A BIOLOGICAL RESOURCES SURVEY REPORT
FOR
THE BROOK FOREST
CONSERVATION / MITIGATION BANK PROJECT
COUNTY OF SAN DIEGO

Prepared for

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Final July 2015

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SDC PDS RCVD 07-17-15
LDGRMJ-00003

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INTRODUCTION

This report addresses biological resources associated with the proposed Brook Forest Conservation/Mitigation Bank (BFCMB) Project in Valley Center. The subject property is an approximately 226-acre property (APNs 185-274-08; 186-061-01, -02, -03; and 186-210-02, -18, -70) located in the unincorporated part of San Diego County south of Betsworth Road (Figure 1). Approximately 224.2 acres of the site constitute the BFCMB. The remaining 1.8 acres of the subject property will not be a part of the BFCMB.

The BFCMB property is located in a rural part of San Diego County, although there are homes in the vicinity. Areas adjoining the property support similar native habitats (chaparral, woodland, etc.) or disturbance-responsive vegetation in association with development.

SITE DESCRIPTION AND PROJECT DESCRIPTION

The BFCMB property is gently to steeply sloping, rising up from flatter areas to the north, northwest, and southwest. A few dirt roads cross the property, with one providing access to the uppermost elevations along the site's central ridge. The lowest portions of the site support agriculture (dry farming) and non-native grasslands. Moosa Creek bisects the northern and eastern portions of the property. This feature, which is well-vegetated with riparian vegetation, mostly parallels the northern and eastern property edge. The balance of the onsite habitat consists of chaparral, coastal scrub, grassland, woodland and other areas of riparian vegetation. Elevations on the property range between approximately 1,263 feet and 1,630 feet MSL. The soil-types found onsite consist of Clayey Alluvial Land (Co) in flat areas, Visalia Sandy Loams (VaB) on gentle slopes between 2 and 5 percent, Fallbrook Sandy Loams (FaE2, FaD2) on slopes between 9 and 30 percent, Cieneba-Fallbrook Rocky Sandy Loams (CnE2, CnG2) on slopes between 9 and 65 percent, and Las Posas Stony Fine Sandy Loams (LrG) on steep slopes between 30 and 65 percent. Las Posas soils are known to support numerous rare and endemic plants, as well as various sensitive plant communities.

The BFCMB property is being proposed for perpetual protection as a formal Conservation and Mitigation Bank. The property would offer conservation credits and mitigation credits and serve as an "offsite" mitigation area to compensate for development-related impacts to native habitat on other properties within established "service areas". The entire Brook Forest Conservation/Mitigation Bank site would be conserved under a Conservation Easement to be granted to the California Department of Fish and Wildlife (CDFW), the United States Fish and Wildlife Service (USFWS), and/or other regulatory bodies or non-governmental organizations (NGOs), as appropriate. As part of the responsibilities of resource management, the biological features of the site will be monitored, managed, and protected in perpetuity.

The BFCMB project proposes the excavation of approximately 80,000 cubic yards of soil that will be used onsite for habitat restoration purposes. The area where the soil will be removed will be planted with indigenous, native riparian forest species in order to establish (create) approximately 22.8 acres of new U.S./State wetlands plus 3.6 acres of new State (only) wetlands. The areas where the excavated soil will be placed will be reseeded with native upland vegetation. This is described in more detail subsequently.

PURPOSE OF STUDY

The primary purpose of this study is to assemble a species inventory of the subject property, identify and map all onsite habitats/plant communities, and identify any signs of rare, endangered, threatened, or otherwise sensitive plants or animals that could occur onsite. These data have been used in an assessment of biological resource values, as they relate to the permanent preservation of the property as a formal Conservation/Mitigation Bank.

A second purpose is to discuss how the re-establishment of new wetlands and uplands on this site will significantly improve the functions and values of the onsite biological resources being conserved as part of the Conservation/Mitigation Banking process. This process will be implemented through resource agency permitting and in compliance with an approved Wetlands Establishment Plan and a Habitat Management Plan as part of the project's Bank Enabling Instrument.

METHODS

The author and others have conducted field surveys of the Brook Forest property during various periods from November 1991 through June 2012. Directed (protocol) surveys examining specific areas of the site were also completed during that time. The specific dates, personnel, and weather conditions are presented in Table 1.

Investigators who have studied this site included Ty Garrison (TG) of Biological Assessment Services, Harold Wier (HW) and Phillip Behrends (PB) of Dudek and Associates, the author (VS), Viviane Marquez (VM) of Marquez and Associates, Patrick Maher (PM), Biological Field Assistant, Shannon Allen (SA), Biological Consultant, Julia Gröbner (JG), Associate Biologist, and Brandon Myers (BM), Field Assistant.

All plants, animals, and habitats encountered during most surveys were noted in the field. Remote areas or areas supporting very dense brush were surveyed with binoculars. The limits of each habitat-type were mapped in the field utilizing aerial photographs of the property. All plants and animals identified in association with the site are listed in Tables 3 and 4 at the end of this report. Wildlife observations were made opportunistically, and plants were generally identified *in situ*, or based on characteristic floral parts collected and later examined in detail. Floral and vegetation nomenclature used in this report follows Hickman (1993) and Holland (1996, as updated). Sensitive plant status follows California Native Plant Society (2012), California Department of Fish and Wildlife (2012), and U.S. Fish and Wildlife Service (2011). Animal nomenclature is taken from Pyle (1995) for butterflies, Stebbins (1985) for reptiles and amphibians, American Ornithologist's Union (1998, as updated) for birds, and Jones, *et. al* (1992).

Several focused field surveys were conducted in conjunction with the baseline biological study of this property. These included spring rare plant surveys, focused Least Bell's Vireo, California Gnatcatcher, Arroyo Toad, and Quino Checkerspot Butterfly survey, and a jurisdictional wetland delineation. Each of these studies followed recommended protocols to maximize detection of the respective resources, if present.

Table 1. Field Surveys – the Brook Forest Conservation/Mitigation Bank Site, Valley Center

Date	Hours	Personnel	Weather Conditions
19 Nov '91	not recorded	TG	not recorded
20 May '97	not recorded	HW	not recorded
5 June '97	not recorded	PB	not recorded
17 Nov '98	08:00 - 12:00	VS	overcast, temps mid 60°s to low 70°s, no wind
24 Nov '98	09:30 - 16:00	VS, VM	clear, mild, temps mid 70°s, light W wind
7 Dec '98	09:30 - 16:00	VS	clear, temps high 60°s to low 70°s, no wind
19 Mar '99	14:00 - 16:00	VS	clear, 70°-72°, light W wind
27 Mar '99	09:00 - 10:30	VS, PM	overcast, damp, temps 56°-62°, no wind
3 Apr '99	12:00 - 15:00	VS	partial sun, cold, damp, 55°-65°, no wind
10 Apr '99	10:00 - 11:45	VS	clear, temps 65°-69°, light W wind
13 Apr '99	19:00 - 21:30	VS, PM	clear, mild, temps high 60° to low 70°s, no wind
16 Apr '99	09:30 - 11:30	VS	clear, warm, temps 76°-82°, no wind
20 Apr '99	19:30 - 21:30	VS, PM	clear, temps low to high 60°s, no wind
23 Apr '99	12:45 - 15:00	VS	partial sun, temps mid 60°s, light W wind
28 Apr '99	19:00 - 22:00	VS, PM	clear, cool, temps low 60°s, no wind
1 May '99	15:00 - 16:30	VS	clear, temps 63°-68°, moderate W wind
7 May '99	14:00 - 15:45	VS	clear, temps 78°-82°, light W wind
2 Feb '02	08:00 - 12:00	VS, SA	clear, mild, temps high 60°s, no wind
9 Apr '02	13:00 - 15:00	VS, SA	clear, temps 70°-73°, light W wind
15 Oct '02	10:45 - 12:00	VS	overcast, cool, temps high 60°s, no wind
5 Dec '02	07:45 - 08:45	VS, SA	clear, cool, temps low 60°s, no wind
6 Aug '06	12:45 -15:30	SA	clear, warm, temps in the low 80°s, no wind
29 Nov '09	11:00 - 15:00	VS, JG	clear, temps in the low 70°s, no wind
2 Mar '11	11:00 - 16:00	VS, JG	overcast, cool, temps mid 60°s, light W wind
20 Apr '12	07:00 - 11:00	VS	clear, cool, temps low 60°s, no wind
30 Apr '12	07:30 - 12:00	VS	clear, temps mid 60°s, light W wind 1-3 MPH
10 May '12	09:00 - 15:00	VS, BM	clear, temps low 70°, no wind
21 May '12	09:00 - 15:00	VS, BM	overcast, temps to mid 60°s, no wind
5 June '12	08:30 - 12:00	VS, BM	overcast, temps mid 60°s, no wind
19 June '12	07:30 - 11:00	VS,BM	clear, temps to low 70°s, light W wind 1-4 MPH
3 July '12	07:00 - 10:00	VS,BM	clear, temps to low 70°s, light NW wind 2-5 MPH
13 July '12	07:45 - 12:00	VS	clear, temps high 70°s, light W wind 1-6 MPH

RESULTS

The BFCMB supports eleven generally discrete plant associations or habitats. These are Diegan Coastal Sage Scrub (Inland Form), Extensive Agriculture, Non-native Grassland, Southern Coast Live Oak Riparian Forest, Open Engelmann Oak Woodland, Southern Willow Scrub, Mafic Southern Mixed Chaparral, Disturbed Mafic Southern Mixed Chaparral, Native Grassland, Disturbed Wetland, and Disturbed Habitat (see Figure 4).

Habitats/Vegetation Communities

1. Diegan Coastal Sage Scrub, Inland Form (Holland Code 32520) – 16.1 acres

The inland form of Diegan Coastal Sage Scrub (DCSS) vegetation occurs on the xeric, south-facing slopes at the southern end of the BFCMB. Indicator plants found in this habitat include Flat-top Buckwheat *(Eriogonum fasciculatum),* California Sagebrush *(Artemisia californica),* Laurel Sumac *(Malosma laurina)*, and other soft-woody shrubs. This vegetation is well developed, rich in species diversity, and of a high quality. However, the habitat does not have direct offsite "in kind" connectivity, instead being linked to chaparral or native and non-native grassland areas on adjoining slopes. Other areas of sage scrub are located to the southeast of the property on other south-facing slopes. Coverage in this habitat onsite varies between 30-60 percent of the habitat, depending on aspect.

2. Extensive Agriculture (Holland Code 18300) – 20.7 acres

The lower, flattish areas surrounding the site's main ridge on the northern portion of the site support open, fallow agricultural lands (EA). This area has been dry-farmed for many decades, with annual cereal grasses (wheat, barley) being planted in the winter and harvested in the late spring. Some of this material has been used for hay. At the present time, the site is fallow and weedy, with common weeds in the habitat including very dense stands of Wild Radish *(Raphanus sativus)* and Ripgut Brome *(Bromus diandrus)*, the noxious Perennial Pepperweed *(Lepidium latifolium),* and numerous other ruderal species that are tolerant of annual discing. This habitat has limited biological resource value, although it does provide an open foraging area for local birds, including birds-of-prey.

3. Non-native Grassland (Holland Code 42200) – 63.6 acres

Non-native Grassland (NNG) vegetation is found in two main areas; on the western and southwestern portions of the site and on the slopes below the site's main ridge in an area that was graded several years ago in anticipation of the construction of a golf course. Indicators in the habitat include Ripgut Brome, Wild Oat and Slender Wild Oat *(Avena fatua, A. barbata)*, Common Tarplant *(Hemizonia fasciculata)*, and many other native and non-native forbs and grasses. The NNG habitat onsite has biological resource value, and it does provide an open foraging area for local birds, including birds-of-prey. This habitat-type is common in the vicinity of the site, being found to the north, east, and partially to the south on nearby, semi-developed properties.

