

F. BIOLOGICAL RESOURCES

This section provides a general description of the biological resources in and around the City of Larkspur. This section also evaluates potential impacts to biological resources that could result from implementing the proposed Larkspur SMART Station Area Plan and recommends mitigation measures to avoid or minimize these potential impacts, if necessary.

1. Setting

This section contains: (1) a description of the methods used by LSA to obtain the information contained in this section; (2) descriptions of the existing habitat types, wildlife habitat values, special-status species, and sensitive habitats within the Plan area; (3) an overview of the existing federal and State regulations pertaining to biological resources; and (4) a summary of goals, policies, and action programs in the 1990 General Plan that are applicable to biological resources.

a. Methods. Prior to conducting fieldwork, LSA reviewed previous background reports prepared for the Plan area. Information from these reports was used to gain familiarity with the habitat types present within the Plan area and identify areas of interest for a future site visit. Sources of information on vegetation and habitat types included:

- *Transportation Authority of Marin, Central Marin Ferry Connection Multi-use Pathway Phase 1 Project, Marin County, California, Initial Study/Mitigated Negative Declaration;*¹
- *Transportation Authority of Marin, Central Marin Ferry Connection Multi-use Pathway Phase 1 Project, Marin County, California, Natural Resources Study Report;*²
- *The Initial Study for the Monahan Pacific Project;*³ and
- *The 2000 Larkspur Landing Circle Expanded Initial Study*⁴

Concurrent with this review, LSA developed an aerial photograph base map of the Plan area using aerial imagery and geographic information system (GIS) layers depicting the Plan area boundary provided by the BMS Design Group. Given the relatively large size of the Plan area and its urban setting, LSA determined that a broad level of habitat analysis was appropriate for this report. As such, the habitat types identified in this chapter have been customized for the Plan area and rely on general habitat characteristics and land use patterns rather than plant species composition. Vegetation mapping was performed manually by LSA in ArcGIS 10, based on aerial photography provided by Esri and the United States Department of Agriculture.

¹ Transportation Authority of Marin, 2010. Central Marin Ferry Connection Multi-use Pathway Phase 1 Project, Marin County, California, *Initial Study/Mitigated Negative Declaration*. September.

² Transportation Authority of Marin, 2010. Central Marin Ferry Connection Multi-use Pathway Phase 1 Project, Marin County, California, *Natural Resources Study Report*. April.

³ EDAW, Inc., 1999. *Initial Study for the Monahan Pacific Project*, City of Larkspur, California. June 4.

⁴ Turnstone Consulting, 2004. *2000 Larkspur Landing Circle Expanded Initial Study*. October 20.

LSA collected information on special-status species known to occur or potentially occurring in the Plan area by searching the California Natural Diversity Database⁵ (CNDDDB) and California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants⁶ for records within the San Rafael U.S. Geological Survey (USGS) 7.5-minute quadrangle. Additional sources of information included *The Marin County Breeding Bird Atlas: A Distributional and Natural History of Coastal California Birds*,⁷ and LSA biologists' personal knowledge of species occurrences in the Larkspur vicinity. For the purposes of this report, special-status species are defined as follows:

- Species that are listed, formally proposed, or designated as candidates for listing as threatened or endangered under the federal Endangered Species Act (ESA);
- Species that are listed, or designated as candidates for listing, as rare, threatened, or endangered under the California Endangered Species Act (CESA);
- Plant species on Lists 1A, 1B and 2 in the CNPS Inventory of Rare and Endangered Plants;
- Animal species designated as Species of Special Concern or Fully Protected by the California Department of Fish and Wildlife (CDFW);
- Species that meet the definition of rare, threatened, or endangered under Section 15380 of the CEQA guidelines; or
- Species considered to be a taxon of special concern by the relevant local agencies.

LSA biologist Dan Sidle conducted a reconnaissance-level survey of the Plan area on June 7, 2012. The purpose of this visit was to assess the habitat conditions and the potential for those habitats to support special-status plant and animal species. Although it was not feasible to cover the entire Plan area on foot, representative areas for each habitat type were identified prior to fieldwork and visited during the survey. Basic information on dominant plant species and animal species were collected. Due to the broad level of habitat mapping for the Plan area, most habitat type boundaries were easily identified on the aerial photograph base map prior to fieldwork. No focused rare plant or special-status animal surveys were conducted for the Plan area, nor was a formal jurisdictional delineation of waters of the United States conducted.

Plant taxonomy and nomenclature in this chapter follows Baldwin et al.⁸ Common and scientific names for special-status species or subspecies conform to the CNDDDB.⁹ Common and scientific

⁵ California Department of Fish and Wildlife, 2012. *California Natural Diversity Database* (commercial version), Biogeographic Data Branch. April 29.

⁶ California Native Plant Society, 2012. *Inventory of rare and endangered plants in California* (online edition, v7-09a). Website: www.cnps.org/inventory (accessed May 21).

⁷ Shuford, W.D., 1993. *The Marin County Breeding Bird Atlas: A Distributional and Natural History of Coastal California Birds*. California Avifauna Series 1.

⁸ Baldwin, B.G., et al., eds., 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. University of California Press, Berkeley.

⁹ California Department of Fish and Wildlife, 2012, op. cit.

names for fish, reptiles, amphibians, birds, and mammals conform to Nelson et al,¹⁰ Crother,¹¹ the American Ornithologists’ Union (AOU) *Check-list of North American Birds*,¹² and Baker and others,¹³ respectively.

b. Existing Biological Resources. The following section provides a description of the geography of the Plan area, habitat types, wildlife habitat values, special-status species, and sensitive habitat.

The Plan area comprises approximately 404.94 acres of Marin County and is bounded to the north and west by residential, commercial, and industrial development; to the south by urban development, Corte Madera Creek, and Corte Madera Marsh State Ecological Reserve; and to the east by open space, Shoreline Band Park, and San Quentin State Prison. Corte Madera Creek flows east and becomes the Corte Madera Channel before flowing into the San Francisco Bay.

(1) Habitat Types. As shown in Table IV.F-1, LSA identified eight habitat types within the approximately 404.94-acre Plan area: developed; ruderal/non-native annual grassland; non-native woody vegetation; coast live oak woodland; riparian woodland; tidal marsh/mudflat; freshwater/brackish marsh; and creek/open water. Figure IV.F-1 identifies the locations of these habitat types.

Table IV.F-1: Acreages of Habitat Types within the Plan Area

Habitat Type	Approximate Acres
Developed	320.73
Ruderal/Non-native annual grassland	20.22
Non-native woody vegetation	11.05
Coast live oak woodland	6.04
Riparian woodland	0.46
Tidal marsh/mudflat	7.34
Freshwater/brackish marsh	2.72
Creek/open water	36.38
TOTAL	404.94

Source: LSA Associates, Inc., 2013.

Three sub-areas are identified within the Plan area: Larkspur Landing – Sub-area 1A; Greenbrae Area – Sub-area 1B; and Redwood Highway Area – Sub-area 2. These sub-areas are shown on Figure IV.F-1.

Table IV.F-1 summarizes the approximate acreage of each habitat type within the Plan area, except for creeks. These acreages were calculated from polygons that were manually digitized using GIS software (i.e., ArcGIS 10) and based on habitat boundaries that were hand-drawn on aerial photo-

¹⁰ Nelson, J.S., et al., eds., 2004. *A list of common and scientific names of fishes from the United States, Canada, and Mexico*. Sixth edition. American Fisheries Society Special Publication 20.

¹¹ Crother, B.I., editor, 2012. *Scientific and standard English names of amphibians and reptiles of North American north of Mexico*. Society for the Study of Amphibians and Reptiles (SSAR) Herpetological Circular 39.

¹² American Ornithologists’ Union, 1998. *Check-list of North American birds*. Seventh edition. American Ornithologists’ Union, Washington, D.C.

¹³ Baker, R. J., et al., 2003. *Revised Checklist of North American Mammals North of Mexico, 2003*.

graphs by LSA Associates, Inc. Besides the open water habitats of the Corte Madera Creek and Corte Madera Channel, the majority of the undeveloped areas within the Plan area are located along the northern shoreline of Corte Madera Creek and in the northern and eastern portions of Sub-area 1A. These areas also support the majority of grassland, tidal marsh/mudflat, and woodland habitat, as shown in Figure IV.F-1.

Habitat types present in the Plan area are described below, and these descriptions are based on LSA's reconnaissance survey of the Plan area, unless otherwise noted.

Developed. Developed habitats of the Plan area include residential neighborhoods; commercial and industrial buildings; roads; parking lots, neighborhood parks, and associated landscaping consisting of lawns and ornamental trees and shrubs.

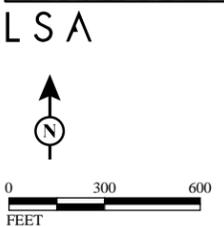
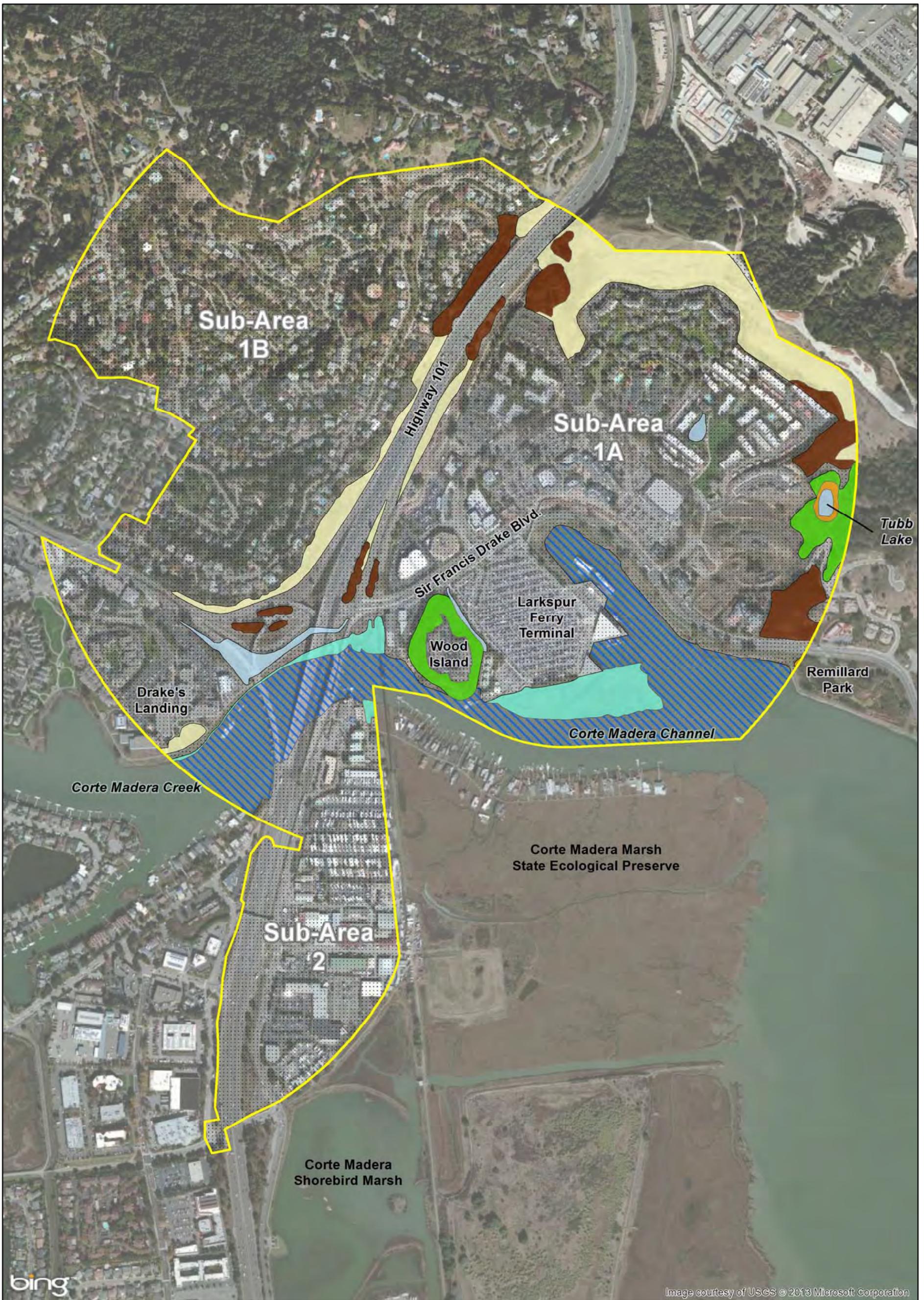
Ornamental trees in the developed portions of the Plan area are primarily non-native, but include some native species. Common non-native trees and shrubs observed in developed habitats include the following: blue gum (*Eucalyptus globulus*), sweet gum (*Liquidambar styraciflua*), weeping willow (*Salix babylonica*), acacia (*Acacia* spp.), fruit trees (*Prunus* spp.), oleander (*Nerium oleander*), pine (*Pinus* spp.), poplar (*Populus* spp.), olive (*Oleo europea*), tobira (*Pittosporum tobira*), American elm (*Ulmus americana*), and Mexican fan palm (*Washingtonia robusta*). Native but non-local trees in developed areas include Monterey pine (*Pinus radiata*), Douglas fir (*Pseudotsuga menziesii*), and coast redwood (*Sequoia sempervirens*). Coast live oak (*Quercus agrifolia*) is a local native species that was observed in developed areas of the Plan area.

Ornamental shrubs observed in the urban areas include bottlebrush (*Callistemon* sp.), pampas grass (*Cortaderia* sp.), Pride of Madeira (*Echium candicans*), agave (*Agave* sp.), broom (*Genista monspessulana*; *G. juncea*; *Cytisus scoparius*), and the native toyon (*Heteromeles arbutifolia*).

English ivy (*Hedera helix*), and Germany ivy (*Delairea odorata*) are also abundant in the developed portion of the Plan area.

Ruderal/Non-Native Annual Grassland Habitat. Most of the ruderal/non-native annual grassland habitat within the Plan area occurs in Sub-area 1B along Highway 101 and near the shoreline of Corte Madera Creek and along the northern portions of Sub-area 1A, as shown in Figure IV.F-1. The ruderal/non-native grassland habitat along the northern portions of Sub-area 1A is interspersed with some rocky outcrops associated with the quarry cuts that characterize the steep hillside above the multi-family housing. This habitat type is dominated by non-native annual grasses and non-native forbs.

Non-native plant species observed in ruderal/non-native grassland habitat include wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), Italian thistle (*Carduus pycnocephalus*), sweet fennel (*Foeniculum vulgare*), summer mustard (*Hirschfeldia incana*), hare barley (*Hordeum murinum* ssp. *leporinum*), Italian ryegrass (*Festuca perennis*), common mallow (*Malva neglecta*), prickly ox-tongue (*Helminthotheca echioides*), cut-leaf plantain (*Plantago coronopus*), rose clover (*Trifolium* sp.), perennial pepperweed (*Lepidium latifolium*), wild radish (*Raphanus sativus*), brome fescue (*Vulpia* sp.), fountain grass (*Pennisetum setaceum*), lupine (*Lupinus* sp.) and pampas grass.



