Buck Gulch Falls Creek Restoration and Trail Improvement Project
Biological Resources Evaluation
Ignacio Valley Preserve
Marin County, California
February 2026

Prepared for:
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Table of Contents

1 Introduction

Marin County Parks (MCP), which includes the Marin County Open Space District (MCOSD), manages and maintains the Ignacio Valley Preserve (Preserve), one of its 34 open space preserves in Marin County. The Preserve supports a small network of trails and limited fire roads for hikers, bikers, dog walkers, and equestrians on the outskirts of Novato. The Buck Gulch Falls Trail within this Preserve has been degraded by heavy public use. Trail improvements, creek restoration, and revegetation of riparian areas have been proposed to enhance and protect existing natural resources adjacent to the trail and Arryo de San Jose Creek. MCOSD retained PCI Ecological (PCI) to complete a biological resources assessment of the Buck Gulch Falls Creek Restoration and Trail Improvement Project. The assessment was completed to 1) document existing plant and wildlife resources within the project area, 2) provide a summary of potential resource impacts and recommendations for protection of biological resources, and 3) identify applicable best management practices from MCOSD's Road and Trail Management Plan (RTMP) (MCPOSD 2014) to avoid and/or minimize impacts on biological resources. This report summarizes PCI's botanical and wildlife assessment for the trail improvements.

2 Setting

The Ignacio Valley Preserve is located in northern Marin County, just south of the city of Novato (Figure 1). The Preserve encompasses approximately 906 acres of rugged woodland and chaparral habitat and lies adjacent to the Loma Verde, Pacheco Valley, and Indian Valley Preserves. Together, these protected lands form a contiguous band of open space along the northern slope of eastern Big Rock Ridge. Notable features of the Ignacio Valley Preserve include Buck Gulch Falls, a 30-foot-tall cascading waterfall, and Big Rock Ridge, which offers sweeping panoramic views. Elevations within the Preserve range from approximately 200 feet near the Buck Gulch Falls trailhead to about 1,200 feet along the surrounding ridgelines. The project area is located in the northwest corner of the Preserve along Arroyo de San Jose Creek, an intermittent stream. Access is provided at the end of Fairway Drive, off Ignacio Boulevard. The Buck Gulch Falls Trail follows the Arroyo de San Jose Creek for approximately 0.7 miles before reaching the falls. The Arroyo de San Jose Creek drains a watershed of approximately 7.4 square miles, flowing into a lagoon at Bel Marin Keys and then eventually into San Pablo Bay via the historical Novato Creek channel and a network of canals within the former Hamilton Army Airfield (Leidy et al., 2005, CDFW 2013).

A portion of the Buck Gulch Falls Trail lies within a public use easement on private property, owned by Hill Ranch and Marin Country Club Estates, LLC, and City of Novato property. The public easement is a 20-foot-wide corridor for pedestrian, equestrian and bicycle use, MCPOSD maintenance vehicle use, and emergency vehicles.

PRIVATE PROPERTY WITH TRAIL EASEMENT

IGNACIO VALLEY OPEN SPACE PRESERVE

PRIVATE PROPERTY WITH TRAIL EASEMENT

Buck Gulch Falls

Buck Gulch Falls Trail

ARROYO DE SAN JOSE CREEK

Spyglass Trail

Trailhead

FAIRWAY DRIVE

Project Area

RED HILL
BURDELL MOUNTAIN
NOSS FLD
LITTLE MOUNTAIN
San Marin Dr
Novato
Black Point
Redwood Blvd
Novato Blvd
Ignacio
SHROYER MOUNTAIN
Lucas Valley Rd
BIG ROCK RIDGE
Marinwood
Forest Knolls
San Geronimo
Woodacre
SANTA MARGARITA VALLEY
Terra Linda
Santa Venetia
GREEN HILL
WHITE

0 200 400 Feet

February 2026
Sources:
Basemap - ESRI 2025
Stream - NV5 2019
Trail & improvements - MCP 2025

PCI ECOLOGICAL

Path: X:\GIS_Projects\Marin County\MCD_Bucks_Gulch\MCD_Bucks_Gulch.aprx

Figure 1

Project Site and Location

Buck Gulch Falls Creek Restoration and Trail Improvement Project
Ignacio Valley Open Space Preserve
Novato, Marin County

- Streams
- Existing Adjacent Trail
- Realigned/Improved Trail
- Property Boundary

3 Trail Improvements

The purpose of the proposed project is to restore portions of Arroyo de San Jose Creek, reduce environmental impacts on sensitive resources, improve trail safety and sustainability, and enhance visitor experience by implementing design and management standards outlined in the goals of MCOSD's RTMP and Inclusive Access Plan (IAP) (MCOSD 2014).

Approximately 1,500 feet of trail is currently located along the banks of the Arroyo de San Jose Creek, with no buffer between the creek and public use. The creek is crossed twice by the trail with unimproved fords, so the public is crossing directly within the creek channel. These areas are experiencing elevated rates of erosion through trampling, soil compaction, and bank failure from visitor use. In addition, muddy trail conditions during wet weather have led to trail braiding, and a loss of understory riparian vegetation as visitors try to avoid mud and slippery areas.

The Buck Gulch Falls Creek Restoration and Trail Improvement Project (proposed project) will protect wildlife resources and sensitive habitats and species, while providing hiking opportunities on sustainable trails. This will be accomplished by improving the existing trail, realigning portions of the trail away from stream banks, and installing two pedestrian trail bridges at the two creek crossing locations. In addition, one puncheon, one boardwalk, and updated trail material will be installed at the three locations where ephemeral drainages cross the trail. Stream restoration will occur along an eroding stream bank and riparian revegetation will be implemented across denuded and decommissioned trail areas (Figure 2). The proposed project will also upgrade the waterfall viewing area to reduce erosion, protect riparian vegetation, and improve the user experience. In total, nearly 2,240 feet of the existing trail will be improved, and 850 feet will be realigned away from the top of the stream bank, with the old alignment decommissioned and restored to native habitat. Other improvements include reductions of trail width; a change in trail use from hiker and equestrian use to hiker use only; adjustments to trail grade and installing new gravel surfacing to reduce muddy conditions; and fencing and signage at the waterfall viewing area to reduce informal access to the falls and resulting erosion.

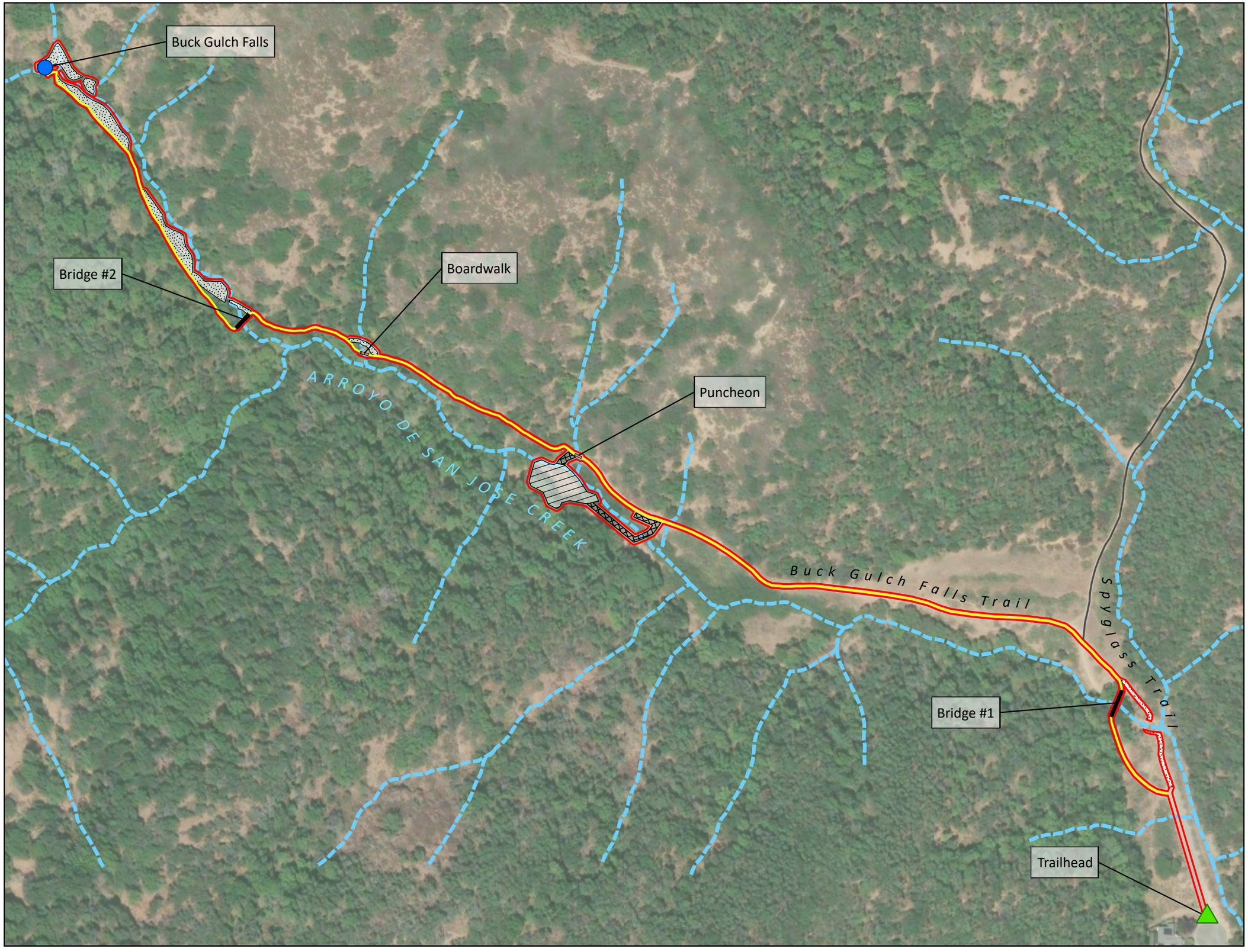

Figure 2
Project Features

Buck Gulch Falls Creek Restoration and Trail Improvement Project
Ignacio Valley Open Space Preserve
Novato, Marin County

- Streams
- Existing Adjacent Trail
- Realigned/Improved Trail**
- Project Area*
- Bridge
- Boardwalk
- Puncheon
- Stream Restoration
- Access & Staging for Stream Restoration
- Decommisioned Trail/Revegetation Area

*Project Area includes a 5' buffer on either side of all work areas. Access for project trail work will be within this buffer while the bank stabilization work has additional designated access and staging areas.

** Approximately 2,240 feet of existing trail will be improved, including 850 feet that will be realigned away from the top of the streambank. Additional details can be found the in Biological Assessment.

0 200 400 Feet

February 2026
Sources:
Basemap - ESRI 2025
Stream - NV5 2019
Trail & improvements - MCP 2025

PCI ECOLOGICAL

Path: X:\GIS_Projects\Marin County\MCD_Bucks_Gulch\MCD_Bucks_Gulch.aprx

4 Methods

Field Surveys

Biological field surveys were completed in 2021 and 2025 by PCI Wildlife Biologists and Vegetation Ecologists, who are familiar with the region's flora and fauna. PCI's assessment followed Marin County's *Preparation of Biological Site Assessments* (Marin County undated).

The field surveys included a general assessment of habitats in the project area and inventories of species observed or potentially occurring within the site. The primary purposes of the assessment were to characterize biological communities and habitat conditions within project areas, determine whether suitable habitat for special-status species is present, provide information to help guide design for benefits to biological resources, identify potential project-related effects, and support identification of appropriate construction-period avoidance and impact minimization measures. The potential for presence of and effects on special-status species and habitats was determined based on site observations, habitat conditions, the presence of unique habitat features, proximity of the site to reported occurrences, geographic range of subject species, and the nature of the proposed disturbance. The area surveyed included the proposed trail work areas, trail decommissioning and revegetation areas, bank stabilization areas, and access and staging areas, with a buffer ranging from 5 to 25 feet outside of the project area. Some portions of these areas were not accessible by foot due to terrain or dense vegetation and were surveyed using binoculars.

BOTANICAL SURVEYS. Botanical surveys of the site were conducted on April 5 and July 5, 2021, and October 22, 2025. Plants observed were identified using the Jepson eFlora (Jepson Flora Project 2026) and *Marin Flora* (Howell et al. 2007) to the taxonomic level necessary to determine whether they were rare. Botanical nomenclature follows the Jepson eFlora. Representative plant species observed within the project area are provided in the sections that follow. For a full list of all plant species observed within the project area, see Appendix B. Plant Species Observed 2021 & 2025. Due to the timing of botanical surveys, some species may not have been visible and/or were unable to be identified. Vegetation alliances and associations were identified based on visual assessment in the field and comparison with Manual of California Vegetation (CNPS 2026) definitions, listed associations of species, and referenced regional project-level reports as available; no detailed quantitative data was collected.

WILDLIFE SURVEYS. Wildlife surveys were conducted with the aid of binoculars on April 5, 2021, and October 22, 2025. Visual cues (e.g., nests, tracks, scat, burrows, skeletal remains), calls, songs, and direct observations were used to identify wildlife. Unique habitat features (e.g., woody debris, water sources, etc.) and other plant materials were examined for the presence of mammals, amphibians, reptiles, birds, and invertebrates. Wildlife species observed within the project area, in addition to species likely to occur in that setting, are provided in the sections that follow. No aquatic sampling was completed as part of the assessment.

This biological assessment is specific to the project area identified in Figure 2, which includes the beginning section of the Spyglass Trail and the entirety of the Buck Gulch Falls Trail; impacts beyond these boundaries were not evaluated. It does not include an evaluation of the cumulative effects of the proposed project at a local and regional scale. Observations were limited in scope due to the seasonal distribution and/or rarity of some species. This report represents PCI's best professional effort to identify all sensitive habitats, species, and resources of concern within the project area.

5 Soils

Soils in the project area are mapped as Tocaloma-McMullin complex (NRCS 2025). These are well-drained to somewhat excessively drained loam and/or gravelly loam soils derived from residuum weathered from sandstone, shale, conglomerate, and metamorphic rock. Depth to bedrock typically ranges from 18 to 43 inches. These soils are not considered hydric. Typical natural vegetation on Tocaloma soils are California bay and oaks, ferns, blackberries, and poison oak. On McMullin soils, typical vegetation includes native bunchgrasses, shrubs including ceanothus and manzanita, hardwoods, forbs, and scattered pine.

6 Existing Conditions

Botanical Resources

The project area includes grassland, shrubland, and riparian forest. An existing trail is present within or directly adjacent to all vegetation communities in the project area. Further description of vegetation communities and proposed project elements in these communities can be found in Table 1, Figure 3, and in the following section. Disturbance and revegetation quantities within each community are provided in the following section.

Table 1. Vegetation Types and Proposed Project Elements in the Project Area

Community Type	Vegetation Alliance and Associations (CDFW Rank)[1, 2]	Sensitive?[3]	Proposed Project Element Description[4]
Annual and Perennial Grasslands	Perennial rye grass (*Festuca perennis*) fields (NA)	No	Temporary disturbance for staging, access, and stream restoration work. Disturbed areas will be reseeded

[1] Alliances and associations are based on the Manual of California Vegetation Online (CNPS 2026a). Note that classification of associations in California by CNPS and CDFW is ongoing and not all associations present in the state are named in the MCV. For this report, the named associations that best fit the site's vegetation have been selected.

[2] Alliances or associations with global or state ranks of "3" or lower are considered by CDFW to be of high inventory priority. Non-native alliances (a.k.a. Semi-natural stands) are not ranked ("NA" in Table 1). "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. "?" indicates the need for further study. NR = no rank. Multiple numbers (e.g., 3/4) indicate variable or intermediate priority. Rankings from CDFW (2025b).

[3] Sensitivity based on federal (U.S. Army Corps of Engineers; Section 404), State of California (CDFW), and local (Marin County) regulations.

[4] Temporary disturbance will occur in areas that are disturbed during construction and subsequently revegetated or restored as part of the proposed project (e.g., staging and access areas). Permanent impacts are identified as areas that vegetation will be permanently removed to accommodate installation of new project elements (e.g., tree or vegetation removal for trail

Community Type	Vegetation Alliance and Associations (CDFW Rank)[1, 2]	Sensitive?[3]	Proposed Project Element Description[4]
	▪ *Festuca perennis – Bromus hordeaceus* Association (NA)		following implementation. Revegetation will occur in the stream restoration area.
	Wild oats (*Avena* sp.) and annual brome (*Bromus* sp.) grasslands (NA) ▪ *Bromus diandrus – Avena* sp. Association (NA)	No	
Shrubland	Coyote brush (*Baccharis pilularis*) scrub (G5S5) ▪ *Baccharis pilularis / Annual grass – herb* Association (G5S5)	No	Temporary disturbance for staging, access, and stream restoration work. Disturbed areas will be reseeded following implementation. Revegetation will occur in the stream restoration and decommissioned trail area.
	Poison oak (*Toxicodendron diversilobum*) scrub (G4S4) ▪ *Toxicodendron diversilobum – Artemisia californica / Leymus condensatus*[5] Association (G3S3)	Yes (Association rank)	Temporary disturbance for access. Disturbed areas will be reseeded following implementation.
Forest and Scrub	Coast live oak (*Quercus agrifolia*) forest (G5S4) ▪ *Quercus agrifolia – Umbellularia californica* Association (G3S3)	Yes (Association rank, riparian)	Temporary disturbance for access and stream restoration work. Disturbed areas will be reseeded following implementation. Permanent understory loss from realigned trail and boardwalk. Revegetation will occur in the decommissioned trail and stream restoration areas.
	California bay (*Umbellularia californica*) forest (G4S3) ▪ *Umbellularia californica* Association (G3S3)	Yes (Association rank, riparian)	Temporary disturbance for access. Disturbed areas will be reseeded following implementation. Permanent loss of understory vegetation and 5 small native trees from realigned trail and bridge. Revegetation will occur in the decommissioned trail area.
	Bigleaf maple (*Acer macrophyllum*) forest (G4S3) ▪ *Umbellularia californica - Acer macrophyllum* Association (G3S3)	Yes (Association rank, riparian)	Temporary disturbance for access. Disturbed areas will be reseeded following implementation. Permanent loss of understory and two small native trees from realigned trail and bridge. Revegetation will occur in the decommissioned trail area.
	Arroyo willow (*Salix lasiolepis*) thickets (G4S4) ▪ *Salix lasiolepis* Association (G4S4)	Yes (riparian)	Temporary disturbance for staging, access, and stream restoration. Disturbed areas will be reseeded

realignment). Additional details, including disturbance and revegetation quantities, are provided in the Project Elements in Plant Communities section below.

[5] *Leymus condensatus* not present at this site, but this is the closest fit association in lists provided by the Manual of California Vegetation Online (CNPS 2026a) and CDFW (2025b).

Community Type	Vegetation Alliance and Associations (CDFW Rank)[1, 2]	Sensitive?[3]	Proposed Project Element Description[4]
			following implementation. Revegetation will occur in the stream restoration area.

Annual and Perennial Grasslands

Grasslands are present along the eastern and central portions of the project area, adjacent to coyote bush (*Baccharis pilularis*) scrub and the existing trail. Non-native annual and perennial grasses are dominant with limited native cover. Non-native grasses present include bromes (*Bromus diandrus* and *B. hordeaceus*), hedgehog dogtail (*Cynosurus echinatus*), orchardgrass (*Dactylis glomerata*), Italian rye grass (*Festuca perennis*), and foxtail barley (*Hordeum murinum*). Non-native forbs are also common and include vetch (*Vicia villosa* and *V. sativa*), dovefoot geranium (*Geranium molle*), English plantain (*Plantago lanceolata*), and Italian thistle (*Carduus pycnocephalus*). In addition, several stands of invasive Harding grass (*Phalaris aquatica*) and large infestations of invasive yellow starthistle (*Centaurea solstitialis*) were observed. Scattered native species were present, including blue wildrye (*Elymus glaucus*), Pacific sanicle (*Sanicula crassicaulis*), buttercup (*Ranunculus californicus*), spikeweed (*Centromadia fitchii*), miniature lupine (*Lupinus bicolor*), miner's lettuce (*Claytonia perfoliata*), and showy ground iris (*Iris macrosiphon*).

Shrubland

Coyote brush scrub occurs in the central and eastern portions of the project area, along the existing trail. Some native blackberry (*Rubus ursinus*) and sticky monkeyflower (*Diplacus aurantiacus*) are also growing within the scrub. The understory is dominated by non-native annual and perennial species, similar in composition to adjacent grassland areas. Native diversity is low in these areas, but native woody species provide valuable habitat for native wildlife. These stands include areas of very limited, unstable soil on rocky slopes and other areas that may be recovering from past disturbance from human land uses.

Poison oak (*Toxicodendron diversilobum*) scrub is present on a south-facing slope in a central portion of the project area adjacent to the existing trail. Native woody and herbaceous species are dominant and diverse, with limited cover of non-native species. Coastal sage brush (*Artemisia californica*), yerba santa (*Eriodictyon californicum*), and poison oak are dominant in the shrub layer with occasional common manzanitas (*Arctostaphylos manzanita*) growing along the forested edges. Other native shrubs and perennials include redberry buckthorn (*Rhamnus crocea*), chamise (*Adenostoma fasciculatum*), sticky monkeyflower (*Diplacus aurantiacus*), California pipevine (*Aristolochia californica*), Pacific false bindweed (*Calystegia purpurata*), buckwheat (*Eriogonum nudum*), coyote mint (*Monardella villosa*), wild hyacinth (*Dichelostemma capitatum*), false babystars (*Leptosiphon androsaceus*), and rusty popcornflower (*Plagiobothrys nothofulvus*). Succulent rock lettuce (*Dudleya cymosa*) was also present on rocky areas along the slope. A few non-native grasses and forbs such as Italian thistle, rattlesnake grass (*Briza maxima*), and ripgut brome were also present within the scrub understory, especially along the edge of the existing trail.

Forest and Scrub

Coast live oak (*Quercus agrifolia*) forest occupies a large portion of the project area adjacent to the Arroyo de San Jose Creek and includes a section of existing trail. Overall, this community has a high diversity and abundance of native woody and herbaceous species with limited cover of non-native species. Portions of the understory are bare in areas with existing trails. Coast live oak and California bay (*Umbellularia californica*) are dominant in the overstory, with occasional big leaf maple (*Acer macrophyllum*), madrone (*Arbutus menziesii*) and California buckeye (*Aesculus californica*) trees also present. Typical native shrub species include snowberry (*Symphoricarpos albus*), hazelnut (*Corylus cornuta*), ocean spray (*Holodiscus discolor*), toyon (*Heteromeles arbutifolia*), California blackberry, and poison oak. Native herbaceous species present include wood fern (*Dryopteris arguta*), honeysuckle (*Lonicera hispidula*), California pipevine, fairy bells (*Prosartes hookeri*), checker lily (*Fritillaria affinis*), canyon larkspur (*Delphinium nudicaule*), false Solomon's seal (*Maianthemum racemosum*), giant wakerobin (*Trillium chloropetalum*), canyon nemophila (*Nemophila heterophylla*) and Chinese houses (*Collinsia heterophylla*). In addition, large swaths of Douglas iris (*Iris douglasiana*) are present in the understory along the proposed trail alignment. Spreading hedgeparsley (*Torilis arvensis*) was the only non-native species observed.

California bay forest occurs along the eastern and western portions of the project area, and is dominated by native species. California bay dominates the overstory, with big leaf maple, buckeye, and coast live oak trees also observed. Typical understory species include hazelnut, snowberry, poison oak, California blackberry, honeysuckle, wood fern, and Douglas iris. Large portions of the understory are also bare in the project area, due to existing trails and high levels of visitation to Buck Gulch Falls.

Big leaf maple forest is in the western portion of the project area, along the Arroyo de San Jose Creek. Big leaf maple is dominant, with buckeye, California bay, and coast live oak also present. Understory composition is similar to adjacent California bay forest with a high abundance of native species. Species present include hazelnut, honeysuckle, wood fern, Douglas iris, maidenhair fern (*Adiantum jordanii*), polypody ferns (*Polypodium californica* and *P. calirhiza*), bee plant (*Scrophularia californica*), and round fruit sedge (*Carex globosa*). Spreading hedgeparsley was the only non-native species observed. As in other communities, portions of the understory are bare in areas with existing trails or high amounts of visitation.

A small thicket of arroyo willow (*Salix lasiolepis*) is present along the lower portion of the Arroyo de San Jose Creek and is dominated by native species. This thicket includes dense cover of arroyo willow with occasional shining willow (*Salix lasiandra* var. *lasiandra*) and big leaf maple in the overstory. Coyote bush is present along the edges of the thicket as the community transitions into upland coyote bush scrub and grassland vegetation.

Proposed Project Elements in Plant Communities

The majority of proposed project work will occur within the footprint of existing trails, limiting impacts on plant communities. 850 feet of trail will be realigned away from

stream banks, to protect sensitive riparian habitat and improve trail safety. Following project implementation, all temporarily disturbed areas will be seeded and revegetation will occur along some areas of decommissioned trail and in the stream restoration area in accordance with the project revegetation plan. MCOSD should ensure the protection measures listed in Section 0 are implemented during project work to minimize impacts on native plants and communities, reduce the spread of invasive species, and prevent the introduction of plant pathogens. The following sections describe impacts in each plant community.