4. Southern Coast Live Oak Riparian Forest (Holland Code 61310) – 18.9 acres

Southern Coast Live Oak Riparian Forest (SCLORF) habitat is found in two disjunct locations onsite: near the northeastern and southwestern ends of the property. This habitat is indicated by mature Coast Live Oaks *(Quercus agrifolia)* with occasional Engelmann Oaks *(Quercus engelmannii)* over a mixed understory including Ripgut Brome *(Bromus diandrus)*, Western Ragweed *(Ambrosia psilostachya)*, Poison Oak *(Toxicodendron diversilobum)*, and others. The more northerly stand occurs on both sides of Moosa Creek, a significant drainage that parallels Betsworth Road. The second area is located at the headwaters of a minor drainage that leads offsite to the west. A number of disjunct oaks are also found in the more mesic areas of the site – these are mapped as part of the riparian forest although they could be mapped as a separate habitat-type: Open Coast Live Oak Woodland (Holland Code 71161). This habitat is well developed, rich in species diversity, and of a high quality. The habitat also has direct offsite connectivity, being more-or-less continuous offsite to the east on adjoining properties.

5. Open Engelmann Oak Woodland (Holland Code 71181) – 20.0 acres

Open Engelmann Oak Woodland (OEOW) is found on the upper north-facing and east-facing slopes of the site's main ridge. The indicator species in this habitat is Engelmann Oak *(Q. engelmannii)*, a sensitive species. Most of the specimens are growing in a matrix containing chaparral shrubs and native forbs. The Engelmann Oak Woodland on this site overlaps extensively with the adjoining areas of chaparral. Although patchy, this habitat is well developed, rich in species diversity, and of a high quality. The woodland also has direct offsite connectivity, being present in a discontinuous distribution offsite to the southeast on adjoining parcels. Isolated Engelmann Oaks are also found in other habitats, particularly in some areas of the chaparral and grassland.

6. Southern Willow Scrub (Holland Code 63320) – 6.3 acres

Southern Willow Scrub (SWS) vegetation occurs in several disjunct locations onsite; near the site's southwestern corner, in a narrow strip adjoining the floodway of Moosa Creek, and in small patches near the center of the property. Indicators in this habitat include various willows *(Salix* spp.) with some Western Cottonwoods *(Populus fremontii)* and California Sycamores *(Platanus racemosa)* over an understory of herbaceous hydrophytes, including Cattails *(Typha latifolia)* and American Bulrush *(Scirpus olneyi)* in the wettest areas. This habitat qualifies as jurisdictional wetlands/"waters", subject to regulatory control by state and federal resource agencies. The Southern Willow Scrub vegetation within the Moosa Creek floodway has gradually grown back over the last twenty years as regular clearing and dredging activities have ceased (compare Figures 2 and 3), although it remains much reduced from the extend that was present before World War II prior to agricultural grading and habitat conversion. Approximately 6.0 acres of SWS are currently present along Moosa Creek. High value habitat is also present on adjoining areas to the southeast. At this time, the willow scrub habitat has become a highly significant site feature, capable of supporting rare species such as Least Bell's Vireo *(Vireo bellii pusillus)* and others. The willow scrub in the site's southwestern corner is also of significant habitat value, being diverse and in direct association with the adjoining SCLORF.

7. Mafic Southern Mixed Chaparral (Holland Code 37122) – 57.5 acres

Mafic Southern Mixed Chaparral (MSMC) vegetation is found in blocks and patches on the site's main ridge and in other areas that are removed from the low-lying areas around the periphery of the property, including many upland areas above the oak woodland. Indicator species in this habitat include Chamise *(Adenostoma fasciculatum)*, Mission Manzanita *(Xylococcus bicolor)*, Ceanothus *(Ceanothus* spp.*)*, and other tall, woody shrubs. Also present are subshrubs, including California Brickellbush *(Brickellia californica)*, Rock Rose *(Helianthemum scoparium)*, and others. Herbaceous indicators include Skunkweed *(Navarretia* sp.), Chaparral Bird's-beak *(Cordylanthus filifolius)*, and various other annual species. The species composition of this habitat varies greatly depending on slope, aspect, and other factors, with the north-facing steep slopes supporting very dense, mostly arborescent shrubs. South-facing slopes support significantly more open chaparral, with lower stature shrubs. Nearly 100 percent of this habitat grows on Los Posas Soils, a mafic soil-type. This suggests the potential presence of numerous rare plants, some of which are very rare. *Nolina parryi* (now *N. cismontana*), a rare mafic species was reported from this property in 1991 by Ty Garrison. This species was not relocated during the current fieldwork, nor were any of the other very rare plants associated with mafic soils. However, the habitat is diverse and in generally good condition, particularly where it interfaces with inclusions of coastal sage scrub and native grasslands. Some of this habitat is also contiguous offsite on adjoining properties to the southeast and to the north. Extensive stands of chaparral are found leading in an archipelago linkage to the Daley Ranch Conservation Bank property to the southwest.

8. Disturbed Mafic Southern Mixed Chaparral (Holland Code #37122) – 8.3 acres

Disturbed Mafic Southern Mixed Chaparral (dMSMC) vegetation in found in patches among the fringe of the (intact) Mafic Southern Mixed Chaparral vegetation where the habitat had been previously disturbed. Indicator species include the same species of the Mafic Southern Mixed Chaparral habitat, with low, annual forbs and some subshrubs such as Sand Aster (*Corethrogyne filaginifolia* var. *virgata*) in the interstices between larger woody shrubs. Most of this vegetation is patchy but stable, providing openings that are of value to local wildlife.

9. Native Grassland (Holland Code 42100) – 5.2 acres

Native Grassland (NG) is found in about ten more-or-less discrete patches within the chaparral and coastal sage scrub. This habitat varies significantly depending on aspect, with the patches on the west-facing slope areas supporting more xerophytic species, and the patches on the cooler, northeast facing slopes supporting delicate ephemeral annuals and low grasses. Indicators in the grassland include Shooting Star *(Dodecatheon clevelandii)*, Purple Stipa *(Stipa pulchra)*, Red Owl Clover *(Orthocarpus purpurascens)*, Erect Plantain *(Plantago erecta)* and numerous other herbaceous annuals and low perennials. This vegetation is well developed, rich in species diversity, and of a very high quality. However, the habitat does not have direct "in kind" offsite connectivity, being rather linked to chaparral or sage scrub areas on the adjoining slopes.

10. Disturbed Wetland (Holland Code # 11200) – 0.3 acres

Disturbed Wetland (DW) occurs in one location onsite; near the site's northern boundary. This habitat grows in a north-south draining tributary to Moosa Creek, joining the floodway of the creek on the northern end of the property. Indicators in the Disturbed Wetland habitat include various disturbance-responsive hydrophytes such as Watercress *(Rorippa nasturtium-aquaticum)* and Cocklebur *(Xanthium strumarium)*. A mature stand of Mexican Fan Palm trees (*Washingtonia robusta)* were planted in a row paralleling the drainage several years ago. The Disturbed Wetland vegetation on this site is poorly developed and limited in species diversity.

11. Disturbed Habitat (Holland Code # 11300) – 7.3 acres

Disturbed Habitat (DH) is found in small areas throughout the site. This habitat consists of graded areas and series of narrow dirt tracks that traverse the project site. Much of this clearing took place during the early 1990s when a former owner attempted to construct a golf course and driving range on portions of the property. Most of these areas still consist of bare dirt and ruderal weeds due to the fact that all topsoil was removed to the mineral earth level in these areas. The biological resource value of this habitat-type is low, although they have restoration potential once organic materials are reintroduced.

Plants

Two hundred and thirty-seven species of vascular plants were detected on the Brook Forest property (Table 3). This is a relatively large number of species for a property of this size, reflecting the diversity of onsite habitats. The plant species observed typify the diversity normally found in interior foothills areas of San Diego County in similar habitats. The species observed are expected to represent at least 80 percent of the naturalized plants occurring on this site. One of the plants observed (Engelmann Oak) is considered sensitive in San Diego County. This is discussed in more detail subsequently.

Animals

A total of one hundred and four animal species were observed using the site (Table 4). These are generally common species, abundant in the site's general vicinity. Most of the animals detected are species associated with dense chaparral, woodland, sage scrub, native and non-native grasslands, riparian areas, oak woodlands, agricultural areas, or the periphery of disturbed habitats. This list includes twenty butterflies, one amphibian, one fish, six reptiles, nine mammals, and sixty-seven species of birds. However, many animals are cryptic, seasonal, or nocturnal. At least several hundred species of animals are expected to use the site, at least on an occasional basis. Fifteen of the animals observed onsite are considered sensitive. These are Southern California Rufous-crowned Sparrow, Great Blue Heron, Green Heron, Red-shouldered Hawk, Turkey Vulture, Yellow Warbler, Greater Roadrunner, Western Bluebird, Bewick's Wren, Lawrence's Goldfinch, Black-shouldered Kite, Mule Deer, Granite Night Lizard, San Diego Coast Horned Lizard, and Orange-throated Whiptail. Each of these is discussed in more detail subsequently.

SENSITIVE BIOLOGICAL RESOURCES

Sensitive Vegetation Communities

Vegetation communities (habitats) are generally considered "sensitive" if they; *(a)* are recognized by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service as being locally depleted; *(b)* are considered rare within the region by local experts, *(c)* are known to support sensitive animal or plant species, including Listed Species; and/or *(d)* they are known to serve as important wildlife corridors. These sensitive habitats are typically depleted throughout their known ranges, or are highly localized and/or fragmented.

All eight of the native plant communities on the Brook Forest site are considered sensitive. These are:

- Diegan Coastal Sage Scrub, Inland Form
- Southern Coast Live Oak Riparian Forest
- Open Engelmann Oak Woodland
- Southern Willow Scrub
- Mafic Southern Mixed Chaparral
- Disturbed Mafic Southern Mixed Chaparral
- Native Grassland
- Disturbed Wetland

The Non-native Grassland and Extensive Agriculture, although not sensitive, *per se*, do support sensitive raptors and other sensitive wildlife. In that respect, they do therefore have limited habitat value, particularly the Non-native Grassland. The Disturbed Habitat areas do not provide significant biological resource value, and they are not considered sensitive habitats.

Sensitive Plants

One sensitive plant species was observed on the Brook Forest property during the field surveys. This is Engelmann Oak. Sensitive plants are those listed as "Rare", "Endangered", "Threatened", "of Special Concern", or otherwise considered noteworthy by the MSCP, the California Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, the California Native Plant Society (CNPS), or other conservation agencies, organizations, or local botanists.

Engelmann Oak / *Quercus engelmannii*
Listing: CRPR 4.2 (CNPS, 2012)
State Rank: S3.2(CNDDB, 2012)
Global Rank: G3 (CNDDB, 2012)
County status: San Diego County "Sensitive Plant" List (DPLU, 2010), List "D" Species
Distribution: Interior areas of San Diego, Orange, and Los Angeles Counties, western Riverside County, and adjacent Baja California. Reported localities in San Diego County include Mesa Grande, Valley Center, Escondido, Ramona, Lee Valley, and other areas. Specimens are relatively rare outside San Diego County except in adjoining areas.
Habitat(s): Occurs on upper fringes of oak woodlands, in a "savanna-like" habitat in native grasslands, and on sheltered slopes in chaparral vegetation.

Status On Site: Hundreds of individual (mature) specimens occur onsite, most on the north and east-facing upper slopes around the main ridge. Scattered specimens also found in association with other habitats.
Comments: Most of the smaller specimens observed onsite show signs of introgressive hybridization with Scrub Oak *(Quercus berberidifolia)*, a shrubby chaparral species that also occurs on this property.

Other sensitive plants known from the general vicinity of the property include the following: San Diego Thorn Mint *(Acanthomintha ilicifolia)*, San Diego Sagewort *(Artemisia palmeri)*, Orcutt's Brodiaea *(Brodiaea orcuttii)*, Long-spinned Spineflower *(Chorizanthe polygonoides* var. *longispina)*, Palmer's Grapplinghook *(Harpagonella palmeri)*, Ramona Horkelia *(Horkelia truncata)*, and others (see Table 6). Most of these are either associated with habitats not found here (such as vernal pools) or are large and distinctive perennials, which would not have been missed if encountered onsite. A few have a potential to occur onsite. However, directed surveys for these and other rare plants in suitable habitats and at the optimal time of year did not reveal the presence of any of these species.

Sensitive Animals

Fifteen sensitive animals were detected on the subject property during the field surveys. Sensitive animals are those listed as "Rare", "Endangered", "Threatened", "of Special Concern" or otherwise considered noteworthy by the California Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, the National Audubon Society, the County of San Diego, or other conservation agencies, organizations, or local zoologists.

