SONOMA COUNTY AGRICULTURAL
PRESERVATION & OPEN SPACE DISTRICT

WRIGHT HILL RANCH OPEN SPACE PRESERVE MANAGEMENT PLAN

Natural and Cultural Resources

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1 INTRODUCTION

In 2007, the Sonoma County Agricultural Preservation and Open Space District (District) acquired Wright Hill Ranch Open Space Preserve (Wright Hill Ranch) in western Sonoma County to "protect the scenic woodlands, meadows, and critical habitats on the property, as well as allow for appropriate low-intensity public outdoor recreation" (District 2012). The California State Coastal Conservancy (Conservancy) contributed $750,000 towards the purchase for the purposes of "protecting, restoring and enhancing habitat and open space, and providing public access where appropriate" (California State Coastal Conservancy 2007a and 2007b). The California Department of Parks and Recreation, Sonoma Land Trust, and LandPaths supported the District and the Conservancy in planning the acquisition. Initially, Wright Hill Ranch was expected to be transferred to California Department of Parks and Recreation as an addition to the Sonoma Coast State Park (State Parks).

Prior to the District's purchase, the 1,236-acre Wright Hill Ranch was the largest privately owned coastal land holding between the Russian River and Bodega Bay. Adjacent to thousands of acres of Sonoma Coast State Park land, the property is a key link in a chain of protected lands that stretches from Bodega Bay to the Jenner Headlands. In addition to providing a critical connection for both people and wildlife, Wright Hill Ranch, with its sweeping views of surrounding watersheds and the sea, has the potential to be a prime destination for coastal visitors and contribute significantly to Sonoma County's scenic beauty. Previously inhabited by the Kashaya Pomo and today an active cattle ranch, the Wright Hill Ranch property remains a tangible link to the region's history. Protected archaeological sites and a 19th Century homestead, which was never connected to electricity or running water, provide a vital connection to the indigenous and immigrant cultures of the property. Although public access and supporting infrastructure (e.g., parking sites, trail development, and interpretive signage) are currently constrained or underdeveloped, there is potential for future expansion of public use of the property.

The property supports grasslands, redwood groves, mixed conifer-hardwood forests, coastal scrub, and riparian scrub. Steep gullies and ephemeral stream corridors, often fringed by small wetlands, cross the landscape. Rock outcroppings, from small to large, occur throughout the property and often support unique vegetation. Wildlife, including many native and some special-status species, rely on the viability of these habitats and the corridors that connect them. Wright Hill Ranch's botanical resources, composed of more than 354 observed plant species (250 of them native to California), sustain myriad wildlife species; at least 86 bird species have been documented on the property and there is potential habitat for 13 reptile, 11 amphibian, and 47 mammal species known to occur locally.

Although there are no perennial streams on the property, Wright Hill Ranch includes portions of the headwaters of Willow Creek and Scotty Creek, with steelhead in both streams and coho salmon in Willow Creek. Intact native vegetation and limited development on Wright Hill Ranch protect downstream channels from excessive sedimentation and nutrient runoff and provide natural sources of woody debris and coarse sediment that are critical for sustaining salmonid habitat. All of the habitats present—forest, woodland, scrub, riparian, and wetland—contribute significantly to local and regional native biodiversity and habitat connectivity.

1.1 REGIONAL PLANNING CONTEXT

Wright Hill Ranch was identified as a priority acquisition property in multiple regional plans, including

the *Sonoma County General Plan* (PRMD 1989), the District's *Connecting Communities and the Land: A Long Range Acquisition Plan* (District 2006), The Nature Conservancy's *Conserving the Landscapes of Sonoma County* (The Nature Conservancy 2003), and Sonoma Land Trust's *Sonoma County Coastal Parcel Study* (Sonoma Land Trust 1999). The property is also located within the Coastal Scenic Landscape Unit of the General Plan. Additionally, its protection is in accordance with the mandates of the *Sonoma Coast State Parks General Plan* (2007), which combines natural and cultural resource preservation with public access. The State Parks General Plan specifically notes the Poff (Wright Hill) Ranch complex buildings as "important in that they are largely intact surviving examples of the kind of complexes that resulted from the farming and ranching enterprises that were commonly active in the region from the latter decades of the 1800s and well into the 20th century" (CDPR 2007).

In addition to these county-wide efforts, acquisition and protection of the property supports many pressing state mandates as well as other key initiatives. For example, the *State of California's Wildlife Action Plan* (SWAP) identifies threats affecting wildlife and their habitats including protecting linkages on public lands — Wright Hill Ranch addresses many of these threats by preserving key wildlife habitats in perpetuity (CDFW 2007). The acquisition also supports the *California Department of Fish and Wildlife's Vision for Confronting Climate Change in California* by creating a large-scale, well-connected system of conserved lands (CDFW 2011). Intact and healthy habitats on Wright Hill Ranch support CDFW's goal of promoting resilience to climate change to allow ecosystems to accommodate gradual changes and maintain key ecosystem functions. The property also falls within a critical corridor linking the Coast Range to the north with habitats in Marin — identified in the *Critical Linkages: The Bay Area and Beyond* (Penrod et al. 2013). This linkage is one of many connections that are vital to the preservation of landscape-level processes and the maintenance of wildlife populations.

1.2 PURPOSE AND GOALS

The purpose of the Wright Hill Ranch Management Plan (Plan) is to guide preservation, protection, and enhancement of the property's biological, ecological, cultural, and historical resources while providing public recreational use and supporting ongoing grazing. The report is intended to be used by the District and its partners to identify and document conservation values on the property, sensitive resources that require protection, and opportunities for enhancement and restoration. This information will be used to guide land management, and to inform the conservation easement structure and transfer agreement when the property is transferred to a land management entity.

The Plan's management recommendations support the following goals for the property:

1. Protect native biodiversity and natural resources and ecological functions
2. Preserve cultural and historical resources
3. Conserve and enhance the coastal agricultural heritage of Sonoma County
4. Provide public recreational and educational opportunities

1.3 DEVELOPMENT PROCESS

1.3.1 DOCUMENT DEVELOPMENT

Development of the Wright Hill Ranch Open Space Preserve Management Plan was enabled through collaboration between the District, Gold Ridge Resource Conservation District (Gold Ridge RCD; primary author of a March 2010 draft), Prunuske Chatham, Inc. (PCI), and the stakeholder group and technical experts. An initial kick-off meeting of the stakeholder group was held in October 2008 to guide priorities and identify management concerns. Meetings were held in March, April, and August of 2009 to exchange information collected during inventories (e.g., botanical, wildlife, cultural, and others) and report development, and to further elaborate recommendations under the leadership of Gold Ridge RCD. Technical report findings and recommendations were presented in November 2009. The planning process was put on hold after changes to State Park objectives regarding the addition to coastal holdings. The document was updated in 2014–2016 to reflect the current goals and intentions for the property and provide a framework for future management of the property after transfer to a land management entity to be opened to the public for recreational and educational uses.

1.3.2 TECHNICAL EXPERTS AND STAKEHOLDER GROUP ENGAGEMENT

The report was developed with the support of the technical experts listed in *Report Authors* above. The following stakeholder group members participated in the meetings and the report development process:

- Sonoma County Agricultural Preservation and Open Space District
- California State Coastal Conservancy
- California Department of Parks and Recreation
- Sonoma-Marin Coastal Prairie Working Group
- LandPaths
- Stewards of the Coast and Redwoods
- Jim Furlong, grazing lessee, and his family

2 PROPERTY DESCRIPTION

2.1 LOCATION AND REGIONAL SETTING

Wright Hill Ranch is located in Sonoma County, approximately three miles southeast of the town of Jenner and one mile inland from the Pacific Ocean and Highway 1 (Figure 1). The property is situated amid a diverse landscape that represents many of the region's characteristic habitats and native species (Community Foundation of Sonoma County 2009). Topographically diverse as well, the property includes two steep forested gulches, Furlong Gulch and Rough Creek, which ascend from 440 feet in the Rough Creek drainage to Wright Hill near the property's center at 1,190 feet. Connecting the contiguous 7,500-acre Sonoma Coast State Park at Willow Creek with multiple conservation easements and private preserves, Wright Hill Ranch contributes substantially to the region's protected and relatively undeveloped lands.

2.2 ADJACENT OWNERSHIP AND LAND USES

The District's acquisition of Wright Hill Ranch provides a crucial addition of preserved open space to the adjacent 10,000-acre Sonoma Coast State Park, which borders Wright Hill Ranch to the north and west, and includes the 3,376-acre Willow Creek Addition and the 910-acre Red Hill Addition. Other adjacent protected lands include the District-held conservation easement on Willow Creek — Seed Orchard Tract (210 acres) and Willow Creek — Northern Tract (305 acres) both owned by Mendocino Redwood Company and Sonoma Land Trust's Freezeout Redwoods (89 acres) along Freezeout Road near Duncans Mills (Figure 1).

Wright Hill Ranch also borders an additional 3,000 acres of conserved land, including the District-held conservation easement on Colliss Ranch to the south (1,570 acres); Rigler easement (415 acres); and Myers Ranch easement (373 acres), as well as Ocean Song (161 acres); Sonoma Land Trust's Finley Creek (237 acres) and Grove of the Old Trees (28 acres); the District's Carrington Ranch (335 acres), and a riparian corridor, Coleman Valley Creek, preserved by the Bodega Land Trust (35 acres). All of these adjacent lands are largely used as open space for recreation and/or natural resource protection.

2.3 HISTORIC LAND USES OF WRIGHT HILL RANCH AND SURROUNDING AREAS

The following includes a brief description of the historic land uses on and around Wright Hill Ranch, including Native American communities to early settlers. A more detailed account of the region's history and life of Jack Poff can be found in Appendix A.

2.3.1 NATIVE AMERICAN COMMUNITIES

Native American archeological findings are common along the Sonoma Coast, particularly near river mouths and beaches throughout the adjacent Sonoma Coast State Park holdings, indicating that the area was heavily used during indigenous times (CDPR 2007). The Kashaya Pomo were the only human inhabitants of the Sonoma Coast until the Russians arrived in the early 19th century, while the Coast Miwok settled to the south in the Bodega Bay region (Kroeber 1925, Wilson 1999). Other references infer that the two groups may have shared the coastal area south of the Russian River, and that the Coast Miwok at least visited the Wright Hill Ranch vicinity (Origer 2009). Local sources, including State Parks historians, believe the Kashaya have inhabited the area for at least 7,000 years, and existed as a small community of only 500º1,500 members at the mouth of Willow Creek (PCI 2005). The Kashaya occupied only about 30 miles of coastline, a territory that extended inland for five to thirteen miles (Heizer 1978).

These communities made use of the abundant resources in the area, including coastal products such as marine fish, shellfish, and seaweed; riparian products such as reeds and sedges for baskets and nets; and forest products such as shredded bark. Chert and glaucophane schist outcrops provided materials for common tools such as projectile points, knives, choppers, and scrapers, some of which were used for ceremonial purposes (Origer 2009). The Kashaya Pomo also influenced the landscape through their frequent use of fire throughout the Sonoma Coast to facilitate hunting, cultivation, and other land uses. Prior to indigenous land management, lightning strikes, and wild grazers and browsers exerted their own forces on the landscape; thus fire (Sugihara et al. 2006) and grazing have shaped the Wright Hill Ranch landscape for millennia.

2.3.2 EUROPEAN SETTLEMENT

Rancho Bodega

The first European settlement in the area was in Bodega, settled by the Spaniards in 1793 to protect the area from an English invasion (Wilson 1999), and named for the Spanish explorer Juan Francisco de la Bodega y Cuadra (Origer 2009). The settlement was soon deserted and remained empty until the arrival of a Russian fur trader named Alexander Kuskoff around 1811. The Russians established Fort Ross as a headquarters in 1812, and developed several ranches in the surrounding area for food and livestock production. Spaniards returned to the Sonoma Coast in 1823, followed by other European settlers in the 1840s, while the Russians, having decimated the beaver, seal, and otter populations, began to desert the area.

Among the first of the new arrivals was Captain Stephen Smith, a Maryland sea captain who requested a huge land tract from the Mexican Governor of California; the 35,487-acre "Rancho Bodega" stretched from south of the Russian River to the Estero Americano, now the border of Marin County, comprising one-third of the Sonoma Coast. In 1846, Smith imported California's first steam engine to construct a steam-operated sawmill along Salmon Creek east of Bodega (Edwards 1948, Wilson 1999). He quickly began to diversify his holdings, raising cattle and horses, building a flour mill and a tannery, constructing roads throughout Bodega, and establishing the first recorded commercial lumber harvest in California in the Willow Creek area (Wilson 1999). The largest mill along the Sonoma Coast was found at Duncan's Mills, producing 25,000 board foot of lumber a day. Rancho Bodega became part of the United States in 1848 when the U.S. acquired California in the Treaty of Guadalupe Hidalgo (Edwards 1948, Trussell 1960, Wilson 1999).

Wright Ranch and Buckhorn Ranch

Rancho Bodega was eventually subdivided, with a large section purchased by Winfield S.M. Wright in 1863 (Tuomey 1926). When Wright died in 1892, his son Sampson W. Wright continued to raise sheep on the ranch including the lands comprising the present-day Wright Hill Ranch. Sheep ranching played an important role in Sonoma County's economy at the time, although to a lesser extent than cattle ranching or dairying. Brought to the county in large numbers during the Gold Rush, sheep were raised for food rather than wool, and could be raised in areas with less forage and water than cattle.

Railroads began to rapidly transform the region in the 1870s, stimulating larger-scale exports and bringing more and more families, resulting in a county population of almost 40,000 by 1900 (Wilson 1999). Led by experienced Swiss, Irish, and Italian settlers, the dairy industry also began to grow in the late 1800s, (Trussell 1960), with the founding of the Bodega Creamery in 1895 (Press Democrat 1936).

In addition to their sheep operation, the Wright family also had a dairy on the property, as did many ranches at the time. The barn still supports the wooden stanchions used to hold the milking cattle. The Wrights leased the property to the Patrick Furlong family in 1896, and later his sons Thomas, William, and Charles, who ran a dairy there until around 1916. Called the "Buckhorn Ranch" at the time, the dairy operation supported up to 180 cows. The major gulch draining down the western side of the Wright Hill Ranch property still bears the family name — Furlong Gulch. Like many farms during the time period, the Furlong's operation on the Buckhorn Ranch produced a number of products and large, less steep tracts of the ranch were cultivated, primarily for forage hay.

Wright Hill Ranch

The Wright Ranch was further subdivided, and the Wright Hill Ranch Open Space Preserve portion was purchased from the Wright heirs by the Poff family in 1953 for $64,500 (J. Lites pers. comm. 2009). The Poffs had emigrated from Germany in the 1830s, when they established a homestead in the Plantation area north of Jenner. Jack Poff ran a variety of livestock on the property, eventually raising a herd of 700 sheep. Jack and his wife Irene married in 1977. They lived in the property's ranch house for about 20 years with only a wood cook stove, gas lighting, a small gasoline-powered engine to pump water to the house, and a former wooden telephone with a line running to the neighboring Mann property (J. Lites pers. comm. 2009). In 1995, Jack and Irene purchased a home in Petaluma to have a place to stay when conducting business in town and also to have a place to live when they got older (J. Lites pers. comm. 2015).

Wright Hill Ranch in 1954. Photos by Jack Poff through Sonoma State University Northbay Digital Library.

Jack Poff on the property, unknown date. Jerry Lites.

In 1992 at age 77, Jack leased the property to Jim Furlong, Patrick's great-grandson; nearly a century after the Furlong family had run a dairy there, along with selling him his approximately 700 sheep. Jim marketed both lamb and wool. After only two lambing seasons, as a result of predator problems, Jim was forced to switch to cattle in 1994 (J. Furlong pers. comm. 2009a). Until his failing health forced him to leave the ranch house, Jack Poff continued to help the Furlongs with their ranching operation, maintaining the barn and fences. He continued to visit the property regularly, until he died in December 2006 at almost 92 (LeBaron 2007). His wife Irene passed away in November 2014 (J. Lites pers. comm. 2015).

2.4 CURRENT LAND USES

At the writing of this document, Jim Furlong continues to raise cattle on Wright Hill Ranch, now on a year-to-year lease with the District. The current calf-beef operation consists of approximately 100 to 110 mother cows, their calves, and five bulls; they are kept on site year-round. Cows are bred in early spring, producing young in the fall (October to November). Supplemental feeding is usually required at some point to support the livestock and reduce pressure on the land. Calving occurs about two months later than most other cow-calf operations in the Sonoma-Marin area, so that green forage is available soon after calves are born, reducing the need for supplemental feeding at a time when the lactating mother cows need optimal nutrition. Calves are typically sold in July, generating the entire year's income. The current ranching operation is described in more detail in *Section 7, Livestock Grazing*.

Recreational uses have thus far been limited to docent-led hikes, conducted several times a year through LandPaths' outings program contract with the District. No other recreational uses are currently permitted. Opportunities for additional recreational uses are described in more detail in *Section 9, Public Uses*.

2.5 PHASE I ENVIRONMENTAL ASSESSMENT

Waste disposal site in gully

A Phase I Environmental Assessment was prepared by Trans Tech Consultants after the property was acquired in August 2007, with the purpose "to assess the possible contamination of the project site with hazardous or toxic substances or wastes to conform to the American Society of Testing and Materials (ASTM) Standard E 1527-05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Practice" (Trans Tech Consultants 2007). The report indicated no significant environmental hazards on the property, except for an old sheep dip tank (below), which has since been remediated. A complete description of these sites can be found in the 2007 Remedial Action Plan (Trans Tech Consultants 2007).

Sheep dip trench

Sheep Dip Trench

The assessment uncovered a sheep dip trench, where sheep were immersed for treatment with pesticides. Sheep dips are "a known potential source of arsenic, organophosphorus, and organochlorine pesticide contamination to soils and groundwater" (Trans Tech Consultants 2007). The assessment recommended both soil and groundwater sampling "to characterize potential pesticide contamination in this area." Soil and water samples were collected and analyzed for these substances in August 2007, and a Remedial Action Plan was developed. The plan recommended excavation of the site, including demolition of the concrete wash pad and volatization of chemically contaminated soils. In October 2011, the sheep dip trough and associated wash pad area were removed and soil around the site excavated and disposed of off-site.

Waste Areas

Several areas throughout the property were also identified where metal and other waste have been discarded. The barn contains a number of empty glass jugs, several five-gallon metal pails, and an array of old farm implements and materials.

3 PHYSICAL FEATURES

3.1 TOPOGRAPHY AND ELEVATION

Wright Hill Ranch supports varied topography (Figure 2). The majority of the property has slopes under 25%, although several of the larger drainages, including Rough Creek and Furlong Gulch, have slopes exceeding 35%. The most steeply sloped areas are generally forested. Elevation ranges from Wright Hill, near the center of the property at 1,190 feet to 440 feet in the Rough Creek drainage.

3.2 GEOLOGY AND SOILS

The bedrock of Sonoma County's coastal region is composed of relatively young ocean sediment layers, which were pushed onto the continent's edge by the subduction of the Pacific Plate under the North American Plate. These geological movements created the region's unstable and erosive Franciscan mélange, a soupy mixture of greywacke sandstone, chert, greenstone, serpentinite, iron-rich igneous volcanic and plutonic rocks, and other clastic rock types of varying hardness and erosion rates (Wilson 1999, Trans Tech Consultants 2007, USDA 2014). The region itself is unstable, with the property sitting within one mile of the San Andreas Fault. Rockslides, gullies, rill erosion, and mass wasting are common throughout the region, particularly at higher elevations (CDPR 2007). Numerous soil types are found throughout the property, supporting a wide range of vegetation (e.g., grassland, scrub, woodland, and coniferous forest; Figure 3).

Grassland Soils

Wright Hill Ranch's grassland soils are typical of marine and bench terraces, and are generally considered suitable for range and pastureland. They are characterized by slow to moderate permeability, rapid runoff, and high erosion potential. Over a quarter of Wright Hill Ranch is composed of the Laughlin soil unit, a shallow, loamy soil supporting upland grasslands of 10–25% slope. Laughlin soils consist of well-drained loams that have a sandy clay loam subsoil, underlain by fine-grained sandstone and shale. Another quarter of the property consists of Kinman loams on flatter claypan with small areas on slopes of up to 25%. The Kinman series consists of moderately well-drained loams with clay subsoil, underlain by fine-grained, hard, sedimentary rocks. About 9% of the property consists of Hugo-Atwell complex soils. While the USDA soil survey states this soil mainly supports forests, on Wright Hill Ranch it is covered in grassland with less than 10% slope. Kinman-Kneeland loam complexes form only around 3% of Wright Hill Ranch, forming claypan grassland slopes less than 10% just south of the western road entrance. These soils are characterized by rapid runoff and high erosion rates, with a depth to sandstone at 25–40 inches. A very small sliver on the northwest corner of the property touches a Sobrante loam area on grassland slopes less than 10%; this comprises less than 0.1% of the property. This series consists of well-drained loams with acidic clay loam subsoil, underlain by andesitic basalt at 20–40 inches.

Scrub and Woodland Soils

Other areas are formed of soils more characteristic of scrub and woodland areas. The Maymen series consist of well drained gravelly sandy loams underlain by weathered sandstone and shale bedrock at 10–20 inches, and are characterized by high to very high runoff and moderate permeability. Areas of Maymen soils support scrub and chaparral species and comprises about 6% of Wright Hill Ranch.

Kneeland soils comprise 12% of the property on coastal terrace uplands, with half on slopes of 10–25%, and half on slopes less than 10%. Kneeland soils consist of well-drained loams with clay loam subsoils, underlain at 25–45 inches by weathered graywacke. These soils demonstrate slow runoff and only slight erosion hazard, and generally support a mixture of shrub habitat and mixed forests as well as grassland, although they can be used for growing potatoes and some row crops.

Forest Soils

Around 18% of property's soils are composed of Hugo very gravelly loam. Nearly half of these areas are on moderate slopes of 10–25%, with a very small section of one east-facing slope measuring greater than 40%. This series consists of well-drained very gravelly loams with gravelly sandy clay loam subsoil, underlain at 30–60 inches by weathered, fine-grained sandstone and shale. Most Hugo soils were covered in conifer or mixed conifer-hardwood forests with shrub understories and were used for historical timber production or cleared for low-productivity forage seeding. Only about 2% of the soils, along the northeastern property line, consist

of Hely soils. These areas are covered in a mixed conifer-hardwood forest on slopes under 25% and are well drained with rapid permeability and slow runoff.

3.3 CLIMATE AND PRECIPITATION

Wright Hill Ranch is located in the California Mediterranean coastal zone, where temperatures remain relatively cool throughout the summer. Summer nighttime temperatures usually drop into the low 50s Fahrenheit, and rarely reach freezing during the winter (CDPR 2007). Average yearly rainfall is approximately 33 inches, and is concentrated during the November-May winter period; coastal fog during the summer can provide significant moisture, particularly at lower elevations. However, the property's grasslands usually dry and become unproductive during the summer. Vegetation on west-facing slopes and ridgetops can be subject to persistent onshore winds.

3.4 WATERSHEDS

Sitting atop the drainage divide for three watersheds, Wright Hill Ranch supports twelve ephemeral drainages (Figure 4); there are no perennial streams on the property. To the southeast, the largest section of the property (over 650 acres) contains the drainage of Rough Creek, a tributary to Scotty Creek, and several tributaries to Rough and Scotty Creeks. Approximately 325 acres of the northern part of the property, including Pomo Creek and several large unnamed gulches, drain into the Willow Creek watershed to the north. Both Willow Creek and Scotty Creek support threatened salmonid populations, which are limited by sedimentation and nutrient runoff from upland properties such as Wright Hill Ranch. The remaining western portion drains into several unnamed coastal gulches, including the nearly two-mile long Furlong Gulch, which flow into the Pacific Ocean.

Bodega Head to south (above) and views to north (below) from the property.

3.5 VIEWSHEDS

Hosting the highest point in the area's coastal zone between Bodega Bay and the Russian River at the peak of Wright Hill, Wright Hill Ranch plays a key role in the scenic beauty of the Sonoma Coast. Sweeping views of the property can be had from the coastline and from adjacent properties. While on the property, visitors are provided with unobstructed views of Bodega Head to the south and the Jenner Headlands to the north. Limited development throughout this region has allowed for the preservation of panoramic vistas of rolling grasslands, mixed forests and redwood groves, rock outcroppings, and the Pacific Ocean.

4 BIOLOGICAL RESOURCES

4.1 INTRODUCTION

Wright Hill Ranch supports coastal grasslands, scrub, woodlands, forests, and wetlands. This varied vegetation carpets a topographical matrix of rolling uplands, shallow to deep canyons, riparian corridors, and rock outcrops. Wright Hill Ranch supports a wide variety and abundance of wildlife species due in part to this diverse vegetation and topography. At least 354 plant taxa have been documented on the property; and 250 of them are native to Sonoma County. At least 86 bird species have been documented on the property, and there is potential habitat for 13 reptile, 11 amphibian, and 47 mammal species. This section describes Wright Hill Ranch's vegetation and potential and observed wildlife, including special-status species. A discussion of management considerations is included at the end of the section with specific recommendations provided in *Section 10*.