LEGEND

Plan Area Boundary	Coast Live Oak Woodland	Freshwater/Brackish Marsh
Riparian Woodland	Non-native Woody Vegetation	Tidal Marsh/Mudflat
Ruderal/Non-native Annual Grassland	Creek/Open Water	Developed

FIGURE IV.F-1

SOURCE: Aerial Imagery from Microsoft Bing ((c) 2012).
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Native species observed in this habitat include California poppy (*Eschscholzia californica*), coyote brush (*Baccharis pilularis*), and toyon.

Woodland. Woodland habitats within the Plan area consist of three broadly defined vegetation types: non-native woody vegetation, coast live oak woodland, and riparian woodland. Woodland habitats primarily occur along the eastern, northern, and southern portions of Sub-area 1A, as shown in Figure IV.F-1.

Non-Native Woody Vegetation. This habitat type occurs along the Highway 101 corridor in Sub-areas 1A and 1B and in the northern and eastern portion of Sub-area 1A. Dominant species observed in this habitat include eucalyptus (*Eucalyptus* sp.), broom, pine, acacia, coast live oak, and oleander. Associate species observed include cotoneaster (*Cotoneaster lacteus*), sweet fennel, pampas grass, coyote brush, toyon, and non-native forbs and annual grasses. Although a few native species were observed in this habitat, the dominant vegetation is non-native.

Coast Live Oak Woodland. Coast live oak woodland occurs in the eastern portion of Sub Area 1A and in the area surrounding the Wood Island business complex, situated just west of the Larkspur Ferry Terminal in Sub-area 1A. Coast live oaks provide the dominate canopy layer in these areas. Dominant understory species observed within this habitat type consist of broom and annual non-native grasses. Portions of the understory of the coast live oak woodland at Wood Island have been landscaped with mulch and planted with native and ornamental shrubs, such as sticky monkey-flower (*Mimulus aurantiacus*) and toyon, while understory vegetation in other parts of this woodland consist of mostly broom.

Riparian Woodland. Riparian woodland is dominated by riparian tree species that are adapted to wetland stream banks, floodplains and creek terraces that are seasonally flooded or permanently saturated by freshwater. Riparian woodland was observed within Sub-area 1A at Remillard Park and at Tubb Lake in the eastern portion of Sub-area 1A. These two patches of riparian woodland habitat are dominated by native willows (*Salix* sp.).

Tidal Marsh/Mudflat. Tidal marsh is a highly productive community consisting of salt-tolerant, hydrophytic plants that form moderate to dense cover. Plants are usually segregated vertically depending on their tolerance of inundation and saline soils. This habitat type is typically associated with and occurs adjacent to intertidal mudflats that are devoid of vegetation; during an ebb tide, the bottom is bare mud, cobble, or rock. Within the Plan area, this habitat type occurs along the tidal sloughs and marshlands along the northern shoreline of the Corte Madera Creek and Corte Madera Channel.

All tidal marsh habitats within the Plan area are similar in vertical structure, starting at the low elevation mudflat to the upland vegetation on adjacent levees. The lowest elevation vegetation strata contain pickleweed (*Salicornia pacifica*) co-dominated in places by saltgrass (*Distichlis spicata*) interspersed with areas of open water (or mudflat at low tide). Pickleweed and saltgrass are still dominant components on the elevated benches of the tidal marsh where patches of alkali heath (*Frankenia salina*), gumplant (*Grindelia stricta* ssp. *angustifolia*), and cordgrass (*Spartina* sp.) were observed. Large patches of cordgrass were observed in the tidal wetland east of Drake's Landing. The upland vegetation on the surrounding banks and levees is dominated by non-native grasses and ruderal herbs including mustard (*Brassica* sp.), ice plant (*Carpobrotus* sp.), English plantain (*Plantago lanceolata*), sweet fennel, and perennial pepperweed.

Freshwater/Brackish Marsh. This habitat type supports emergent vegetation that is adapted to permanently or seasonally flooded soils (wetlands), and occurs along the channels and wetlands north of Corte Madera Creek. This marsh habitat occurs east of Drake's Landing in the vicinity of the Highway 101 off- and on-ramps and along the western border of the Larkspur Ferry Terminal. The dominant vegetation in this habitat consists of dense monotypic stands of cattails (*Typha sp.*), or mixed stands of cattails and bulrush (*Scirpus sp.* and/or *Schoenoplectus sp.*). Freshwater habitats in the Plan area include Tubb Lake at the eastern portion of Sub-area 1A and the constructed unvegetated pond situated within a residential complex near the center of Sub-area 1-A. Tubb Lake supports Himalayan blackberry (*Rubus armeniacus*), tall flatsedge (*Cyperus eragrostis*), rush (*Juncus sp.*), teasel (*Dipsacus sp.*), rabbit's-foot grass (*Polypogon monspeliensis*), water milfoil (*Myriophyllum sp.*), and cattail.

Creek/Open Water. Creek and open water habitat within the Plan area occurs along the Corte Madera Creek and Corte Madera Channel. These open water habitats are tidally influenced and support brackish/saline habitat conditions. The northern shoreline of Corte Madera Creek and Corte Madera Channel contains rock rip-rap and/or tidal marsh habitat.

(2) **Wildlife Habitat Values.** The following sections provide information on wildlife species expected to occur in each habitat type. Not every species mentioned was observed during the reconnaissance-level survey, and several species not mentioned may nevertheless occur in the Plan area. As such, the following discussion should not be interpreted as an exhaustive list of every species that may potentially occur, but rather a broad overview of wildlife communities within each habitat type.

Developed Habitat. Most wildlife species that use developed habitats are generalists that have adapted to human-modified habitats, although the specific species present varies depending on the types and diversity of vegetation in an area. Industrial and commercial areas typically have less ornamental plantings and open lawns than residential neighborhoods and urban parks, and thus support fewer species. Species that use industrial and commercial areas are able to use ornamental landscaping as foraging habitat and/or escape cover, and some are able to exploit building crevices, rooftops, and/or ledges on buildings for nesting and/or roosting. Common urban bird species expected to use such features include mourning dove (*Zenaida macroura*), rock pigeon (*Columba livia*), American crow (*Corvus brachyrhynchos*), European starling (*Sturnus vulgaris*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*). Residential neighborhoods and urban parks contain more trees, shrubs, and lawns than industrial and commercial areas, and thus support additional bird species such as Anna's hummingbird (*Calypte anna*), western scrub-jay (*Aphelocoma californica*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), chestnut-backed chickadee (*Poecile rufescens*), bushtit (*Psaltirparus minimus*), and California towhee (*Pipilo crissalis*). Many of these species also occur in undisturbed, more natural habitats (e.g., oak woodland, coastal scrub) throughout Marin County, but have successfully adapted to urban landscapes. During the winter, the resident bird community is supplemented by species that breed farther north or at higher elevations, such as cedar waxwing (*Bombycilla cedrorum*), ruby-crowned kinglet (*Regulus calendula*), yellow-rumped warbler (*Dendroica coronata*), Townsend's warbler (*Dendroica townsendi*), and golden-crowned sparrow (*Zonotrichia atricapilla*). Large heritage-sized oaks in several City parks may attract cavity-nesting oak woodland birds such as Nuttall's woodpecker (*Picoides nuttallii*) and oak titmouse (*Baeolophus inornatus*). All of these species may occur in adjacent residential areas, as well, provided that large trees are present.

Several amphibians and reptile species can occur in developed habitats if suitable cover is present. Ornamental shrubs, leaf litter, and well-watered lawns provide cover and foraging habitat for Sierran treefrog (*Pseudacris sierra*), western toad (*Bufo boreas*), arboreal salamander (*Aneides lugubris*), California slender salamander (*Batrachoseps attenuatus*), and common garter snake (*Thamnophis sirtalis*). Such species are more likely to occur in residential areas or parks rather than industrial or commercial areas.

Mammal species expected to occur in developed habitats include Virginia opossum (*Didelphis virginiana*), fox squirrel (*Sciurus niger*), Botta's pocket gopher (*Thomomys bottae*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), house rat (*Rattus rattus*), northern raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and black-tailed deer (*Odocoileus hemionus*). Coyotes (*Canis latrans*) and gray fox (*Urocyon cinereoargenteus*) may forage in the more open or forested portions of developed areas.

Ruderal/Non-Native Annual Grassland Habitat. As stated above, the majority of ruderal/non-native annual grassland habitat within the Plan area is located along the northern portion of Sub-area 1A, the Highway 101 corridor, and the southern portion of Drake's Landing. Grasslands provide foraging habitat for raptors such as white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and barn owl (*Tyto alba*). Other bird species typically associated with grasslands include killdeer (*Charadrius vociferus*), loggerhead shrike (*Lanius ludovicianus*), American pipit (*Anthus rubescens*), savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), and red-winged blackbird (*Agelaius phoeniceus*). Common amphibian and reptile species expected to occur in grasslands include western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis catenifer*), Sierran treefrog, western toad, and common garter snake. Areas with accumulated thatch and sufficient grass cover are likely to support small mammal species such as deer mouse (*Peromyscus maniculatus*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), and Botta's pocket gopher. Other common mammal species expected to occur in grasslands include black-tailed jackrabbit (*Lepus californicus*), northern raccoon, striped skunk, black-tailed deer, and coyote.

Non-Native Woody Vegetation and Woodland Habitats. Many of the same wildlife species that occur in developed habitats also use non-native woody vegetation and native woodland habitats since such areas within the Plan area largely consist of narrow corridors (e.g., along Highway 101 or Via La Cumbre) or patches (e.g., in the northern and eastern portions of Sub-area 1A) within an otherwise urbanized landscape. Nevertheless, the somewhat higher structural diversity of the coast live oak and riparian woodlands provides habitat for understory species such as spotted towhee (*Pipilo maculatus*), fox sparrow (*Passerella iliaca*), and hermit thrush (*Catharus guttatus*), the latter two of which winter but do not breed in the Bay Area. This increased structural diversity also provides migratory stopover habitat for species such as Pacific-slope flycatcher (*Empidonax difficilis*), warbling vireo (*Vireo gilvus*), yellow warbler (*Setophaga petechia*), Wilson's warbler (*Wilsonia pusilla*), black-headed grosbeak (*Pheucticus melanocephalus*), and western tanager (*Piranga ludoviciana*). Some of these species may forage in adjacent residential areas, as well. Larger trees provide nesting habitat for red-shouldered hawk (*Buteo lineatus*), Cooper's hawk (*Accipiter cooperii*), and downy woodpecker (*Picoides pubescens*).

The increased leaf litter, moisture content, and, in some areas, understory vegetation of woodland habitats provides increased foraging opportunities and cover for amphibians and reptiles. Many of the same species that occur in the developed and ruderal/non-native annual grassland habitats are also

likely to occur in woodlands, especially species that prefer leaf litter and woody ground cover such as arboreal salamander and California slender salamander.

Most of the same mammal species that occur in developed habitats are expected to use woodland habitats. The linear nature of the woodlands along Highway 101 facilitates movement and dispersal for these species through the urban environment. Larger trees may occasionally support bat species such as hoary bat (*Lasiurus cinereus*) (winter and migration only), and pallid bat (*Antrozous pallidus*).

Tidal Marsh/Mudflat. Tidal marsh and mudflat habitats support a variety of wildlife species specifically adapted to the salt-tolerant vegetation, microhabitats (e.g., channels and sloughs), and tidal regimes that characterize such areas. Along with open water, this habitat type supports the greatest diversity of wildlife within the Plan area, as well as the majority of special-status species known to occur in the region, including California clapper rail (*Rallus longirostris obsoletus*), California black rail (*Laterallus jamaicensis coturniculus*), San Francisco (salt marsh) common yellowthroat (*Geothlypis trichas sinuosa*), Samuels (San Pablo) song sparrow (*Melospiza melodia samuelis*), Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*), and possibly salt marsh harvest mouse (*Reithrodontomys raviventris*). Tidal marshes also provide foraging habitat for special-status raptors such as white-tailed kite. Tidal mudflats support a diverse benthic macroinvertebrate community which in turn attracts large numbers of migrating and wintering shorebirds such as willet (*Tringa semipalmata*), long-billed curlew (*Numenius americanus*), marbled godwit (*Limosa fedoa*), dowitchers (*Limnodromus* spp.), and various sandpipers (*Calidris* spp.). These species forage on mudflats as they are exposed by receding tides, often concentrating at the water's edge where worms, crustaceans, and bivalves are closer to the mud's surface. Vegetated portions of tidal marshes are not heavily used by shorebirds, although willets tend to forage next to pools created on the marsh plain during extremely high tides. Wading birds such as snowy egret (*Egretta thula*), great egret (*Ardea alba*), and great blue heron (*Ardea herodias*) forage along the margins of tidal channels and marsh edges. Dabbling (i.e., surface-feeding) ducks, such as mallard (*Anas platyrhynchos*), forage over inundated mudflats and tidal channels.

When inundated by high tides, tidal channels and mudflats provide important foraging habitat for a variety of estuarine species, including bat ray (*Myliobatis californica*), leopard shark (*Triakis semifasciata*), and various fish species.

Amphibian or reptile use of tidal marshes and mudflats is limited due to high salinity and risk of drowning. Western fence lizards and southern alligator lizards have been observed on levees and berms adjacent to marsh habitats, but are not expected to use portions of the marsh subject to tidal influence.

Other mammal species known to use tidal marshes, in addition to the special-status species mentioned above, include black-tailed jackrabbit, deer mouse, California vole, coyote, northern raccoon, and striped skunk.

Freshwater/Brackish Marsh. Freshwater and brackish marsh within the Plan area provides foraging and nesting habitat for many of the species that occur in tidal marsh/mudflat habitat, as well as a few bird species specifically adapted to the dense vegetation (i.e., cattails and tules) and wet soils that characterize such habitats. Species that inhabit this category include Virginia rail (*Rallus limicola*), sora (*Porzana carolina*), Wilson's snipe (*Gallinago delicata*), marsh wren (*Cistothorus*

palustris), Samuels song sparrow, and red-winged blackbird. Linear channels supporting marsh vegetation within the Plan area provide foraging habitat for egrets and great blue herons, as well as mammalian predators such as northern raccoon, striped skunk, and coyote. Wildlife species observed in the freshwater pond in Sub-area 1A during LSA's June 7, 2012, site visit consist of western mosquitofish (*Gambusia affinis*) and Sierran treefrog larvae. Other fish species that may occupy Tubb Lake include green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), and largemouth bass (*Micropterus salmoides*).