Southern California Rufous-crowned Sparrow / *Aimophila ruficeps canescens*
Listing: "Declining" (Unitt, 1984)
County status: San Diego County "Sensitive Animal" List (DPLU, 2010), Group I Species
State status: "Watch List" (CDFG, 2011)
Federal status: Former Federal Endangered Species Candidate: C2 (USFWS, 1996)
Distribution: Ssp. *canescens* occurs in southern California and adjacent Baja California.
Habitat(s): This species typically forages and nests in rocky sage scrub and chaparral habitats, particularly on xeric south-facing hillsides.
Status On Site: A single Southern California Rufous-crowned Sparrow was observed moving about in the Diegan Coastal Sage Scrub. Additional specimens are likely present, although this species is not common onsite.
Comments: The distribution of this subspecies in Southern California is almost wholly restricted to extensive areas of sage scrub and chaparral within the coastal lowlands.

Great Blue Heron / *Ardea herodias*
Listing: "Species of Special Concern" (NAS, 1990)
Federal/State status: none
County status: San Diego County "Sensitive Animal" List (DPLU, 2010), Group II Species
Distribution: Occurs throughout the United States and adjacent Canada and Mexico.
Habitat(s): Occurs in a variety of marshy habitats; riparian woodlands, at the edges of ponds and lakes, freshwater marshes, and sometimes larger vernal pools.
Status On Site: Single specimen observed foraging in Moosa Creek.
Green Heron / *Butorides striatus*
Listing: "Species of Special Concern" (NAS, 1990)
Federal/State status: none
Distribution: Occurs throughout the southern United States and Mexico.
Habitat(s): Occurs in a variety of marshy habitats; riparian woodlands, at the edges of ponds and lakes, freshwater marshes, and sometimes larger vernal pools.
Status On Site: Single specimen observed foraging in Moosa Creek.

Red-shouldered Hawk / *Buteo lineatus*
Listing: "Blue List" (1986)
"Fully Protected" (CDFG, 1993)
Federal status: none
County status: San Diego County "Sensitive Animal" List (DPLU, 2010), Group I Species
Distribution: Southeastern Canada and the eastern US to California and Mexico.
Habitat(s): Roost and nest in a variety of woodland habitats. Eucalyptus woodlands, oak groves, open riparian forests, related broken wooded areas.
Status On Site: Two specimens observed soaring over the site on several occasions during the field surveys. Probably nest onsite or in the immediate vicinity.
Comments: Population numbers of this species in Southern California seem to have changed little over the last century, although other areas within the species' range have experienced significant population declines.

Turkey Vulture / *Cathartes aura*
Listing: "Blue-list" (Tate, 1986)
"Fully Protected" (CDFG, 1993)
"Declining" (Unitt, 1984)
County status: San Diego County "Sensitive Animal" List (DPLU, 2010), Group I Species
Distribution: Southern Canada to the bottom of South America.
Habitat(s): Forages over undeveloped land and agricultural areas.
Status On Site: Single Turkey Vulture seen soaring above the project site.
Comments: In San Diego County, this species has declined significantly in numbers, principally as a result of urbanization, accidental poisoning, and pesticide use, which has resulted in a decrease in egg shell thickness.

Greater Roadrunner / *Geococcyx californicus*
Listing: "Declining" (Unitt, 1984)
Federal/State status: none
County Status: none
Distribution: Occurs over a large area of the southwest, from Louisiana and Oklahoma west to California and south to central Mexico.
Habitat(s): Open country, dominated by scattered shrubs, cactus. etc.
Status On Site: A single specimen was observed near the central portion of the project site at the interface between the coastal sage scrub and the agricultural area. This specimen probably nests on or near the property.
Comments: Greater Roadrunner populations in western San Diego County are being seriously threatened by a loss of habitat, primarily because of development. These characteristic birds of the coastal lowland are certainly not "common", as once they were considered (Unitt, 1984).

Western Bluebird / *Sialia mexicana*
Listing: "Declining" (Unitt, 1984)
Federal/state status: none
County status: San Diego County "Sensitive Animal" List (DPLU, 2010), Group II Species
Distribution: Occurs throughout the western United States
Habitat(s): Inhabits open areas, especially at the edges of woodlands or near farms, etc.
Status On Site: Five specimens were observed in the agricultural area of the property. These specimens were observed foraging in open areas between trees.
Comments: This species has declined in portions of its range as nesting habitat (holes in trees, nest boxes, etc.) is consumed by competing species, particularly Starlings *(Sturnus vulgaris)*.

Bewick's Wren / *Thryomanes bewickii*
Listing: "Blue List" (Tate, 1986)
Federal/State status: none
County Status: none
Distribution: Western and central North America from Canada to Mexico.
Habitat(s): Occupies a variety of shrubby or woodland habitats.
Status On Site: At least five specimens were observed – all in association with denser areas of chaparral and woodland vegetation. This songbird is relatively common onsite, and ample nesting habitat is available.
Comments: Numbers of this species appear to be stable in San Diego County, although the species is on the decline in other parts of the U.S.

Lawrence's Goldfinch / *Carduelis lawrencei*
Listing: County status: none
State status: none
Federal status: "Bird of Conservation Concern" (USFWS, 2008)
Distribution: From west Texas south to northern Mexico
Habitat(s): In southern California, open areas of sage scrub and chaparral vegetation. Also associated with edges of other habitats, including riparian areas and grasslands
Status on Site: Approximately 10 Lawrence's Goldfinches were observed along Moosa Creek in 2012. These were likely transient birds.

Black-shouldered Kite / *Elanus leucurus*
Listing: County status: State status: "Fully Protected" (CDFG, 2011)
County status: San Diego County "Sensitive Animal" List (DPLU, 2010), Group I Species
Federal status: Protected Raptor (16 U.S.C. 668-668d, 54 Stat. 250), as amended
Distribution: Black-shouldered Kites breed primarily along the coastal lowland and the species occurs over a broad area of the western U.S. through Mexico and into South America.
Habitat(s): Roost and nest in a variety of woodland habitats, mainly riparian woodlands, oak groves, and related habitats.
Status on Site: One specimen was observed soaring over the northern portion of the property in 2012. Kites could nest onsite, although no evidence of nesting was detected.
Comments: Population numbers in the county appear to have increased since the 1950's, and this species is not considered threatened or endangered, although it is still relatively rare.

Mule Deer / *Odocoileus hemionus*
Listing: "MSCP indicator" (County of San Diego, 1995)
Federal/State status: none
County status: San Diego County "Sensitive Animal" List (DPLU, 2010), Group II Species
Distribution: Much of western North America from Mexico to southern Canada. Fairly common in San Diego County foothills
Habitat(s): Woodlands, chaparral, sage scrub, grasslands. Usually indicated by distinctive scats, occasionally by sightings of specimens themselves.
Status On Site: Scats characteristic of Mule Deer were seen in several places on the project site. The largest concentrations were observed in the more remote areas, such as along drainages at the periphery of the property.
Comments: This species, while clearly not becoming rare or endangered, is listed on the County of San Diego's sensitive mammal list because it is an indicator of high-quality wildlife habitat, as defined by the MSCP. This species is a regulated game animal in California, under jurisdiction of the California Department of Fish and Wildlife.

Granite Night Lizard . *Xantusia henshawii henshawii*
Listing: "Threatened" (SDHS, 1980)
Federal/State status: none
County Status: none
Distribution: Southern California from the southern edge of the Coachella Valley south to Baja California.
Habitat(s): Areas of extensive granite outcrops. Chaparral, sage scrub, and desert scrub plant communities.
Status On Site: A single specimens of this distinctive lizard was observed beneath a cap rock near the crest of the site's main ridge. This species is probably quite abundant in rocky areas of the site, because of the presence of large outcrops and extensive areas of appropriate, undisturbed scrub and chaparral habitat. Population levels cannot be ascertained without causing extensive habitat damage, however.
Comments: This species is critically dependent on exfoliating rock outcrops, where it remains hidden in the daylight hours.

San Diego Coast Horned Lizard / *Phrynosoma coronatum blainvillei*
Listing: "Endangered" (San Diego Herpetological Society, 1980)
"Species of Concern" (USFWS, 2002)
California Species of Special Concern (CDFG, 2003)
County status: San Diego County "Sensitive Animal" List (DPLU, 2010), Group II Species
Distribution: Occurs from about Ventura County south into northern Baja California.
Habitat(s): Found in cismontane areas of with sufficient openings in the vegetation.

Status On Site: Single juvenile specimen observed in the native grassland on the south-facing slope of the site's main ridge. Other specimens certainly present in this habitat. This very cryptic species is difficult to observe in large numbers.

Orange-throated Whiptail *(Cnemidophorus hyperythrus beldingi)*
Listing: "Species of Concern" (USFWS, 1998)
"California Species of Special Concern" (CDFG, 1994)
Former Fed. Endangered Species Candidate: C2 (USFWS, 1996)
County status: San Diego County "Sensitive Animal" List (DPLU, 2010), Group II Species
Distribution: Extreme southwestern California: from Orange and Riverside Counties south into northern Baja California.
Habitat(s): Inhabits coastal sage scrub, chaparral and areas of open brush with loose soils. May also be found in open, dry riparian areas. Sea level to about 1,800 feet MSL, occasionally higher on hot, south-facing slopes.
Status On Site: One specimen observed onsite in association with Mafic Southern Mixed Chaparral habitat.
Comments: Relatively abundant where it still remains, although major portions of former range have been lost to urbanization and agricultural land conversions.

It is anticipated that a variety of additional sensitive animals occurs on this property, on at least an occasional basis. This list could include several species of uncommon reptiles, such as Coronado Skink *(Eumeces skiltonianus)*, Coastal Western Whiptail *(Cnemidophorus tigris multiscutatus)*, San Diego Ringneck Snake *(Diadophis punctatus similis)*, and Red-diamond Rattlesnake *(Crotalus ruber ruber)*. Sensitive birds known from the area include a number of wide-ranging raptors, such as Merlin *(Falco columbarius)*, Cooper's Hawk *(Accipiter cooperii)*, and others. Several species of rare mammals are also known from the vicinity, including various wide-ranging bats and other small species. Sensitive animals known from the vicinity are listed in Table 6.

Least Bells Vireo Habitat Evaluation and Focused Survey

Least Bell's Vireo *(Vireo bellii pusillus)* was listed as "Endangered" under the California Endangered Species Act on October 2, 1980 and under the Federal Endangered Species Act on May 2, 1986. The destruction and degradation of this species' habitat, as well as brood parasitism by the Brown-headed Cowbird (*Molothrus ater*), resulted in a range-wide decline of the Least Bell's Vireo and the extirpation of many populations of this species. Least Bell's Vireo is an obligate riparian species during the breeding season. Vireos generally inhabit willow-dominated riparian thickets, although plant species composition does not appear to be as important as the presence of dense cover within 3-6 feet of the ground for nesting and a dense, stratified canopy for foraging. Breeding vireos occur in such habitats as cottonwood-willow woodlands, riparian forests, willow scrubs, and mule fat scrub. Vireos are also known to extend their territories up to 200 feet into adjacent upland habitats, such as coastal sage scrub, occasionally even nesting in these adjoining upland habitats. Fieldwork associated with this study consisted of a series of eight focused field surveys starting in April of 2012, pursuant to the most current USFWS protocol for this species. No Least Bell's Vireos were detected during the field survey, although two pairs were recently reported as occurring within 1 km of the site, within the same drainage, on the Wood's Valley Golf Course to the southeast (C. Edwards, personal communication, 2012). Based on the results of this survey, Brook Forest site is presently considered "unoccupied" by Least Bell's Vireo, although the habitat, which is currently in a narrow, linear strip, will be able to support vireos in the near

future as the species recovers and the habitat improves. This will be a result of the re-establishment of new riparian forest vegetation within the greatly widened floodway of Moosa Creek.

Southwestern Willow Flycatcher Habitat Evaluation

Southwestern Willow Flycatcher *(Empidonax trailii extimus)* is a federally-listed "Endangered" migratory songbird that nests in mature riparian vegetation, most typically over running or standing water, with a specific understory structure. An evaluation of the habitat quality on the Brook Forest site indicates that the Southwestern Willow Flycatcher is unlikely to occur on the property at this time. The existing habitat forms a narrow strip with significant edges and a lack of a dense, closed canopy that has sufficient structure to support this species. However, it is possible that the site may be able to support flycatchers in the future as the species recovers and the habitat improves. This will be a result of the re-establishment of new riparian forest vegetation within the greatly widened floodway of Moosa Creek.