4.2 DATA COLLECTION METHODS

4.2.1 BOTANICAL

Initial botanical work for this report was carried out in 2009 by Peter Warner, and updated in 2014 by PCI. An extensive background literature and database search was completed to help characterize the botanical resources on the property. These sources include: a topographical quadrangle map for the area (USGS 1943); aerial photography from 2007, 2011, and 2013; and a geologic map of California (USGS 2009). The California Department of Fish and Wildlife (CDFW) *List of Vegetation Alliances and Associations* (2010) and the Manual of California Vegetation (Sawyer et al. 2009) were reviewed for vegetation alliances potentially present on the property.

Following compilation of potential vegetation types, the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2014) was consulted to determine the potential for habitat that might support special-status plant species, subspecies, or varieties. Plant taxa listed in the Inventory, and identified with a California Rare Plant Rank, meet the provisions of the federal Endangered Species Act, the California Endangered Species Act, the Native Plant Protection Act (Section 1901, Chapter 10), or the California Fish and Wildlife Code (Sections 2062, 2067). The Inventory was queried to assemble a potential special-status plant list the met the following criteria: a) vegetation types common to western Sonoma County, b) substrate (geologic) types known from the Sonoma County coastal area, c) elevations up to 1,000 meters, and d) geographical location. The Jepson Flora Project (2014), Calflora (2014), Baldwin et al. (2012), Best et al. (1996), and Golec (2005) provided further distributional information on rare plants with potential to occur on the property.

Descriptions of the vegetation types on Wright Hill Ranch are based primarily on botanical observations developed during a series of eight site visits conducted during a single phenological season from February through August 2009. The survey dates span the peak phenologies (plant growth and development phenomena, including flowering and fruit production) for most taxa known to exist in the climate, habitats, and vegetation types of western Sonoma County. Floristic surveys were conducted in the manner generally prescribed by CNPS (2001). Site visits included assessing ecological conditions across the property and within the specific vegetation types, especially noting conditions that might influence vegetation structure, composition, and cover. No bryophyte (moss and other non-vascular plants), lichen, algae, or fungi identifications were included in the Wright Hill Ranch inventory.

Additional reconnaissance-level surveys were conducted by PCI in early summer 2014 to update botanical information. Plant nomenclature was updated based on the Jepson Flora Project (2014), with vegetation sensitivity information updated according to CDFW (2010). PCI also reviewed CNDDB records for more current documentation of special-status plants (CDFW 2014).

4.2.2 WILDLIFE

The following section includes a discussion of the background review completed by PCI's wildlife biologist prior to initiating field surveys and a description of the approaches used to identify and collect information on biotic resources present on the property.

Background Research

Prior to field work, existing literature and databases were consulted for background information on biological communities and features within the region, wildlife species composition, and potential occurrence of spe-

cial-status animal species[1] on the property. The list of potential wildlife species was based on a comparison of existing habitat conditions and presence of unique habitat features on the property, proximity to reported occurrences, and geographic range of subject species. The search focused on reported occurrences for the Duncans Mills 7.5' United States Geological Survey (USGS) map quadrangle (quad) where the property is located, surrounding quads (e.g., Arched Rock, Bodega Head, Camp Meeker, Valley Ford), and available references and studies. The review included, but was not limited to, the following resources:

- California Department of Fish and Wildlife (CDFW) Natural Diversity Database2 (CNDDB; CDFW 2014)
- Sacramento U.S. Fish and Wildlife Service (USFWS) Office Species Lists (USFWS 2014)
- Field guides and general references for birds, mammals, reptiles, and amphibians (Brown 1997; Jameson and Peeters 2004; Jennings and Hayes 1994; Kays and Wilson 2002; Shuford and Gardali 2008; Sibley 2000; Stebbins 2003; Zeiner et al. 1990)
- Local surveys and references for Sonoma County birds (Burridge 1995; Bolander and Parmeter 2000, ebird 2014, USGS 2014).

1 Special-status animal species include those species that are afforded legal protection under the federal and California Endangered Species Acts (ESA and CESA, respectively) and other regulations, including:

- Fish and wildlife listed or proposed for listing as threatened or endangered under the federal and California ESA or proposed for listing under the California ESA;
- Fish and wildlife species that are recognized as candidates for future listing by agencies with resource management responsibilities;
- California Species of Special Concern and Fully Protection species classified by CDFW
- Fish and wildlife species that otherwise meet the definition of rare, threatened, or endangered as described in the CEQA Guidelines.

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

General Wildlife Surveys

PCI conducted wildlife surveys of the property between January and August 2009. The purpose of the surveys was to characterize biological communities within the property, determine whether or not suitable habitat for special-status animal species was present, and evaluate the observable impacts of ongoing cattle grazing on wildlife resources. The surveys consisted of traversing the property on foot and evaluating representative habitats. Due to the size of the property and steep topography in some locations, certain areas were not surveyed.

During the surveys, an inventory was compiled of all animal species observed. Surveys were conducted with the aid of binoculars. Visual cues (e.g., nests, tracks, scat, burrows, and skeletal remains), calls, songs, and direct observations were used to identify wildlife. Habitat features associated with wildlife (e.g., woody debris, water sources, etc.) and other plant materials were examined for presence of mammals, amphibians, reptiles, and birds. Protocol-level surveys for special-status species were not conducted, nor were nocturnal or focused surveys conducted for invertebrates (insects, spiders, etc.), herpetofauna (amphibians and reptiles), or mammals; see *Data Gaps*. Appendices C and D include lists of potential and observed wildlife species.

Two additional reconnaissance-level surveys were conducted by PCI in May and June 2014 to update wildlife information. Nomenclature and listing status of special-status species were updated and current CNDDB records were reviewed (CDFW 2014). A bat habitat assessment and building survey was completed in May and June 2015 by Wildlife Research Associates (2015) to assess habitat suitability and use of the historic buildings by bats.

Focused Bird Surveys

Bird surveys of Wright Hill Ranch were conducted in an effort to collect baseline information on species composition and seasonal use of the property. Two separate types of surveys were completed.

Wright Hill Ranch was included in the annual volunteer Western Sonoma County Christmas Bird Count (CBC) conducted by Madrone Audubon Society, a county-wide winter bird survey over a two-week period around Christmas which documents species composition and

numbers of birds. Counts on Wright Hill Ranch were conducted on January 4, 2009, January 3, 2010, January 2, 2011, and January 1, 2012. During the counts, a group of birders would record the number of individual birds observed on the property over a several hour period.

Focused breeding bird surveys were also completed in April and May 2009. . The surveys were led by a professional biologist from PCI with assistance from volunteers from Madrone Audubon Society. The surveys were fashioned after protocols outlined in the Sonoma County Breeding Bird Atlas (Burridge 1995). The property was divided into seven blocks of approximately equal size, with each containing representative habitats. One to two birders surveyed each block to record individual birds, observe breeding activity, and assign a series of ranked breeding criteria codes. Codes are defined as follows: observed (species observed but no evidence of breeding; not in suitable habitats), possible (species observed in suitable breeding habitat or singing male present in suitable habitat during breeding season), probable (pair observed, permanent territory, courtship, copulation, visiting probable nest site, agitated behavior, or anxiety), and confirmed (carrying nest material, nest building, recently fledged young, occupied nests, carrying food, etc.).

The first breeding bird survey was conducted on April 19, 2009. Participants were Veronica Bowers, Jennifer Michaud, Len Nelson, Becky Olsen, Bob Speckels, Ken Wilson, and Patrick Woodworth. The second survey was conducted on May 24, 2009. Participants were Gay Bishop, Bill Doyle, Andy LaCasse, Jennifer Michaud, Len Nelson, Becky Olsen, Elaine Pruett, Claire Shurvinton, Ken Wilson, and Patrick Woodworth. Observations from the focused bird surveys (both WSCCBC and breeding bird surveys) are incorporated into the following resource descriptions and provided in Appendix C under the appropriate columns.

4.3 VEGETATION TYPES AND ALLIANCES

Vegetation types at Wright Hill Ranch include:

- coastal grassland (including rock outcrops)
- wetlands
- coastal scrub
- riparian woodland and scrub
- broadleaf upland woodland
- Douglas-fir forest
- coast redwood forest

These broad vegetation types are each comprised of multiple vegetation alliances. Alliance names and descriptions are based on the Manual of California Vegetation (Manual; Sawyer et al. 2009), with one additional alliance included that is not described in the Manual, but included provisionally here. These groupings are typically named for a dominant or characteristic species, and membership in the groups is usually defined by percent cover of those species. The table below shows the primary vegetation alliances present on Wright Hill Ranch (Table 4-1). The botanical inventory completed for this report did not use quantitative methods to describe and delineate vegetation alliances, so this list should be considered preliminary and not exhaustive. Vegetation alliances considered sensitive based on their CDFW (2010) rankings are noted with an asterisk. Vegetation alliances that may include one or more associations (finer-scale vegetation groupings) that are considered sensitive, and which may occur on Wright Hill Ranch, are noted with two asterisks.

Table 4-1. Vegetation Types and Alliances on Wright Hill Ranch

VEGETATION TYPE	VEGETATION ALLIANCES
Grasslands	Annual brome (*Bromus hordeaceus*, *B. diandrus*)
	California oatgrass (*Danthonia californica*)*
	Hairy oat grass (*Rytidosperma penicillatum*; provisional alliance)
	Harding grass (*Phalaris aquatica)*
	Perennial rye grass (*Festuca perenne*)
	Purple needlegrass (*Stipa pulchra*)*
	Tufted hairgrass (*Deschampsia cespitosa*)**
Coastal scrub	Coffeeberry scrub (*Frangula californica*)**
	Coyote brush (*Baccharis pilularis*)
	Hazelnut (*Corylus cornuta*)*
	Ocean spray (*Holodiscus discolor*)*
	Poison-oak scrub (*Toxicodendron diversilobum*)
	Wax myrtle scrub (*Morella californica*)*
Wetlands	Soft rush (*Juncus effusus*)
	Western (gray) rush (*Juncus patens*)

VEGETATION TYPE	VEGETATION ALLIANCES
Riparian scrub and woodland	Arroyo willow (*Salix lasiolepis*)*
	Himalayan blackberry (*Rubus armeniacus*)
	Pacific willow (*Salix lasiandra* = *S. lucida*)*
	Red alder (*Alnus rubra*)**
	Sitka willow (*Salix sitchensis*)*
Broadleaf upland woodland	California bay (*Umbellularia californica*)*
	Coast live oak (*Quercus agrifolia*)
	Oregon white oak (*Quercus garryana*)*
	Tanoak (*Notholithocarpus densiflora*) forest*
Douglas-fir forest	Douglas-fir (*Pseudotsuga menziesii*)**
Redwood forest	Redwood (*Sequoia sempervirens*)*

In general, plant species richness is high for a property of this size but at least in the grasslands, most of the dominant taxa are non-native. Many of the native plant species present are very limited in distribution, and for some species, individual plant numbers observed are very low. Total plant species richness (native and non-native species) was found to be greatest within the grasslands (156 species observed during the field surveys), and lowest in coast redwood forest (22 species observed). Forests and woodlands frequently have lower species richness than more open habitats because their more extensive tree cover tends to limit herbaceous cover.

A complete list of all plant taxa observed on the property is included as Appendix B. Vegetation types are mapped on Figure 5. This does not include disturbed vegetation along road surfaces and margins, and horticultural plantings around the ranch complex (the area of the historic house and adjacent outbuildings).

4.3.1 GRASSLANDS

Native forbs harvest brodiaea and California poppy

Grasslands are the most extensive habitat on Wright Hill Ranch, comprising approximately half of the landscape—though native-dominated grasslands are much more limited. Grasslands provide forage for livestock, native plant and wildlife habitat, carbon storage, and protection of soil and water resources. Grassland habitats include coastal grasslands, transitional grasslands, and rock outcrops.

Coastal Grasslands

Hairy oatgrass

The grassland vegetation on Wright Hill Ranch is, unless otherwise noted, a mix of native and non-native species. Many species present here are also common in coastal terrace prairie, but the upland aspect of the property, and the lack of dominance by tufted hairgrass *(Deschampsia cespitosa)* and other native bunchgrasses, distinguish it from true coastal terrace prairie. In this report, the "coastal grassland" category includes open areas transitional to other vegetation types as well as the rock outcrops that occur amid the grassy expanses.

Coastal grassland on the property occurs on slopes of all aspects, atop ridges, and across plateaus. Cover includes grasses, forbs, and herbaceous perennials. Trees and shrubs occur only as isolated small stands or individuals. Bare ground, especially on or near ridgetops and rock outcrops, is common. Soils range from the barren gravels of ridgetops to the claypans present in flatter areas.

The species that best characterizes the coastal grasslands only becomes evident in late spring or summer. Hairy oatgrass (*Rytidosperma penicillatum*) is a non-native, short-statured cespitose (clumping) perennial with sparse, narrow, short leaves; until flowering begins

in late spring or summer, it is not especially prominent. However, during summer, when stems bearing inflorescences (flowers, fruits, and seeds) mature, virtually all corners of the property's grasslands are visibly dominated by this species. The establishment of hairy oatgrass in the region may have been facilitated by historic sheep grazing. This species appears to displace native perennial grasses and to be capable of continuing spread (Cal-IPC 2014). It is also considered to reduce forage value (Crampton 1974).

Douglas' iris

Earlier in spring, a broader diversity of grasses and forbs (broad-leaved herbaceous plants) characterize Wright Hill Ranch's grassland vegetation. The most abundant early-flowering grass is the non-native annual soft chess (*Bromus hordeaceus*), with patches dominated by a variety of native and non-native forbs. Common natives include California dichondra (*Dichondra donnelliana)* and California poppy *(Eschscholzia californica)*; common non-natives include English plantain (*Plantago lanceolata*), subterranean clover (*Trifolium subterraneum*), and broadleaf filaree (*Erodium botrys).* Other common grasses include the native perennials California oatgrass (*Danthonia californica*) and blue wildrye (*Elymus glaucus*), and the non-native annuals silver European hairgrass (*Aira caryophyllea*), slender wild oat (*Avena barbata*), and hedgehog dogtail (*Cynosurus echinatus*). In late spring, the grassland features patchily extensive cover of yellow hayfield tarweed (*Hemizonia congesta* ssp. *lutescens*) and blue flax (*Linum bienne*).

As summer approaches, hairy oatgrass begins to flower, and by July is clearly the dominant grass. In cooler, moister sites, there are grassland patches dominated by perennial non-native purple velvet grass (*Holcus lanatus*) and, more occasionally, Harding grass (*Phalaris aquatica*).

Douglas fir regeneration in grassland

While the grassland flora includes numerous native taxa comprising the majority of grassland species, the relative cover of native forbs and grasses is typically less than 10%–15% in most areas. Native-dominated grassland stands are rare at Wright Hill Ranch, with nine mapped patches comprising less than 1% of the total grassland present. The most abundant native grassland species include California oatgrass, purple (*Stipa pulchra*) and foothill (*S. lepida*) needlegrass, tufted hairgrass, blue wildrye, Idaho fescue (*Festuca idahoensis*), junegrass (*Koeleria macrantha*), Douglas' iris (*Iris douglasiana*), bracken fern (*Pteridium aquilinum*), coast buckwheat (*Eriogonum latifolium*), lotuses (*Acmispon* and *Hosackia* spp.), lupines (*Lupinus* spp.), and elegant tarweed (*Madia elegans*). Grassland areas of high native cover are shown in Figure 10, and discussed in *Special-status Species and Vegetation Types* below.

Two transitional vegetation types adjoining grassland on the property are stands of coyote brush (*Baccharis pilularis*) and Douglas-fir (*Pseudotsuga menziesii*). These areas may represent habitats in transition from grassland to scrub or forest, respectively. The grassland areas with coyote brush cover generally retain many grassland constituent species in the understory, and the coyote brush density is relatively sparse in comparison to adjacent patches of coastal scrub. In contrast, along the grassland margins where Douglas-fir grows, the transition to dense thickets of young trees can be rather abrupt, with the dense conifer canopy often correlated

with an abrupt reduction in herbaceous diversity in its understory. These transitional areas may represent the recovery of woody types from past livestock grazing practices, or the spread of woody species into long-standing grassland areas. Further study of soil types, historic grazing and other management practices, fire history, and historic vegetation patterns would be needed to determine causes more definitively. In at least some cases, these woody species occur in grassland areas mapped as soil types that typically support woody vegetation.

Coast live-forever

Coast buckwheat

Rock Outcrops

Wright Hill Ranch features many exposed islands of bedrock within the grassland matrix; these are also present within other vegetation types, though often not as apparent there due to cover by shrubs or trees. In terms of topography, the outcrops span a range of landforms from steep, craggy spires and bulwarks through more modest piles of boulders, to thin domes or bulges of bedrock or gravel with little or no distinguishing profile. Presumably composed of substrate more resistant to erosion than adjacent rocks, soils in the vicinity of these outcrops are generally less well developed than adjacent soils, or are lacking altogether. Ecologically, these outcrops provide refugia for a number of organisms, including vascular plants, mosses, lichens, and small animals.

The floristic composition of the outcrops is highly variable. Some outcrops, especially the largest boulders, are rich in native plant diversity (Figure 10). Many of the larger outcrops feature numerous crevices and nooks and wind-shelters that provide habitat for woody plants. Some of the largest individual boulders support a diversity of native succulents [coast live-forever (*Dudleya farinosa)* and stonecrop *(Sedum spathulifolium*) and other species typical of coastal bluff scrub. The smallest outcrops often support just a few non-native taxa such as sheep sorrel (*Rumex acetosella*) and smooth (*Hypochaeris glabra*) and rough cat's ear (*H. radicata*). Other common forbs and non-native annual grasses that appear to thrive on relatively thin, stony soils, if not on the most barren rock surfaces, include dichondra, California poppy, soft chess, and ripgut brome (*Bromus diandrus*).

4.3.2 COASTAL SCRUB

Coastal scrub, a shrub-dominated vegetation type, comprises approximately 10% of the property. It provides important wildlife habitat, protects soil from erosion on slopes and along many of the drainages, and supports primarily native vegetation.

Ocean spray

Coastal scrub on Wright Hill Ranch generally occurs on slopes, with significant stands also atop some ridges and along seasonal drainages, and in some areas encroaches into grasslands. Scrub cloaks both north- and south-facing slopes above Furlong Gulch and the upper slopes of the west fork of Rough Creek, covers many lower slopes across the property's southern exposure, and inhabits patches around several rocky outcrops.

Pink-flowering currant

Like grassland vegetation, species composition in Californian scrub plant communities is highly variable, influenced by climate, soils, hydrology, fire regimes, and many other factors. On Wright Hill Ranch, coastal scrub vegetation is primarily characterized by coyote brush, although many areas feature significant cover by other native species including ocean spray (*Holodiscus discolor*), hazel (*Corylus cornuta var. californica*), California coffeeberry (*Frangula californica*), poison-oak (*Toxicodendron diversilobum*), Pacific wax-myrtle (*Morella californica*), and blue blossom (*Ceanothus thyrsiflorus*). Shrubs that are particularly common in relatively moist areas include snowberry (*Symphoricarpos albus var. laevigatus*), pink-flowering currant (*Ribes sanguineum var. glutinosum*), hairy honeysuckle (*Lonicera hispidula var. vacillans*), oso berry (*Oemleria cerasiformis*), roses (*Rosa californica, R. nutkana*), thimbleberry (*Rubus parviflorus*), and salmonberry (*Rubus spectabilis*).

In some shrub stands, herbaceous diversity is relatively robust, perhaps in part because the canopy is composed of several deciduous shrub species (e.g., *Holodiscus, Corylus, Toxicodendron*) that allow significant light penetration to the soil, but also afford some seasonal protection from maximum insolation and heating. Prominent, characteristic herbaceous plants of coastal scrub habitat are natives including cow parsnip (*Heracleum maximum*), bee plant (*Scrophularia californica*), sticky monkeyflower (*Mimulus aurantiacus*), sword fern (*Polystichum munitum*), California blackberry (*Rubus ursinus*), bracken (*Pteridium aquilinum var. pubescens*), hedge-nettle (*Stachys rigida* var. *rigida*), false Solomon's-seal (*Maianthemum racemosum, M. stellatum*), stinging nettle (*Urtica dioica*), coast (*Marah fabacea*) and Oregon (*M. oregana*) man-root, Franciscan paintbrush (*Castilleja subinclusa* ssp. *franciscana*), Indian thistle (*Cirsium brevistylum*), fringe cups (*Tellima grandiflora*), and Douglas' iris.

Many scrub areas also include an open canopy of emergent Douglas-fir trees; these Douglas-firs are of varying ages but many are mature enough to reproduce. Some of the more mature Douglas-firs provide habitat for the epiphytic leather fern (*Polypodium scouleri)*.

Non-native plant cover is limited in the coastal scrub at Wright Hill Ranch, but a few invasive non-native taxa, including Cape-ivy (*Delairea odorata*), Himalayan blackberry (*Rubus armeniacus*), cherry (*Prunus* sp.), and poison-hemlock (*Conium maculatum*) are present.

4.3.3 WETLANDS

Springs and seeps, generally isolated pockets of surface water, are scattered across Wright Hill Ranch (see *Riparian Woodland and Scrub* section for description of vegetation along continuous drainages). As with that of rock outcrops, the flora of seeps and springs is generally more distinctively differentiated from adjacent vegetation within grass- and herb-dominated plant communities than in shrub- or tree-dominated types.

Invasive purple velvet grass

Cow parsnip

Most seep and spring areas are well delineated along the upper edge of surface emergence, with fairly distinct disjunctions in plant cover or composition. Water accumulates, to variable degrees, below the emergence areas as a result of site-specific topography and soil types. Some of these resulting pocket wetlands soon narrow into more or less active stream channels, while others dissipate downslope more gradually, forming small marshes or fanning more broadly across gentler slopes into patches of scrub or riparian vegetation. Some of these seeps remain active through summer while others dry out, at least on the surface, by mid-summer.

Unlike rock outcrops in grassland, springs, and seeps are generally characterized by relatively few plant taxa, and prevailing cover mostly of grasses, rushes, and sedges. Within areas of surface saturation, generally including standing water and mud with a high organic component, non-native purple velvet grass, perennial ryegrass (*Festuca perennis*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), and weak mannagrass (*Glyceria declinata*) are common. Other prominent rushes and sedges include native gray rush (*Juncus patens*), Pacific rush (*J. effusus* ssp. *pacificus*), and wonder-woman sedge (*Carex gynodynama*). Common forbs include non-native pennyroyal (*Mentha pulegium*), sheep sorrel (*Rumex acetosella*), and clustered dock (*R. conglomeratus*), and native common monkeyflower (*Mimulus guttatus*). Some springs also support numbers of non-native Italian thistle (*Carduus pycnocephalus*), or species transitional to coastal scrub, such as native California blackberry (*Rubus ursinus*), thimbleberry (*R. parviflorus*), and cow parsnip.

Some of the springs that have been tapped for watering livestock, and adjacent wet areas, have reduced vegetative cover due to cattle trampling. To some degree, these developed springs also appear to support a reduced proportion of native flora, but this distinction has not been quantitatively verified. The effects of livestock on native plant composition at the seeps merits further study. Regardless of their plant composition, wetlands are of particular importance for land management due to their important hydrologic and wildlife functions, and should be protected from livestock overuse.

4.3.4 RIPARIAN WOODLAND AND SCRUB

Sitting atop the drainage divide for three watersheds, Wright Hill Ranch supports 12 ephemeral stream channels. These habitats and the vegetation they support serve many important functions in the landscape. Healthy aquatic habitats can slow winter storm flows, increase infiltration of runoff into the soil, protect streambanks from erosion, and improve water quality. These areas also provide critical habitat, movement corridors, and water for wildlife. As our climate changes, aquatic areas may become even more important as naturally resilient habitats, thermal refugia, and migration corridors.

Riparian woodland and scrub occurs in narrow corridors along stream channels on the property. Both vegetation types include species that thrive with greater access to water and are not generally found in adjacent upland areas.

Red elderberry

Along California's North Coast, riparian woodlands are often characterized by red alder (*Alnus rubra*), a relatively small, deciduous tree, and one or more species of willow (*Salix* spp.). This is typical on Wright Hill Ranch, where red alder is associated (in Furlong Gulch and along the west fork of Rough Creek and a few other smaller streams) with arroyo (*Salix lasiolepis*), shining or Pacific (*S. lasiandra* ssp. *lasiandra*), or Sitka (*S. sitchensis*) willows. The tree layer along the low- to moderate-volume streams is often intermittent, with considerable cover by shrubs.

Riparian shrubs include creek dogwood (*Cornus sericea* ssp. *sericea*), red elderberry (*Sambucus racemosa var. racemosa*), twinberry (*Lonicera involucrata*), Pacific wax-myrtle (*Morella californica*), thimbleberry, and salmonberry.