Perennial rye grass fields and wild oats and annual brome grasslands: Grasslands within and adjacent to the project area are dominated by non-native species, with limited cover of native species. Approximately 9,630 square feet (0.22 acres) will be temporarily disturbed for access, staging, and stream restoration work, including grading for stream restoration work. All disturbed access and staging areas will be reseeded following project construction. Following implementation, the stream restoration area will be revegetated (6,200 square feet, 0.14 acres) with native woody and perennial species in accordance with the project revegetation plan. Soil compaction and disturbance may occur where heavy equipment is staged and used for stream restoration work. MCOSD should ensure the protection measures outlined in Section 0 are implemented to minimize compaction and ground disturbance, through actions such as minimizing soil disturbance areas and scarification of soils where compaction occurs, to prepare for revegetation.

Coyote brush scrub: Approximately 5,082 square feet (0.12 acres) of coyote bush scrub will be disturbed for access, staging, and stream restoration work, including trimming and removal of coyote brush plants and grading for stream restoration work. All disturbed access and staging areas will be reseeded following project construction. Following implementation, the stream restoration area (6,200 square feet, 0.14 acres) and the decommissioned trail area (2,400 square feet, 0.05 acres) will be revegetated with native woody and perennial species (including coyote bush) in accordance with the project revegetation plan. Soil compaction and disturbance may occur where heavy equipment is staged and used for stream restoration work. MCOSD should ensure the protection measures outlined in Section 0 are implemented to minimize compaction and ground disturbance, through actions such as minimizing soil disturbance areas and scarification of soils where compaction occurs, to prepare for revegetation.

Poison oak scrub: Impacts to this community are discussed in Section 8 Special-status Species and Habitats.

Forest and Scrub: Impacts to these communities are discussed in Section 8 Special-status Species and Habitats.

Douglas iris stand

Yellow star thistle stands

Figure 3
Plant Communities

Buck Gulch Falls Creek Restoration and Trail Improvement Project
Ignacio Valley Open Space Preserve
Novato, Marin County

- Streams
- Project Area

Plant Communities

- Annual and perennial grassland
- Coyote brush scrub
- Poison oak scrub
- Chamise chaparral
- Eastwood manzanita brush
- Pacific madrone forest
- Coast live oak woodland
- California bay forest
- Bigleaf maple forest
- Arroyo willlow thickets
- Developed

0 200 400 Feet

February 2026
Sources:
Basemap - ESRI 2025
Stream - NV5 2019
Vegetation - MCP 2018, PCI 2025

PCI ECOLOGICAL

Path: X:\GIS_Projects\Marin County\MCD_Bucks_Gulch\MCD_Bucks_Gulch.aprx

Wildlife Resources

The project area supports oak and riparian forests interspersed with patches of coyote brush, grassland, and seasonal channels. It is part of a continuous swath of protected lands on the outskirts of Novato. The wooded habitats provide important corridors that allow wildlife to move to and from surrounding lands and along the drainages. The intact forests buffer wildlife from recreational use and nearby development. The project area, and larger Preserve, provide valuable habitat for many of Marin County's wildlife species.

Native forest within the project area provides suitable habitat for a variety of terrestrial birds, mammals, amphibians, and reptiles. Birds represent the most abundant and prominent wildlife species within this habitat. Year-round resident birds observed included Anna's hummingbird, California quail, chestnut-backed chickadee, common bushtit, dark-eyed junco, spotted towhee, and California scrub-jay. Seasonal migrants observed within the woodlands, that are also likely to breed within the habitat, included orange-crowned warbler, Pacific-slope flycatcher, and Wilson's warbler. Red-shouldered hawk and turkey vulture were observed soaring over the wooded areas. Small vertebrates within the habitat are likely to serve as a food source for predatory birds. Nocturnal avian predators may also be present. Due to their nocturnal nature and timing of the field survey, no owls were observed. Two special-status bird species, Cooper's hawk and northern spotted owl (NSO) have been reported within the Preserve (MCOSD 2015, Marin County 2021, CDFW 2026a). Location data for the Cooper's Hawk observation is unknown; however, a NSO activity center is documented 0.12 miles south from the project area and was active in 2023 and 2024; see Section 8 and Appendix C for further discussion.

Native oaks within the project area serve as a significant resource for many wildlife species, providing both food and shelter. Every part of the oak tree is utilized as forage, 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, California scrub-jays, and western gray squirrels; both species were observed within the project area. Bat species may forage over the grassland and woody habitats and roost in nearby larger trees. A California kingsnake was observed climbing the trunk of a large tree within the woodland habitat during the 2021 spring survey; this is a seldom-seen snake in Marin County.

Grasslands provide important habitat for wildlife; provide foraging opportunities for a number of bird species which are attracted to seeds, other plant material, invertebrates, and small vertebrates. Species such as the western bluebird and American goldfinch were observed foraging in these open areas. Coyote brush scrub and poison oak scrub occurs in small patches along the existing trail, adjacent to the project area. Scrub provides habitat for a wide variety of wildlife, including California quail, California scrub-jay, and spotted towhee. Western fence and alligator lizards were observed near rocky outcrops in the scrub. Native butterflies were abundant within the project area, foraging in all of the habitat types. Larger mammals, such as deer and foxes will likely forage or hunt in these areas.

Arroyo de San Jose Creek is a critical aquatic resource for local wildlife, as it provides intermittent flows and a seasonal water source. The diverse plant community and habitat complexity provides critical foraging, roosting, and nesting habitat along the creek. The drainage is well vegetated and provides cool and moist microclimate conditions required by many wildlife species, especially common and special-status amphibian species. At the upper limit of the project area, immediately west of Buck Gulch Falls, there is a deep pool that provides a persistent water source. During the spring 2021 survey, adult California newts were observed in this pool. Small, isolated pools with California newt adults and egg masses were also observed (spring 2021) in the creek bed near the downstream end of the project area. This species, and others, can be especially vulnerable to impacts during the rainy season, when amphibians tend to be mobile and disperse longer distances. The creek is also an important movement corridor for wildlife, especially in areas that are buffered from public access. The smaller ephemeral drainages feeding into Arroyo de San Jose Creek also provide seasonal water sources during the rainy season and movement corridors for wildlife.

Animals Observed

Animals observed (directly and indirectly: scat, tracks, burrows, sounds) within the project area by PCI during the surveys in 2021 or 2025 included the following:

Birds

acorn woodpecker
American crow
American goldfinch
American robin
Anna's hummingbird
band-tailed pigeon
Bewick's wren
brown creeper
bushtit
California quail
California scrub-jay
Cassin's vireo
chestnut-backed chickadee
common bushtit
common raven
dark-eyed junco
golden-crowned kinglet
golden-crowned sparrow
hermit thrush
house finch
northern flicker
oak titmouse
orange-crowned warbler
Pacific-slope flycatcher
pileated woodpecker
red-shouldered hawk
song sparrow
spotted towhee
Steller's jay
turkey vulture
western bluebird
Wilson's warbler
wrentit

Amphibians

California newt
Pacific tree frog

Reptiles

alligator lizard
California kingsnake
western fence lizard

Mammals

black-tailed deer
coyote
western gray squirrel

Invertebrates (butterflies)
California buckeye
California pipevine swallowtail
California sister
western tiger swallowtail

7 Arroyo de San Jose Creek and Tributary Drainages

The Arroyo de San Jose Creek is an intermittent stream, based on PCI's field observations and as mapped on the USGS topo map, and has a defined bed and banks throughout the project area reach. At its upper limits, a large bedrock outcrop creates Buck Gulch Falls. A deep pool also occurs above the falls, beyond the Preserve boundary and project area. A shallow pool is present below the falls, outside of the project area, and flows downstream into the creek channel. Areas of deep incision and bank erosion are evident throughout the project area reach, especially at the downstream limits. During PCI's April 5, 2021, survey, the creek was mostly dry with the exception of the pool below the falls and several small (3-4" deep) pools near the downstream limits of the project area. Likewise, in the 2025 October survey, the creek was completely dry in all locations within the project area.

Several small ephemeral drainages flow into Arroyo de San Jose Creek from the surrounding slopes, with three of these drainages flowing across the existing trail. The drainages are not mapped on the USGS topo map and lack defined bed and banks as they cross the existing trail, but have a defined channel upstream. These ephemeral drainages were completely dry in both the 2021 and 2025 surveys and likely only flow in direct response to rainfall.

The Ordinary High-Water Mark (OHWM) for the Arroyo de San Jose Creek within the project area was identified by a PCI engineer on April 1 and 2, 2024, following the methods outlined in the U.S. Army Corps of Engineers' *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Corps 2008). The approximate limits of the OHWM were identified using geomorphic features, such as slopes and substrate, and vegetation composition. These field observations were then compared with 1-foot LiDAR-derived topographic contours to refine and map the OHWM.

Proposed Project Elements in Arroyo de San Jose Creek and Tributary Drainages

The proposed project includes project elements that will occur within the bed and banks of Arroyo de San Jose Creek and three small ephemeral drainages: a reach of Arroyo de San Jose Creek not associated with trails or public access will be restored, two bridges will be installed, two existing rock fords will be decommissioned, and a puncheon and boardwalk will be installed to provide access over the small drainages at the trail crossings.

Stream restoration work will occur in an approximately 175-foot reach of the Arroyo de San Jose Creek to stabilize the stream channel and stop active erosion, reduce sedimentation in the channel, and restore native riparian vegetation along the banks (Figure 2). This section of the channel has a gravel- and cobble-dominated bed that mostly receives full sun. Vegetation on top of the eroding bank consists mostly of nonnative annual grasses and coyote bush, with coast live oak forest to the southwest and some arroyo willow on the northeast creek edge. During the 2021 and 2025 surveys, this section of the creek was completely dry. Stream restoration work will occur both above and below the top of bank (TOB) and extend below the OHWM at the streambank toe, where

boulders will be installed to provide long-term stability against scour from high-flow events. Erosion control and native plant revegetation will occur along the banks as part of the site restoration.

Additional proposed project activities include two creek crossings: one near the trailhead, along the Spyglass Trail (before the Buck Gulch Trail takes off to the west; Bridge #1), and one near the end of the trail, before the falls (Bridge #2; see Figure 2). The proposed project also includes channel and bank restoration at the two existing fords near the two bridges to enhance conditions and to keep visitors from using the fords in the future.

At the Spyglass crossing, the trail will be realigned from its current position (i.e., along the existing emergency access road) to further downstream, where the creek is much narrower. At this location, the channel ranges from 13 to 20 feet wide at the OHWM and 17 to 28 feet wide at the TOB. Vegetation in this area is primarily coyote bush scrub, with limited canopy cover from the adjacent bay forest. Substrate in the channel is mostly gravel and cobble, with no woody debris, undercut banks, or emergent vegetation present. The bridge will fully span the creek, with abutments located above the OHWM and TOB.

At the second crossing, where Bridge #2 will be installed, the creek channel within the project area ranges from 10 to 12 feet wide at the OHWM and 39 to 42 feet wide at the TOB. Channel substrate is composed of gravel and cobble with a few boulders. Some undercut banks and scattered woody debris are present, but there is no emergent vegetation. Overhanging branches provide moderate to high canopy cover and are comprised of big-leaf maple, California bay, and toyon. The understory here is sparse, but leaf duff and moss proliferate. Further description of typical plant species present is detailed in Section 6. The bridge will span the creek in its entirety, with abutments placed above the OHWM and TOB.

In three locations, small ephemeral tributary drainages cross the existing trail within the project area. To protect these resources, trail improvements will be added to two of these crossings; a puncheon (16 feet long) and boardwalk (18 feet long) will be installed to prevent erosion and maintain water quality. Both features will span the entirety of these drainages, with footings located in the adjacent uplands. For the third location, aggregate base will be added to the existing trail to prevent muddy conditions and erosion.

For further details on trail features, see the Buck Gulch Falls Accessible Trail Feasibility Study (PCI 2024a) and Buck Gulch Falls Trail Arroyo San Jose Streambank Stabilization Site Plan (PCI 2024b).

Figure 4

Delineation of Waters of the U.S. and State

Buck Gulch Falls Creek Restoration and Trail Improvement Project
Ignacio Valley Open Space Preserve
Novato, Marin County

- Map Reference Points
- Project Area (1.6 acres)
- Arroyo de San Jose (5656 sq ft)
- Ordinary High Water Mark (OHWM)
- Ephemeral Tributaries
- OHWM Outside Project Area
- Topography (2-foot contours)
- Top of Bank (TOB)

0 200 400 Feet

February 2026
Sources:
Basemap - ESRI 2025
Project area, OHWM, Impacts - PCI 2025

PCI ECOLOGICAL

Path: X:\GIS_Projects\Marin County\MCD_Bucks_Gulch\MCD_Bucks_Gulch.aprx

Figure 5
Delineation of Waters of the U.S. and State - Waterfall

Buck Gulch Falls Creek Restoration and Trail Improvement Project
Ignacio Valley Open Space Preserve
Novato, Marin County

- Map Reference Points
- Project Area (1.6 acres)
- Arroyo de San Jose (1758 sq ft)
- Ordinary High Water Mark (OHWM)
- OHWM Outside Project Area
- Topography (2-foot contours)
- Top of Bank (TOB)

0 20 40 Feet

February 2026
Sources:
Basemap - ESRI 2025
Project area, OHWM, Impacts - PCI 2025

PCI ECOLOGICAL

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Figure 6

Delineation of Waters of the U.S. and State - Bridge #2

Buck Gulch Falls Creek Restoration and Trail Improvement Project
Ignacio Valley Open Space Preserve
Novato, Marin County

- Project Area (1.6 acres)
- Arroyo de San Jose (1462 sq ft)
- Ordinary High Water Mark (OHWM)
- OHWM Outside Project Area
- Topography (2-foot contours)
- Top of Bank (TOB)

0 15 30 Feet

February 2026
Sources:
Basemap - ESRI 2025
Project area, OHWM, Impacts - PCI 2025

PCI ECOLOGICAL

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Figure 7

Delineation of Waters of the U.S. and State - Stream Restoration

Buck Gulch Falls Creek Restoration and Trail Improvement Project
Ignacio Valley Open Space Preserve
Novato, Marin County

- Project Area (1.6 acres)
- Arroyo de San Jose (2216 sq ft)
- Ordinary High Water Mark (OHWM)
- OHWM Outside Project Area
- Topography (2-foot contours)
- Top of Bank (TOB)
- Ephemeral Stream
- Ephemeral Stream Outside Project

0 25 50 Feet

February 2026
Sources:
Basemap - ESRI 2025
Project area, OHWM, Impacts - PCI 2025

PCI ECOLOGICAL

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Figure 8

Delineation of Waters of the U.S. and State - Bridge #1

Buck Gulch Falls Creek Restoration and Trail Improvement Project
Ignacio Valley Open Space Preserve
Novato, Marin County

- Project Area (1.6 acres)
- Arroyo de San Jose (219 sq ft)
- Ordinary High Water Mark (OHWM)
- OHWM Outside Project Area
- Topography (2-foot contours)
- Top of Bank (TOB)

0 15 30 Feet

February 2026
Sources:
Basemap - ESRI 2025
Project area, OHWM, Impacts - PCI 2025

PCI ECOLOGICAL

Path: X:\GIS_Projects\Marin County\MCD_Bucks_Gulch\MCD_Bucks_Gulch.aprx

Figure 9

Delineation of Waters of the U.S. and State - Boardwalk

Buck Gulch Falls Creek Restoration and Trail Improvement Project
Ignacio Valley Open Space Preserve
Novato, Marin County

- Project Area (1.6 acres)
- Arroyo de San Jose Creek Channel
- Ephemeral Stream
- Ephemeral Stream Outside Project Area
- Topography (2-foot contours)

0 15 30 Feet

February 2026
Sources:
Basemap - ESRI 2025
Project area, OHWM, Impacts - PCI 2025

PCI ECOLOGICAL

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8 Special-status Species and Habitats

PCI conducted a background literature and database search to determine the potential for occurrence of special-status species within the project area. The search focused on reported occurrences for the Novato 7.5' USGS quadrangle where the project area is located; the San Geronimo quadrangle was also included for background review on special-status plant species. General references, including aerial photographs, were also consulted to evaluate the potential for unique biological communities and special-status species. The review included the following sources:

- California Natural Diversity Database (CNDDB)[6](CDFW 2026a)
- California Sensitive Natural Communities (CDFW 2026b)
- California Special Animals List (CDFW 2025)
- Information for Planning and Conservation (IPaC) Trust Resource List for the project area (USFWS 2025)
- A Manual of California Vegetation Online (CNPS 2026a)
- CNPS Inventory of Rare and Endangered Vascular Plants of California (CNPS 2026b)
- Calfora database (Calflora 2026)
- Jepson Flora Project (Jepson 2026)
- Natural Resources Conservation Service Web Soil Survey (NRCS 2025)
- Field guides and general references for plants, birds, mammals, reptiles, amphibians, and invertebrates
- Marin County Open Space District Vegetation and Biodiversity Management Plan (MCOSD 2015)
- Northern Spotted Owl 2020 GIS Data (Marin County Parks 2021; provided by Point Blue)

Definition of Special-status Species

In California, special-status plants and animals include those species that are afforded legal protection under the federal and California Endangered Species Acts (ESA and CESA, respectively) and other regulations. These species must be considered during project evaluation to comply with CEQA, during consultation with State and federal resources agencies, and in development of specific management guidelines for resource protection. Special-status species are defined as the following:

- 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 U.S. Fish and Wildlife Service (USFWS), NOAA's

[6] 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 CDFW. 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.

National Marine Fisheries Service (NMFS), and California Department of Fish and Wildlife (CDFW);
- Species defined by CDFW as California Species of Special Concern (SSC);
- Species classified as Fully Protected by CDFW;
- Plant species, subspecies, and varieties defined as rare or threatened by the California Native Plant Protection Act (California Fish and Game Code Section 1900, et seq.);
- Per CNPS and CDFW guidance, some plant taxa listed as CRPR 3 or 4 (i.e., taxa ranked as needing further study, or of limited distribution), depending on circumstances such as local rarity, location on the periphery of the taxa's distribution, or having occurrences on unusual substrates or rare and declining habitats;
- Species that otherwise meet the definition of rare, threatened, or endangered pursuant to Section 15380 of the CEQA Guidelines;
- Mountain lions protected under the California Wildlife Protection Act of 1990 (Proposition 117) and designated as a "specially protected mammal in California"; and
- Native nesting birds, including species identified in the Migratory Bird Treaty Act and species defined by USFWS as Birds of Conservation Concern (BCC).

Additional species found on the Special Animal and Special Plant Lists maintained by CDFW may be included in reporting and analysis based on the proposed project elements, location and potential impacts (CDFW 2025, 2026b). These include taxa designated as a special status, sensitive, or declining species by other state or federal agencies (other than CDFW or USFWS; e.g. US Forest Service) or a non-governmental organization (e.g., The Western Bat Working Group), and determined by the CNDDB to be rare, restricted, declining, or threatened across their range in California. Also included are species that are considered of special concern to CDFW due to lack of adequate information to permit listing or rejection for state or federal status and have not been designated as California Species of Special Concern.

Evaluation Criteria

The potential for special-status species to occur in the project area was reviewed and classified into the following categories: not present, not likely to occur, moderate potential to occur, high potential to occur, or present. The criteria for each of these categories are:

Not Present – Suitable habitat is not present within the project area; the site lacks critical habitat requirements for the species and/or project area is outside the range of the species.

Not Likely to Occur – One or more key habitat components is absent from the project area; no known occurrences in region; or habitat present but species not observed during field surveys that would be expected to discover species, if present, based on season and level of effort. Species is unlikely to occur within the project area.

Moderate Potential to Occur – 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. Field surveys did not confirm or rule out species presence. Species may occur within the project area.

High Potential to Occur – 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. Field surveys did not confirm or rule out species presence. Species is likely to occur within the project area.

Present – Species has reported occurrences within the project area that are believed to be still extant and/or species was observed within the project area during field surveys.

Figure 10 provides a map of reported occurrences of special-status species in the project region, from the CNDDB (CDFW 2026a).

The following species have reported occurrences (CDFW 2026) within the map extent shown:

Actinemys marmorata	northwestern pond turtle
Adela oplerella	Opler's longhorn moth
Amsinckia lunaris	bent-flowered fiddleneck
Antrozous pallidus	pallid bat
Athene cunicularia	burrowing owl
Bombus occidentalis	western bumble bee
Corynorhinus townsendii	Townsend's big-eared bat
Dicamptodon ensatus	California giant salamander
Eriogonum luteolum var. caninum	Tiburon buckwheat
Eucyclogobius newberryi	tidewater goby
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant
Hesperolinon congestum	Marin western flax
Laterallus jamaicensis coturniculus	California black rail
Melospiza melodia samuelis	San Pablo song sparrow
Rallus obsoletus obsoletus	California Ridgway's rail
Rana boylii pop. 1	foothill yellow-legged frog - north coast DPS
Streptanthus glandulosus ssp. pulchellus	Mt. Tamalpais bristly jewelflower
Strix occidentalis caurina	northern spotted owl

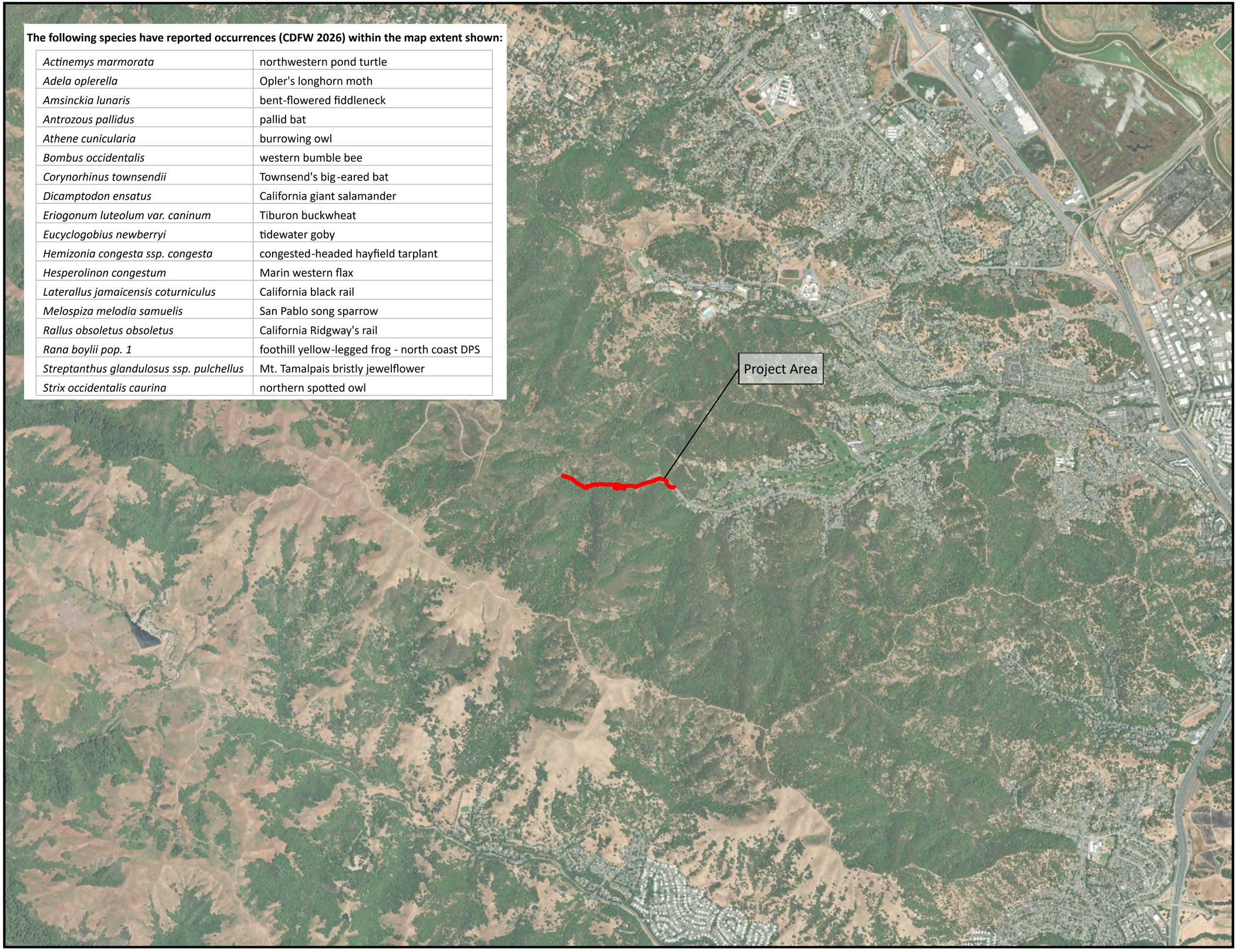

Figure 10
Special-status Species Reported Occurrences

Buck Gulch Falls Creek Restoration and Trail Improvement Project
Ignacio Valley Open Space Preserve
Novato, Marin County

CNDDB version 01/2026. Please Note: The occurrences reported within this area represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not yet been surveyed and/or mapped. Lack of information in the CNDDB about a species or an area can never be used as proof that no special status species occur in an area.