Creek/Open Water. Open water habitats within the Plan area include the tidal influenced mouth of the Corte Madera Creek and Corte Madera Channel that flow into San Francisco Bay. In addition to providing foraging and roosting habitat for wintering and migrating shorebirds and waterfowl, these areas provide habitat for American avocet (*Recurvirostra americana*), black-necked stilt (*Himantopus mexicanus*), California gull (*Larus californicus*), western gull (*Larus occidentalis*), Caspian tern (*Hydroprogne caspia*), and Forster's tern (*Sterna forsteri*). Diving ducks such as canvas-back (*Aythya valisineria*), greater scaup (*Aythya marila*), lesser scaup (*Aythya affinis*), bufflehead (*Bucephala albeola*), and ruddy duck (*Oxyura jamaicensis*) winter in large numbers in the open waters connected to the San Francisco Bay. Other waterbird species expected to use open water habitats within the Plan area include American coot (*Fulica americana*), Canada goose pied-billed grebe (*Podilymbus podiceps*), horned grebe (*Podiceps auritus*), eared grebe (*Podiceps nigricollis*), western/Clark's grebe (*Aechmophorus* spp.), American white pelican (*Pelecanus erythrorhynchos*), California brown pelican (*Pelecanus occidentalis californicus*), great egret, snowy egret, and great blue heron.

Corte Madera Creek supports a variety of both native and introduced fish species. Native fish species known to occur in the Corte Madera Creek watershed include steelhead (*Oncorhynchus mykiss*), Chinook salmon (*O. tshawytscha*), California roach (*Lavinia symmetricus*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), threespine stickleback (*Gasterosteus aculeatus*), longjaw mudsucker (*Gillichthys mirabilis*), staghorn sculpin (*Leptocottus armatus*), prickly sculpin (*Cottus asper*), riffle sculpin (*Cottus gulosus*), starry flounder (*Platichthys stellatus*) and possibly Pacific lamprey (*Entosphenus tridentatus*).¹⁴ Introduced species include common carp (*Cyprinus carpio*), rainwater killifish (*Lucania parva*), western mosquitofish, and possibly black crappie (*Pomoxis nigromaculatus*).¹⁵ Coho salmon (*Oncorhynchus kisutch*), tule perch (*Hysterocarpus traskii*), and tidewater goby (*Eucyclogobius newberryi*) are considered extinct in the Corte Madera watershed.¹⁶

Although none have been recorded in the vicinity of Corte Madera Creek within the Plan area, this creek also contains suitable habitat for western pond turtles (*Actinemys marmorata*).

¹⁴ Leidy, R.A., 2007. *Ecology, Assemblage Structure, Distribution, and Status of Fishes in Streams Tributary to the San Francisco Estuary, California*. San Francisco Estuary Institute Contribution No. 530. San Francisco Estuary Institute, Oakland, California.

¹⁵ Ibid.

¹⁶ Ibid.

Corte Madera Creek also provides foraging habitat for cliff swallows (*Petrochelidon pyrrhonata*) and barn swallows (*Hirundo rustica*). Cliff swallow, in addition to house finch, nests were observed under the Highway 101 on- and off-ramp bridges over Corte Madera Creek during the June 7, 2012, site visit.

(3) Special-Status Species and Sensitive Habitats. This section outlines special-status species and sensitive habitats within the Plan area.

Special-Status Plants. A total of 32 special-status plant species that occur within a 5-mile radius of the Plan area were evaluated for their potential to occur in the Plan area. These special-status plant species are listed in Table IV.F-2. Marginal habitat is present for 18 of these special-status plants (see Table IV.F-2), but most of these species are unlikely to occur in the Plan area due to the high level of disturbance, dominant cover of non-native plant species, and its urban setting. The CNDDDB maps two of these species, marsh microseris (*Microseris paludosa*) and white-rayed pentachaeta (*Pentachaeta bellidiflora*), as occurring the Plan area, but the exact location of these occurrences are unknown.¹⁷ Point Reyes bird's-beak (*Cordylantus maritimus* ssp. *palustris*) is the only one of the 18 plant species that has a moderately high probability of occurring in the Plan area; this species was recorded in the tidal marsh just south of the Plan area along the southern shoreline of Corte Madera Creek, but could also occur along the northern shoreline. Fourteen of the plants in Table IV.F-2 are not likely to occur in the Plan area because they occur in habitats or soils not present in the Plan area such as chaparral, coastal scrub, and serpentine soils.

Special-Status Animals. Based on a review of the CNDDDB and other sources identified below, LSA identified 32 special-status animal species known to occur or potentially occurring in the vicinity of Larkspur, which are listed in Table IV.F-3. The following special-status species may occasionally pass through or forage within the Plan area, but are not known or likely to breed in the Plan area: Chinook salmon (*Oncorhynchus tshawytscha*), green sturgeon (*Acipenser medirostris*), redhead (*Aythya americana*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), American peregrine falcon (*Falco peregrinus anatum*), long-eared owl (*Asio otus*), olive-sided flycatcher (*Contopus cooperi*), purple martin (*Progne subis*), grasshopper sparrow (*Ammodramus savannarum*), tricolored blackbird (*Agelaius tricolor*), pallid bat (*Antrozous pallidus*), western red bat (*Lasiurus blossevillii*), and American badger (*Taxidea taxus*). American white pelican and California brown pelican are known to regularly forage over or near Corte Madera Creek and Corte Madera Channel, but do not breed in the San Francisco Bay area. Coho salmon (*Oncorhynchus kisutch*) and tidewater goby (*Eucyclogobius newberryi*) are considered extirpated in the Plan area. The Plan area is outside of the known range of Suisun shrew (*Sorex ornatus sinuosus*). The remaining special-status species are discussed in further detail below.

¹⁷ California Department of Fish and Wildlife, 2012, op cit.

Table IV.F-2: Special-Status Plant Species Known to Occur or Potentially Occurring in the Vicinity of Larkspur, Marin County, California

	Species	Status ^a	Habitat/Blooming Period	Potential for Occurrence
1	<i>Amorpha californica</i> var. <i>napensis</i> Napa false indigo	1B	Openings in broadleaved upland forest, chaparral, cismontane woodland. April-July	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB occurrence is approximately 1.9 miles from the Plan area.
2	<i>Amsinckia lunaris</i> Bent-flowered fiddleneck	1B	Coastal bluff scrub, cismontane woodland, valley and foothill grassland. March-June	Not likely to occur in the ruderal/non-native annual grasslands in the Plan area due to the prior disturbance and the introduction of non-native vegetation. The CNDDDB does not list any occurrence within 5 miles of the Plan area.
3	<i>Arctostaphylos hookeri</i> ssp. <i>montana</i> Mt. Tamalpais Manzanita	1B	Chaparral, valley and foothill grassland/serpentine, rocky. February-April	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB occurrence is approximately 2.4 miles from the Plan area.
4	<i>Arctostaphylos virgata</i> Marin Manzanita	1B	Broadleaved upland forest, closed-cone coniferous forest, chaparral, North Coast coniferous forest on sandstone, or granitic substrates. January-March	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB occurrence is approximately 3.9 miles from the Plan area.
5	<i>Calochortus tiburonensis</i> Tiburon mariposa-lily	FT/ST	Open, rocky slopes in serpentine grassland. March-June	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB occurrence is approximately 1.6 miles from the Plan area.
6	<i>Castilleja affinis</i> ssp. <i>neglecta</i> Tiburon paintbrush	FE/ST	Rocky serpentine sites in grasslands. April-June	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB occurrence is approximately 4.8 miles from the Plan area.
7	<i>Chloropyron maritimum</i> ssp. <i>palustre</i> Point Reyes bird's-beak	1B	Marshes and swamps (coastal salt), usually in coastal salt marsh with <i>Salicornia</i> , <i>Distichlis</i> , <i>Jaumea</i> and <i>Spartina</i> ; 0-10 meters. June-October	Suitable habitat present within the tidal marsh habitat of the Plan area. Closest CNDDDB occurrence is approximately 0.1 mile from the Plan area along the south bank of Corte Madera Creek, just south of the Greenbrae boardwalk.
8	<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i> San Francisco Bay spineflower	1B	Sandy soil on terraces and slopes in coastal bluff, coastal dunes, coastal scrub, and coastal prairie habitat. April-July (August rarely)	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB occurrence is approximately 2.9 miles from the Plan area.
9	<i>Cirsium hydrophilum</i> var. <i>vaseyi</i> Mt. Tamalpais thistle	1B	Serpentine seeps and streams in chaparral and woodland. May-August	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB occurrence is approximately 3.9 miles from the Plan area.
10	<i>Eriogonum luteolum</i> var. <i>caninum</i> Tiburon buckwheat	1B	Serpentine soils; sandy to gravelly sites. May-September	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB occurrence is approximately 1.6 miles from the Plan area.
11	<i>Fissidens pauperculus</i> Minute pocket moss	1B	Moss growing on damp soil in coniferous forests along the coast; in dry streambeds and stream banks.	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB record is a record from an unknown location approximately 1.5 miles from the Plan area in Mill Valley.
12	<i>Fritillaria liliacea</i> Fragrant fritillary	1B	Coastal scrub, valley and foothill grassland, and coastal prairie; often on serpentine; various soils reported though usually clay. February-April	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. The CNDDDB does not list any occurrence within 5 miles of the Plan area.
13	<i>Helianthella castanea</i> Diablo helianthella	1B	Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. March-June	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB record is a 1938 record from an unknown location in Mill Valley.

Table IV.F-2: Special-Status Plant Species Known to Occur or Potentially Occurring in the Vicinity of Larkspur, Marin County, California

	Species	Status ^a	Habitat/Blooming Period	Potential for Occurrence
14	<i>Hesperolinon congestum</i> Marin western flax	FT/ST	Serpentine barrens and serpentine grassland and chaparral. April-July	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB record is a 1880s record from an unknown location, approximately 0.4 mile from the Plan area in San Rafael.
15	<i>Holocarpha macradenia</i> Santa Cruz tarplant	FT/SE	Light, sandy soil or sandy clay, often with non-natives in coastal prairie and grasslands. June-October	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB record is an 1883 record from an unknown location, approximately 1.4 mile from the Plan area in the vicinity of Ross.
16	<i>Horkelia tenuiloba</i> Thin-lobed horkelia	1B	Broadleafed upland forest, chaparral, valley and foothill grassland on sandy soils, mesic openings. May-July	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB record is approximately 3 miles from the Plan area.
17	<i>Kopsiopsis hookeri</i> Small groundcone	2	Open woods, shrubby places, generally on <i>Gaultheria shallon</i> . April-August	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB record is a 1970 record from an unknown location in Mill Valley.
18	<i>Lessingia micradenia var. micradenia</i> Tamalpais lessingia	1B	Usually on serpentine, in serpentine grassland or chaparral, often on roadsides. (June rarely) July-October	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB record is from a population last observed in 1960 approximately 2.5 miles from the Plan area at Phoenix Lake.
19	<i>Microseris paludosa</i> Marsh microseris	1B	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. April-June	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB record is from an unknown location in Corte Madera.
20	<i>Navarretia rosulata</i> Marin County navarretia	1B	Closed-cone coniferous forest and chaparral on serpentinite. May-July	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB occurrence is on Mount Tamalpais, approximately 4.6 miles from the Plan area.
21	<i>Pentachaeta bellidiflora</i> White-rayed pentachaeta	FE/SE	Cismontane woodland, valley and foothill grassland on open, dry rocky slopes and grassy areas, often on serpentinite. March-May	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest extant CNDDDB record is from a population last observed in 1912 approximately 1.7 miles from the Plan area in Kentfield.
22	<i>Plagiobothrys glaber</i> Hairless popcorn-flower	1A	Coastal salt marshes, alkaline meadows, and seeps. March-May	Not likely to occur in the Plan area due to the small size of suitable tidal marsh habitat and the rarity of the species in the region. Closest CNDDDB record is a 1924 record of a possibly extinct population, approximately 2.6 miles from the Plan area.
23	<i>Pleuropogon hooverianus</i> North Coast semaphore grass	SE	Wet grassy, usually shady areas, sometimes in freshwater marsh, associated with forest environments. April-June	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB record is a 1940s record of a possibly extirpated population approximately 2.7 miles from the Plan area.
24	<i>Quercus parvula var. tamalpaisensis</i> Tamalpais oak	1B	Lower montane coniferous forest. March-April	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB record is from an unknown location approximately 2.1 miles from the Plan area in Mill Valley.

Table IV.F-2: Special-Status Plant Species Known to Occur or Potentially Occurring in the Vicinity of Larkspur, Marin County, California

	Species	Status ^a	Habitat/Blooming Period	Potential for Occurrence
25	<i>Sidalcea calycosa ssp. rhizomata</i> Point Reyes checkerbloom	1B	Freshwater marshes near the coast. April-September	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB record is approximately 3.7 miles from the Plan area.
26	<i>Stebbinsoseris decipiens</i> Santa Cruz microseris	1B	Broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland in open areas, sometimes on serpentinite. April-May	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation within the grasslands in the Plan area. Closest CNDDDB record is approximately 4.5 miles from the Plan area.
27	<i>Streptanthus batrachopus</i> Tamalpais jewel-flower	1B	Closed-cone coniferous forest, chaparral, Talus serpentine outcrops. April-June	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB record is approximately 3.4 miles from the Plan area.
28	<i>Streptanthus glandulosus ssp. niger</i> Tiburon jewel-flower	FE/SE	Shallow, rocky serpentine slopes in grasslands. May-June	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB record is approximately 3.8 miles from the Plan area.
29	<i>Streptanthus glandulosus ssp. pulchellus</i> Mount Tamalpais bristly jewel-flower	1B	Serpentine slopes. May-July (August rarely)	Not likely to occur due to the absence of suitable habitat. Closest CNDDDB record is approximately 4.4 miles from the Plan area.
30	<i>Symphotrichum lentum</i> Suisun Marsh aster	1B	Marshes and swamps (brackish and freshwater); most often seen along sloughs with <i>Phragmites</i> , <i>Scirpus</i> , blackberry, <i>Typha</i> , etc. May-November	Not likely to occur in the Plan area due to the small size of suitable habitat, the introduction of non-native plant species, and the rarity of the species in the region. Closest CNDDDB record is approximately 4.4 miles from the Plan area.
31	<i>Trifolium amoenum</i> Showy Rancharia clover	FE/1B	Coastal bluff scrub, valley and foothill grassland, sometimes on serpentinite. April-June	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB record is approximately 1.5 miles from the Plan area.
32	<i>Triquetrella californica</i> Coastal triquetrella	1B	Grows within 30 miles from the coast in coastal scrub, grasslands, and in open gravels on roadsides, hillsides, rocky slopes	Not likely to occur in the Plan area due to the prior disturbance and the introduction of non-native vegetation. Closest CNDDDB occurrence is 2.2 miles from the Plan area in an unknown location east of Ring Mountain.