Although not strictly typical of riparian corridors, several woodland or forest trees comprise a significant component of the canopy along some drainages. These include redwood (such as along Rough Creek), Douglas-fir (in Furlong Gulch), and California bay. Occasional tanoak (*Notholithocarpus densiflorus*) and bigleaf maple (*Acer macrophyllum*) are also present.

Western red columbine

Sticky monkey flower

The herbaceous component of the riparian vegetation includes many species common or occasional in coastal scrub, such as California blackberry, stinging nettle, lady (*Athyrium filix-femina*) and chain (*Woodwardia fimbriata*) ferns, and coast hedge-nettle (*Stachys chamissonis*). Relatively uncommon plants on Wright Hill Ranch that were observed in this type, as well as in moist places in coastal scrub, include giant trillium (*Trillium chloropetalum*), water parsley (*Oenanthe sarmentosa*), western columbine (*Aquilegia formosa*), and meadow-rue (*Thalictrum fendleri* var. *polycarpum*).

Riparian vegetation on the property is mostly native, although pockets of non-native taxa [Himalayan blackberry, jubata grass (*Cortaderia jubata*), purple velvet grass, poison-hemlock, et al.] grow along stream reaches that lack a substantial canopy of woody plants. Some intermittent streams, especially those drain-

ing western and southern slope exposures, have little cover by woody plants and the herbaceous cover along such reaches is often more characteristic of springs and seeps. Along other reaches dominated by forest trees and shrubs — much of Rough Creek, parts of Furlong Gulch, and tributaries of Willow Creek — vegetation also includes elements of forest and woodland types.

4.3.5 FORESTS

Native forests on Wright Hill Ranch, comprising approximately 40% of the landscape, are dominated by mixed broadleaf upland forests, remnant redwood groves, and mature California bay and Douglas-fir. These habitats provide valuable forage and cover for wildlife, maintain soil stability, protect water quality, and add to the beauty of the property for human visitors. Several listed wildlife species likely call these areas home including northern spotted owl and Sonoma tree vole.

Forest types on Wright Hill Ranch intergrade extensively; Douglas-fir is common along the perimeters of redwood stands and as an emergent tree in broadleaf forest (and in coastal scrub); tanoak occurs in all the other forest types; California bay is common on slopes with Douglas-fir and along Rough Creek with redwood; and so on. Within the broadleaf upland forest and Douglas-fir types, a few other hardwood taxa are often present, most notably coast live oak, but these do not constitute stands of significant size.

Broadleaf Upland Forest

Douglas fir seedlings in the shade of an oak

Both physically and compositionally, the broadleaf upland forest at Wright Hill Ranch can be considered, throughout much of its distribution, as a transitional vegetation type. It supports many emergent Douglas-firs and harbors canopy-gaps occupied by shrubs typical of coastal scrub. The most common trees in this forest are California bay and tanoak; more open stands may include significant cover by coast live oak or California buckeye (*Aesculus californica*); some stands have Pacific madrone (*Arbutus menziesii*). One small ridge-top patch of this forest type, in the north-central part of the property, supports a dense stand of Oregon white oak, somewhat cryptic amidst tanoak and bay trunks and foliage. The property also supports a number of relatively homogeneous California bay groves, some located in the shelter of rock outcrops along the western side, and one grove of mature trees adjacent to the main ranch road towards the eastern property boundary.

Denser stands of the evergreen trees (e.g., bay, tanoak) have a relatively limited understory of shrubs, but canopy openings and rocky outcrops feature shrubs such as toyon (*Heteromeles arbutifolia*), hazel, and poison-oak, while moist or cooler slopes are inhabited with shrubs like black huckleberry (*Vaccinium ovatum*), ocean spray, and wood rose (*Rosa gymnocarpa*). Hairy honeysuckle is abundant, in both its groundcover and vine-like forms. A few straggling stems of Oregon-grape (*Berberis aquifolium var. aquifolium*) occur in a stand of broadleaf forest near the property's southeastern corner, near Rough Creek.

In addition to emergent Douglas-fir trees forming an intermittent upper canopy, the understory, in places, is rich in Douglas-fir seedlings and saplings; in many locations, this is the most abundant plant in the understory, in terms of cover. Otherwise, the broadleaf forest herbaceous layer is often sparse or barren, with moderate to dense accumulations of leaf litter. Some more open stands of trees show signs of extensive hoof-trampling, and livestock trails through the forest are widespread. The scattered herbs include native sword fern (*Polystichum munitum*), wood fern (*Dryopteris arguta*), modesty (*Whipplea modesta*), Pacific snakeroot (*Sanicula crassicaulis*), milk maids (*Cardamine californica*), sweet cicely (*Osmorhiza berteroi*), and wood strawberry (*Fragaria vesca*).

Invasive plant populations are limited in the property's woodlands. One population of English ivy (*Hedera helix*) was observed at the edge of fir forest in the eastern part

of the property. Milk thistle (*Silybum marianum*) occurs in some of the bay groves heavily used by cattle, and at the edges of other isolated tree canopies where cattle congregate for shade. Some of the isolated bay groves in the western part of the property are frequented by cattle, and some soil erosion is evident. Scattered within this vegetation type are signs of infestation (leaf-tip staining on bay) by *Phytophthora ramorum*, the pathogen that causes Sudden Oak Death.

Douglas-Fir Forest

Black huckleberry

Douglas-fir forest is most common on the north- and east-facing slopes at Wright Hill Ranch, and the greater proportion of this vegetation is in the eastern half of the property. The best representative, contiguous stands of this forest occurs across the northern slope, upland ridges in the northeast, and on east and north aspects above the west fork of Rough Creek to the property's eastern boundary. However, Douglas-fir trees, saplings, and seedlings occur in almost all other vegetation types. In terms of individual plants, Douglas-fir may be the most abundant tree species on the property.

Toyon

This forest type is best represented within stands of large stem-diameter, reproductively mature Douglas-fir trees, even though forest elements extend well beyond such stands of older trees, including into other vegetation types. Mature forest comprises much less than the total area mapped as this type, which includes many thickets of younger trees and transitional areas of dense sapling growth. In the more open stands of mature trees, many exceed one meter in diameter, some with large, lower limbs over 30 centimeters in diameter. The density of trees is much lower than in the presumably younger or more transitional stands, with sparser, mostly herbaceous understory growth.

Douglas-fir is the dominant tree in the upper canopy, with scattered redwood trees (*Sequoia sempervirens*) sometimes present. Where present, the lower tree canopy is typically tanoak, with California bay sometimes present, and occasionally madrone. Shrub cover is often sparse or lacking, but the most common shrubs are black huckleberry and tanoak, with hazel and toyon sometimes present. Poison-oak is generally more common in this vegetation as a clambering vine, as opposed to the shrub form this species assumes in more open habitats.

Coast redwood

Herbaceous cover is usually quite sparse, except in canopy gaps. The most common forest floor taxa include modesty, hairy honeysuckle, sweet cicely, woodland madia (*Anisocarpus madioides*), Hooker's fairy bells (*Prosartes hookeri*), slender-footed sedge (*Carex leptopoda*), California bedstraw (*Galium californicum*), wood (*Dryopteris arguta*) and sword (*Polystichum munitum*) ferns, and any of several forest grasses, such as blue wildrye, Geyer's melic (*Melica geyeri*), slender hairgrass (*Deschampsia elongata*), and nodding oatgrass (*Trisetum canescens*). All of these are native species. Invasive non-native plant populations are uncommon in the property's Douglas-fir forests.

Coast Redwood Forest

Defined by a predominant layer of coast redwood in the upper canopy, this forest is limited to a few stands in the northeastern to southeastern parts of the property. Three such stands occur in relatively upland locations, across north- to east-facing slopes or near the tops of ridges, while two others are situated within riparian zones: in the southeast along Rough Creek, and in the northeast along a southern tributary of Willow Creek. Upland stands are generally mixed with Douglas-fir, with tanoak in the lower tree canopy, while riparian stands have a sparser subcanopy of other trees, such as California bay and tanoak.

Redwood sorrel

Shrub cover is similar to that of Douglas-fir forest, with black huckleberry, shrubby tanoaks, and hazel common; some canopy gaps are characterized by significant patches of blue blossom. The herbaceous elements, while not extensive in cover, are generally distinctive. More widespread species include modesty, sword fern, sweet cicely, and hedge-nettle. Species more limited to redwood forest include redwood sorrel (*Oxalis oregana*), calypso orchid (*Calypso bulbosa*), smooth violet (*Viola glabella*), western wake robin (*Trillium ovatum*), Smith's fairy bells (*Prosartes smithii*), and trail plant (*Adenocaulon bicolor*). In many areas, deep litter, composed mostly of redwood and tanoak leaves and twigs, appears to preclude dense growth of forbs.

Most of the trees in these redwood stands are growing from old stumps, evidence of a past history of timber harvest; many trees, re-sprouts or not, have attained significant diameters. Fire scars are evident at the bases of many of the larger trees, with "goose-pen" hollows formed in some lower trunks where fire damage was more extensive. Across the floors of both Douglas-fir and redwood forests, large downed trunks and branches persist, evidence of past storm events and remnants of harvesting activities. Other than sprouts from cut stumps and logs, redwoods do not appear to be regenerating in substantial numbers, although an occasional sapling or young tree can be found growing along a forest edge or in adjacent scrub vegetation.

Livestock use is evident in the redwood stand adjacent to the main ranch road, just east of the road's passage from grassland to wooded habitats. The understory in this large patch has been degraded significantly by cattle trampling and grazing; although the trees themselves do not appear to be experiencing significant impacts, there is little to no apparent seedling regeneration there.

4.3.6 RUDERAL VEGETATION AND HORTICULTURAL PLANTINGS

In addition to the natural vegetation types present on the property, two categories of vegetation have been strongly shaped by human uses on the ranch: roadside vegetation and horticultural plantings around the ranch complex.

The plant species along road corridors are primarily ruderal or early successional. Because of the compacted gravel and soil on the road treads, as well as continual force applied by motor vehicles and animal and human foot-traffic, most plants are herbaceous and low-growing in form. Vegetation is mostly non-native, including such disturbance-adapted species as field bindweed (*Convolvulus arvensis*), filarees (*Erodium* spp.), and annual grasses. However, a few hardy natives that tol-

erate trampling and compacted soil are also present, including California oatgrass and dwarf cudweed (*Hesperevax sparsiflora* ssp. *sparsiflora*).

Vegetation around the ranch complex includes horticultural plantings such as blue gum (*Eucalyptus globulus*), butterfly bush (*Buddleja* sp.), oleander (*Nerium oleander*), fuchsia (*Fuchsia* sp.), and rose (*Rosa* spp.). None of these plantings appear to be actively spreading, but a few (i.e., *Amaryllis, Narcissus*) also occur elsewhere on the property. A few locally native taxa (e.g., *Polystichum*) are also among the plants around the house.

4.4 WILDLIFE COMMUNITIES

Wright Hill Ranch supports a wide variety and abundance of wildlife species due in part to the diverse vegetation types from native grasslands, seasonal wetlands, and riparian habitats, to redwood, California bay, and coastal scrub. This diverse mixture of habitats provides nesting habitat, food, shelter, and movement corridors for a number of native wildlife species. During wildlife surveys of the property, 3 reptiles, 1 amphibian, 86 bird, and 12 mammal species were documented with potential habitat for many more species.

Three general categories of environmental factors determine the variety and abundance of animal species within an area such as Wright Hill Ranch. These habitat features include vegetation types, physical factors (e.g., soils, climate, etc.), and disturbance factors. The species described below are those that would be expected to occur on the property where suitable habitat exists. Although the characteristic assemblages of species occur predictably within certain vegetation types, it should be recognized that relatively few species are restricted to a single habitat, and, indeed, some species may require more than one habitat type.

Anna's hummingbird

Appendix C provides a list of all of the bird species observed on the property. The list of birds may underrepresent the actual number of species with potential for occurrence on the property due to the seasonal nature of some species and rarity of others. In addition, owls may not be accurately represented in the table, as nocturnal surveys were not conducted. Appendix D provides a list of all of the reptile, amphibian, and mammal species documented or potentially occurring on the property based on a comparison of habitats and the geographic range of species overlapping the property.

The following discussion includes a general summary of wildlife typically associated with each habitat on the property as based on regional occurrence as well as the field observations. Wildlife species' common names in the text are used because they are unequivocal. Additional life history and occurrence information on special-status wildlife is provided in the section which follows.

Lark sparrow (Len Nelson)

Grasslands

Coastal grasslands are habitat for a range of wildlife species. They provide nesting cover and foraging opportunities in the form of seeds and other plant parts, attracting prey species such as small rodents. Grassland songbirds on Wright Hill Ranch are abundant including horned lark, savannah sparrow, grasshopper sparrow, and western meadowlark, which use the property for breeding. Species such as the western bluebird and Say's phoebe also use grasslands especially when there are adequate perches such as fences from which to forage. Predatory hawks and owls, including northern harrier, American kestrel, white-tailed kite, and barn owls, frequent these areas. Small vertebrates and invertebrates within the habitat are likely to serve as a food source for these birds and other predatory vertebrates.

American badger burrow

Subterranean foragers, such as Botta's pocket gopher and California mole, commonly occur in grassland habitats. In addition, mice (e.g., deer and harvest), California vole, black-tailed jackrabbit, coyote, and black-tailed deer are frequently observed. Within the property, American badgers are plentiful as evidenced by the abundance of dens and hunting holes. Reptiles frequenting grasslands include western fence lizard, alligator lizard, and snakes such as gopher, rubber boa, racer, and garter. Bats may also forage over grasslands. Rocky outcroppings within the grasslands provide perching sites and added habitat complexity.

4.4.1 COASTAL SCRUB

Coastal scrub provides habitat for a variety of wildlife adapted to moist, shrub-dominated habitats. Mammals typically observed within this habitat type on Wright Hill Ranch include black-tail deer, coyote, northern raccoon, striped skunk, Botta's pocket gopher, and brush rabbit. Observed bird species representative of coastal scrub habitats include California quail, Allen's hummingbird, western scrub-jay, bushtit, Bewick's wren, wrentit, spotted towhee, song sparrow, white-crowned sparrow, and American goldfinch.

Rough-skinned newt

Riparian and Aquatic Habitats

Healthy riparian woodlands support a mixture of plant species, sizes, and ages that are structurally diverse. The ephemeral stream channels and adjacent moist riparian scrub/woodland occurring on the property are important habitat for a variety of aquatic-associated species. Salamanders (e.g., rough-skinned and California newts and California giant salamander) use channels seasonally. Aquatic macroinvertebrates serve as the food base for both terrestrial and other aquatic species. Due to a lack of perennial flow and pools and position in the watershed, stream channels on the property do not support fish; however, state and federally listed steelhead and coho salmon are known to occur downstream in Willow Creek and steelhead in Scotty Creek. Common reptiles found in the moist woodlands adjacent to the stream channels include sharp-tailed, ring-necked, and aquatic garter snakes.

Sierran treefrog

Wetlands and stream channels also provide an important water source for local wildlife. Primary bird members of structurally diverse riparian habitats include warbling vireo, tree swallow, Wilson's warbler, yellow warbler, Swainson's thrush, song sparrow, and black-headed grosbeak; however, these species are not restricted to this habitat type.

Wetlands occurring on the property, typically within the grasslands formed by coastal seeps or along drainages, provide seasonal habitat for additional wildlife species. Shallow pockets of water provide breeding habitat for common amphibians such as the Sierra tree frog, which is most active during winter months.

Due to the lack of deep pools with persistent water, federally listed as threatened and CDFW Species of

Special Concern, California red-legged frogs are unlikely to breed on the property but may use aquatic and upland habitats as foraging and aestivation habitat and during overland migration. California red-legged frogs are known to occur in the adjacent Willow and Scotty Creek watersheds. They are likely to occur upslope of these drainages on the property.

Persistent springs with water into late summer are also critical watering holes for local wildlife when other sources have dried up. Low-growing herbaceous plants (e.g., rushes and sedges) lining the wetlands provide cover and breeding habitat for many of the birds utilizing adjacent grasslands. Many grassland songbirds, including grasshopper and savannah sparrows, appear to be using the patches of rushes within the grasslands for nesting. Some species (e.g., swallows, Steller's jay, American robin) also rely on the exposed mud within these wetlands for construction of all or portions of their nests.

4.4.2 FORESTS

Forests provide suitable habitat for terrestrial birds, mammals, amphibians, and reptiles. Birds represent the most abundant and prominent wildlife taxa within these habitats. Year-round resident birds of the Wright Hill Ranch woodland and forest habitats include: chestnut-backed chickadee, Steller's and western-scrub jays, American robin, common bushtit, Bewick's wren, California towhee, spotted towhee, band-tailed pigeon, California quail, and dark-eyed junco. The most common finch species include house and purple finches. Additional migratory species potentially breeding on the property include Swainson's thrush, orange crowned-warbler, Wilson's warbler, Pacific-slope flycatcher, and vireos (e.g., Cassin's, Hutton's, and warbling). Tree climbing birds are also abundant and include pileated, acorn, downy, and hairy woodpeckers; white-breasted and red-breasted nuthatches; and brown creeper. Casual winter residents include winter wren, red-breasted sapsucker, ruby-crowned kinglet, varied thrush, and Townsend's warbler.

Dusky-footed woodrat nest

Forests also support suitable foraging and breeding habitat for raptors including American kestrel and Cooper's, sharp-shinned, and red-tailed hawks. Small vertebrates within the habitat are likely to serve as a food source for predatory birds. The large Douglas-fir and coast redwood are prime habitat for nesting raptors. Historically, old growth forests in the Willow Creek watershed and other coastal forests, including Wright Hill Ranch, may have supported breeding marbled murrelet — a special-status inland breeding seabird. No local sightings have been documented but positive confirmation is very difficult (USFWS 1997). Their presence on the Wright Hill Ranch property is unknown.

Bobcat

The dense, multi-layered forests that dominate the drainages on Wright Hill Ranch provide suitable foraging and nesting habitat for special-status northern spotted owl. These remote and relatively unfragmented drainages with limited human disturbance are ideal locations for this forest dwelling bird. There are a number of spotted owl territories documented in the adjacent Willow Creek watershed and along the Wright Hill Ranch property boundary. Additional nocturnal avian predators likely to occur on the property include western screech, great horned, northern pygmy, and northern saw-whet owls. Great horned and barn owls have been documented on the property.

The property's forested habitats, particularly those with dense understories and/or tree cavities, support a variety of mammals, providing escape, cover, and nesting sites. These densely wooded habitats provide protective cover and likely key migration corridors for native wildlife, especially those along the well-developed drainages. The presence of a large number of vertebrate species may serve as a significant food source for larger predatory mammals such as coyote, bobcat, and mountain lion. Some of the most commonly observed mammals include western gray squirrel, dusky-footed woodrat, and black-tailed deer. Dusky-footed woodrats, a primary food source for northern spotted owl, are plentiful on the property as evidenced by the number of shelters constructed of leaves, twigs, and other materials. The large stands of older growth Douglas-fir provide potential habitat for special-status Sonoma tree vole, a tree-dwelling rodent that lives almost exclusively within the trees and consumes fir needles. In addition, bats may forage over the property and roost within crevices and tree hollows.

Barn swallow nest

Native oaks on the property (Oregon white and coast live) serve as a significant resource for many wildlife species, providing food, shelter, and nest sites. Every aspect of the oak tree may be utilized as forage for native species including acorns, leaves, twigs, pollen, roots, and sap. Perhaps the most widely recognized source of food is the acorn. This high-energy food is used heavily by acorn woodpeckers, Steller's jays, western scrub jays, western gray squirrel, black-tailed deer, and dusky-footed woodrats. The use of acorns by a number of wildlife species is important for dispersal and colonization of trees. The entire tree from the canopy to the roots is used as shelter, as well as the layer of detritus around the base, which is used by a number of amphibians and insects. Individual trees are also important food storage sites for species such as the acorn woodpecker, which caches acorns for future consumption.

Barn swallows

Within the forest floor, woody debris piles and layers of duff undisturbed by cattle provide habitat for amphibians. Locally common amphibians include Oregon ensatina, California giant salamander, California slender salamander, and western toad; however, these species are not restricted to this habitat type (see *Riparian and Aquatic Habitats* above). Common reptiles of this community include western skink, western fence lizard, alligator lizard, and sharp-tailed, ring-necked, common kingsnake, rubber boa, and gopher snakes.

4.4.3 RANCH COMPLEX

The wildlife habitat value of developed areas is generally considerably less than in surrounding natural habitats and relatively few species use these areas in comparison. Wildlife species in the developed areas are

typically more acclimated to human activity and include species common in urban and suburban habitats such as western scrub-jay, California towhee, mourning dove, house finch, American robin, American robin, and non-native house sparrow, mockingbird, Norway rat, house mouse, and Virginia opossum. Exotic and ornamental trees and shrubs do provide roosting and potential nesting substrate for a number of bird species around the ranch complex. Most likely because the homestead is vacant or infrequently used, breeding birds are abundant in this area. Brewer's blackbird, European starling, Anna's hummingbird, and American goldfinch can be found nesting in or around the old home site. The barn and outbuildings are also occupied by barn swallows and house finches. Typically, barn owls take up residence in old abandoned barns; although no evidence of nesting was observed during the bird surveys, a barn owl has been sighted in the barn by LandPaths staff. Abandoned structures that are free from frequent human disturbance are also critical roosting area for bats. The ranch house and surroundings outbuildings support a number of bat species. The ranch house supports a bachelor day and night-roosting population of special-status Townsend's big-eared bat, a maternity day roost for Yuma myotis, and other roosting bats (Wildlife Research Associates 2015). Badgers have also been noted surrounding the ranch complex and may be burrowing under the house.

4.5 SPECIAL-STATUS SPECIES AND VEGETATION TYPES

4.5.1 LISTED PLANT SPECIES

Harlequin lotus

The background literature review identified the potential presence of 74 rare and unusual plant species, and two sensitive vegetation types, including north coastal scrub and coastal terrace prairie. While the two sensitive vegetation types do exist on the property, none of the 74 species were identified during the botanical inventories.

One species found on the property, harlequin lotus (*Hosackia gracilis)*, is classified by CNPS as Rare Plant Rank 4, a "watch list" category for native plant taxa that are of limited distribution but not currently considered at risk of extinction (CNPS 2014). Harlequin lotus is relatively widespread, though patchy, in seasonally mesic grassland areas, mostly south of the main ranch road. A population of California bottlebrush grass (*Elymus californicus*), also Rare Plant Rank 4, was found during botanical surveys just north of the property boundary. This population consists of a few scattered individuals in Douglas-fir forest along a former logging road; it is possible that additional individuals may also occur on Wright Hill Ranch proper, as it is locally abundant on the adjoining California State Parks' Willow Creek unit (P. Warner, personal observation).

In addition to the ranked plant species, western dog violet (*Viola adunca* ssp. *adunca*) plants are abundant in grassland on north- to northeast-facing slopes, north of the main ranch road, often near or within shrub or forest ecotones. This species is considered the primary larval host for the federally endangered Myrtle's silverspot butterfly (*Speyeria zerene myrtleae*; Butterfly Conservation Initiative 2014). Adult nectar plants observed on Wright Hill Ranch include coyote mint (*Monardella villosa)* and bull thistle (*Cirsium vulgare*; see *Special-status Wildlife Species* below).

4.5.2 SPECIAL NATIVE VEGETATION

Several relatively small areas were identified that merit special conservation protections, including rock outcrops, significant patches of native grasses, wetlands, and an old bay stand (Figures 5 and 10 above and Table 4-1.

Stonecrop

Rock Outcrops

Several rock outcrops support plant species not commonly observed elsewhere on Wright Hill Ranch. Immediately south of and within 15 meters of the west gate entrance to the property is a low-profile outcrop with a west-facing escarpment; it is perhaps 3 to 4 meters in height relative to surrounding topography. This outcrop supports one of the few stands of coast barberry (*Berberis pinnata*) observed on the property, although others are readily apparent in nearby coastal grasslands, and likely grow on more remote rock outcrops not explored during field surveys. Likewise, the only population of coast onion (*Allium dichlamydeum*) observed on the property grows there. This rocky outcrop also provides habitat for coast phacelia (*Phacelia californica*), coast buckwheat (*Eriogonum latifolium*), live-forever (*Dudleya farinosa*), and several other plant taxa lacking from the deeper soils of the surrounding scrub and grassland vegetation. None of these taxa is considered rare, yet their distributions on the property appear limited to one or a few of these rocky outposts.

Coast onion

In the south-central grassland, towards the southern perimeter of the property, are a number of prominent outcrops, and each one supports distinctive vegetation. One hosts a diversity of native and non-native grasses (including two native *Melica* spp.), goldenrods (*Solidago spp.*), and coffee fern (*Pellaea andromedifolia*), while another provides refuge for a wind-dwarfed stand of coast live oak and another of deerweed (*Acmispon glaber*). In the north-central grassland, immediately alongside the ranch road that trends towards Red Hill, one outcrop's sheer north face is draped with stonecrop (*Sedum spathufolium*), while its ledged summit is festooned with coast buckwheat. Other rock outcrops support scarlet delphinium (*Delphinium nudicaule*), coyote-mint, bracteate popcorn flower (*Plagiobothrys bracteatus*), and California saxifrage (*Micranthes californica*).