0 0.5 1 Miles

February 2026
Sources:
Basemap - ESRI 2025
CNDDB - CDFW 01/2026

PCI ECOLOGICAL

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Special-status Plant Species

Based on the background literature review, a number of special-status plant species were identified as having the potential to occur within the project area (Figure 10). Species with reported observations in close proximity to the project area and/or in habitat types of relevance (e.g. grassland, shrubland, forest) were evaluated for potential to occur in the project area; see Appendix D. Special-status Plant Species Evaluated for Potential to Occur within the Project Area. Species requiring habitat or microhabitat types not present in the project area (e.g., coastal salt marsh, vernal pools, conifer forests) were not evaluated.

No special-status plant species were observed by PCI in the project area during the botanical surveys conducted in April 2021, July 2021, and October 2025. No federally or state listed threatened or endangered species have been documented in the project area. Two special status species (*Elymus californicus* and *Micropus amphibolus*) were determined to have a moderate potential to occur. Preconstruction botanical surveys of the project area will be conducted during the typical blooming period of these species (i.e., in April and June) in the habitat types these species occupy. If any special-status plant species are found in the project area during the preconstruction survey, MCOSD should ensure the Special-Status Plants-2 protection measures listed in the RTMP (MCOSD 2014) are implemented. If impacts cannot be avoided, the appropriate regulatory agency (CDFW or USFWS) will be contacted to identify an appropriate course of action, such as salvage and transplanting to an appropriate nearby location; seed collection, propagation, and planting; and monitoring for success under the direction of a qualified biologist as approved by the appropriate regulatory agencies.

Sensitive Natural Communities

California Department of Fish and Wildlife (CDFW) ranks natural communities based on their rarity and vulnerability to human impacts. Communities – currently described in terms of vegetation alliance and/or association[7] -- are given both a state level ("S") and global ("G") ranking; those listed as critically imperiled (Rank 1), imperiled (Rank 2), or vulnerable (Rank 3) within the state are considered special-status, defined as "communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects" (CDFW 2026b). In addition, riparian and wetland habitats are typically considered sensitive based on federal, State, and/or local policies.

Poison oak scrub and all forest and scrub communities are considered sensitive due to their association ranking and proximity to the Arroyo de San Jose Creek. See Table 1,

[7] The Manual of California Vegetation (MCV; CNPS 2026) provides membership rules for alliances but not for associations. The MCV references other documents that provide association-level information, but those documents are not always readily available for review. For this report, associations were determined based on dominant species within each layer and comparison with referenced regional project-level reports, if available. Where the MCV-provided associations did not completely match observed stand composition, the best fit alliance was selected.

Figure 3, and Section 6 for further description of vegetation communities within the project area.

Proposed Project Elements in Sensitive Natural Communities

The majority of proposed project work will occur within existing trail footprints and will not extend into or affect native vegetation. A short segment of trail in the coast live oak, California bay, and bigleaf maple forest will be realigned away from stream banks, to protect sensitive riparian habitat and improve trail safety. Following project implementation, all temporarily disturbed areas will be seeded and revegetation will occur along areas of decommissioned trail and in the stream restoration area in accordance with the project revegetation plan. MCOSD should ensure the protection measures listed in Section 0 are implemented during project work to minimize impacts on native plants and communities, reduce the spread of invasive species, and prevent the introduction of plant pathogens. The following sections describe impacts in each sensitive native plant community.

Poison oak scrub: Approximately 938 square feet (0.02 acres) of poison oak scrub will be temporarily disturbed for access to the work area, including herbaceous understory damage from vehicle access. This work will occur along edge of this community, where non-native grasses and forbs are dominant. All disturbed access areas will be reseeded following project construction. Soil compaction and disturbance may occur where heavy equipment is moved through the edge of this community for access to work areas. MCOSD should ensure the protection measures outlined in Section 0 are implemented to minimize compaction and ground disturbance, through actions such as minimizing soil disturbance areas and scarification of soils where compaction occurs, to prepare for revegetation.

Coast live oak forest: Approximately 9,768 square feet (0.22 acres) of native understory will be temporarily disturbed for access to work areas and stream restoration work, including herbaceous understory damage from vehicle access and grading for stream restoration work. Permanent loss from the realigned trail and boardwalk will occur in 331 square feet (0.008 acres) of coast live oak understory. No tree removal in coast live oak forest is planned, but some minor tree trimming may occur on mature live oak trees as part of project work. All disturbed access areas will be reseeded following project construction, and some native understory species may be able to be salvaged and replanted following project implementation (i.e. Douglas iris). The stream restoration area (6,200 square feet, 0.14 acres) and decommissioned trail (641 square feet, 0.01 acres) will be revegetated with native woody and perennial species (including coast live oak) in accordance with the project revegetation plan. Soil compaction and disturbance may occur within the root zone of native trees, where heavy equipment is used for boardwalk and trail installation. MCOSD should ensure the

protection measures outlined in Section 0 are implemented to minimize impacts to native understory and trees, through actions such as minimizing soil disturbance areas, scarification of soils where compaction occurs, avoiding disturbance in sensitive communities and in wet conditions, and minimizing pruning.

California bay forest: Most of the bay understory is existing trail or bare from high amounts of visitation, especially near Buck Gulch Falls. The waterfall viewing area will be placed near Buck Gulch Falls, where no understory is present. No impacts will occur in the bay forest from this improvement, as no trees will be removed and the understory is bare from visitor access. Approximately 781 square feet (0.02 acres) of temporary disturbance will occur from access to work areas, including herbaceous understory damage from vehicle access. The realigned trail and bridge will permanently impact 935 square feet (0.02 acres) of bay forest, which includes impacts to understory vegetation and removal of 5 native trees (all with diameter at breast height [DBH] of 6" or less). All disturbed access areas will be reseeded following project construction, and some native understory species may be able to be salvaged and replanted following project implementation (i.e. Douglas iris). The decommissioned trail (5,491 square feet, 0.13 acres) will be revegetated with native species in accordance with the project revegetation plan. Soil compaction and disturbance may occur within the root zone of native trees, where heavy equipment is used for bridge, trail, and the viewing area installation. MCOSD should ensure the protection measures outlined in Section 0 are implemented to minimize impacts to native understory and trees, through actions such as minimizing soil disturbance areas, scarification of soils where compaction occurs, and avoiding disturbance in sensitive communities and in wet conditions.

Bigleaf maple forest: Approximately 4,246 square feet (0.1 acres) of temporary disturbance will occur in the forest understory for access to work areas. The realigned trail and bridge will permanently impact 1,218 square feet (0.03 acres) of big leaf maple forest, which includes impacts to the understory vegetation, trimming of native trees, and removal of 2 native trees (one with a DBH of 6" and the other with a DBH of approximately 8"). All temporarily disturbed access areas will be reseeded following project construction, and some native understory species may be able to be salvaged and replanted following project implementation (i.e. Douglas iris). Soil compaction and disturbance may occur within the root zone of native trees, where heavy equipment is used for bridge and trail installation. MCOSD should ensure the protection measures outlined in Section 0 are implemented to minimize impacts to native understory and trees, through actions such as minimizing soil disturbance areas, scarification of soils where compaction occurs, and avoiding disturbance in sensitive communities and in wet conditions. In addition, a portion of the decommissioned trail (7,414 square

feet, 0.17 acres) will be revegetated with native species in accordance with in accordance with the project revegetation plan; this revegetation will improve understory vegetation in the big-leaf maple forest, as a significant portion of the understory is bare from existing trails and high levels of visitation near the Arroyo de San Jose Creek.

Arroyo willow thickets: Temporary disturbance will occur in arroyo willow thickets, from access, staging, and stream restoration work, including grading for stream restoration work. Approximately 3,905 square feet (0.09 acres) will be temporarily impacted, which may include trimming and removal of arroyo willow. All disturbed access and staging areas will be reseeded following project construction. Following implementation, the stream restoration area (approximately 6,200 square feet, 0.14 acres) will be revegetated with native woody and perennial species (including woody riparian species) in accordance with the project revegetation plan. Soil compaction and disturbance may occur where heavy equipment is used for stream restoration work. MCOSD should ensure the protection measures outlined in Section 0 are implemented to minimize compaction and ground disturbance, through actions such as minimizing soil disturbance areas and scarification of soils where compaction occurs, to prepare for revegetation.

Special-status Animals

Based on the background literature review and prior work by PCI, a number of special-status wildlife species were identified as having the potential to occur within the project area; see Figure 10. PCI evaluated these species for likelihood of occurrence within the project area based on field observations, suitability of habitat, and proximity of recorded sightings; see the following discussion and Appendix C. Listing status[8] is based on CDFW (2026a). Species requiring habitat types not present in the project area (e.g., green sea turtle, monarch butterfly, etc.) are not included in the table.

Special-status wildlife species determined to have moderate potential to occur in the project area are:

- California giant salamander (*Dicamptodon ensatus*, SSC)
- Cooper's hawk – nesting (*Accipiter cooperii*, WL)
- Northern spotted owl (*Strix occidentalis caurina*, FT, ST)
- Pallid bat (*Antrozous pallidus*, SSC, Western Bat Working Group, high priority species; see *Special-status and Common Bat Species* below)

[8] Listing Status: FE-federally listed as endangered, FT-federally listed as threatened, BCC-Bird of Conservation Concern, ST- State listed as threatened, SE-State listed as endangered, Candidate ST-State candidate to be listed as threatened under CESA, FP-State of California fully-protected species, SSC-California Species of Special Concern, and WL-Watch List (CDFW 2025c).

Other species that were evaluated for the potential to occur within the project area include the following:

- California red-legged frog (*Rana draytonii*, FT, SSC)
- Foothill yellow-legged frog (*Rana boylii*, SSC)
- Townsend's big-eared bat (*Corynorhinus townsendii*, SSC, Western Bat Working Group, high priority species; see *Special-status and Common Bat Species* below)
- Western pond turtle (*Actinemys marmorata*, SSC)
- Western bumble bee (*Bombus occidentalis*, SE)
- White-tailed kite (*Elanus leucurus*, FP)

PCI did not observe any special-status species during field surveys of the project area. Northern spotted owls are discussed below; all species evaluated for potential to occur and potential project impacts on these species are discussed in ***Error! Reference source not found.***[9].

In addition to the special-status species listed above, several species designated as Birds of Conservation Concern (BCC; USFWS 2026)[10] are reported for this area and may occur in the surrounding landscape. Many of these species are locally common (i.e., oak titmouse, wrentit, Nuttall's woodpecker) and others are highly unlikely. These species are not described further in this report but should be protected in accordance with the protected bird species recommendations in Section 0.

Northern Spotted Owl (Strix occidentalis caurina), FT/ST

Point Blue works with Marin County Parks to monitor the nesting of northern spotted owl within their parks, providing detailed, high-quality, up-to-date data for this species. An activity center (AC) for northern spotted owl was documented approximately 0.12 miles south of the study area, with confirmed activity in both 2023 and 2024 and additional recent positive observations in the vicinity (J. Hoorn, pers. comm., Jan. 26, 2026; CDFW 2026a). The project area does not contain suitable nesting or roosting habitat for northern spotted owl due to the lack of large-diameter trees, absence of a dense, multi-layered canopy. While portions of the project area provide limited foraging habitat within forested areas, the higher-quality nesting, roosting, and foraging (NRF) habitat (characterized by dense forest, large trees, and a multi-layered canopy) is only present in areas adjacent to, but outside of, the project area. Given the limited habitat suitability within the project area and the location of documented activity centers and observations, the presence of northern spotted owl within the project area during daytime construction work is unlikely. However, there is a moderate potential for individuals to occur in the

[9] Species that require habitat not present within or immediately adjacent to the project area, and species whose ranges do not include the project area, are not included in the table.

[10] The BCC designation is used by USFWS to identify bird species of high conservation priority that deserve proactive attention, but are not currently designated as endangered or threatened.

suitable habitat that exists within the forests adjacent to the project area (within a 0.25-mile radius). For natural history and more detailed occurrence information, see Appendix C.

While dusky-footed woodrat (a prey species of NSO) has been documented in the surrounding lands (iNaturalist 2026), the project area does not contain suitable woodrat habitat and therefore, does not warrant specific mitigation measures for this particular project.

Proposed Project Impacts on Northern Spotted Owl

The proposed project will include the removal of seven trees (five bay and two big-leaf maple; all less than 10" dbh), with one having previously fallen naturally within the project area; native trees will be planted as part of the revegetation effort. No removal of northern spotted owl NRF habitat is anticipated as a result of project construction. Proposed project activities will not result in net loss of habitat or a downgrade or removal of the function of suitable NRF habitat. All potential NRF habitat present will continue to function in the capacity that existed prior to project work. The RTMP includes measures designed to avoid and minimize impacts on NSO, including designated work windows for noise producing construction activities to avoid the NSO breeding season (Feb. 1 – Jul. 30; USFWS 2011) since approximately 0.4 miles of the project area work falls within 0.25 miles of the documented AC; additional details are in Section 9.

Nesting Birds

Nesting native bird species are protected under both federal and State regulations; California Fish and Wildlife Code (§3503 and §3513) protects birds and their nests, while the federal Endangered Species Act and California Endangered Species Act protects any nesting threatened and endangered bird species. Bald and golden eagles are also protected under the federal Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) of 1940. If construction occurs within the typical nesting season (March 15 – August 15), protection measures outlined in Section 8 will be implemented to avoid impacts to nesting birds.

Proposed Project Impacts on Nesting Birds

The project area supports foraging and breeding habitat for a number of native bird species. If birds are nesting in trees within or adjacent to the project site during construction, this could cause nest abandonment. The RTMP includes a suite of measures designed to avoid and minimize impacts on nesting birds. These RTMP measures include minimizing potential impacts by limiting work to times outside the nesting bird period for birds that could use the habitat in the project area or by surveying the area for the present of bird nests, and determining appropriate buffers to protect the nests as described in RTMP measure *Special-*

status Wildlife-3: Seasonal Restrictions During Bird Nesting Season and *Special-status and Nesting Birds Protection* and *Special-status and Nesting Birds Mitigation Measures*.

Special Status and Common Bat Species

Foraging habitats for bats range from woodlands, forests, and grasslands to open water. Most Marin County bat species are insectivorous and feed by echolocation. Bats use caves, mines, buildings, bridges, tree hollows, curled leaves or tree bark, and other natural and man-made crevices for roosting. Focused surveys for bats were not performed as part of this biological assessment; however, a number of bat species are likely to use the project area and adjacent lands. Two special-status bat species – pallid bat and Townsend's big-eared bat – are reported within the region (CDFW 2025a), with the pallid bat determined to have a moderate potential for occurrence within the project area.

Proposed Project Impacts on Special Status and Common Bat Species

If roosting bats are present in tree hollows or crevices within the project area during tree removal, they could be injured or crushed. Roosting bats that are present during construction in trees immediately adjacent to the project area could be disturbed by construction noises. Construction will occur during daylight hours, which will eliminate temporary construction impacts on bats that forage within the project area. Additional protection measures should be implemented to minimize impacts on these species (see Special-status Species and Habitats 9). Minimal loss of roosting tree habitat will occur, and no long-term impacts to bats are expected.

9 Protection Measures

The following measures should be implemented to avoid or minimize impacts to biological and aquatic resources during construction of the proposed project as required in the RTMP. They apply to this proposed project based on the project elements, project location, and the presence of federally listed species, state-listed species, or California Species of Special Concern. The in-channel project construction period will occur during the dry season when water is not flowing in the Arroyo de San Jose Creek. The Best Management Practices (BMPs) within the MCOSD's Road and Trail Management Plan (MCOSD 2014; see Appendix E.) should be followed to minimize impacts and protect natural resources.

General Protection Measures During Construction

MCOSD should ensure the following actions are implemented during construction to avoid and minimize potential impacts on natural resources during construction. These protection measures come from MCOSD's Road and Trail Management Plan; see Appendix E. for details of each protection measure.

- General-1: Limit Work Area Footprints in Sensitive Resource Areas.

- General-3: Minimize Potential for Erosion.
- General-4: Control Food-Related Trash.
- General-9: Conduct Worker Training.
- General-10: Road and Trail Inspections.
- Sensitive Natural Resources-1: Modify Management Practices near Sensitive Natural Resources.

Protection of Native Plants and Communities

MCOSD should ensure the following actions are implemented during construction to avoid and minimize potential impacts on native plants and communities. These protection measures come from MCOSD's Road and Trail Management Plan; see Appendix E. for details of each protection measure.

- General-1: Limit Work Area Footprints in Sensitive Resource Areas.
- General-3: Minimize Potential for Erosion.
- General-5: Modify Construction Methods Relating to Soil Disturbance, Restrict use of Offsite Soil, Aggregate, or Other Construction Materials.
- General 11-: Management of Sudden Oak Death.
- Special-Status Plants-2: Avoidance and Protection of Special-Status Plant Species near Road and Trail Management Projects. Surveys should be conducted in April and June, before construction and during the typical blooming period for special-status species with moderate potential to occur in the project area (*Elymus californicus* and *Micropus amphibolus*). If any special status plant species are found, follow the measures in Special-Status Plants-2.
- Special-Status Plants-11: Reuse and Replanting of Native Trees and Shrubs. Salvage can also include native perennial species such as Douglas Iris.
- Invasive Plant-3: Survey and Control Invasive Plants in Project Footprint, Including Access Roads and Staging Areas.
- Invasive Plant-4: Limit Soil Disturbance.
- Invasive Plant-5: Clean Invasive Plant Materials and Propagules from Heavy Equipment, Maintenance Tools, and Fire Management Vehicles.
- Invasive Plant-6: Reduce Potential for Establishment of Invasive Plants on Disturbed Soil Surfaces.
- Invasive Plant-10: Monitoring Decommissioned Areas.

In addition to the RTMP protection measures listed above, MCOSD should ensure that the following measures are implemented during proposed project activities to protect native trees:

- Minimize pruning. Light pruning may occur at any time of year. Heavy pruning may cause problems due to vigorous sprouting and subsequent witches broom or powdery mildew diseases. Heavy pruning shall be done on deciduous trees in the winter.

- Minimize impacts within the Root Protection Zone (RPZ), which is defined as 1.5 times the dripline radius measured from the tree trunk and extends approximately three feet below the soil surface.
- Soil compaction within protected tree perimeters shall be avoided to the extent feasible.
- Heavy equipment, vehicles, and/or construction materials shall not be parked or stored beneath trees or operated within the delineated protected perimeter.
- Where heavy equipment and vehicles must travel outside of the existing trail alignment for staging, access, or other project work in wooded habitats (coast live oak forest, California bay forest, bigleaf maple forest, and arroyo willow thickets) within the root protection zones of trees, use the smallest vehicle feasible, travel only when soil is dry, and install construction mats to prevent compaction as directed by a staff forester or ecologist.
- Protect native trees from incidental equipment damage to their trunk and limbs. Install tree wrap if equipment will come within 10 feet of mature native trees.

Special-status Wildlife Protection Measures

MCOSD should ensure the following actions are implemented during construction to avoid and minimize potential impacts on special-status wildlife species. These protection measures come from MCOSD's Road and Trail Management Plan; see Appendix E. for details of each protection measure.

- Special-status Wildlife-2: Preconstruction Surveys.
- Special-status Wildlife-3: Seasonal Restrictions During Bird Nesting Season.
- Special-status Wildlife-7: Protection of Fish Habitats.
- Special-status Wildlife-8: Worker Awareness Training.
- Special-status Wildlife-9: Construction Monitoring.
- Special-status Wildlife-10: Relocation of Special-status Species.

Northern Spotted Owl Protection Measures

MCOSD should ensure the following actions are implemented during construction to avoid and minimize potential impacts on northern spotted owl. This protection measure comes from MCOSD's Road and Trail Management Plan; see Appendix E. for details of each protection measure.

- Special-status Wildlife-4: Avoidance and Protection of the Northern Spotted Owl.

Special-status and Nesting Birds Mitigation Measures

In addition to *Special-status Wildlife-3: Seasonal Restrictions During Bird Nesting Season*, and *Special-status Wildlife-4: Avoidance and Protection of the Northern Spotted Owl*, MCOSD should ensure the following actions, which provide guidance by guild and nesting season as well as buffer specifications, are implemented during construction to adequately ensure a less than significant impact on nesting birds. If work occurs outside the nesting bird window of January 1 to July 31, surveys and avoidance measures would

not be necessary for special-status and nesting birds. The broadest nesting bird window based on Table 6 would be January 1 – October 31. The project area does not include habitat for double-crested cormorant, herons, egrets, bitterns, or California black rail and these species would not be affected by implementation of the proposed project; therefore, the nesting bird window of January 1 – July 31 is appropriate for the proposed project.

- Surveys shall be conducted within seven days of the start of active ground-disturbing activities within the general buffers identified in Table 3: Guideline Buffers by Species or Guild. If the work area is left unattended for more than seven days following the initial surveys, additional surveys shall be completed. This timing is standard protocol based on common knowledge of avian biology. Ongoing construction monitoring of active nests shall occur to ensure no nesting activity is disturbed.
- If the biologist finds no active nesting or breeding activity, work can proceed without restrictions.
- If active raptor or owl nests or active nests of other special-status birds are identified within the buffer area guidelines included in Table 3, a qualified biologist shall determine whether construction activities may impact the active nest or disrupt reproductive behavior. If the biologist determines construction would not affect an active nest or disrupt breeding behavior, construction can proceed without restrictions. The determination of disruption shall be based on the species' sensitivity to disturbance, which can vary among species; the level of noise or construction disturbance; and the line of sight between the nest and the disturbance. If the biologist determines activities would be detrimental to the species nest, the buffer area guidelines identified in Table 3: Guideline Buffers by Species or Guild would be established until the nest has been vacated, meaning that the chicks have fledged.
- If state and/or federally listed birds are found breeding within the construction area, MCOSD would consult with the CDFW and USFWS prior to the initiation of work. If construction activities must continue and would not incur take of the listed species, MCOSD would establish the buffer area guidelines included in Table 3: Guideline Buffers by Species or Guild, until the nest has been vacated, meaning that the chicks have fledged.

Table 3: Guideline Buffer by Species or Guild Species/Guild	**Recommended Buffer** (meters/feet)	**Nesting Season**
Diurnal Raptors (i.e.: Cooper's hawk)	76 meters (250 feet)	January 01 – July 31
Owls (except northern spotted owl)	50 meters (160 feet)	January 01 – July 31
Northern Spotted Owl	402 meters (1,320 feet or ¼ mile)	February 01- July 31
Double-crested Cormorant	50 meters (160 feet)	March 01 – October 31
Herons/Egrets/Bitterns	100 meters (330 feet)	January 01 – September 30
Waterfowl (Ducks/Geese/Swans)	30 meters (100 feet)	March 01 – July 31

California black rail	213 meters (700 feet)	February 01 – August 31
Larger Passerines: Corvids (crows, jays), Thrushes	20 meters (65 feet)	March 01 – July 31
Most Songbirds	10 meters (30 feet)	March 01 – July 31
Hummingbirds	10 meters (30 feet)	January 01 – July 31
Woodpeckers	15 meters (50 feet)	March 01 – July 31
Band-tailed Pigeon (BTPI)	30 meters (100 feet)	March 01 – July 31
Pigeons/Doves (except BTPI)	20 meters (65 feet)	March 01 – July 31
Species of Special Concern (olive-sided flycatcher, grasshopper sparrow, San Pablo song sparrow)	22 meters (75 feet)	March 01 – July 31
Blackbirds (tri-colored and red-winged)	30 meters (100 feet)	March 01 – July 31
Turdidae (robins, thrushes)	20 meters (65 feet)	March 01 – July 31
Killdeer	22 meters (75 feet)	March 01 – July 31

Common and Special-Status Roosting Bat Mitigation Measures

In addition to the protection measures provided in the RTMP for special-status wildlife (see above), MCOSD should implement the following mitigation measure to add protection specific to common and special-status bat species:

- Bat Tree Habitat Assessment and Surveys. Prior to any tree removal, a Qualified Biologist shall conduct a habitat assessment for bats, unless otherwise approved in writing by CDFW. The habitat assessment shall be conducted at least two weeks prior to tree removal and shall include a visual inspection of potential roosting features (e.g., cavities, crevices in wood and bark, exfoliating bark for colonial species, suitable canopy for foliage roosting species). If suitable habitat trees are found, they shall be flagged or otherwise clearly marked. Trees may be removed outside seasonal periods of bat activity (September 1-October 15), or if: a) a Qualified Biologist conducts night emergence surveys or completes visual examination of roost features that establish absence of roosting bats, or b) presence of bats is presumed, or documented during the surveys described above, and removal using the two-step removal process detailed below occurs. Two-step tree removal shall be conducted over two consecutive days as follows: 1) the first day (in the afternoon), under the direct supervision and instruction by a Qualified Biologist with experience conducting two-step tree removal, limbs and branches shall be removed by a tree cutter using chainsaws only. Limbs with cavities, crevices, or deep bark fissures shall be avoided, and 2) the second day the entire tree shall be removed.

10 References

Armstrong, Amon Jotesh, "Use of redwood basal hollows by bats: a focus on the Townsend's big-eared bat on the North Coast of California" (2021). Cal Poly Humboldt theses and projects. 491.
https://digitalcommons.humboldt.edu/etd/491

Calflora. 2026. Calflora database – Information on Wild California Plants for Conservation, Education, and Appreciation. Accessed at: http://www.calflora.org/.

