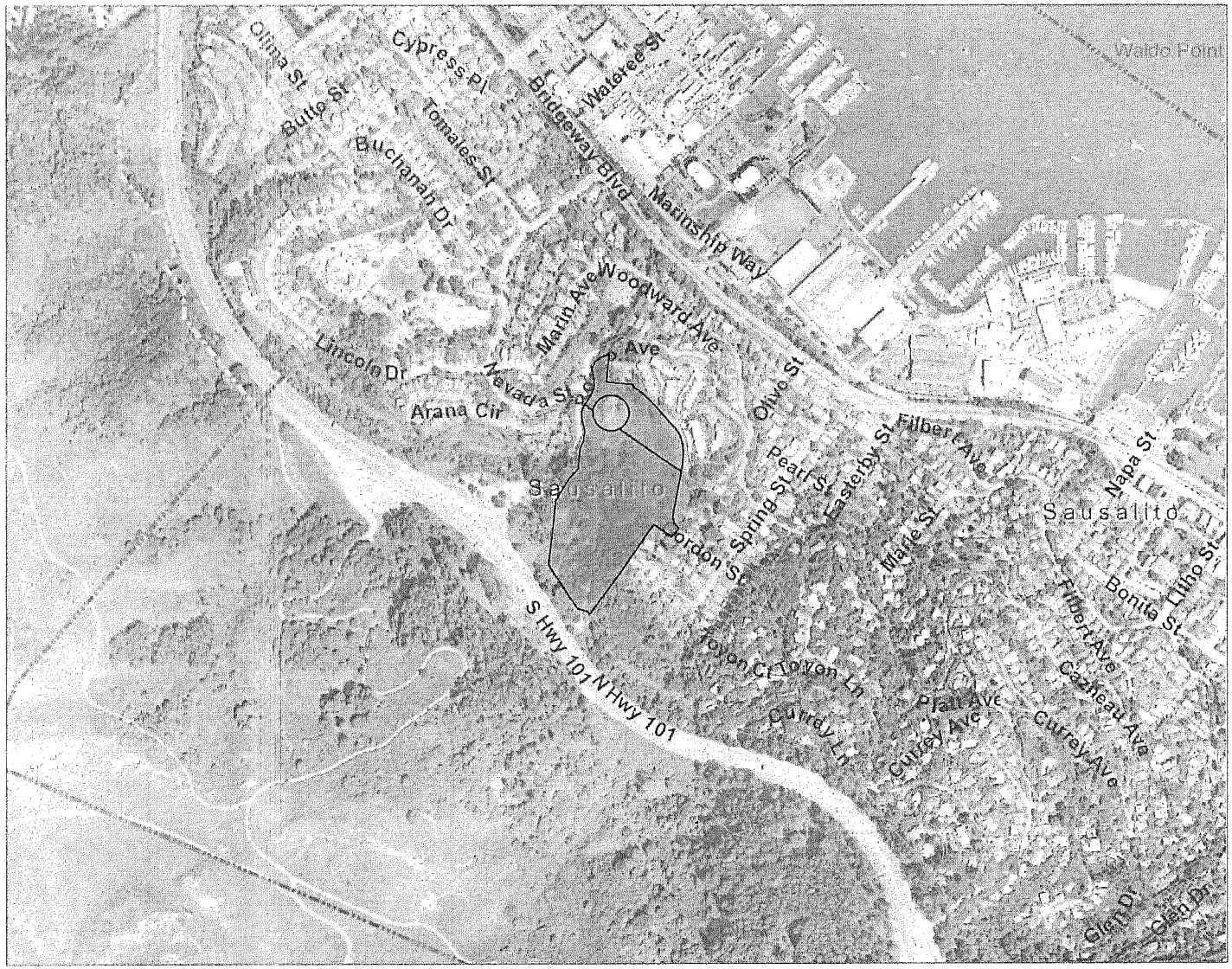
REVIEWED BY:

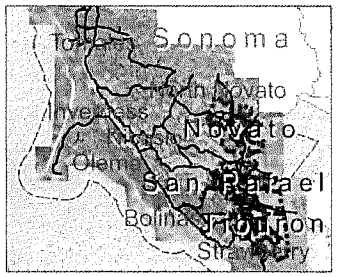
Jim Irving
Fire Chief
Southern Marin Fire Protection District

SUBMITTED BY:

Adam W. Politzer
City Manager

Cypress Ridge Open Space Preserve Location Map





Legend

- Road (Major)
- Road Name
- Parcel
- Condominium Common Area
- City
- Community
- 2007 Countywide Ortho
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3
- 2004 East Marin Ortho
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3
- 2004 West Marin Ortho
  - Red: Band_1
  - Green: Band_2
  - Blue: Band_3
- Marin County Legal Boundary
- Other Bay Area County
- Ocean and Bay

1:9,226

0.3 0 0.15 0.3 Miles

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS REPRESENTATIONAL ONLY DATA ARE NOT SURVEY PRECISE.

Notes

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PRUNUSKE CHATHAM, INC.

Biological Resources Assessment
Cypress Ridge Open Space Preserve
Vegetation Management and Restoration Project
June 2011

Prepared for:
City of Sausalito
420 Litho Street
Sausalito, CA 94965

Prepared by:
Prunuske Chatham, Inc.
400 Morris Street, Suite G
Sebastopol, CA 95472

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Appendices

Table 1: Special-status Plant Species Considered in the Evaluation of the Project Based on the Background Literature Review

Table 2: Special-status Animals or Species of Interest Considered in the Evaluation of the Project Based on the Background Literature Review

Table 3: Plants Observed, Cypress Ridge Open Space Preserve, June 8, 2011

Figure 1: Project Location Map

Figure 2: Map of CNDDB Records of Special-status Species in the Project Vicinity

Project Photographs

Attachments

California Department of Fish and Game, Natural Diversity Database – San Francisco North USGS Quadrangle

U.S. Fish & Wildlife Service, Sacramento Fish & Wildlife Office, Federal Endangered and Threatened Species – San Francisco North Quadrangle

1 Introduction

Cypress Ridge Open Space Preserve (Preserve) is a 10-acre City of Sausalito property located east of the intersection of Highway 101 and Rodeo Avenue. Currently, the Preserve functions as undeveloped open space, with one utility road and several short informal trails providing access. A cell phone tower is located on the western portion of the site. The City also disposes of chipped vegetation and street sweeper debris on the Preserve.

The City is planning fuel reduction measures, invasive plant removal, and native plant revegetation at the Preserve. Based on the Vegetation Management Prescription prepared by Kent Julin, California Registered Professional Forester (Julin 2010), the City of Sausalito is proposing to:

- Cut all eucalyptus with a diameter at breast height of less than 10 inches, cover stumps with plastic sheeting to prevent resprouting, chip debris and leave on site;
- Cut all plum trees, remove chips off site, and cover stumps with plastic;
- Cut all pines and leave chips on site;
- Prune lower cypress branches to a height of 20 feet and leave chips on site;
- Cut all broom, cotoneaster, and Himalayan blackberry near ground level, dispose of off site, and do follow-up treatment of resprouts or new seedlings;
- Clear all English and Cape ivy and dispose of off site; and
- Chip all downed tree branches longer than 6 feet on site.

The City has also retained Prunuske Chatham, Inc. (PCI) to prepare a native plant revegetation plan for the site.

The City requested a biological assessment of the Preserve to determine potential impacts of the proposed vegetation management on biological resources. This report summarizes an on-site assessment, addresses potential project impacts on biological resources, and provides general recommendations to protect biological resources.

2 Field Survey Methodology

A field survey of the project site was conducted on June 8, 2011, by a wildlife biologist and a vegetation ecologist from PCI who are familiar with the region's flora and fauna. The purpose of the survey was to characterize biological communities within the Preserve and to determine whether or not suitable habitat for special-status plant and animal species is present. The potential presence of and impacts on special-status species were determined based on a comparison of existing habitat conditions and presence of unique habitat features, proximity of the Preserve to reported occurrences, and geographic range of subject species.

The one-day survey of the Preserve occurred over an approximately 3-hour period. The survey was confined to representative habitats on the Preserve and limited in extent due to access constraints and steep topography. During the survey, conditions were cool (57° at 10:00 am) with light rain and 100% cloud cover.

The survey followed protocols established by California Department of Fish and Game (CDFG 2009) and industry standards. During the survey, an inventory of all plant and animal species observed was compiled. The survey was conducted with the aid of binoculars. Visual cues, calls, songs, and direct observations were used to identify wildlife species. Unique habitat features (e.g., woody debris, water sources, etc.) and other plant materials were examined for presence of mammals, amphibians, reptiles, and invertebrates.

The number of species observed on the Preserve is limited due to activity period and seasonal nature of some species, rarity of others, and limited field surveys. This level of analysis is standard at this stage of project review and is meant to guide the City in making initial determinations for compliance with the California Environmental Quality Act (CEQA), identifying needs for further study, and/or planning restoration and enhancement activities.

3 Project Setting

The Preserve is located southeast of the intersection of Highway 101 and Rodeo Avenue in Sausalito. It is mapped on the San Francisco North USGS Quadrangle (37.8602° N, 122.4998° W) at 200-350 feet in elevation. The Preserve includes a portion of a north-south trending ridge and its primarily east-facing slopes. The site drains into an unnamed drainage and eventually into Richardson Bay. To the west, the Preserve is bordered by Highway 101 and the associated right-of-way, with open space lands of the Golden Gate National Recreation Area beyond. The remainder of the site is bordered by residential development.

Soils on the site are described as Tamalpais-Barnabe Variant very gravelly loams, well-drained soils derived from sandstone or chert (NRCS 2011).

Figure 1 is a location map with the project area noted. Following the figures are photographs of the site taken during the field survey.

4 Existing Communities

4.1 Botanical Resources

Vegetation on the Preserve includes non-native woodland intermingled with coast live oak woodland, coastal scrub, and grassland habitat. While much of the Preserve is dominated by invasive species, fragments of relatively diverse native oak woodland and

coastal scrub remain on the site. The table below lists plant communities identified on the site, using classification systems from both Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986) and A Manual of California Vegetation (MCV; Sawyer et al. 2009). Sensitivity is based on rarity rankings (CDFG 2010) and inventory priority (CDFG 2011a) by CDFG. A complete list of all plant species observed on the property is provided in Table 1, at the conclusion of the report.

Holland Community Type	Manual of California Vegetation Alliance(s)	Sensitivity	CDFG Rank*
Monterey cypress forest [Eucalyptus forest – not listed]	*Callitropsis macrocarpa* Woodland Special Stands *Eucalyptus globulus* Semi-natural Woodland Stands	No	--
Coast live oak woodland	*Quercus agrifolia* Woodland Alliance	No	G5S4
Northern coastal scrub	*Baccharis pilularis* Shrubland Alliance	No	G5S5
Non-native grassland	*Lolium perenne* Semi-natural Herbaceous Stands	No	--

*G indicates conservation priority at the global level, and S refers to the state level.
1 = critically imperiled; 2 = imperiled; 3 = vulnerable; 4 = apparently secure; 5 = secure.

Non-native woodland, dominated by mature blue gum eucalyptus (*Eucalpytus globulus*) and Monterey cypress (*Callitropsis macrocarpa*), occupies approximately one third of the site, from the upper ridge near Rodeo Drive downslope into the central portion of the Preserve. This community type is common on disturbed coastal Marin County hills, where both eucalyptus and Monterey cypress have naturalized from nearby plantings. The trees form an intermittent to mostly closed canopy with a variable understory dominated by non-native shrubs. Occasional native trees are also present, including coast live oak (*Quercus agrifolia*) and bay (*Umbellularia californica*). Shrubs include invasive French broom (*Genista monspessulana*) and native poison oak (*Toxicodendron diversilobum*). On one slope along the entry from Rodeo drive, invasive Cape ivy (*Delairea odorata*) forms a dense carpet in the understory. Grasses and forbs are sparse and almost exclusively non-native.

Coast live oak woodland is present on the southern end of the Preserve, covering approximately one third of the site. In some locations, including the southern tip of the property, this habitat is relatively rich in native species, with California bays also present and an understory of shrubs including oceanspray (*Holodiscus discolor*), California blackberry (*Rubus ursinus*), snowberry (*Symphoricarpos albus*), wood fern (*Dryopteris arguta*), and sword fern (*Polystichum munitum*). Elsewhere, the understory is dominated by non-native invasive species, including English ivy (*Hedera helix*) and French broom. A pile of vegetative debris has been dumped in oak woodland below the

access road; several of the species that were dumped show signs of spreading on the Preserve, including English ivy (*Hedera helix*) and pride of Madeira (*Echium candicans*). Other highly invasive species present in oak woodland are pampas grass (*Cortaderia jubata*), periwinkle (*Vinca major*), and Cape ivy.