The largest rock outcrops have not been fully explored for plant life, as they cannot all be reached on foot. Some of these outcrops may host other unusual, or even sensitive, species.

Tufted hairgrass

Native Grassland

Native grassland species (including both grasses and forbs) occur scattered throughout the property's open habitats, mixed with non-natives. However, in several areas, native species are denser and/or more diverse. The most prominent of these is the south-facing slope above Furlong Gulch, which fosters significant stands of purple and foothill needlegrass, coast buckwheat, lotuses, lupines, and elegant tarweed. Many of the property's north-facing slopes also support native grasses and perennial herbs. Areas north of the main road feature a relatively robust diversity of native grasses, including tufted hairgrass, blue wildrye, Idaho fescue, and Junegrass.

Old bay stand

These areas also contain native perennial forbs such as Douglas' iris, bracken, hairy wood rush (*Luzula comosa*), California buttercup (*Ranunculus californicus*), blue-eyed grass (*Sisyrinchium bellum*), hedge-nettle, and vari-colored lupine (*Lupinus variicolor*). Grassland areas of relatively high native species cover are shown in Figure 10.

Bay Grove

A bay grove, containing trees of over five feet in diameter, is both ecologically and culturally significant. The area also provides shelter and shade for cattle, and as a consequence the herbaceous understory has been degraded. In parts of the stand that appear to be less heavily used by cattle, a native herbaceous understory of sword fern, trail plant, California blackberry, Pacific sanicle, and smooth violet is present.

Other groves of smaller bay trees occur in several other locations on the property, primarily in the western portion, in the shelter of large rock outcrops. These are visually interesting due to their sculpting by coastal wind, and also provide shade for hikers and cattle.

4.5.3 SPECIAL-STATUS WILDLIFE SPECIES

The background literature review and field surveys identified the potential presence of a number of special-status or animal species of interest within and around Wright Hill Ranch. Based on the suitability of habitat within the property and surrounding areas and proximity of recorded sightings, these species were evaluated for potential occurrence within the property. A number of special-status animals were identified as having a high potential to occur on the property or were observed during field surveys (Appendix C and D).

Western dog violet

All reported special-status or animal species of interest that occur in habitat types found within the property, and/or have reported sightings within close proximity, are described further in Appendix E. This includes a discussion of listing status, habitat requirements, and potential for occurrences on Wright Hill Ranch. A number of species reported on USFWS and CDFW species lists were excluded from the table or further discussion. They do not occur in habitat types found within the property and/or have no local occurrences and are unlikely to occur there. A map of regional occurrences of listed animal species is included as Figure 6.

The following descriptions include those special-status species identified as having a high potential for occurrence on Wright Hill Ranch, species observed during field surveys, and/or species of historical significance that warrant management consideration.

INVERTEBRATES:

Myrtle's Silverspot Butterfly

Status: Federally listed as Endangered

The Myrtle's silverspot butterfly (*Speyeria zerene myrtleae*) is a brown to orange butterfly with a wingspan of approximately 2.2 inches. They are brush-footed butterflies of the Family Nymphalidae. Myrtle's silverspots live in coastal dunes, scrub, and prairie habitats, within 3 miles of the coast. They generally prefer sites at less than 1,000 feet elevation, sheltered from the wind and within the fog zone, which provide a large numbers of adult nectar plants. Adult Myrtle's silverspots nectar on a number of species including, but not limited to, gum plant, yellow sand verbena, mints, seaside daisy, and non-native bull thistle, and false dandelion. Females lay eggs singly on or near dried stems of the western dog violet (*Viola adunca* ssp. *adunca*) and the entire reproductive cycle is dependent on this species. Historically, the Myrtle's silverspot butterfly was widespread in coastal areas from the Russian River south to San Mateo County.

Local Occurrence and Observations: There are four extant populations of Myrtle's silverspot butterfly: two in the Point Reyes Seashore, one on private land immediately north of the Seashore, and one in Sonoma County. It is possible that unknown populations still exist on private lands along the coast in Marin and Sonoma counties. Myrtle's silverspot butterflies were not observed during field surveys of the property; however, focused surveys were not conducted. Suitable larval host plants (western dog violet) are present on north to northeast facing slopes in grasslands habitats north of the main ranch road, often near or within shrub or forest ecotones within the property. Two sizable populations of host plants were identified on the property during the botanical assessment in 2009, but could not be verified in 2014 (Figure 10). Potential adult nectar plants (e.g., coyote mint and bull thistle) also occur on the property. Additional surveys of all rock outcrops and grassland habitats should be completed to map current locations of western dog violet host plants during the blooming season (April through August) to inform land management and for project sites in grassland habitat near outcrops. Adult flight season surveys should also occur, from late June to early September, to determine presence of the butterfly.

AMPHIBIANS:

California Red-legged Frog

Status: Federally listed as Threatened and CDFW Species of Special Concern

California red-legged frog

The California red-legged frog (*Rana draytonii*) is the largest native frog in the western U.S. with females reaching up to 5¼ inches in length and males being slightly smaller. They are most common in marshes, streams, lakes, reservoirs, ponds, and other water sources with plant cover. Breeding occurs in deep, slow-moving waters with dense shrubby or emergent vegetation from late November through April. Floating egg masses

are attached to emergent vegetation (e.g., *Typha* sp. or *Scirpus* sp.) near the water's surface. Tadpoles require 3½ to 7 months to attain metamorphosis. During the non-breeding season, California red-legged frogs can remain at the breeding site (in the presence or absence of water) or move into surrounding non-breeding habitats. Radio tracking of frogs in Marin County by Fellers and Kleeman (2007) noted the dispersal of frogs at a median distance of 500 feet from breeding sites (range of 100 to 4,600 feet). They also noted year-round, small-scale (<100-foot) movements around breeding sites. These results indicate the importance of uplands for non-breeding season and migratory corridor habitat. Adults eat invertebrates and small vertebrates. Larvae are thought to be algal grazers. Primary threats to this species include loss and degradation of habitat and non-native predators (USFWS 2002).

Local Occurrence and Observations: California red-legged frogs are known to occur immediately downstream of the property in the Scotty and Willow Creek watersheds. This species was not observed during field surveys of the property. Due to the lack of deep, perennial pools, frogs are unlikely to breed on the property. However, they are likely to use aquatic and upland habitats as foraging and aestivation habitat and during overland migration. The presence of California red-legged frog in all riparian drainages and wetland should be assumed for all future land management actions.

Grasshopper sparrow

BIRDS:

Grasshopper Sparrow

Status: CDFW Species of Special Concern

The grasshopper sparrow (*Ammodramus savannarum*) is a small, open-country sparrow named for its buzzy, insect-like song. They forage for insects and seeds. Breeding habitat preferences include grasslands of intermediate height mixed with clumped vegetation and interspersed with bare ground (Dechant et al. 2003). Nests are constructed on the ground and made of grasses and forbs. Breeding occurs from early-April through mid-July; they lay four to five eggs per nesting attempt and may raise multiple broods per season. Nests are vulnerable to predation and trampling. In California, grasshopper sparrows breed in foothills and lowlands along the coast and Central Valley. Threats to this species include urbanization, vineyard development, and fire suppression resulting in the conversion of grasslands to scrub (Shuford and Gardali 2008). The effects from grazing are variable. Locally, a grassland bird study completed by PRBO on the Jenner Headlands and adjacent Sonoma Coast State Parks lands found grasshopper sparrows to be one of the most abundant bird species on grazed grasslands (DiGaudio 2010).

Local Occurrence and Observations: Grasshopper sparrows are an uncommon summer resident in Sonoma County in ungrazed or lightly grazed grasslands (Bolander and Parmeter 2000; Burridge 1995). Grasshopper sparrows have been observed on the property during summer exhibiting breeding behavior. They are likely to forage and breed throughout the grasslands especially on the western slopes of the property.

Marbled Murrelet

Status: Federally listed as Threatened and State listed as Endangered

The marbled murrelet (*Brachyramphus marmoratus*) is an uncommon permanent resident of the west coast from California to Alaska. This species is permanent resident along the Sonoma Coast, but sightings are uncommon during the breeding season from May through July. This seabird forages for small fish and plankton in offshore areas and along the rocky coastline. It has an unusual nesting behavior. Unlike most alcids, it does not nest in burrows or cliff colonies, but uses old-growth forests dominated by conifers and red-

woods. Nesting may occur as far as 45 miles inland. A single egg is laid on a platform of lichen and moss on large tree limbs. Adult movements to and from the nest occur most often at dusk and dawn. Breeding success is very low. The decline of this species has been attributed to the loss of old-growth forests (USFWS 1997).

Local Occurrence and Observations: Marbled murrelet is commonly seen along the Sonoma Coast, but there are no confirmed breeding records in Sonoma County (Burridge 1995). However, a possible breeding confirmation was reported near the South Fork Gualala River in 2014 as part of the Sonoma County Breeding Bird Atlas update; this is the first possible breeding record for Sonoma County (USGS 2014). No birds have been documented inland during informal surveys of Red Hill in early 2000s, and they were not found during recent surveys of Armstrong Redwood State Reserve (B. O'Neil pers. comm. 2014). There is some speculation that older growth forests in the vicinity of Wright Hill Ranch may support this species. It is possible that the densely forested drainages on the property may provide nesting habitat for marbled murrelet. Nests are extremely difficult to locate. If present on Wright Hill Ranch, efforts to confirm presence would require a rigorous survey effort.

Northern Harrier

Status: CDFW Species of Special Concern

The northern harrier (*Cirus cyaneus*) is a low-flying hawk of open grasslands, marshes, and fields. It can often be seen flying low over the ground hunting for small mammals and birds. At far glance, this species looks like an owl with its owl-like facial disk to aid in hunting. Adult males have a grayish appearance while the female is brown from above, both show a distinctive white rump patch. Breeding occurs in open habitats and nests are constructed on or near the ground. Nests consist of a shallow depression lined with grass or platform of sticks and grass. Clutch size is typically 4 to 6 eggs. Young are capable of flight after about 30 days. Locally, this species typically breeds from April through July. Primary threats to this species include loss and degradation of habitat, nest site disturbance, unnatural predation pressure, and agricultural practices.

Local Occurrence and Observations: Northern harriers are a year-round resident in Sonoma County with numbers increasing in winter (Bolander and Parmeter 2000). This species has documented breeding occurrences along the Sonoma Coast (Burridge 1995). This species was documented on Wright Hill Ranch on multiple occasions during winter. It is possible it may also breed on the property as suitable foraging and breeding habitat is present.

Yellow warbler (Lisa Hug)

Yellow Warbler

Status: USFWS Bird of Conservation Concern and CDFW Species of Special Concern (nesting)

The yellow warbler (*Dendroica petechia)* is a brightly colored bird of riparian woodlands with willows, alders, and cottonwoods and wet meadows. They typically nest along stream courses but can occur in a variety of habitats during migration and on their wintering grounds. Nests are constructed in the fork of a tree or small shrub, usually three to six feet off the ground. Breeding occurs from April through late-July; average clutch size is four to five eggs per nesting attempt. Yellow warblers feed primarily by gleaning vegetation for insects from low levels to tree tops. This is one of the most widespread breeding warblers in North America. Although the primary threat to this species is loss of habitat, nests are also frequently parasitized by brown-headed cowbirds, especially in the west.

Local Occurrence and Observations: The yellow warbler is a fairly common summer resident in Sonoma County within riparian woodland habitats (Bolander and Parmeter 2000). Yellow warbler were observed on the property during the breeding season, but not confirmed.

Olive-Sided Flycatcher

Status: USFWS Bird of Conservation Concern and CDFW Species of Special Concern (nesting)

The olive-sided flycatcher (*Contopus cooperi*) is a larger flycatcher with a short tail and distinctive loud song, quick-three-beers. They nest in coniferous forests in canyons and along habitat edges where it uses high snags for perching. Insects are caught from the treetops. Nests are constructed typically in conifers from 5 to 70 feet off the ground. Breeding occurs in the northern coniferous forests and winters in the tropics. Locally, breeding occurs from May to August. Habitat degradation and loss are the primary threats to this species.

Local Occurrence and Observations: Olive-sided flycatchers are summer residents in Sonoma County (Bolander and Parmeter 2000; Burridge 1995). This species was documented during breeding bird surveys in suitable habitat and determined to be possibly breeding. The deep canyons and mature Douglas-fir forests are prime nesting habitat for this species.

Bryant's savannah sparrow (Lisa Hug)

Bryant's Savannah Sparrow

Status: CDFW Species of Special Concern

Savannah sparrows (*Passerculus sandwichensis)* are medium-size, streaked, greyish or brownish sparrows that spend most of their time on the ground, running or hopping in open, grassy or weedy habitats, and perching on grass stems or fences. Their diet consists primarily of animal matter (i.e., invertebrates) during winter, while seeds and fruit make up the bulk of their diet in winter. Open-cup nests are constructed on the ground in clumps or under matted vegetation. Adults when disturbed usually run along the ground, rather than take flight (Alsop 2001). The Bryant's subspecies (*P. s. alaudinus*) is restricted to a narrow coastal strip from Humboldt Bay to Morro Bay, in "tidally influenced habitats, adjacent ruderal areas, moist grasslands within and just above the fog belt, and infrequently, drier grasslands" (Shuford and Gardali 2008).

Local Occurrence and Observations: Savannah sparrows are a permanent resident in Sonoma County, becoming more widespread in winter (Bolander and Parmeter 2000; Burridge 1995). Savannah sparrows have been observed on the property during summer exhibiting breeding behavior. They are likely to forage and breed throughout the grasslands especially on the western slopes of the property.

Northern Spotted Owl

Status: Federally listed as Threatened and CDFW Species of Special Concern; candidate for protection at Threatened species under the State ESA (CDFW 2015)

The northern spotted owl (*Strix occidentalis caurina*) is an uncommon permanent resident of dense forest habitats in northern California and oak and oak-conifer habitats in southern California. This nocturnal species requires dense, multi-layered canopy cover for roosting sites. Spotted owls feed upon a variety of small mammals, birds, and large arthropods. Nest sites include tree or snag cavities or broken tops of large trees. The typical breeding period lasts from early March through June rearing two young per season. A pair of owls may use the same breeding site for five to 10 years; however, they may not breed every year. Individual territories are typically several hundred acres. The spotted owl has experienced a population decline due to the loss and degradation of existing mature and old growth forests. They are a fairly common permanent resident in Sonoma County where they occupy "old-growth coniferous forests of redwood, Douglas-fir or pines blended with smaller evergreen hardwoods" (Burridge 1995).

Local Occurrence and Observations: Spotted owls are a fairly common permanent resident in Sonoma County (Bolander and Parmeter 2000) and have a number of established territories within the Willow Creek watershed immediately to the northwest of the property (CDFW 2014). Spotted owls were not observed on the

property during field surveys. However, suitable habitat is present in the Douglas-fir, redwood, and mixed hardwoods throughout the property and owls may occur there year-round. Given the proximity of the property to documented owl occurrences, territory size of the species, and existing habitat conditions, Wright Hill Ranch is likely to support both breeding habitat and foraging habitat for nearby nesting birds. The presence of northern spotted owl should be assumed for all future land management actions.

BREEDING BIRDS

Most bird species, with a few specific exceptions, are protected under federal and state laws. Under the federal Migratory Bird Treaty Act (MBTA), it is unlawful to take, kill, and/or possess migratory birds at any time or in any manner, unless the appropriate permits are obtained. Protections extend to active nests, eggs, and young birds still in the nest. Birds and their nests are also protected under the State of California Fish and Wildlife Code (§3503 and §3503.5) and federal Bald and Golden Eagle Protection Acts. Disturbance activities in areas with suitable breeding habitat during the breeding period, typically mid-March to mid-August in this region (RHJV 2004), can result in direct losses to nests or disturbance to nesting birds. While not currently present on the property, heron and egret rookeries (colonial nest sites) also would be protected under the above-mentioned regulations and are considered a sensitive resource by CDFW.

Sonoma Tree Vole

Status: CDFW Species of Special Concern

The Sonoma tree vole (*Arborimus pomo*) occurs in coniferous forest in humid areas of northwestern California, where it is reported to be rare or uncommon. They are largely nocturnal and active year-round. Their home range generally consists of one to several Douglas-fir trees, whose needles are their primary food source. Needle resin ducts are removed before eating and often used to line the nest cup and nests are typically constructed from six to 150 feet above ground, preferably in tall trees, and located on outer branches or on whorls of limbs against the trunk. Breeding occurs year-round, with peak activity from February to September. The primary predators of voles are spotted owls, saw-whet owls, and possibly raccoons.

Local Occurrence and Observations: Sonoma tree voles are known to occur in the Willow Creek watershed and to the north on the Jenner Headlands (CDFW 2014). This species was not observed during field surveys of the property. However, suitable habitat for tree voles occurs in the Douglas-fir dominated habitats especially along the northwest and southeast facing drainages on the property. The presence of Sonoma tree vole in all Douglas-fir dominated habitats should be assumed for all future land management.

American badger burrow

American Badger

Status: CDFW Species of Special Concern

The American badger (*Taxidea taxus*) is a widespread, uncommon resident across California. They occur in a variety of habitat types (e.g., herbaceous, shrub, or forest habitats) with dry, friable soils. Badgers are characterized by their large claws, short legs, and black and white striped face. Adult badgers measure 30 to 35 inches in length, weigh an average of 12 to 16 pounds, and can live up to 12 years. They are carnivorous and consume primarily burrowing rodents but will also eat reptiles, insects, eggs, birds, and carrion. Badgers are territorial throughout the year with size of the territory dependent on the availability of food. Typical territory size is approximately three or four square miles. Territories may be shared. Badgers dig their own burrows which are often quite extensive. They are active year-round, although less active in winter. Mating occurs in summer and early fall with young (average 2 to 3) born in early spring. Badgers can tolerate some level of human activity.

Local Occurrence and Observations: American badgers are known to occur on the property; a single adult was observed during daylight near the ranch complex by Madrone Audubon and Gold Ridge RCD in November 2008, and another in the grassland areas east of there by Gold Ridge RCD staff in May 2009. Evidence of badgers (e.g., burrows and hunting holes) is found throughout the property especially in open grassland habitats. Focused badger surveys should be completed to map and identify habitat utilization and burrow density. The presence of this species will need to be considered for all future land management, especially any proposed work in open grassland habitats.

BATS

Wright Hill Ranch supports a wide variety of habitats which provide critical foraging and roosting habitat for a number of bat species. Within Northern California, there are approximately 15 bat species with known occurrences. Bats are highly mobile with many being migratory. Foraging habitats range from woodlands, forests, grasslands, to open water habitats. All of our local species are insectivorous and feed by echolocation. Bats use caves, mines, buildings, bridges, tree hollows, and other natural and man-made crevices for roosting. Two special-status bat species have reported occurrence in coastal Sonoma County. Additional bat species (i.e., hoary bat, fringed bat) identified as having moderate to high priority for conservation by the Western Bat Working Group, a local conservation organization comprised of agencies, organizations, and individuals, are reported within the region, but are not described here. A bat habitat assessment of the Wright Hill Ranch house and outbuildings was completed by Wildlife Research Associates (2015) as noted above.

Pallid bat

Pallid Bat

Status: CDFW Species of Special Concern

The pallid bat (*Antrozous pallidus*) occupies grassland, shrubland, woodland, and forest habitats at low elevations in California. It can most commonly be found in open, dry habitats with suitable rocky areas for roosting. This species can also be found roosting in caves, crevices, mines, hollow trees, and buildings during the day. Night roosts generally consist of more open areas such as porches and open buildings. Pallid bats feed on large flightless arthropods which they pick from they capture from the ground — a unique foraging strategy in comparison with other bat species. The pallid bat is a yearlong resident throughout most of its range. During the non-breeding season, both sexes may be found roosting in groups of 20 or more individuals. Young are born from April to July. As with many bat species, pallid bats are extremely sensitive to roosting site disturbance.

Local Occurrence and Observations: Pallid bats were not observed during field surveys of the property. Pallid bats have been documented in a number of roosts in western Sonoma County and may use both man-made structures and natural habitats on the property. The presence of this species will need to be considered for all future land management, especially any proposed work on the buildings and public uses of the ranch complex.

Townsend's Big-eared Bat

Status: CDFW Species of Special Concern; candidate for protection under the State ESA (CDFW 2015)

Townsend's big-eared bat (*Corynorhinus townsendii*) occupies low to mid-elevation mesic habitat including, riparian, mixed forest, coniferous forest, prairies, and agricultural lands. This species emerges in late evening and forages for small moths and insects which it picks from leaves. Their flight pattern is slow and maneuverable and they are capable of hovering. Roosting sites include caves, mines, tunnels, buildings, and other man-made structures. Unlike other bat species, Townsend's do not tuck themselves in crevices and prefer open roosts with their fur erect and ears tucked back from optimal thermoregulation. Mating typically occurs in winter with a single young born in May or June. Maternal roosts consist of a small number of females and young, typically less than 100 individuals. Townsend's are a year-round resident in California.

Local Occurrence and Observations: The largest colony of Townsend's big-eared bat reported in Sonoma County was recently discovered on Carrington Ranch, 3.1 miles south of Wright Hill Ranch (K. Marsh pers. comm. 2014). In May 2014, a maternal roost of up to 50 females and young were documented in the old ranch house on the site. In May and June 2015, a bat habitat assessment and survey of the historic buildings on Wright Hill Ranch was completed by Wildlife Research Associates (2015). Townsend's big-eared bats were documented in the attic of the house. Several individuals were documented entering, emerging, and re-entering the gable window on the house. Wildlife Research Associates determined the building supports a bachelor day and night-roosting population of Townsend's big-eared bat. The presence of this species will need to be considered for all future land management, especially any proposed work on the buildings and public uses of the ranch complex.

4.6 MANAGEMENT CONSIDERATIONS

All human uses of the land—from grazing livestock to opening hiking trails to the public—are likely to affect Wright Hill Ranch's native habitats and the wildlife communities that depend on them (Reed and Merenlender 2008, Taylor and Knight 2003, Thurston and Reader 2001). Before proceeding with new public uses, impacts to plant, wildlife, soil, and aquatic resources should be carefully considered. For those activities that are ongoing, monitoring of habitat conditions will be needed to determine how natural resources are affected by those uses, and whether changes to practices are warranted. The added variable of changing climate makes understanding human impacts both more challenging and more important, as land managers attempt to support Wright Hill Ranch's natural systems in adjusting to new stresses. Where negative human impacts have already occurred or are planned, habitat restoration should be undertaken.

Many of the following management considerations overlap across habitat types and extend beyond the property boundaries. For example, Wright Hill Ranch includes swaths of intact native forest, drainages lined with coastal scrub, and extensive grassland. Both on their own and in the context of surrounding protected landscapes, these habitats serve important functions for the movement of native wildlife and dispersal of native plants. Connection to adjacent similar habitats supports dispersal, maintenance of microclimate conditions, and habitat quality (Penrod et al. 2013). This connectivity is likely to be increasingly important as climate changes, requiring many species to migrate to suitable environments if they are to survive (The Heinz Center 2008). Protecting habitats from fragmentation by carefully planning any roads, trails, or other Preserve developments will help maintain these functions on the property.

In addition, linear disturbances can result in ever smaller, disjointed patches of habitat, diminishing their value to native wildlife and changing their microclimates (Forman and Alexander 1998, Spellerberg 1998, Taylor and Goldingay 2010), so new trails and roads should be minimized and routed along existing stable roads where possible. Disturbance from trail and road construction also frequently facilitates the spread of invasive species and accelerates soil erosion (Hansen and Celvenger 2005). There are a number of invasive plant species on the property and control of these plants will help protect habitat qualities. There are also a number of opportunities for revegetation or other ecological enhancement efforts of native habitats on Wright Hill Ranch. Measures to prevent the spread of invasive plant species should be used on all revegetation and other ecological enhancement efforts.

Protecting existing riparian, wetland, and other native habitats will also require maintaining minimum vegetated buffer widths from typical Preserve uses. Specific buffer widths needed to provide benefits to natural resources will vary with site conditions. Generally, the wider the buffer, the greater the protection provided to natural resources (Castelle et al. 1994, Leea et al. 2004, Osborne and Kovacic 2004). Setback distances will need to provide a balance between maximizing resource protection and accommodating Preserve uses. For instance, in a Preserve setting, visitors will want to visit and explore special habitats regardless of formal trail placement, and requiring very wide setbacks for trails from destination habitats could lead to informal trail creation. Informal trail creation could in turn have greater impacts on habitats than carefully-planned formal trails.

Wright Hill Ranch supports a number of sensitive resources including special-status plants and wildlife (Figure 10). Many of these species are protected by state and federal regulations. Site development and ongoing management of the property will need to comply with existing regulations, which will include implementing resource protection measures such as pre-construction trainings, surveys, and avoidance measures.