California Department of Fish and Wildlife (CDFW). 2013. Arroyo San Jose Creek Stream Habitat Assessment Report. Surveyed 2009. Report completed in 2013.

California Department of Fish and Wildlife (CDFW). 2019b. Assessment of the status of the Townsend's big-eared bat in California. Available from:
https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=172788&inline

California Department of Fish and Wildlife (CDFW). 2026a. California Natural Diversity Database, RareFind Version 5.0, Spotted Owl Viewer, and BIOS. California Department of Fish and Game. Sacramento, CA. http://www.dfg.ca.gov/biogeodata/cnddb

California Department of Fish and Wildlife (CDFW). 2026b. Sensitive Natural Communities. California Department of Fish and Wildlife. Sacramento, CA.
https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153609&inline

California Department of Fish and Wildlife (CDFW). 2025. Special Animals List – October 2025. Periodic publication.

California Native Plant Society (CNPS). 2026a. A Manual of California Vegetation Online. California Native Plant Society. Sacramento, CA. http://vegetation.cnps.org/

California Native Plant Society (CNPS). 2026b. Inventory of Rare and Endangered Plants (online edition). California Native Plant Society. Sacramento, CA.

Cal-IPC. 2026. Cal-IPC Inventory - Plants A to Z – California Invasive Plant Council. www.cal-ipc.org.

Cormier, R. L. 2020. Northern Spotted Owl Monitoring on Marin County Parks and Marin Municipal Water District Lands, 2020 Report. Point Blue Conservation Science, Petaluma, CA.

Ellis TD. 2018. Monitoring northern spotted owls on federal lands in Marin County, California: 2017 report. Natural Resource Report. NPS/SFAN/NRR—2018/1677. National Park Service. Fort Collins, CO.

Golden Gate National Parks Conservancy, Tamalpais Lands Collaborative (One Tam) and Tukman Geospatial LLC, and Aerial Information Systems. 2021. Marin County Fine Scale Vegetation Map. https://parksconservancy.maps.arcgis.com/apps/webappviewer/index.html?id=4ef2881436bc4365be881b17f69ab067

Hoorn, Jason. Natural Resources Planner, Marin County Parks. Personal communication with author, January 26, 2026.

Howell J.T., F. Almeda, W. Follette, and C. Best. 2007. *Marin Flora.* California Academy of Sciences, San Francisco, CA. 510 pp.

iNaturalist. 2025. iNaturalist [Online database for species observations by the public]. Accessed at: https://www.inaturalist.org/

Jepson Flora Project (eds.) 2026. Jepson eFlora. http://ucjeps.berkeley.edu/eflora/

Leidy, R.A., G.S. Becker, B.N. Harvey. 2005. Historical distribution and current status of steelhead/rainbow trout (*Oncorhynchus mykiss*) in streams of the San Francisco Estuary, California. Center for Ecosystem Management and Restoration, Oakland, CA.

Marin County. Undated. Preparation of Biological Site Assessments. County of Marin, Community Development Agency, Planning Division.

Marin County Open Space District (MCOSD). 2014. Road and Trail Management Plan. December 14, 2014 Final. Prepared for Marin County Parks and Marin County Open Space District.

Marin County Open Space District (MCOSD). 2015. Vegetation and Biodiversity Management Plan. April 2015 Draft. Prepared for Marin County Parks and Marin County Open Space District.

Marin County Parks. 2021. Northern Spotted Owl 2020 GIS Data. Provided by Point Blue. GIS layer.

Nafis, G. 2021. California Herps – A Guide to the Amphibians and Reptiles of California. www.californiaherps.com/index.html.

Natural Resources Conservation Service (NRCS). 2025. Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Point Blue Conservation Science (Point Blue). 2020. Northern Spotted Owl Monitoring on Marin County Open Space District and Marin Municipal Water District Lands, 2020 Report. Report to Marin County Parks and Marin Municipal Water District 2020.

PCI Ecological (PCI). 2024a. Buck Gulch Falls Accessible Trail Feasibility Study.

PCI Ecological (PCI). 2024b. Buck Gulch Falls Trail Arroyo San Jose Streambank Stabilization Site Plan.

Riparian Habitat Joint Venture (RHJV). 2004. Version 2.0. The Riparian Bird Conservation Plan: A Strategy for Reversing the Decline of Riparian Associated Birds in California.

Shuford, W.D. 1993. The Marin County Breeding Bird Atlas. A Distributional and Natural History of Coastal California Birds. California Avifauna Series 1. Bushtit Books, Bolinas, CA.

U.S. Fish and Wildlife Service (USFWS). 2023. Recovery Outline – Foothill Yellow-Legged Frog. Available from: https://ecos.fws.gov/docs/recovery_plan/Signed%20FYLF%20Recovery%20Outline%209-14-23.pdf.

U.S. Fish and Wildlife Service (USFWS). 2025. Information for Planning and Conservation (IPaC) Trust Resource Report. https://ecos.fws.gov/ipac/

Appendix A. Project Area Photographs 2021 and 2025

Grasslands, with a yellow-star thistle patch visible in grey. Taken in April 2021.

Existing trail through coyote brush scrub (left) and poison oak scrub (right). Taken in April 2021.

Poison oak scrub along existing trail, with California sagebrush and yerba santa also visible. Taken in April 2021.

Arroyo willow thicket along Arroyo de San Jose Creek. Taken in April 2021.

Coast live oak forest along the existing trail. Taken in April 2021.

Iris stand growing within a drainage in the oak forest understory. Taken in April 2021.

Bigleaf maple forest understory, with the Arroyo de San Jose Creek and existing trail visible. Taken in October 2025.

California bay forest surrounding Arroyo de San Jose Creek, with limited understory due to high visitation. Taken in October 2025.

Appendix B. Plant Species Observed 2021 & 2025

Common Name	Latin Name	Family - Common Name	Introduced (I) / Highly Invasive (HI)
bigleaf maple	*Acer macrophyllum*	Soapberry Family	
deerweed	*Acmispon glaber*	Legume Family	
chamise	*Adenostoma fasciculatum*	Rose Family	
California maidenhair fern	*Adiantum jordanii*	Brake Family	
California buckeye	*Aesculus californica*	Soapberry Family	
bent grass	*Agrostis* sp.	Grass Family	varies
common fiddleneck	*Amsinckia intermedia*	Waterleaf Family	
wiry snapdragon	*Antirrhinum vexillocalyculatum*	Plantain Family	
Pacific madrone	*Arbutus menziesii*	Heath Family	
common manzanita	*Arctostaphylos manzanita*	Heath Family	
California pipe vine	*Aristolochia californica*	Birthwort Family	
coastal sage brush	*Artemisia californica*	Sunflower Family	
slender wild oat	*Avena barbata*	Grass Family	I
wild oat	*Avena fatua*	Grass Family	I
coyote brush	*Baccharis pilularis*	Sunflower Family	
brook foam	*Boykinia occidentalis*	Saxifrage Family	
rattlesnake grass	*Briza maxima*	Grass Family	I
ripgut brome	*Bromus diandrus*	Grass Family	I
soft chess brome	*Bromus hordeaceus*	Grass Family	I
Pacific false bindweed	*Calystegia purpurata*	Morning-Glory Family	
milk maids	*Cardamine californica*	Mustard Family	
bitter cress	*Cardamine oligosperma*	Mustard Family	
Italian thistle	*Carduus pycnocephalus*	Sunflower Family	I
round fruit sedge	*Carex globosa*	Sedge Family	
yellow star-thistle	*Centaurea solstitialis*	Sunflower Family	HI
spikeweed	*Centromadia fitchii*	Sunflower Family	
sticky chickweed	*Cerastium glomeratum*	Pink Family	I
soap plant	*Chlorogalum pomeridianum var. pomeridianum*	Century Plant Family	
Venus thistle	*Cirsium occidentale* ssp. *venustum*	Sunflower Family	
miner's lettuce	*Claytonia perfoliata*	Miner's Lettuce Family	
Chinese houses	*Collinsia heterophylla*	Plantain Family	
jubata grass	*Cortaderia jubata*	Grass Family	HI
hazelnut	*Corylus cornuta* ssp. *californica*	Birch Family	
hedgehog dogtail	*Cynosurus echinatus*	Grass Family	I
tall flatsedge	*Cyperus eragrostis*	Sedge Family	
orchard grass	*Dactylis glomerata*	Grass Family	I
canyon larkspur	*Delphinium nudicaule*	Buttercup Family	
wild hyacinth	*Dichelostemma capitatum*	Lily Family	
sticky monkeyflower	*Diplacus aurantiacus*	Lopseed Family	

Common Name	Latin Name	Family - Common Name	Introduced (I) / Highly Invasive (HI)
wood fern	*Dryopteris arguta*	Wood Fern Family	
rock lettuce	*Dudleya cymosa*	Stonecrop Family	
blue wildrye	*Elymus glaucus*	Grass Family	
California fuchsia	*Epilobium canum*	Evening-Primrose Family	
yerba santa	*Eriodictyon californicum*	Waterleaf Family	
naked buckwheat	*Eriogonum nudum*	Buckwheat Family	
long beaked filaree	*Erodium botrys*	Geranium Family	I
red stemmed filaree	*Erodium cicutarium*	Geranium Family	I
seep monkeyflower	*Erythranthe guttata*	Lopseed Family	
California poppy	*Eschscholzia californica*	Poppy Family	
brome fescue	*Festuca bromoides*	Grass Family	I
California fescue	*Festuca californica*	Grass Family	
annual ryegrass	*Festuca perennis*	Grass Family	I
checker lily	*Fritillaria affinis*	Lily Family	
cleavers, goose grass	*Galium aparine*	Madder Family	
cut-leaf geranium	*Geranium dissectum*	Geranium Family	I
crane's bill geranium	*Geranium molle*	Geranium Family	I
toyon	*Heteromeles arbutifolia*	Rose Family	
oceanspray	*Holodiscus discolor*	Rose Family	
Mediterranean barley	*Hordeum marinum* ssp. *gussoneanum*	Grass Family	I
farmer’s foxtail	*Hordeum murinum* ssp. *leporinum*	Grass Family	I
smooth cat's ear	*Hypochaeris glabra*	Sunflower Family	I
rough cat's ear	*Hypochaeris radicata*	Sunflower Family	I
Douglas iris	*Iris douglasiana*	Iris Family	
ground iris	*Iris macrosiphon*	Iris Family	
Pacific rush	*Juncus effusus* ssp. *pacificus*	Rush Family	
gray rush	*Juncus patens*	Rush Family	
hillside pea	*Lathyrus vestitus* var. *vestitus*	Legume Family	
false babystars	*Leptosiphon androsaceus*	Phlox Family	
woodland star	*Lithophragma affine*	Saxifrage Family	
honeysuckle	*Lonicera hispidula*	Honeysuckle Family	
miniature lupine	*Lupinus bicolor*	Legume Family	
scarlet pimpernel	*Lysimachia arvensis*	Myrsine Family	I
coastal tarweed	*Madia sativa*	Sunflower Family	
false Solomon’s seal	*Maianthemum racemosum*	Butcher's-Broom Family	
mallow	*Malva* sp.	Mallow Family	I
pineapple weed	*Matricaria discoidea*	Sunflower Family	I
burclover	*Medicago polymorpha*	Legume Family	I
Torrey's melic	*Melica torreyana*	Grass Family	
coyote mint	*Monardella villosa* ssp. *villosa*	Mint Family	
canyon nemophila	*Nemophila heterophylla*	Waterleaf Family	

Common Name	Latin Name	Family - Common Name	Introduced (I) / Highly Invasive (HI)
baby blue eyes	*Nemophila menziesii*	Waterleaf Family	
sweet-cicely	*Osmorhiza berteroi*	Carrot Family	
coffee fern	*Pellaea andromedifolia*	Brake Family	
goldenback fern	*Pentagramma triangularis*	Brake Family	
Harding grass	*Phalaris aquatica*	Grass Family	I
rusty popcornflower	*Plagiobothrys nothofulvus*	Waterleaf Family	
English plantain	*Plantago lanceolata*	Plantain Family	I
California polypody	*Polypodium californicum*	Polypody Family	
licorice fern	*Polypodium calirhiza*	Polypody Family	
western sword fern	*Polystichum munitum*	Wood Fern Family	
fairy bells	*Prosartes hookeri*	Lily Family	
coast live oak	*Quercus agrifolia*	Oak Family	
black oak	*Quercus kelloggii*	Oak Family	
valley oak	*Quercus lobata*	Oak Family	
interior live oak	*Quercus wislizeni*	Oak Family	
buttercup	*Ranunculus californicus*	Buttercup Family	
Himalayan blackberry	*Rubus armeniacus*	Rose Family	HI
California blackberry	*Rubus ursinus*	Rose Family	
sheep sorrel	*Rumex acetosella*	Buckwheat Family	I
dock	*Rumex* sp.	Buckwheat Family	I
shinning willow	*Salix lasiandra* var. *lasiandra*	Willow Family	
arroyo willow	*Salix lasiolepis*	Willow Family	
blue elderberry	*Sambucus nigra* ssp. *caerulea*	Muskroot Family	
Pacific sanicle	*Sanicula crassicaulis*	Carrot Family	
bee plant	*Scrophularia californica*	Figwort Family	
common sowthistle	*Sonchus oleraceus*	Sunflower Family	I
rough hedgenettle	*Stachys rigida*	Mint Family	
common chickweed	*Stellaria media*	Pink Family	I
snowberry	*Symphoricarpos albus*	Honeysuckle Family	
creeping snowberry	*Symphoricarpos mollis*	Honeysuckle Family	
spreading hedgeparsley	*Torilis arvensis*	Carrot Family	I
poison oak	*Toxicodendron diversilobum*	Sumac or Cashew Family	
Fremont's star lily	*Toxicoscordion fremontii*	False-Hellebore Family	
rose clover	*Trifolium hirtum*	Legume Family	I
clover	*Trifolium* sp.	Legume Family	varies
subterranean clover	*Trifolium subterraneum*	Legume Family	I
giant wakerobin	*Trillium chloropetalum*	False-Hellebore Family	
California bay	*Umbellularia californica*	Laurel Family	
spring vetch	*Vicia sativa*	Legume Family	I
California wild grape	*Vitis californica*	Grape Family	

Appendix C. Special-status Animal Species Evaluated to Occur within the Project Area

The following table lists the special-status animal species evaluated for potential occurrence within the project area. Species that are known to occur in the region but are not included in the following table are considered not present within the project area due to a lack of nearby CNDDB occurrences and/or no suitable habitat present in the project areas[11]. Bird species of Conservation Concern that may occur in the project vicinity are not included in the following table; they will be protected; see *Nesting Bird Protection*.

Species and Status[12] USFWS/CDFW	Habitat and Life History	Potential for Occurrence[13] within the Project Area & Potential Effects
Amphibians		
foothill yellow-legged frog – north coast DPS *Rana boylii* --/SSC	Found in or near partly shaded rocky streams from near sea level to 6,300 feet in a variety of habitats. Breeding generally occurs from mid-February to early July after high winter flows have subsided. Egg masses are attached to the downstream side of rock and gravel in shallow, slow, or moderate-sized streams. Tadpoles require three to four months to attain metamorphosis. Adults eat aquatic and terrestrial invertebrates while tadpoles graze along rocky stream bottoms on algae and diatoms. This species is generally found near water year-round, but adults move away from larger streams in the fall, to avoid high-velocity flows. Juveniles also disperse away from natal streams into uplands in the fall, usually at night during rainy weather or nights with high humidity.	**Not likely to occur.** A small population of frogs have been reported 2.5 miles to the west of the project area in the Nicasio Creek watershed, which is the nearest perennial creek. There is a small population in Cascade Canyon Creek, 5.75 miles south of the project area. There is a historic occurrence from the 1940s at Hamilton Army Airfield, 2 miles downstream of the project area. This population is possibly extirpated. There are no extant records of foothill yellow-legged frog in the Arroyo de San Jose Creek watershed (CDFW 2026a). Suitable breeding habitat for foothill yellow-legged frogs is not present within the project area as the Arroyo de San Jose Creek does not have the persistent perennial flow required by this species to successfully reproduce but does contain limited amounts of dispersal (creek) and foraging (creek and upland) habitat. This species is generally not found far (within 50 m) from water during all seasons. Juveniles and adults can disperse up to 7 km from their natal streams, however, once sexually mature (age 2-3 years) they move back to their natal streams to reproduce (USFWS

[11] This includes the burrowing owl (*Athene cunicularia*), California Least Tern (*Sternula antillarum browni*), California black rail (*Laterallus jamaicensis coturniculus*), California Ridgway's rail (*Rallus obsoletus obsoletus*), green sea turtle (*Chelonia mydas*, FT/--), green sturgeon – southern DPS (*Acipenser medirostris pop. 1*), longfin smelt - San Francisco Bay-Delta DPS (*Spirinchus thaleichthys pop. 2*), monarch butterfly - California overwintering population (*Danaus plexippus plexippus pop. 1*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), salt-marsh harvest mouse (*Reithrodontomys raviventris*), San Pablo song sparrow (*Melospiza melodia samuelis*), tidewater goby (*Eucyclogobius newberryi*), and western snowy plover (*Charadrius nivosus nivosus*).

[12] Listing Status: FE-federally listed as endangered, FT-federally listed as threatened, FC-candidate for federal listing, BCC-Bird of Conservation Concern, SE-state listed as endangered, ST-state listed as threatened, Candidate SE-state candidate to be listed as endangered under CESA Candidate ST-state candidate to be listed as threatened under CESA, FP-State of California fully-protected species, SSC-California Species of Special Concern, and WL-Watch List.

[13] See *Special-status Species Evaluation Criteria.*

Species and Status[12] USFWS/CDFW	Habitat and Life History	Potential for Occurrence[13] within the Project Area & Potential Effects
		2023). Dispersal events generally occur at night, during or after rain events, so construction will not interfere with dispersing individuals. Given the lack of water within the Arroyo de San Jose Creek during the construction period, there is low potential for an adult or juvenile, potentially dispersed from the small Nicasio Creek watershed population, to be present within the project area.

Species and Status[12] USFWS/CDFW	Habitat and Life History	Potential for Occurrence[13] within the Project Area & Potential Effects
California giant salamander *Dicamptodon ensatus* --/SSC	Occur in wet coastal forests near permanent and semi-permanent streams and springs, occurring within 50 meters of streams. Breeding occurs mostly in spring, but sometimes fall. Eggs are laid in water and larvae exhibit an enlarged tail fin for swimming with external gills. They transform into nocturnal land-dwelling salamanders with lungs around 18 to 24 months. They consume a wide variety of animals from small invertebrates to salamanders, rodents, and lizard – they exhibit a sit and wait feeding style. Most active and often observed on damp nights in the rainy season.	**Moderate potential to occur.** California giant salamanders are reported within several miles of the project area (CDFW 2026a). The nearest reported occurrence is from the adjacent Miller Creek watershed on the Lucas Valley Preserve; salamanders were reported there in 2010 within 1.6 miles of the project area. Additional sightings are reported within 4.75 miles near Nicasio and within 4.3 miles in the San Geronimo Valley. There are no reported occurrences of California giant salamander within the Arroyo de San Jose Creek watershed in the CNDDB (CDFW 2026a). Suitable upland habitat for California giant salamanders is present within the project area (forest understory and burrows within 50 m of cool, heavily forested drainages); however, suitable aquatic habitat (breeding) habitat (perennial streams or pools) is very limited. The project area only crosses the Arroyo de San Jose Creek in a few areas. At the time of the surveys in 2025, these creek crossing areas were completely dry and exhibited topography that does not support perennial pools or water; however, creek topography can shift from year to year. If a perennial pool is present within the area where the project area crosses the creek there is a chance salamanders could use the project area for breeding, and however, water would need to be present year-round for successful transformation of juveniles (18 + month larval stage). It is more likely that this salamander species breeds in other areas of the Creek outside the project area, where reliable perennial pools exist; for example, a pool above Buck Gulch Falls, outside the project area, may support persistent water and successful breeding habitat. Salamanders may use the creek and adjacent channels for dispersal and be present within the adjacent upland habitat within the project areas during all seasons. Adults could use the forest understory for refuge and terrestrial foraging habitat, being most active at night and when there is high humidity or rain events. They could be present within burrows or understory within the project area during construction. **With implementation of the avoidance and minimization measures impacts would be less than significant.**

Species and Status[12] USFWS/CDFW	Habitat and Life History	Potential for Occurrence[13] within the Project Area & Potential Effects
California red-legged frog *Rana draytonii* FT/SSC	Breeding habitat includes 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 November through April depending on location. During the non-breeding season, California red-legged frogs can remain at the breeding site (in the presence or absence of water) or move into surrounding habitats.	**Not likely to occur.** According to the CNDDB, there are no reported populations of California red-legged frog within 5 miles of the project area (CDFW 2026a). The nearest CNNDB sightings are reported on the Tiburon Peninsula and Lagunitas Creek. However, Marin County staff have documented frogs on Mount Burdell Preserve within 4.75 miles of the project area (MCOSD 2015). Suitable habitat for California-red legged frogs is not present within the project area. The project area does not support aquatic breeding habitat. There are nearby open space lands that support potential breeding sites, but none within suitable migration distances for this species.
Reptiles		
northwestern pond turtle *Actinemys marmorata* Proposed FT/SSC	A year-round resident of Sonoma County 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, in upland areas (typically grassy with good sun exposure). Nest sites can occur over 500 m from water. Eggs hatch in late summer or fall. In northern California, hatchlings can remain buried until the following spring. Turtles may use uplands for overland migration (movements up to 5 km).	**Not likely to occur.** Pond turtles occur year-round in select Marin County streams, ponds, and reservoirs. Pond turtles are known to occur within the watershed. There is a small population of pond turtles directly north of the Ignacio Valley Preserve at Pacheco Pond in the Indian Valley Preserve (CDFW 2021a; PCI personal observation). CDFW (2013) also documented pond turtles during a stream inventory of Arroyo de San Jose Creek. Turtles were documented in the vicinity of the golf course which is downstream of the project area. Suitable habitat for pond turtles is not present within the project area. The project area was evaluated during spring (2021) and fall (2025) and the stream channel supported only minimal flow and small isolated pools. Based on the observed conditions in spring, the project area does not appear to support deeper pools with persistent water and aquatic habitat refugia. Pond turtles could move upstream into the area on occasion but are not likely to be present during the low flow season when construction would occur. Based on PCI's observations, suitable habitat for pond turtles is not present within the project area.
Mammals		
Pallid bat *Antrozous pallidus* --/SSC high priority species with the	Grassland, shrubland, forest, and woodland habitats at low elevations up through mixed coniferous forests. Most common in open, dry habitats with rocky areas for roosting. Forages over open ground (1.6-8 ft) above ground and can hunt large, hard-shelled prey (beetles, spiders, moths, etc.). Gleaning is usual strategy with some	**Moderate potential to occur.** Pallid bats are reported within several miles of project area (CDFW 2021a). There is a reported occurrence within 2.5 miles to the south of the project area near Gallinas Valley from 2001; the sighting is a maternity colony documented in a residential structure but is

Species and Status[12] USFWS/CDFW	Habitat and Life History	Potential for Occurrence[13] within the Project Area & Potential Effects
Western Bat Working Group	aerially taken prey. A social species forming small colonies. Roosting sites include caves, mines, crevices, and occasionally buildings and hollow trees during day, more open sites used at night (porches, open buildings). At low elevations, locally common in California. Easily disturbed at roosting sites.	assumed to be possibly extirpated. There is an additional maternal colony reported 4 miles to northwest of the project area near Stafford Lake; this colony is also assumed to be possibly extirpated. There was a collection made in the 1880s to the southwest of the project area. There are additional sightings over 5 miles from the project area. Suitable roosting habitat is present within (tree hollows and crevices) and adjacent (buildings, rocky crevices) to the project area and roosting bats may be present in the project area during construction. The project area also supports suitable foraging habitat and invertebrate food sources are likely to be abundant. Construction will occur only during daylight hours and will not interfere with the foraging ability of bats. Any native tree removal will follow protection measures to minimize impacts and habitats will not be modified that would be detrimental to this taxon. **With implementation of the avoidance and minimization measures impacts would be less than significant.**
Townsend's big-eared bat *Corynorhinus townsendii* --/SSC high-priority species with the Western Bat Working Group	This species occurs in low to mid-elevation mesic habitats including riparian, mixed forest, coniferous forest, prairies, and agricultural lands. Unlike many bat species that roost in cracks and crevices, this species prefers open roosting areas in large chambers so they can rest with their fur erect for maximum insulation and their large ears coiled back. Roosting sites include caves, mines, tunnels, buildings, and other man-made structures and sometimes, trees with large basal hollows (CDFW 2019b; Armstrong 2021). Individuals may use separate sites for night, day, hibernation, or maternity roosts. They generally avoid wet or damp roosts and prefer dry sites with stable microclimatic conditions. Hibernation sites can be cold but will not dip below freezing while maternity roosts are in relatively warm sites. Mating typically occurs in winter with single young born in May or June. Maternal roosts consist of a small number of females with young, typically less than 100 individuals. Principal food for this species are small moths, but they will also consume beetles and soft-bodied insects. They utilizes edge habitat for foraging or glean prey from brush or trees and will forage up to 13km from their day roost. They also drink water regularly, unlike most bats. This species is known to occur throughout California with its current distribution is correlated with the availability of caves and cave-like roosting	**Not likely to occur.** Townsend's big-eared bats are reported within several miles of the project area (CDFW 2021a). There was a collection made in the 1930s within 1.25 miles of the project area, directly to the north. There are additional more recent sightings over 5 miles from the project area. The project area supports suitable foraging habitat (riparian corridor) and invertebrate food sources (moths, etc.) are likely to be abundant. Suitable roosting habitat (caves, mines, trees with large basal hollows, buildings) is not present within the project area but may be found in adjacent areas. This bat species is not likely to be present during construction as roosting habitat is not present within the project area and they are nocturnal foragers; Construction will occur only during daylight hours and will not interfere with the foraging ability of bats.