Coastal scrub is present in the area around the cell phone tower. It is characterized by a dense to intermittent cover of shrubs, including both natives [coyote brush (*Baccharis pilularis*), poison oak, and toyon (*Heteromeles arbutifolia*)] and invasive non-natives [cotoneaster (*Cotoneaster pannosa*) and French broom]. Native species are more abundant in less-disturbed areas, including the rock outcrop above the access road. Plants around the outcrop include native sticky monkeyflower (*Mimulus aurantiacus*), coastal sagebrush (*Artemisia californica*), Pacific false bindweed (*Calystegia purpurata* ssp. *purpurata*), soap plant (*Chlorogalum pomeridianum*), and wild cucumber (*Marah fabaceus*). Occasional native bunchgrasses are present, including California oatgrass (*Danthonia californica*) and purple needlegrass (*Nassella pulchra*). In the disturbed area around the parking pad for the cell phone tower, non-native grasses are abundant, including wild oats (*Avena* spp.), false brome (*Brachypodium distachyon*), and Italian ryegrass (*Lolium perenne*).

Two additional areas on the northeast side of the Preserve are dominated by shrubby vegetation, but these are characterized by almost complete cover of non-native species. One slope above Gordon Avenue is densely covered with a large expanse of Himalayan blackberry (*Rubus armeniacus*). Just north of this patch, a thicket of cotoneaster and French broom is present. This thicket is adjacent to a residential development that may be one source of cotoneaster plants. Cotoneaster is a widely planted landscaping species that thrives in coastal habitats like Sausalito. Its berries are eaten and seeds readily spread by birds. There are a number of cotoneaster plants on the edge of the thicket that appear to have been incorporated into the residential landscaping.

Grassland is present on the Preserve in the area covering and adjacent to the buried water tank. This habitat is dominated by non-native annual grasses and forbs, some of which may have been seeded for erosion control. These include Mediterranean barley (*Hordeum marinum*), Italian ryegrass, rose clover (*Trifolium hirtum*), and crimson clover (*Trifolium incarnatum*). Occasional native purple needlegrass occurs within and along the water tank access road, which is lined with open concrete pavers. Below the water tank, one large stand of invasive Harding grass (*Phalaris aquatica*) is present.

4.2 Wildlife Resources

The wildlife resources described below are those that would be expected to occur on the project site and/or in nearby areas where suitable habitat exists. Although the characteristic assemblages may occur predictably within certain vegetation types, it should be recognized that relatively few wildlife species are restricted to a single

habitat, and, indeed, some species may require more than one habitat type. The following discussion includes a general summary of species typically associated with each community based on regional occurrence and field observations. Wildlife species' common names are used in the text because they are unequivocal.

Upland native woodlands and forests provide suitable habitat for terrestrial birds, mammals, amphibians, and reptiles. Birds represent the most abundant and prominent wildlife species within these habitats. Year-round resident birds of woodland and forest habitats, such as those found within the Preserve, include chestnut-backed chickadee, western-scrub jay, American robin, common bushtit, oak titmouse, Bewick's wren, California quail, dark-eyed junco, Anna's hummingbird, mourning dove, and spotted towhee (Shuford 1993). The most common finch species include house and purple finches. Additional migratory species potentially breeding within the Preserve include orange crowned-warbler, Wilson's warbler, Pacific-slope and ash-throated flycatchers, and vireos. Tree climbing birds such as Nuttall's, acorn, downy, and hairy woodpeckers, white-breasted nuthatch, and brown creeper may also frequent the Preserve. Casual winter residents include ruby-crowned kinglet, varied thrush, and Townsend's and yellow-rumped warblers. Forests and woodlands that are structurally diverse with a healthy understory of low-growing groundcover, midstory shrubs and small trees, high canopy of trees and vines, and snags are critical for supporting the various habitat needs of the above-mentioned species.

Suitable foraging and breeding habitat also exists for raptors, including red-shouldered and red-tailed hawks. Cooper's and sharp-shinned hawks may also utilize the Preserve, especially in winter when they are typically more abundant. Small vertebrates are likely to serve as a food source for predatory birds. The larger oaks and evergreen trees are prime habitat for nesting raptors. Nocturnal avian predators include western screech and great horned owls.

The woodland and forested habitats support a variety of mammals. Given the close proximity to urban development and Highway 101, the most common mammal species are likely those adapted to human disturbance. These include black-tailed deer, western gray squirrel, striped skunk, and non-native Virginia opossum. In addition, common bat species may forage over the habitats and roost in larger trees. Dusky-footed woodrats are established within the Preserve. Several nest structures were observed. These are large, domed-shaped structures consisting of small sticks and detritus that are several feet in height.

Dusky-footed woodrats observed.

Native oaks within the Preserve serve as a significant resource for many wildlife species in the form of both food and shelter. Every aspect of the oak tree is utilized as forage for native species, including acorns, leaves, twigs, pollen, roots, and sap. Perhaps the most widely recognized source of food is the acorn. This high-energy food is used

heavily by acorn woodpeckers, western-scrub jays, western gray squirrel, black-tailed deer, and dusky-footed woodrats. Individual trees are important food storage sites for acorn woodpeckers, which cache acorns for future consumption, particularly in dead and dying oak trees. The use of acorns by a number of wildlife species is important for dispersal and colonization of trees. The entire tree from the canopy to the roots is used as shelter, as well as the layer of detritus around the base, which is utilized by a number of amphibians and insects.

Within the woodland and forest floor, woody debris piles and layers of duff provide habitat for amphibians. Locally, common amphibians include ensatina and California slender salamander. Common reptiles of this community include western skink, western fence lizard, and alligator lizard, and gopher and garter snakes.

Scrub communities, particularly coastal scrub, provide habitat for a wide variety of wildlife. Mammals typically observed within this habitat type include black-tail deer, coyote, northern raccoon, striped skunk, Botta's pocket gopher, and brush rabbit. Representative birds include California quail, Anna's hummingbird, western scrub-jay, bushtit, Bewick's wren, wrentit, California thrasher, spotted towhee, rufous-crowned sparrow, and sage sparrow (Shuford 1993).

Non-native forest (Monterey pine, cypress, and eucalyptus) provides additional habitat for wildlife. This type is most commonly used by larger birds for breeding, roosting, and perching. Great horned owls are commonly observed using these areas, and egrets and herons have an affinity for establishing rookeries in trees of these species. Additional birds commonly found in eucalyptus groves include Allen's hummingbird, olive-sided flycatcher, chestnut-backed chickadee, Bewick's wren, American robin, house finch, pine siskin, and American goldfinch (Shuford 1993). Some of the more common mammal species (e.g., deer, raccoons) are also frequently observed. While a number of bird species frequent eucalyptus trees, when in flower these trees are considered to be detrimental to small native songbirds whose feathers and nasal passages become clogged with gum produced by the flowers. Locally, coastal non-native forests are known to provide winter roost sites for monarch butterflies.

During the field survey, wildlife observations (direct and indirect [scat, tracks, burrows]) included Anna's hummingbird, wrentit, chestnut-backed chickadee, Wilson's warbler, spotted towhee, purple finch, common bushtit, Swainson's thrush, dark-eyed junco, common crow, western scrub-jay, song sparrow, California quail, red-shouldered hawk, black-tailed deer, and dusky-footed woodrat. Wildlife observations during the field survey were limited due to cool and rainy conditions.

5 Special-status Species

5.1 Background Research

A background literature and database search was conducted to determine the potential occurrence of special-status species within the Preserve based on a comparison of existing habitat conditions and presence of unique habitat features, proximity to reported occurrences, and geographic range of subject species. The search focused on reported occurrences for the San Francisco North 7.5' USGS quadrangle where the Preserve is located and the surrounding quads (Point Bonita, San Rafael). General references were also consulted to evaluate the potential for unique biological communities and special-status species. The review included, but was not limited to, the following sources:

- California Department of Fish and Game (CDFG) Natural Diversity Database (CNDDB)[1] (CDFG 2011a)
- CNDDB/Spotted Owl Viewer on-line database for the reported sightings of northern spotted owl (CDFG 2011b)
- A Manual of California Vegetation, 2nd Edition (Sawyer et al. 2009)
- Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986)
- California Department of Fish and Game Natural Communities List (CDFG 2010)
- CNPS Inventory of Rare and Endangered Vascular Plants of California on-line inventory (CNPS 2011)
- Marin Flora (Howell et al. 2007)
- Sacramento U.S. Fish and Wildlife Service (USFWS) Office Species Lists for the San Francisco North USGS Quadrangle (USFWS 2011)
- Natural Resources Conservation Service Web Soil Survey (NRCS 2011)
- Field guides and general references for birds, mammals, reptiles, amphibians, and invertebrates (e.g., Brown 1997; Jameson and Peeters 2004; Jennings and Hayes 1994; Kays and Wilson 2002; Shapiro and Manolis 2007; Shuford 1993; Shuford and Gardali 2008; Sibley 2000; Stebbins 2003; Zeiner et al. 1990).

5.2 Definition of Special-status Species

In California, special-status species include those plants and animals that are afforded legal protection under the federal and California Endangered Species Acts (ESA and CESA, respectively) and other regulations. Consideration of these species must be

[1] The California Natural Diversity Data Base (CNDDB) is a repository of information on sightings and collections of rare, threatened, or endangered plant and animal species within California. It is maintained by CDFG. CNDDB reports occurrences of special-status species that have been entered into the database and does not generally include inventories of more common animals or plants. The absence of a species from the database does not necessarily mean that they do not occur in the area, only that no sightings have been reported. In addition, sightings are subject to observer judgment and may not be entirely reliable as a result.

included during project evaluation in order to comply with CEQA[2] and in consultation with state and federal resource agencies.

Special-status species of California include, but may not be limited to:

- Species listed or proposed for listing as threatened or endangered under the federal ESA.
- Species listed or proposed for listing as threatened or endangered under CESA.
- Species that are recognized as candidates for future listing by agencies with resource management responsibilities such as USFWS, NOAA's National Marine Fisheries Service (NOAA Fisheries), and CDFG.
- Species defined by CDFG as California Species of Special Concern.
- Species classified as Fully Protected by CDFG.
- Plant species, subspecies, and varieties defined as rare or threatened by the California Native Plant Protection Act (California Fish and Game Code §1900 et seq.).
- Plant species listed by the California Native Plant Society (CNPS) as List 1 and 2 and some List 3 plants under CEQA (CEQA Guidelines §15380).
- Species that otherwise meet the definition of rare, threatened, or endangered pursuant to §15380 of the CEQA Guidelines.

5.3 Protected Bird Species

Nesting native bird species are protected under both federal and state regulations. Under the federal Migratory Bird Treaty Act (MBTA), it is unlawful to take, kill, and/or possess migratory birds at any time or in any manner, unless the appropriate permits are obtained. Protections extend to active nests, eggs, and young birds still in the nest. Birds and their nests are also protected under the California Fish and Game Code (§3503 and §3503.5). Most bird species, with a few specific exceptions, are protected under the MBTA and California Fish and Game Code. Vegetation removal and/or construction activities in areas with suitable habitat during the breeding period, typically mid-March to mid-August in this region (RHJV 2004), could result in nest abandonment or loss of native nesting birds unless appropriate actions are taken (e.g., preconstruction surveys, monitoring, etc.) Heron and egret rookeries are also protected under the above-mentioned regulations. In addition, while not formally listed, CDFG considers rookeries to be a sensitive resource.

5.4 Special-status Plants

The background literature review identified the potential presence of a number of special-status plant species within the project area's region. Based on the suitability of

[2] Projects undertaken, funded, or requiring a permit by a state or local public agency must comply with CEQA. The primary purpose of CEQA is to inform decision makers and the public about the potential environmental impacts of the proposed activities.

habitat within the Preserve and surrounding areas and proximity of recorded sightings, these species were evaluated for potential occurrence within the site. For the special-status plant species that occur in habitat types found within the Preserve and/or have reported sightings within close proximity to the site, status and life history characteristics, and potential for occurrences within the project are described in the attached Table 1. A map showing CNDDB records of special-status plants and animals in the project vicinity is attached as Figure 2.

During the field survey, no special-status plant species were observed within the Preserve. Based on the background literature review and field survey, the following species were identified as having moderate potential for occurrence within the Preserve:

Franciscan thistle (*Cirsium andrewsii*)
Seaside tarplant (*Hemizonia congesta* ssp. *congesta*)
marsh microseris (*Microseris paludosa*)
San Francisco popcorn-flower (*Plagiobothrys diffuses*)
Oregon polemonium (*Polemonium carneum*)
San Francisco campion (*Silene verecunda* ssp. *verecunda*)

However, the field survey occurred within the blooming period for all of these species, and none were found. No species were identified as having high potential to occur on the Preserve.

Vegetation removal is planned only for habitats dominated by non-native invasive species, where special-status species are very unlikely to occur. No impacts to special-status plants are expected.

5.5 Special-status Animals

The background literature review identified the potential presence of a number of special-status or animal species of interest within the project area's region. Based on the suitability of habitat within the Preserve and surrounding areas and proximity of recorded sightings, these species were evaluated for potential occurrence within the area. For the animal species that occur in habitat types found within the Preserve and/or have reported sightings within close proximity to the site, status and life history characteristics and potential for occurrences within the Preserve are described in the attached Table 2. A map showing CNDDB records of special-status plants and animals in the project vicinity is attached as Figure 2.

A number of species reported on USFWS and CDFG species lists were excluded from the table or further discussion. They do not occur in habitat types found within the Preserve and/or have no local occurrences and are unlikely to occur on the Preserve.