Illicit marijuana cultivation, not yet observed on Wright Hill Ranch but common in other local public lands, can also have a major impact on botanical and wildlife resources, soil erosion, and water quality, as a result of habitat clearing, stream diversions, and pesticide use (Barringer 2013, Thompson et al. 2013). Wright Hill Ranch should be regularly monitored for this illegal activity to protect natural resources on the property and ensure the safety of visitors.

The following sections describe the management considerations for each habitat type and associated wildlife communities found on the property followed by guidance on managing invasive species and addressing climate change. Overall, the key management goals for natural resources on Wright Hill Ranch include maintaining diverse and self-sustaining native plant and animal communities, providing migratory and dispersal corridors for wildlife, and protecting water quality and soil resources.

Grasslands

Key management considerations for Wright Hill Ranch's grassland habitats include careful management of livestock grazing and invasive species; protection of intact native grassland stands, rock outcrop flora, and other specialized or sensitive plants and wildlife; and management of the spread of native coyote brush and Douglas-fir into what is currently grassland habitat.

Livestock grazing has complex effects on grasslands and the wildlife communities they support (Bakker et al. 2006, DiGaudio 2010, Proulx and Mazumder 1998; see *Section 7. Livestock Grazing*, for a discussion on wildlife-friendly infrastructure). Impacts depend on factors including livestock species; intensity, duration, and timing of grazing; soil qualities; and the composition of the vegetation where livestock graze, water, rest, and travel. The current composition of Wright Hill Ranch's grasslands has been shaped by past livestock grazing, and future grazing practices are likely to continue to be a primary influence on this habitat. Well-managed grazing on the property may help reduce certain invasive plant populations and reduce the thatch buildup from non-native annual grasses that can suppress native herbaceous species. Using grazing to maintain a range of vegetation densities and growth forms (i.e., short, medium, and tall grasses) with varying amounts of litter accumulation and patches of bare ground can benefit wildlife, especially grassland birds (DiGaudio 2010). On the other hand, poorly managed grazing can spread invasive species, reduce native plant populations, and lead to soil erosion. To benefit native species, livestock grazing will require ongoing monitoring and adaptive management. Key indicators to assess include native plant species richness and abundance and invasive plant species abundance. Such an adaptive regimen will increase land managers' understanding of grazing effects specific to the property and allow them to adjust grazing timing and intensity to address seasonal and year-to-year variations in plant composition, productivity, and soil conditions.

Protecting existing patches of high-quality native grassland will also be critical to maintaining the plant and animal species diversity present on the property. Although they are generally long-lived and ecologically resilient once established, native perennial grass species are typically slow to establish. In contrast, non-

native annual species that are abundant on Wright Hill Ranch typically germinate and grow rapidly and are well adapted to soil disturbance. Activities such as trail or road development would be likely to facilitate invasion by these non-natives. Even in annual grassland not identified as having a high native component, soil disturbance from human activities can be detrimental as noxious weed populations may increase, and erosion may be exacerbated. Other consequences of invasive species in grasslands can include disruptions to native wildlife niches, loss of quality forage for livestock, changes in soil moisture availability, and increased fire hazards. Prevention of new infestations and control of existing high priority invasive populations should be a top priority.

Several other unusual and sensitive components of Wright Hill Ranch's grasslands merit special management consideration: rock outcrop flora, grassland specialist birds, American badgers, and Myrtle's silverspot butterfly host plants. Each of these assemblages and populations should be protected from impacts related to human recreation and monitored over time. If declines are observed, additional investigation may be needed to determine potential causes and remedies. For example, some of the rock outcrops scattered across the property (typically the largest outcrops) support rich assemblages of native species, including coastal bluff scrub plants. These large outcrops are probably not at risk from livestock use, but recreational use by humans could pose a threat if public trail use is allowed nearby. Similarly, badger populations on the property have likely flourished in the absence of humans for some period of time. Increased recreational uses of the property may pose a threat to this species if locations of trail development and other Preserve infrastructure are not carefully planned and managed.

In several locations on Wright Hill Ranch, native coyote brush and Douglas-fir are spreading into what is currently grassland habitat. This may reflect a recovery of woody habitats in areas that had heavier livestock grazing or more frequent fire in the past. Based on 2014 surveys, the spread of these two woody species did not appear to be extensive, nor did they appear to threaten high-quality native grassland; spread was primarily into non-native grassland. Continuing to monitor these successional changes will help determine whether they pose a threat to native plant or wildlife populations or to livestock forage availability. Unless historical disturbance regimes (such as fire or native herbivores) are re-introduced to grassland and scrub vegetation, continual manipulation (e.g., by mechanical or chemical methods) of woody plants to maintain or increase grassland cover would likely be costly. For targeted locations where encroachment is threatening native wildlife or native grassland, hand removal would be appropriate.

Coastal Scrub

The primary management considerations for Wright Hill Ranch's coastal scrub are protection from livestock grazing and the potential spread of scrub species into native grasslands patches (see *Grasslands* above). Livestock grazing at Wright Hill Ranch is focused on grassland vegetation. However, where it occurs in coastal scrub, such as in transitional areas between scrub and grassland or along constrained travel routes, grazing is likely to reduce the vigor, cover, and regeneration of the native woody species and perennials. Livestock should be excluded from scrub habitat, unless it is determined that scrub is encroaching on valuable grassland habitat and reduction of woody species is desired. The spread of scrub species into grassland habitat is described in the Grasslands section above.

Riparian and Wetland Habitats

Key management considerations for Wright Hill Ranch's riparian and wetland habitats include protection from development and livestock grazing, protection of both common and special-status wildlife species, and maintaining vegetated buffers.

Many of the drainages on Wright Hill Ranch are relatively steep, but these areas are still used to varying degrees by cattle. Providing adequate buffers between human activity and riparian corridors and wetlands improves the connectivity between aquatic and upland habitats and allows for natural regeneration. Restoring existing habitats where needed will help achieve the goal of providing self-sustaining native plant and wildlife communities.

The steepness of most of the drainages also limits livestock use. However, where they are accessible, riparian areas tend to attract cattle. The riparian habitat to the west of the ranch complex is one such area. This area is proposed as a riparian protection zone to allow for the natural regeneration of the native plant community and

to conserve habitat for wildlife (see Figure 10). Intensive livestock use of riparian areas, especially when soils are moist, may result in erosion, reduced water quality (through both sediment and nutrient inputs), damage to vegetation, and impacts on native wildlife (Kauffman and Krueger 1984). Erosion from trampling or trails around riparian areas can also increase sediment delivery into sensitive downstream habitats. Managing livestock use of these sensitive habitats and improving livestock water structures will protect aquatic resources.

Similarly, wetlands are used extensively by cattle due to their proximity to existing water troughs and often, the more sustained seasonal availability of forage. Existing cattle trails follow wetland contours and these areas show signs of heavy use especially during summer and winter. As in riparian areas, intensive livestock use of wetlands may result in erosion, reduced water quality, damage to vegetation, and impacts on native wildlife. Many amphibians breed in wetlands in winter and are especially at risk. Similarly, trampling and heavy browsing during the spring and early summer months can have negative consequences for many low- and ground-nesting birds. Erosion from trampling or trails near wetlands can also increase sediment delivery into sensitive downstream habitats. Managing livestock use of wetlands and improving livestock water structures will protect aquatic resources.

Forests

Key management considerations for Wright Hill Ranch's forests include minimizing fragmentation, protecting wildlife habitat, managing the effects of livestock, and minimizing the spread of *Phytophthora ramorum* and other pathogens.

Fragmentation in forests, by construction of new roads or trails, has potential to spread invasive species into relatively uninfested areas, and to diminish habitat quality for many wildlife species (Miller et al. 1998, Cole 2004). Species such as the northern spotted owl are especially sensitive to human presence. Cutting roads and trails through forest habitat can also substantially change microclimate conditions; for instance, the resulting higher sun exposure may be detrimental to shade-loving forest floor species. Leaving large swaths of woodland and forest intact, with minimal human use, will help protect forest and woodland flora and fauna. Preserving key migratory corridor routes, especially along drainages, will also be important for species dispersal and movement (see Figure 10).

Livestock use forest and woodland habitats on the property primarily along travel routes and when seeking shade. Effects of livestock use are especially evident in some of the old bay groves, where cover of understory species is reduced in the most favored loafing areas. Soil may also be compacted in areas of heavy use, reducing the ability of water to infiltrate, and reducing the ability of native plants to regenerate. A 45-acre forest protection zone is proposed in the northeastern part of the property, where exclusionary fencing would be installed to prevent cattle access, allowing for understory regeneration as well as protecting an important wildlife movement corridor. This conservation area is intended to be permanently protected from cattle unless a management need arises that cattle grazing could address.

Many of Wright Hill Ranch's forested areas are currently infected with *Phytophthora ramorum*, the organism that causes Sudden Oak Death (SOD). While complete control of the disease is infeasible, steps can be taken to minimize further spread and to protect the public from the hazard of falling dead trees. Educating Preserve users about SOD and restricting public use of trails through infested areas during the rainy season may help minimize pathogen spread. All Preserve staff should know and follow standard best practices during their travel and maintenance work on the property. If loss of trees becomes extensive, forest composition may substantially change over time. These areas should be monitored to determine whether any active restoration efforts are needed to maintain diverse native forest. Where infected trees are adjacent to areas heavily used by the public, pruning or removal may be warranted for safety reasons.

Invasive Plants

Non-native plant species that are capable of spreading quickly into the natural landscape can have substantial effects on the habitats they invade (Vilà, M. et al. 2011). Invasive plant species, which typically thrive in disturbed settings, can outcompete natives to create large monotypic stands with low species diversity. Consequences can include disruptions to native wildlife, loss of quality forage for livestock, and increased fire risk.

Many invasive plant species are currently established on Wright Hill Ranch. The grasslands are dominated by non-native grasses, while other habitats have much more limited non-native and invasive species populations. Prevention of new infestations should be a top priority. Control of high and moderate priority invasive plants will help protect habitat qualities (Appendix G)). Appendix G provides guidance on suggested methods of control. Especially for infestations which are extensive, multiple methods may be needed for most effective control. Complete eradication of species that are widespread, like hairy oat grass, or that are common on adjacent lands, may not be feasible. However, preventing their spread into more intact habitats may be possible. As feasible, invasive removal should be accompanied by restoration plantings and other habitat restoration measures using methods that will no spread infestations

Invasive Animals

Like invasive plants, invasive animal species can have deleterious effects on native biodiversity. Non-native animals displace native species, compete with and consume native wildlife, carry diseases, change the food web by displacing or destroying native food sources, and reduce biodiversity. Without proper management and monitoring, problematic species can quickly become established and widespread.

Currently, invasive wildlife species on Wright Hill Ranch do not appear to be a significant problem. Three non-native species have been documented on the property — European starling, brown-headed cowbird, and wild turkey. Wild turkeys are increasingly common throughout Sonoma County. While the effects of introduced turkeys on native wildlife are not well understood, this opportunistic omnivore could pose a threat to native wildlife through predation or direct competition (CDFW 2004).

There are a number of additional species that have established along the coast and throughout the County with expanding distributions and are of concern on Wright Hill Ranch. To the north of the Russian River, feral pigs occur in the coastal hills in remote regions. They are known to occur on the Jenner Headlands Preserve and The Wildlands Conservancy actively manages the population through a winter trapping program (B. Edwards pers. comm. 2014). The population on the property is now under control. Pigs have not been documented on the south side of the Russian River (B. O'Neil pers. comm. 2014), but they could expand their range southward and onto Wright Hill Ranch. Other non-native birds may also be present on the property (e.g., Eurasian collared dove, house sparrow). While many of these bird species are ubiquitous across Sonoma County and beyond and would be difficult to control, more recent introductions (e.g., Eurasian collared dove) and larger animal species (e.g., feral pigs) may be able to be managed effectively. Ongoing monitoring of these species' presence on Wright Hill Ranch will be an important consideration for land managers as well as implementing control measures.

Climate Change

Climate change is an important factor to consider in planning management of Wright Hill Ranch's natural resources. Emissions of greenhouse gases have already caused average temperatures in the U.S. to increase by 1.5º F, leading to more intense heat waves, stronger storms, and more frequent and severe droughts (PEW 2011). Within California, most predictions are for slight declines in precipitation overall, but with more intense storms during a shorter rainy period and a longer, hotter dry season, resulting in both more droughts and more floods (Karl et al. 2009). In coastal California, fog patterns—an important element of Sonoma County's climate—may also change with altered ocean conditions (Bakun 1990; Johnstone and Dawson 2010).

These climate changes are expected to influence many ecological variables relevant to Wright Hill Ranch, from the geographic ranges of species, plant phenology, and species interactions, to stream flows, frequencies of wildfire, insect outbreaks, and disease outbreaks. Exactly how these variables will change at the local scale is unknown.

In the face of rapid but uncertain change, an important conservation strategy is to manage for healthy ecosystem function so that the environment can retain maximum ability to adapt (Heller and Zavaleta 2009, Gillson et al. 2013). Protecting habitats and ecological processes will become even more valuable over time. Limiting non-climate stresses, such as invasive species spread and habitat fragmentation, will also be increasingly important—and more locally manageable than climate changes. Three key resources on Wright Hill

Ranch that may help allow natural systems to adjust to climate stresses are habitat connectivity, water resources, and biodiversity. In addition, adaptive management of the property will be necessary to address future changes.

5 EROSION

5.1 INTRODUCTION

The coastal hills of southwestern Sonoma County, whose fragile Franciscan soils have been subject to intensive historical uses such as grazing and logging, suffer widely from erosion. Grassland and forest gullies pour large quantities of fine sediment into waterways throughout the region, threatening aquatic life, and sensitive salmonid populations. Countless unpaved ranch and logging roads and road remnants thread throughout the coastal hills, many inadequately maintained. Wright Hill Ranch is no exception, with its erosive soil composition, history of livestock grazing, and steeply sloped grazing lands. The property contains a network of cattle trails and nearly 3.5 miles of unpaved roads, including a 2.3-mile section of Wright Hill Road, once part of an important travel route but now used exclusively for ranching operations on the property. Multiple grassland gullies drain down from its peaks, many disappearing into steep forested gulches. This section provides a summary of road and gully assessments completed on the property from 2009 through 2014. The goal of the erosion assessments were to provide guidance to land managers as to where to focus more detailed assessment of erosion problems, including recommending treatments for erosion prevention and erosion control.

A discussion of livestock-induced erosion, namely around water sources or incised trails, is provided in *Section 7, Livestock Grazing*. Gold Ridge RCD completed a visual assessment of the property to determine the level of rainsplash, sheet, and rill erosion. These erosion types generally occur on surfaces with minimal vegetative cover and/or low permeability. The visual assessment indicated that erosion was occurring; however no specific sites were identified and the soil loss was not quantified.

5.2 DATA COLLECTION METHODS

The District commissioned several road evaluations and gully and erosion assessments between 2009 and 2014.

Road Assessments

In 2009, PWA completed an inventory of approximately 4.5 miles of roads (PWA 2009). This included approximately 3.5 miles of ranch roads located within the Wright Hill Ranch property boundary, and approximately one mile of Wright Hill Road, the access road that connects through California State Parks property to State Highway 1.

Experienced field personnel walked the roads to identify and assess sites of existing or potential future erosion. These include sites where sediment delivery to a stream is currently occurring or has the potential to occur in the future, as well as sites where no sediment delivery is occurring but where erosion of the road, ditch or cutbank was having an impact on the drivability of the road (maintenance sites). For each site, basic data were collected, including the site type, length of hydrologically connected road, erosion potential, and an estimate of the future erosion and sediment delivery volumes.

In 2013, PWA completed a more detailed reassessment of a portion of the access road to Wright Hill Ranch, which received only preliminary assessment in 2009 (PWA 2013). The 2013 assessment evaluated 1.47 miles of the unsurfaced midslope Wright Hill Ranch access road (Wright Road) from Highway 1 to the ranch complex to determine the road drainage design, identify design deficiencies, and to identify erosion and sediment control measures. In 2014, an additional 0.46 miles of road was assessed to the east of the ranch complex (PWA 2014). In August 2015, a field review of the treatment areas was completed with District and Regional Park staff (PWA 2015).

Gully Assessment

In 2009, PWA completed an assessment of 22 hillslope gullies on the property (PWA 2009). This included both road-related and non-road related gullies, that had previously been identified and mapped by Gold Ridge RCD staff through an aerial photo analysis. Two of the assessed gullies (#8 and 10; see below) were large and complex enough that field personnel divided them into multiple segments which were assessed separately, bringing the total of assessed gullies and gully segments to 25.

For each gully, basic data was collected in the field on a site data form, including average overall gully dimensions, hillslope and gully wall gradients, and hydrologic connectivity to the stream system, a brief description of each site, and a site sketch. In addition, field personnel assigned a designation of treatment immediacy, and

made judgments as to the stability of each gully and the feasibility of treatment. Treatment feasibility was evaluated by determining whether the gully would be accessible to heavy equipment, small equipment or hand labor, and whether it would be possible to stage and manage materials likely to be required for successful erosion prevention treatment. Although a particular gully might be accessible to hand labor, small equipment, or even heavy equipment, it may not be feasible to treat due to the logistics required for treatment, including distance from a staging area.

Estimates of future erosion and sediment delivery volumes were not included as part of the gully assessment. The factors influencing these volumes are varied and highly complex, and the time period over which any estimated sediment volume would be eroded and delivered would be extremely difficult to calculate. Treatment immediacies developed for the gully assessment relied on factors such as the overall dimensions and stability of each gully.

5.3 ASSESSMENT RESULTS

5.3.1 2009 ROAD ASSESSMENT

The 2009 road assessment identified 11 road-related erosion and sediment delivery sites on the property and an additional five sites on the access road between the property boundary and Highway 1. The 2013 and 2014 road assessments reassessed the main access road from the ranch complex to Highway 1. Sites 9 through 16 from the 2009 road assessment were reevaluated in 2013 and 2014; therefore, the 2009 assessment results shown below only include road-related erosion sites 1 through 8. The remaining sites are discussed in the results from the 2013–2014 assessments below. The 2009 road-related erosion sites are shown on Figure 7 along with assessment reaches for 2013 and 2014.[3]

Erosion along Wright Hill Road

Roads within the Wright Hill Ranch property are generally narrow and unsurfaced, with insloped, flat, and outsloped road shapes. Most of the road length on the property itself lies on ridgetops or upper slopes, with minimal road fill prisms. Wright Hill Road occupies a mid-slope position between Highway 1 and the Wright Hill Ranch gate and extends to the east side of the property. Some sections of Wright Hill Road are rock surfaced. Roads within the project boundary appear to receive very little use and are in passable condition.

The eight road-related erosion sites located on the property identified in 2009 have to potential to deliver over 1,900 cubic yards of sediment to streams on the property over a 10-year period (Figure 7). Of the eight sites, three (#2, 3, 4) were assigned high or high-medium priority for complete assessment and erosion prevention and erosion control treatment. Four sites were identified as low to moderate treatment urgency. All of the sites, with exception of #8, were judged to be delivering or having the potential to deliver sediment to the downstream stream system (Table 5-1). If left untreated, sites have the potential to deliver large quantities of sediment to unnamed coastal streams and the lower Russian River watershed via Willow Creek and its tributaries over the next decade. Site 8 was not connected to a stream system, and was therefore classified as a maintenance site. Of the eight sites, one was classified as a stream crossing, four as ditch relief culverts, two as road-related gullies, and one site as a spring.

3 All road-related erosion sites described in PWA 2013 and 2014 are proposed for treatment in summer 2016. Maps of these sites are provided in the original reports. Assessment areas are indicated on Figure 7.

Table 5-1. Road-related Erosion Sites (2009)

SITE	SITE TYPE	TREATMENT IMMEDIACY	HYDROLOGICALLY CONNECTED ROAD LENGTH (FT)	TOTAL FUTURE SEDIMENT DELIVERY VOLUME (YD[4])
1	Spring	L	210	9
2	Ditch relief culvert	HM	250	211
3	Stream crossing	HM	290	117
4	Gully	H	2,050	1,178
5	Ditch relief culvert	M	1,630	151
6	Ditch relief culvert	M	1,435	204
7	Gully	ML	540	76
8	Ditch relief culvert	Maintenance	0	0
Totals	**1 stream crossing** **4 ditch relief culverts** **2 gullies** **1 spring**		**6,405 ft**	**1,946 yd[4]**

5.3.2 2013–2014 ROAD ASSESSMENTS

The segment of road evaluated in November 2013 consisted of approximately 7,500 feet (1.47 miles) of native, unsurfaced, midslope ranch road. The ranch road exhibits gradients ranging from 5 to 20% in steepness as it descends from the ranch complex to Highway 1. As noted in 2009, some sections of Wright Hill Road are rock surfaced. Roads within the property boundary appear to receive very little use and are in generally good condition.

The 2013 assessment results indicate that the existing road shape lacks sufficient permanent drainage breaks to allow water to adequately shed off the road surface. Currently, six ditch relief culverts (DRC) drain the 7,500 feet of road. Active to semi-active gullies up to 2 feet deep are present below each outlet, and each gully connects a longer segment of road for sediment delivery to nearby stream channels.

The segment of road evaluated in November 2014 included approximately 2,450 feet (0.46 miles) of native, unsurfaced midslope ranch road, with a similar road shaped with minor rill development occurring on the road surface. Two DRCs were observed, although no sediment delivery to local streams appeared likely.

Of the total 1.93 miles of road inventoried by PWA in 2013 and 2014, a total of seven sites and 1.39 miles of hydrologically connected road surfaces were identified with potential to deliver sediment to streams within the watershed. Of the seven sites, one was classified as a stream crossing, five as ditch relief culverts, and one as a road-related gully (Table 5-2). The entire road was recommended for treatment for erosion control and erosion prevention. Of the assessed sites, three were assigned treatment immediacies of high to high-moderate, three were assigned moderate or moderate-low, and one was assigned a low treatment immediacy. If left untreated, the seven sites determined to be connected to the stream system have the potential to deliver approximately 730 yd[4] of sediment downstream over the next decade (Table 5-3).

4 Total future erosion volume is calculated as the sum of the future site-specific and chronic erosion volumes. Chronic erosion volume is based on the total length of hydrologically connected road, a road width of 8 to 12 ft, and a lowering rate of either 0.1, 0.2 or 0.3 ft per decade (determined on a per-site basis in the field), calculated over 10 years.

Table 5-2. Sediment Delivery Sites and Hydrologically Connected Road Segments

SOURCES OF SEDIMENT DELIVERY	SEDIMENT DELIVERY SITES		HYDROLOGICALLY CONNECTED ROADS ADJACENT TO SITES		TOTAL LENGTH OF ROADS SURVEYED (MI)
	INVENTORIED (#)	RECOMMENDED FOR TREATMENT (#)	INVENTORIED (MI)	RECOMMENDED FOR TREATMENT (MI)	
Stream crossing	1	1	0.19	0.19	—
Ditch relief culverts	5	5	0.86	0.86	—
Gully	1	1	0.35	0.35	—
Total	**7**	**7**	**1.39**	**1.39**	**1.47**

Table 5-3. Estimated Future Sediment Delivery for Sites and Road Surfaces Recommended for Treatment on Wright Hill Ranch Access Road

SOURCES OF SEDIMENT DELIVERY	ESTIMATED FUTURE SEDIMENT DELIVERY (YD^3)	PERCENT OF TOTAL
1. Episodic sediment delivery from road-related erosion sites (indeterminate time period)		
Stream crossing	20	31%
Ditch relief culverts	35	54%
Gully	10	15%
Total episodic sediment delivery	**65**	**100%**
2. Chronic sediment delivery from road surface erosion (estimated for a 10 yr period)[a]		
Total chronic sediment delivery	665	
Total estimated future sediment deliver for the project area	**730**	

[a] Sediment delivery is calculated for a 10 yr period using (1) field-measured road, ditch, and cutbank contributing areas; (2) field-measured percent delivery of hydrologically connected surfaces, and (3) an empirical value of erosion based on field analyses by PWA staff for road surface, ditch and cutbanks of: (a) 0.1 ft/10 yr (low rating); (b) 0.2 ft/10 yr (moderate rating); and (c) 0.3 ft/10yr (high rating).

PWA recommended nine different types of erosion control and erosion prevention treatments for the project area, which we generally subdivide into two categories: site-specific treatments and road surface treatments. These prescriptions include upgrading treatments, such as installing or replacing culverts, reshaping the road, and installing permanent road drainage features.

The focus of the recommended treatments are to control road drainage by reshaping the roadbed, which redirects concentrated flow to stable slopes and prevents sediment delivery to streams. Upgrading treatments to redirect flow include outsloping the road, installing rolling dips, cutting ditches, and installing sediment basins. Road surface erosion is curtailed by adding road rock, which fortifies the surface and reduces the production of fine sediment.

Mapped locations, recommended treatments, and estimated costs to implement erosion control and erosion prevention treatments along the access road are described further in the complete PWA reports (PWA 2013, 2014, and 2015). See *Road Repairs and Maintenance* below for treatment schedule.