Species and Status[12] USFWS/CDFW	Habitat and Life History	Potential for Occurrence[13] within the Project Area & Potential Effects
	habitat, with population centers occurring in areas dominated by exposed, cavity forming rock and/or historic mining districts. Threats to this species include loss of roosting habitat and pesticide use.	
Invertebrates		
western bumble bee *Bombus occidentalis* --/SE	This medium-sized social bee occurs in varied habitat. Most common nesting habitat includes grasslands, agricultural lands, and forests or forest edges. Nests underground, primarily in abandoned rodent burrows or cavities and sometimes in above-ground locations (logs, etc.) Nest entrances usually found on flat ground with duff or leaf litter within 1 m, and downed woody debris within 10 m. Bees will often forage 100 m or more from a nest. Mate in fall, queens overwinter in ground then in spring they emerge and find an appropriate nest site for the colony. Multiple broods laid over the course of the summer.	**Not likely to occur.** Outside species' current known range but within historical range and contains suitable habitat (forested edge with downed debris and duff). Only historic reported occurrences nearby (approximately 3 miles north of project area; 1962; CDFW 2026a).
Birds		
Cooper's hawk - nesting *Accipiter cooperii* --/WL	Cooper's hawks are a medium-sized hawk of mature forests, open woodlands and brushlands. They are gray above and have pale orange barring below with short, rounded wings and tail. They feed primarily of birds and small mammals. They are stealthy birds, pouncing on bred with rapid and powerful flight. Nests are constructed in forests and woodlands with tall trees and openings or edge habitats. Nests are constructed 25 to 50 feet off the ground and consists of a bulky structure of sticks and lined with finer material. Clutch size is typically 3 to 5 eggs. Young are capable of flight after about 4-5 weeks. Locally, this species typically breeds from February through August.	**Moderate potential to occur.** In Marin County, Cooper's hawks are primarily a winter resident and are transient during fall migration (Shufford 1993). This species has documented breeding occurrences in central Marin County in the vicinity of the project area (CDFW 2026a) and has been documented on the Ignacio Valley Preserve by Marin County staff (MCOSD 2015). Due to the size and narrow nature of the project area (mostly containing existing trail, except for stream restoration and restoration areas), there is a low likelihood of this species nesting within the project area. There is a high potential for this species to nest in trees adjacent to the project area or in the surrounding areas. If this species was nesting in or adjacent to the project area during tree felling or construction, nest abandonment or destruction could occur. Tree removal and construction will occur outside (August 1 – December 31) this species nesting season (January 1 – July 31) to prevent construction impacts on nesting hawks. **With implementation of the avoidance and minimization measures impacts would be less than significant.**
northern spotted owl *Strix occidentalis caurina*	Dense forest habitats in northern California. Requires multi-layered canopy cover for roosting sites. Breeding sites include tree or snag cavities or broken tops of large trees. These are nocturnal hunters, eating mostly small mammals.	**Not likely to occur within project site during construction/Moderate potential to occur in adjacent areas.** An activity center (AC) with two nestlings was documented 0.12 mile south of the project area (2024; CDFW

Species and Status[12] USFWS/CDFW	Habitat and Life History	Potential for Occurrence[13] within the Project Area & Potential Effects
FT/ST	Permanent year-round resident in Mendocino County where it is known from breeding occurrences in old-growth and mixed forest habitats.	2026a). This AC was also active in 2023. The nearest additional positive occurrence is located approximately 0.2 mile north of the project area and is likely associated with the same AC (CDFW 2026a). The small project area does not contain suitable habitat (large trees, dense, multi-layered canopy, proximity to development and current public uses) for nesting or roosting; however, it does contain suitable foraging habitat (forested area) and there is suitable nesting, roosting and foraging habitat (NRF; dense forest with large trees and multi-layered canopy) adjacent to the project area. During construction, it is unlikely a northern spotted owl will be present within the project area, but there is a moderate chance it could be present in adjacent areas within 0.25 miles of the project area. Breeding season for this species is defined as February 1 through July 30, with their noise-sensitive nesting period from February 1 through July 31. Tree removal along the west end of the trail is limited to trees smaller than 10" dbh and does not qualify as significant impact to suitable NRF habitat for this species. **With implementation of the avoidance and minimization measures impacts would be less than significant.**
white-tailed kite *Elanus leucurus* --/FP	Raptor of semi-open areas. Hunts small rodents by hovering and parachuting down on its prey. Nests in trees and tall bushes. Year-round resident in Sonoma County in open woodlands, bottomlands, and agricultural grasslands.	**Not likely to occur.** White-tailed kites are a present but not abundant resident in Marin County (Shufford 1993). This species has documented breeding occurrences in eastern Marin County in the vicinity of the project area. This species has not been documented in the Ignacio Valley Preserve by Marin County staff (MCOSD 2015) or PCI but may still be present. The project area is mostly wooded with open grassland habitat limited to the Preserve entrance. Due to the habitat composition and levels of public use, white-tailed kites are not likely to be present within the project area during construction, but birds may forage and nest within the larger Preserve.

Additional Birds of Conservation Concern (BCC) and other protected species are reported to be likely to occur in the project area (USFWS 2026a):

Allen's hummingbird
bald eagle
Belding's savannah sparrow
black skimmer
black swift
Bullock's oriole
California gull
California spotted owl
Clark's grebe
common yellowthroat
elegant tern
golden eagle
marbled godwit
northern harrier
Nuttall's woodpecker
oat titmouse
olive-sided flycatcher
Santa Barbara song sparrow
short-billed dowitcher
tricolored blackbird
western grebe
western gull
western screech-owl
willet
wrentit

Appendix D. Special-status Plant Species Evaluated for Potential to Occur within the Project Area

The following table lists the special-status plant species evaluated for potential occurrence within the project area. Species that are known to occur in the region but are not included in the following table are considered not present within the project area because it is outside their known range, and/or because there is no suitable habitat or microhabitat present in the project area.

Scientific Name	**Common Name**	**Listing Status USFWS/CDFW/CRPR**	**Life Form, Blooming Period, and General Habitat**	**Potential for Occurrence in Project Area**
Amorpha californica var. *napensis*	Napa false indigo	--/--/ 1B.2	Perennial deciduous shrub. Blooms April-July. Broad-leafed upland forest (openings), chaparral, woodland. 120-2000 m.	**Not likely to occur**. Recent occurrence 4 miles north. Suitable habitat is present, but species not observed during site visits.
Amsinckia lunaris	bent-flowered fiddleneck	--/--/ 1B.2	Annual herb. Blooms March-June. Coastal bluff scrub, woodland, grassland. Typically, on gravelly slopes, grassland, openings in woodland, often serpentine. 3-500 m.	**Not likely to occur**. One historic occurrence approximately 2 miles west. Suitable habitat present, but no serpentine soils in the project area. Species not observed during site visits.
Arabis blepharophylla	Coast rock cress	--/--/ 4.3	Perennial herb. Blooms February to May. Rocky outcrops in broadleaf upland forest, coastal bluff scrub, costal prairie, and coastal scrub. 50 - 300m.	**Not present**. Appropriate habitats and/or microhabitats are not present within the project area.
Arctostaphylos montana ssp. *montana*	Mt. Tamalpais manzanita	--/--/ 1B.3	Perennial evergreen shrub. Blooms February-April. Serpentinite, rocky chaparral or grassland. 160-800 m.	**Not present**. Recent occurrences 4 to 5 miles southwest. Limited chaparral habitat is present in the project area, but no serpentine soils are present.
Calystegia collina ssp. *oxyphylla*	Mt. Saint Helena morning-glory	--/--/ 4.2	Rhizomatous herb. Blooms April-June. Open grassy or rocky places in oak or pine woodland, often serpentine. 279-600 m.	**Not likely to occur**. Recent occurrence 1 mile southeast. Limited open, rocky habitat present. Species not observed during site visits.
Castilleja affinis var. neglecta	Tiburon paintbrush	FE / ST / 1B.2	Perennial herb (hemiparasitic). Blooms April-June. Strict endemic of serpentine grassland. 60-400 m.	**Not present.** No occurrences within 5 miles of project area. Grassland is present, but serpentine soil is not present. Species not observed during site visit.

Scientific Name	Common Name	Listing Status USFWS/CDFW/CRPR	Life Form, Blooming Period, and General Habitat	Potential for Occurrence in Project Area
Dirca occidentalis	western leatherwood	--/--/ 1B.2	Perennial deciduous shrub. Blooms January-March. Broad-leafed upland forest, closed-cone coniferous forest, chaparral, woodland, North Coast coniferous forest. Generally, on north or northeast facing slopes, in fog belt. 50-400 m.	**Not likely to occur.** No occurrences within 5 miles of project area. Riparian forest is present, but species not observed during site visits.
Elymus californicus	California bottle brush grass	--/--/ 4.3	Perennial grass. Blooms May - August. Broad-leafed upland forest and woodland, North Coast coniferous forest, and riparian woodland. 15-470 m.	**Moderate potential to occur**. Recent occurrences approximately 1.5 to 2 miles east and southwest in Lucas Valley Preserve. Suitable riparian forest habitat is present.
Eriogonum luteolum var. *caninum*	Tiburon buckwheat	--/--/ 1B.2	Annual herb. Blooms May-September. Serpentinite, sandy to gravelly locations in chaparral, woodland, coastal prairie, and grassland. 0-700 m.	**Not present**. Recent occurrences 2 miles west of the site. Limited to serpentine soils that are not present in the project area. Species not observed during site visits.
Fritillaria liliacea	fragrant fritillary	--/--/ 1B.2	Perennial bulbiferous herb. Blooms February-April. Woodland, coastal prairie, coastal scrub (sometimes serpentinite). 3-410 m.	**Not likely to occur.** Multiple occurrences 5 miles west and north, mostly in native dominated grassland. Forest and grassland habitat are present, but the grassland is dominated by non-native grasses and forbs. Species not observed during site visits.
Hemizonia congesta ssp. *congesta*	white seaside tarplant (congested-headed hayfield tarplant)	--/--/ 1B.2	Annual herb. Blooms April-November. Marsh edges and grassy sites, sometimes roadsides. 20-560 m.	**Not likely to occur**. Historic occurrences within 5 miles of the preserve. Suitable habitat is present, but species not observed during site visits.
Hesperolinon congestum	Marin western flax	FT / ST / 1B.1	Annual herb. Blooms April-July. Serpentinite chaparral and grassland. 5-370 m.	**Not present**. Appropriate soil conditions are not present within the project area.
Iris longipetala	coast iris	--/--/ 4.2	Perennial rhizomatous herb. Blooms March-May. Moist coastal prairie, open coastal forest, and meadows and seeps. 0-600 m.	**Not likely to occur**. Recent occurrences reported within 2 miles east. Marginally suitable habitat is present within the project area, but species not observed.

Scientific Name	**Common Name**	**Listing Status USFWS/CDFW/CRPR**	**Life Form, Blooming Period, and General Habitat**	**Potential for Occurrence in Project Area**
Leptosiphon aureus (formerly *L. acicularis*)	bristly leptosiphon	--/--/ 4.2	Annual herb. Blooms April - July. Grassland, woodland, and chaparral. 55-1500 m.	**Not likely to occur**. Recent and historic occurrences approximately 2 miles south and southwest in Lucas Valley Preserve. Suitable habitat is present in the project area. Species not observed during site visits.
Lessingia hololeuca	woolly-headed lessingia	--/--/ 3	Annual herb. Blooms June-October. Broadleafed upland forest, coastal scrub, chaparral, lower montane coniferous forest, grassland, roadsides. Occasionally on alkali or serpentine soil. 15-305 m.	**Not likely to occur**. Historic occurrences approximately 2.5 miles east. A small area of chaparral and grassland are present in the project area, but the grassland is dominated by dense non-native species. Serpentine and alkali soils are not present. Species not observed during site visits.
Lessingia micradenia var. *micradenia*	Tamalpais lessingia	--/--/ 1B.2	Annual herb. Blooms June or July-October. Thin gravelly soil of serpentinite outcrops, roadcuts, in chaparral and grassland. 100-500 m.	**Not likely to occur**. Suitable habitat with areas of thin soil are present, but not serpentine soils. Species not observed during site visits.
Micropus amphibolus	Mt. Diablo cottonseed	--/--/ 3.2	Annual herb. Blooms March-May. Openings on grassy or rocky slopes and ridges in broadleafed upland forest, chaparral, woodland, and grassland. Shallow soils of sedimentary or volcanic origin. 45-900 m.	**Moderate potential to occur**. Multiple occurrences 1 to 1.5 miles east and south in Ignacio and Lucas Valley Preserves. Only limited extent of suitable rocky chaparral habitat is in the project area.
Pleuropogon hooverianus	North Coast semaphore grass	--/ ST / 1B.1	Perennial rhizomatous herb. Blooms April-August. Wet, grassy usually shady areas, sometimes freshwater marsh; associated with forest environments. 10-671 m.	**Not likely to occur.** Historical occurrences present 4 to 6 miles southwest, but populations are likely to be extirpated. Riparian forest habitat is present, but no marsh or persistent wet areas were observed in the project area. Species not observed during site visits.
Streptanthus glandulosus ssp. *pulchellus*	Mt. Tamalpais bristly jewel-flower	--/--/ 1B.2	Annual herb. Blooms May-July. Dry, open grassland, chaparral, open conifer and oak woodland; occasionally on serpentine. 150 - 800 m.	**Not likely to occur**. Historic occurrences nearby along Big Rock Ridge and in Lucas Valley Preserve. Suitable habitat is present, but grassland is dominated by dense non-native species. Serpentine soils are not present. Species not observed during site visits.

APPENDIX E – MCOSD ROAD AND TRAIL MANAGEMENT PLAN POLICIES AND BEST MANAGEMENT PRACTICES

POLICIES

Policy SW.1: Application of this Road and Trail Management Plan Policies

The policies and requirements of this plan will apply within all open space preserves, and within any new preserves that may be established. These policies will also apply to existing and future trail easements unless they would conflict with the terms of the easement, in which case the easement will prevail.

Policy SW.2: System Roads and Trails

The MCOSD will, following adoption of this plan, designate a system of roads and trails, referred to as "system roads and trails", in all existing and new open space preserves, through a collaborative public process. Those roads and trails eligible for consideration as part of the system must have been constructed as of November 2011. The MCOSD may improve, maintain, convert, or reroute system roads and trails according to the policies and requirements of this plan, as time and resources allow. Nonsystem roads and trails, defined as those roads and trails not designated as system roads and trails, may be decommissioned at any time, as time and resources allow.

Policy SW.3: Social Trails

For the purpose of this policy, social trails are defined as narrow pedestrian footpaths that a) were not constructed; and b) have not been improved, managed, or maintained. This definition extends to wildlife trails used occasionally by pedestrians. This plan recognizes that, for all practical purposes, social trails will continue to exist after the system of roads and trails has been designated. Social trails are not subject to closure or decommissioning unless a) their continued existence compromises public safety; b) results in unacceptable levels of erosion, or damage or disruption to plants and wildlife; c) their volume of use increases; and/or d) they are used by equestrians or bikers.

Policy SW.4: Overall Reduction of Road, Trail, and Visitor Impacts

The designated system of roads and trails will have less overall impact to resources compared to the network of roads and trails existing as of November 2011. Impacts will be reduced by decommissioning non-system roads and trails, and by the improvement, conversion, or rerouting of system roads and trails. The MCOSD will maximize the reduction of road, trail, and visitor impacts in Sensitive Resource Areas, compared to Conservation Areas and Impacted Areas. Impacted Areas will exhibit the widest range of acceptable road, trail and visitor impacts.

Policy SW.5: Policy on Pedestrian Activities

Pedestrians are encouraged to stay on system roads and trails.

Policy SW.6: Prohibition on Off-Road or Off-Trail Equestrian Use

Horses and pack animals must stay on system roads and trails, except when watering or resting the animal. Off-trail riding is prohibited. Riding or possession of a horse or pack animal on non-system roads and trails is prohibited. Riding or possession of a horse or pack animal on social trails is prohibited.

Policy SW.7: Prohibition on Off-Road or Off-Trail Bicycle Use

Mountain bikers must stay on system roads and trails designated for bicycle use. Off-trail riding is prohibited. Riding or possession of a bicycle on non-system roads and trails is prohibited. Riding or possession of a bicycle on social trails is prohibited.

Policy SW.8: Prohibition on Off-Road or Off-Trail Pedestrians with Dogs or Other Domestic Animals

Pedestrians with dogs and other domestic animals must stay on system roads and trails. Off-trail use by pedestrians with dogs and other domestic animals is prohibited. Use of non-system roads and trails, and social trails, by pedestrians with dogs and other domestic animals is prohibited.

Policy SW.9: Prohibition of Dogs within Sensitive Water Resources
Dogs are not allowed to travel, run, walk, hunt, or bathe in streams or any sensitive water bodies, such as marshes, lakes, or ponds, within the preserves.

Policy SW.10: Policy on Leash Only Preserves
Due to the occurrence of sensitive resources, dogs must be leashed on all roads and trails in those preserves currently designated as “leash only” (i.e., Cascade Canyon, Ring Mountain, and Rush Creek Preserves). The MCOSD may designate other “leash only” preserves in the future.

Policy SW.11: Policy on Leash Requirements for Dogs
Dogs must be on leash (no more than 6 feet in length) a) in all designated “leash only” preserves; and b) on all trails. Dogs may be off leash, but under voice control, only on fire roads that are not within leash only preserves. The MCOSD will identify roads passing through leash only preserves with signs. Dogs under voice control must remain on the fire road.

Policy SW.12: Road and Trail Connectivity
The MCOSD will strive to increase road and trail connectivity for all trail users. The MCOSD will strive to provide opportunities for short to medium distance loops and long-distance routes. The MCOSD may consider one-way, uphill-only, time separation, and single-use or priority-use trails to achieve these ends.

Policy SW.13: Prohibition on Dangerous Activities
Activities that exceed the established speed limit, are reckless, or pose a danger to the user or to other road and trail users, are prohibited.

Policy SW.14: Road and Trail Etiquette
All road and trail users will practice good etiquette at all times. Mountain bikers will always yield to both hikers and equestrians. Hikers will yield to equestrians. Mountain bikers must announce their presence by using a bell or calling out when overtaking other trail users.

Policy SW.15: Expectation of Active Cooperation of All Road and Trail Users
Increased trail use opportunities must be coupled with cooperation among all trail users, and with the MCOSD, to promote lawful trail use, reduce violations, reduce impacts to natural resources, prevent displacement of any trail user types, minimize disturbance to existing neighbors, and avoid endangerment of other trail users.

Policy SW.16: Prohibition of Uses
The MCOSD may prohibit certain trail uses or apply increased trail use restrictions within certain areas to enhance safety, minimize conflicts between trail users, and protect natural resources. Examples of areas where this policy may apply include, but are not limited to, those proximate to stables and those traditionally heavily traveled by equestrians, and in Sensitive Resource Areas.

Policy SW.17: Displacement of Existing Trail Users
The MCOSD will strive to prevent displacement of equestrians and pedestrians when accommodating trail access and trail connections for mountain bikers. When considering the designation of existing trails as single-use or priority-use, the MCOSD will take care to maintain connectivity between destinations for user groups historically using those trails.

Policy SW.18: Unauthorized Trail Construction and Maintenance
The MCOSD has no tolerance for unauthorized trail construction and unauthorized reopening of closed or decommissioned roads and trails. The MCOSD will prosecute such violations to the fullest extent of the law. The MCOSD will apply new deterrence methods, including rigorous investigation and increased penalties to stop such damaging and unlawful activities.

Policy SW.19: Redundant Roads and Trails
Redundant roads or trails are defined as those that roughly parallel an existing route serving essentially the same purposes, uses, and user groups. Through designation of the road and trail system, the MCOSD will reduce the overall level of redundancy compared to baseline levels and when doing so will exclude from designation the road or trail segment or segments that have the highest overall maintenance costs and the

worst profile of environmental impacts. The MCOSD may strategically retain some redundant roads and trails in the interest of separating user groups and avoiding user conflict. Redundant roads and trails that are not designated as system roads and trails will be decommissioned as time and resources allow. All decommissions of redundant fire road segments will be subject to consultation with Marin County Fire and the relevant local fire agencies.

Policy SW.20: Conversion of System Roads to Trails
The MCOSD may convert system roads to trails to protect natural resources, enhance visitor experience and/or safety, or align maintenance costs with available funds. System roads encumbered by license, lease, or easement for nonrecreational purposes, and roads required for maintenance or emergency access, may not be converted to trails unless encumbrances are removed, or roads are no longer necessary for maintenance or emergency use.

Policy SW.21: Roads or Trails Serving Nonrecreational Uses
Roads or trails subject to or encumbered by license, lease, or easement, for nonrecreational purposes, and those roads required for maintenance or emergency access, will become system roads and trails, unless encumbrances are removed, or roads are no longer necessary for maintenance or emergency use.

Policy SW.22: Protect High-Value Vegetation Types
As a general policy, visitors will be directed away from areas of high-value vegetation types, as identified in the MCOSD's mapped Legacy Vegetation Management Zones and other more site-specific biotic assessments undertaken or commissioned by the MCOSD, to prevent disturbance and adverse impact. This will be done through the appropriate placement of new and rerouted trails, by erecting fencing, or by installing educational signs that provide information about the resource values being protected.

Policy SW.23: Identify High Value Biological Resources
Designation of the road and trail system and evaluation of road and trail project proposals will be based on best available data, including inventories of wildlife, and vegetation resources. The MCOSD will undertake site specific and programmatic efforts to extend and improve upon the biological data underlying its decision-making criteria. System designations, project design, and project implementation are subject to amendment on the basis of new information.

Policy SW.24: Minimize Intrusions into Larger Contiguous Habitat Areas and Wildlife Corridors
In designating the system of roads and trails, the MCOSD will minimize their adverse effects on sensitive vegetation, as well as, habitat connectivity and migration corridors for all native species of wildlife.

Policy SW.25: Helmet Requirement
Per California state law, bicycle riders less than 18 years old are required to wear a helmet when riding on the MCOSD roads and trails.

Policy SW.26: Control or Restrict Access to Ignition Prevention Zones when Red-Flag Conditions Exist
Appropriate actions will be taken to minimize the risk of wildfire ignition when red-flag conditions exist. These actions may include prohibiting vehicle access, closing trails, or closing entire areas to all human activities until red-flag conditions expire. The public will be informed of the reasons why such actions are being taken, and areas will be patrolled to ensure compliance.

Policy SW.27: Protect High-Value Cultural and Historic Resources by Rerouting or Confining Visitor Access
Areas of high- value cultural and historic resources will be protected from disturbance and adverse impact. This will be done through the appropriate placement of trails, by erecting barriers, or other methods to discourage access.

Policy SW.28: Remove or Realign Roads and Trails Away from High-Value Cultural and Historic Resources

As a general policy, designated roads and trails will be rerouted away from high-value cultural and historic resources whenever possible and feasible. Areas where roads or trails are removed will be restored to natural conditions. The removal or realignment of roads will be done in consultation with Marin County Fire and other local fire agencies.

Policy SW.29: Retrofit or Upgrade Construction Equipment

Work with the Bay Area Air Quality Management District to implement feasible actions from the 2010 Clean Air Plan MSM C-1 – Construction and Farming Equipment. Pursue funding to retrofit the existing construction equipment engines with diesel particulate filters or upgrade to equipment with electric, Tier III, or Tier IV off-road engines. Seek to rent construction equipment that meets these criteria, if available.

Policy SW.30: Permeable Paving

For any new parking areas and other large areas of potentially impermeable surfaces, use permeable paving or an equivalent for all paved areas to provide for the infiltration of rainfall.

Policy SW.31: Floodplain Policy for New and Improved Roads and Trails

The MCOSD will review current Federal Emergency Management Agency Flood Insurance Rate Maps and other current flood maps to assess potential flood impacts to any proposed new or improved road, trail, or associated facilities located in the lower elevation bayland or coastal areas (i.e., Santa Margarita Island, Santa Venetia Marsh, Bothin Marsh, Rush Creek, Deer Island, and Bolinas Lagoon). In cases where a flood risk is identified, proposed facilities shall either be relocated outside of the flood prone area or designed and constructed in a manner to protect public safety and not increase base flood elevations. As part of public safety, the MCOSD shall also review the most current Tsunami Inundation Maps as part of the trail improvement planning efforts in those areas in order to identify areas that may require escape plans or proper notification.