These include marine invertebrates, reptiles (turtles), birds, and mammals (i.e., whales, seals, sea-lions, otters), coastal and estuarine birds, and coastal, estuarine, and freshwater fish.

During the field survey, no special-status animal species were observed within the Preserve. Based on the background literature review and field survey, the following species were identified as having and moderate to high potential for occurrence within the Preserve.

pallid bat (*Antrozous pallidus*)
great blue heron (*Ardea herodias*)
Townsend's big-eared bat (*Corynorhinus townsendii*)
monarch butterfly (*Danaus plexippus*)
western red bat (*Lasiurus blossevillii*)
hoary bat (*Lasiurus cinereus*)

Additional recommendations specific to these species are provided in the conclusions and recommendations below; also see Table 2.

Conclusions and General Recommendations

Based on the background search and field survey, the following biological resource impact determinations were made:

- The Preserve supports coast live oak woodland and patches of native coastal scrub.
- The Preserve supports habitat for a variety of common wildlife species (e.g., reptiles, amphibians, mammals).
- The Preserve supports breeding habitat for birds protected under the Migratory Bird Treaty Act and California Fish and Game Code.
- The Preserve supports potential roosting and foraging habitat for special-status and common bat species.
- The Preserve supports potential winter roosting habitat for monarch butterflies.

The following are general recommendations to protect biological resources during vegetation removal, invasive species control, and revegetation activities. Additional recommendations for native habitat restoration will be addressed in a separate document.

1. Native trees are particularly susceptible to disturbance, especially within the root crown (the base of the trunk) and root zone, commonly referred to as the

Root Protection Zone (RPZ; defined as 1.5 times the dripline radius measured from the trunk). The RPZ also extends approximately 3 feet below the soil surface. When feasible, work within the RPZ should be limited.

2. No native tree removal has been proposed, but if any native trees are removed or damaged during vegetation management, restoration planting should include replacement at a ratio of 3:1 for all trees over 6 inches in diameter.

3. Plant material from other locations should not be disposed of at the Preserve. This will help avoid introducing additional invasive species to the site.

4. Areas of ground disturbance should be replanted as soon as possible with native vegetation and should be monitored for invasive species infestation. When feasible, hand labor or mechanical methods should be used to control exotic and unwanted vegetation. The use of chemical agents should be avoided whenever possible. The use of pesticides and herbicides should be limited to prevent runoff into adjacent aquatic and terrestrial habitats. However, broom, cotoneaster, Himalayan blackberry, English ivy, and cape ivy are all likely to resprout vigorously if only cut above ground. Removal of roots and/or treatment with herbicides will be needed to provide effective control of these plants.

5. There is some evidence that eucalyptus may have allelopathic properties that suppress other plant growth. If eucalyptus chippings are kept on site, they should be distributed in areas where oak regeneration is not desired and replanting is not planned. For instance, the chips may be suitable for pathways.

6. Existing snags (i.e., dead or dying trees) should be left in place as these provide important habitat for wildlife. Large trees with extensive canopy should also be maintained, as feasible, to preserve existing cover and habitat.

7. To avoid potential losses to breeding birds, vegetation pruning and removal activities should occur in the nonbreeding season (i.e., these activities should occur between August 15 and March 15). If vegetation removal must occur within the breeding season, but begins begin prior to the start of the breeding season, preconstruction breeding bird surveys will not be necessary.

   If vegetation management must begin after March 15, the work area should be surveyed by a qualified biologist to determine if active nests are present. If, during breeding season, the construction site is left unattended for more than one week, a survey should be completed to determine if birds have moved back into the area and are occupying active nests. If active nests or behavior indicative of nesting is encountered, those areas plus a 50-foot buffer area for

small songbirds and 200 feet for larger species (e.g., raptors, owls, etc.) should be designated by the biologist and avoided until the nests have been vacated.

8. If work must occur in non-native forest during the monarch butterfly's winter roosting season (fall through spring), the Preserve should be surveyed prior to vegetation removal. If monarchs are found to be using the Preserve, appropriate buffers should be established to minimize disturbance.

9. To avoid impacts on special-status and common bat species, vegetation management should be limited to daylight hours to prevent interference with foraging abilities. Prior to tree removal, a qualified biologist should survey for roosting bats or evidence of their presence. If occupied roosts are identified, removal of the roost trees should not occur until the roost is unoccupied.

10. Before any construction begins, a qualified biologist should conduct a training session for all construction crew personnel. The training should include a discussion of the sensitive biological resources within the Preserve and the potential presence of special-status species. This should include a discussion of special-status species' habitats, protection measures to ensure species are not impacted by project activities, project boundaries, and biological conditions outlined in the project permits.

11. Proper erosion control and other water quality Best Management Practices (BMPs) should be implemented to avoid sedimentation and disturbance to downstream habitats.

12. All staging, maintenance, fueling, and storage of construction equipment should be conducted in a location and manner that will prevent potential runoff of petroleum products. Oil-absorbent and spill-containment materials should be on site at all times.

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Table 1. Special-Status Plant Species Considered in the Evaluation of the Project Based on the Background Literature Review and Field Surveys

Scientific Name	Common Name	Listing Status (Federal/State/ CNPS)*	Life Form, Blooming Period, and General Habitat	Potential for Occurrence within the Project Site
Arctostaphylos franciscana	Franciscan manzanita	--/--/List 1B.1	Perennial evergreen shrub. Blooms February-April. Chaparral (serpentinite). 60-300 m.	**Low.** Occurrence documented within 5 miles. No serpentine observed on site. No manzanita species observed.
Arctostaphylos montana ssp. montana	Mt. Tamalpais manzanita	--/--/List 1B.3	Perennial evergreen shrub. Blooms February-April. Rocky, serpentinite chaparral or grassland. 160-760 m.	**Low.** Occurrence documented within 5 miles. No serpentine observed on site. No manzanita species observed.
Arctostaphylos montana ssp. ravenii (= A. hookeri ravenii)	Presidio manzanita	FE/CE/List 1B.1	Perennial evergreen shrub. Blooms February-March. Serpentinite outcrops in chaparral, coastal prairie, coastal scrub. 45-215 m.	**Low.** Occurrence documented within 5 miles. No serpentine observed on site. No manzanita species observed.
Calochortus tiburonensis	Tiburon mariposa-lily	FT/CT/List 1B.1	Perennial bulbiferous herb. Blooms March-June. Serpentinite grassland. 50-150 m.	**Low.** Occurrence documented within 5 miles. No serpentine observed on site. Species not observed.
Castilleja affinis ssp. neglecta	Tiburon paintbrush	FE/ST/List 1B.2	Perennial herb (hemiparasitic). Blooms April-June. Serpentinite grassland. 60-400 m.	**Low.** Occurrence documented within 5 miles. No serpentine observed on site. Species not observed.
Chloropyron maritimum ssp. palustre	Point Reyes bird's beak	--/--/List 1B.2	Annual herb, hemiparasitic. Blooms June-October. Coastal salt marsh. Usually in coastal salt marsh with Salicornia, Distichlis, Jaumea, Spartina, etc. 0-15 m.	**Not present.** Occurrence documented within 1 mile, but no suitable habitat present on site. Species not observed.
Cirsium andrewsii	Franciscan thistle	--/--/List 1B.2	Perennial herb. Blooms March-July. Broadleafed upland forest, coastal bluff scrub, coastal prairie, mesic coastal scrub, sometimes serpentinite. 0-150 m.	**Moderate.** Occurrence documented within 1 mile, in GGNRA along north-facing seep. Potentially suitable habitat present. Species not observed.
Clarkia franciscana	Presidio clarkia	FE/CE/List 1B.1	Annual herb. Blooms May-July. Serpentine outcrops in grassland and coastal scrub. 25-335 m.	**Low.** Occurrence documented within 5 miles. No serpentine observed on site. Species not observed.
Collinsia multicolor	San Francisco collinsia	--/--/List 1B.2	Annual herb. Blooms March-May. Closed-cone coniferous forest, coastal scrub, sometimes serpentinite or decomposed shale. 30-250 m.	**Low.** Only one occurrence documented in Marin County, on Angel Island; occurrence information non-specific and undated. No serpentine or decomposed shale observed. Survey occurred outside of blooming period.
Eriogonum luteolum var. caninum	Tiburon buckwheat	--/--/List 1B.2	Annual herb. Blooms May-September. Serpentinite, sandy to gravelly locations in chaparral, woodland, coastal prairie, and grassland. 0-700 m.	**Low.** Occurrence documented within 5 miles. No serpentine observed on site. Species not observed.
Gilia capitata ssp. chamissonis	blue coast gilia	--/--/List 1B.1	Annual herb. Blooms April-July. Coastal dunes, coastal scrub. 2-200 m.	**Low.** Occurrence documented within 5 miles. No sandy habitat present. Species not observed.

Table 1. Special-Status Plant Species Considered in the Evaluation of the Project Based on the Background Literature Review and Field Surveys

Scientific Name	Common Name	Listing Status (Federal/State/ CNPS)*	Life Form, Blooming Period, and General Habitat	Potential for Occurrence within the Project Site
Grindelia hirsutula var. maritima	San Francisco gumplant	--/--/List 1B.2	Perennial herb. Blooms June-September. Sandy or serpentinite locations in coastal bluff scrub, coastal scrub, and grassland. 15-400 m.	**Low.** Occurrence documented within 5 miles. No sandy or serpentinite locations observed. Species not observed.
Helianthella castanea	Helianthella castanea	--/--/List 1B.2	Perennial herb. Blooms March-June. Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland.	**Low.** One historic (1938) occurrence documented within 5 miles. No other occurrences recorded in Marin County. Potentially suitable habitat present. Species not observed.
Hemizonia congesta ssp. congesta	Seaside tarplant	--/--/List 1B.2	Annual herb. Blooms April-November. Valley and foothill grassland, sometimes roadsides. 20-560 m.	**Moderate.** Occurrence documented within 5 miles. Potentially suitable habitat present. Species not observed.
Hesperolinon congestum	Marin western flax	FT/CT/List 1B.1	Annual herb. Blooms April-July. Serpentinite chaparral and grassland. 5-370 m.	**Low.** Occurrence documented within 5 miles. No serpentine observed on site. Species not observed.
Horkelia cuneata ssp. sericea	Kellogg's horkelia	--/--/1B.1	Perennial herb. Blooms April-September. Sandy or gravelly openings in closed-cone coniferous foerst, maritime chaparral, coastal dunes, and coastal scrub. 10-200 m.	**Low.** Occurrence documented within 5 miles. Only marginally suitable habitat present. Species not observed.
Microseris paludosa	marsh microseris	--/--/List 1B.2	Perennial herb. Blooms April-June (rarely July). Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. 5-300 m.	**Moderate.** Three occurrences documented within 5 miles, but these are all historic and/or extirpated. Potentially suitable habitat present. Species not observed.
Pentachaeta bellidiflora	white-rayed pentachaeta	FE/SE/List 1B.1	Annual herb. Blooms March-May. Woodland, grassland (often serpentinite). 35-620 m.	**Low.** No serpentine observed on site. Extirpated occurrence documented within 1 mile. Survey occurred outside of blooming period.
Plagiobothrys diffusus	San Francisco popcorn-flower	--/SE/List 1B.1	Annual herb. Blooms March-June. Coastal prairie, grassland. 60-360 m.	**Moderate.** Historic occurrence documented within 5 miles. Potentially suitable habitat present. Species not observed.
Plagiobothrys glaber	hairless popcorn-flower	--/--/List 1A	Annual herb. Blooms March-May. Coastal salt marshes and alkaline meadows. Presumed extinct in California. 5-180M.	**Not present.** Historic (1924) occurrence documented within 1 mile, but no suitable habitat present on site. Species not observed.
Polemonium carneum	Oregon polemonium	--/--/List 2.2	Perennial herb. Blooms April-September. Coastal prairie, coastal scrub, lower montane coniferous forest. 0-1830 m.	**Moderate.** Historic occurrence documented within 1 mile. Potentially suitable habitat present. Species not observed.
Quercus parvula var. tamalpaisensis	Tamalpais oak	--/--/List 1B.3	Perennial evergreen shrub. Blooms March-April. Lower montane coniferous forest. 100-750 m.	**Low.** Occurrence documented within 5 miles. Only marginally suitable habitat present. Species not observed.

Table 1. Special-Status Plant Species Considered in the Evaluation of the Project Based on the Background Literature Review and Field Surveys

Scientific Name	Common Name	Listing Status (Federal/State/ CNPS)*	Life Form, Blooming Period, and General Habitat	Potential for Occurrence within the Project Site
Silene verecunda ssp. verecunda	San Francisco campion	--/--/List 1B.2	Perennial herb. Blooms March-August. Sandy coastal bluff scrub, chaparral, coastal prairie, coastal scrub, grassland. Often on mudstone or shale, sometimes serpentine. 30-645 m.	**Moderate.** Occurrence documented within 5 miles. Potentially suitable habitat present. Species not observed.
Stebbinsoseris decipiens	Santa Cruz microseris	--/--/List 1B.2	Annual herb. Blooms April-May. Open areas in loose or disturbed soil, sometimes serpentinite, in broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, and grassland. 10-500 m.	**Low.** Historic (1968) occurrence documented within 5 miles, on Angel Island. Only marginally suitable habitat present. Species not observed. Survey occurred outside of blooming period.
Streptanthus glandulosus var. hoffmanii	Hoffman's bristly jewel-flower	--/--/List 1B.3	Annual herb. Blooms March-July. Shallow, rocky serpentine slopes in chaparral, cismontane woodland, and valley and foothill grassland. 120-475 m.	**Low.** Occurrence documented within 5 miles. No serpentine observed. Species not observed.
Trifolium amoenum	showy rancheria clover	FE/--/List 1B.1	Annual herb. Blooms April-June. Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite). Open, sunny sites, swales. 5-415 m.	**Low.** Occurrence documented within 5 miles. Only marginally suitable habitat present. Species not observed.
Triphysaria floribunda	San Francisco owl's-clover	--/--/List 1B.2	Annual herb. Blooms April-June. Coastal prairie, coastal scrub, valley and foothill grassland (usually serpentinite). 10-160 m.	**Low.** Occurrence documented within 5 miles. No serpentine observed on site. Species not observed.