Gully erosion site #9 (top). Gully erosion site # 11 leading from Wright Hill Road (bottom).

5.3.3 GULLY ASSESSMENT RESULTS

In 2009, PWA assessed 25 gullies and gully segments (PWA 2009). The assessed gullies are located primarily in midslope areas of the Wright Hill Ranch. They are significant features on the landscape, ranging in length from 75 feet to over 2,000 feet (averaging less than 900 feet). Gully widths averaged approximately 18 feet and depths averaged four feet (Table 5-4). Of the 25 gullies and gully segments assessed, all but two (#14 and 16) were found to be connected to the stream system, and only two (#11 and 21) were determined to be influenced by road drainage. One gully (#15) was related to a landslide complex, and dimensions were not measured for it (Appendix G, Figure 12).

Of the 25 assessed gullies and gully segments, 10 (#1, 3, 6, 8A, 9, 11, 13, 17, 19, 20) were assigned high or high-moderate treatment immediacy, six (#5, 8B, 8C, 10A, 18, 21) were assigned moderate or moderate-low treatment immediacy, and nine (#2, 4, 7, 10B, 12, 14, 15, 16, 22) were assigned a low treatment immediacy rating.

Of the gullies assigned with a high or high-moderate immediacy rating, six (#8A, 9, 11, 17, 19, 20) were judged to be accessible to heavy equipment, while the other four (#1, 3, 6, 13) could be accessed using small equipment such as bobcats.

The results of the gully assessment indicate that gully related erosion represent significant and imminent threats to aquatic resources in the Wright Hill Ranch area. Detailed assessment and treatment recommendations should be completed for the high priority gullies that will allow heavy equipment access, with further study of treatment feasibility for all other sites with heavy equipment access. Most of the gullies observed on Wright Hill Ranch are large enough to pose a continuing risk of erosion and sediment delivery and to degrade other resource values, such as aesthetics, if left untreated.

Table 5-4. Gully Erosion Sites (2009)

GULLY #	TREATMENT IMMEDIACY	HYDROLOGICALLY CONNECTED?	GULLY LENGTH (FT)	AVG. WIDTH (FT)	AVG. DEPTH (FT)	KNICK-POINTS (#)	EQUIPMENT ACCESS*	FEASIBLE TO TREAT?
1	HM	Yes	1100	15	4	7	BC	Yes
2	L	Yes	1500	30	10	0	BC	Yes
3	HM	Yes	1700	7	2	4	BC	Yes
4	L	Yes	2300	3	1	0	BC	Yes
5	M	Yes	1800	25	2.5	0	BC	Yes
6	HM	Yes	1000	25	3	4	BC	Yes
7	L	Yes	700	10	3	0	BC	Yes
8A	HM	Yes	750	12	3	8	HE	Yes
8B	ML	Yes	450	40	6.5	3	HL	No
8C	M	Yes	1300	15	6	Many	HL	No
9	H	Yes	400	30	7	0	HE	Yes
10A	ML	Yes	1800	18	4	6	BC	No
10B	L	Yes	900	6	2	0	HL	No
11	H	Yes	1000	15	10	7	HE	Yes
12	L	Yes	500	8	3	1	BC	Yes
13	HM	Yes	750	10	2	7	BC	Yes
14	L	No	150	15	3	3	BC	Yes
15	L	Yes	N/A	N/A	N/A	N/A	HL	No
16	L	Partial	75	20	2	0	HL	No
17	HM	Yes	1000	30	6	3	HE	Yes
18	M	Yes	1000	15	5	4	HE	Yes
19	HM	Yes	250	20	4	3	HE	Yes
20	HM	Yes	100	30	5	2	HE	Yes
21	ML	Yes	700	30	3	3	HE	Yes
22	L	Yes	300	10	2	0	HE	Yes

* HE = Heavy equipment; BC = Bobcat or other small equipment; HL = Hand labor only.

5.3.4 ROAD REPAIRS AND MAINTENANCE

In summer 2016, the District completed repairs and maintenance to the Wright Hill access road from Highway 1 and a portion of the internal road system, as described in PWA 2014 and 2015. PWA identified seven sites that have the potential to deliver sediment to downstream stream system including Furlong Gulch, and about 2 miles of road surface that flow into nearby the drainage. If left untreated, the sites have the potential to deliver large quantities of sediment to sensitive aquatic systems over the next decade.

Additional road repair work is being planned by State Parks with funds from Caltrans' Environmental Enhancement Mitigation Program and in collaboration with Gold Ridge RCD. Work is proposed on the seasonal access road running from the center of the property towards Red Hill on the adjacent State Parks land. The road is contributing fine sediment into Willow Creek due to erosion and drainage issues. Gold Ridge RCD has designed the repairs and will oversee construction. Construction is planned for a future date.

5.4 MANAGEMENT CONSIDERATIONS

Conserving the soil and hydrologic processes on Wright Hill Ranch will be important to the health of plants and wildlife on the property itself, as well as to downstream

waterways and aquatic life. Maintaining native vegetative cover and repairing existing areas of accelerated erosion will help protect water quality for the salmonid-bearing streams downstream. These activities will also maintain existing topsoil and increase infiltration of rainfall into the soil, supporting the forests, scrub, and grasslands that occur on the property. As climate changes, water availability and the protection of soil from erosion during extreme drought or precipitation events may be increasingly important.

The results of the Wright Hill Ranch erosion assessment indicate that both gullies and road-related erosion represent significant and imminent threats to the resources and warrant repair. In addition, soil-disturbing activities should be minimized, and when necessary, should be carefully planned to protect water quality during construction and to restore native vegetation quickly afterwards.

6 FIRE

6.1 INTRODUCTION

California vegetation, particularly grasslands, have been shaped and defined by fire over several millenia (Sugihara et al. 2006). The native flora of California is largely composed of species that have evolved over millions of years with periodic burning, and in many ways, California plant communities and their plant taxa are dependent on fire and its effects for survival (Fites-Kaufman et al. 2006). Prior to human settlement, lightning strikes started most fires, abetted by the influences of California's Mediterranean-type climate and its diverse topography. Native Americans, arriving in California as early as 11,000 years ago, used fire to facilitate hunting and to clear land for cultivation, practices which were strongly influential in shaping regional vegetation, particularly coastal grasslands and woodland areas.

Reduction of fire in many ecosystems in the late 19th century was initially a direct consequence of Euro-American decimation of the indigenous cultures. Control and suppression of wildland fires was later adopted as a deliberate component of public land management policies starting in the late 19th century (Stephens and Sugihara 2006) and adopted as policy for private lands soon thereafter. The ensuing dramatic alteration in fire regimes has resulted in detrimental changes in species composition, conversions of vegetation types, invasion by non-native plants, fuel buildup, and increased fire hazard.

Much research has highlighted the value of fire for maintaining healthy grassland ecosystems, including rangelands, by effectively controlling invasive grassland species; deterring shrub and Douglas-fir encroachment; and removing thatch buildup (CNPS 2008). It has also been used extensively in forested areas to reduce fuel loads and control disease spread. However, controlled fire use as a management tool is often limited due to control concerns, public perception, and air quality regulations. Even researchers attempting to establish test plots to study the effects of burning have had great difficulties implementing the studies. Although not truly a replacement for fire, livestock grazing for fuel reduction has proven more feasible to implement.

Wright Hill Ranch and its primary sources of increased fire risk were assessed by CalFire in 2009. The following provides a discussion of the assessment and considerations for managing fire risk on the property.

6.2 MANAGEMENT CONSIDERATIONS

While fire is an important and natural part of healthy forest and grassland ecosystems such as those found on Wright Hill Ranch, it also poses some obvious risks. Many of the natural resources on the property and surrounding properties have an economic value, primarily livestock forage and timber production, that could be compromised in the event of a large fire. Ranching and housing structures in the vicinity could be threatened, as could public safety and air quality. Fuel loads in many surrounding areas have reached such levels that prescribed burns could be hard to control.

Potential ignition sources for fire on Wright Hill Ranch include human carelessness or arson, sparks or heat from machinery or electrical equipment, or lightning strikes. Lightning, especially during the dry season, is relatively uncommon in the region. However, with increased human presence on the property when it is opened to the public, there is greater potential for fire ignition from human sources. Increased fire fuel loads on Wright Hill Ranch may result from four primary sources: thatch buildup in grassland areas, shrub encroachment, Douglas-fir encroachment, and Sudden Oak Death.

Thatch Buildup

Thatch buildup in an ungrazed non-native grassland

Thatch buildup occurs in grassland when natural or historic disturbance regimes, such as grazing or fire, are removed. Thatch tends to be especially dense in non-native annual grassland, compared to native California perennial grassland, and in more highly productive grasslands. Livestock grazing at moderate levels serves to effectively remove the thatch layer, and has been shown to change wildfire behavior by shortening flame length and reducing fire intensity. However, grazing for thatch removal does not significantly reduce the risk of fire ignition (Stechman 1983). On Wright Hill Ranch, thatch buildup is currently relatively low. The property's grasslands are not highly productive, and the current livestock grazing is effective at reducing dry herbaceous matter.

Shrub Encroachment

Coyote bush encroachment into neighboring State Parks land

Like thatch buildup, shrub encroachment into grassland areas occurs when disturbance regimes are removed. High-density scrub can be seen throughout the region where fires have been suppressed for long periods and grazing has been reduced or removed. In particular, coyote brush occurs over large areas of ungrazed lands. As noted above, this succession or transition is not necessarily detrimental from a conservation perspective—especially if the native woody species are spreading into non-native grassland. Coyote brush cover can be desirable for wildlife habitat, and it may represent an intermediate stage between grassland and woodland or forest development. However, dense shrub cover does increase fuel loading and fire risk.

McBride (1974) found that, 50 years after grazing was removed from the Berkeley hills, coyote brush density had increased dramatically. Grasslands in the Berkeley hills that are grazed are relatively free of coyote brush and other shrub species, while ungrazed grasslands in this area have been, or are rapidly being, invaded by coyote brush. However, it is important to note that coyote brush encroachment, if not disturbed, is frequently a transitional state that leads to the establishment of the lower-fire-risk vegetation of oak woodland.

Douglas-Fir Encroachment

The spread of Douglas-fir trees into grassland or other woodland areas has historically been limited by fire, as seedlings are intolerant to burning. While apparently effective at controlling thatch buildup and shrub encroachment, cattle grazing on Wright Hill Ranch appears to have less impact on Douglas-fir encroachment, which is currently occurring on some north-facing slopes in the northern part of the property. Anecdotal evidence indicates that sheep, which were grazed on Wright Hill Ranch until 1992, may have been more effective at controlling Douglas-fir seedlings than cattle (J. Furlong pers. comm. 2009b).

Infected oak

Sudden Oak Death

Sudden Oak Death is a disease caused by the introduced oomycete (water mold) pathogen *Phytophthora ramorum*. This disease is well established in western Sonoma County and in coastal California forests and woodlands, and has been confirmed throughout the adjacent Sonoma Coast State Park and Willow Creek

areas. Sudden Oak Death mortalities have created heavy fuel loads in some forested areas.

The botanical inventory and a February 2009 field visit by Jill Butler, CalFire's division chief, determined that *P.ramorum* infestation on Wright Hill Ranch is widespread, although apparent mortality is somewhat less than in other tanoak and coast live oak stands in Marin and Sonoma Counties. A number of other documented foliar host plant species (e.g., *Sequoia, Pseudotsuga, Umbellularia, Vaccinium, Heteromeles, Acer*) are widespread within the forests on the property, although *P. ramorum* is only occasionally fatal to hosts that exhibit foliar symptoms alone. However, these foliar hosts may serve as reservoirs for the water mold and as a potential source of inoculum (spores) that could infest tanoaks or coast live oaks.

There is no effective treatment for Sudden Oak Death over a large area such as the hardwood stands on the property. See *Contaminant and Pathogen Control* below for approaches to minimizing the spread of Sudden Oak Death.

6.3 FIRE CONTROL ACCESS AND PUBLIC SAFETY CONSIDERATIONS

Particularly with an expected increased public use of the property, maintaining access for fire vehicles and crew is a priority management concern. Wright Hill Road is currently in good condition, although vegetative growth has begun to encroach slightly as it passes through the ungrazed State Parks property to the west. The condition of the road to the east, as it passes through private property, is unknown, and the gate on the eastern property boundary is locked. Erosion sites on both the eastern part of the property and on State Parks property may eventually threaten access if not addressed. Several trees along the main road are infected with Sudden Oak Death and have the potential to drop limbs onto the road or fall across the road themselves.

Fire safety clearance around the ranch house and buildings is excellent, as cattle currently have access to graze those areas. Were these areas to be closed to grazing, other measures would need to be taken to prevent fuel buildup around the structures.

7 LIVESTOCK GRAZING

7.1 INTRODUCTION

Cattle on Wright Hill Ranch overlooking Willow Creek

Wright Hill Ranch supports one of the few remaining livestock operations on the Sonoma County coast. Much of the nearby former ranchland is now owned by State Parks or private estate owners; on these lands, historic agricultural uses have been terminated. The District recognizes the potential ecological benefits of well-managed grazing, as well as the value of grazing for fire fuel management, cultural/historical preservation and its own mandate to preserve agricultural lands, including rangelands. This section presents a description of the current cattle ranching operation and site conditions; management considerations are provided at the end of the section.

7.2 GRAZING CONSIDERATIONS

Livestock species, grazing capacity and stocking rate, and season of use are major considerations in designing a grazing operation to meet site objectives. These elements of the Wright Hill Ranch grazing program are discussed below.

Livestock Species

Different species and classes of animals have particular foraging habits, behaviors, and other characteristics that may make one preferable to another for meeting site-specific management goals. Predator problems and site topography are also important considerations. Local availability of livestock types also may restrict choices.

Different species of animals prefer different topographic positions. Steepness of slope significantly influences distribution of cattle (Heady and Child 1994), while smaller animals, such as sheep and goats, are more able to traverse steep hillsides. Larger animals, including cattle and horses, prefer to graze level to gently rolling land. In areas with steep terrain, cattle generally congregate on more level areas, which can lead to heavy use of flat land unless infrastructure or attractants are used to improve distribution. From this standpoint, sheep would be ideally suited to Wright Hill Ranch; sheep were in fact run there for many years, until the predator populations on the Sonoma coast increased significantly in the late 1980s and early 1990s, making sheep ranching economically unfeasible due to predation losses.

Grazing animals are divided into groups based on their vegetation preferences and primary foraging methods. These groups include the grazers (cattle and horses), which have a diet dominated by grasses and grass-like plants, the browsers (goats), which consume primarily forbs and shrubs, and the intermediate feeders (sheep), which have no particular preference for grasses, forbs, or shrubs (Holechek et al. 1998). Browsers commonly consume large amounts of green grass during rapid growth stages, but avoid dry, mature grass and often experience digestive upsets if forced to consume too much mature grass (Vallentine 1990).

Cattle on Wright Hill Ranch

Body size and reticulo-rumen capacity; anatomical differences in teeth, lips, and mouth structure; grazing ability; and differences in digestive systems account for some of the differences in foraging behavior. Mouth size directly affects the degree of selectivity that is physically possible: ruminants with small mouth parts (sheep and goats), in contrast to cattle and horses, can more effectively utilize shrubs while selecting against woody material. This explains why coyote brush and Douglas-fir have increased on the Wright Hill Ranch since sheep ranching ceased (J. Furlong pers. comm. 2009b).

In addition to physiological influences on diet selection, animal behavior can strongly affect what livestock choose to eat. Young animals learn foraging behaviors from their mothers and peers and can be taught to eat or avoid certain plants.

Grazing Capacity

Grazing capacity is a measure of forage production upon which stocking rates are based. Although the grazing capacity of a site can be estimated mathematically (see below), determination of a number of animals that a site can carry does not reflect seasonal fluctuations in forage availability within a year. For example, the grazing season normally begins in California in the fall when annual grasses germinate and start to grow in response to the first rains. By late fall and winter, when cold weather sets in, forage growth slows though feed intake requirements of livestock do not. Warm spring weather accelerates forage growth, with peak production occurring in April and May. During the summer, fall, and winter forage deficits can occur, and forage growth can exceed forage demand in late spring. Supplemental feeding of hay is often necessary during forage deficit periods, especially to meet the nutritional needs of pregnant or lactating livestock.

Although many other factors can influence forage consumption, animal unit equivalents (AUEs) can be useful in estimating stocking rates and comparing forage demand of different ages and species of animals. Animal unit equivalents vary by source, actual weight of animal, and individual animal (USDA 2003). Table 7-1 gives AUEs for common domestic livestock and can be used as follows:

Table 7-1. Animal Unit Equivalents

ANIMAL TYPE AND CLASS	ANIMAL UNIT EQUIVALENT (AUE)	MONTHLY FORAGE CONSUMPTION (POUNDS DRY WEIGHT)
Cow, dry	0.92	920
Cow, with calf	1.00	1,000
Bull, mature	1.35	1,350
Cattle, 1 year old	0.60	600
Cattle, 2 year old	0.80	800
3 mature bulls = 4 animal units (3 x 1.35) 48 two-year old cattle = 38 animal units (48 x .8) (Adapted from Vallentine 1990)		

Grazing capacity is expressed in pounds or tons of forage produced, often described in animal unit months (AUMs).

Stocking rate is expressed as animal units (AUs) per time period. For example, one AU can graze a pasture that produces 12 AUMs of available forage for 12 months.

Available forage is the forage produced minus the amount of residual dry matter (RDM) desired.

Although it is impossible to know the actual amount of forage produced on a site, especially given the large annual fluctuations in forage production that are common in this part of California, useful estimates can be calculated. Grazing capacity can be estimated by several different methods including: use of forage production estimates for range sites identified in the USDA Soil Survey (1972); direct measurement methods that involve clipping and weighing of vegetation; knowledge of present or historical stocking rates on the site, or on a similar nearby site; and a scorecard method based on climate zone, topography, and tree canopy cover (Bartolome et al. 2002).

Residual Dry Matter (RDM) Monitoring

Residual dry matter (RDM) is the dry, herbaceous biomass remaining on the ground at the end of the grazing season, and before fall rains begin. Retaining an appropriate level of RDM serves several purposes: it ensures that soil is covered adequately to prevent or reduce early season erosion from rain splash; it provides favorable conditions for seed germination; and has been shown to affect future years forage production and species composition on annual rangelands. University of California researchers have established minimum RDM standards for different grassland types and climatic regions based on these purposes. These published standards (Bartolome et al. 2002), personal communication with Dr. Jim Bartolome (2009), and professional judgment were used to determine a conservative target RDM level of 1,200 pounds per acre for Wright Hill Ranch.

RDM monitoring is typically conducted in the fall prior to the rainy season, but may need to be measured earlier in the year, especially in poor forage years when destocking or supplemental feeding may be needed to meet target fall RDM levels.

If RDM is measured earlier, an adjustment must be made to correct for losses due to decomposition. Research has demonstrated that the amount of RDM, by weight, will average a decrease of 7% per 30-day period from the time of peak standing crop[5] of annual herbaceous species to occurrence of the germinating rain in the fall (Frost et al. 2005). This rate can be used to calculate backward from the desired RDM amount in mid-October to an amount that must be present earlier in the summer.

Soil Survey Forage Production Estimate

The USDA Soil Survey for Sonoma County provides estimates of forage production for range sites and/or soil map units for years of "favorable" and "unfavorable" moisture (USDA 1972). Although these estimates are very general, conservative, and do not reflect site specific conditions such as past land uses and forage species composition,[6] range site estimates from soil surveys do provide rough guidelines for comparison with other methods.

Scorecard Grazing Capacity Estimate

University of California researchers developed a simple "scorecard" that can be used to estimate grazing capacity on annual-dominated rangelands based on desired RDM levels and general site characteristics. This method provides rough estimates based on rainfall, canopy cover, and slope (McDougald et al. 1991). The scorecard method of estimating grazing capacity accounts for animal behavior by recognizing that grazing use decreases on steeper slopes.

Current and Historic Stocking Rates

Appropriate stocking rates can also be determined by reviewing what rates have been used on the property, and what effect these levels of grazing pressure have had on management goals. For example, if current stocking rates appear to be resulting in desired habitat conditions, they should be maintained. If current stocking rates result in degraded habitats, they may need to be adjusted downward.

5 Peak standing crop occurs in the spring when most grasslands species are fully mature, but before significant seed drop has occurred.

6 According to Leonard Jolley of the Natural Resources Conservation Service (NRCS) Resource Inventory and Assessment Division in Beltsville Maryland "[Forage] production has often been described as very conservative, in part not to mislead the producers, particularly in your volatile climate." (L. Jolley pers. comm. 2006).

7.3 ASSESSMENT RESULTS

7.3.1 LIVESTOCK SPECIES

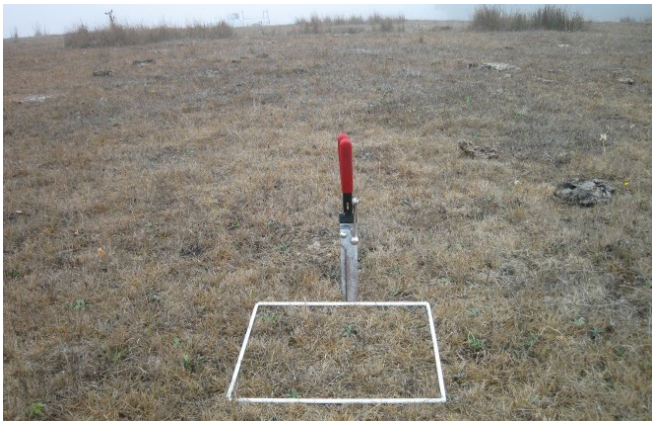
The current operation is focused on beef cattle production, consisting of approximately 100 to 110 mother cows and five bulls, which are kept on site year-round. Cows are bred in winter, producing young in the fall and early winter (October to November). Calves are typically sold in July. This is later than most ranchers in the region, and done to reduce supplemental feeding needs (nevertheless, supplemental feeding is usually required at some point).

7.3.2 FORAGE QUANTITY AND STOCKING RATE ESTIMATES

RDM Monitoring Results

Limited RDM sampling was conducted at Wright Hill Ranch on October 3, 2008, following one of the poorest forage years in the previous decade. Dense fog prevented surveillance of the entire property, but RDM estimates ranged from several hundred pounds on flat, heavily used areas to approximately 1,200 pounds per acre. Two biomass samples collected at Wright Hill Ranch in July and September of 2009, which was a much more favorable forage production year than 2008, indicated that fall, 2009 RDM would be well above the 1,200-acre target in most areas.

Grazing on low RDM for a single year (i.e., overuse) is not apt to cause significant, lasting negative effects on forage resources, plant species composition, or other features. However, low RDM in two or more consecutive years should be avoided by destocking or supplemental feeding.



Low RDM as measured in 2008

Soil Survey Results

Table 7-2 gives range site estimates for "unfavorable" and "favorable" moisture years for total AUMs, where one AUM is equal to 1,000 pounds of forage (Table 7-1, "cow, with calf"). Subtracting 1,200 pounds per acre of RDM, results in an "unfavorable" year total of 329 available AUMs and a "favorable" year total of 1,200 available AUMs. Divided by 12 months, these values can be converted into stocking rates in AUs per year for a year-round grazing operation. The "unfavorable" year stocking rate would be 27 AUs/year, and the "favorable" year stocking rate would be 100 AUs/year.

Table 7-2. Wright Hill Ranch Soil Survey Range Site Forage Estimates for Grassland Soils

SOIL UNIT		GRASSLAND* ACRES	AUMS/ACRE UNFAVORABLE YEAR	AUMS/ACRE FAVORABLE YEAR	TOTAL AUMS UNFAVORABLE YEAR	TOTAL AUMS FAVORABLE YEAR
HeF	Hely silt loam 30–50% slopes	24	1.0	2.24	24	53
HlF	Hugo-Atwell complex 50–70% slopes	106	1.0	2.25	106	233
KlE	Kinman loam 15–30% slopes	64	1.5	3.0	96	192
KlF	Kinman loam 30–50% slopes	219	1.6	2.8	350	613
KmF	Kinman-Kneeland loams 30–50% slopes	30	1.5/1.6	2.2/2.8	46	75
LgF	Laughlin loam 30–50% slopes	110	1.2	2.4	132	264
LgG	Laughlin loam 50–75% slopes	209	2.2	2.8	460	585
	Totals	**762**			**1214**	**2015**
RDM 1,200 pounds (=1.2 AUMs) per acre x 762 acres					-914	-914
Total available forage in AUMs (Total AUMs — RDM)					300	1,101
Stocking rate in AUs for a year-round (12 month) operation (Total available forage in AUMs/12 months					25	92
* This includes grassy areas in paddocks, the riparian protection zone, and around the ranch complex. However, as these non-pasture areas will need to be grazed periodically for weed control and fire safety, they have been included here.						

Scorecard Grazing Capacity Estimate Results

A digital elevation model shows that approximately 640 of the 762 acres of open grassland (0 to 25% canopy cover) at Wright Hill Ranch is on slopes less than 10%, while the remaining 122 acres of open grassland is on slopes between 10 and 25%. Using a grazing capacity scorecard constructed for this site based on McDougald et al. (1991) (Table 7-3) available forage and a stocking rate were estimated for Wright Hill Ranch (Table 7-4).