Policy T.1: Loop and Long-Distance Trail Connections

When designating system roads and trails, the MCOSD will seek to maintain and/or develop new opportunities for loop and long-distance travel, when such opportunities do not conflict with resource protection or visitor safety.

Policy T.2: Visitor Amenities

The MCOSD may provide or permit visitor amenities such as a) facilities to encourage the pickup and disposal of pet waste; b) watering opportunities for horses and other pack animals; c) potable water; and d) small bike repair stations.

Policy T.3: Visitor Safety

The safety of all road and trail users depends in large part on visitor conduct. The MCOSD expects that all users will conduct themselves in a safe manner, to protect their own safety and the safety of other users. The MCOSD shall consider visitor safety in designating the road and trail system.

SPECIAL USE POLICIES

In addition to providing public access for recreational uses, the MCOSD preserves also allows uses such as commercial dog walking, recreational events, and access for utility providers such as Verizon and PG&E. There is a need for a consistent and structured approach for the MCOSD to respond to requests for special uses. New policies to accomplish this are described below.

Policy SP-1: Lease/License/Other Form of Approval Required for Land Management or Utility Activities

Consistent with the MCOSD's Nonconforming Use Policy, all agencies and service providers requesting access to open space preserves will be required to obtain a lease, license, or other form of approval from the MCOSD describing the purpose and timing of their activities. The MCOSD may impose fees and conditions. Such conditions may include, but will not be limited to, the timing of the activity with respect to seasonal and weather concerns, the protection of natural resources, and the location of the activity. The MCOSD's Nonconforming Use Policy provides specific guidance for permitting use of open space by utilities, water districts, and other similar entities.

Policy SP-2: Permit Required for Organized Recreational Activities or Events

All private parties or public agencies requesting access to the MCOSD preserves for recreation-related or other special events will be required to complete and obtain a permit detailing the purpose and timing of their activities. The MCOSD may impose fees and conditions. Such conditions may include, but will not be limited to, the timing of the activity with respect to seasonal and weather concerns, the number of participants, the protection of natural resources, and the location of the activity. An administrative fee will be charged by the MCOSD for reviewing and granting any permits. Additional fees may be incurred by the applicant for administration and monitoring of the event by the MCOSD staff, or if compliance with the California Environmental Quality Act or any regulatory permit is required. The MCOSD insurance and indemnity requirements will also apply.

Policy SP-3: Prohibition on Unofficial, Non-sponsored Group Activities

Any unofficial, non-sponsored outdoor recreation event involving more than 15 participants is prohibited.

GENERAL BMPs

General 1: Limit Work Area Footprints in Sensitive Resource Areas

Limit the size of construction-related road and trail management activities to the minimum size needed to meet project objectives. BMPs include:

- Minimize project footprint. Minimize the size of the work area, including the project area, access roads, and staging areas. Wherever possible, use existing upland roads, trails, and other disturbed areas for project activities in order to reduce unnecessary disturbance, minimize soil and water erosion, and reduce overall project costs.
- Reduce or relocate footprint during planning and design phase. Reduce the work area footprint in sensitive resource areas or move the work area to common natural communities and upland areas. Implement further refinements during site preparation and construction to further reduce impacts.
- Minimize soil disturbance**.** Minimize soil disturbance to the greatest extent possible to reduce the potential for introducing or spreading invasive plants, to protect topsoil resources, and to reduce available habitat for the establishment of new invasive plants.
- Mark project footprint near sensitive natural resources. Mark ingress/egress routes, staging areas, and sensitive resources to prevent inadvertent impacts to sensitive resources.
- Restrict soil disturbance and import of nonnative soil or fill material. To reduce the potential for damage of native plants and/or introduction of invasive plants, the contractor will be required to minimize the footprint of soil disturbance to the minimum amount necessary to complete the contracted work. In particular, access roads, staging areas, and areas of temporary disturbance will be minimized in size. The contractor and its staff and subconsultants agree not to drive off-road or drive or park on native vegetation unless approved in advance by the MCOSD natural resource staff. The contractor agrees that if soil excavation is required, every attempt will be made to have a balanced cut and fill project that reuses all native soils onsite. No nonnative soil or fill material will be brought onsite or used during the contractor's activities unless approved by the MCOSD natural resource staff.

General-2: Modify Construction- Related Vegetation Management Methods in and near Wetlands, Riparian Vegetation

Restrict construction-related vegetation management near wetlands in a manner that reduces the potential for sediment or pollutants to enter wetlands. Implement the following BMPs, as needed:

- Establish a buffer of 100 feet from wetland and tidally influenced areas (i.e., from the ordinary high-water mark of flowing or standing water in creeks, streams, or ponds). Avoid construction work within this buffer area. If construction work in wetlands and riparian areas cannot be fully avoided, consult with the appropriate state and federal agencies to obtain permits.
- Within the buffer, restrict routine vegetation management activities in creeks, streams, other waterways, and tidally influenced areas. Limit vegetation management work to least-harmful methods; restrict herbicides to those that are EPA-approved for use near water. Prohibit activities that disturb soil or could cause soil erosion or changes in water quality.
- Within the buffer, limit work that may cause erosion to the low flow or low tide periods. Low flow months for local creeks are typically August to October. For tidal areas, work will not occur within 2 hours of high tide events at construction sites when high tide is greater than 6.5 feet measured at the Golden Gate Bridge, using corrections for areas near individual MCOSD preserves. Tide charts are available online from the National Oceanic and Atmospheric Agency/National Weather Service (http://www.wrh.noaa.gov/mtr/sunset.php).
- Within the buffer, minimize erosion and sedimentation; maintain erosion and sediment control devices during ground disturbing activities and until all disturbed soils have been stabilized. Measures include weed-free straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the

introduction of wheat, barley, and other nonnative plant seeds. Erosion control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap, and rice straw wattles, etc.) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians.

- Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) to protect water quality for work in or near wetlands, ponds, seeps, creeks, tidal areas, or stream crossings.

General-3: Minimize Potential for Erosion

Conduct road and trail activities in a manner that controls and minimizes the potential for soil erosion and contribution of sediment to wetlands. Implement the following as needed:

- To minimize erosion and sedimentation, maintain erosion and sediment control devices during ground disturbing activities and until all disturbed soils have been stabilized. Measures include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the introduction of wheat, barley, and other nonnative plant seeds. Erosion control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians.
- Unless no feasible alternative is available, avoid using heavy equipment in areas with soils that are undisturbed, saturated, or subject to extensive compaction. Where staging of heavy equipment, vehicles, or stockpiles is unavoidable, limit and mark the allowable disturbance footprint with flagging or fencing. Following the end of work, scarify surface soils to retard runoff and promote rapid revegetation.
- Immediately rehabilitate areas where project actions have disturbed soil. Require areas disturbed by equipment or vehicles to be rehabilitated as quickly as possible to prevent erosion, discourage the colonization of invasive plants, and address soil compaction. Techniques include decompacting and aerating soils, recontouring soils to natural topography, stabilizing soils via erosion control materials, revegetating areas with native plants, and removing and monitoring invasive plants.

General-4: Control Food-Related Trash

Food-related trash can attract wildlife to road and trail project sites. Store food-related trash in closed containers and remove from the project site daily.

General-5: Modify Construction Methods Relating to Soil Disturbance, Restrict use of Offsite Soil, Aggregate, or Other Construction Materials

Conduct construction-related vegetation management in a manner that restricts the use of offsite materials that could introduce or spread invasive plants. Implement the following as needed:

- Minimize soil disturbance. Minimize soil disturbance to the greatest extent possible to reduce the potential for introducing or spreading invasive plants, to protect topsoil resources, and to reduce available habitat for the establishment of new invasive plants.
- Do not allow the introduction of incompatible fill. Use only clean, native soils and aggregate materials from projects within the preserve or use fill that is purchased from a certified weed-free source, before allowing the importation of materials from outside the preserves. Fill materials should be approved by natural resource staff to ensure compatibility with future restoration/rehabilitation goals.
- Segregate and treat soils and vegetation contaminated with invasive plant seeds and propagules. Treat, as appropriate, to prevent the spread of invasive plants**.** Treatment may include disposal onsite within already infested areas, chipping or pile burning and mulching to eliminate viable seeds, or disposal at an approved cogeneration plant or green waste facility.
- Salvage, store, and reuse topsoil. Where activities disturb soil temporarily, require salvage of the top 6 to 12 inches of topsoil (to retain seeds, soil mycorrhizae, and fungi) from all excavation and

disturbance areas. Require reapplication of the salvaged topsoil as a topdressing or topcoat over backfill, unless known to contain invasive plant seeds or propagules.

- Establish dedicated areas for cleaning vehicles, inside and out, of soil or invasive plant seeds or plant parts before entering the MCOSD preserves, whenever moving equipment between areas within the preserves, and before leaving preserves. Within the wash areas, the tires and body of vehicles and equipment will be brushed off and/or hosed down.
- Inspect construction equipment for soil or invasive seeds or plant parts. Require contractors to make equipment available for inspection before entering the MCOSD preserves, when moving between sites within the preserves, and before leaving preserves.
- Develop a native seed mix for erosion control. Develop the seed mixture on a project-by-project basis based on the observed mixture of native and naturalized plants in and near the impact area. Where possible, ensure that seeds are collected locally (i.e., within the same watershed or preserve as the impact), or obtained from a reputable native plant nursery specializing in seed that is collected from local sources.
- Maintain erosion and sediment control devices during ground disturbing activities and until all disturbed soils have been stabilized to help minimize erosion and sedimentation. Measures include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified as weed-free to prevent the introduction of wheat, barley, and other nonnative plant seeds. Erosion control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and not of plastic monofilaments or other materials that could entrap snakes or amphibians.
- Immediately rehabilitate areas where road and trail project activities have disturbed soil. Areas disturbed by equipment or vehicles should be rehabilitated as quickly as possible to prevent erosion, discourage the colonization of invasive plants, and address soil compaction. Techniques include de-compacting and aerating soils, recontouring soils to natural topography, stabilizing soils via erosion control materials, revegetating areas with native plants, and removing and monitoring invasive plants.

General-6: Prevent or Reduce Potential for Pollution

Ensure that actions are taken during ongoing road and trail project activities to prevent or reduce the potential for pollutants entering the MCOSD preserve. Implement the following as needed:

- Prohibit, or restrict equipment refueling, fluid leakage, equipment maintenance, and road surfacing activities near wetlands. Require placement of fuel storage and refueling sites in safe areas well away from wetlands. Safe areas include paved or cleared roadbeds, within contained areas such as lined truck beds, or other appropriate fuel containment sites. Inspect equipment and vehicles for hydraulic and oil leaks regularly. Do not allow leaking vehicles on the MCOSD preserves and require the use of drip pans below equipment stored onsite. Require that vehicles and construction equipment are in good working condition, and that all necessary onsite servicing of equipment be conducted away from the wetlands.
- Require all contractors to possess, and all vehicles to carry, emergency spill containment materials. Absorbent materials should be on hand at all times to absorb any minor leaks and spills.

General-7: Include Standard Procedures in Construction Contracts

When using contractors to perform vegetation management, related to road and trail project activities, the MCOSD will include some or all of the following standard procedures in those contracts.

The contractor will work with the MCOSD natural resource staff to determine the optimal timing of contracted work. Many timing restrictions relate to protecting special-status species. Other types of timing restrictions include timing to control invasive plants; timing to avoid migration, gestation, or flowering periods for special-status species; or timing work in wetlands to the dry season.

- Establish a buffer of 100 feet from wetland and tidally influenced areas (i.e., from the ordinary high-water mark of flowing or standing water in creeks, streams, or ponds). Avoid construction work within this buffer area.
- Within the buffer, limit work that may cause erosion to low flow periods. Low flow months for local creeks are typically August to October. For tidal areas, work will not occur within 2 hours of high tide events at construction sites when high tide is greater than 6.5 feet measured at the Golden Gate Bridge, using corrections for areas near individual MCOSD preserves. Tide charts are available online from the National Oceanic and Atmospheric Agency/National Weather Service (http://www.wrh.noaa.gov/mtr/sunset.php).
- If construction work cannot be fully avoided in wetlands and riparian areas, consult with the appropriate state and federal agencies to obtain permits.
- Require the contractor to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) to protect water quality for road and trail project work in or near wetlands, ponds, seeps, creeks, tidal areas, or stream crossings.

The contractor will work with the MCOSD natural resource staff to identify any priority invasive plants that occur near the project work area, including the project footprint, access roads, staging areas, and similar work areas. The contractor agrees to comply with requirements to reduce the spread or transport of priority invasive plants related to construction activities. Requirements may include some or all of the following:

- Conduct a training program for all field personnel involved with the proposed road and trail project prior to initiating project. The program will consist of a brief presentation by person's knowledgeable in the special-status species, sensitive resource, or invasive plants known from the project area. The program will include the following: a photograph and description of each special-status species, sensitive resource, or invasive plant known from the project area; a description of its ecology and habitat needs; an explanation of the measures being taken to avoid or reduce adverse impacts; and the workers' responsibility under the applicable environmental regulation. The worker training may be conducted in an informal manner (e.g., as part of a routine tailgate safety meeting).
- Restrict work to periods when invasive plants are not in fruit or flower.
- Establish dedicated area for cleaning vehicles, inside and out, of soil or invasive plant seeds or plant parts before entering the MCOSD preserves, whenever moving equipment between areas within the preserves, and before leaving preserves. Within the wash areas, the tires and body of equipment will be brushed off or hosed down.
- Inspect construction equipment for soil or invasive seeds or plant parts. Require contractors to make equipment available for inspection before entering the MCOSD preserves, when moving between sites within the preserves, and before leaving preserves.
- Dispose of green waste in a manner that does not spread invasive plants. Methods include onsite disposal in an already infested area; offsite disposal to a cogeneration plant or an approved green waste composting facility).
- Protect environmentally sensitive areas. The MCOSD natural resource staff will identify any Environmentally Sensitive Areas in or near the road and trail project area prior to the start of work. Environmentally Sensitive Areas may include: special-status plant or wildlife species or their habitats (e.g., woodrat nests, habitat for special-status plant and wildlife species, individuals or populations of listed special-status plant or wildlife species or locally rare species); wetlands including creeks streams and related riparian area; and sensitive vegetation types as described in this report. The MCOSD staff and contractors will fully avoid and protect such areas during habitat restoration work or will help obtain and comply with necessary permits and regulatory requirements.
- Use locally collected plant materials for revegetation projects. Plant materials will be collected onsite at the MCOSD preserves or within the same watershed as the revegetation project. The contractor will work with the MCOSD to identify native plant nurseries that can collect and

propagate seed and other plant materials from the local area. No use of commercial grassland mixtures for erosion control unless approved in advance by the MCOSD. The contractor will allow the MCOSD to inspect and approve all plant materials and seed prior to use onsite.

- Protect special-status species habitat. For vegetation work in or near special-status species habitat, the contractor is required to comply with requirements of the MCOSD project permits to protect special- status species and their associated habitats before and during construction, and to cooperate with the MCOSD in implementing any state and federal permits and agreements for the project. The special- status species population plus a buffer should be designated as an "Environmentally Sensitive Area" using lath and flagging, pin flags, or temporary fencing (depending on resource sensitivity to work). The contractor will be required to avoid all designated Environmentally Sensitive Areas during construction. For any special-status species or their habitats that cannot be fully avoided, the contractor will work with the MCOSD to obtain and comply with federal and state Endangered Species Acts, the federal Migratory Bird Treaty Act, and the state Fish and Game Code permits and agreements.
- Restrict soil disturbance, import of nonnative soil or fill material. To reduce the potential for damage of native plants and/or introduction of invasive plants, the contractor will be required to minimize the footprint of soil disturbance to the minimum amount necessary to complete the contracted work. In particular, minimize the footprint of access roads, staging areas, and areas of temporary disturbance. The contractor and its staff and subconsultants agree not to drive off-road or drive or park on native vegetation unless approved in advance by the MCOSD natural resource staff. The contractor agrees that if soil excavation is required, every attempt will be made to have a balanced cut and fill project that reuses all native soils onsite. Unless pre-approved by the MCOSD natural resource staff, there will be no use of nonnative soil or fill material during the contractor's activities.
- To minimize erosion and sedimentation, maintain erosion and sediment control devices during ground disturbing activities and until all disturbed soils have been stabilized. Measures include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials will be certified weed-free to prevent the introduction of wheat, barley, and other nonnative plant seeds. Erosion control materials will be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians.

Other procedures:

- All entry gates to the project site not used for construction access will be locked at all times and gates used for construction access will be locked during non-construction hours.
- All vehicles will carry a suitable fire extinguisher.
- Immediately rehabilitate areas where project actions have disturbed soil. Require areas disturbed by equipment or vehicles to be rehabilitated as quickly as possible to prevent erosion, discourage the colonization of invasive plants, and address soil compaction. Techniques include de-compacting and aerating soils, recontouring soils to natural topography, stabilizing soils via erosion control materials, revegetating areas with native plants, and removing and monitoring invasive plants.
- Unless no feasible alternative is available, avoid using heavy equipment in areas with soils that are undisturbed, saturated, or subject to extensive compaction. Where staging of heavy equipment, vehicles, or stockpiles is unavoidable, limit and mark the allowable disturbance footprint with flagging or fencing. Following the end of work, scarify surface soils to retard runoff and promote rapid revegetation.

General-8: Control Noise

To reduce daytime noise and potential disturbance to wildlife species, the MCOSD will require contractors to muffle or control noise from equipment through implementation of the following measures:

- Equipment and vehicles should utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, and use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds, and installation of sound blanket around the project site.

General-9: Conduct Worker Training

The MCOSD will conduct a worker-training program for all field personnel involved with the proposed road and trail management project prior to initiating the project. The program will consist of a brief presentation by persons knowledgeable in the special-status species, sensitive resource, or invasive plants known from the project area. The worker training may be conducted in an informal manner (e.g., as part of a routine tailgate safety meeting). The program will include a photograph and description of each special-status species, sensitive resource, or invasive plant known from the project area; and a description of its ecology and habitat needs; an explanation of the measures being taken to avoid or reduce adverse impacts; and the workers' responsibility under the applicable environmental regulation(s).

General-10: Road and Trail Inspections

- Regularly inspect road and trail features and associated infrastructure to ensure they are well maintained and posing no threat to surrounding sensitive and/or special-status natural resources. Staff will record information pertaining to the status of biophysical resources that could be affected by road or trail use, maintenance, or management activities. These inspections will monitor for the spread of invasive, exotic plants that could affect sensitive and/or special-status native plant or wildlife habitats and any other changes that could create negative impacts to known sensitive and/or special-status native plant or wildlife populations in the immediate vicinity. Staff will report any findings and make recommended corrective actions if appropriate.

General-11: Management of Sudden Oak Death

To reduce and control the spread of Sudden Oak Death (SOD) within the MCOSD system, the following practices will be implemented.

- The MCOSD staff will educate visitors about preventing the spread of Sudden Oak Death (SOD).
- The MCOSD may use interpretive signs, brochures, ranger talks, and other online and print materials that explain the importance of preventing the spread of pathogens and use of preventative measures.
- The education materials should explain that SOD occurs within the preserve; identify typical symptoms; explain that SOD can be spread by park users, especially during rainy and windy weather; and request that park visitors:
  - Use designated parking areas
  - Avoid transporting SOD on shoes, bicycles, and the feet of pet dogs and horses through the use of cleaners and disinfectants.

The MCOSD staff shall be trained about SOD host species and disease transmission pathways and, when undertaking road and trail construction and maintenance activities in areas of the preserves affected by SOD, shall implement the following measures.

- Clean equipment, boots, truck tires, and any other exposed material after working in forest and woodland habitats, with a 10% bleach solution or other disinfectant
- Avoid pruning oaks or other affected trees in wet weather.
- Avoid work in forest and woodlands during the wet season when spores are being produced and infections are starting.
- Leave potentially infected downed trees on site instead of transporting the material to an uninfected area.
- Remove potentially infected downed trees from the property only if it is the first infected tree to be detected in the area or if there is a high fire risk.

- Dispose of infected materials at an approved and permitted dump facility within the 14-county infected quarantine zone.
- If necessary to reduce safety or fire hazards or to address aesthetic or recreational impacts, cut, branch, chip, and/or split infected trees in areas where the material would be less likely to be transported to an uninfected location.
- Purchasing nursery stock for restoration plantings at nurseries that follows current BMPs for preventing the spread of SOD (consult the California Oak Mortality Task Force, **www.suddenoakdeath.org,** for current standards).
- Inspect all plant materials for symptoms of SOD before bringing any plants onto the property.

SENSITIVE NATURAL RESOURCES BMP

Sensitive Natural Resources–1: Modify Management Practices near Sensitive Natural Resources

For construction related activities requiring extensive ground disturbance in and near known sensitive biological resources, the MCOSD will assess the project or proposed action prior to the start of work to suggest modifications to standard procedures considered necessary to help ensure avoidance of impacts to special- status species and other sensitive biological resources. Actions that many be taken include one or more of the following:

- Mark project footprint near sensitive natural resources. Mark ingress/egress routes, staging areas, and sensitive resources to prevent inadvertent impacts to sensitive resources.
- Inspect ingress/egress routes, escort vehicles, and equipment onto the site if necessary to help prevent impacts on ground nesting and ground dwelling species. Work should be conducted during bird non- breeding season (published California Department of Fish and Wildlife non-breeding season dates are August 15 - March 1 but should be adjusted to local conditions).
- Maintain a 15 MPH speed limit in sensitive habitat areas. This will reduce the potential for mortality, dust impacts on vegetation and wildlife. For larger projects, water the roads for dust control near sensitive resources.

SPECIAL STATUS WILDLIFE BMPs

Special-Status Wildlife-1: Literature Reviews

Prior to all road and trail management activities, literature reviews will be conducted to determine if special-status wildlife-species or critical habitats exist within the project area.

The first source reviewed will be the MCOSD's database of special-status wildlife occurrences and sensitive habitats. This database is actively updated and maintained by the MCOSD natural resource staff and contains the most relevant data on sensitive resources on MCOSD land.

In addition to the MCOSD database, the following resources will be reviewed, as necessary, prior to work:

- U.S. Geological Survey topographic maps
- Aerial photographs
- California Department of Fish and Wildlife Natural Diversity Database records
- U.S. Fish and Wildlife Service quadrangle species lists
- University of California at Davis Information Center for the Environment Distribution Maps for Fishes in California
- National Marine Fisheries Service Distribution Maps for California Salmonid Species

Database searches for known occurrences of special-status wildlife species will focus on the vicinity of the project area. Biological communities will be classified as sensitive or non-sensitive as defined by the California Environmental Quality Act and other applicable laws and regulations

Special-Status Wildlife-2: Preconstruction Surveys

If it is determined that special-status wildlife species may occur in a project area, a qualified biologist will survey the area during the appropriate time window to determine the presence or absence of the species. If the species is located, the MCOSD should conduct the activity to avoid impacts to the species. If avoidance is not possible, the appropriate resource agencies will be contacted to obtain guidance or the necessary permits.

Special-Status Wildlife-3: Seasonal Restrictions During Bird Nesting Season

The MCOSD will implement the following seasonal restrictions to protect nesting birds. If work will occur outside the nesting bird window of February 1 to August 31, surveys and avoidance measures will not be necessary for nesting birds. However, surveys for special-status species may still be necessary if they are present in the area.

- Identify potential habitat for nesting birds and survey to determine if active nests are present before initiating road and trail management actions. Surveys will include the proposed road and trail management footprint, and a ¼ mile buffer area (for raptors) or a 150 foot buffer area (for other birds). Surveys will be conducted within 14 days of the start of active ground-disturbing activities.
- If any active nests of protected bird species are found, prohibit brushing, mowing and tree removal activities at the nest site and within a buffer area until the young birds have fledged and left the site, and/ or the nest has been abandoned. The buffer area will be 50-250 feet, or as determined through consultation with the California Department of Fish and Wildlife, pursuant to section 2081 of the California Fish and Game Code and the federal Migratory Bird Treaty Act. In general, a line-of-site buffer of at least 150 feet between the nest site and road and trail management activities is recommended. For raptors, buffer distances may be increased to 250 feet or more, depending on the visual distance from the nest to the road and trail management work area, and the sensitivity of the raptor species to road and trail management activities. In addition, a 5 MPH speed limit will be enforced in and near bird nesting habitats and other sensitive habitat areas.
- If impacts to nesting birds cannot be avoided, contact the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife to obtain the necessary permits before initiating road and trail management activities.