STATUS CODES:

FEDERAL:
FE = Listed as endangered (in danger of extinction) by the federal government
FT = Listed as threatened (likely to become endangered within the foreseeable future) by the federal government

STATE OF CALIFORNIA:
SE = Listed as endangered by the State of California
ST = Listed as threatened by the State of California
SR = Listed as rare by the State of California

CNPS (California Native Plant Society):
1A – Believed to be extirpated.
1B – CNPS listed as rare or endangered in California (CA) and elsewhere.
1B.1 = Seriously endangered in CA; 1B.2 = Fairly endangered in CA; 1B.3 = Not very endangered in CA
2 – CNPS listed as rare or endangered in CA, more common elsewhere.
2.1 = Seriously endangered in CA; 2.2 = Fairly endangered in CA; 2.3 = Not very endangered in CA
3 – CNPS listed plants for which we need more information.
3.1 = Seriously endangered in CA; 3.2 = Fairly endangered in CA; 3.3 = Not very endangered in CA

Table 2. Special-status Animal Species Identified within the Region Based on the Background Literature Review

Common Name	Scientific Name	Listing Status* (Federal/ State)	Description	Potential for Occurrence* within the Project Site and Local Observations
Invertebrates				
San Bruno elfin butterfly	*Callophrys mossii bayensis*	FE/--	Coastal, mountainous areas with grassy ground cover. All known locations restricted to San Mateo County. Host plant is Pacific sedum (*Sedum spathulifolium*). Adult flight season is late February to mid-April.	**Not present.** Suitable habitat is not present within the preserve. No local, recent observations are reported.
sandy beach tiger beetle	*Cicindela hirticollis gravida*	--/--	Occupies beach habitats along non-brackish water from San Francisco Bay to northern Mexico. Prefers clean dry sand. Larvae typically found below ground and in moist sands protected by wave action.	**Not present.** Suitable habitat is not present within the preserve. No local, recent observations are reported.
monarch butterfly	*Danaus plexippus*	--/--	Winters in coastal California where it utilizes wind-protected tree groves (e.g., eucalyptus, Monterey pine and cypress) along the coast. Roosts site typically located close to nectar and water sources.	**High.** Suitable habitat is present within the existing eucalyptus stands on the preserve. Wintering monarchs are reported approximately 2.0 miles to the west and south of the preserve.
bumblebee scarab beetle	*Lichnanthe ursina*	--/--	Coastal sand dunes from Sonoma County south to San Mateo County. Typically flies near the crest of sand dunes near the surface.	**Not present.** Suitable habitat is not present within the preserve. No local, recent observations are reported.
mission blue butterfly	*Plebejus icarioides missionensis*	FE/--	Occurs in coastal chaparral and coastal grasslands. Known from Fort Baker, Marin County, San Bruno Mountain, San Mateo County, and Twin Peaks in San Francisco; however, this population may be extirpated. Larvae feed on lupine *(Lupinus* sp.) where eggs are laid. Adults feed on additonal species. Adult flight season from late March to early July.	**Not present.** Suitable habitat with associated host plants is not present within the preserve. The nearest reported occurrence for this species is at Fort Baker; however, there are no local, recent observations near the preserve.
robust walker	*Pomatiopsis binneyi*	--/--	Found in freshwater habitats. Known from a collection in meadow springs. No published information of life history or behavior.	**Low.** Marginally suitable habitat is present within the preserve. No local, recent observations are reported. This species is not formally listed and little information is available on its local distribution.
callippe silverspot butterfly	*Speyeria callippe callippe*	FE/--	Historically, occupied grassland habitats in seven counties surrounding the San Francisco Bay. Now known from only five locations. Larvae feed on Johnny jump-up (*Viola pedunculata*) where eggs are laid. Adult flight season from mid-May to mid-July. Adults known to feed on flowers of a number of species. Hilltops and ridges are important breeding grounds.	**Not present.** Suitable habitat with associated host plants is not present within the preserve. The nearest reported occurrence for this species is approximately 8 miles to the south of the preserve.

Table 2. Special-status Animal Species Identified within the Region Based on the Background Literature Review

Common Name	Scientific Name	Listing Status* (Federal/ State)	Description	Potential for Occurrence* within the Project Site and Local Observations
Marin hesperian	*Vespericola marinensis*	--/--	Moist coastal spots in coastal brush and chaparral vegetation in Marin County. Microhabitat includes seeps, leaf mold along streams, and alder and mixed evergreen forests.	Low. Marginally suitable habitat is present within the preserve. An undated, non-specific historic occurrence is documented in the Sausalito area, but no local, recent observations are reported. This species is not formally listed and little information is available on its local distribution.
Amphibians				
California red-legged frog	*Rana aurora draytonii*	FT/SSC	Marshes, streams, lakes, reservoirs, ponds, and other water sources with plant cover. Breeding occurs in deep, slow-moving waters with dense, shrubby, or emergent vegetation. Breeds from January through April, exact timing dependent on location. Eggs hatch after 6 to 14 days and attain metamorphosis after 4 to 5 months.	**Not present.** Suitable habitat is not present within the preserve. The preserve is not adjacent to any areas with suitable breeding habitat; it is bordered by upland forest, residential development, and Highway 101. The nearest observation of this species is approximately 3.4 miles from the preserve.
foothill yellow-legged frog	*Rana boylii*	--/SSC	In or near partly shaded rocky streams that are shallow, slow, and moderately size from sea level to 6,300 feet. Breeding occurs from spring to early summer after high flows have receded. Eggs are laid at downstream end of rocks. Tadpoles require 3 to 4 months to attain metamorphosis. During all season, never found far from water.	**Not present.** Suitable habitat is not present within the preserve. Preserve lacks perennial stream channels capable of supporting this species. In addition, no local, recent observations are reported.
Reptiles				
western pond turtle	*Emys marmorata*	--/SSC	The only native turtle in the North Bay region. Size varies from 3.5 to 7.5 inches. Found in or near permanent or semi-permanent water sources (e.g., ponds, lakes, rivers, streams) with suitable basking sites and underwater retreats. Eggs are laid in shallow holes dug by the female from April through August. Eggs hatch in late summer or fall. In northern California, hatchlings remain buried until the following spring.	**Not present.** Suitable habitat is not present within the preserve. Preserve lacks perennial or intermittent water sources capable of supporting this species. In addition, no local, recent observations are reported.

Table 2. Special-status Animal Species Identified within the Region Based on the Background Literature Review

Common Name	Scientific Name	Listing Status* (Federal/ State)	Description	Potential for Occurrence* within the Project Site and Local Observations
Birds				
great blue heron	*Ardea herodias*	--/--	Great blue herons feed primarily in saline and freshwater habitats. Their diet is comprised primarily of fish, but they will also take smaller animals. Colonial nests are built in large trees or snags, often in association with great egrets. For herons and egrets, pre-laying and courtship can begin as early as January to March with the nesting season extending into June to August or later (Kelly, et al., 2006). Year-round resident in Sonoma County.	**High.** Suitable breeding habitat is present within the preserve. Herons have a strong affinity for establishing rookeries in eucalyptus trees. The nearest reported rookery is on De Silva Island approximately 2 miles from the preserve.
San Pablo song sparrow	*Melospiza melodia samuelis*	--/SSC	The song sparrow is a widespread, permanent resident songbird of Sonoma County. There are two subspecies within the County, one of which occurs in the saltwater marshes around San Pablo Bay and northern San Francisco Bay. This species breeds from March to July in wetland gum plants (*Grindelia* ssp.).	**Not present.** Suitable habitat is not present within the preserve. Preserve lacks marsh habitats capable of supporting this species. However, preserve may support unlisted, subspecies found in upland shrubby habitats
bank swallow	*Riparia riparia*	--/ST	Nests on earthen banks and bluffs, especially along riverbanks. Forages over a variety of habitats. There are no recently reported breeding occurrences of bank swallow in Marin County.	**Low.** Suitable breeding habitat is not present within the preserve. Preserve lacks riverbanks and bluffs capable of supporting nesting birds. Bank swallows may forage over the site on occasion.
Mammals				
pallid bat	*Antrozous pallidus*	--/SSC	Grassland, shrubland, forest, and woodland habitats at low elevations up through mixed coniferous forests. A social species forming small colonies. Roosting sites include caves, mines, crevices, buildings, and hollow trees during day, more open sites used at night. At low elevations, locally common in California.	**Moderate.** Suitable habitat present within the preserve. Bats may utilize the area for foraging and larger trees for roosting. No local, recent observations are reported.
Townsend's big-eared bat	*Corynorhinus townsendii*	--/SSC	Low to mid-elevation mesic habitats including riparian, mixed forest, coniferous forest, prairies, and agricultural lands. Utilizes edge habitat for foraging. Roosting sites include caves, mines, tunnels, buildings, and other man-made structures. Occurs throughout California but distribution not well known.	**Moderate.** Suitable habitat present within the preserve. Bats may utilize the area for foraging and larger trees for roosting. No local, recent observations are reported. Townsend's big-eared bats are reported within 4 miles of the preserve on Angel Island.
western red bat	*Lasiurus blossevillii*	--/SSC	Forages over grasslands, shrublands, open woodlands, and agricultural areas. Roosts in forests and woodlands from low elevations up through mixed coniferous forests. Winters in lowlands and coast areas. Largely solitary. Feeds on moths, crickets, beetles, and cicades.	**Moderate.** Suitable habitat present within the preserve. Bats may utilize the area for foraging and larger trees for roosting. No local, recent observations are reported.

Table 2. Special-status Animal Species Identified within the Region Based on the Background Literature Review

Common Name	Scientific Name	Listing Status* (Federal/ State)	Description	Potential for Occurrence* within the Project Site and Local Observations
hoary bat	*Lasiurus cinereus*	--/--	Occurs in open habitat or habitat mosaics. Requires medium to large trees for cover and habitat edges and/or open areas for foraging habitat. Tend to be solitary roosting in trees and foliage. Widespread in California except patchy in desert regions.	**Moderate.** Suitable habitat present within the preserve. Bats may utilize the area for foraging and larger trees for roosting. No local, recent observations are reported.

***Listing Status Codes:**

Federal:

FE = Listed as endangered (in danger of extinction) by the federal government.

FT = Listed as threatened (likely to become endangered within the foreseeable future) by the federal government.

Candidate = Candidate for listing as threatened or endangered by the federal government.

State of California (State):

SE = Listed as endangered by the State of California.

ST = Listed as threatened by the State of California.

SSC = California Species of Special Concern.

FP = Fully protected.

WL = Watch list.

Species Presence Definitions:

Not Present – Suitable habitat is not present within the project area and/or project area is outside the range of the species.

Unknown – Further information is needed to determine potential for species occurrence within the project area.

Low – One or more key habitat components is absent from the project area. Species is unlikely to occur within the project area.

Moderate – Some of the habitat components required by this species are present within the project area and/or marginally suitable habitat is present within surrounding areas. Species may occur within the project area.

High – All of the habitat components required by this species are present within the project area and/or it is known to occur in surrounding areas. Species is likely to occur within the project area.

Present – Species has reported occurrences within the project area and/or was observed on the project site during field surveys.