^a Status:
FE = federally endangered
FT = federally threatened
SE = State endangered
ST = State threatened
1A = CRPR List 1A: Presumed extinct in California
1B = CRPR List 1B: Rare, threatened or endangered in California and elsewhere
2 = CRPR List 2: Rare, threatened, or endangered in California, but more common elsewhere

Source: Compiled by LSA Associates, Inc., 2013. Nearest records are based on CNDDDB (2012) occurrences unless otherwise noted.

Table IV.F-3: Special-Status Animal Species Known to Occur or Potentially Occurring in the Vicinity of Larkspur, Marin County, California

	Species	Status ^a	Habitat	Potential for Occurrence within Plan Area
Fish				
1	<i>Oncorhynchus kisutch</i> Coho salmon (Central California Coast ESU ^b)	FE, SE	Coastal streams from Punta Gorda in northern California down to and including the San Lorenzo River in central California, as well as some tributaries to San Francisco Bay	Not likely to occur. Species historically occurred in Corte Madera Creek but is considered extinct in the watershed. ¹⁸ Species last recorded from San Francisco Bay tributary during early-to-mid 1980s. ¹⁹ Corte Madera Creek is designated as critical habitat (San Pablo Bay hydrologic unit #18050002) and essential fish habitat for this species.
2	<i>Oncorhynchus tshawytscha</i> Chinook salmon (Central Valley Spring-run ESU)	FT, ST	Requires clear, cool streams with pools and riffles, with coarse gravel beds for spawning, Sacramento River and its tributaries	Known to occasionally occur in Corte Madera Creek, but fish may be of hatchery origin. Both native and hatchery fish may occur in the watershed. ²⁰
3	<i>Oncorhynchus mykiss</i> Steelhead (Central California Coast ESU)	FT	Coastal streams from Russian River south to Aptos Creek (Santa Cruz Co.), including streams tributary to San Francisco and San Pablo Bays	Known to occur in Corte Madera Creek. ²¹ Corte Madera Creek is designated as critical habitat.
4	<i>Acipenser medirostris</i> Green sturgeon	FT, CSC	Oceanic waters, bays, and estuaries; spawns in deep pools in large, turbulent freshwater river mainstems; known to forage in estuaries and bays from San Francisco Bay to British Columbia	May occur at the mouth of Corte Madera Creek and in the Corte Madera Channel.
5	<i>Eucyclogobius newberryi</i> Tidewater goby	FE, CSC	Brackish shallow lagoons and lower stream reaches where water is fairly still but not stagnant	Closest CNDDDB record is of an extirpated population recorded in 1961 approximately 0.3 mile from the Plan area in Corte Madera Creek. Species is considered extirpated in the region.
Amphibians and Reptiles				
6	<i>Rana draytonii</i> California red-legged frog	FT, CSC	Ponds, streams, drainages and associated uplands; requires areas of deep, still, and/or slow-moving water for breeding.	Suitable habitat present in Tubb Lake in Sub-area 1A, but the species was not found during surveys conducted at the lake in 1999 for the Monahan Pacific Project. ²² The CNDDDB does not list any occurrences within 5 miles of the Plan area.

¹⁸ Leidy, R.A., 2007, op. cit.

¹⁹ Leidy, R.A., 2007, op. cit.

²⁰ Leidy, R.A., G.S. Becker, and 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 and Restoration, Oakland, California.

²¹ Ibid.

²² EDAW, Inc., 1999, op. cit.

Table IV.F-3: Special-Status Animal Species Known to Occur or Potentially Occurring in the Vicinity of Larkspur, Marin County, California

	Species	Status^a	Habitat	Potential for Occurrence within Plan Area
7	<i>Actinemys marmorata</i> Western pond turtle	CSC	Ponds, streams with deep pools, drainages and associated uplands for egg laying	May occur in Corte Madera Creek, Tubb Lake, and the freshwater/brackish channels where suitable basking sites (sandy banks and rocks) are present. Closest CNDDDB occurrence is in Phoenix Lake, approximately 2.8 miles from the Plan area.
Birds				
8	<i>Aythya Americana</i> Redhead	CSC	Large, deep bodies of water; nests in freshwater emergent wetlands	May winter in small numbers on open water habitats along Corte Madera Creek, but not likely to breed within Plan area.
9	<i>Pelecanus erythrorhynchos</i> American white pelican	CSC	Forages over shallow inland waters and coastal marine habitats, nests on isolated islands or peninsulas	May forage and roost in the open water habitat within the Plan area from late summer through spring; does not breed in San Francisco Bay. Observed in Corte Madera Shorebird Marsh, immediately south of Sub-area 2 during LSA's June 2012 site visit.
10	<i>Pelecanus occidentalis californicus</i> California brown pelican	CFP	Coastal shorelines and bays; rarely found on fresh water	May forage and roost in the open water habitat within the Plan area from late summer through spring; does not breed in San Francisco Bay.
11	<i>Elanus leucurus</i> White-tailed kite	CFP	Open grasslands, meadows, or marshes; require dense-topped trees or shrubs for nesting and perching	Suitable nesting and foraging habitat present in the Plan area.
12	<i>Haliaeetus leucocephalus</i> Bald eagle	SE, CFP	Ocean shorelines, lake margins, and rivers for both nesting and wintering; nests in large trees with open branches	Known to occasionally forage along Corte Madera Creek during winter, but not likely to remain for long periods or breed within Plan area. Observed flying over Corte Madera Creek in December 2009 (LSA personal observation).
13	<i>Circus cyaneus</i> Northern harrier	CSC	Nests in wet meadows and marshes, forages over open grasslands and agricultural fields	Suitable foraging and nesting habitat present in the grassland habitat within the Plan area.
14	<i>Aquila chrysaetos</i> Golden eagle	CFP	Rolling foothills and mountain areas. Nests in cliff-walled canyons or large trees in open areas	May occasionally forage over the Plan area, but not likely to remain for long periods or breed within Plan area due to the lack of high quality nesting and foraging habitat within the Plan area.
15	<i>Falco peregrinus</i> American peregrine falcon	CFP	A variety of open habitats including coastlines, mountains, marshes, bay shorelines, and urban areas. Nest on cliffs, bridges, and tall buildings	May forage over the Plan area, but not likely to breed within Plan area. Small rocky crevices and cliff faces along the northern portion of Sub-area 1A are not likely to support nesting peregrine falcons due to the close proximity of the cliff faces to residential development.
16	<i>Laterallus jamaicensis coturniculus</i> California black rail	FT, CFP	Salt marshes bordering larger bays, also found in brackish and freshwater marshes	May occur in tidal marsh habitats south of the Larkspur Ferry Terminal parking lot; known to occur at the Corte Madera Marsh State Ecological Reserve approximately 100 feet south of the Plan area.
17	<i>Rallus longirostris obsoletus</i> California clapper rail	FE, SE, CFP	Tidal salt marshes with sloughs and substantial cordgrass (<i>Spartina</i> sp.) cover	May occur in tidal marsh habitats south of the Larkspur Ferry Terminal parking lot; known to occur at the Corte Madera Marsh State Ecological Reserve approximately 100 feet south of the Plan area.

Table IV.F-3: Special-Status Animal Species Known to Occur or Potentially Occurring in the Vicinity of Larkspur, Marin County, California

	Species	Status^a	Habitat	Potential for Occurrence within Plan Area
18	<i>Athene cunicularia</i> Burrowing owl	CSC	Open, dry grasslands that contain abundant ground squirrel burrows	May winter in the tidal marsh, ruderal/non-native grasslands, and rock rip-rap along Corte Madera Creek. Considered a rare breeder in Marin County. ²³
19	<i>Asio otus</i> Long-eared owl	CSC	Conifer, oak, riparian, pinyon-juniper, and desert woodlands adjacent to grasslands, meadows, or shrublands	May pass through or winter in the woodland habitat within the Plan area. Not likely to nest in the Plan area due to the small size of woodland habitat and the Plan area's urban setting.
20	<i>Contopus cooperi</i> Olive-sided flycatcher	CSC	Coniferous forests with open canopies	Not likely to occur in the Plan area due to the small number of coniferous trees and the Plan area's urban setting.
21	<i>Lanius ludovicianus</i> Loggerhead shrike	CSC	Open grasslands and woodlands with scattered shrubs, fence posts, utility lines, or other perches; nests in dense shrubs and lower branches of trees	Suitable foraging and nesting habitat present within the ruderal/grassland habitat in the Plan area.
22	<i>Progne subis</i> Purple martin	CSC	Woodlands; nests in tree snags and abandoned woodpecker cavities and human-made structures	May forage over the Plan area, but not likely to nest due to the lack of suitable habitat.
23	<i>Geothlypis trichas sinuosa</i> San Francisco (salt marsh) common yellowthroat	CSC	Salt, brackish, and freshwater marshes; and riparian woodlands; nests on or near ground in low vegetation	Suitable breeding and foraging habitat in the tidal marsh and freshwater/brackish marsh habitat within the Plan area.
24	<i>Passerculus sandwichensis alaudinus</i> Bryant's savannah sparrow	CSC	Tidal marshes and adjacent ruderal habitat, moist grasslands in the coastal fog belt, and infrequently, drier grasslands further inland; in South Bay, nests primarily on levee tops overgrown with annual grasses and levee banks dominated by pickleweed	May forage and breed in tidal marsh habitat adjacent to Corte Madera Creek.
25	<i>Ammodramus savannarum</i> Grasshopper sparrow	CSC	Grasslands with scattered shrubs.	Marginal habitat present in the ruderal/grassland habitat in the northern portion of Sub-area 1A, but the size of the habitat and its isolation from large tracts of open grasslands, likely precludes presence.
26	<i>Melospiza melodia samuelis</i> San Pablo (Samuels) song sparrow	CSC	Tidal salt marshes dominated by pickleweed; nests primarily in pickleweed and marsh gumplant	Known to occur in marshes adjacent to the mouth of Corte Madera Creek, likely occurs in other tidal marsh habitats in the Plan area. Detected in the tidal marsh south of the Larkspur Ferry Terminal parking lot, in the riparian woodland habitat in Remillard Park, and in the tidal channels north of Corte Madera Creek during LSA's reconnaissance survey.

²³ Shuford, W.D., 1993, op. cit.

Table IV.F-3: Special-Status Animal Species Known to Occur or Potentially Occurring in the Vicinity of Larkspur, Marin County, California

	Species	Status^a	Habitat	Potential for Occurrence within Plan Area
27	<i>Agelaius tricolor</i> Tricolored blackbird	CSC	Nests in dense vegetation near open water; forages in grasslands and agricultural fields.	May forage in grasslands during nonbreeding season, but not likely to breed within Plan area due to lack of large stands of freshwater marsh.
Mammals				
28	<i>Reithrodontomys raviventris</i> Salt marsh harvest mouse	FE, SE, CFP	Tidal salt marshes of San Francisco Bay and its tributaries. Requires tall, dense pickleweed for cover	Suitable habitat present in tidal marshes on and adjacent to the Plan area, but lack of adjacent upland refugia likely precludes presence. Closest CNDDDB occurrence is immediately south of the Plan area within the Corte Madera Marsh State Ecological Reserve.
29	<i>Sorex ornatus sinuosus</i> Suisun shrew	CSC	Tidal and brackish marshes of the northern shores of San Pablo and Suisun Bays. Requires dense low-lying cover above the mean high tide line.	Although suitable habitat is present within the tidal and brackish marshes, the Plan area is outside of the known range for this species.
30	<i>Antrozous pallidus</i> Pallid bat	CSC	A variety of open arid habitats (e.g., chaparral, open woodland, deserts); primary roost sites include bridges, old buildings, and in tree hollows and/or bark; sometimes roost in caves and rock crevices	May forage over open habitats within Plan area (e.g., grasslands, tidal marsh), but no known active roost sites in vicinity. The closest CNDDDB occurrences are from 1891 and 1961 specimen records collected at unknown locations in the vicinity of San Rafael and Ross, respectively.
31	<i>Lasiurus blossevillii</i> Western red bat	CSC	Forested canyons and riparian woodlands for roosting, a variety of open habitats for foraging; typically roosts in snags and trees with moderately dense canopies	May occasionally forage and/or roost in trees near Corte Madera Creek in winter, but no known roost sites in Plan area vicinity and species' rarity likely precludes occurrence.
32	<i>Taxidea taxus</i> American badger	CSC	Open habitats with friable soils	Marginal habitat present in the ruderal/grassland habitat in the northern portion of Sub-area 1A, but the size of the habitat and its isolation from large tracts of open grasslands likely precludes presence.

^a Status:
FE = federally endangered
FT = federally threatened
SE = State endangered
ST = State threatened
CSC = California Species of Special Concern
CFP = California Fully Protected Species

^b ESU = Evolutionarily Significant Unit

Source: Compiled by LSA Associates, Inc., 2013. Nearest records are based on CNDDDB (2012) occurrences unless otherwise noted.

Steelhead – Central California Coast ESU (Federally Threatened). The steelhead is the anadromous form of rainbow trout, migrating from the ocean to freshwater streams to spawn. Juveniles spend one to three years in their natal streams before going to sea as smolts. Most steelhead return to freshwater streams after spending two to three years at sea. Important factors associated with preferred stream channel conditions include temperature, velocity, depth, gravel substrate, and water quality. Shaded banks with overhanging riparian vegetation (termed “shaded riverine aquatic cover” by the U.S. Fish and Wildlife Service) are also beneficial to salmonids, providing foraging habitat and cover from predators. High water temperatures, low rates of stream flow, low levels of dissolved oxygen, low sediment input, and stream obstructions can be detrimental to steelhead populations.

Corte Madera Creek is known to support a resident steelhead population that appears to produce smolts. As recent as 1999, electrofishing surveys conducted by Friends of Corte Madera Creek found steelhead in the creek.²⁴ Historic occurrences of steelhead were recorded within Corte Madera Creek as early as 1960.²⁵ The portion of Corte Madera Creek within the Plan area supports migration habitat to the spawning and rearing habitat within the upper reaches of the Corte Madera Creek watershed. Corte Madera Creek is designated as critical habitat for the Central California Coast ESU of steelhead.