According to this scorecard, the 640 acres of nearly level grassland should provide 2.1 AUMs/acre of available forage, while the 122 acres of slightly steeper ground should provide 0.7 AUMs/acre of available forage. Other slope classes that occur on the property do not provide any available forage, resulting in a total of 1,429 AUMs of available forage, or a stocking rate of 119 AUs on a year-round basis, as shown in Table 7-4 below.

Table 7-3. Site-specific Scorecard for Wright Hill Ranch

CANOPY COVER (PERCENT) *	SLOPE CLASSES <10%	10%–25 %	25%– 40%	>40%
	AUM/acre*			
0% to 25% (Grassland)	2.1	.7	.3	0
25% to 50%	1.5	0	0	0
50% to 75%	.8	0	0	0
75% to 100%	0	0	0	0
	RDM lb/acre			
	1,200	1,200	1,200	1,200
* Averaged values from published scorecards for Northern California Zone (10" to 40" precipitation) and Northern California Zone (› 40" precipitation)				

Table 7-4. Total AUMs and Stocking Rate Estimates from Site-specific Scorecard

SLOPE CLASS	GRASSLAND ACRES	AUMS/ACRE	TOTAL AUMS
<10% slope	640	2.1	1,344
10%–25 %	122	.7	85
25%–40%	0	0	0
>40%	0	0	0
Totals	762		
NA	1,429		
Stocking rate in AUs for a year-round (12 month) operation (Total AUMs/12 months			119

Current and Historic Stocking Rates

The current stocking rate at Wright Hill Ranch is 115 AUs (J. Furlong pers. comm. 2009b). Wright Hill Ranch supported a 180-cow dairy without any imported supplemental feed in the early 1900s (J. Furlong pers. comm. 2009a). However, grassland could have been somewhat more extensive at the time; the dairy cows were also likely smaller than current beef cattle, so not perfectly comparable to the current operation. Jack Poff ran a herd of about 700 sheep for many years (approximately equivalent to 140 head of mature cattle) until he left the ranch in 1990.

7.3.3 FORAGE QUALITY AND PRODUCTION

The extensive rangeland on Wright Hill Ranch has typically provided green forage for eight or nine months each year, although forage quality is generally low, and includes a high proportion of unpalatable species such as hairy oatgrass and English plantain. Hairy oatgrass, a small-statured perennial species introduced from Australia, is a poor forage plant, as it produces a low amount of forage and is a "non-palatable weedy grass" (Love 1951). English plantain is also a poor forage plant, which produces very little biomass and crowds out more favorable species with its low growing rosettes. In addition to hairy oatgrass and English plantain, the Wright Hill Ranch grasslands include many other non-native species that are more suitable forage plants including subterranean clover, filaree, and soft chess.

Poor quality forage

In general, forage quality fluctuates between seasons and phenological stages of plant growth, and is highest in mid-spring when grasses are approaching maturity but have not yet flowered. This corresponds with the rapid spring growth period, when grassland biomass is also highest.

Wright Hill Ranch forage production is fair, with low production on many of the slopes where soils are thin and rocky. Production can vary dramatically between years, depending on rainfall amount and distribution. For example, the dry spring of 2008 resulted in very low forage production, while late spring rains in 2009 produced one of the best grass crops in recent decades.

7.3.4 NATIVE VEGETATION

Continued grazing at Wright Hill Ranch is recommended for many reasons, including preservation of grasslands and grassland species, although grazing effects on native vegetation vary by vegetation type. Livestock grazing can affect grasslands both negatively and positively, although removal of grazing in coastal California can lead to type conversion and proliferation of some non-native grassland species, such as velvet grass. Grazing effects on grassland species composition are difficult to impossible to predict in most cases due to a dearth of definitive research.

Grazing does negatively affect several vegetation types at Wright Hill Ranch. Trampling and herbivory of upland woodland and forest understory plants, riparian woodland and scrub, and hydrophytic vegetation in and around springs has caused damage to these habitats.

7.3.5 RIPARIAN AREAS, WATER QUALITY, AND EROSION

Potential Livestock Related Erosion and Water Quality Issues

Livestock can cause or contribute to degradation of aquatic resources including riparian areas, springs, and other wetlands. Unrestricted livestock access to drainages can result in trampling and heavy grazing of vegetation, bank erosion, and water quality degradation caused by inputs of sediment, nutrients, and pathogens.

Spring requiring repairs

Livestock can also cause or exacerbate some upland erosional processes. Sheet and rill erosion can occur on bare ground in animal confinement areas, but this type of erosion is not likely to occur on grazed pastures, unless grazing intensity is extreme. Small-scale sacrifice areas that receive high livestock impact due to frequent use, such as around water troughs and at gates, can become denuded, but typically these areas are very small, and are not significant sediment sources. Cattle trails can concentrate flows on hillslopes, causing gully initiation.

Nutrient and pathogen pollution from animal waste can result from rangeland grazing, but this most often occurs when livestock are confined and animal wastes are concentrated, or when livestock urinate and defecate directly into waterways. Ammonia from livestock urine can cause acute toxicity to aquatic species. Pathogens are a less common but potentially serious source of water quality degradation. Since pathogens are transmitted through animal wastes, the same conditions that cause nutrient pollution, can cause pathogen pollution. Some pathogens carried by livestock can cause illnesses in humans and wildlife.

Existing Livestock-Related Erosion and Water Quality Issues

Wright Hill Ranch sits atop the drainage divide for three significant watersheds, including Willow Creek, Scotty Creek, and Furlong Gulch, in addition to several unnamed coastal gulches. The dense woody vegetation and steep slopes that characterize Furlong Gulch, Rough Creek, and the Willow Creek tributaries limit significantly livestock access to these drainages. The upper portions of the unnamed southwestern tributaries are more accessible and are more impacted by livestock. Some sediment is likely produced and mobilized by livestock in the drainages, but the extent of livestock induced stream erosion in the lower, heavily vegetated reaches is unknown because they were not surveyed due to their inaccessibility.

Grazing may have over the years contributed to the gullying in the upper drainages by compaction of soil, which can increase saturation overland flow and thus stream incision. However, the relationship between grazing and gully erosion at Wright Hill Ranch is unknown. Typical signs of sheet and rill erosion, often characterizing heavily grazed areas, include visible rills; sediment accumulation on lower slopes, and pedestalling of small stones, perennial plants, and other small-scale landscape features. These were not noted at Wright Hill Ranch; however, scattered areas of varying sizes with very low vegetative cover can be seen throughout the property.

Some degree of nutrient and pathogen runoff into drainages may occur at Wright Hill Ranch, but because animals are not confined, livestock waste is distributed across the landscape and may not ever reach downstream waters.

Deeply incised cattle trail

7.3.6 EXISTING INFRASTRUCTURE

Existing Fencing

Nearly all of the fencing at the Wright Hill Ranch is in poor condition, and portions of the boundary are unfenced, allowing livestock to roam from the property. Fencing is constructed of various materials, including woven wire sheep fencing, barbed wire, and a combination of old wood posts and metal t-posts. In May 2014, the District installed approximately 600 feet of barbed wire fencing and repaired approximately 800 feet of boundary fencing in the south-eastern portion of the property. In 2016, the District installed approximately 2,000 feet of wildlife friendly fencing along the northern property boundary. This was done to address the grazing lessee's concern about his cattle wandering off the property along this boundary. State law requires that livestock be contained on-site, and as the landowner, the District will continue to provide fencing.

Cross fencing secures Pasture 7 and Pasture 8 (see Figure 8), but most of the remaining cross fencing is not functional, making it difficult to distribute and manage cattle throughout the remainder of the property. The eight pastures that are delineated by the functional and non-functional cross fencing were established for Jack Poff's sheep operation, but also are appropriate for managing the existing cattle operation. Pastures 7 and 8 are used in the current ranching operation to separate bulls from cows, or whenever cattle need to be collected in a small area. In addition, some of the gates are in poor condition and should be replaced, in particular the gate between Pastures 2 and 3.

CF 7-8

Existing fences and unfenced boundary reaches are shown in Figure 8, and Appendix G details fencing repair and construction needs and priorities. Proposed pastures, pasture sizes, and natural resource protection areas (i.e., proposed exclosures) are illustrated in Figures 9 and 10 and Appendix G.

BF 5

Existing Livestock Watering System

Water souces W6-7 (left) and W6a (right)

The Wright Hill Ranch livestock watering system consists of numerous spring-fed troughs. The troughs are all placed in close proximity to their source springs, so minimal piping is required to deliver water. Each pasture has at least one spring and trough, although the trough in Pasture 5 is not currently functional, due to a broken pipe.

Many of the spring boxes are no longer functioning properly and need to be cleaned, repaired, and/or redeveloped. Some of the water troughs are located within drainages, creating trampled, muddy areas and possibly, resource degradation. These troughs should be moved to protect water resources. Several springs overflow into seasonal drainages, which are impacted by cattle trampling. Appendix G details recommended livestock water system improvements. Recommendations for renovating livestock watering sources, protecting associated aquatic habitat, and providing wildlife friendly water sources are included in the management section.

In June 2015, in an emergency response to a water pipe break, the District installed approximately 700 feet of temporary, above ground water pipe and a new shut-off valve at the water tank located within the barn complex. This was done to ensure a water supply to the water trough listed as WBarn in Appendix G.

Wright Hill Ranch Barn

The large redwood barn has been used to store hay, tools, and equipment for many years. Until the 1940s, a dairy was operated on-site and cows were milked in this building. According to the current grazing operator, the barn is in adequate condition for its current uses (J. Furlong pers. comm. 2009). However, in the winter of 2015, a portion of the roof of the barn was torn off, leaving the southern portion of the barn exposed to the elements (see *Section 8, Cultural and Historical Resources*). The area used by the grazing operator continues to be enclosed and protected from the elements, and is still useable by him.

7.4 MANAGEMENT CONSIDERATIONS

Wright Hill Ranch is one of a few remaining working ranches on the Sonoma County coast. The property has been actively grazed for many years and continued grazing will serve as an important land management tool on Wright Hill Ranch. However, this will require careful management to preserve natural resources and a number of infrastructure improvements to maintain or improve the ranching operation. Due to predator issues, cattle are currently the only practical species for grazing throughout the Wright Hill Ranch (see *Livestock Species* above).

Stocking Rate

The Soil Survey forage production estimate for "favorable years" would support a stocking rate of 92 AUs year-round and the scorecard stocking rate estimate of 119 AUs year-round suggest that the current stocking rate is appropriate in a favorable moisture and forage year such as 2009 (McDougald et al. 1991, USDA 1972). An average of these two figures, 105 AUs year-round is

recommended as a preliminary stocking rate. Although the "unfavorable year" Soil Survey forage production estimate suggests that the property could only support 25 AUs in a poor year, in reality, forage production likely ranges somewhere between the high and low Soil Survey values in most years, and may exceed these in years with optimal conditions for forage production. Due to warming temperatures and recent winter drought conditions, forage production is less predictable than in recent decades. This makes regular monitoring of forage conditions essential and may necessitate adjustment of the initial recommended stocking rate. Any adjustments to stocking rate should be made in cooperation with the grazing lessee.

Long-term damage to grassland vegetation is not apt to occur in a single poor forage year, but repeated grazing at a rate that results in low RDM could cause degradation of grassland species composition and exacerbate soil erosion. Conversely, reduced grazing pressure could result in increased woody plant invasion into grasslands and other undesirable shifts in vegetation.

Residual dry matter should be monitored to ensure that stocking rates are maintaining levels at an average of 1,200 pounds per acre, according to RDM monitoring protocols described in California Guidelines for Residual Dry Matter (RDM) Management on Coastal and Foothill Annual Ranges (Bartolome et al. 2002). Long-term stocking rate adjustments should be considered if monitoring reveals the need for increased or decreased grazing pressure. In late spring or early summer of a poor forage year, fall RDM should be projected as described in *Section 8, Grazing Management*. Destocking through culling or supplemental feeding should be used to decrease grazing pressure and maintain adequate fall RDM.

Grazing Season

The Wright Hill Ranch should continue to support continuous or year-round grazing on a majority of the property. Reasons for this include:

- Cow-calf operations, which are the foundation of California's livestock industry, require land year-round. This is because mother cows and bulls, both of which are essential for producing the annual calf crop, and thus the economic impetus for continued livestock grazing, must be maintained on pasture all year. Unlike some parts of California and other western states, where livestock are moved to higher elevation pastures in summer, there are no alternate sites for a coastal California cow-calf operator to move his or her cattle for part of the year.
- Bringing cattle on-site for only a portion of the year would be time-consuming, expensive, and inconvenient, given the fairly remote location of the Wright Hill Ranch. Additionally, the steep dirt access road from Highway 1 would be impossible to access with a cattle trailer during the rainy season.

Livestock Distribution, Fencing, and Water

Livestock distribute themselves over the landscape based on topography, availability of forage species, water source or attractant locations, and inherent and learned feeding behaviors that affect plant palatability and animal selectivity. Construction of grazing infrastructure, including cross fencing and water sources, is the primary method for the land manager to influence livestock distribution. Secure boundary fencing is essential for keeping livestock on site, while interior pasture fencing is necessary for distributing livestock throughout pastures to make good use of available forage and to avoid overuse of some areas. However, completely uniform grazing is undesirable because variations in vegetation height provide structure for a wider range of wildlife species.

Wright Hill Ranch cross fencing is limited by rugged topography and water sources, as each separate pasture must include at least one livestock water source. Recommended pasture fencing is shown in Figure 9, with total acreage.

Livestock fencing at Wright Hill Ranch should be designed to prevent passage of cattle and calves, yet allow movement of small mammals and other wildlife without injury (smaller species should be allowed to pass under or climb over freely and deer should be able to jump over). Pasture fencing should be constructed of wood braces, steel t-posts and five strands of wire, including three strands of barbed wire, with smooth wires on the top and bottom. The smooth bottom wire should be 8 inches from the ground and the top wire should be no more than 48 inches from the ground. Boundary fences should be constructed with five strand of barbed wire to minimize the risk of cattle escaping from Wright Hill Ranch.

Existing fencing to be incorporated into the riparian protection zone and forest protection zone should eventually be replaced with wildlife-friendly fencing in sections where woven wire was used (Paige 2008). Other intact non-wildlife friendly pasture fencing could be replaced with wildlife-friendly fencing as it becomes nonfunctional.

Additional fencing is necessary to protect sensitive natural and cultural resource areas. The stream channel originating just west of the barn (gully #2) is appropriate for exclusion fencing, as it is already fenced on one side. The remaining side could be fenced to create a riparian protection zone, as shown in Figure 10. Fencing should be established no less than 25 feet from the top of bank. Additional fencing could be established south of Furlong Gulch to keep cattle from entering that large drainage. Several springs may also require fencing as determined during improvement efforts, as some troughs may be moved off channel. Changes in the vegetation community in these fenced areas should be monitored to ensure the area is not overrun with non-native invasive plants, and controlled seasonal grazing or removal efforts implemented if non-native plants become problematic. The encroachment of Douglas-fir trees, coastal scrub shrubs, and non-native vegetation should also be monitored and managed by removal, short-term grazing, or other methods as appropriate to the plant species and location and desired outcomes.

A 45-acre forest protection zone should be established in Pasture 4, as shown in Figure 10 to protect a portion of the upland woodlands and forests from trampling, grazing, and browsing. This effort would also protect archeological resources; if the forest protection zone is not established immediately, the archeological site and adjacent spring should be fenced.

Several springs, including the spring at water source W4a, may also require protective fencing after improvements have been implemented. All proposed resource protection fencing is shown in Figure 8 and Appendix G.

The livestock water system at Wright Hill Ranch consists of springs that have been developed to collect the water into a spring box from which it is then distributed through pipes to livestock water troughs. The springs that serve the water troughs are variable in terms of production, and flow rates are unknown. Apparently, they provide sufficient water to support both the livestock operation and to provide at least some of the water for the abundant wildlife on Wright Hill Ranch.

Livestock water needs vary seasonally, with low amounts of drinking water required during winter and spring when green forage has high water content, and higher amounts needed during summer. Generally, beef cattle on pasture need 15 to 20 gallons per day during dry periods. For a 100 head herd, the summer water demand would be between 1,500 and 2,000 gallons per day.

Most of the troughs associated with the Wright Hill Ranch livestock watering system are functional, although their condition as well as production is variable. Many have been placed within the flow channel and are creating gullies and threatening water quality. Supplemental water sources for cattle should be placed away from aquatic resources to limit intrusion into these areas and sufficient water retained for wildlife. As water sources are repaired and upgraded, they should be installed off-channel and any overflow water discharged into surrounding uplands. Livestock water source recommendations are provided in Appendix G. While priority rankings have been assigned to these repairs, addressing all water sources at once would be the most cost effective, as moving equipment on and off the property is a major expense.

A water storage tank could be installed to capture rainwater from the barn roof and serve as a supplement source of water.

Because many wildlife species rely on livestock troughs for at least part of their water needs, troughs should be designed to accommodate their access and to prevent drowning of small animals (Taylor and Tuttle 2007), many of the existing troughs do not meet these standards. This would include providing adequate escape structures, minimizing hazardous obstacles, proper placement, and maintaining full water levels where feasible, or draining troughs when not in use. Troughs should be monitored at least twice annually for trapped or drowned wildlife.

Recommendations concerning livestock management and infrastructure maintenance should be included in the livestock lease or license agreement.

Livestock attractants such as salt licks and mineral tubs can be used in addition to permanent fencing and

water sources to increase use of certain areas within a pasture. Salt licks or mineral tubs should be placed in underutilized areas to increase localized grazing pressure as needed. They should not be placed near water sources or in areas that naturally receive high livestock use, as this can result in overutilization of these areas.

8 CULTURAL AND HISTORICAL RESOURCES

8.1 INTRODUCTION

Wright Hill Ranch and its surroundings have a long history of human occupation, dating back at least 7,000–9,000 years when Kashaya Pomo and Coast Miwok inhabited the Sonoma Coast through to the modern-day ranching operations (N. Tipon pers. comm. 2009). Remnants of these uses exist throughout the property, and their preservation can contribute significantly to an understanding and appreciation of the area's cultural heritage. The property also provides an opportunity for the native community to participate in land stewardship and support ongoing cultural uses and education. This document seeks to balance natural resource protection, its continued status as a working landscape with the preservation of this historical heritage, public use of the property, and engagement of the native community.

A comprehensive archeological survey of the property was conducted in the spring of 2009 by qualified archeologists, during which both Native American and more recent historic resources were documented (Origer 2009). Additionally, the site was visited by local historians in July 2009 to discuss preservation and/or renovation of the historical ranch buildings. In March 2016, a subsequent study was completed from State Route 1 to the Wright Hill Ranch property line for road improvement work on State Park property.

8.2 REGULATORY CONTEXT

The comprehensive resource survey conducted on Wright Hill Ranch in 2009 and the 2016 survey for potential access road improvements were designed to satisfy environmental issues specified in the CEQA and its guidelines (Title 14 CCR §15064.5) by: (1) identifying all cultural and historical resources within the project area; (2) offering a preliminary significance evaluation of the identified resources; (3) assessing resource vulnerability to impacts that could arise from project activities; and (4) offering recommendations intended to protect resource integrity, as warranted.

8.2.1 RESOURCE DEFINITIONS

Historical resources are classified by the State Office of Historic Preservation (OHP) as sites, buildings, structures, objects, and districts; each is defined by OHP (1995) as follows:

Site: A site is the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historic, cultural, or archeological value regardless of the value of any existing structure.

Building: A building, such as a house, barn, church, hotel, or similar construction, is created principally to shelter any form of human activity. "Building" may also be used to refer to a historically and functionally related unit, such as a courthouse and jail, or a house and barn.

Structure: The term structure is used to distinguish from buildings those functional constructions made usually for purposes other than creating human shelter.

Object: The term object is used to distinguish from buildings and structures those constructions that are primarily artistic in nature or are relatively small in scale and simply constructed. Although it may be, by nature or design, movable, an object is associated with a specific setting or environment.

District: A district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.

8.2.2 SIGNIFICANCE CRITERIA

When a project might affect a cultural or historical resource, the project proponent is required to conduct an assessment to determine whether the effect may be one that is significant. Consequently, it is necessary to determine the importance of resources that could be affected. The importance of a resource is measured in terms of criteria for inclusion on the California Register of Historical Resources (Title 14 CCR, §4852) listed below. A resource may be important if it meets any one of the criteria below, or if it is already listed on the California Register of Historical Resources or a local register of historical resources.

By definition, an important historical resource is one which:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- Is associated with the lives of persons important in our past.
- Embodies the distinctive characteristics of a type, period, region or method of construction; represents the work of an important, creative individual; or possesses high artistic values.
- Has yielded, or may be likely to yield, information important in prehistory or history.

Additionally, the OHP advocates that all historical resources over 45 years old be recorded for inclusion in their filing system (OHP 1995), although professional judgment is urged in determining whether a resource warrants documentation.

8.3 DATA COLLECTION METHODS

Native American Contact

Both Gold Ridge RCD and Tom Origer & Associates contacted the Native American Heritage Commission, the Northwest Information Center at Sonoma State University, local tribes, and other community members with historical resource knowledge to provide a general notification about the management report process for Wright Hill Ranch, and to request information they may have regarding resources on the property. Tom Origer & Associates provided letters to the Federated Indians of Graton Rancheria and to Stewarts Point Rancheria notifying the tribes of the archeological survey and to request information.

Archival Research Procedures

Archival research included examination of the library and project files at Tom Origer & Associates office. Reviews (file No. 08-0630 and 15-1410) were completed of the archaeological site base maps and records, survey reports, and other materials on file at the Northwest Information Center (NWIC), Sonoma State University, Rohnert Park. Sources of information included, but were not limited to the current listings of properties on the National Register of Historic Places, California Historical Landmarks, California Register of Historical Resources, and California Points of Historical Interest as listed in the Office of Historic Preservation's *Historic Property Directory* (OHP 2009 and 2012).

As noted above, the Office of Historic Preservation has determined that structures in excess of 45 years of age should be considered potentially important historical resources, and former building and structure locations could be potentially important historical archaeological sites. Archival research included an examination of historical maps to gain insight into the nature and extent of historical development in the general vicinity, and especially within the property. Maps ranged from hand-drawn maps of the 1800s (e.g., General Land Office 1857) to more modern topographic maps issued by the U.S. Geological Survey (USGS) and U.S. Army Corps of Engineers (Corps).

The archeologist from Tom Origer & Associates met with members of the Sonoma County Heritage Network in February 2009, including Press Democrat journalist Gaye LeBaron and long-time member Harry Lapham, and reviewed ethnographic literature that describes appropriate Native American groups, local historical societies, and other county histories. Gold Ridge RCD researched the property through materials provided by the Sonoma County History and Geneology Library and the Sonoma County Historical Society, and interviewed the Furlong family and Jack Poff's close friend, Jerry Lites.

Field Survey Procedures

Based on information obtained from archival research, it was anticipated that both Native American and more recent historic-period resources could be found throughout the property. To identify resources on Wright Hill Ranch, archeologists completed a mixed-strategy field survey of the property between January 9 and March 10, 2009. An intensive survey was completed along the access road on March 28, 2016. Surface visibility varied from primarily poor to occasionally excellent. Dense grasses and forbs in open areas and duff in wooded areas constituted major hindrances to ground surface inspection. Hoes were used to clear small patches of vegetation and duff so that the soil surface could be inspected.

Archaeological site indicators expected to be found in the region include, but are not limited to: obsidian and chert flakes and chipped stone tools; grinding and mashing implements such as slabs and handstones, and mortars and pestles; bedrock outcrops and boulders with mortar cups; and locally darkened midden soils containing some of the previously listed items plus

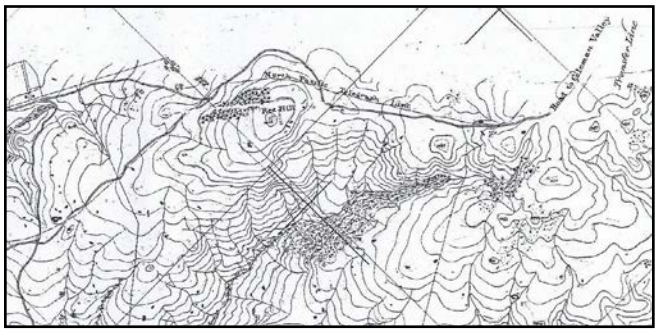
fragments of bone, shellfish, and fire affected stones. Historical period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

8.4 ASSESSMENT RESULTS

8.4.1 ARCHIVAL STUDY FINDINGS

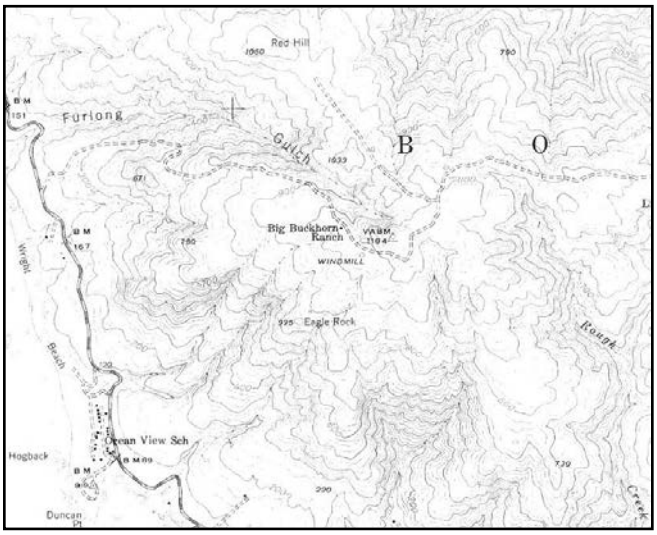
Archival research found that there were no recorded Native American resources and no ethnographic sites reported within Wright Hill Ranch (Barrett 1908, Kroeber 1925, 1932, Kelly 1978); however, the property had not been the subject of prior cultural resources investigation. Two cultural resources surveys have been performed on properties adjacent to Wright Hill Ranch and four on properties nearby, but not contiguous to Wright Hill Ranch. Adjacent surveys found one prehistoric archaeological site that was recorded just outside of the project area (Edwards 1995, Ramaley 2000).