Table 3. Plants Observed, Cypress Ridge Open Space Preserve
June 8, 2011

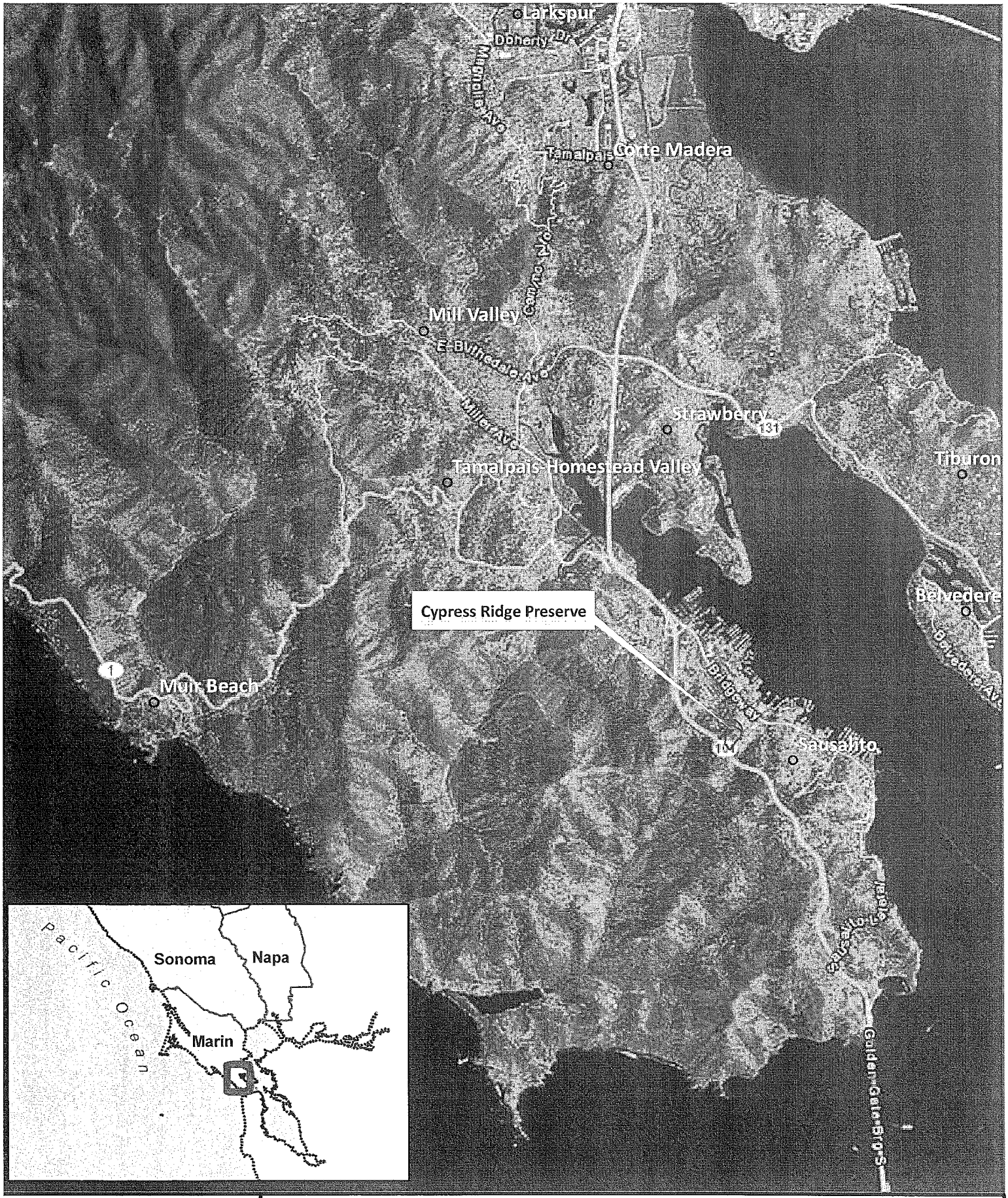
Latin Name	Common Name	Native (N) or Introduced (I)
Allium triquetrum	three cornered leek	I
Anagallis arvensis	scarlet pimpernel	I
Anaphalis margaritacea	pearly everlasting	N
Artemisia californica	coastal sagebrush	N
Artemisia douglasiana	mugwort	N
Avena fatua	wild oat	I
Baccharis pilularis	coyote brush	N
Bellardia trixago	Mediterranean lineseed	I
Brachypodium distachyon	false brome	I
Brassic nigra	black mustard	I
Briza maxima	rattlesnake grass	I
Bromus diandrus	ripgut brome	I
Bromus hordeaceus	soft chess brome	I
Calystegia purpurata ssp. purpurata	Pacific false bindweed	N
Carduus pycnocephalus	Italian thistle	I
Chlorogalum pomeridianum var. pomeridianum	soap plant	N
Claytonia perfoliata	miner's lettuce	N
Conium maculatum	poison hemlock	I
*Cortaderia sp.**	pampas grass	I
*Cotoneaster pannosa**	cotoneaster	I
Cupressus macrocarpa	Monterey cypress	I
*Cytisus scoparius**	Scotch broom	I
Dactylis glomerata	orchard grass	I
Danthonia californica	California oat grass	N
*Delairea odorata**	Cape ivy	I
Dryopteris arguta	wood fern	N
Dudleya farinosa	sea lettuce	N
Echium candicans	pride of Madeira	I
Ehrharta erecta	upright veldt grass	I
Eucalyptus globulus	blue gum	I
*Foeniculum vulgare**	fennel	I
Galium aparine	cleavers	N
Gastridium ventricosum	nit grass	I
*Genista monspessulana**	French broom	I
Geranium molle	crane's-bill geranium	I
Gnaphalium sp.	cudweed	N
Heteromeles arbutifolia	toyon	N
Holodiscus discolor	oceanspray	N
Hordeum brachyantherum	meadow barley	N
Hordeum marinum ssp. gussoneanum	Mediterranean barley	I
Iris sp.	native iris	N
Juncus bufonius var. bufonius	toad rush	N
Lactuca serriola	prickly lettuce	I
Layia platyglossa	tidy tips	N
Linum bienne	narrowleaf flax	I
Logfia gallica (prev. Filago gallica)	narrowleaf cottonrose	I
Lolium multiflorum	annual ryegrass	I
Lonicera hispidula var. vacillans	honeysuckle	N
Lythrum hyssopifolium	hyssop loosestrife	I

* Indicates invasive species of high concern

Table 3. Plants Observed, Cypress Ridge Open Space Preserve
June 8, 2011

Latin Name	Common Name	Native (N) or Introduced (I)
Marah fabaceus	wild cucumber	N
Medicago polymorpha	burclover	I
Mimulus aurantiacus	sticky monkeyflower	N
Nassella pulchra	purple needle grass	N
*Phalaris aquatica**	Harding grass	I
Picris echioides	bristly ox-tongue	I
Plantago lanceolata	English plantain	I
Poa annua	annual bluegrass	I
Polypogon monspeliensis	annual rabbitsfoot grass	I
Polystichum munitum	western sword fern	N
Prunus sp.	ornamental plum	I
Quercus agrifolia	coast live oak	N
Rubus ursinus	California blackberry	N
Rumex sp.	dock	
Salix sp.	willow	N
Scrophularia californica	bee plant	N
Stachys ajugoides var. rigida	rigid hedge nettle	N
Symphoricarpos albus	snowberry	N
Tellima grandiflora	fringe cups	N
Toxicodendron diversilobum	western poison oak	N
Trifolium dubium	little hop clover	I
Trifolium hirtum	rose clover	I
Trifolium incarnatum	crimson clover	I
Trifolium tomentosum	woolly clover	I
Tritelaiea laxa	Ithuriel's spear	N
Umbellularia californica	California bay	N
Vicia benghalensis	purple vetch	I
Vicia sativa	spring vetch	I
*Vinca major**	periwinkle	I
Vulpia bromoides	brome fescue	I
Wyethia angustifolia	narrow leaf mule ears	N

* Indicates invasive species of high concern



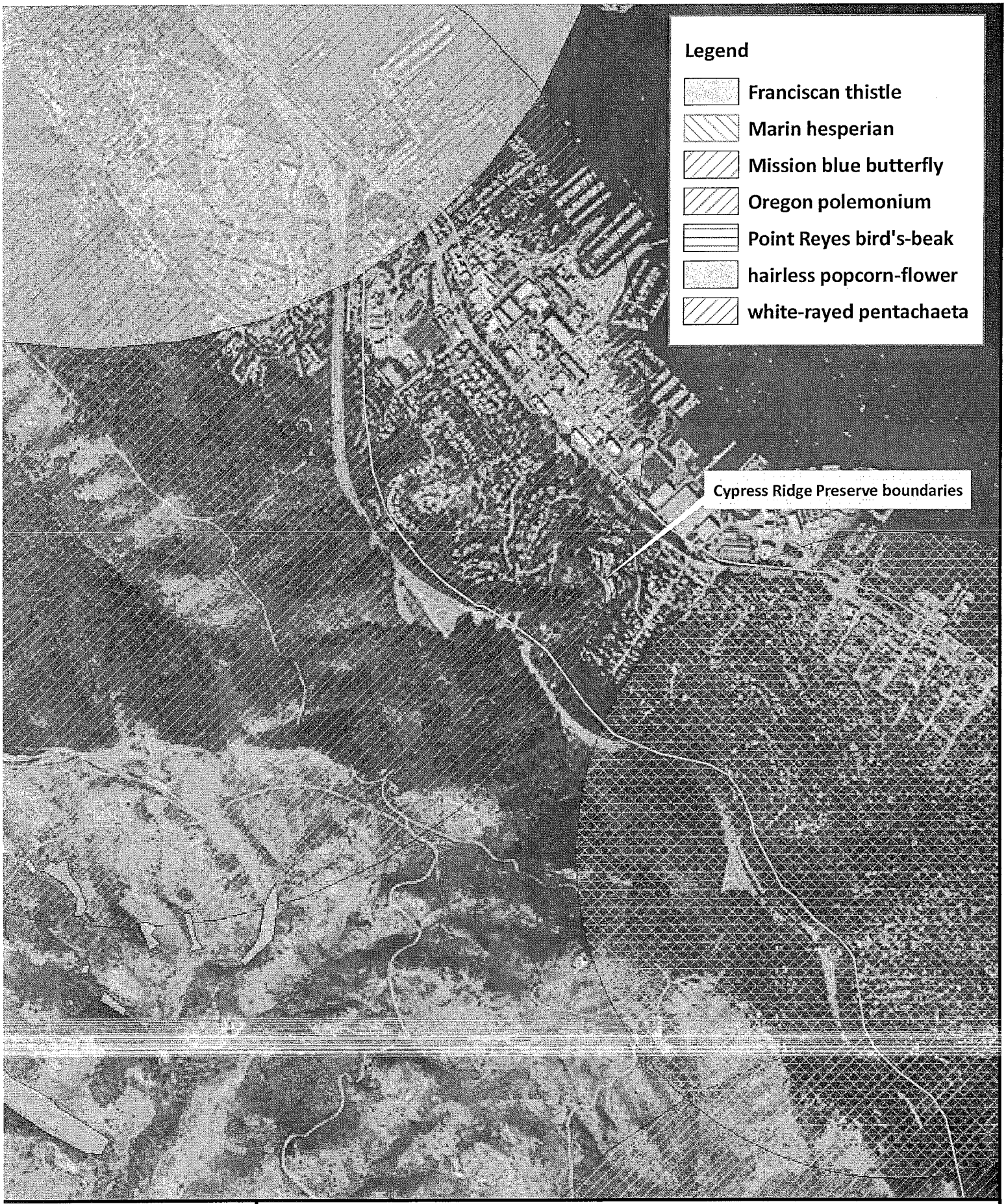
PRUNUSKE CHATHAM, INC.

Date Created: June 24, 2011
Created By: Joan Schwan

Figure 1. Project Location Map
Cypress Ridge Preserve, Sausalito, CA

Scale: 0 0.5 1 2 Miles

46
31



PRUNUSKE CHATHAM, INC.