California Gnatcatcher Habitat Evaluation and Focused Survey

California Gnatcatcher *(Polioptila californica)* was listed as "Threatened" under the Federal Endangered Species Act on March 30, 1993. This distinctive species is known from habitat similar to that found on this site. Gnatcatchers occur in coastal and interior areas of coastal sage and related scrub habitats typically dominated by California Sagebrush *(Artemisia californica)*, Flat-top Buckwheat, Laurel Sumac, and other soft-woody shrubs. A directed field survey for this species, pursuant to current survey protocols, was conducted by the author in 1998, as allowed pursuant to the requirements of Federal 10(a) Permit #TE788133. This survey did not reveal the presence of *P. californica.* An updated presence/absence survey was completed in 2012 and the results were similarly negative.

Quino Checkerspot Butterfly Habitat Evaluation and Focused Survey

Quino Checkerspot Butterfly, a federally-listed "Endangered" butterfly, occurs in certain open habitats, including sage scrub and chaparral. An Adult Flight Season survey for Quino Checkerspot was completed by the author, as permitted pursuant to the requirements of Federal 10(a) Permit #TE788133 in March, April, and May of 1999, in conformance with the then-current FWS protocol recommendations for this species (the survey protocol has since changed). Although the property formerly fell within the recommended Quino survey area, as identified by the USFWS, Quino was not detected on or nearby the subject site during the survey and the onsite habitat is considered "unoccupied" by this species. Since that time, the USFWS has reissued new survey protocols (December, 2014), which excludes the Brook Forest site from the recommended survey area.

Arroyo Toad Habitat Evaluation and Focused Survey

Arroyo Toad, a federally-listed "Endangered" anuran, occurs in certain open riparian habitats, including willow scrubs and drainages containing open, sandy alluvial deposits. A nocturnal survey for this distinctive species was conducted by the author in April of 1999, in conformance with the then-current FWS protocol recommendations for this species (the survey protocol has since changed). At that time, the vegetation was

sparse and numerous areas of seemingly suitable, open sandy habitat were observed. The vegetation in 1999 is now known to have been in a successional state as a result of manipulation of the property (clearing and dredging of the Moosa Creek floodway. Since that time (1999), the riparian area within the floodway of the creek has regrown and the canopy has closed, mostly eliminating the potential for Arroyo Toad on this site. Arroyo Toad was not detected on or nearby the subject site during the 1999 survey. The nearest known occurrence for Arroyo Toad is on the San Luis River, approximately 7 miles to the northeast near Pauma Valley, and the onsite habitat is no longer considered suitable for this species. This very habitat-specialized toad is not anticipated to occur on or nearby this property, and the onsite habitat is considered "unoccupied" by this species.

JURISDICTIONAL WETLANDS AND "WATERS"

Wetland habitats are present in various areas of the site. The term "*wetlands*" as defined by the U.S. Army Corps of Engineers (ACoE) and other federal agencies means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. These are the three necessary criteria necessary to qualify an area as a federal wetland: wetlands vegetation, wetlands hydrology, and hydric soils. Wetlands generally include marshes and similar areas.

California Department of Fish and Wildlife (CDFW)-defined wetlands and County-defined (RPO) wetlands are present in additional areas, including several of the dry lateral drainages. These areas do not contain all three of the requisite the indicators as listed above; instead, they generally supporting only one. For this site, these indicators consists of wetlands hydrology and/or wetlands vegetation. None of the non-federal jurisdictional wetlands contain hydric soil types.

A formal Jurisdictional Wetland Delineation, prepared in compliance with the 1987 Unified Federal Method for Wetland Delineation (including the Arid West Region Supplement (2008), and pursuant to state and federal standards, was completed in June of 2012. This verified the presence of significant state and federal wetlands and "waters" on the site, most in association with Moosa Creek and its tributaries.

Moosa Creek, a U.S.G.S. blue-line stream, crosses the northern portion of the property from southeast to northwest. A lateral drainage is present to the north of Moosa Creek, which drains under Betsworth Road and into the creek. Several unnamed tributaries to Moosa Creek, one of which is also a U.S.G.S. blue-line stream, cross the southwestern corner of the property, also running from southeast to northwest. The entire onsite portion of the Moosa Creek floodway supports Southern Willow Scrub (SWS) vegetation, which is dominated by a closed canopy of Willows (*Salix* spp.) with occasional California Sycamores (*Platanus racemosa*) and Western Cottonwoods (*Populus fremontii*). Indicators in the understory of the SWS include Curly Dock (*Rumex crispus*), Douglas Sagewort (*Artemisia douglasiana*), Cattails (*Typha latifolia*), American Bulrush (*Scirpus*

olneyi), and numerous other species. Moosa Creek and its southern tributaries are the main wetland areas onsite, although several other minor drainages are found throughout the property.

The habitat values of the wetland areas on this site vary significantly. Moosa Creek supports very high-quality riparian vegetation. The wetland areas in the southwestern portions of the site are also of high resource values, being supported by unusual artesian seeps and springs, and the site's general physiography. The drainage areas in this corner of the property also support large oaks, riparian forest and willow-dominated vegetation. Most of the minor drainages that qualify as CDFG and RPO wetlands are only dry, incised swales that do not support any hydrophytes. Most of these do qualify as "Waters of the United States" however, as they connect to federally-regulated wetlands.

NCCP COMPATIBILITY

The conservation of natural habitats in the unincorporated County of San Diego is currently regulated through its Subarea Planning efforts in compliance with the Natural Communities Conservation Program (NCCP) process. The intent of these efforts is to retain larger, connected areas of coastal sage scrub, chaparral, oak woodland, and other native habitats in order to preserve habitat values and reduce the endangerment of "covered" species through the retention of essential biotic variability and long-term habitat viability.

The County of San Diego is currently preparing a Subarea Plan for the North County Multiple Species Conservation Program (NCMSCP). The Brook Forest Conservation/Mitigation Bank Project is entirely compatible with the NCMSCP Plan, once the Plan is approved and implemented. The Bank project has been designed to be consistent with the goals and objectives of the NCMSCP with respect to habitat conservation, corridor linkages, and restoration. Part of the subarea planning process involves the identification of biologically-significant lands, or lands that are "pre-approved" for conservation/mitigation purposes. These are referred to as "Pre-approved Mitigation Area" (PAMA) lands. The Brook Forest property has been mapped in the draft NCMSCP as 100 percent PAMA lands. This has implications with respect to conservation at both the Subarea and the Subregional level, with implications with respect to offsite mitigation allowances. By conserving Brook Forest, a part of the MSCP Regional Preserve will be permanently established, and the site can be used to offset project impacts to species and habitats within the NCMSCP but outside of PAMA lands.

CONSTRUCTION IMPACTS AND MITIGATION

The Brook Forest Conservation/Mitigation Bank will modify existing habitats in order to establish wetlands. With respect to habitats requiring mitigation (where impacts are potentially "significant" per CEQA via the County's Guidelines for Determining Significance and Report Format), the project will impact approximately 5.4 acres of Non-native Grassland and 0.3 acres of Disturbed Wetlands. Impacts to the approximately 5.4 acres of Non-native Grassland will be mitigated at a 0.5:1 ratio by using 2.7 acres of the remaining Non-native Grassland.

Impacts to the 0.3 acre of Disturbed Wetlands will be mitigated through enhancement/re-habilitation of the habitat, converting the Disturbed Wetland to higher value Southern Cottonwood-Willow Riparian Forest.. The mitigation acreage of NNG (2.7 acres) will be preserved onsite as a part of the BFCMB but removed from the available credits to be sold.

ANALYSIS OF HABITAT VALUES AND RECOMMENDATIONS

The Brook Forest Conservation/Mitigation Bank property supports an extremely rich diversity of native species, including hundreds of species of native plants and animals, many of them locally or regionally sensitive. The majority of the property is in a natural, undisturbed state, making its biological resource value very high. The conservation of this large, highly significant core of habitat containing a large wetland area (suitable for significant expansion) will preserve an essential block of biological diversity and ensure the survival of numerous species found on the property and in the vicinity in perpetuity.

In order to ensure the perpetual viability of the Brook Forest Conservation/Mitigation Bank site, a Conservation Easement should be granted over the entire site to the CDFW, USACE, and/or other regulatory body or NGO, as appropriate. The bank will be managed by a Habitat Manager approved by the CDFW and USACE, pursuant to a Habitat Management Plan (HMP) approved by the CDFW and USACE. The HMP will specify measures to protect the site in perpetuity, including methods, types, and frequency of monitoring and management activities, types and locations of protective fencing and signage, measures to eradicate or prevent the spread of invasive species, sensitive species monitoring, and other actions designed to maintain the biological resources present onsite. The HMP will also describe the funding mechanism for the perpetual management of the bank, which is currently proposed to consist of a non-wasting endowment that will be created as the mitigation credits are sold.

Conservation (mitigation) acre-credits will be calculated at a 1:1 ratio; that is, each acre of habitat found onsite will correspond to one mitigation acre-credit, with the minimum credit size for upland habitats being 0.1 acre and the minimum credit size for wetland habitats being 0.01 acre. Table 2 summarizes the available mitigation acre-credits that the BFCMB proposes to offer. In addition, species credits may be offered at a 1:1 ratio. The bank supports 20 acres of Engelmann Oaks within the OEOW. In addition, there are 45 Engelmann Oaks that are not within the OEWE. These isolated Engelmann Oak trees may be offered, along with the underlying habitat-type, to mitigate Engelmann Oak tree impacts with the caveat that no duplication of credit sales may take place. With respect to "species credits", each Engelmann Oak species credit sold will consume 0.1 acre of the underlying habitat credits, which consist of NNG, MSMC, and DCSS. Once all of the underlying habitat-credits have been sold, Engelmann Oak species credits may be no longer be offered.

In addition to the habitat-based and species-based mitigation credits summarized above and in Table 2, the Brook Forest Conservation/Mitigation Bank will offer both U.S. and state wetlands re-establishment and enhancement/re-habilitation credits in association with the segment of the Moosa Creek floodplain currently in

agriculture. Accumulated material, consisting of clayey and sandy silt, will be removed from a defined area (Figure 5) and placed in mostly disturbed areas onsite in order to create a wetland re-establishment area and restore long-disturbed slopes and old dirt tracks. The areas that will be graded support primarily EA, although a small amount of NNG will be removed as a part of this effort. The details are described in *A Wetland Establishment Plan for the Brook Forest Conservation/Mitigation Bank*. At the end of the habitat re-establishment process, Moosa Creek will be widened, and the existing narrow strip of riparian scrub along Moosa Creek will be expanded to approximately 32.4 gross acres, becoming a mature riparian forest (Southern Cottonwood-Willow Riparian Forest) as a part of the process. This habitat will become highly suitable for Least Bell's Vireo and other obligate riparian breeders, including (possibly) Southwestern Willow Flycatcher *(Empidonax trailii extimus)* and other listed species.

None of the SCLORF qualifies as jurisdictional wetlands, and no re-establishment or enhancement/re-habilitation credits are being sought for that habitat. SCLORF is considered an upland habitat-type, to be offered through the conservation banking process as upland habitat preservation credits only.

As a part of project implementation, the owners of the Brook Forest Conservation/Mitigation Bank shall obtain a 1600-Series Streambed Alteration Agreement from the CDFW, provide evidence from the ACOE of qualification under the Nationwide 404 Permit (or obtain an individual 404 Permit), and obtain Water Quality Certification from the RWQCB pursuant to Section 401 of the Clean Water Act.

Site grading or the removal of any vegetation within 300 feet of any potential avian nesting location is not permitted during the spring/summer avian breeding season, defined as from 1 January to 31 August of each year. This is required in order to ensure compliance with the federal Migratory Bird Treaty Act and Sections 3503, 3503.5 and 3513 of the California Fish and Game Code, which prevent the "take" of eggs, nests, feathers, or other parts of most native bird species. Should site grading be proposed to take place during the avian breeding season, a preconstruction nesting sweep survey of all areas within 300 feet of the proposed activity is required. The results of the survey will be provided in a report to the Wildlife Agencies for concurrence with the conclusions and recommendations.