Special-Status Wildlife-4: Avoidance and Protection of Northern Spotted Owl

Northern spotted owls have potential to occur on the MCOSD preserves. The MCOSD will undertake the following actions when construction-related road and trail management actions are planned to occur within or adjacent to potential northern spotted owl habitat:

- Identify potential habitat for the northern spotted owl and survey to determine if it is occupied or if active nests are present before initiating road and trail management activities. Surveys will include the proposed road and trail management footprint and a 150 foot buffer area. Surveys will be conducted within 14 days of the start of active ground-disturbing activities.
- To the greatest extent possible, avoid occupied habitat completely during key northern spotted owl breeding and nesting season (March-September).
- Mark occupied habitat with flagging or temporary fencing.
- Avoid removal of trees with documented northern spotted owl nests. Removal of nest trees typically requires compensatory mitigation.
- Establish a buffer of at least 100 feet around occupied habitats. Within the buffer area, select least harmful road and trail management activities. Within the buffer area, retain old-growth forest trees and forest canopy, and minimize removal of other vegetation to the fullest extent possible.
- Avoid cutting native trees greater than 10 inches in diameter at breast height within occupied northern spotted owl habitat.
- Conduct a worker training program for all field personnel involved with the proposed road and trail management project prior to project initiation. The program will consist of a brief presentation by persons knowledgeable about the northern spotted owl. The program will include the following: a photograph and description of the northern spotted owl, a description of its ecology and habitat needs, an explanation of the measures being taken to avoid or reduce adverse impacts, and the workers' responsibility under applicable environmental regulations. The worker training may be conducted in an informal manner (e.g., as part of a routine tailgate safety meeting).
- If impacts cannot be avoided, contact the U.S. Fish and Wildlife Service and/or the California Department of Fish and Wildlife to obtain the necessary permits before initiating road and trail management activities.
- Notify the U.S. Fish and Wildlife Service and/or the California Department of Fish and Wildlife within 24 hours of finding any injured northern spotted owl or any unanticipated damage to its habitat associated with the proposed action. Notification must include the date, time, and precise location of the specimen/ incident, and any other pertinent information. Dead animals will be sealed in a plastic zip lock bag containing a piece of paper indicating the location, date, and time when it was found, and the name of the person who found it; the bag should be frozen in a freezer in a secure location. The MCOSD will contact the U.S. Fish and Wildlife Service within seven days to transfer any dead or injured specimens.

Special-Status Wildlife-5: Avoidance and Protection of Double-Crested Cormorant Nests and Heron and Egret Rookery Sites

There are several known or suspected double-crested cormorant, great blue heron, snowy egret, and black-crowned night heron rookery or nesting sites existing on the MCOSD preserves. These procedures are similar to those described in Special-Status Wildlife Protection-3 for seasonal restrictions during bird nesting season but are more specific to these particular bird species and therefore supersede the more general practices for protecting all nesting birds. The MCOSD will undertake the following procedures when construction-related road and trail management is planned to occur within or adjacent to potential nesting or rookery sites for these species:

- Identify potential habitat for double-crested cormorant, heron, and egret nest and rookery sites and survey to determine if they are occupied or if nests are present before initiating road and trail management actions. Surveys will include the proposed road and trail management footprint and

a 150-foot buffer area. Surveys will be conducted within 14 days of the start of active ground-disturbing activities.

- To the greatest extent possible, avoid nests and rookery sites completely during key breeding and nesting periods. Activities in or near known sites will be limited during the known nesting seasons for each species, or until young have fully fledged.
- Establish a buffer of at least 100 feet around rookery and nest sites. Within the buffer area, select least harmful road and trail management activities. Restrict activities within the buffer to those that will not disturb roosting or nesting behavior (e.g., noise and visual disturbances).
- Mark occupied habitat with flagging or temporary fencing.
- Prohibit the removal of known roost or nest trees. Restrict the removal of other mature riparian trees within the buffer zone.
- Conduct a worker training program for all field personnel involved with the proposed road and trail management project prior to project initiation. The program will consist of a brief presentation by persons knowledgeable about the special-status species. The program will include the following: a photograph and description of the special-status species, a description of its ecology and habitat needs, an explanation of the measures being taken to avoid or reduce adverse impacts, and the workers' responsibility under applicable environmental regulations. The worker training may be conducted in an informal manner (e.g., as part of a routine tailgate safety meeting).
- If impacts cannot be avoided during the nesting season (March 1 – August 31), contact the California Department of Fish and Wildlife to obtain the necessary permits before initiating road and trail management activities.
- Notify the California Department of Fish and Wildlife within 24 hours of finding any injured special-status species or any unanticipated damage to its habitat associated with the proposed action. Notification must include the date, time, and precise location of the specimen/incident, and any other pertinent information. Dead animals will be sealed in a plastic zip lock bag containing a piece of paper indicating the location, date, and time when it was found, and the name of the person who found it; the bag should be frozen in a freezer in a secure location. The MCOSD will contact the California Department of Fish and Wildlife within seven days to transfer any dead or injured specimens.
- Prohibit or restrict equipment refueling, fluid leakage, equipment maintenance, and road surfacing activities near wetlands. Fuel storage and refueling will occur in safe areas well away from wetlands; safe areas may include paved or cleared roadbeds and other contained areas, such as lined truck beds. Equipment and vehicles will be inspected regularly for hydraulic and oil leaks, and leaking vehicles will not be allowed on the MCOSD preserves. Drip pans will be placed underneath equipment stored on site. Vehicles and construction equipment will be maintained in good working condition, and any necessary on-site servicing of equipment will be conducted away from the wetlands.
- Require all contractors to possess, and all vehicles to carry, emergency spill containment materials**.**
- Absorbent materials will be on hand at all times to absorb any minor leaks and spills**.**

Special-Status Wildlife-6: Avoidance and Protection of California Clapper Rail, California Black Rail, and Salt Marsh Harvest Mouse

The MCOSD preserves encompass some tidal areas that are known to support, or have the potential to support, California clapper rail, California black rail and salt-marsh harvest mouse. In areas where road and trail management activities are planned to occur within or adjacent to salt marsh or brackish marsh habitats, the MCOSD will first consult with the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife to determine locations where these species could potentially be affected. The MCOSD will obtain and comply with necessary permits for working in suitable habitat for these species, including, but not limited to the following types of protective actions to prevent harm to these species:

- To the greatest extent possible, avoid occupied California clapper rail and California black rail habitat completely during key breeding and nesting periods. Noise-generating activities, including operating heavy machinery in or near known California clapper or California black rail sites, will be avoided during the nesting season (March 1 – August 31).
- During the California clapper rail and California black rail breeding season, identify potential habitat for California clapper rail and California black rail, and survey to determine if it is occupied before initiating road and trail management activities. Survey will include the proposed road and trail management footprint and a 150-foot buffer area around occupied habitat. Surveys will be conducted within 14 days of the start of active ground- disturbing activities. Occupied habitat will be marked with flagging or temporary fencing.
- Assume presence of salt marsh harvest mouse in appropriate habitats, avoid impacting these areas, and establish a protective buffer. Because the U.S. Fish and Wildlife Service frequently does not allow trapping of the salt marsh harvest mouse to determine its presence, the MCOSD will assume presence in appropriate habitats and avoid disturbing them. If appropriate habitats are present, a 200-foot buffer will be established around the habitat. If work is required within the buffer, activities will be restricted within the buffer to those that will not disturb nesting behavior (e.g., through noise or visual disturbances), and vegetation will be removed by hand under the supervision of a qualified biologist to ensure no impacts to the salt marsh harvest mouse occur.

Special-Status Wildlife-7: Protection of Fish Habitat

If crossing a stream with the potential to support fish is part of a road or trail project, proper fish passage will be designed:

- Preference will be for a bridge instead of a culvert, and an open-arch culvert instead of a pipe culvert. A bridge that will not affect streamflow will be the preferred option. If a culvert is necessary, an open-arch design that does not affect the bed or flow of the stream will be preferred. If an open arch culvert is not possible, pipe culverts will be installed slightly below grade in an area perpendicular to the crossing where the existing streamflow is linear. Resting pools will be designed above and below culverts to allow fish to rest before and after having to pass through the culvert.

Special-Status Wildlife-8: Worker Awareness Training

Conduct worker awareness training. Worker training will include the following information: a photograph and description of each special-status species, sensitive, resource, or invasive plant known from the project area; a description of its ecology and habitat needs; potentially confusing resources (e.g., similar species or habitats); an explanation of the measures being taken to avoid or reduce adverse impacts; reporting and necessary actions if sensitive resources are encountered; and workers' responsibility under the applicable environmental regulation.

Special-Status Wildlife-9: Construction Monitoring

If federal- or state-listed wildlife species are known to be present in the project area or immediate surroundings, a qualified biologist will monitor construction activities to ensure impacts to species will be avoided. If listed wildlife species are present within the immediate vicinity of the project area, a more involved monitoring program might be necessary to ensure that these species do not enter the project area. If a listed species is observed by a worker or construction monitor, work will cease immediately, and the appropriate resource regulatory agency will be contacted if necessary. A construction monitoring program will be developed for each project on a project-specific basis.

Special-Status Wildlife-10: Relocation of Special-Status Species

If federal- or state-listed wildlife species are located on site, the appropriate resource agency will be contacted, and a qualified biologist possessing any necessary permits will relocate individuals to suitable habitat off site as applicable.

Special-Status Wildlife-11: Noise Control

Utilize the best available noise-control techniques when in proximity to occupied sensitive wildlife habitat. The best available noise-control techniques (e.g., improved mufflers, equipment redesign, and use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) will minimize disturbance of nearby wildlife populations.

Special-Status Wildlife Protection-12: Trash Control
Store food-related trash in closed containers and remove it from the project site daily. Food-related trash can attract wildlife to construction sites, disrupting their normal behavior patterns.

Special-Status Wildlife-13: Road and Trail Inspections
Regularly inspect road and trail features and associated infrastructure to ensure they are well maintained and posing no threat to surrounding special-status wildlife species. Staff will record information pertaining to the spread of invasive exotic plants that could affect wildlife habitats and to the status and quality of any known special-status wildlife species in the immediate vicinity that could be affected by road or trail use, maintenance, or management activities. Staff will report any findings to MCOSD natural resource staff and make recommended corrective actions if appropriate.

SPECIAL STATUS PLANTS BMPs

Special-Status Plants-1: Literature Reviews

Prior to all management activities, literature reviews will be conducted to determine if special-status plant species, critical habitats, or sensitive communities exist within the project area. In addition to the MCOSD database, the following resources will be reviewed, as necessary, prior to work:

- U.S. Geological Survey topographic maps
- U.S. Fish and Wildlife Service National Wetlands Inventory maps
- Bay Area Aquatic Resource Inventory Database
- Aerial photographs
- California Department of Fish and Wildlife Natural Diversity Database records
- U.S. Fish and Wildlife Service quadrangle species lists
- California Native Plant Society inventory records

Database searches for known occurrences of special-status plant species will focus on the vicinity of the project area. Biological communities present in the project location and surrounding areas will be classified based on existing plant community descriptions described in the Preliminary Descriptions of the Terrestrial Natural Communities of California. Biological communities will be classified as sensitive or non-sensitive as defined by the California Environmental Quality Act and other applicable laws and regulations.

Special-Status Plants-2: Avoidance and Protection of Special- Status Plant Species near Road and Trail Management Projects

The MCOSD will undertake the following actions when construction-related road and trail management is planned to occur within or adjacent to special-status plant populations:

- Identify potential special-status plant habitat and survey to determine if it is occupied before initiating road and trail management activities. Surveys will include the proposed road and trail management footprint and a 100-foot buffer area around the footprint if potential special-status plant habitat exists. Surveys will be conducted within 14 days of the start of active ground-disturbing activities.
- To the greatest extent possible, avoid occupied special-status plant populations completely.
- If full avoidance is not possible, restrict work to the period when special-status plants have flowered or set seed**.**
- Establish a buffer of at least 100 feet around special-status plant populations. Within the buffer area, select the least harmful road and trail management activities.
- Mark special-status plant populations with flagging or temporary fencing.
- Prevent unnecessary vehicular and human intrusion into special-status plant species habitat from adjacent construction, maintenance, and decommissioning activities. Where necessary, reroute or sign and fence trails to avoid the special-status plant population.
- Prohibit or restrict equipment refueling, fluid leakage, equipment maintenance, and road surfacing activities near special-status plant populations. Activities will be restricted within the buffer to those that will not disturb roosting or nesting behavior (e.g., through noise or visual disturbances). Fuel storage and refueling will occur in safe areas well away from wetlands; safe areas may include paved or cleared roadbeds and other contained areas, such as lined truck beds. Equipment and vehicles will be inspected regularly for hydraulic and oil leaks, and leaking vehicles will not be allowed on the MCOSD preserves. Drip pans will be placed underneath equipment stored on site. Vehicles and construction equipment will be maintained in good working condition, and any necessary on-site servicing of equipment will be conducted away from special-status plant populations.

- To minimize downslope erosion and sedimentation near special-status plants, maintain erosion- and sediment-control devices during ground-disturbing activities and until all disturbed soils have been stabilized. Control devices include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the introduction of wheat, barley, and other nonnative plant seeds. Erosion-control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians.
- Conduct a worker training program for all field personnel involved with the proposed road and trail management project prior to project initiation. The program will consist of a brief presentation by people knowledgeable about the special-status species. The program will include the following: a photograph and description of the special-status species, a description of its ecology and habitat needs, an explanation of the measures being taken to avoid or reduce adverse impacts, and the workers' responsibility under applicable environmental regulations. The worker training may be conducted in an informal manner (e.g., as part of a routine tailgate safety meeting).
- If impacts cannot be avoided, contact the U.S. Fish and Wildlife Service and/or the California Department of Fish and Wildlife to obtain the necessary permits before initiating road and trail management activities. Permit conditions will likely require presence of a biological monitor, installation of exclusion fencing, surveys to relocate or avoid the species, and/or possibly timed or staged road and trail management activities that avoid the species or reduce potential for take or harm.
- If a special-status plant species is detected during work activities, stop work immediately at that location and contact the U.S. Fish and Wildlife Service and/or the California Department of Fish and Wildlife within two working days. Work will not resume at that location until authorization is obtained from the appropriate agency (unless prior approval has already been granted).
- Notify the U.S. Fish and Wildlife Service and/or the California Department of Fish and Wildlife within 24 hours of finding any damaged special-status plant species or any unanticipated damage to plant habitats associated with the proposed action. Notification must include the date, time, and precise location of the specimen/incident, and any other pertinent information. Dead plants should be sealed in a zip lock bag containing a piece of paper indicating the location, date, and time when it was found, and the name of the person who found it; the bag should be frozen in a freezer in a secure location. The MCOSD will contact the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service within two days and transmit the specimen in the appropriate manner.
- If work occurs during the dry season and is greater than 100 feet from special-status plant species habitat, erosion control and water quality protection measures generally will not be necessary.

Special-Status Plants-3: Ensure Proposed Actions are Consistent with Ongoing Special-Status Plant Management Programs

Some MCOSD preserves (e.g., Ring Mountain and Old Saint Hilary's) have ongoing special-status plant management and monitoring programs. In these locations the MCOSD will ensure that all new proposed road and trail management activities are consistent with the ongoing management of these sites:

- Review existing management plans and analyze proposed actions for consistency against adopted procedures.
- Ensure that new road and trail management projects do not interfere with ongoing management and maintenance activities.

Special-Status Plants-4: Earthwork near Special-Status Plant Populations

Many special-status plants are closely associated with specific soil types or geologic conditions (e.g., serpentine or ultramafic soils). To protect these species, the MCOSD will implement the following practices:

- Use native soil in all MCOSD road and trail management projects in natural habitat areas.

- Do not allow the introduction of incompatible fill near special-status plant populations. Fill will consist of clean, native soils and aggregate materials from other projects within the preserve if available, or it will be purchased from a certified weed-free source before allowing the importation of other materials from outside the preserves. Fill materials will be approved by natural resource staff to ensure compatibility with future restoration/rehabilitation goals.
- Salvage, store, and reuse topsoil. Where activities disturb soil temporarily, the top 6 to 12 inches of topsoil will be salvaged to retain seeds, soil mycorrhizae, and fungi from the excavated or otherwise disturbed area. The salvaged topsoil will be reapplied as a topdressing or topcoat over backfill, unless it is known to contain invasive plant seeds or propagules.

Special-Status Plants-5: Erosion Potential near Special-Status Plants

The MCOSD will seek to prevent erosion near special-status plants. To protect these species, the MCOSD will:

- Unless no feasible alternative is available, avoid using heavy equipment in areas with soils that are undisturbed, saturated, or subject to extensive compaction. Where staging of heavy equipment, vehicles, or stockpiles is unavoidable, the allowable disturbance footprint will be limited and marked with flagging or fencing. Following the end of work, surface soils will be scarified to retard runoff and promote rapid revegetation.
- Maintain a 15 MPH speed limit in sensitive habitat areas. This will reduce the potential for dust impacts on vegetation. For larger projects, roads will be watered for dust control near sensitive resources.
- Immediately rehabilitate areas where project actions have disturbed soil. Areas disturbed by equipment or vehicles will be rehabilitated as quickly as possible to prevent erosion, discourage the colonization of invasive plants, and address soil compaction. Techniques include decompacting and aerating soils, recontouring soils to natural topography, stabilizing soils via erosion-control materials, revegetating areas with native plants, and removing and monitoring invasive plants.
- To minimize erosion and sedimentation, maintain erosion- and sediment-control devices to protect special-status plant populations during ground- disturbing activities and until all disturbed soils have been stabilized. Measures include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the introduction of wheat, barley, and other nonnative plant seeds, must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.), and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians. If work occurs during the dry season and is more than 100 feet from special- status plant populations, erosion-control and water quality protection measures will not be necessary.

Special-Status Plants-6: Introduction of Invasive and Nonnative Plants and Plant Material
The MCOSD will prevent the introduction of invasive and other nonnative plant material into special-status plant habitats by implementing the following practices:

- To the extent feasible, use plant seeds, cuttings, and other propagules that are collected from the same area as the project site (usually the same watershed or preserve). Allow collection of no more than 5% of any native plant population to prevent over collecting of wild plant material sources.
- To minimize erosion and sedimentation, maintain erosion- and sediment-control devices during ground- disturbing activities and until all disturbed soils have been stabilized. Measures include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Only weed-free materials will be used as erosion- and sediment control devices. Materials must be certified weed- free to prevent the introduction of wheat, barley, and other nonnative plant seeds. Erosion-control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and not of plastic monofilaments or other materials that could entrap snakes or amphibians.
- Do not allow the introduction of incompatible fill near special-status plant populations. Fill will consist of clean, native soils and aggregate materials from other projects within the preserve if available, or it will be purchased from a certified weed-free source before allowing the importation of other materials from outside the preserves. Fill materials will be approved by natural resource staff to ensure compatibility with future restoration/rehabilitation goals.
- Segregate and treat soils and vegetation contaminated with invasive plant seeds and propagules. To prevent the spread of invasive plants, treatment of contaminated soils may include disposal on site within already infested areas, chipping or pile burning and mulching to eliminate viable seeds, or disposal at an approved cogeneration plant or green-waste facility.
- Clean vehicles of contaminated soil, invasive plant seeds, or plant parts before entering the MCOSD preserves, whenever moving equipment between areas within the preserves, and before leaving the preserves. Vehicle-cleaning areas will be established for this purpose. Within the cleaning areas, tires and interior and exterior of vehicles and equipment will be brushed off or hosed down.
- Inspect construction equipment for soil or invasive seeds or plant parts. Contractors will be required to make equipment available for inspection before entering the MCOSD preserves, when moving between sites within the preserves, and before leaving the preserves.

Special-Status Plants-7: Revegetation with Native, Geographically Appropriate Plant Species
The MCOSD will revegetate areas where construction and ground disturbance has occurred, to promote a species composition and vegetative structure that integrates with the surrounding natural community, to the maximum extent possible. This will be accomplished by implementing the following:

- Revegetate with annual grasses and forbs. Use of annual grasses and forbs can provide rapid vegetative cover and initial soil stabilization, and erosion control, promote habitat for native species, and provide a more desirable visual cover.
- Prepare a project-specific revegetation plan. The MCOSD natural resource staff will develop a revegetation plan for projects as needed.
- Wherever possible use locally collected native plant materials from the project footprint and surrounding areas. If possible, plant materials should be collected from within the same watershed or preserve. The MCOSD will allow collection of no more than 5% of any native plant population to prevent over collection of wild plant material sources. If sufficient local plant materials are not available for collection prior to project activities, geographically appropriate native plant materials will be purchased from a local nursery or seed supplier.

Special-Status Plants-8: Worker Awareness Training
The MCOSD will conduct a worker awareness training for all field personnel involved with proposed road and trail management activities prior to initiating the project. The program will include the following:

- a photograph and description of each special-status species, sensitive resource, or invasive plant known from the project area
- a description of its ecology and habitat needs
- potentially confusing resources (e.g., similar species or habitats)
- an explanation of the measures being taken to avoid or reduce adverse impacts
- reporting and necessary actions if sensitive resources are encountered
- workers' responsibility under the applicable environmental regulation

Special-Status Plants-9: Relocation of Special- Status Plants
If special-status species are located in the project area and impacts to these species are unavoidable, plants and/or propagules will be relocated to suitable habitat off site prior to the commencement of construction or management activities. Alternatively, off-site mitigation for impacts could be considered. If special-status wildlife species are located on site, the appropriate resource agency will be contacted, and a qualified biologist possessing any necessary permits will relocate individuals to suitable habitat off site as applicable.

Special-Status Plants-10: Road and Trail Inspections
Regularly inspect road and trail features and associated infrastructure to ensure they are well maintained and posing no threat to surrounding special-status plant resources. Staff will record information pertaining to the spread of invasive, exotic plants that could affect special-status plant habitats and to the status and quality of any known special-status plant populations in the immediate vicinity that could be affected by road or trail use, maintenance, or management activities. Staff will report any findings and make recommended corrective actions if appropriate.

Special-Status Plants-11: Reuse and Replanting of Native Trees and Shrubs
Where feasible, replant excavated trees and shrubs, removed from unstable fill slopes and cut banks, on graded contours to restore the areas with native vegetation and promote native plant habitat. These plants will represent the most locally appropriate materials for restoration and conform to the vegetation types of the surroundings.

Special-Status Plants-12: Ripping and Recontouring Roads
Rip and de-compact road and trail surfaces where appropriate. Ripping surfaces provides a more suitable substrate for recolonization or revegetation by native plant materials. Decommissioned road and trail surfaces will be recontoured and sloped away from wetlands and water bodies to prevent the potential for erosion into these features. Any shoulders, ditches, or embankments will also be removed, and the area graded to a natural contour.

INVASIVE PLANTS BMPs

Invasive Plants-1: Compliance with Integrated Pest Management Ordinance

All herbicide use will be administered under Marin County's Integrated Pest Management (IPM) Ordinance, and work will only be conducted under the supervision of a certified pest control applicator. All herbicide use for vegetation management actions will be posted and reported consistent with the ordinance.

Invasive Plants-2: Herbicide Use near Sensitive Natural Resources

Limit herbicide use within 100 feet of sensitive natural resources. Hand control, mechanical control, and cultural control will be used wherever possible to minimize the use of herbicides near sensitive resources.

Invasive Plants-3: Survey and Control of Invasive Plants in Project Footprint

Before ground-disturbing activities begin, inventory, and prioritize invasive plant infestations for treatment within the project footprint and along access routes. Controlling priority invasive plant infestations at least a year prior to the planned disturbance, if feasible, will minimize invasive plant seeds in the soil.

- Where feasible, survey the road shoulders of access routes for invasive plant species and remove priority invasive plants that could be disturbed by passing vehicles.
- Avoid establishing staging areas in areas dominated by invasive plants. If populations of priority invasive plants occur within or near staging areas, their perimeters will be flagged so that vehicle and foot traffic can avoid them.
- Clean vehicles of contaminated soil, invasive plant seeds, or plant parts before entering the MCOSD preserves, whenever moving equipment between areas within the preserves, and before leaving the preserves. Vehicle-cleaning areas will be established for this purpose. Within the cleaning areas, tires and the insides and outsides of vehicles and equipment will be brushed off or hosed down.
- Inspect construction equipment for soil or invasive seeds or plant parts. Contractors will be required to make equipment available for inspection before entering the MCOSD preserves, when moving between sites within the preserves, and before leaving the preserves.

Invasive Plants-4: Limited Soil Disturbance

Soil disturbance during road and trail projects will be minimized to reduce the potential for introduction or spread of invasive plant species, to protect topsoil resources and to reduce available habitat for new invasive plant species:

- Plan all road and trail management activities to disturb as little area as possible.

Invasive Plants-5: Cleaning of Heavy Equipment, Maintenance Tools, and Fire Management Vehicles

The MCOSD will implement the following procedures when working in or near infested areas:

- Clean vehicles of contaminated soil, invasive plant seeds, or plant parts before entering the MCOSD preserves, whenever moving equipment between areas within the preserves, and before leaving the preserves. Vehicle-cleaning areas will be established for this purpose. Within the cleaning areas, tires and the insides and outsides of vehicles and equipment will be brushed off or hosed down.
- Inspect construction equipment for soil or invasive seeds or plant parts. Contractors will be required to make equipment available for inspection before entering the MCOSD preserves, when moving between sites within the preserves, and before leaving the preserves.