Date Created: June 24, 2011
Created By: Joan Schwan

Figure 2. CNDDB Records of Special-Status Species in the Project Vicinity

Scale: 0 0.125 0.25 0.5 Miles

4b
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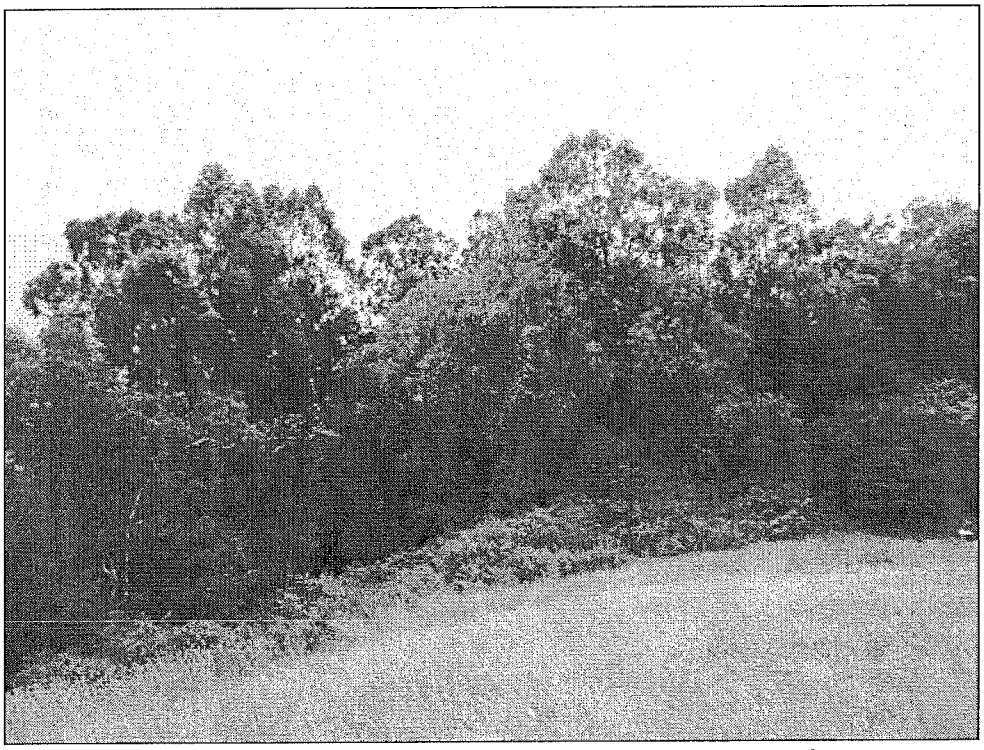
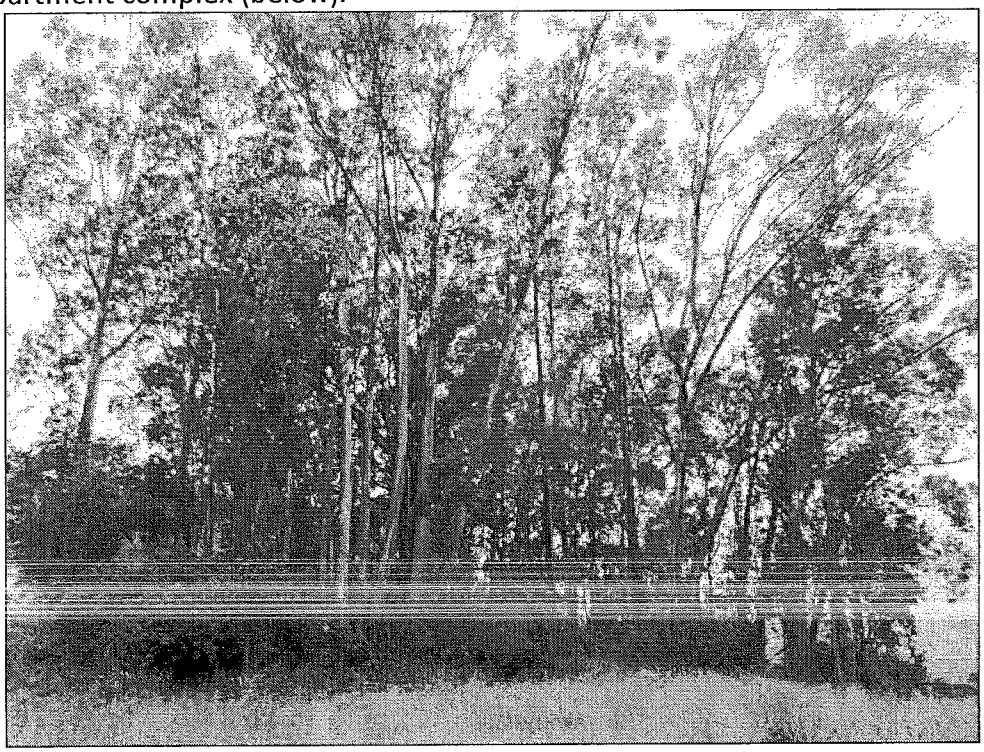
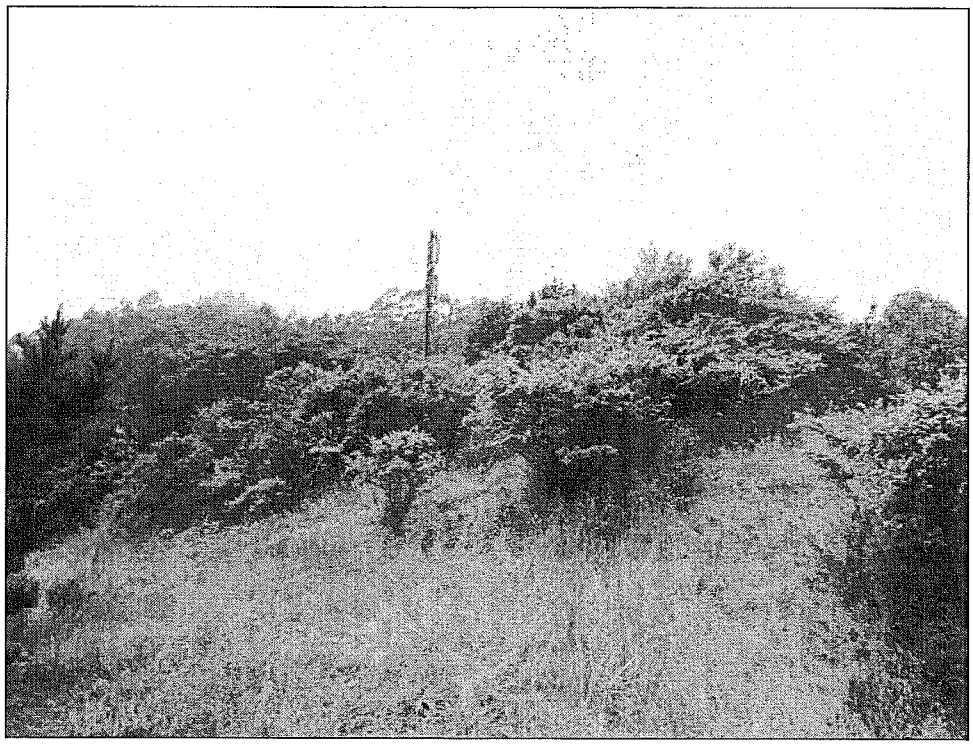
Project Photographs

Two views of large eucalyptus grove at main entrance to the Preserve (above and below). Debris box for storage of street-sweeper debris is also visible.

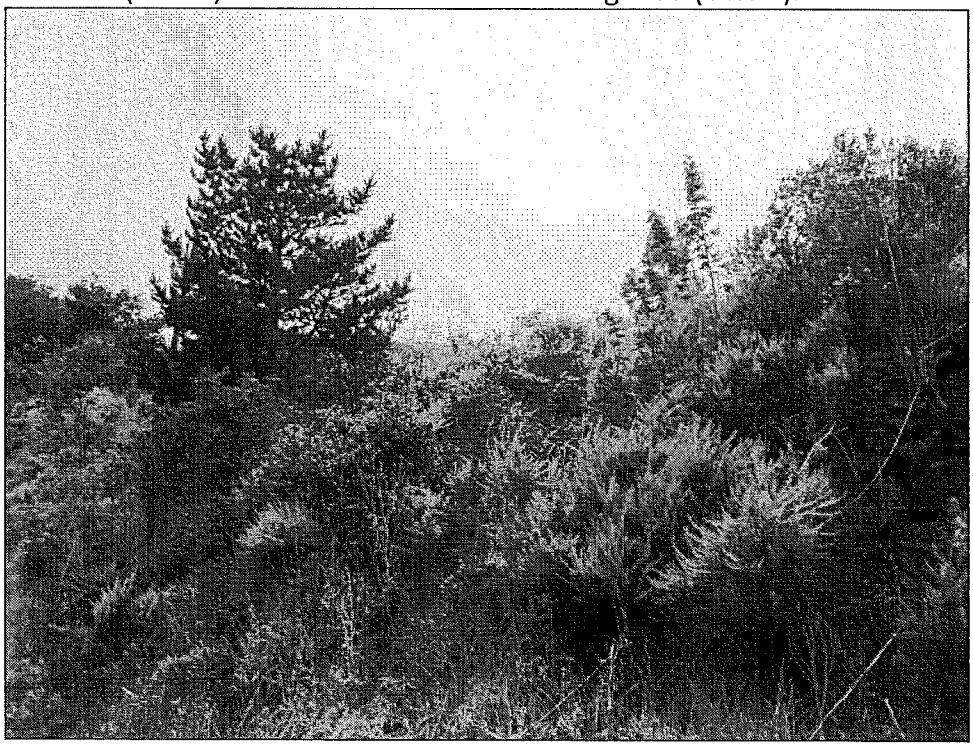


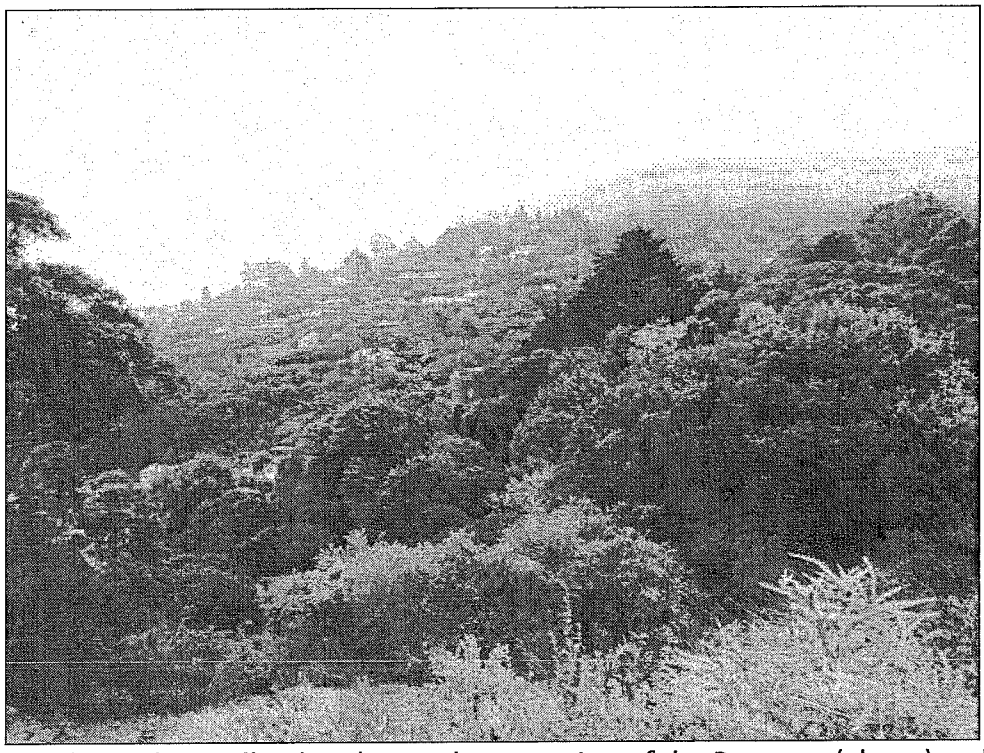
View of large central eucalyptus grove (above) and smaller eucalyptus grove near apartment complex (below).



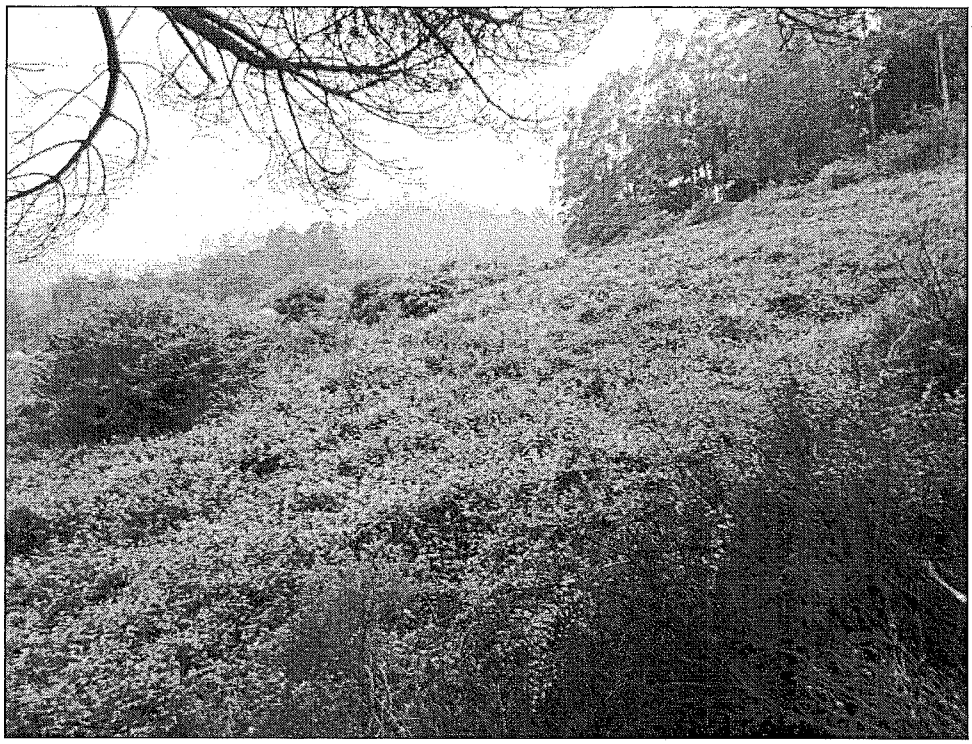


Hillside dominated by cotoneaster and remnant native coastal scrub near existing cell tower (above) and native coastal scrub along road (below).





Coast live oak woodland in the southern portion of the Preserve (above) and close-up view of woodland with Monterey cypress and broom present (below).



Dense Himalayan blackberry infestation in eastern part of the Preserve (above) and cape ivy infestation under a canopy of eucalyptus trees (below).