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Table 2. Proposed Mitigation Credits – Brook Forest Conservation/Mitigation Bank

Upland Habitat Credits

Resource Type	Total Acres Existing in BFCMB	Available Credits[1]
DCSS	16.1	16.1 acre-credits
OEOW	20.0	20.0 acre-credits
MSMC + dMSMC	57.5 + 8.3[2]	65.8 acre-credits
NG	5.2	5.2 acre-credits
SCLORF	18.9	18.9 acre-credits
NNG	63.6	55.6 acre-credits[3]
DH (to be reseeded)[4]	~ 7.3	TBD. None, until converted to DCSS/ MSMC/ NNG
EA	20.7	None, all converted to SCWRF
Total Uplands Habitat	**~ 217.6 acres**	**181.6 Upland acre-credits**

Riparian Habitat Enhancement/Re-habilitation Credits

DW (Riparian Habitat)	0.3 acre	0.3 acre (converted to SCWRF)
SWS (Riparian Habitat)	6.3 acres[5]	6.0 acres (converted to SCWRF)
Total Upland and Riparian Habitat	**224.2 acres**	**187.9 Total Upland + Riparian Habitat acre-credits (not including reseeded DH)[1]**

Wetland Re-establishment Credits[6]

U.S. and State Wetlands	n/a	22.80 acre-credits
State Only Wetlands	n/a	3.60 acre-credits

Species Credits[7]

Engelmann Oak	45 trees	45 species-credits

[1] - *Upland Credits and Wetland Credits may be sold at 1/10th -acre and 1/100th-acre increments, respectively.*
[2] - *These habitats are combined because the dMSMC will continue to regrow to MSMC in the future as the habitat is protected.*
[3] - *The available 55.6 NNG acre-credits will consist of the existing habitat (63.6 ac), minus the onsite impact (5.3 ac) in the wetland establishment area and fill disposal site,, minus the acreage (2.7 ac) needed to mitigate this impact.*
[4] - *Credits for conversion of DH to DCSS, MSMC, and/or other habitat-type will be determined on the basis of specific criteria and future restoration success milestones.*
[5] - *Out of the 6.3 acres of SWS existing on-site, 0.3 acres exist in the southwestern part of the site that will not be enhanced.*
[6] - *All of the Extensive Agriculture (20.7 ac) and Disturbed Wetland (0.3 ac) along with 2.7 acres of Non-native Grassland and 2.7 acres of Extensive Agriculture beneath the tree canopy of the SWS and SCLORF will be removed to create a planting area for the establishment of 26.4 acres of Southern Cottonwood-Willow Riparian Forest (of which 22.8 acres will be U.S. and State wetlands and 3.6 will be State only..*
[7] - *Engelmann Oak species credits will be sold along with the underlying habitat-type. Each Engelmann Oak tree, if sold as a species credit, will consume 0.1 acre of the underlying habitat, which consists of DCSS, MSMC, or NNG.*

Figure 1. Regional Location – Brook Forest Conservation/Mitigation Bank

Portion of U.S.G.S. "Valley Center, California" 7.5' Quadrangle Map

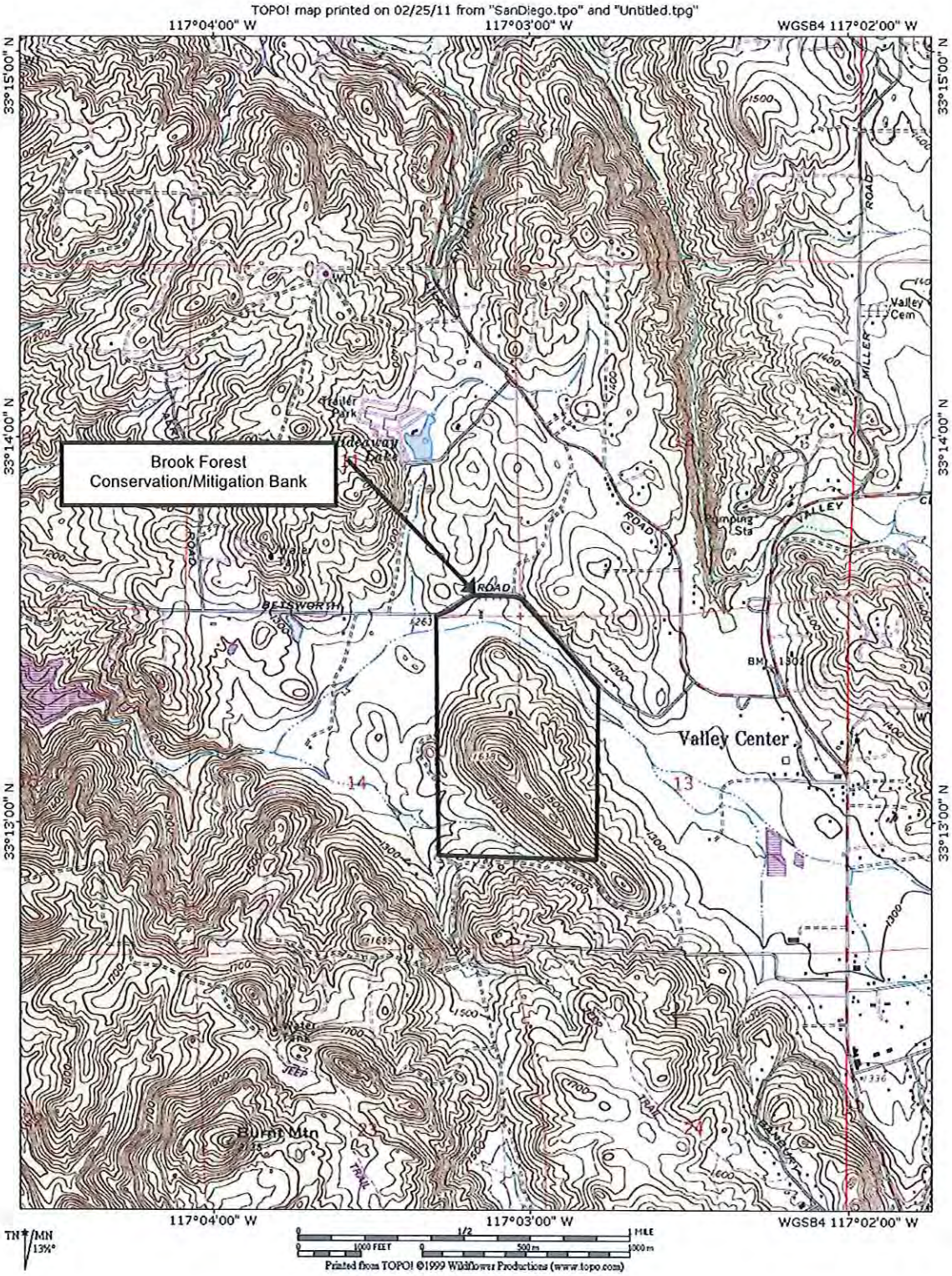
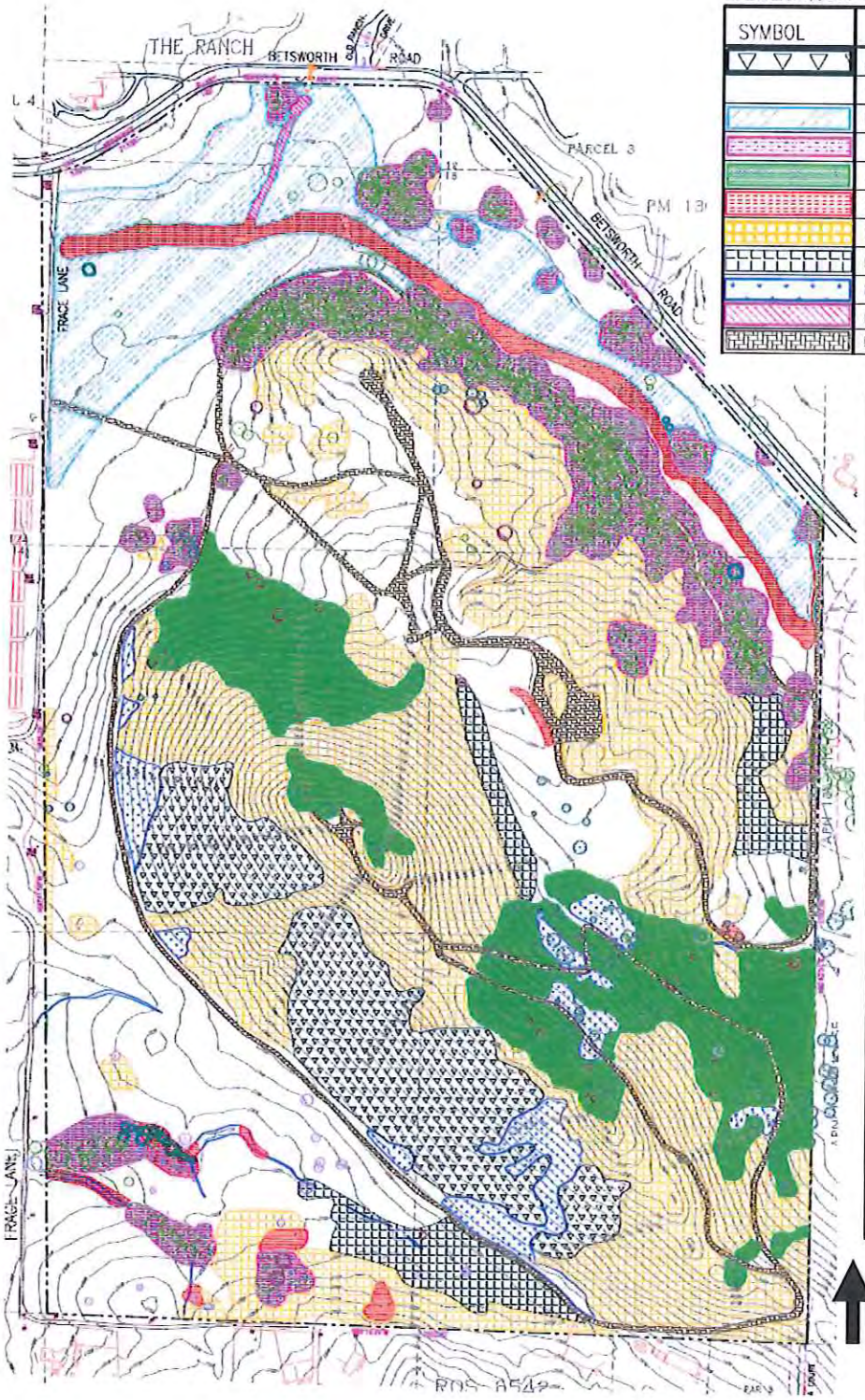


Figure 2. Sept-1996 Aerial Photo – Brook Forest Conservation/Mitigation Bank Showing General Lack of Vegetation in Moosa Creek

Figure 3. Recent (Aug-2010) Aerial Photo – Brook Forest Conservation/Mitigation Bank Showing Linear Regrowth of Riparian Scrub in Moosa Creek

Figure 4. Vegetation Exhibit – Brook Forest



VEGETATION ZONE LEGEND

SYMBOL	VEGETATION TYPE
	DIEGAN COASTAL SAGE SCRUB, INLAND FORM (Holland Code #32520)
	NON-NATIVE GRASSLAND (Holland Code #11300)
	EXTENSIVE AGRICULTURE (Holland Code #18300)
	SOUTHERN COAST LIVE OAK RIPARIAN FOREST (Holland Code #61310)
	OPEN ENGELMANN OAK WOODLAND (Holland Code #71181)
	SOUTHERN WILLOW SCRUB (Holland Code #63320)
	MAFIC SOUTHERN MIXED CHAPARRAL (Holland Code #37122)
	DISTURBED MAFIC SOUTHERN MIXED CHAPARRAL (Holland Code #37122)
	NATIVE GRASSLAND (Holland Code #42100)
	DISTURBED WETLAND (Holland Code #11200)
	DISTURBED HABITAT (Holland Code #11300)

Sensitive Species [1]