California Red-Legged Frog (Federally Threatened). The California red-legged frog has been extirpated or nearly extirpated from 70 percent of its former range. Population declines of this species have been attributed to a variety of factors, with habitat loss and predation by non-native aquatic predators (e.g., bullfrogs, crayfish, other non-native fishes) typically implicated as the primary threats. California red-legged frogs occur in and along freshwater marshes, streams, ponds, and other semi-permanent water sources. Optimal habitat contains dense emergent or shoreline riparian vegetation closely associated with deep (i.e., greater than 2.3 feet), still, or slow-moving water.²⁶ Cattails, bulrushes, and willows provide the habitat structure that seems to be most suitable for California red-legged frogs.²⁷ Although the species can occur in intermittent streams and ponds, they are unlikely to persist in streams in which all surface water disappears.²⁸ Suitable breeding ponds and pools usually have a minimum depth of 20 inches, but California red-legged frogs do sometimes breed successfully in pools as shallow as 10 inches.²⁹ Regardless of water depth, suitable breeding habitat must contain water during the entire development period for eggs and tadpoles. Reproduction for red-legged frogs is also sensitive to salinity levels in the water.

The CNDDDB does not list any occurrences of California red-legged frogs within 5 miles of the Plan area.³⁰ Although no red-legged frogs were observed, the Initial Study for the Monahan Pacific Project

²⁴ Leidy, R.A., G.S. Becker, and B.N. Harvey, 2005, op. cit.

²⁵ Ibid.

²⁶ Jennings, M.R., and M.P. Hayes, 1994. *Amphibian and Reptile Species of Special Concern in California*. Final report to California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova.

²⁷ Ibid.

²⁸ Ibid.

²⁹ Fellers, G.M., 2005. *California Red-Legged Frog*. In M. Lannoo, editor. *Amphibian Declines: The Conservation Status of United States Species*. University of California Press, Berkeley.

³⁰ California Department of Fish and Wildlife, 2012, op. cit.

states that suitable habitat is present in Tubb Lake (shown in Figure IV.F-1).³¹ Red-legged frogs are not likely to occur in the Plan area's reach of Corte Madera Creek and the Plan area's tidal channels due to the high salinity of the water, lack of suitable breeding pools, and lack of natural streamside vegetation.

Western Pond Turtle (California Species of Special Concern). Western pond turtles occur in a wide variety of aquatic habitats, including ponds, lakes, marshes, rivers, streams, and irrigation ditches that typically have a rocky or muddy bottom and contain stands of aquatic vegetation.³² The presence or absence of pond turtles at a given aquatic site is largely dependent on the availability of suitable basking sites and adjacent upland habitat for egg-laying (e.g., sandy banks or grassy open fields) and over-wintering. Nests are typically dug in dry substrate with a high clay or silt fraction since the female moistens the site where she will excavate the nest prior to egg-laying.³³ Hatchlings require shallow water habitat with relatively dense submergent or short emergent vegetation in which to forage.³⁴

Western pond turtles have been recorded at Phoenix Lake, approximately 2.8 miles west of Plan area. Corte Madera Creek and the tidal channels within the Plan area may provide habitat for pond turtles, especially where suitable basking sites (sandy banks and/or rocks) are present. However, surrounding residential development has likely resulted in the elimination of suitable upland habitat for egg-laying, reducing the likelihood that the species is present in the Plan area.

White-tailed Kite (California Fully Protected Species). Most white-tailed kites in California occur west of the Sierra Nevada in lowlands and foothills, where they are often seen year-round.³⁵ This species nests in densely foliated trees and large shrubs located near suitable foraging habitat (e.g., grasslands, marshes, agricultural fields). Preferred prey items include California voles and mice.

The ruderal/non-native annual grassland and tidal marsh habitats provide foraging habitat for white-tailed kites, and the scattered trees and large shrubs provide suitable nest sites.

Northern Harrier (California Species of Special Concern). Northern harriers are widespread in California, although they have become uncommon in the southern part of the State.³⁶ Their preferred habitats are freshwater wetlands and salt marshes, although they are also commonly found over grasslands and agricultural fields.³⁷ Harriers breed from mid-March to September, building their nests on the ground.

³¹ EDAW, Inc., 1999, op. cit.

³² Stebbins, R.C., 2003. *A Field Guide to Western Amphibians and Reptiles*. Third edition. Houghton Mifflin Company, Boston, Massachusetts.

³³ Holland, D.C., 1991. *Status and Reproductive Dynamics of a Population of Western Pond Turtles (Clemmys marmorata) in Klickitat County, Washington, in 1991*. Unpublished report prepared for the Washington Department of Wildlife, Olympia. Cited in Jennings and Hayes 1994, op. cit.

³⁴ Jennings, M.R., and M.P. Hayes, 1994, op. cit.

³⁵ Peeters, H., and P. Peeters, 2005. *Raptors of California*. University of California Press, Berkeley.

³⁶ Ibid.

³⁷ Ibid.

Suitable foraging and/or nesting habitat for northern harriers is present in the ruderal/non-native annual grassland and tidal marsh habitats in the Plan area.

California Black Rail (Federally Threatened; California Fully Protected Species). Around the San Francisco Bay Estuary, California black rails primarily inhabit tidal salt marsh dominated by pickleweed, but also occupy brackish marshes dominated by bulrush. California black rails prefer tidal marshes but apparently will use high marshlands during “wet” years.³⁸ Black rails build nests in tall grasses or marsh vegetation during the spring, with most nests constructed of pickleweed and placed on or slightly above the ground.

California black rails have been detected south of the Plan area within the Corte Madera Marsh State Ecological Reserve and in the tidal marsh habitat along Corte Madera Creek just east of the Plan area.³⁹ This species may inhabit the tidal marsh habitat south of the Larkspur Ferry Terminal parking lot and in other tidal marsh habitat within the Plan area.

California Clapper Rail (Federally and State Endangered; California Fully Protected Species). This secretive species prefers tidal salt marshes dominated by pickleweed and cordgrass with adjacent areas of high marsh cover dominated by pickleweed, gumplant, saltgrass, alkali heath, and/or fleshy jaumea (*Jaumea carnosa*).⁴⁰ Clapper rails also occupy tidal brackish marshes dominated by bulrush. The California subspecies of clapper rail is now restricted to the tidal marshlands around the San Francisco, San Pablo, and Suisun Bays. A Bay-wide survey in the early 1970s estimated a total population of between 4,000 and 6,000 birds.⁴¹ The most recent population estimate for California clapper rails was approximately 1,040 to 1,264 individuals in San Francisco Bay.⁴² Although habitat loss is implicated in population declines, predation of rails by the introduced red fox (*Vulpes vulpes*) is another major threat.

Clapper rails have been detected in the tidal marsh habitat along Corte Madera Creek.⁴³ This species may inhabit the tidal marsh habitat south of the Larkspur Ferry Terminal parking lot and other tidal marsh habitat within the Plan area.

Burrowing Owl (California Species of Special Concern). Burrowing owls have undergone substantial population declines throughout central and coastal California, primarily due to habitat

³⁸ Trulio, L.A., and J.G. Evens, 2000. *California Black Rail*. Pages 341-345 in Goals Project. Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish, and wildlife. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P. R. Olofson, ed. San Francisco Bay Regional Water Quality Control Board, Oakland, California.

³⁹ California Department of Fish and Wildlife, 2012, op. cit.

⁴⁰ Albertson, J.D., and J.G. Evens, 2000. *California Clapper Rail*. Pages 332-340 in Goals Project. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish, and Wildlife. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P. R. Olofson, ed. San Francisco Bay Regional Water Quality Control Board, Oakland, California.

⁴¹ Gill, Jr., R., 1979. *Status and Distribution of the California Clapper Rail (Rallus longirostris obsoletus)*. California Fish and Game 65:36-49.

⁴² Albertson, J. D., and J. G. Evens, 2000, op. cit.

⁴³ California Department of Fish and Wildlife, 2012, op. cit.

loss.⁴⁴ This species occurs in open, well-drained grasslands with abundant small mammal burrows, particularly those of California ground squirrels. Burrowing owls also prefer areas with short vegetation so they can easily scan their surroundings and spot potential predators.⁴⁵ In human-modified areas, burrowing owls often use burrows under the edges of concrete, asphalt, rubble piles, and riprap.⁴⁶

Burrowing owls may winter in the tidal marsh and associated rock rip-rap along Corte Madera Creek and in the ruderal/non-native annual grasslands within the Plan area. They are considered a very rare breeder in Marin County.⁴⁷

Loggerhead Shrike (California Species of Special Concern). Loggerhead shrikes occur in open habitats with scattered shrubs, trees, posts, fences, utility lines, and other perches. Shrikes primarily nest in the lower branches of dense shrubs and tall trees, although they have also been observed nesting in buildings and debris piles. They feed primarily on large insects, small birds, and mammals.

The ruderal/non-native annual grasslands and scattered trees and shrubs provide suitable habitat conditions for loggerhead shrikes. Shrikes may also occasionally forage over tidal marshes, if suitable perches are nearby.

San Francisco (Salt Marsh) Common Yellowthroat (California Species of Special Concern). The common yellowthroat is a widely distributed warbler in North America, occurring in wetlands, moist thickets, and grasslands. The San Francisco subspecies is restricted to riparian habitat, brackish marsh, freshwater marsh, tidal salt marsh, and adjacent grassland and ruderal vegetation along the margins of San Francisco Bay. Despite the common name, most salt marsh common yellowthroats breed in brackish or freshwater marshes.

Within the Plan area, suitable habitat for salt marsh common yellowthroats is present in the brackish or freshwater marsh vegetation along the northern shoreline of Corte Madera Channel and Corte Madera Creek. In particular the freshwater marsh and riparian woodland habitat at Remillard Park (shown in Figure IV.F-1) provides suitable habitat for this species.

Bryant's Savannah Sparrow (California Species of Special Concern). Bryant's savannah sparrow is a California endemic restricted to a narrow coastal strip between Humboldt Bay south to the Morro Bay area, with its primary center of abundance appearing to be the San Francisco Bay

⁴⁴ DeSante, D.F., et al., 2007. *A Census of Burrowing Owls in Central California in 1991*. Pages 38–48 in J. L. Lincer and K. Steenhof, eds. *The Burrowing Owl, Its Biology and Management: Including the Proceedings of the First International Symposium*. Raptor Research Report No. 9.

⁴⁵ Zarn, M., 1974. *Burrowing Owl (Spetyto cucicularia hypugaea)*. *Habitat Management Series for Unique or Endangered Species*. Technical Report T-N-250. Bureau of Land Management, Denver, Colorado.

⁴⁶ Barclay, J., 2001. *Burrowing Owl Species Summary*. Appendix IV in Colonel Allensworth State Historic Park Final Burrowing Owl Mitigation and Management Plan. Albion Environmental, Inc., Santa Cruz, California. March.

⁴⁷ Shuford, W.D., 1993, op. cit.

area.⁴⁸ This subspecies occupies low, tidally influenced habitats, adjacent ruderal areas, moist grasslands within and just above the fog belt, and infrequently drier grasslands. Around San Francisco Bay, Bryant's savannah sparrows primarily occur in the transition zone between tidal marsh and upland; such habitats are typically dominated by pickleweed or saltgrass.⁴⁹

Within the Plan area, suitable habitat for Bryant's savannah sparrows is present in the brackish or freshwater marsh vegetation along the northern shoreline of Corte Madera Channel and Corte Madera Creek, including the tidal marsh south of the Larkspur Ferry Terminal parking lot.

Samuels (San Pablo) Song Sparrow (California Species of Special Concern). This subspecies of the widely distributed song sparrow is restricted to the tidal marshes and adjacent uplands around the San Pablo Bay portion of the San Francisco Bay. They occur primarily in tidal salt marshes, but may also nest or forage in other shoreline habitats such as seasonal wetlands, intertidal mudflats, and adjacent uplands.⁵⁰ Favored nesting substrates include gumplant and cordgrass adjacent to tidal sloughs, although they also occur in perennial pepperweed and bulrush.

During LSA's reconnaissance survey, Samuels song sparrows were detected in the tidal marsh south of the Larkspur Ferry Terminal parking lot, in the riparian woodland habitat in Remillard Park, and in the tidal channels north of Corte Madera Creek.

Salt Marsh Harvest Mouse (Federally and State Endangered; California Fully Protected Species). Salt marsh harvest mouse are endemic to the tidal salt marshes of the San Francisco Bay Estuary. This species primarily occurs in marshes dominated by pickleweed, but also uses adjacent upland habitats during high tides. The presence of adequate peripheral halophyte plant cover adjacent to the pickleweed-dominated marsh plain is an important habitat component for this species, which depends on such cover for refuge from terrestrial predators during extremely high tides.

Within the Plan area, salt marsh harvest mice have been recorded at the Corte Madera Marsh State Ecological Reserve and along the northern shoreline of Corte Madera Creek.⁵¹ The mice recorded along the north bank of the mouth of Corte Madera Creek are from specimens collected in the 1940s and 1960s when upland refugia was more abundant. This species is likely extirpated from the northern shoreline of Corte Madera Creek due to the lack of adjacent upland habitat.

Sensitive Habitats. Special plant communities and jurisdictional waters are described below.

⁴⁸ Fitton, S.D., 2008. *Bryant's Savannah Sparrow (Passerculus sandwichensis alaudinus)*. Pages 382–387 in Shuford, W.D., and T. Gardali, eds. *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California*. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

⁴⁹ Fitton, S.D., 2008, op. cit.

⁵⁰ Cogswell, H., 2000. *Song Sparrow*. Pages 374–385 in *Goals Project. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish, and Wildlife*. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P. R. Olofson, ed. San Francisco Bay Regional Water Quality Control Board, Oakland, California.

⁵¹ California Department of Fish and Wildlife, 2012, op. cit.

Special Plant Communities. The CDFW tracks the occurrences of “special” plant communities that are either known or believed to be of high priority for inventory in the CNDDDB. These plant communities are listed in the CDFW publication *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database*.⁵² These communities are sometimes addressed by lead or trustee agencies in CEQA documents, but generally are not afforded the same protection as RPR List 1B and 2 plant species. Many special plant communities support special-status plants and animals and are addressed under CEQA as habitat for those species.

The following special plant communities occur within a 5-mile radius of the Plan area: northern coastal salt marsh, coastal brackish marsh, and coastal terrace prairie. The latter two are known to occur in Marin County and but are unlikely to occur in the Plan area. Northern coastal salt marsh is dominated by native halophytes and usually supports an abundance of native forbs and potentially supports special-status plants. This community occurs along the northern shoreline Corte Madera Creek within the Plan area.

Jurisdictional Waters. Although a formal jurisdictional delineation of wetlands and other waters of the U.S. and State was not conducted for the Plan area, several features can be assumed to fall under U.S. Army Corps of Engineers (Corps) and Regional Water Quality Control Board (RWQCB) jurisdiction pursuant to Sections 401 and 404 of the federal Clean Water Act and the Porter-Cologne Water Quality Control Act.

Features within the Plan area that would likely be considered wetlands or other waters of the U.S. by the Corps include Corte Madera Channel, Corte Madera Creek; Tubb Lake and the associated drainage channel; tidal marshes along the northern shoreline of Corte Madera Creek; and the tidal channels and associated wetlands north of Corte Madera Creek. Additional other waters and wetlands may be present in other undeveloped portions of the Plan area, but would require site-specific evaluations to be fully identified.