	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1	A leaf-cutter bee *Trachusa gummifera*	IIHYM80010			G1	S1	
2	American badger *Taxidea taxus*	AMAJF04010			G5	S4	SC
3	Angel Island mole *Scapanus latimanus insularis*	AMABB02032			G5T1	S1	
4	Bay checkerspot butterfly *Euphydryas editha bayensis*	IILEPK4055	Threatened		G5T1	S1	
5	California black rail *Laterallus jamaicensis coturniculus*	ABNME03041		Threatened	G4T1	S1	
6	California red-legged frog *Rana draytonii*	AAABH01022	Threatened		G4T2T3	S2S3	SC
7	Choris' popcorn-flower *Plagiobothrys chorisianus var. chorisianus*	PDBOR0V061			G3T2Q	S2.2	1B.2
8	Franciscan manzanita *Arctostaphylos franciscana*	PDERI040J3			G1	S1	1B.1
9	Franciscan thistle *Cirsium andrewsii*	PDAST2E050			G2	S2.2	1B.2
10	Kellogg's horkelia *Horkelia cuneata ssp. sericea*	PDROS0W043			G4T1	S1.1	1B.1
11	Marin hesperian *Vespericola marinensis*	IMGASA4140			G2G3	S2S3	
12	Marin western flax *Hesperolinon congestum*	PDLIN01060	Threatened	Threatened	G2	S2.1	1B.1
13	Mission blue butterfly *Plebejus icarioides missionensis*	IILEPG801A	Endangered		G5T1	S1	
14	Oregon polemonium *Polemonium carneum*	PDPLM0E050			G4	S1	2.2
15	Point Reyes bird's-beak *Chloropyron maritimum ssp. palustre*	PDSCR0J0C3			G4?T2	S2.2	1B.2
16	Point Reyes jumping mouse *Zapus trinotatus orarius*	AMAFH01031			G5T1T3Q	S1S3	SC
17	Presidio clarkia *Clarkia franciscana*	PDONA050H0	Endangered	Endangered	G1	S1.1	1B.1
18	Presidio manzanita *Arctostaphylos montana ssp. ravenii*	PDERI040J2	Endangered	Endangered	G3T1	S1	1B.1
19	San Francisco Bay spineflower *Chorizanthe cuspidata var. cuspidata*	PDPGN04081			G2T2	S2.2	1B.2
20	San Francisco campion *Silene verecunda ssp. verecunda*	PDCAR0U213			G5T2	S2.2	1B.2
21	San Francisco collinsia *Collinsia multicolor*	PDSCR0H0B0			G2	S2.2	1B.2
22	San Francisco gumplant *Grindelia hirsutula var. maritima*	PDAST470D3			G5T2	S2.1	1B.2
23	San Francisco lessingia *Lessingia germanorum*	PDAST5S010	Endangered	Endangered	G1	S1.1	1B.1
24	San Francisco owl's-clover *Triphysaria floribunda*	PDSCR2T010			G2	S2.2	1B.2

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	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
25	San Francisco popcorn-flower *Plagiobothrys diffusus*	PDBOR0V080		Endangered	G1Q	S1.1	1B.1
26	San Pablo song sparrow *Melospiza melodia samuelis*	ABPBXA301W			G5T2?	S2?	SC
27	Santa Cruz microseris *Stebbinsoseris decipiens*	PDAST6E050			G2	S2.2	1B.2
28	Townsend's big-eared bat *Corynorhinus townsendii*	AMACC08010			G4	S2S3	SC
29	adobe sanicle *Sanicula maritima*	PDAPI1Z0D0		Rare	G2	S2.2	1B.1
30	alkali milk-vetch *Astragalus tener var. tener*	PDFAB0F8R1			G2T2	S2	1B.2
31	bank swallow *Riparia riparia*	ABPAU08010		Threatened	G5	S2S3	
32	beach layia *Layia carnosa*	PDAST5N010	Endangered	Endangered	G2	S2.1	1B.1
33	blue coast gilia *Gilia capitata ssp. chamissonis*	PDPLM040B3			G5T2	S2.1	1B.1
34	bristly sedge *Carex comosa*	PMCYP032Y0			G5	S2?	2.1
35	bumblebee scarab beetle *Lichnanthe ursina*	IICOL67020			G2	S2	
36	callippe silverspot butterfly *Speyeria callippe callippe*	IILEPJ6091	Endangered		G5T1	S1	
37	coastal triquetrella *Triquetrella californica*	NBMUS7S010			G1	S1	1B.2
38	dark-eyed gilia *Gilia millefoliata*	PDPLM04130			G2	S2.2	1B.2
39	double-crested cormorant *Phalacrocorax auritus*	ABNFD01020			G5	S3	
40	fragrant fritillary *Fritillaria liliacea*	PMLIL0V0C0			G2	S2.2	1B.2
41	hairless popcorn-flower *Plagiobothrys glaber*	PDBOR0V0B0			GH	SH	1A
42	hoary bat *Lasiurus cinereus*	AMACC05030			G5	S4?	
43	marsh microseris *Microseris paludosa*	PDAST6E0D0			G2	S2.2	1B.2
44	marsh sandwort *Arenaria paludicola*	PDCAR040L0	Endangered	Endangered	G1	S1	1B.1
45	monarch butterfly *Danaus plexippus*	IILEPP2010			G5	S3	
46	rose leptosiphon *Leptosiphon rosaceus*	PDPLM09180			G1	S1.1	1B.1
47	round-headed Chinese-houses *Collinsia corymbosa*	PDSCR0H060			G1	S1.2	1B.2
48	sandy beach tiger beetle *Cicindela hirticollis gravida*	IICOL02101			G5T2	S1	

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	Common Name/Scientific Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
49	seaside tarplant *Hemizonia congesta ssp. congesta*	PDAST4R065			G5T2T3	S2S3	1B.2
50	southern sea otter *Enhydra lutris nereis*	AMAJF09012	Threatened		G4T2	S2	
51	western pond turtle *Emys marmorata*	ARAAD02030			G3G4	S3	SC
52	western red bat *Lasiurus blossevillii*	AMACC05060			G5	S3?	SC
53	white-rayed pentachaeta *Pentachaeta bellidiflora*	PDAST6X030	Endangered	Endangered	G1	S1.1	1B.1

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U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office
Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 110615120222

Database Last Updated: April 29, 2010

Quad Lists

Listed Species

Invertebrates

Haliotes cracherodii
black abalone (E) (NMFS)

Haliotes sorenseni
white abalone (E) (NMFS)

Icaricia icarioides missionensis
mission blue butterfly (E)

Speyeria callippe callippe
callippe silverspot butterfly (E)

Fish

Acipenser medirostris
green sturgeon (T) (NMFS)

Eucyclogobius newberryi
tidewater goby (E)

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus kisutch
coho salmon - central CA coast (E) (NMFS)
Critical habitat, coho salmon - central CA coast (X) (NMFS)

Oncorhynchus mykiss
Central California Coastal steelhead (T) (NMFS)
Central Valley steelhead (T) (NMFS)
Critical habitat, Central California coastal steelhead (X) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Rana draytonii
California red-legged frog (T)

Birds

Charadrius alexandrinus nivosus

western snowy plover (T)

Diomedea albatrus
short-tailed albatross (E)

Pelecanus occidentalis californicus
California brown pelican (E)

Sternula antillarum (=Sterna, =albifrons) browni
California least tern (E)

Mammals

Arctocephalus townsendi
Guadalupe fur seal (T) (NMFS)

Balaenoptera borealis
sei whale (E) (NMFS)

Balaenoptera musculus
blue whale (E) (NMFS)

Balaenoptera physalus
finback (=fin) whale (E) (NMFS)

Enhydra lutris nereis
southern sea otter (T)

Eubalaena (=Balaena) glacialis
right whale (E) (NMFS)

Eumetopias jubatus
Critical Habitat, Steller (=northern) sea-lion (X) (NMFS)
Steller (=northern) sea-lion (T) (NMFS)

Physeter catodon (=macrocephalus)
sperm whale (E) (NMFS)

Reithrodontomys raviventris
salt marsh harvest mouse (E)

Plants

Arctostaphylos hookeri ssp. ravenii
Presidio (=Raven's) manzanita (E)

Clarkia franciscana
Presidio clarkia (E)

Hesperolinon congestum
Marin dwarf-flax (=western flax) (T)

Lessingia germanorum
San Francisco lessingia (E)

Quads Containing Listed, Proposed or Candidate Species:

SAN FRANCISCO NORTH (466C)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

Take may include significant habitat modification or degradation where it actually kills or

injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6520.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be September 13, 2011.

PRUNUSKE CHATHAM, INC.

Sausalito Cypress Ridge
Restoration Recommendations

August 23, 2011

Prepared by
Joan Schwan, M.S., Vegetation Ecologist

Background

Cypress Ridge Open Space Preserve (Preserve) is a 10-acre City of Sausalito property located east of the intersection of Highway 101 and Rodeo Avenue. Currently, the Preserve functions as undeveloped open space, with one utility road and several short informal trails providing access. A cell phone tower is located on the western portion of the site. The City also disposes of chipped vegetation and street sweeper debris on the Preserve. Vegetation on the Preserve includes non-native woodland intermingled with coast live oak woodland, coastal scrub, and grassland habitat. While much of the Preserve is dominated by invasive species, fragments of relatively diverse native oak woodland and coastal scrub remain on the site.

The City is planning fuel reduction measures and invasive plant removal on the Preserve based on the Vegetation Management Prescription prepared by Kent Julin, California Registered Professional Forester (Julin 2010), including:

- Cut all eucalyptus with a diameter at breast height of less than 10 inches, cover stumps with plastic sheeting to prevent resprouting, chip debris and leave on site;
- Cut all plum trees, remove chips off site, and cover stumps with plastic;
- Cut all pines and leave chips on site;
- Prune lower cypress branches to a height of 20 feet and leave chips on site;
- Cut all broom, cotoneaster, and Himalayan blackberry near ground level, dispose of off-site, and do follow-up treatment of resprouts or new seedlings;
- Clear all English and Cape ivy and dispose of off-site; and
- Chip all downed tree branches longer than 6 feet on site.

PCI developed a biological assessment of the Preserve to determine potential impacts of the proposed vegetation management on biological resources. Significant biological resources identified on the site include:

- coast live oak woodland and patches of native coastal scrub.
- habitat for a variety of common wildlife species (e.g., reptiles, amphibians, mammals).
- breeding habitat for birds protected under the Migratory Bird Treaty Act and California Fish and Game Code.

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- potential roosting and foraging habitat for special-status and common bat species.
- potential winter roosting habitat for monarch butterflies.

The City retained Prunuske Chatham, Inc. (PCI) to prepare native plant restoration recommendations for the site. This document provides general restoration guidelines, restoration areas and actions, restoration methods, schedule, and recommendation species for restoration plantings.

These restoration recommendations are designed to be compatible with fuel and fire hazard reduction on the Preserve. The level of fire hazard posed by any particular plant species varies widely with climate, habitat conditions, and maintenance methods. However, it is generally agreed that eucalyptus and nonnative brooms pose relatively high fire hazards; they burn readily, produce high fuel volumes, and shredding eucalyptus bark provides a "fuel ladder" into the canopy. According to FireSafe Marin (2011), of the dominant native plants on the Preserve, coyote brush and bay are also considered to be "fire prone." However, these species also serve important ecological functions. Coyote brush is a fast-growing shrub that can colonize disturbed areas and has potential to outcompete nonnative shrubs. Bay trees provide cover and food resources for many wildlife species, and protect soil from erosion. At Cypress Ridge, bays occur scattered within relatively moist habitats, with a relatively open understory; these habitat qualities may mitigate fire risk associated with this species.

The recommendations in this document focus on restoration of oak woodland habitat, the dominant native habitat currently (and probably historically) in this location, and a habitat type likely to pose lower fire hazards than the existing nonnative eucalyptus and broom-dominated habitats.

Restoration Guidelines
The extent of, timing of, and resources available for native plant restoration on the Preserve have not yet been determined. The following general principles will provide a basis for proceeding with restoration at any level of effort:

1. *Prioritize invasive plant removal near existing native vegetation.*
If not all invasive plant removal will be done at once, initial efforts should focus in areas where native vegetation is intermingled with or adjacent to invasive plants. This will facilitate natural regeneration of native plants, and is more likely to be successful than working in the interior of a dense patch of invasive plants, where repeated recolonization of invasives will be most likely and most rapid.

2. *Ensure that invasive plant removal efforts are overseen by staff familiar with native plants.*
Removing invasive species near desirable native vegetation will require attention and familiarity with local species. For instance, many young native plants are present hidden

within or under invasive shrub stands. Preserving and protecting these natives will be a very cost-efficient approach to restoration.

3. *Plant or protect native species that are functionally similar to, and capable of competing with, invasive nonnative species.* Where possible, encourage native species that are lower in flammability (i.e., low in volatile oils and/or relatively high moisture content in leaves). For instance, encourage regeneration of native oak trees to replace eucalyptus trees; native vines (wild cucumber, Pacific false bindweed, California honeysuckle) to replace invasive vines (English ivy, Cape ivy); native perennial grasses to replace European annual grasses; and disturbance-adapted, fast-growing native shrubs (coyote brush, poison oak) to help reduce regeneration of invasive broom and cotoneaster. Coyote brush is considered relatively flammable, so this species may be less desirable adjacent to residences.

4. *Plant native species where natural regeneration is limited.*
Where extensive stands of invasive species are removed and little native vegetation exists, plant promptly with a diversity of native plant types capable of competing with invasives. Typically, this will involve seeding with native grasses and forbs as well as planting woody species from containers.