Invasive Plants-6: Reducing Potential for Establishment of Invasive Plants on Disturbed Soil Surfaces

To minimize the establishment of invasive species in disturbed soil areas, the MCOSD will implement one or more of the following actions:

- To minimize erosion and sedimentation, maintain erosion- and sediment-control devices during ground- disturbing activities and until all disturbed soils have been stabilized. Control devices include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the introduction of wheat, barley, and other nonnative plant seeds. Erosion-control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles, etc.) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians.
- Do not allow the introduction of incompatible fill. Fill will consist of clean, native soils and aggregate materials from other projects within the preserve if available, or it will be purchased from a certified weed- free source before allowing the importation of other materials from outside the preserves. Fill materials will be approved by natural resource staff to ensure compatibility with future restoration/rehabilitation goals.
- Segregate and treat soils and vegetation contaminated with invasive plant seeds and propagules. To prevent the spread of invasive plants, treatment of contaminated soils may include disposal on site within already infested areas, chipping or pile burning and mulching to eliminate viable seeds, or disposal at an approved cogeneration plant or green-waste facility.

Invasive Plant Management-7: Monitor and Control of Invasive Plants in Road and Trail Management Work Areas

- Periodically monitor areas subject to road and trail management activities for a minimum of three years following project completion for the presence of invasive plant species. If invasive plants threaten to become established or spread as a result of project activities, they will be treated in conformance with the Vegetation and Biodiversity Management Plan.

Invasive Plant Management-8: Protection of Streambanks and Water Quality During Invasive Plant Removal

- Install approved erosion-control devices following the removal of invasive plants from streambanks to prevent sediment movement into watercourses and to protect bank stability. The MCOSD will obtain and comply with necessary wetland permits and integrated pest management procedures related to work in and near wetlands. Where appropriate, the MCOSD will also seek guidance from a fisheries biologist regarding the amount of material permissible to remove from stream corridors when controlling large patches of invasive plants, so as to prevent changes in water temperature and quality. If work occurs during the dry season near seasonally wet areas, erosion-control and water quality protection measures generally will not be necessary.

Invasive Plant Management-9: Road and Trail Inspections

Regularly inspect road and trail features and associated infrastructure to ensure they are well maintained and posing no threat to surrounding sensitive biological resources. Inspectors will record information pertaining to invasive exotic plant populations and new infestations that may be threatening sensitive species and habitats. Inspectors will report any findings and make recommended corrective actions if appropriate.

Invasive Plant Management-10: Monitoring Decommissioned Areas

Monitor areas of decommissioned roads and trails for the presence of invasive plant species for two years following decommissioning to ensure no infestations develop. If invasive species are detected at this time, corrective actions will be taken as appropriate.

CONSTRUCTION CONTRACTS BMP

Construction Contracts-1: Standard Procedures in Construction Contracts

When using contractors to perform road and trail management, the MCOSD will include some or all of the following standard procedures into construction contracts.

Time of work. The contractor will work with the MCOSD natural resource staff to determine the optimal timing of contracted work. Many timing restrictions relate to avoiding migration, gestation, or flowering periods for special-status species. Other types of timing restrictions relate to avoiding the spread of invasive plants or scheduling work in wetlands during the dry season.

Work in and near water bodies and wetlands. To protect water quality, the contractor will be required to prepare and implement a stormwater pollution prevention plan for road and trail management work in or near wetlands, ponds, seeps, creeks, tidal areas, or stream crossings. The following practices will be followed to protect these habitats:

- Avoid construction work within a buffer of 100 feet from the ordinary high-water mark of any water body, wetland, or tidally influenced area. If construction work cannot be fully avoided in water bodies, wetlands and riparian areas, the appropriate state and federal agencies will be consulted and permits obtained.
- Within the buffer, restrict activities to the least-harmful methods. For example, herbicides will be restricted to those that are EPA-approved for use near water. Activities that disturb soil or could cause soil erosion or changes in water quality will be prohibited.
- Within the buffer, limit work that may cause erosion to low-flow periods. Low-flow months for local creeks are typically August to October. For tidal areas, work will not occur within two hours of high-tide events at construction sites when high tide is greater than 6.5 feet as measured at the Golden Gate Bridge, using corrections for areas near individual MCOSD preserves. Tide charts are available online from the National Oceanic and Atmospheric Agency/National Weather Service (http://www.wrh.noaa.gov/mtr/sunset.php).

Work in and near invasive plant infestations. The contractor will work with the MCOSD natural resource staff to identify any priority invasive plants that occur near the project work area, including the project footprint, access roads, staging areas, and similar work areas. The contractor will agree to comply with requirements to reduce the spread or transport of priority invasive plants related to construction activities. Requirements may include some or all of the following:

- Conduct a training program for all field personnel involved with the proposed road and trail management project prior to initiating the project. The program will consist of a brief presentation by persons knowledgeable about the special-status species, sensitive resource, or invasive plants known from the project area. The program will include the following: a photograph and description of each special-status species, sensitive resource, or invasive plant known from the project area; a description of its ecology and habitat needs; an explanation of the measures being taken to avoid or reduce adverse impact; and the workers' responsibility under the applicable environmental regulation. The worker training may be conducted in an informal manner (e.g., as part of a routine tailgate safety meeting).
- Restrict work to periods when invasive plants are not in fruit or flower.
- Clean vehicles of contaminated soil, invasive plant seeds, or plant parts before entering the MCOSD preserves, whenever moving equipment between areas within the preserves, and before leaving the preserves. Vehicle-cleaning areas will be established for this purpose. Within the cleaning areas, tires and insides and outsides of vehicles and equipment will be brushed off or hosed down.

- Inspect construction equipment for soil or invasive seeds or plant parts. Contractors will be required to make equipment available for inspection before entering the MCOSD preserves, when moving between sites within the preserves, and before leaving the preserves.
- Dispose of green waste in a manner that does not spread invasive plants. Disposal practices may include on-site disposal in an already infested area or off-site disposal in a cogeneration plant or an approved green-waste composting facility.

Work in environmentally sensitive areas. The MCOSD natural resource staff will identify any environmentally sensitive areas in or near construction projects prior to the start of the project. The following practices will be followed to protect these resources: Environmentally sensitive areas may include special-status plant or wildlife species or their habitats; wetlands; creeks, streams, and related riparian areas; and sensitive vegetation types as described in this report.

- Avoid work in environmentally sensitive areas. If work cannot be fully avoided, any applicable regulatory agencies will be consulted and the necessary permits obtained.
- Use locally collected plant materials for revegetation projects. Whenever possible, locally collected native plant materials from the project footprint and surrounding area will be used for revegetation. Plant materials should be collected from within the same watershed or the MCOSD preserve if possible. The MCOSD will allow collection of no more than 5% of any native plant population to avoid over collection of wild plant material sources. If sufficient local plant materials are not available for collection prior to project activities, geographically appropriate native plant materials will be purchased from a local nursery or seed supplier. The contractor will allow the MCOSD to inspect and approve all plant materials and seed prior to use on site.
- Comply with requirements of the MCOSD project permits to protect special-status species and their associated habitats. For road and trail management work in or near special-status species habitat, the contractor is required to comply with requirements of the MCOSD project permits to protect special-status species and their associated habitats before and during construction, and to cooperate with the MCOSD in implementing any state and federal permits and agreements for the project. The special-status species population plus a buffer will be designated as an environmentally sensitive area using lath and flagging, pin flags, or temporary fencing (depending on resource sensitivity to work). The contractor will be required to avoid all designated environmentally sensitive areas during construction. For any special-status species or their habitats that cannot be fully avoided, the contractor will work with the MCOSD to obtain and comply with federal and state Endangered Species Acts, the federal Migratory Bird Treaty Act, and the California Fish and Game Code permits and agreements.
- Restrict soil disturbance and import of nonnative soil or fill material. To reduce the potential for damage of native plants and/or introduction of invasive plants, the contractor will be required to minimize the footprint of soil disturbance to the minimum amount necessary to complete the contracted work. This includes the footprint of access roads, staging areas, and areas of temporary disturbance. The contractor and its staff and subcontractors will agree not to drive off road or drive or park on native vegetation unless approved in advance by the MCOSD natural resource staff. The contractor will agree that if soil excavation is required, every attempt will be made to have a balanced cut-and-fill project that reuses all native soils on site. Nonnative soil or fill material will not be used unless preapproved by the MCOSD natural resource staff.
- To minimize erosion and sedimentation, maintain erosion- and sediment-control devices during ground- disturbing activities and until all disturbed soils have been stabilized. Control devices include rice straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials will be certified weed-free to prevent the introduction of wheat, barley, and other nonnative plant seeds. Erosion-control materials will be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians.

Other procedures:

- Keep all entry gates to the project site locked during non-construction hours or locked at all times if not needed for construction access.
- Equip all vehicles with a suitable fire extinguisher.
- Immediately rehabilitate areas where project actions have disturbed soil. Areas disturbed by equipment or vehicles will be rehabilitated as quickly as possible to prevent erosion, discourage the colonization of invasive plants, and address soil compaction. Techniques include de-compacting and aerating soils, recontouring soils to natural topography, stabilizing soils via erosion-control materials, revegetating areas with native plants, and removing and monitoring invasive plants.

CULTURAL RESOURCES BMPs

Cultural Resources-1: Historical and Archaeological Resource Mapping

Prior to constructing any project that would involve ground disturbance outside road or trail beds or other areas previously disturbed when constructing the road and trail system, the MCOSD staff will determine whether or not the project area is located within an area that is mapped as "historically or archaeologically sensitive" according to map 4-1 (Historical Resources) in the Marin Countywide Plan and/or identified as culturally sensitive on other confidential maps on file with the county that list prehistoric or archeological sites. If the project area is identified as sensitive on any of these maps, the site will be field surveyed by a state-qualified archeologist or an archeological consultant recommended by the Federated Indians of Graton Rancheria, who will make recommendations and develop proposals for any procedures deemed appropriate to further investigate and/or mitigate adverse impacts to those resources.

Cultural Resources-2: Consultation with Northwest Information Center

Prior to constructing any project that would involve ground disturbance outside road or trail beds or other areas previously disturbed when constructing the road and trail system, the MCOSD staff will contact the Northwest Information Center of the California Historical Resources Information System and request a records search of known historic and cultural resources within and adjacent to the proposed project area, and seek the determination of the information center coordinator regarding the potential for cultural resources on the site. Should the records request or the recommendation of the coordinator indicate the presence of sensitive resources, the site will be field surveyed by a state-qualified archeologist or archeological consultant recommended by the Federated Indians of Graton Rancheria, who will make recommendations and develop proposals for any procedures deemed appropriate to further investigate and/or mitigate adverse impacts to those resources.

Cultural Resources-3: Tribal Consultation

The following tribal consultations will be conducted prior to any new ground disturbance related to road or trail construction:

- Send the road and trail project description information to the Native American Heritage Commission and request contact information for tribes with traditional lands or places located within the geographic areas affected by the proposed changes.
- Contact each tribe identified by the commission in writing and provide them the opportunity to consult about the proposed project.
- Organize a consultation with tribes that respond to the written notice within 90 days.
- Refer proposals associated with proposed road and trail modifications to each tribe identified by the commission at least 45 days prior to the proposed action.
- Provide notice of a public hearing at least 10 days in advance to tribes and any other persons who have requested that such notice be provided.

Cultural Resources-4: Alteration of Historic Structures

Limit the modification of ranch structures or other historical features to maintain the aesthetic quality, historical setting, and rural character of the preserves.

Cultural Resources-5: Permanent Protection

Where road and trail activities cannot avoid sensitive cultural resources, require modifications to the actions to incorporate the resource and include a resource protection plan for its maintenance and future protection.

Cultural Resources-6: Construction Discovery Protocol

If cultural resources are discovered on a site during construction activities, halt all earthmoving activity in the area of impact until a qualified archeological consultant examines the findings, assesses their significance, and develops proposals for any procedures deemed appropriate to further investigate and/or mitigate adverse impacts to those resources.

Cultural Resources-7: Human Remains
In the event that human skeletal remains are discovered, discontinue work in the area of the discovery and contact the County Coroner. If skeletal remains are found to be prehistoric Native American remains, the coroner will call the Native American Heritage Commission within 24 hours. The commission will identify the person(s) it believes to be the most likely descendant of the deceased Native American. The most likely descendant will be responsible for recommending the disposition and treatment of the remains. The most likely descendant may make recommendations to the landowner or the person responsible for the excavation/grading work for means of treating or disposing of the human remains and any associated grave goods as provided in section 5097.98 of the California Public Resources Code.

Cultural Resources-8: Community Awareness
Increase public awareness of local history and archeology, and the need to protect cultural resources. This may be accomplished by highlighting cultural resources along a road or trail with interpretive signs and information kiosks, and/or by placing a historical marker along the road or trail segment to inform trail users about the importance of the site and/or event.

WATER QUALITY BMPs

Water Quality-1: Modifications to Road and Trail Management Actions to Protect Water Bodies, Wetlands, and Tidally Influenced Areas

Road and trail management activities will be restricted near wetlands and other waters to reduce the potential for sediment or pollutants to enter water bodies or wetlands. If work occurs during the dry season and is greater than 100 feet from creeks and wetlands, erosion control and water quality protection measures will not be necessary.

- If possible, avoid work around water bodies, wetlands, and tidally influenced areas, including a buffer area of 100 feet around these areas (i.e., as measured from the top bank of creeks, streams, or ponds).
- If construction work in wetlands, riparian areas, or tidally influenced areas cannot be fully avoided, consult with the appropriate state and federal agencies. This consultation may result in wetland delineation, permit applications, and mitigation that meets Countywide Plan and other regulatory requirements.
- Within the 100-foot buffer, limit construction activities. Limit activities to least-harmful methods; restrict herbicides to those that are EPA-approved for use near water. Prohibit activities that disturb soil or could cause soil erosion or changes in water quality.
- Within the 100-foot buffer, limit work that might cause erosion to low-flow or low-tide periods. Low-flow months for local creeks are typically August to October. For tidal areas, work will not occur within two hours of high-tide events at construction sites when high tide is greater than 6.5 feet as measured at the Golden Gate Bridge, using corrections for areas near individual MCOSD preserves. Tide charts are available online from the National Oceanic and Atmospheric Agency/National Weather Service (http://www.wrh.noaa.gov/mtr/sunset.php).
- Within the 100-foot buffer, minimize erosion and sedimentation by maintaining erosion- and sediment- control devices during ground-disturbing activities and until all disturbed soils have been stabilized. Control devices include weed-free straw, hydromulch, geofabrics, wattles, sediment traps, check dams, drainage swales, and sand bag dikes. Materials must be certified weed-free to prevent the introduction of wheat, barley, and other nonnative plant seeds. Erosion-control materials must be constructed of natural fibers (e.g., coconut fiber mats, burlap and rice straw wattles) and may not be constructed with plastic monofilaments or other materials that could entrap snakes or amphibians.

Water Quality-2: Temporary Erosion and Sediment Control

Temporary sediment-control practices will be implemented when new trail construction or existing trail improvements will result in greater than 1 acre of disturbance. Temporary practices may also be required when disturbance is less than 1 acre but close to a sensitive resource or has the potential to discharge a significant amount of sediments or pollutants to surface water. Several of the listed temporary practices can also be used as post-construction stabilization measures: Information and standard details for temporary erosion-control BMPs can be found in the California Stormwater BMP Handbook – Construction (CASQA 2009).

- Install temporary fencing around staging areas and along limits of construction when work areas are immediately adjacent to sensitive resources. This will limit the disturbance footprint and help protect resources, including native vegetation, wetlands, and streams, during grading operations.
- Install linear sediment barriers to slow and filter stormwater runoff from disturbed areas. Fiber or straw roll barriers can also be spaced along the contours of a disturbed area after construction to prevent concentrated flow and stabilize the area until there is sufficient vegetation coverage.
- Apply one or more of the following to restore or protect areas disturbed by excavation or grading operations:
  - tilling (minimum 6-inch depth) and seeding

    - hydromulch and tackifier
    - planting
    - straw or wood mulch
    - coir (jute) netting
    - biodegradable erosion-control blankets
    - plastic sheeting (only as an interim protection during storm events when construction site is still active)
- Cover soil and loose material stockpiles with weighted plastic sheeting when inactive or prior to storm events.
- Active and inactive material stockpiles will be encircled at all times with a linear sediment barrier.
- Manage sediment when diverting streamflow. When constructing trail or road stream crossings, a temporary clear-water diversion may be required. The following options will be considered for isolating the work area and protecting resources when diverting streamflow via gravity-fed flexible pipe or active pumping around the work area: sand or gravel bag coffer dam enclosed in plastic sheeting, water-filled dam (e.g., Aquadam), sheet piling, and turbidity curtains.
- Manage sediment during dewatering operations. The following options will be considered for applying or containing and treating sediment-laden water produced during dewatering operations: sprinkler system to open area (as long as there is no visible surface runoff), temporary constructed sediment basin or trap, rented sedimentation tank (e.g., Baker Tank).

Water Quality-3: Erosion Control Measures

- Avoid the use of heavy equipment in areas with soils that are undisturbed, saturated, or subject to extensive compaction.
- If no feasible alternative is available and staging of heavy equipment, vehicles, or stockpiles is unavoidable, limit the disturbance footprint and flag or mark the allowable disturbance area in the field. Following the end of work, newly disturbed soils will be scarified to retard runoff and promote rapid revegetation.
- Immediately rehabilitate areas where project actions have disturbed soil. Require areas disturbed by equipment or vehicles to be rehabilitated as quickly as possible to prevent erosion, discourage the colonization of invasive plants, and address soil compaction. Techniques include decompacting and aerating soils, recontouring soils to natural topography, stabilizing soils via erosion-control materials, revegetating areas with native plants, and removing and monitoring invasive plants.
- Leave the roots of target invasive trees and shrubs in place in areas with highly erosive soils or steep slopes. Stumps may be cut or ground down to the ground level.

If work occurs during the dry season and is greater than 100 feet from water bodies and wetlands, erosion control and water quality protection measures will not be necessary.

Water Quality-4: Preventing or Reducing the Potential for Pollution

- Include spill prevention and clean-up in annual staff training sessions.
- Properly use, store, and dispose of chemicals, fuels, and other toxic materials according to manufacturer's specifications and agency regulations.
- Prohibit or restrict equipment refueling, fluid leakage, equipment maintenance, and road surfacing activities near wetlands. Fuel storage and refueling will occur in safe areas well away from wetlands; safe areas may include paved or cleared roadbeds and other contained areas, such as lined truck beds.
- Equipment and vehicles will be inspected regularly for hydraulic and oil leaks, and leaking vehicles will not be allowed on the MCOSD preserves. Drip pans will be placed underneath equipment

stored on site. Vehicles and construction equipment will be maintained in good working condition, and any necessary on-site servicing of equipment will be conducted away from the wetlands.

- Require all contractors to possess, and all vehicles to carry, emergency spill containment materials.
- Absorbent materials will be on hand at all times to absorb any minor leaks and spills.

Water Quality-5: Road and Trail Inspections

Inspect roads and trails for conditions that might adversely affect water quality or other resources. Road and trail maintenance staff will use road/trail inspection forms to facilitate complete and consistent data capture and reporting of the following conditions:

- concentrated flows on roads and trails that cause erosion, rilling, or gullying
- runoff and effects to water quality of nearby habitats
- the spread of invasive exotic plants near wetlands and waters
- the status and quality of any known sensitive resources in the immediate vicinity that could be affected by road or trail use and/or maintenance

Staff will report any findings and make recommended corrective actions if appropriate.

Water Quality-6: Grading Windows

Restrict grading activity to the dry months (generally May 15 – October 15), when associated erosion will be reduced to the maximum extent possible.

Water Quality-7: Culvert Inspection

Inspect culverts on a regular basis. Inspections will ensure that culverts do not clog with sediment or debris. Blocked culverts may affect water quality, change the water course, increase erosion or sediment runoff, or affect wildlife. Any materials blocking culverts will be removed and disposed of outside of the watercourse in an area not subject to erosion. If a significant blockage or sedimentation exists, the MCOSD will plan and implement corrective actions as necessary. Excavation of sediments within streams may require a maintenance permit from the U.S. Army Corps of Engineers, the California Department of Fish and Wildlife, and/or the San Francisco Water Quality Control Board.

Water Quality-8: Proper Disposal of Excess Materials

Avoid resource impacts when disposing of materials. Any excess material related to new construction, maintenance, or decommissioning (including soils, debris, trash, or other materials that need to be removed as part of management activities) will be disposed of at an appropriate site where materials could not impact sensitive resources. For example, grading-related excess soils or removed debris will not be placed in or around a water body or wetland, where the materials could be subject to erosion that would affect water quality.

Water Quality-9: Sidecasting Construction Material

Avoid sidecasting, or at a minimum contain and remove sidecast material when it has the potential to reach surface waters. The following “rules of thumb” based on Fishnet 4C Guidelines (2007) will be used as guidance:

Slope Gradient	Distance to Watercourse	Sidecast Rule
Any Slope	Will likely enter watercourse	Not Allowed
Less than or equal to 20 percent	Greater than 150 feet	Allowed
Less than or equal to 50 percent	Greater than 300 feet	Allowed
Greater than 50 percent	Long vegetated slope	Allowed
Greater than 50 percent	Shorter, sparsely vegetated slope	Not Allowed

GEOLOGIC HAZARDS BMPs

Geologic Hazards-1: Assessment and Requirements in Areas of Potential Geologic Hazard

Given the unique and potentially high risks associated with geologic hazards, general best management practices for these types of potential impacts are not appropriate. Instead, when new trails or trail improvements are proposed in preserve areas with a propensity for geologic instabilities, including slides or debris flows in the more elevated areas and subsidence or liquefaction in the low-lying areas, a site assessment will be conducted by a certified geologist or geotechnical engineer. If geologic hazards are confirmed in the area, the site assessment will propose adequate avoidance measures or engineering elements to ensure trail and infrastructure stability and maintained public safety.

Geologic Hazards-2: Construction in Areas of Slides and Debris Flows

In areas of identified slide and debris flow hazards, locate and design new trails, drainage improvements, or irrigation so as not to alter the shape or stability, or change the drainage or groundwater conditions, of an existing slide area. Such alterations would potentially result in reactivation or further destabilization of the slope.

Geologic Hazards-3: Construction in Areas of Erodible and Expansive Soils

Use avoidance tactics or engineered grading to mitigate adverse geologic conditions and potential hazards. Prior to final road or trail project design, consult with engineering geologists and/or geotechnical engineers to identify and implement mitigating road or trial designs for new facility locations or when improving existing facilities.

Geologic Hazards-4: Construction in Areas of Collapsible Soils

In any of the lower elevation preserves (i.e., those near sea level) assess soil type and the potential for subsidence to determine optimum trail location and structural foundations necessary to avoid collapsible soils. In consultation with a certified geologist or geotechnical engineer, design roads and trails to avoid or reduce this potential hazard through optimizing location or by implementing appropriate engineering designs.

AIR QUALITY BMPs

Air Quality-1: Implement BAAQMD Measures

As part of the review process required under the California Environmental Quality Act, the MCOSD will use the current Bay Area Air Quality Management District guidelines to evaluate the significance of air quality impacts from road and trail management plans and projects, and to establish appropriate mitigation requirements.

Air Quality-2: Minimize Dust Control Emissions during Construction

The MCOSD will require its staff or contractors to implement appropriate Bay Area Air Quality Management District control measures for emissions of dust during construction of all road and trail modifications and improvements. The following basic control measures cover routine operation and maintenance and day-to-day upkeep of roads and trails, minor road and trail reconstruction, and minor decommissioning activities, they also cover changes in use, the conversion of a road to a trail, or any proposed action that does not involve construction activities, but an increase or decrease in the level of activity:

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard (vertical space between the top surface of the material and the top of the hauling container).
- Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

Air Quality-3: Enhanced Dust Control during Construction

The following enhanced control measures cover major road and trail reconstruction, rerouting, and decommissioning activities, such as repairing, replacing, or restoring heavily used and wide road and trail segments; they also cover resurfacing, replacing, and restoring trailhead areas and installing new water quality and drainage features:

- Hydroseed or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
- Enclose, cover, water twice daily, or apply nontoxic soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 miles per hour.
- Install sandbags or other erosion-control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

Air Quality-4: Dust Control during Construction in Sensitive Resource Areas

The MCOSD will require its staff or contractors to implement appropriate Bay Area Air Quality Management District optional control measures for emissions of dust during construction of all road and trail modifications and improvements that are large in area, located near sensitive resources, or which for any other reason may warrant additional emission reductions. The following measures cover rerouting road and trail alignments, significant decommissioning or restoration activities, and the construction of a new road and trail alignment on undisturbed land to connect previously unconnected points:

- Install wheel washers for all exiting trucks or wash off the tires or tracks of all trucks and equipment leaving the site.
- Install wind breaks, or plant trees/vegetative wind breaks, at windward side(s) of construction areas.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 miles per hour.
- Limit the area subject to excavation, grading, and other construction activity at any one time.

NOISE BMPs

Noise-1: County Noise Ordinance Requirements

For all maintenance and construction projects using powered or heavy equipment, implement the day and time restrictions for equipment operation and maintenance specified by Marin County Ordinance 3431, Construction Noise.

Noise-2: Noise Control during Construction within and adjacent to Sensitive Wildlife Populations

- Ensure that equipment and vehicles utilize the best available noise-control techniques (e.g., improved mufflers, equipment redesign, and use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) to prevent disturbance of nearby wildlife populations.

Except for emergency projects, prohibit nighttime operations or planned operations during breeding season in areas adjacent