Tubb Lake and all the creeks and channels within the Plan area are also expected to fall under CDFW jurisdiction pursuant to Section 1602 of the California Fish and Game Code. Unlike Corps jurisdiction, however, which is limited to the Ordinary High Water Mark, CDFW jurisdiction over these features extends to the top of bank, or the outer dripline of riparian vegetation, whichever is greater.

c. Regulatory Context. Biological resources within the Plan area may be subject to agency jurisdiction or regulations, as described below.

(1) Endangered Species Act. The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over federally listed threatened and endangered plant and animal species. The federal Endangered Species Act (ESA) and its implementing regulations prohibit the take of any fish or wildlife species that is federally listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10 of the ESA. ESA defines “take” as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Federal regulation 50 CFR §17.3

⁵² California Department of Fish and Wildlife, 2003. *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Data Base*. Wildlife and Habitat Data Analysis Branch, Vegetation Classification and Mapping Program, California Department of Fish and Game, Sacramento.

defines the term “harass” as an intentional or negligent act that creates the likelihood of injuring wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns such as breeding, feeding, or sheltering (50 CFR §17.3). Furthermore, federal regulation 50 CFR §17.3 defines “harm” as an act that either kills or injures a listed species. By definition, “harm” includes habitat modification or degradation that actually kills or injures a listed species by significantly impairing essential behavior patterns such as breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR §217.12).

Section 10(a) of the ESA establishes a process for obtaining an incidental take permit that authorizes nonfederal entities to incidentally take federally listed wildlife or fish. Incidental take is defined by ESA as take that is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.” Preparation of a habitat conservation plan, generally referred to as an HCP, is required for all Section 10(a) permit applications. The USFWS and National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NOAA Fisheries Service) have joint authority under the ESA for administering the incidental take program. NOAA Fisheries Service has jurisdiction over anadromous fish species and USFWS has jurisdiction over all other fish and wildlife species.

Section 7 of the ESA requires all federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any species listed under the ESA, or result in the destruction or adverse modification of its habitat. Federal agencies are also required to minimize impacts to all listed species resulting from their actions, including issuance or permits or funding. Section 7 requires consideration of the indirect effects of a project, effects on federally listed plants, and effects on critical habitat (ESA requires that the USFWS identify critical habitat to the maximum extent that it is prudent and determinable when a species is listed as threatened or endangered). This consultation results in a Biological Opinion prepared by the USFWS stating whether implementation of the action will result in jeopardy to any listed species or will adversely modify critical habitat and the measures necessary to avoid or minimize effects to listed species.

Although federally listed animals are legally protected from harm no matter where they occur, Section 9 of the ESA provides protection for endangered plants by prohibiting the malicious destruction on federal land and other “take” that violates State law. Protection for plants not living on federal lands is provided by the California Endangered Species Act.

(2) Clean Water Act. The Corps is responsible under Section 404 of the Clean Water Act to regulate the discharge of fill material into “waters of the U.S.” and their lateral limit are defined in 33 CFR Part 328.3(a) and include streams that are tributaries to navigable waters and their adjacent wetlands. The lateral limits of jurisdiction for a non-tidal stream are measured at the line of the Ordinary High Water Mark (33 CFR Part 328.3[e]) or the limit of adjacent wetlands (33 CFR Part 328.3[b]). Any permanent extension of the limits of an existing water of the U.S., whether natural or man-made, results in a similar extension of Corps jurisdiction (33 CFR Part 328.5).

Waters of the U.S. fall into two broad categories: wetlands and other waters. Other waters include waterbodies and watercourses generally lacking plant cover such as rivers, streams, lakes, springs, ponds, coastal waters, and estuaries. Wetlands are aquatic habitats that support hydrophytic wetland plants and include marshes, wet meadows, seeps, floodplains, basins, and other areas experiencing extended seasonal soil saturation. Seasonally or intermittently inundated features, such as seasonal ponds, ephemeral streams, and tidal marshes, are categorized as wetlands if they have hydric soils and

support wetland plant communities. Seasonally inundated waterbodies or watercourses that do not exhibit wetland characteristics are classified as other waters of the U.S.

Waters and wetlands that cannot trace a continuous hydrologic connection to a navigable water of the U.S. are not tributary to waters of the U.S. These are termed “isolated wetlands.” Isolated wetlands are jurisdictional when their destruction or degradation can affect interstate or foreign commerce (33 CFR Part 328.3[a]). The Corps may or may not take jurisdiction over isolated wetlands depending on the specific circumstances.

In general, a project proponent must obtain a Section 404 permit from the Corps before placing fill or grading in wetlands or other waters of the U.S. Prior to issuing the permit, the Corps is required to consult with the USFWS under Section 7 of the ESA if the project may affect federally listed species.

All Corps permits require water quality certification under Section 401 of the Clean Water Act. In the San Francisco Bay Area, this regulatory program is administered by the San Francisco Bay RWQCB. Project proponents who propose to fill wetlands or other waters of the U.S. must apply for Section 401 water quality certification from the RWQCB. The RWQCB has adopted a policy requiring mitigation for any loss of wetland, streambed, or other jurisdictional area.

(3) Migratory Bird Treaty Act. The federal Migratory Bird Treaty Act (MBTA) (Title 16 United States Code, Section 703-712 as amended; 50 Code of Federal Regulations Section 21; and 50 Code of Federal Regulations Section 13) prohibits the taking, hunting, killing, selling, purchasing, etc. of migratory birds, parts of migratory birds, or their eggs and nests. As used in the MBTA, the term “take” is defined as “to pursue, hunt, shoot, capture, collect, kill, or attempt to pursue, hunt, shoot, capture, collect, or kill, unless the context otherwise requires.” Most bird species native to North America are covered by this act.

(4) California Endangered Species Act. The CDFW has jurisdiction over State-listed endangered, threatened, and rare plant and animal species under the California Endangered Species Act (CESA) (Fish & Game Code, Section 2050-2098). CESA is similar to the federal ESA both in process and substance; it is intended to provide additional protection to threatened and endangered species in California. Species may be listed as threatened or endangered under both acts (in which case the provisions of both State and federal laws apply) or under only one act. A candidate species is one that the Fish and Game Commission has formally noticed as being under review by CDFW for addition to the State list. Candidate species are protected by the provisions of CESA.

The Habitat Conservation Planning Branch of the CDFW administers the State’s rare species program. The CDFW maintains lists of designated Endangered, Threatened and Rare plant and animal species as designated by the California Fish and Game Commission or under the California Native Plant Protection Act (NPPA). Habitat degradation or modification is not expressly included in the definition of “take” under the California Fish and Game Code; however, the CDFW has interpreted “take” to include the “killing of a member of a species which is the proximate result of habitat modification...”.

Section 2081(b) and (c) of the CESA allows CDFW to issue an incidental take permit for a state-listed threatened and endangered species only if specific criteria are met. These criteria can be found in Title 14 CCR, Sections 783.4(a) and (b)

(5) **California Environmental Quality Act.** The California Environmental Quality Act (CEQA) applies to “projects” proposed to be undertaken or requiring approval by State and local government agencies. Projects are defined as having the potential to have physical impact on the environment. Under Section 15380 of CEQA, a species not included on any formal list “shall nevertheless be considered rare or endangered if the species can be shown by a local agency to meet the criteria” for listing. With sufficient documentation, a species could be shown to meet the definition of rare or endangered under CEQA and be considered a “de facto” rare or endangered species.

(6) **California Fish and Game Code.** The CDFW is also responsible for enforcing the California Fish and Game Code, which contains several provisions potentially relevant to construction projects. For example, Section 1602 of the Fish and Game Code governs the issuance of Lake and Streambed Alteration Agreements by the CDFW. Lake or Streambed Alteration Agreements are required whenever project activities substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated as such by the CDFW.

The Fish and Game Code also lists animal species designated as Fully Protected or Protected, which may not be taken or possessed at any time. The CDFW does not issue licenses or permits for take of these species except for necessary scientific research, habitat restoration/species recovery actions, or live capture and relocation pursuant to a permit for the protection of livestock. Fully Protected species are listed in Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the Fish and Game Code, while Protected amphibians and reptiles are listed in Chapter 5, Sections 41 and 42.

Section 3503 of the Fish and Game Code prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Subsection 3503.5 specifically prohibits the take, possession, or destruction of any birds in the orders Falconiformes (hawks and eagles) or Strigiformes (owls) and their nests. These provisions, along with the federal MBTA, essentially serve to protect nesting native birds. Non-native species, including European starling, house sparrow, and rock pigeon, are not afforded any protection under the MBTA or California Fish and Game Code.

(7) **Porter-Cologne Water Quality Control Act.** Under this Act (California Water Code Sections 13000–14920), the RWQCB is authorized to regulate the discharge of waste that could affect the quality of the State’s waters. The RWQCB asserts jurisdiction over isolated waters and wetlands, as well as waters and wetlands that are regulated by the Corps. Therefore, even if a project does not require a federal permit, it still requires review and approval by the RWQCB. When reviewing applications, the RWQCB focuses on ensuring that projects do not adversely affect the “beneficial uses” associated with waters of the State. In most cases, the RWQCB seeks to protect these beneficial uses by requiring the integration of waste discharge requirements (WDRs) into projects that will require discharge into waters of the State. For most construction projects, the RWQCB requires the use of construction and post-construction Best Management Practices (BMPs).

(8) **McAteer-Petris Act.** The McAteer-Petris Act and Suisun Marsh Preservation Act were adopted to protect San Francisco Bay and Suisun Marsh as great natural resources for the benefit of the public and to encourage development compatible with this protection. The San Francisco Bay Conservation and Development Commission (BCDC) was established to carry out this Act. The two primary goals of the BCDC are: (1) to prevent the unnecessary filling of San Francisco Bay; and (2) to increase public access to and along the Bay shoreline. BCDC approval is required for all projects

within 100 feet of the Bay shoreline, as well as projects that propose any filling or dredging within Bay waters.

(9) Other Statutes, Codes, and Policies Affording Species Protection. The CDFW maintains an administrative list of Species of Special Concern (SSC), defined as a “species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:

- Is extirpated from the State, or, in the case of birds, in its primary seasonal or breeding role;
- Is listed as federally, but not State-, threatened or endangered;
- Meets the State definition of threatened or endangered but has not formally been listed;
- Is experiencing, or formerly experienced, serious (nonscyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for State threatened or endangered status;
- Has naturally small populations exhibiting high susceptibility to risk from any factor(s) that, if realized, could lead to declines that would qualify it for State threatened or endangered status.”

The CDFW’s Nongame Wildlife Program is responsible for producing and updating SSC publications for mammals,⁵³ birds,⁵⁴ and reptiles and amphibians.⁵⁵ The Fisheries Branch is responsible for updates to the Fish SSC document and list.⁵⁶ Section 15380 of the *CEQA Guidelines* clearly indicates that SSC should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outline therein. In contrast to species listed under the federal ESA or CESA, however, SSC have no formal legal status.

Special-status plants in California are assigned to one of five “California Rare Plant Ranks” by a collaborative group of over 300 botanists in government, academia, non-governmental organizations, and the private sector. This effort is jointly managed by the CDFW and the non-profit California Native Plant Society (CNPS). The five California Rare Plant Ranks currently recognized by the CNDDDB include the following:

- Rare Plant Rank 1A: Plants presumed extinct in California;
- Rare Plant Rank 1B: Plants rare, threatened, or endangered in California and elsewhere;

⁵³ Williams, D. F., 1986. *Mammalian Species of Special Concern in California*. California Department of Fish and Game, Sacramento.

⁵⁴ Shuford, W. D., and T. Gardali, editors, 2008. *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California*. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

⁵⁵ Jennings, M. R., and M. P. Hayes, 1994, op. cit.

⁵⁶ Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake, 1995. *Fish Species of Special Concern in California: Second Edition*. Final report to California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova. Contract No. 2128IF.

- Rare Plant Rank 2: Plants rare, threatened, or endangered in California, but more common elsewhere;
- Rare Plant Rank 3: Plants about which more information is needed - a review list; and
- Rare Plant Rank 4: Plants of limited distribution – a watch list.

Substantial impacts to plants ranked 1A, 1B, and 2 are typically considered significant based on Section 15380 of the *CEQA Guidelines* depending on the policy of the lead agency. Plants ranked 3 and 4 may be evaluated by the lead agency on a case-by-case basis to determine significance thresholds under CEQA.

(10) Larkspur General Plan Policies. The following policies from the 1990 General Plan are related to biological resources:

Environmental Resources Element

Goal 1: Preserve and enhance a variety of open space features including ridgelines, the wetlands along the Bay and the creeks, wildlife habitats, view corridors, and other amenities which contribute to a sense of openness in Larkspur.

Goal 2: Maintain Corte Madera and Southern Heights Ridges as community separators.

- **Policy a:** Work with local and regional open space agencies and interest groups to develop an open space preservation strategy.
 - **Action Program [1]:** Map and rank open space features as to their value to the community.
 - **Action Program [2]:** Support the efforts of the Marin County Open Space District to acquire more open space in the Larkspur Sphere of Influence.
 - **Action Program [3]:** Identify financing mechanisms to acquire privately held lands designated for future open space.
 - **Action Program [4]:** Educate school children and the general public about Larkspur's open space resources.
- **Policy b:** Designate and preserve in open space the areas so shown on the General Plan Land Use map. They include those of the Northridge that are above the 350-foot elevation, Baltimore canyon, the Piedmont and Redwood Avenue areas, Big and Little King Mountains and their saddle area, the Tubb Lake watershed, and the ridge above the old quarries on the San Quentin Peninsula.
- **Policy c:** Designate and preserve in Shoreline/Marsh Conservation area the wetlands along Corte Madera Creek and at Piper Park, Redwood High School, and the Larkspur Ferry Terminal, and the shoreline between East Sir Francis Drake Boulevard and the Bay waters.
 - **Action Program [5]:** Designate and preserve in Shoreline/Marsh Conservation area the wetlands along Corte Madera Creek and at Piper Park, Redwood High School, and the Larkspur Ferry Terminal, and the shoreline between East Sir Francis Drake Boulevard and the Bay waters.
- **Policy d:** Allow low-intensity development on hillsides and near Corte Madera Creek only if the design preserves natural features, such as significant stands of trees, forested hillsides, riparian vegetation, marshlands, wildlife habitats, ridgelines, and buffer zones.
- **Policy e:** Encourage the use of cluster site plans for large parcels of land provided the design will not be detrimental to the character and scale of the community.
 - **Action Program [6]:** Require new development to preserve some natural area.