Restoration Areas and Actions
As shown on the attached Figure 1 (Restoration Zones), the preserve contains several different vegetation types. Each is described below, with a list of restoration action items shown with priority level (1 = high/urgent, 3 = low but still valuable). Priority levels apply across vegetation type (i.e., Priority 1 items in all habitats have a similar priority level). Table 1 below lists appropriate native plants for restoration planting; Table 2 shows grass and herbaceous seed mix recommendations, and Table 3 shows invasive plant management recommendations.

A: Eucalyptus/Monterey cypress forest
This habitat is dominated by invasive species and includes many of the trees and shrubs to be removed. Many native oaks and bays occur in the central and eastern sections of this area and are likely to thrive as nonnative tree cover declines.

Recommended Actions, by Priority Level:

1 – Remove invasives near existing native vegetation, using caution to avoid injury to natives.
2 – Plant with native species as needed where no naturally-occurring plants are present, or where understory species are missing.
2 – Continue removal of young or dead eucalyptus and Monterey cypress over time to allow gradual conversion to native oak and bay woodland.

B: Cotoneaster/broom scrub
This area is densely covered with nonnative invasive shrubs. Few natives appear to be present. However, this is a high priority area to address because it will otherwise act as a major source for reintroduction of these plants to the rest of the Preserve. It also contains large quantities of

flammable material near the Preserve boundary, adjacent to residences. Facilitating conversion of this nonnative scrub habitats to lower-flammability native oak woodland will help reduce fire hazard.

Recommended Actions, by Priority Level:

1 – Remove cotoneaster and French broom, including pruned shrubs adjacent to apartment complex driveway.

1 – Plant with native oak woodland species adapted to dry, sunny conditions (see Table 1).

2 – Discuss landscape goals with apartment complex management and, if possible, other adjacent landowners. Request that invasive species be replaced over time with locally-appropriate native species (see Table 1).

C: Himalayan blackberry scrub

This area is densely covered with nonnative invasive Himalayan blackberry and very few native species. Himalayan blackberry does not appear to be spreading vigorously into adjacent oak woodland. Himalayan blackberry is considered a moderate fire hazard, as large quantities of dry stems can build up over time, but the plant is low in volatile oils. Restoration of this area could be very successful but would require extensive planting of native species. Priority for restoration of this area is relatively low.

Recommended Actions, by Priority Level:

2 – Remove Himalayan blackberry at the edges of this infestation, around native trees and shrubs, to prevent patch from expanding and gradually reduce its extent.

3 – Plant with native oak woodland species (see Tables 1 and 2).

D: Coast live oak woodland

This area includes relatively high-quality, intact native habitat. In general, encouraging natural regeneration of natives will be more appropriate in this area than intensive plantings. Some invasives are present on the periphery and scattered within. English ivy is climbing on mature oaks and can eventually weaken and kill them. English ivy also forms a dense mat at the upper end of the drainage in the southern part of the Preserve, adjacent to the service road. This dense growth reduces natural regeneration of oaks and other natives.

Recommended Actions, by Priority Level:

1 – Remove English ivy, especially from mature trees and where ivy forms a dense monoculture.

1 – Discourage the use of this area as a disposal site for unwanted vegetation.

2 – Remove plum trees and other invasives near existing native vegetation, using caution to avoid injury to natives.

2 – Remove dead wood as need for fire risk abatement.

2 – Plant with native species to replace invasives removed.

E: Coyote brush scrub

This small area in the southwestern portion of the Preserve includes primarily high-quality native habitat. Thinner soils and rocky slopes facing south-southeast make this most suitable to

remain native scrub habitat. Some invasive shrubs are present at the northeastern corner of the area, adjacent to the road to the cell tower.

Recommended Actions, by Priority Level:

2 – Remove invasive shrubs from northeastern corner, adjacent to road to cell tower.

2 -- Replace any removed invasives with native shrubs tolerant of dry conditions (e.g. coffeeberry, toyon, ceanothus; see Table 1.)

Restoration Methods

Tree and Shrub Planting

Exact placement of plantings cannot be determined until greater detail is available about site selection and spoils placement. Table 1 below shows microhabitat suitability for each species. In general, plantings should be clustered in sets of roughly 3-5 same-species plants to maximize wildlife benefits of restoration, and should be placed in a naturalistic pattern to mimic existing vegetation patterns. See Table 1 for within-cluster spacing and microhabitat specifications.

Most plants should be planted from nursery stock in containers of size similar to a Deepot 40 (40 cubic inches) or larger. Oaks may be planted from locally-collected acorns or from container stock. All plant propagules should be from within Marin County, if possible.

Planting holes should be dug to the same depth, and at least twice as wide, as the container plant root mass. Inoculant should either be included in the compost (and will contain both ectomychorrizal and endomychorrizal species), or inoculant should be added from a collection of litter and a shallow layer of topsoil from nearby native oak woodland. Any collection of duff and soil from native woodland should include precautions to avoid damage to the donor site.

All woody plantings should be protected from herbivory or seed predation with wire cages. Cages should be constructed of hardware cloth or other metal screen capable of excluding deer and rodents, extending approximately 24" above ground and 6" below ground, and closed at the top. A soil berm should be shaped to provide a 3' diameter watering basin, and a 3" layer of mulch placed within the berm. Mulch should consist of clean, weed-free chipped woody material. This could include chipped cypress, plum, or pine material from on the site if no seeds are included.

Herbaceous Seeding

All areas of ground disturbance should be seeded promptly with a mixture of native grass and forb seed (see Table 2 below, which includes mixes for both sunny/dry locations and moister/partly shaded locations). All seed should be of Marin County provenance, if possible. All legume seed should be inoculated with species-appropriate rhizobial bacteria prior to planting.

Appropriate seeding methods will depend on the size of the treatment area. For small areas, seed can be broadcast by hand or with belly grinders. For greatest establishment success, native perennial grasses can also be planted from plugs, if budget allows. For larger areas,

hydroseeding may be appropriate. All treatment methods should ensure that seed is in firm contact with soil, and that seed is covered by a protective layer of weed-free mulch.

Irrigation

Irrigation will be required for all trees and shrubs planted. The type of irrigation that will be most efficient depends on final plant numbers and arrangement, and availability of water at the Preserve. For small numbers of plants, installation of two Dri-Water™ gel packs per tree for irrigation is recommended (see Other Maintenance and Monitoring). Alternatively, a drip irrigation system may be installed if final plant numbers warrant the expense of installation. A drip system would probably entail installation of water storage tank and timer system.

Invasive Species Management

General recommendations for invasive species management have already been prescribed in the Vegetation Management Prescriptions developed by Kent Julin for the City (Julin 2010). See Table 3 below for recommended methods of invasive species control related to native plant restoration. In all cases, monitoring of eradication results will be needed, and repeated treatment are likely to be required. Where extensive ground disturbance is planned, caution will be required to avoid injury to native tree roots, and erosion control BMPs may be needed.

Other Maintenance and Monitoring

Irrigation will require maintenance work through the dry season. Dri-Water™ gel packs will require replacement roughly monthly from July through September, depending on weather. This irrigation will continue as needed for up to three years after planting; then the Dri-Water™ tubes will be removed and the holes backfilled with native soil. If a drip system on a timer is installed, regular inspection and repairs of the system will be required. During irrigation maintenance visits, any needed repairs to plant protection cages and/or augmentation of mulch will also be made. All non-biodegradable plant irrigation materials should be removed from project sites prior to the conclusion of the project.

Monitoring of planting survival and health can be a very valuable part of an ongoing restoration effort. If possible, plantings should be assessed formally once each year, in June or July for five years after planting. Survivorship and heights of woody plantings, or a selected subset of the plantings, should be recorded and general observations of plant health noted. This will help alert managers to any disease or herbivory problems and help guide future choices about plant selection, protection and irrigation, etc. Annual changes to invasive species cover in treatment areas should also be observed and noted, with extent of infestations mapped and/or photographed from permanent photo points.

Schedule

The following schedule shows the recommended seasonal timing for revegetation activities.

Mid-August-October	Training of construction personnel on sensitive resources present Survey for monarch butterfly presence if removal occurs in fall through spring Survey for bat presence prior to tree removal Removal of invasive trees and shrubs
November-December	Restoration planting and seeding
May-July	Additional weed management, as needed
May-October	Monthly replacement of Dri-Water™ or operation/maintenance of drip irrigation, and site inspection/repairs
July	Annual monitoring of vegetation success

Table 1. Recommended Species for Restoration Planting.

Species shown in bold are primary species to compose the bulk of restoration plantings, supplemented by the other species planted in smaller numbers.

Species	Common Name	Restoration Areas	Microhabitat	Plant Spacing
TREES				
Arbutus menziesii	**Madrone**	**A, B, C, D**	**All**	**12'-15'**
Garrya elliptica	Silk tassel	A, B, C, D	All	10'-12'
Quercus agrifolia	**Coast live oak**	**A, B, C, D**	**All**	**12'-15'**
Umbellularia californica (Ensure that nursery stock is free of Sudden Oak Death.)	California bay	A, B, C, D	All	12'-15'
SHRUBS				
Ceanothus thyrsiflorus	**Wild lilac**	**B, E**	**Dry, sunny locations**	**6'-8'**
Corylus cornuta	Hazelnut	A, C, D	Moist or partly shaded locations	6'-8'
Frangula californica	**Coffeeberry**	**All**	**Dry, sunny locations**	**6'-8'**
Heteromeles arbutfifolia	**Toyon**	**All**	**Dry, sunny locations**	**6'-8'**
Holodiscus discolor	Oceanspray	A, C, D	Moist or partly shaded locations	6'-8'
Rosa californica	**California rose**	**A, C, D**	**Moist or partly shaded locations**	**4'-6'**
Rubus parviflorus	Thimbleberry	A, C, D	Moist or partly shaded locations	**4'-6'**
Symphoricarpos albus	**Snowberry**	**A, C, D**	**Moist or partly shaded locations**	**4'-6'**
VINES & OTHER PERENNIALS				
Lonicera hispidula	California honeysuckle	All	All	3'-5'
Marah fabaceus	Wild cucumber	All	All	3'-5'
Polystichum munitum	Western sword fern	A, C, D	Moist or partly shaded locations	2'-4'

Table 2. Recommended Seed Mix for Grass and Forb Planting

Species	Common Name	Life Form	Pounds Pure Live Seed/Acre
GRASSES/FORBS – DRY/SUNNY LOCATIONS			
Achillea millefolium	Common yarrow	perennial forb	2
Bromus carinatus	California brome	perennial grass	8
Elymus glaucus	Blue wildrye	perennial grass	8
Lupinus nanus	Sky lupine	annual forb, N-fixing	3
Madia elegans	Common madia	annual forb, late-season	3
Nassella pulchra	Purple needlegrass	perennial grass	8
Vulpia microstachys	Small fescue	annual grass	8
TOTAL			40
GRASSES/FORBS – MOIST/PARTLY SHADY LOCATIONS			
Festuca rubra	Red fescue	perennial grass	8
Hordeum brachyantherum	Meadow barley	perennial grass	8
Elymus glaucus	Blue wildrye	perennial grass	8
Claytonia perfoliata	Miner's lettuce	annual forb	2
Bromus carinatus	California brome	perennial grass	8
TOTAL			34

Table 3. Recommendations for Invasive Plant Control

Species	Common Name	Recommended Treatment
Cortaderia jubata	Pampas grass	Manual removal. Dispose of off-site.
Cupressus macrocarpa	Monterey cypress	See Julin 2010 recommendations. Prune lower branches and chip on-site.
Cytisus scoparius *Genista monspessulana* *Cotoneaster spp.* *Rubus armeniacus*	Scotch broom French broom Cotoneaster Himalayan blackberry	Julin 2010 recommends. Cut at ground level. For ongoing control, dig out rootstocks by hand or with machinery, and/or spot-treat stumps with herbicide (glyphosate or triclopyr) in spring. Dispose of off-site.
Delairea odorata	Cape ivy	Manual removal, using caution to avoid leaving plant fragments on-site. Or treat with a mixture of glyphosate and triclopyr in spring. Dispose of off-site.
Eucalyptus globulus	Bluegum eucalyptus	See Julin 2010 recommendations. Cut young trees and cover stumps with black plastic. Use chips for pathways.
Foeniculum vulgare	Fennel	Manual removal (grubbing) of isolated large plants. Dispose of off-site.
Hedera helix	English ivy	Manual removal. Dispose of off-site.
Phalaris aquatica	Harding grass	Manual removal. Dispose of off-site.
Pinus radiata	Monterey pine	See Julin 2010 recommendations. Cut all trees and chip on-site.
Vinca major	Periwinkle	Manual removal (grubbing), including all roots and stolons, which may extend one foot belowground. Dispose of off-site.

References

Fire Safe Marin. 2011. Firewise Plant List. Accessed at: http://www.firesafemarin.org/plantlist.htm

Julin, K. 2010. Cypress Ridge Open Space Preserve, Vegetation Management Prescription. September 21, 2010. Prepared for the City of Sausalito

PRUNUSKE CHATHAM, INC.

Date Created: July 25, 2011
Created By: Joan Schwan

Figure 1. Restoration Zones
Cypress Ridge Open Space Preserve
City of Sausalito

Scale: 0 100 200 400 Feet