- Engelmann Oak – *scattered across north and east-facing slopes*
- Southern California Rufous-crowned Sparrow – *moving about in the sage scrub*
- Great Blue Heron – *foraging and flying down Moosa Creek floodway*
- Red-shouldered Hawk – *soaring over site*
- Turkey Vulture – *soaring over site*
- Greater Roadrunner – *running between sage scrub and agricultural area*
- Western Bluebird – *foraging in open areas between trees in agricultural area*
- Bewick's Wren – *abundant within denser areas of chaparral and woodland vegetation*
- Lawrence's Goldfinch – *transient birds moving along Moosa Creek floodway*
- Black-shouldered Kite – *soaring over northern portion of site*
- Mule Deer – *scats occasional throughout site*
- Granite Night Lizard – *beneath rock cap at crest of hill, likely abundant in rocks*
- San Diego Coast Horned Lizard – *observed in the native grassland, likely well distributed in open areas*
- Orange-throated Whiptail – *single specimen observed in chaparral, likely well distributed in brushy areas*

[1] *All specimens either too numerous to map or exact locations not known*

0 200 400 800

Figure 5. Conceptual Grading And Wetlands Establishment Plan
Brook Forest Conservation/Mitigation Bank

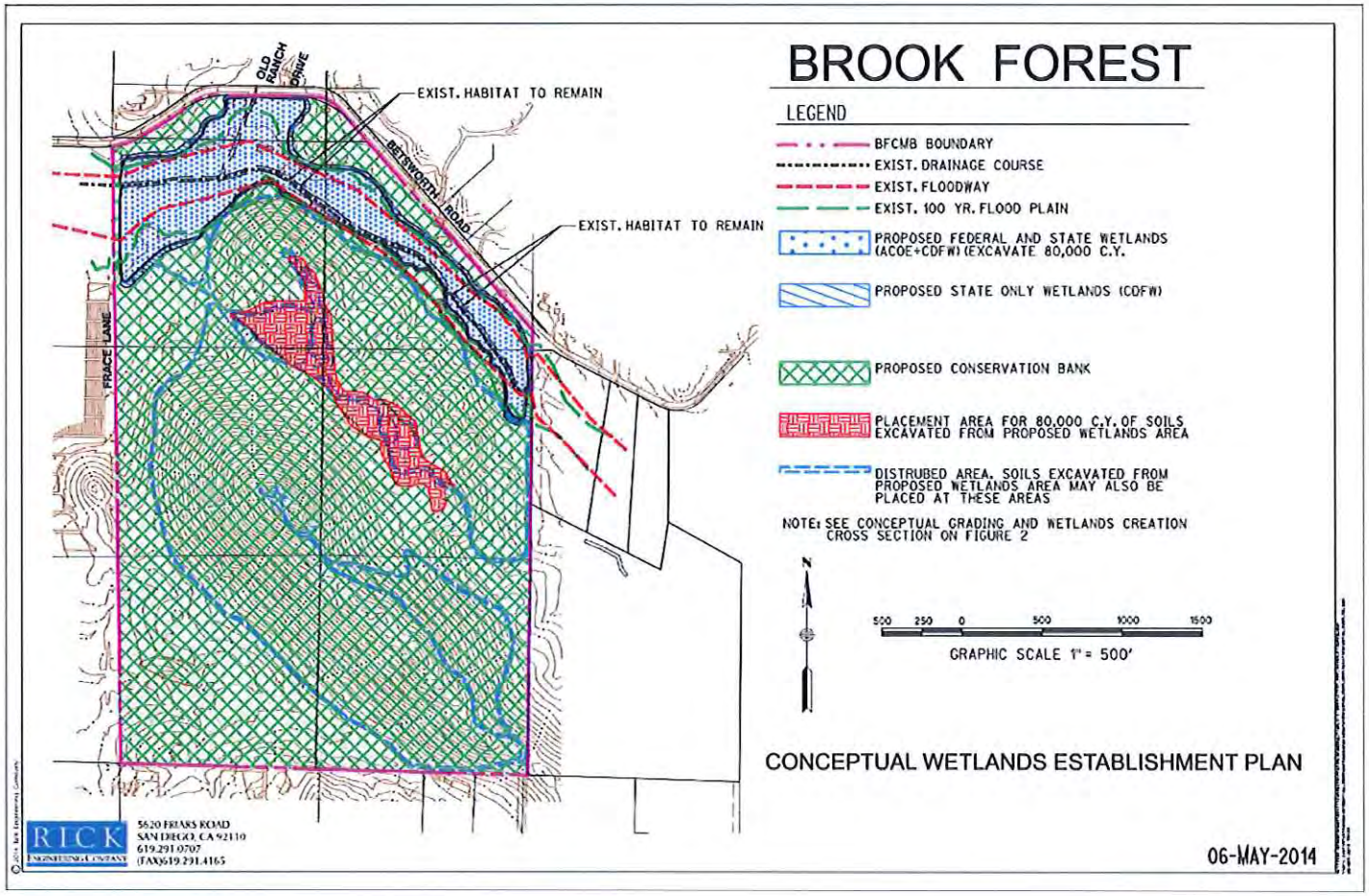


Figure 6. Jurisdictional Wetlands and "Waters" – Brook Forest Conservation/Mitigation Bank

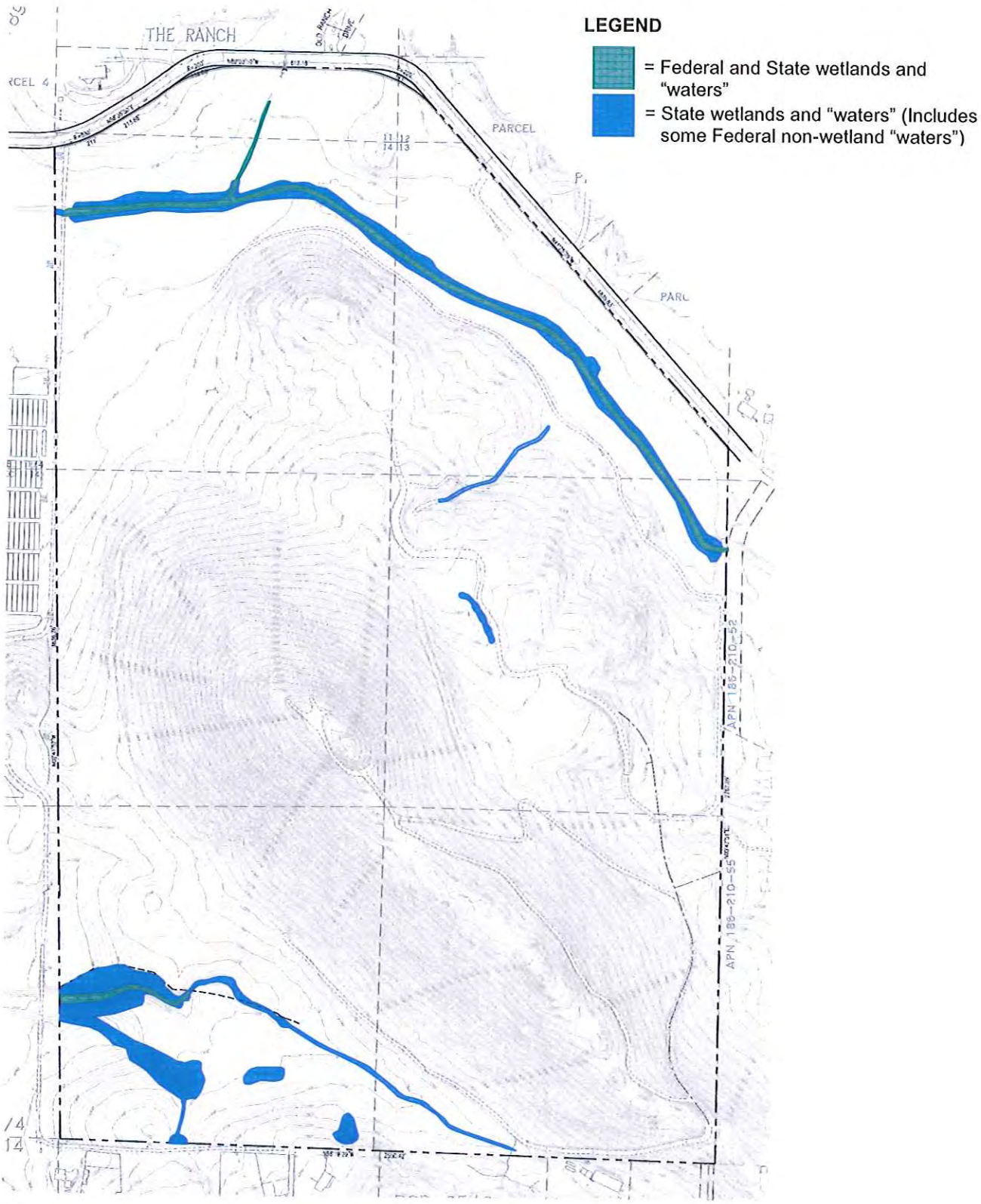


TABLE 3. CURRENT PLANT COMMUNITIES – BFCMB

Habitat	Holland Code	Total
Diegan Coastal Sage Scrub Inland Form	32520	16.1 acres
Southern Coast Live Oak Riparian Forest	61310	18.9 acres
Open Engelmann Oak Woodland	71181	20.0 acres
Southern Willow Scrub	63320	6.3 acres
Non-native Grassland	42200	63.6 acres
Native Grassland	42100	5.2 acres
Mafic Southern Mixed Chaparral	37122	57.5 acres
Disturbed Mafic Southern Mixed Chaparral	37122	8.3 acres
Extensive Agriculture	18300	20.7 acres
Disturbed Wetland	11200	0.3 acres
Disturbed Habitat	11300	7.3 acres
Total		**224.2 acres**

TABLE 4. FLORA CHECKLIST – BROOK FOREST

Scientific Name	Common Name	Habitat
Achnantherum coronatum	Giant Needlegrass	C
Acourtia microcephala	Sacapellote	C
Adenostoma fasciculatum	Chamise	C
Ambrosia psilostachya	Western Ragweed	R
Amsinckia menziesii	Rigid Fiddleneck	A
Anagallis arvensis *	Scarlet Pimpernel	N
Anthemis cotula	Dog Mayweed	N
Antirrhinum nuttallianum	Nuttall's Snapdragon	S
Apiastrum angustifolium	Mock Parsley	S
Apium graveolens *	Common Celery	R
Artemisia californica	California Sagebrush	S
Asclepias californica	California Milkweed	G
Avena barbata *	Slender Wild Oat	N
Avena fatua *	Wild Oat	N
Avena sativa *	Cultivated Oat	A
Baccharis glutinosa	Mule Fat	R
Baccharis pilularis	Coyote Brush	C
Bellis perenns *	English Daisy	N
Brassica nigra *	Black Mustard	A
Brickellia californica	California Brickellbush	S
Bromus diandrus *	Ripgut Brome	N
Bromus hordeaceus *	Soft Chess	G
Bromus madritensis var. *rubens* *	Red Brome	S
Calochortus splendens	Splendid Mariposa Lily	S
Calochortus weedii	Weed's Mariposa Lily	C
Calycadenia ternata	Rosin Weed	S
Camissonia bistorta	Southern Sun Cup	S
Carduus tenuiflorus *	Italian Thistle	N
Ceanothus tomentosus	Ramona Lilac	C
Centaurea melitensis *	Tocalote	N
Centaurea solstitialis *	Yellow Star Thistle	A
Centaurium venustum	Canchalagua	S
Cerastium glomeratum *	Mouse-ear Chickweed	F
Cercocarpus minutiflorus	San Diego Mountain Mahogany	C
Cirsium occidentale	Western Thistle	S
Cirsium vulgare *	Bull Thistle	N
Clarkia purpurea	Four-spot Clarkia	G
Clarkia similis	Canyon Clarkia	F
Clarkia unguiculata	Elegant Clarkia	F
Claytonia perfoliata	Miner's Lettuce	F
Cnicus benedictus	Blessed Thistle	A
Convolvulus arvensis *	Field Bindweed	A
Conyza canadensis *	Common Horseweed	N
Conyza coulteri *	Horseweed	N
Cordylanthus rigidus	Dark-tipped Bird's-beak	C