- Action Program [7]: If a development proposal requires the removal of trees or other vegetation of significant resource value or adversely impacts a wetlands area (as defined in implementing ordinances), require the developer to replace the lost resources.
- Action Program [8]: Avoid development in areas which contain rare or endangered species of plants or animals.

Goal 3: Provide reasonable access to open space areas and trails without adversely impacting natural habitats.

- Policy h: Seek a balance between the recreational aspects of open space and the need to protect wildlife and fragile vegetation from intrusion by humans and domestic animals.
 - Action Program [12]: Provide a buffer zone between natural habitats and human use areas (such as paths), and clearly mark the boundaries. Place restrictions on access to these sensitive areas by pets.
 - Action Program [13]: Provide hiking trails to connect Tubb Lake with the ridge top, Larkspur Landing, and Sir Francis Drake Boulevard.
- Policy i: Seek to balance the needs for community safety with the goal for protection of the environment.
 - Action Program [14]: When dredging Corte Madera Creek, protect the wetlands along the creek.
 - Action Program [15]: Plan future development of the ferry terminal so as to minimize impact on nearby creek and marshland habitats.

(11) Larkspur Municipal Code. Heritage trees are defined in Chapter 12.16 of the Larkspur Municipal Code as either of the following: (1) a live tree or grove of live trees of historical significance specifically designated by official action of the City Council; or (2) any live tree that has a trunk with a circumference of 50 inches or more, measured at 24 inches above the natural grade, or at a point 24 inches above the highest grade. The measurement producing the greatest circumference shall be used. In the case of multi-trunk trees, the circumference of each trunk is to be measured in the manner previously described, and the circumference of each trunk is to be added to ascertain the total circumference of the tree.

Any person desiring to remove one or more heritage trees or prune beyond the “best practices” pruning guidelines promulgated by the International Society of Arboriculture or the American National Standards Institute shall apply to the City Manager or his/her designee or Planning Department, as appropriate, for a permit.

2. Impacts and Mitigation Measures

The following section discusses potential impacts to the biological resources that could result from implementation of the Station Area Plan. The section begins with the criteria of significance, establishing the thresholds to determine whether an impact is potentially significant. The latter part of this section presents the impacts and recommends mitigation measures, if required.

a. Criteria of Significance. Implementation of the Station Area Plan would have a significant impact if it were to result in:

- A substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- A substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- A substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means;
- Substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impediment to the use of native wildlife nursery sites;
- Any conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Any conflict with the provisions of an adopted HCP, Natural Community Conservation Plan, or other approved local, regional, or state HCP.

b. Impacts Analysis. The following section provides an evaluation and analysis for the potential impacts to biological resources from implementation of the Plan for each of the criteria of significance listed above.

(1) Candidate, Sensitive, or Special-Status Species. Thirty-two special-status plants and 32 special-status animals have the potential to occur in the general vicinity of the Plan area. The Point Reyes bird's-beak, a special-status plant, has a moderately high probability of occurring within the tidal marsh habitat in the Plan area. Thirteen special-status animal species are known to occur or have the potential to occur in the ruderal/non-native annual grassland and/or tidal marsh habitats of the Plan area. Suitable breeding habitat for California red-legged frogs may be present in Tubb Lake, but due to the lake's isolation from other occupied breeding sites, the species' rarity in the region, and the presence of introduced predators such as American bullfrogs (*Lithobates catesbeianus*) and fish, this species is highly unlikely to occur in Tubb Lake or other parts of the Plan area. Western pond turtles could occur in Tubb Lake, Remillard Park, and within the other freshwater/brackish marsh habitat in the Plan area. Corte Madera Creek is known to support steelhead and may also support western pond turtle.

Several policies and action programs within the Larkspur 1990 General Plan specify protection of special-status species that occur in the Plan area. Specifically, Action Program 8 avoids development in areas that contain special-status species, Policy H protects wildlife and fragile habitat from intrusion by humans and domestic animals, and Action Program 12 places restrictions on access to sensitive areas by pets.

Impact BIO-1: Implementation of the Station Area Plan may result in the destruction of nests occupied by special-status bird species. (S)

The riparian woodland, coast live oak woodland, non-native woody vegetation, ruderal/non-native annual grassland, freshwater/brackish marsh, tidal marsh/mudflat habitats, and developed habitat (i.e., landscaped trees) in the Plan area provide nesting habitat for special-status bird species. Grading and

construction activities near nests could cause nest abandonment and/or loss of eggs or young during the breeding season and would represent a significant impact.

Implementation of the following mitigation measure would reduce this impact to less-than-significant level.

Mitigation Measure BIO-1: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- All proposed new development within the Plan area shall protect nesting birds by requiring pre-construction surveys prior to tree removal, ground disturbing, or construction activities on the site to locate and protect active nests on or immediately adjacent to the site. For example, pre-construction surveys shall be conducted no more than 14 days prior to the start of pruning, construction, or ground disturbing activities if the activities occur during the nesting season (February 1 to August 31). Pre-construction surveys shall be repeated at 14-day intervals until construction has been initiated in the area. Locations of active nests shall be described and protective measures implemented. Protective measures shall include establishment of clearly delineated (i.e., orange construction fencing) exclusion zones around each nest site as determined by a qualified wildlife biologist, taking into account the species of bird nesting on-site and their tolerance for disturbance. In general, exclusion zones shall be a minimum of 300 feet from the drip line of the nest tree or nest for raptors and 50 feet for passerines and other species. The active nest sites within an exclusion zone shall be monitored on a weekly basis throughout the nesting season to identify signs of disturbance. The radius of an exclusion zone may be increased by the project biologist if project activities are determined to be adversely affecting the nesting birds. Exclusion zones may be decreased by the project biologist only in consultation with CDFW. The protection measures shall remain in effect until the young have left the nest and are foraging independently or the nest is no longer active. A report shall be submitted to the City and CDFW at the end of the construction season documenting the observations made during monitoring. (LTS)

Impact BIO-2: Implementation of the Station Area Plan may impact western pond turtle or pond turtle habitat in the Plan area. (S)

Suitable western pond turtle habitat is present in Corte Madera Creek and in the freshwater/brackish marsh of the Plan area such as Tubb Lake and Remillard Park (shown in Figure IV.F-1). Construction within or adjacent to these areas could impact pond turtles, if present.

Implementation of the following mitigation measure would reduce this impact to western pond turtles to a less-than-significant level.

Mitigation Measure BIO-2: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- Pre-construction surveys for the western pond turtle shall be conducted in areas of suitable upland and/or aquatic habitat that is within 300 feet of Corte Madera Creek, Tubb Lake, Remillard Park, or other freshwater/brackish marsh in the Plan area. The survey shall be conducted immediately prior to ground disturbance to ensure that no turtles are in the construction area. If turtles are observed in the construction area, they shall be relocated to

suitable habitat outside the construction zone prior to initiation of construction activities. All relocations will be made by a biologist qualified to handle turtles and with approval of the CDFW.

- All construction activities within channels, lakes, ponds, and marshes within the Plan area shall be conducted during the period when pond turtles are active (May through September). Turtles are expected to be more easily observed during this period and able to escape construction activities that may pose a risk of mortality. (LTS)

Impact BIO-3: Implementation of the Station Area Plan may result in impacts to special-status plants. (S)

Potential habitat for special-status plant species is present in the Plan area. Point Reyes bird's-beak, in particular, has a moderately high probability of occurring in the Plan area; this species was recorded in the tidal marsh just south of the Plan area along the southern shoreline of Corte Madera Creek, but could also occur along the northern shoreline. Future development in this area and other parts of the Plan area could impact undocumented occurrences of special-status plant species, if present.

Mitigation Measure BIO-3: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- Prior to ground disturbance, focused surveys for special-status plants shall be conducted in the development areas of the Plan area according to the CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Plant Populations and Natural Communities*.⁵⁷ Plant surveys shall be conducted throughout the blooming period of those species for which suitable habitat is present. The number of surveys to be conducted shall be determined by a qualified biologist following the CDFW protocol. If populations/stands of a special-status species are identified during the surveys and impacts are unavoidable, compensatory mitigation shall be implemented in one of the following ways: (1) establishment of an off-site mitigation area that supports the species being impacted; (2) purchase of credits in a mitigation bank that is approved to sell credits for the impacted species; or (3) relocation of the affected plants and/or collection and planting of seed of the impacted plants to a location that will be preserved in perpetuity and protected from future development.

The location of the mitigation sites shall be determined in consultation with, and subject to approval of USFWS and/or CDFW (depending on the federal and/or State status of the plants). Compensatory mitigation shall be acquired at a minimum ratio of 3:1 (acquired:impacted) based on acreage of occupied habitat impacted (i.e., if one acre of occupied habitat is impacted, three acres of occupied habitat will be acquired) or the number of individual plants impacted (i.e., if a population of a 100 plants is impacted, a population of 300 plants must be reestablished at a mitigation site by the end of five years). Implementation of off-site mitigation shall include provisions for the long-term protection of the species through establishment of a conservation easement on the on the mitigation site and an endowment for the maintenance, monitoring, and long-term of management of

⁵⁷ California Department of Fish and Wildlife, 2009. *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. November 24, 2009. Sacramento, California.

the site. The amount of the endowment shall be determined by the City and appropriate resource agencies. (LTS)

Impact BIO-4: Implementation of the Station Area Plan may impact special-status tidal marsh animal species. (S)

Suitable habitat for California black rail, California clapper rail, and salt marsh harvest mouse is present in the approximately 7 acres of tidal marsh habitat within the Plan area. Construction would not likely extend into existing marsh habitat. Nevertheless, these species are known to use grasslands and other dense vegetation adjacent to marshes as escape cover during high tides. As such, there is a small chance that they may occur within the construction footprint during high tides, if present in the marsh habitat. In addition, construction noise has the potential to disturb nesting tidal marsh rails since suitable habitat may be present within 100 feet of the construction footprint.

Because clapper rails may occur within the tidal marsh/mudflat habitat south of the existing Larkspur Ferry Terminal (shown in Figure IV.F-1), changes in the land-use, such as the residential development, in this area could impact clapper rails and other special-status marsh species, if present. Potential impacts may include increased lighting, noise, and domestic pets.

Several policies and action programs within the Larkspur 1990 General Plan Environmental Resources Element specify protection of the tidal marsh habitat and the wildlife and special-status species that occur there. Policy C calls for the preservation of the wetlands along Corte Madera Creek and the Larkspur Ferry Terminal. Policy D allows low-intensity development near Corte Madera Creek only if the design preserves natural features, such as marshlands and wildlife habitats. Action Program 8 specifies avoiding development in areas that contain special-status species. Policy H protects wildlife and fragile habitat from intrusion by humans and domestic animals. Action Program 12 places restrictions on access to sensitive areas by pets. Action Program 15 calls for designing future development of the ferry terminal so as to minimize impact on the nearby creek and marsh habitat. These policies will reduce impacts of the Station Area Plan, but not to a less-than-significant level.

Implementation of the following mitigation measure would reduce these impacts to a less-than-significant level.

Mitigation Measure BIO-4: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- Ground disturbing activities within upland habitat in the vicinity of the tidal marsh shall be conducted only when high tides are not at their winter or summer extremes, to reduce the likelihood that tidal marsh rails and salt marsh harvest mice will be present in the construction footprint. Ground disturbance shall be avoided during the highest tides of June–July and December–January (\pm one week each month).
- To avoid potential disturbance to nesting tidal marsh rails, construction shall be conducted during the non-breeding season (September 1 through January 31), unless current surveys indicate that marsh habitat within 100 feet of the construction footprint is not part of an active rail breeding territory. Such surveys must be conducted in accordance with a project-specific survey methodology prepared in accordance with the USFWS and CDFW protocols.

- No work shall be permitted within suitable habitat for salt marsh harvest mice (i.e., tidal marsh/mudflat and adjacent ruderal/non-native annual grassland) without the appropriate authorization from the USFWS and CDFW. Prior to ground disturbance within suitable salt marsh harvest mouse habitat, a qualified biologist experienced with salt marsh harvest mouse exclusion procedures shall prepare a site-specific salt marsh harvest mouse avoidance plan. The plan will be subject to approval by USFWS and CDFW and be consistent with the Biological Opinion and Incidental Take Permit issued by the USFWS and CDFW, respectively, for the project. At a minimum, the plan shall include: (1) installation of a barrier fencing around the entire portion of the work area that is within 100 feet of the edge of the marsh to exclude salt marsh harvest mouse from the work area; (2) clearing of all vegetation using hand-tools within the fenced work area prior to the initiation of construction activities; and (3) relocation to the marsh of any salt marsh harvest mouse found during vegetation removal (relocation must be approved by USFWS and CDFW prior to initiation of construction activities). Construction work shall start as soon as possible (and no longer than 3 days) after vegetation has been cleared. All exclusion measures and initial ground disturbance activities shall be monitored by a qualified biologist who is approved by the USFWS and CDFW to implement protection measures for salt marsh harvest mouse.
- To protect sensitive habitats during construction activities, a permanent fence shall be constructed outside of the marsh along the southern edge of the Larkspur Ferry Terminal parking area to restrict access of humans and dogs into the tidal marsh/mudflat habitat. A qualified biologist shall provide advice regarding the location and design of the fence, and BCDC and the City shall approve fence design, dimensions and location. The upland habitat on the project site should be landscaped with native shrub species characteristic of the upper marsh zone such as gumplant, saltgrass, and/or coyote brush to buffer the tidal marsh from activity on the parking area and provide rails and other marsh birds with shelter during extreme high tides. Such vegetation (e.g., gumplant) could also provide potential nesting habitat for various species of birds inhabiting the marsh.
- If any development occurs within the existing Larkspur Ferry Terminal parcel, the City shall require building design features to reduce predators and lighting that would impact tidal marsh species. Such design features may include anti-predator perching devices or building designs to discourage predatory birds from nesting or perching in proximity to the marsh and lights that are shielded and focused away from the marsh and sensitive habitat areas. (LTS)

(2) Riparian Woodland and Other Sensitive Natural Communities. Riparian woodland within the Plan area is limited to the area near Tubb Lake and Remillard Park. Other sensitive natural communities within the Plan area consist of the freshwater/brackish marsh, tidal marsh/mudflat habitat, and the creek/open water habitats near the Corte Madera Creek and Corte Madera Channel (as shown in Figure IV.F-1). These marsh communities are located at several areas near the northern boundaries of the Corte Madera Creek and Corte Madera Channel. This analysis assumes that the current ferry schedule will remain similar to the current schedule. Changes to the schedule could increase disturbance levels to tidal marsh/mudflat habitat and wintering migratory ducks and other waterbirds.

Development within the Plan area could directly and/or indirectly impact the riparian woodland and other sensitive habitats. These impacts may include removal of riparian vegetation and the introduction of invasive plant species.