TABLE 4. FLORA CHECKLIST – BROOK FOREST

Scientific Name	Common Name	Habitat
Corethrogyne filaginifolia var. *virgata*	Sand Aster	N
Cryptantha decipiens	Gravel Cryptantha	S
Cryptantha intermedia	Common Cryptantha	S
Cryptantha sp.	Cryptantha	F
Cupressus sp. *	Cypress	N
Cuscuta californica	California Dodder	S
Cynodon dactylon *	Bermuda Grass	N
Cyperus involucratus *	Umbrella Sedge	R
Cyperus sp.	Sedge	R
Chaenactis artemisiaefolia	White Pincushion	C
Cheilanthes newberryi	Cotton Fern	C
Chenopodium album *	Lamb's Quarters	R
Chenopodium ambrosioides *	Mexican Tea	F
Chenopodium californicum	California Goosefoot	F
Chlorogalum parviflorum	Soap Plant	C
Chorizanthe fimbriata	Fimbriate Spineflower	C
Chorizanthe procumbens var. *albiflora*	Fallbrook Spineflower	C
Datura meteloides	Jimsonweed	N
Daucus pusillus	Rattlesnake Weed	G
Delphinium parryi	Parry's Larkspur	G
Dichelostemma pulchellum	Blue Dicks	G
Dipsacus sp. *	Teasel	F
Dodecatheon clevelandii	Shooting Star	G
Dryopteris arguta	Coastal Wood Fern	F
Dudleya pulverulenta	Chalk Live-forever	C
Eleocharis acicularis	Perennial Spike-rush	R
Eleocharis macrostachya	Spike-rush	R
Elymus glaucus	Wild Rye	F
Eremocarpus setigerus	Dove Weed	N
Erigeron foliosus	Fleabane	S
Eriogonum fasciculatum	Flat-top Buckwheat	S
Eriophyllum confertiflorum	Golden Yarrow	C
Erodium botrys *	Long-beaked Stork's-bill	G
Erodium sp. *	Stork's-bill	N
Eschscholzia californica	California Poppy	G
Eucalyptus camaldulensis *	Murray Red Gum	A
Eucalyptus globulus *	Blue Gum	A
Eucalyptus sp. *	Eucalyptus	A
Eucrypta chrysanthemifolia	Common Eucrypta	S
Euphorbia peplus *	Petty Spurge	N
Filago californica	California Filago	S
Filago gallica *	Narrow-leaf Filago	S
Galium angustifolium	Narrow-leaf Bedstraw	S
Galium aparine *	Common Bedstraw	F
Galium nuttallii	Nuttall's Bedstraw	S

TABLE 4. FLORA CHECKLIST – BROOK FOREST

Scientific Name	Common Name	Habitat
Gastridium ventricosum *	Nitgrass	G
Gnaphalium bicolor	Bicolor Cudweed	S
Gnaphalium californicum	California Cudweed	F
Gutierrezia californica	California Matchweed	C
Hazardia squarrosa	Hazardia	N
Hedra helix *	English Ivy	N
Helianthemum scoparium	Rock Rose	C
Heliotropium curvassavicum	Wild Heliotrope	R
Hemizonia fasciculata	Common Tarplant	G
Heteromeles arbutifolia	Toyon	C
Heterotheca grandiflora *	Telegraph Weed	N
Hirschfeldia incana *	Short-pod Mustard	N
Hordeum vulgare *	Cultivated Barley	A
Hordeum murinum *	Wild Barley	F
Hypochaeris radicata	Hairy Cat's Ear	F
Hypochoeris glabra *	Smooth Cat's-ear	G
Isocoma menziesii	Coastal Goldenbush	S
Jepsonia parryi	Parry's Jepsonia	G
Juncus bufonius	Toad Rush	R
Juncus mexicanus	Mexican Rush	R
Keckiella antirrhinoides	Yellow Bush Penstemon	S
Keckiella cordifolia	Climbing Bush Penstemon	E
Lactuca serriola *	Wild Lettuce	N
Lasthenia californica	Gold Fields	G
Lepidium latifolium *	Perennial Pepperweed	A
Lepidium sp.	Peppergrass	G
Leptochloa uninervia	Sprangle Top	R
Lessingia glandulifera	Lessingia	G
Lolium multiflorum *	Italian Ryegrass	N
Lolium perenne *	English Ryegrass	R
Lomatium lucidum	Shining Lomatium	G
Lomatium utriculatum	Common Lomatium	G
Lonicera subspicata	Wild Honeysuckle	S
Lotus argophyllus	Silver Lotus	C
Lotus corniculatus *	Birdfoot Trefoil	A
Lotus hamatus	Grab Lotus	S
Lotus purshianus	Spanish Clover	N
Lotus salsuginosus	Lotus	S
Lotus scoparius	Deerweed	S
Lotus sp.	Lotus	G
Lupinus concinnus	Bajada Lupine	G
Lupinus sp.	Lupine	G
Lythrum hyssopifolium	Loosestrife	R
Malacothamnus densiflorus	Bush Mallow	C
Malacothamnus fasciculatus	Bush Mallow	S

TABLE 4. FLORA CHECKLIST – BROOK FOREST

Scientific Name	Common Name	Habitat
Malosma laurina	Laurel Sumac	S
Malva parviflora *	Cheeseweed	N
Marah macrocarpus	Man Root	C
Marrubium vulgare *	Horehound	A
Medicago polymorpha *	Bur Clover	N
Melica frutescens	Tall Melic	C
Melica imperfecta	Coast Range Melic	S
Melilotus indicus *	Indian Sweet Clover	R
Microseris lindleyi	Silver Puffs	G
Mimulus aurantiacus	Bush Monkeyflower	S
Mimulus guttatus	Monkeyflower	R
Mirabilis californicus	Wishbone Bush	S
Muilla maritima	Common Muilla	G
Nassella pulchra	Purple Needlegrass	G
Navarretia atractyloides	Holly-leaf Skunkweed	D
Navarretia hamata	Skunkweed	C
Nicotiana glauca *	Tree Tobacco	N
Oenothera elata	Hooker's Evening Primrose	R
Olea europa *	European Olive	N
Orthocarpus purpurascens	Red Owl Clover	G
Oryzopsis miliacea *	Indian Rice Grass	R
Paeonia californica	California Peony	S
Pellaea mucronata	Bird's-foot Fern	G
Penstemon spectabilis	Showy Penstemon	S
Phacelia cicutaria hispida	Caterpillar Phacelia	C
Phacelia parryi	Parry's Phacelia	S
Phacelia ramosissima	Phacelia	C
Phalaris sp. *	Canary Grass	A
Picris echioides *	Bristly Ox-tongue	R
Pityrogramma triangularis var. *triangularis*	Goldenback Fern	S
Pityrogramma triangularis var. *viscosa*	Silverback Fern	C
Plagiobothrys sp.	Popcornflower	G
Plantago erecta	Erect Plantain	G
Plantago major *	English Plantain	R
Platanus racemosa	California Sycamore	F
Polygonum arenastrum *	Yard Knotweed	N
Polygonum lapathifolium	Willow Weed	F
Polygonum sp.	Smartweed	R
Polypogon monspeliensis *	Rabbitfoot Grass	R
Populus fremontii	Western Cottonwood	F
Porophyllum gracile	Odora	C
Prunus ilicifolia	Holly-leaf Cherry	C
Pterostegia drymarioides	Thread Stem	C
Quercus agrifolia	Coast Live Oak	F
Quercus berberidifolia x *engelmannii*	Hybrid Oak	E

TABLE 4. FLORA CHECKLIST – BROOK FOREST

Scientific Name	Common Name	Habitat
Quercus berberidifolia	Interior Scrub Oak	C
Quercus engelmannii	**Engelmann Oak**	**E**
Raphanus sativus *	Wild Radish	N
Rhamnus ilicifolia	Redberry	C
Rhamnus pilosa	Interior Redberry	C
Rhus ovata	Sugarbush	C
Rhus trilobata	Squawbush	F
Ribes indecorum	Winter Currant	C
Rorippa nasturtium-aquaticum *	Watercress	DW
Rosa californica	California Rose	R
Rumex acetosella *	Sheep Sorrel	R
Rumex crispus *	Curly Dock	A
Rumex salicifolius	Willow-leaf Dock	F
Salix hindsiana	Sandbar Willow	R
Salix gooddingii	Southwestern Willow	R
Salix lasiolepis	Arroyo Willow	R
Salsola tragus *	Russian Thistle	N
Salvia mellifera	Black Sage	C
Salvia apiana	White Sage	S
Salvia apiana x *mellifera*	Hybrid Sage	S
Sambucus mexicanus	Elderberry	C
Sanicula crassicaulis	Snakeroot	C
Scirpus olneyi	American Bulrush	R
Scrophularia californica	Bee Plant	S
Scutellaria tuberosa	Skullcap	G
Selaginella bigelovii	Bigelow's Spikemoss	G
Senecio mikanioides *	German Ivy	R
Sidalcea malvaeflora	Checkers	G
Silene gallica *	Common Catchfly	N
Silene lanciniata	Indian Pink	S
Silybum marianum *	Milk Thistle	N
Solanum americanum	White Nightshade	R
Solanum xanti	Chaparral Nightshade	C
Solidago californica	Western Ragweed	F
Sonchus asper *	Sow Thistle	N
Sonchus oleraceus *	Sow Thistle	R
Spergula arvensis *	Corn Spurry	N
Spergularia sp.	Spurry	N
Stephanomeria virgata	Stephanomeria	S
Stylocline gnapthalioides	Everlasting Nest-straw	C
Tamarix sp. *	Salt Cedar	R
Thalictrum polycarpum	Bush Rue	F
Toxicodendron diversilobum	Poison Oak	F
Trichostema lanceolatum	Vinegar Weed	A
Triticum aestivum *	Cultivated Wheat	A

TABLE 4. FLORA CHECKLIST – BROOK FOREST

Scientific Name	Common Name	Habitat
Typha angustifolia	Lesser Cattails	R
Typha latifolia	Cattails	R
Urtica dioica *	Hoary Nettle	R
Veronica peregrina	Purslane Speedwell	R
Vicia benghalensis	Vetch	A
Viola pedunculata	Johnny Jump-up	G
Washingtonia robusta *	Mexican Fan Palm	DW
Xanthium strumarium *	Cocklebur	R
Xylococcus bicolor	Mission Manzanita	C
Yucca schidigera	Mojave Yucca	C
Yucca whipplei	Our Lord's Candle	S
Zauschneria californica	California Fuschia	R

Total: Two hundred and thirty-seven plant species detected.

* = non-native taxon
Bold = sensitive species

Habitat codes:

S = Diegan Coastal Sage Scrub, Inland Form
F= Southern Coast Live Oak Riparian Forest
E = Open Engelmann Oak Woodland
R = Southern Willow Scrub
C = Mafic Southern Mixed Chaparral
DW = Disturbed Wetland
G = Native Grassland
N = Non-native Grassland
A = Extensive Agriculture
D= Disturbed Habitat

TABLE 5. FAUNA CHECKLIST – BROOK FOREST

Scientific Name	Common Name	Habitat
Birds		
Agelaius phoeniceus	Red-winged Blackbird	R
Aimophila ruficeps canescens	**S. Calif. Rufous-crowned Sparrow**	**S**
Anas platyrhynchos	Mallard	F
Aphelocoma coerulescens	Scrub Jay	C
Ardea herodias	**Great Blue Heron**	**R**
Buteo jamaicensis	Red-tailed Hawk	F
Buteo lineatus	**Red-shouldered Hawk**	**F**
Butorides striatus	**Green Heron**	**R**
Calypte anna	Anna's Hummingbird	F
Carduelis lawrencei	**Lawrence's Goldfinch**	**F**
Bubo virginianus	Great Horned Owl	F
Callipepla californica	California Quail	C
Carduelis psaltria	Lesser Goldfinch	C
Carpodacus mexicanus	Housefinch	C
Cathartes aura	**Turkey Vulture**	**F**
Catharus guttatus	Hermit Thrush	F
Chamaea fasciata	Wrentit	C
Chondestes grammacus	Lark Sparrow	F
Colaptes auratus	Common Flicker	F
Contopus sordidulis	Western Wood Peewee	F
Corvus brachyrhynchos	Common Crow	A
Corvus corax	Common Raven	F
Dendroica coronata	Audubon's Warbler	C
Dendroica nigrescens	Black-throated Gray Warbler	F
Dendroica petechia	**Yellow Warbler**	**F**
Elanus leucurus	**Black-shouldered Kite**	**F**
Empidonax difficilis	Western (Pacific Slope) Flycatcher	R
Falco sparverius	Kestrel	A
Geococcyx californicus	**Greater Roadrunner**	**S**
Geothlypis trichas	Common Yellowthroat	R
Guiraca caerulea	Blue Grosbeak	R
Hirundo pyrrhonota	Cliff Swallow	F
Icterus bullockii	Bullock's Oriole	F
Icterus cucullatus	Hooded Oriole	F
Icterus galbula	Northern Oriole	F
Junco hyemalis	Dark-eyed Junco	A
Melanerpes formicivorus	Acorn Woodpecker	F
Melospiza melodia	Song Sparrow	R
Mimus polyglottos	Mockingbird	N
Molothrus ater	Brown-headed Cowbird	R
Myiarchus cinerascens	Ash-throated Flycatcher	N
Parus inornatus	Plain Titmouse	F
Passerella iliaca	Fox Sparrow	S
Phainopepla nitens	Phainopepla	C
Pheucticus melanocephalus	Black-headed Grosbeak	R
Picoides nuttallii	Nuttall's Woodpecker	F