Impact BIO-5: Invasive plants introduced to the Station Area Plan area may invade the native riparian woodland and tidal marsh mudflat/mudflat and displace native habitat. (S)

Construction within or adjacent to riparian woodland and marsh areas could result in ground disturbance that leaves areas of bare soil susceptible to colonization by non-native invasive plant species. Invasive plants can have a variety of impacts on native plant communities, including alteration of ecosystem processes; displacement of native species; support of non-native animals, fungi, or microbes; and alteration of gene pools through hybridization with native species. Additionally, many ornamental plants used in landscaping can become invasive and spread to adjacent habitats where they can become established and displace native plant species. If not controlled, invasive plants could encroach into native riparian woodland and tidal marsh/mudflats within the Plan area, reducing their habitat value for native plants and wildlife, including special-status species.

The spread of invasive plants is not typically a concern on developed parcels as unwanted plants in the landscaping are typically removed and not allowed to become established. In open spaces, invasive plants can become established in disturbed areas or out of the way areas, at which time they become more difficult to eradicate or control.

The following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-5: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- Species listed in California Invasive Plant Council's *Invasive Plant Inventory*⁵⁸ shall be prohibited from being planted in the Plan area. Plant palettes for individual projects shall be reviewed by a biologist to ensure that the prohibited species are not included in the landscaping plans.
- During construction activities, the following measures shall be implemented to the extent feasible to reduce the spread of invasive plants:
 - Avoid vehicle travel through weed-infested areas.
 - Avoid the disturbance of soil and vegetation to the extent feasible during construction activities.
 - Use only certified weed-free erosion control materials and native seed mixes. (LTS)

Impact BIO-6: Implementation of the Station Area Plan could impact up to approximately 5 acres of riparian woodland in the Plan area. (S)

⁵⁸ California Invasive Plant Council, *Invasive Plant Inventory*. Website: www.cal-ipc.org/ip/inventory/index.php#categories.

Implementation of the Station Area Plan could directly impact up to approximately 5 acres of riparian woodland within the Plan area. Riparian habitat occurs in Remillard Park near the southeastern boundary of the Plan area and in the vicinity of Tubb Lake in the eastern portion of Sub-area 1A (as shown in Figure IV.F-1). Riparian woodland in these areas may be impacted by proposed trails and development.

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-6: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- A Lake and Streambed Alteration Permit shall be obtained from the CDFW prior to the removal or damage of any riparian trees, shrubs, or other vegetation within CDFW jurisdiction (bed or bank of the lake, pond, river creek, or drainage and the riparian vegetation associated with these features).
- A tree survey shall be conducted within any portion of the riparian woodland that may be impacted by development. Riparian trees and shrubs removed or otherwise permanently impacted (i.e., limbs or trunk severely pruned or roots cut, trenches cut through root zone) as result of implementation of the Station Area Plan shall be replaced either onsite or at an off-site, public open space mitigation area (i.e., park or open space). Riparian trees and shrubs will be replaced at a 3:1 ratio (replaced: impacted). Replacement plant material will be of native, local stock. An endowment or other secure funding source will be established for the long-term maintenance and monitoring of the replacement trees.
- Trees to be avoided or retained shall be enclosed in a tree protection zone (TPZ) to prevent direct damage to the trees and their growing environment during the construction process. A TPZ fence shall be established around the trees at a distance no less than 5 feet outside the dripline. In no case shall the TPZ fence be less than 10 feet from the trunk of the tree. The fencing shall be installed before site preparation, construction activities, or tree trimming begins and shall consist of blaze orange barrier fencing supported by metal “T rail” fence posts.
- Heavy machinery shall not be allowed to operate or park within the Tree Protection Zone, nor shall any excess soil, chemicals, debris, equipment or other materials be dumped or stored within the TPZ or upslope of the protected trees. If it is necessary for heavy machinery to operate within the dripline of the preserved protected trees, then measures to reduce compaction of the soil within the dripline shall be employed as directed by a qualified arborist. (LTS)

(3) Federally and State Protected Wetlands. Wetlands provide valuable habitat for native plant and animal species and contribute to the maintenance of water quality. Known wetlands within the Plan area include the freshwater/brackish marsh, tidal marsh/mudflat, and creek/open water cover types (as shown in Figure IV.F-1). Development may impact wetlands potentially subject to federal jurisdiction. Any such impacts would be subject to federal (Clean Water Act) and State (Porter-Cologne Water Quality Control Act) regulations and would require the appropriate State and federal permits if they were proposed to be filled or impacted.

Impact BIO-7: Implementation of the Station Area Plan may impact waters of the United States and/or waters of the State within the Plan area. (S)

Up to approximately 7 acres of tidal marsh/mudflat, 3 acres of freshwater/brackish marsh, and 36 acres of creek/open water may be impacted by construction within the Plan area.

Implementation of the following mitigation measures would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-7: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- For all activities within jurisdictional waters, the applicant shall obtain the appropriate permits from the regulatory agencies (Corps, RWQCB, CDFW, and BCDC). Each activity in jurisdictional areas will likely require a Section 404 Corps permit and Section 401 water quality certification from the Water Board. Creek restoration activities may also require a CDFW Lake or Streambed Alteration Agreement, depending on site-specific conditions.
- Impacts to jurisdictional wetlands shall be mitigated at a minimum replacement ratio of 1:1 (i.e., one acre created [and preserved] for every acre impacted). Replacement habitat will be of the same type (i.e., marsh, channel, seasonal wetland) as the area impacted unless it can be shown that a different habitat type would provide greater value. Mitigation features should be created in the same general area as the original impact. Off-site mitigation may be approved by the City if the amount of required replacement habitat exceeds that which is available in the vicinity of the impact site.

A wetland mitigation and monitoring plan (MMP) shall be developed for each mitigation site, detailing the mitigation design, wetland planting design, adaptive management, maintenance and monitoring requirements, reporting requirements, and success criteria for the created wetland(s). An endowment or other assured funding mechanism in an amount to be determined by the permitting agencies will be provided by the project applicant for the long-term maintenance, management, and monitoring of the wetland mitigation area.

As an alternative to establishing an on- or off-site mitigation area, the project applicant may purchase mitigation credits at an agency approved mitigation bank that includes the project site in its service area. Credits equivalent to the mitigation acreage requirement for a mitigation site will be purchased and proof of purchase of the credits will be provided to the City prior to issuance of a building permit. Credits will be for the same type of wetland that is impacted. A mitigation and monitoring plan and endowment will not be required if credits are purchased at a bank to fully cover the mitigation requirement. (LTS)

Implementation of these measures would reduce impacts to federally protected wetlands to a less-than-significant level and no additional mitigation measures are required.

(4) Wildlife Corridors and Nursery Sites. Wildlife movement corridors are usually linear-shaped habitat features (e.g., creeks) that enable organisms to move among patches of their habitat. The primary movement corridors in the Plan area are Corte Madera Creek and Corte Madera Channel, which provide a link between San Francisco Bay and undeveloped areas west and north of the Plan area. These corridors enable both aquatic and terrestrial species to move between these areas and may also provide cover, food, and water for wide-ranging species moving through otherwise

unsuitable developed habitats. Disruption of these corridors by removal of vegetation or placement of permanent structures or active recreational facilities within corridors would constitute significant impacts to wildlife movement or nursery sites. No permanent structures or barriers to movement along the creek channels are proposed in the Plan area.

Impact BIO-8: Implementation of the Station Area Plan could impact bird nests that are protected under the MBTA and California Fish and Game Code. (S)

Nests of native birds protected under the MBTA and Fish and Game Code are considered a nursery site under CEQA. Several protected bird species were observed foraging in the Plan area and have the potential to nest in existing landscaping and riparian habitat. The proposed project could result in the removal of trees and understory vegetation. Several protected bird species could nest in trees and other vegetation on or adjacent to construction areas and therefore, could be impacted by the proposed project.

Implementation of the following mitigation measure would reduce impacts to nesting bird species to a less-than-significant level.

Mitigation Measure BIO-8: Implement Mitigation Measure BIO-1 to avoid impacts to nesting birds. (LTS)

Impact BIO-9: Implementation of the Station Area Plan may result in the loss of foraging and roosting habitat for the pallid bat and other special-status bat species and may result in injury or mortality to these species and their offspring. (S)

Development associated with implementation of the Station Area Plan could result in both direct and indirect impacts to the pallid bat and other special-status bat species.

Implementation of the following five-part mitigation measure would reduce this impact to bats to a less-than-significant level.

Mitigation Measure BIO-9: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- Pre-construction surveys for bat roosts shall be required for all buildings or trees that will be removed or modified within the Plan area. The survey shall take place no more than 30 days prior to construction/demolition/removal activities. Preconstruction surveys shall be repeated if demolition or construction activities are delayed more than 30 days.
- If a bat roost is found in a building or tree cavity, the species of bat using the roost shall be identified and methods to encourage the bats to leave the roost or to prevent them from returning to the roost shall be implemented prior to roost removal. A mitigation plan shall be developed by a biologist experienced in working with bats to specify the methods to be used and the timing of the activities. The mitigation plan shall be submitted to the City and CDFW for approval.
- Materials from roost sites shall be salvaged, when feasible, to be used in the construction of artificial roosts.

- If special-status bats are found on-site, and the roost would be destroyed during development, a replacement roost shall be provided for the bats. The replacement roost shall be constructed and placed on-site prior to removal of the original roost. A mitigation plan specifying the construction details and siting of the replacement roost, performance standards, type of monitoring and maintenance required, remedial actions if the bats were not to use the replacement roost, and annual reports shall be prepared and approved by the City and CDFW prior to removal of the existing roost. If bats do not use the replacement roost, a different type of replacement roost shall be constructed or the replacement roost shall be moved to a different location. The project sponsor shall provide a secure source of funding for the monitoring of the replacement roost, including any relocated or rebuilt replacement, roosts for a period of at least five years to determine whether the bats used the replacement roost. The roost and roost site will be secured as wildlife habitat in perpetuity through placement of a conservation easement on the mitigation site where the roost is constructed. An endowment in an amount to be determined in consultation with CDFW will also be provided for the long-term maintenance and monitoring of the roost site. A report documenting the implementation of the plan shall be provided to the City within one month of completion of the replacement roost. The plan shall be completed and implemented prior to the issuance of the grading permit.

If placement of the roost on the site is not feasible, the replacement roost may be constructed at an offsite location in the Larkspur area. The off-site mitigation site shall be placed in a conservation easement and an endowment shall be provided for the long-term maintenance and monitoring of the roost. The off-site mitigation site must be approved by CDFW. Conservation easements established for preservation of plant and animal habitat will be in favor of the CDFW or another qualified conservation organization that can legally hold conservation easements. The conservation easement shall be recorded within 6 months of acceptance of the mitigation and monitoring plan by the CDFW.

- Removal of maternity roosts for special-status bats shall be coordinated with CDFW prior to removal. Maternity roosts for any species of bat, either common or special-status, shall not be demolished until the young are able to fly independently of their mothers. (LTS)

Impact BIO-10: New buildings developed as part of implementation of the Station Area Plan could result in bird collisions. (S)

Wide expanses of glazing on new buildings associated with implementation of the Station Area Plan could result in bird collisions and associated bird fatalities. Resident and migratory birds may die or be injured by striking reflective and plate glass windows. Incorporating design features that make it easier for birds to identify buildings and avoid flying into the structures would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-10: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- Bird-safe design practices^{59,60,61,62} shall be incorporated into the building designs to the degree feasible, as determined by Community Development Department director. Design elements such as building facades that create “visual noise” via cladding, or other design features that make it easier for birds to identify buildings and not mistake windows for open sky or trees, and windows that are not clear or reflective shall be incorporated into the building designs. Examples of suitable materials include windows that incorporate glass types such as UV-A or fritted glass and windows that incorporate UV-absorbing and UV-reflecting stripe and grid patterns in locations with the highest potential for bird-window collisions (e.g., lower levels near trees). (LTS)

Implementation of the above mitigation measures would reduce potential impacts on wildlife corridors and nursery sites to a less-than-significant level.

(5) Local Policies and Ordinances. Implementation of the Station Area Plan may impact Heritage Trees, as defined in Chapter 12.16 of the Larkspur Municipal Code. Any person desiring to remove one or more heritage trees or prune beyond the “best practices” pruning guidelines promulgated by the International Society of Arboriculture or the American National Standards Institute shall apply to the City Manager or his/her designee or Planning Department, as appropriate, for a permit.

In addition to the City’s tree protection ordinance, Action Program 7 of the Larkspur General Plan Environmental Resources Element specifies that if a development proposal requires the removal of trees or other vegetation of significant resource value, these significant resources would need to be replaced.

Impact BIO-11: Implementation of the Station Area Plan may result in the removal of trees that are protected under the City of Larkspur’s Tree Protection Ordinance. (S)

Implementation of the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-11: The following language shall be included as a Condition of Approval for new projects associated with implementation of the Station Area Plan:

- A tree survey shall be required prior to development by a certified arborist to identify trees protected by the City ordinance. Protected trees shall be avoided to the maximum practicable extent. Protected trees that are removed or damaged during project construction shall be replaced at a minimum 1:1 ratio (replaced: impacted) or according to the terms of the permit issued by the City, whichever is greater. (LTS)

⁵⁹ San Francisco Planning Department, 2011. *Standards for Bird-Safe Buildings, San Francisco, California*. Adopted July 14, 2011.

⁶⁰ Doeker, R., 2005. *Bird-Safe Design Practices*. Website: www.birdsandbuildings.org/docs/birdsafedesign.pdf.

⁶¹ Toronto, City of, 2007. *Bird-Friendly Development Guidelines*. Green Development Standard, City Planning, Toronto, Ontario, Canada.

⁶² New York City Audubon Society, 2007. *Bird Safe Building Guidelines*. New York, NY. Website: www.birdsandbuildings.org/docs/BirdSafeBuildingGuidelines.pdf.

(6) **Approved Conservation Plans.** No portions of the Plan area are subject to approved local, regional, or State conservation plans. The proposed Plan will have no impact on approved conservation plans and no additional mitigation measures are required.

c. **Cumulative Impacts of the Station Area Plan.** The Plan area contains several regionally important biological resources. The tidal marsh habitats of the Plan area are part of the larger San Francisco Bay ecosystem that supports numerous special-status wildlife species as well as large numbers of migrating and wintering waterbirds (e.g., shorebirds and waterfowl). The Station Area Plan is not expected to contribute to cumulative impacts to these biological resources since they are located in protected areas where no future development will likely occur under the Plan. The remainder of the Plan area is already surrounded by development and sensitive biological resources in these areas are limited. In addition, implementation of Mitigation Measures BIO-1 through BIO-11 will reduce any impacts the Station Area Plan may have to biological resources to a less-than-significant level and similarly reduce the Station Area Plan's contribution to any cumulative impacts. As such, implementation of the Station Area Plan will not have significant cumulative impacts to biological resources.