TABLE 5. FAUNA CHECKLIST – BROOK FOREST

Scientific Name	Common Name	Habitat
Birds (cont)		
Pipilo crissalis	California Towhee	C
Pipilo erythrophthalmus	Rufous-sided Towhee	F
Pipilo maculatus	Spotted Towhee	R
Piranga ludoviciana	Western Tanager	F
Psaltriparus minimus	Bushtit	C
Sayornis saya	Say's Phoebe	A
Sturnella neglecta	Western Meadowlark	A
Thryomanes bewickii	**Bewick's Wren**	**C**
Troglodytes aedon	House Wren	F
Sialia mexicana	**Western Bluebird**	**A**
Sayornis nigricans	Black Phoebe	A
Toxostoma redivivum	California Thrasher	C
Turdus migratorius	American Robin	F
Tyrannus verticalis	Western Kingbird	A
Tyrannus vociferans	Cassin's Kingbird	A
Vermivora celata	Orange-crowned Warbler	C
Vireo huttoni	Hutton's Vireo	F
Zenaida macroura	Mourning Dove	F
Zonotrichia leucophrys	White-crowned Sparrow	C
Wilsonia pusilla	Wilson's Warbler	R
Sturnus vulgaris	Starling	R
Mammals		
Canis latrans	Coyote	N
Didelphis marsupialis	Opossum	R
Lynx rufus	Bobcat	N
Neotoma fuscipes	Dusky-footed Woodrat	C
Odocoileus hemionus	**Mule Deer**	**C**
Peromyscus sp.	Deer Mouse	C
Spermophilus beecheyi	California Ground Squirrel	N
Sylvilagus audubonii	Desert Cottontail	S
Thomomys bottae	Valley Pocket Gopher	N
Butterflies		
Adelpha bredowii californica	California Sister	R
Anthocharis sara	Sara Orangetip	F
Apodemia mormo virgulti	Behr's Metalmark	C
Artogeia rapae	Cabbage White	A
Callophrys dumetorum	Bramble Hairstreak	C
Coenonympha californica	California Ringlet	G
Erynnis sp.	Duskywing	N
Glaucopsyche lygdamus	Southern Blue	S
Icaricia acmon	Acmon Blue	S
Incisalia augusta	Brown Elfin	C
Limenitis lorquini	Lorquin's Admiral	R
Nymphalis antiopa	Mourning Cloak	F
Papilio eurymedon	Pale Swallowtail	F
Papilio rutulus	Western Tiger Swallowtail	F

TABLE 5. FAUNA CHECKLIST – BROOK FOREST

Scientific Name	Common Name	Habitat
Butterflies (cont)		
Papilio zelicaon	Anise Swallowtail	F
Polyommatinae	Blue	S
Pyragus albescens	Checkered Skipper	F
Vanessa atalanta	Red Admiral	F
Vanessa annabella	West Coast Lady	F
Vanessa sp.	Lady	F
Amphibians		
Hyla regilla	Pacific Treefrog	R
Fish		
Gambusia affinis	Mosquito Fish	R
Reptiles		
Sceloporus orcuttii	Granite Spiny Lizard	C
Cnemidophorus hyperythrus beldingi	**Orange-throated Whiptail**	**C**
Crotalus viridis	Western Rattlesnake	C
Sceloporus occidentalis	Western Fence Lizard	F
Xantusia henshawii henshawii	**Granite Night Lizard**	**C**
Phrynosoma coronatum blainvillei	**San Diego Coast Horned Lizard**	**S**

Total = 104 species of native and naturalized vertebrates and butterflies detected: 67 birds, 9 mammals, 20 butterflies, 6 reptiles, 1 amphibian, and 1 fish

* = non-native taxon
Bold = sensitive species

Habitat codes:

S = Diegan Coastal Sage Scrub, Inland Form
F= Southern Coast Live Oak Riparian Forest
E = Open Engelmann Oak Woodland
R = Southern Willow Scrub
C = Mafic Southern Mixed Chaparral
DW = Disturbed Wetland
G = Native Grassland
N = Non-native Grassland
A = Extensive Agriculture
D= Disturbed Habitat

Table 6. Sensitive Species Known from the Vicinity – Brook Forest

Scientific Name	Common Name	Federally Endangered	Federally Threatened	State Threatened	State Rare	Coastal Sage Scrub	Mixed Chaparral	Grassland	Riparian	Oak Woodland	Chamise Chaparral	Mixed Conifer	Closed Cone Forest	Piñon-Juniper	Freshwater Marsh	Desert Scrub	Desert Wash	Salt or Alkali Marsh	Vernal Pools	Montane Meadow	Coastal or Desert Dune	Lakes and Bays	Probability of Occurrence
Taxidea taxus	American Badger					X	X	X		X	X	X		X		X	X			X			L
Bufo microscaphus californicus	Arroyo Toad	X				X	X	X	X	X	X									X			L
Thryomanes bewicki	Bewick's Wren					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	O
Nyctinomops macrotis	Big Free-Tailed Bat					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	M
Elanus caeruleus	Black-Shouldered Kite							X	X														O
Rana aurora draytoni	California Red -Legged Frog		X						X						X					X		X	L
Clarkia delicata	Campo Clarkia									X													M
Nolina cismontana	Chaparral Beargrass						X				X												L
Salvadora hexalepis virgultea	Coast Patch-Nosed Snake					X	X				X			X									M
Charina trivirgata roseofusca	Coastal Rosy Boa					X	X			X	X												M
Cnemidophorus tigris multiscutatus	Coastal Western Whiptail						X		X	X	X												M
Accipiter cooperii	Cooper's Hawk							X	X	X													M
Chaetodipus californicus femoralis	Dulzura California Pocket Mouse					X	X	X		X	X	X											M
Quercus engelmannii	Engelmann Oak								X	X													O
Monardella hypoleuca lanata	Felt Leaved Rock Mint						X				X												L
Polygala cornuta fishiae	Fish's Milkwort						X				X												L
Myotis thysanodes	Fringed Myotis						X		X	X	X	X	X	X						X			M
Senecio ganderi	Gander's Butterweed				X		X				X												L
Aquila chrysaetos	Golden Eagle					X	X	X		X	X	X	X	X									M
Xantusia henshawii	Granite Night Lizard					X	X				X			X									O
Ammodramus savannarum	Grasshopper Sparrow							X															M
Geococcyx californicus	Greater Roadrunner					X	X	X		X	X	X		X		X	X						O
Eumops perotis californicus	Greater Western Mastiff Bat					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	M
Eremophila alpestris actis	Horned Lark							X												X			M
Carduelis lawrencei	Lawrence's Goldfinch					X	X		X	X	X	X	X	X		X	X			X			O
Lanius ludovicianus	Loggerhead Shrike					X		X	X	X						X	X						M
Myotis evotis	Long Eared Myotis						X		X	X	X	X	X	X						X			M
Myotis volans	Long Legged Myotis						X		X	X	X	X	X	X						X			M
Perognathus longimembris brevinasus	Los Angeles Little Pocket Mouse					X	X	X		X	X										X		L
Danaus plexippus	Monarch Butterfly							X		X										X			M
Felis concolor	Mountain Lion					X	X		X	X	X	X	X	X		X	X			X			L
Crotalus ruber ruber	N Red Diamond Rattlesnake					X	X				X			X		X							M
Cnemidophorus hyperythrus	Orange-Throated Whiptail					X	X	X	X		X												O
Brodiaea orcuttii	Orcutt's Brodiaea							X	X	X	X								X				M
Harpagonella palmeri	Palmer's Grappling Hook					X		X			X												M
Tetracoccus dioicus	Parry's Tetracoccus						X				X												L
Chorizanthe leptotheca	Peninsular Spine Flower						X				X												M
Nyctinomops femorosaccus	Pocketed Free-Tailed Bat					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	M
Horkelia truncata	Ramona Horkelia						X																M
Buteo lineatus	Red-Shouldered Hawk								X	X													O
Coleonyx variegatus abbotti	San Diego Banded Gecko					X		X			X												M

Table 6. Sensitive Species Known from the Vicinity – Brook Forest

Scientific Name	Common Name	Federally Endangered	Federally Threatened	State Threatened	State Rare	Coastal Sage Scrub	Mixed Chaparral	Grassland	Riparian	Oak Woodland	Chamise Chaparral	Mixed Conifer	Closed Cone Forest	Piñon-Juniper	Freshwater Marsh	Desert Scrub	Desert Wash	Salt or Alkali Marsh	Vernal Pools	Montane Meadow	Coastal or Desert Dune	Lakes and Bays	**Probability of Occurrence**
Bassariscus astutus	Ringtail						X				X												**L**
Aimophila ruficeps canescens	Rufous-Crowned Sparrow					X					X												**O**
Lepus californicus bennettii	San Diego Black-Tailed Jackrabbit					X	X	X		X	X	X	X										**M**
Neotoma lepida intermedia	San Diego Desert Woodrat					X			X	X	X												**M**
Phrynosoma coronatum blainvillei	San Diego Coast Horned Lizard					X	X	X	X		X	X											**O**
Diadophis punctatus similis	San Diego Ringneck Snake					X	X		X	X	X	X	X										**M**
Accipiter striatus	Sharp-Shinned Hawk					X				X		X											**M**
Anniella pulchra pulchra	Silvery Legless Lizard					X		X	X												X		**M**
Myotis ciliolabrum	Small-Footed Myotis						X		X	X	X	X	X	X			X			X			**M**
Thamnophis sirtalis ssp. novum	South Coast Garter Snake								X						X								**L**
Onychomys torridus ramona	Southern Grasshopper Mouse					X	X	X			X												**L**
Chamaebatia australis	Southern Mountain Misery						X				X												**L**
Odocoileus hemionus	Southern Mule Deer					X	X	X	X	X	X	X	X	X		X	X			X			**O**
Dipodomys stephensi	Stephen's Kangaroo Rat	X		X		X		X															**L**
Corynorhinus townsendii	Townsend's Big-Eared Bat						X	X	X	X	X	X	X	X		X	X			X			**M**
Agelaius tricolor	Tricolored Blackbird							X	X						X								**L**
Butorides striatus	Green Heron								X						X								**O**
Ardea herodias	Great Blue Heron								X						X								**O**
Cathartes aura	Turkey Vulture					X	X	X	X	X	X	X	X										**O**
Sialia mexicana	Western Bluebird								X	X													**O**
Lasiurus blossevillii	Western Red Bat								X	X		X	X							X			**M**
Dendroica petechia	Yellow Warbler								X														**O**
Icteria virens	Yellow-Breasted Chat								X														**M**
Myotis yumanensis	Yuma Myotis					X	X	X	X	X	X	X	X	X	X			X	X	X		X	**M**

Probability of Occurrence Codes:

L – Low Probability; rare species in area, and no significant habitat (animals), *or* distinctive perennial that would not have been missed if present onsite (plants)

M – Moderate Probability; could be expected to occur onsite on at least an occasional basis, based on habitat quality (animals), *or* could occur onsite, but very rare, and/or poorly known (plants)

H – High Probability; certain to occur onsite on a regular basis (animals), but cryptic, *or* ephemeral species known from the immediate vicinity, but seasonal in occurrence (plants)

O – Observed; see text for detailed discussion