Review of historical maps (see *Maps 1 to 4* below; Bell and Heyman 1888, Corps 1921, McIntire and Lewis 1908, Peugh 1934, Reynolds and Proctor 1898, Thompson 1877, U.S. Coast and Geodetic Survey 1876, USGS 1943) showed the first historical period modifications occurred as early as 1867 (Bowers 1867). This modification consisted of a road connecting Coleman Valley Road to Bridgehaven. In more recent times this road was called the Wright Hill Road. This road is shown on historical maps extending to Bridgehaven; however, a 1943 map (Map 3) shows it terminating at the north boundary of the property. The U.S. Coast and Geodetic Survey map (Map 1) also shows the North Pacific Telegraph Line along Wright Hill Road.

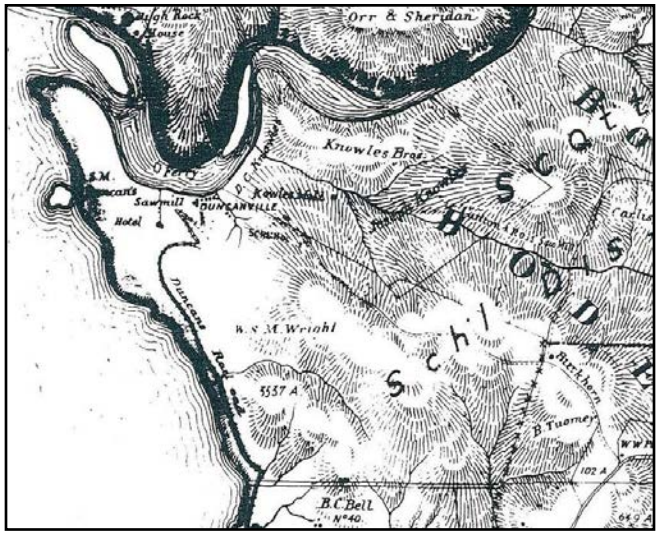


Map 1. Topography of Duncan's Landing Northward (United States Coast and Geodetic Survey 1876). Map shows the North Pacific Telegraphs Line and Wright Hill Road.

Map 2. Map of Sonoma County, California (McIntire and Lewis 1908). Map shows a house in the northwestern portion of the property, at the time part of the large Winfried S. Wright holdings. The Furlong property in Willow Creek is also shown.



Map 3. Duncan Mills Quadrangle (USGS 1943). Map shows the current location of the ranch house, and the former road ending at the north end of the property. A large coastal gulch named for the Furlong family is also apparent. At this time, the property is referred to as Big Buckhorn Ranch.



Map 4. of Sonoma County, California (USGS 1887). Map shows the Little Buckhorn Ranch, east of Wright Hill Ranch (once called the Big Buckhorn Ranch), and a road connecting Coleman Valley Road to Bridgehaven.

Typical rock outcrop on Wright Hill Ranch

Native American Sites

Archeological field surveys identified six Native American resources, four isolated artifacts, and two historical cultural resources. These resources and their locations are detailed in the required Department of Parks and Recreation 523 primary record forms, and in "A Cultural Resources Survey of Wright Hill Ranch" (Origer 2009), a comprehensive confidential report provided by Tom Origer & Associates to the Gold Ridge RCD and the District. However, archaeological site information is legally exempt from the Freedom of Information Act under California Government Codes 6254 and 6254.10. This means publication of archaeological site information is prohibited, and their exact locations are therefore not included in this document. Documentation pertaining to the archeological findings on Wright Hill Ranch is on file at Tom Origer & Associates (File No. 09-01S).

A general description of six identified sites is provided below:

Site 1: This site consists of obsidian and chert flakes, obsidian projectile points, and a concentration of shellfish fragments.

Site 2: This site consists of a rock outcrop that appears to have been quarried to obtain raw material for making chipped stone tools during prehistoric times.

Site 3: This site consists of a small rock outcrop that appears to have been quarried.

Site 4: This lithic scatter site consists of a sparse scatter of obsidian and chert flakes and a few marine shellfish fragments.

Site 5: This site consists of a large chert rock outcrop that has been extensively quarried.

Site 6: This site consists of a wide scatter of chert, schist, and obsidian flakes and tools.

Uniface fragment found during the arheological survey on Wright Hill Ranch.

In addition, three isolated specimens (an obsidian biface fragment, a uniface, and an obsidian flake) were found unassociated with the above sites. The locations of these isolates were noted, and the findings were left intact.

These findings collectively indicate that Wright Hill Ranch was well-utilized by Native American groups, and therefore retains cultural significance to their descendants.

8.4.2 ETHNOBOTANICAL RESOURCES

Representatives of Kashaya Pomo and Coast Miwok emphasize that many natural resources also are considered cultural resources to tribal members, including salmonids and many plant species, as shown in

Table 8-1 below. These plants have traditionally provided materials for food, shelter, clothing, basket or trap material, tools, medicine, ceremonies, and a multitude of other uses.

California buckeye (left) and mugwort (right) — two plant species of cultural significance to Native American culture.

It is not simply the plant species themselves that have cultural significance, but also the natural processes and human manipulation that have traditionally maintained the ecological conditions supporting these species. Native American management practices included burning grasslands and woodlands; cultivating grasses and sedges; and building fish weirs that influenced stream hydrology. Ethnobotanists, historians, and tribal representatives have emphasized both the ecological and cultural importance of reintroducing these practices into modern land management (Anderson 2005, Lightfoot and Parrish 2009, N. Tipon, pers. comm 2009).

Table 8-1. Culturally Significant Plants on Wright Hill Ranch[7]

SCIENTIFIC NAME	COMMON NAME	COAST MIWOK*	SOUTHERN POMO	USE
Achillea millefolium L. var.	yarrow	kickin	sunam ketey	Medicinal
Aesculus californica	buckeye	yawi (tree) 'ulem (mush)	bah sa	Food / Tool / Ceremonial
Artemisia douglasiana	mugwort (sage)	kicin (Tomales) po'-to-po'-to (Bodega)	qa p ula	Ceremonial / Medicinal
Baccharis pilularis	coyote brush	tcu'u		Medicinal / Shelter
Chlorogalum pomeridianum	soaproot	hakka	ha 'an	Food / Tool / Ceremonial
Cornus sericia L. ssp dogwood			mahsa	
Dichelostemma capitatum	bluedick	waila (Tomales) putcu (Bodega)	hi bu la	Food
Eschscholzia californica	California poppy	munkai	si dohcho	Medicinal
Heteromeles arbutifolia	toyon	puylak (berries) puilak	bu'du	Food
Iris douglasiana	Douglas' iris	lawik	si wi ta	Cordage / Medicinal
Morella californica	wax myrtle			
Quercus agrifolia	coast live oak	saata	sa can	Food / Fuel
Ranunculus californicus	buttercup	sitila	qa baja	Food
Rhamnus californica	coffeeberry	po'-tah (Tomales) ko'-tah (Bodega)	si bas bak le	Medicinal
Rubus spectabilis Pursh	salmonberry			Food
Rubus ursinus	blackberry	wate	ti bahqay	Food / Medicinal
Satureja douglasii	Yerba Buena	yerba beenu	yerba beena	Medicinal
Salix lasiandra	grey willow	luma	k a lan	Food / Baskets / Medicinal
Sequoia sempervirens	redwood	lume	kas'in	Shelter / Medicinal
Triteleia laxa Benth.	Ithuriel's spear	putcu	bim'u	Food
Umbellularia californica	bay laurel	sow'-las (Tree) sotok (nuts) tcisa	bahsa (tree) beh e (nut)	Food / Medicinal
Vaccinium ovatum	huckleberry		po' te	Food
* Courtesy of Federated Indians of Graton Rancheria				

8.4.1 HISTORIC RANCH COMPLEX AND RANCHING INFRASTRUCTURE

The ranch complex (ranch house, a large barn, and three outbuildings) and ranching infrastructure (cattle chutes and corrals) is contained within a 15-acre area in the west-central part of Wright Hill Ranch (Figure 11). Miscellaneous ranching features such as fencing, corrals, developed springs, feeding areas, and trash dumps are scattered throughout the property. The ranch complex supports habitat for special-status bat species.

7 Courtesy of Federated Indians of Graton Rancheria

Homestead

Built in the 1880s, the Wright Hill Ranch house has maintained much of its original character, having never been substantially renovated. The structure is listed in the State Park General Plan as a significant historic building in the region, and serves as an integral part of the property's heritage. Jack Poff and his wife Irene, the property's final residents, lived there without many modern amenities for 20 years or so until they started spending more time in Petaluma at their second home.

Built along the ridge road at approximately 1,000 feet in elevation, the house sits to the southeast of the ranch complex, surrounded by a small fenced yard, which remains landscaped. It is a one-story, 1,248 square foot frame building with a shed addition at the rear. The moderately pitched, side-gabled roof is close raked and is now clad with metal sheeting. The front of the house faces southeast, and is marked by a full-width, shed-roofed porch supported by wood posts. The front entry is centered and is accessed by two narrow steps made by stacking pieces of lumber.

The door has one light above three inset panels. Tall wood-sashed windows flank the entry and are found throughout the house. A six-light window (possible fixed or a hopper-style) is located just below the gable on the east elevation. Corrugated metal siding was at one point added to the western side of the house, while the rest remains clad in the original six-inch wood drop siding. Board-and-batten siding was also added to the rear addition. The house remains equipped with a gas-powered refrigerator and two wall heaters, a wood heating stove, a wood cookstove, a clawfoot bathtub, bathroom fixtures, and a kitchen sink. A stack of firewood still sits in the back shed addition. Simple shelving, closet space, and a small safe in one of the bedrooms are also still intact.

Barn

The barn on the Wright Hill Ranch is believed to be the original barn constructed in the late 1800s, although it has been subject to several modifications since then (J. Lites pers. comm. 2009). The large structure, 136x56 feet, is a long, one-story, gable-roofed building with a hipped roof bay on the south end. It appears to have been built in two phases with the south end being older than the north. Because the barn sits at the edge of a slope, the east side rests on the ground while the west is on posts and piers. The east side of the barn is clad with vertical boards that range from 10 to 15 inches wide. The west side is vertical board-and batten siding. The roof on the south end is wood shakes, and on the north end and part of the hipped portion are corrugated metal sheets.

The barn contains many remnant items from the property's dairying and ranching history, including salvaged redwood planks. The wooden stanchions used to hold the cows' heads in place during milking still exist, although the property has not supported a dairy since around 1916. Shearing bins from the sheep ranching operation are still intact on the south end (J.Furlong pers. comm. 2009). The barn was at one time wired for electrical lighting, but this has since been disconnected (Trans Tech Consultants 2007).

Workshop on Wright Hill Ranch

In the winter of 2015, a portion of the roof of the barn was torn off, leaving the southern portion of the barn exposed to the elements. The District consulted with a contractor who specializes in historical structure rehabilitation and remodeling to ascertain the feasibility of repairing the roof. The contractor recommended against repairing the roof, as all the wood supports and beams are riddled with termites, and would have to be replaced, making any repair prohibitively expensive. Thus, the District does not plan to repair or replace the roof. The area used by the grazing operator continues to be enclosed and protected from the elements, and is still useable by him.

Ranch Outbuildings

Three outbuildings exist within the ranch complex, a workshop, garage, and shed, and have remained intact and functional. They are being used for the current ranch operation (J. Furlong pers. comm. 2009).

The workshop is located east of the barn. This gable-roofed building sits on a concrete pad. The doorway is standard sized and is offset to the left on the west elevation. Cladding is vertical board-and-batten. A gate leading into a corral is affixed to the southeast corners of the shed.

The garage and shed sit side by side, separated by just a few inches. The garage has a gabled roof and opposing doors that open outward. It sits on a post-and-pier foundation. Cladding is vertical boards, and the roof has corrugated metal sheets. This building has a window beneath the gable on the east side, and a lower window on the west side.

Garage (top) and shed (bottom) on Wright Hill Ranch.

The shed is a frame building that has a saltbox roof covered with composition shingles, and is on a post-and-pier foundation. The shed is clad with vertical boards and battens on the east and north elevations and vertical boards on the west. The front of the building faces the east and has opposing doors that swing outward. There is also a small opening to the right of the door that has an awning-type door. At the roof/wall junction, offset from the roof peak, is a tall, narrow, screened vent. The north elevation has three wood sash windows and there is small window on the west elevation.

Corrals and Fences

Wood picket fence (top) and woven wire fence (bottom) around the corrals and barnyards.

Numerous corrals and barnyards exist within the ranch complex, and to the east along the main road. The barnyard also has a chute for loading cattle. Perimeter and cross fencing are constructed from barbed or woven wire, wood pickets, or boards, and wood or T-bar replacement posts.

Foundations and Pits

Foundations from two former adjacent buildings are found at the north end of the complex, opposite the cattle chute. The remains of these buildings include mudsills with joists. The most northerly foundation measures about 10x14 feet. The one to the south is less distinct, only evident from partially buried timbers indicating an area of 14x40 feet.

Northwest of the shed/garage there is a fenced area that measures 8x12x14.5x15 feet. Within the fenced area is a wood floor (or collapsed platform) that covers an oval pit. Adjacent to the enclosure is a second pit that is covered by rough-hewn planks about 12 inches wide and two inches thick. A gap in the planks reveals a wood-lined pit that is from 17 to 12 inches deep. The planks cover an area measuring about six feet long and four feet wide.

A sheep dip trench was present near the southeast corner of the barn. This area was identified in the Phase I Environmental Site Assessment as requiring remediation and has since been removed (Trans Tech Consultants 2007); see *Section 2.5Phase I Environmental Assessment* for details and a photograph.

Feeders

Livestock feeders are found throughout the property, composed of long boxes constructed of wood rails and set on the ground.

Water Development

Water tank for house (top) and developed spring for livestock (bottom).

A pumphouse powered by a gasoline engine sends water 825 feet to a 1,100-gallon tank uphill from the

ranch house, which then gravity-feeds the water to the kitchen and bathroom. Multiple developed springs exist throughout the property for livestock, filling troughs consisting of concrete, metal, or plastic cisterns and bathtubs. The appraisal indicates that the springs on the property have provided sufficient water for a year-round herd of 125 cattle (Case & Associates 2007), although many need to be repaired.

Possible telegraph pole

Telegraph Line

Although a telegraph line was found on historical maps, no clear remains of the line were found during the archeological survey. One post was found in the ground that could have been a telegraph post, but no square nails or wire were found associated with it. Another post was found lying on the ground well away from the mapped location of the route, but was of sufficient length to potentially be a telegraph pole. According to Jim Furlong, the current grazing operator whose grandparents historically ran a dairy on the property, Jack Poff and neighboring Oscar Mann ran a telephone line from the Poff house to the Mann house located near the Willow Creek Ranger Station (J. Furlong pers. comm. 2009). The pole could have been from this telephone line, which may have reused the old telegraph pole. He was unaware of the telegraph line's presence, and stated that his grandparents never mentioned a telegraph. However, the telegraph line may have been a private commercial line not connected to the house.

During the archeological survey there were several locations on the property where modern debris was found, including wood, metal, glass, batteries, paper, and plastic. Most of these dumps were located in drainages and on top of rock outcrops. While most of the debris is related to ranching activities, such as barbed wire and fence posts, the debris is too modern to be considered a part of the historical ranch complex. Other locations were found where scattered boards offered evidence of former feed troughs. In two locations boards or beams associated with bricks and/or concrete building blocks were found. These appeared to simply be places where these items were discarded or stored.

However, there were five locations where the debris appeared to be of sufficient age to be documented. The first location has two bedframes, stove pieces, and a brick pile. One of the stove pieces has the name, "Wetter Poppy//The H. Wetter MFC, CO.//Memphis & South Pittsburgh, Tenn." The H. Wetter Manufacturing Company made stoves and was known by several names over the years becoming the H. Wetter Manufacturing Company in 1891. Its most recent name was the U.S. Stove Company and it went out of business in 2003 (South Pittsburgh Historic Preservation Society, Inc. 2009).

Other findings include older washing machine pieces, an old hay rake, an old mower, what appears to be some wagon axle pieces, and a meat grinder. Written on the side of the meat grinder is, "Enterprise MFC CO., Philadelphia, USA." It appears based on very limited research that the company produced metal hardware and kitchen items and were in production as early as 1888 (Greater Philadelphia GeoHistory Network 2009).

Wright Hill Road

Wright Hill Road comprises the former route between Occidental and Bridgehaven via Coleman Valley Road, and bisects the current Wright Hill Road in the center of the property. This road first shows on the 1876 Coast and Geodetic Map (Map 1), and appears to be the oldest north-south road from the mouth of the Russian River to southern and interior locations. At the same time there was a horse-drawn railroad on the marine terrace, which was used to transport timber products. This road predates Highway 1, which does not appear on historical maps until 1876 (US Coast and Geodetic Survey 1876), and was therefore an important route at one time. While some maps show more detail than others, the road seems to generally follow the ridge top, then veers to the east of Red Hill. For many years the road has been used as a ranch road. In the southern half of the property the road is clearly visible and likely

looks much as it did in early historical times. As the road crosses the property to the north its original path is less clear. Once the road reaches the northern boundary of the property its remains are virtually invisible.

8.5 MANAGEMENT CONSIDERATIONS

Increased public use and more active management of Wright Hill Ranch may result in direct impacts to Native American cultural resource sites and potential artifact collecting and vandalism. Monitoring these potential impacts and developing the property to avoid these areas will be a critical component of allowing future public access and continued grazing. Management activities should be designed protect cultural and historic resources that occur on the property while providing educational opportunities to inform visitors of the rich history of the property and surrounding landscape.

Cultural Resources Management Considerations

Archeological field surveys identified six Native American resources, four isolated artifacts, two historical cultural resources, and isolated pieces of obsidian. Native Americans also used resources on the property that are considered cultural resources to tribal members, including salmonids and many plant species. These findings collectively indicate that Wright Hill Ranch was well-utilized by Native American groups; and therefore retains cultural significance to their descendants. Increased public use and more active management of Wright Hill Ranch may result in direct impacts to Native American cultural resource sites and potential artifact collecting and vandalism. Monitoring these potential impacts and developing the property to avoid these areas will be a critical component of allowing future public access and continued grazing.

Historic Property Management Considerations

Unlike Native American cultural resources, Wright Hill Ranch's historic sites can be best preserved through active renovation and maintenance. Short term management of the property should focus on preventing deterioration in ways that protect the historic characteristics of the ranch buildings, corrals, and landscaping. Long term management actions should focus on the renovation of the buildings and public education opportunities Both short term and long term maintenance and repair and active renovation of the ranch should follow the *Secretary of the Interior's Guidelines for Treatment of Historic Properties* (Weeks 1995) to ensure that the historic elements of the complex are protected. Securing the buildings from the elements with sound roofing, windows, and walls will help to prevent deterioration of existing structures. The historic buildings management plan will provide a sound roadmap for the long term management and renovation of the ranch complex. The ranch house supports sensitive populations of protected bats. With increasing public exposure and access, efforts must be taken to protect the house from unfettered access, preserve it against natural erosive elements, mitigate for liability concerns, and ensure public safety and wildlife usage.

9 FUTURE PUBLIC ACCESS OPPORTUNITIES AND PLANNING PROCESS

Wright Hill Ranch contributes significant and unique opportunities to the public access and outdoor education landscape of Sonoma County. The expansive ridge-top grasslands provide stunning vistas of the Sonoma Coast and coastal hills. In addition, the property offers diverse wildlife habitat, a rich cultural history, and a current ranching operation, all located within a growing complex of connected, protected lands. In addition to preserving the land for the protection, restoration, and enhancement of habitat and open space, Wright Hill Ranch was acquired to provide public access where appropriate (California State Coastal Conservancy 2007a). The primary goal of this section is to identify ways to safely maximize the public's ability to experience, connect with, and understand Wright Hill Ranch's distinguishing features in a manner consistent with protection of its conservation values.

This Plan does not assess the variety of trail connections, access points, trail networks, or parking and staging areas or provide recommendations on trail design, layout, construction, or maintenance procedures. Such analysis will be completed together with the future landowner once the District's Board of Directors authorizes the transfer of the property. The public will be invited to participate in a transparent and inclusive process to help the District assess the types of recreational uses that will be permitted on Wright Hill Ranch Open Space Preserve and public access improvements. While the District intends to transfer the fee interest for Wright Hill Ranch, it will hold a conservation easement across the property to ensure that the conservation values are protected forever.

Appropriate and well-planned public access to and use of Wright Hill Ranch has the potential to provide a multitude of benefits to residents of Sonoma County and visitors from elsewhere. Studies conducted locally and at the State level show great interest in undeveloped/ wilderness-type recreation and strong support for more accessible, undeveloped open space and regional trails, specifically coastal trail connections (CDPR 2007, SCRP 2003). Potentially compatible public uses could include hiking, horseback riding, mountain biking, bird watching, botany, photography, and cultural/ historical interpretation; these activities provide opportunities for respite, relaxation, exercise, and education. Public use increases peoples' appreciation for and understanding of local agriculture, natural resources, and cultural heritage. Personal experience with these values helps to foster public advocacy for open space in Sonoma County and beyond.

9.1 PUBLIC ACCESS AND RECREATION OPPORTUNITIES

Wright Hill Ranch has many distinguishing characteristics that present unique opportunities for recreation and education for the public. These include:

- **Local agriculture in action.** This relatively rare example of a publicly-owned, working ranch provides an opportunity for the public to experience local agriculture first-hand, to learn more about ranching past and present, and to connect with the land.
- **Historic house and outbuildings.** The ranch house and other buildings provide a unique opportunity to preserve the ranching history, but are limited by public use due to the presence of sensitive wildlife species.
- **Wilderness experience.** The property's remote location and intact wildlife habitat provide an opportunity for visitors to experience a relatively wild landscape.
- **Scenic vistas.** The property's elevation and location along the Sonoma Coast provides one of the only locations on the coast where visitors can experience unobstructed views from Bodega Head to Jenner and the native habitats that surround.
- **Important trail connections.** Surrounding protected lands could make Wright Hill Ranch a key link in a network of longer-distance routes for passive recreation extending visitors' experiences to include day-long and multi-day trips.

The property also has a number of issues that must be addressed to ensure that access programs are safe and do not conflict with other management goals, including protection of natural and cultural resources, and ranching operations (see *Management Considerations* below). Allowable uses on the property, access, and trail

connections would be developed by the District and the ultimate property owner as part of the conservation easement and transfer agreement.

9.1.1 TRAIL CONNECTIVITY WITH SURROUNDING LANDS AND REGIONAL LINKAGES

Wright Hill Ranch is situated in a complex of largely undeveloped rural parcels, both publicly and privately held (Figure 1). Only when considered together with these surrounding parcels is the property able to showcase two of its distinguishing features: a wilderness-like feel and a potential to connect currently isolated or limited trails to create a regional trail network. The lack of apparent development visible on and from Wright Hill Ranch contributes to a wilderness experience within easy reach of urban centers (e.g., Santa Rosa and San Francisco Bay area).

LandPaths outing on Wright Hill Ranch (Jonathan Glass)

9.1.2 PUBLIC EDUCATION

The property offers an excellent opportunity for public educational events and programs that highlight current ranch operations, cultural significance, and natural resources. Such events provide a means to reach beyond recreation enthusiasts to include a broader audience. Public access and education could include scheduled gatherings around oral/cultural history, natural history, and guided themed hikes. Whenever possible, these events could feature local partners (e.g., ranchers, neighbors, cultural and natural resource specialists, etc.). However, use of the buildings around the ranch complex would be limited due to the presence of protected bat species that are highly susceptible to human disturbance.

9.1.3 VOLUNTEER PROGRAMS

Volunteers could be trained and utilized to report property conditions; conduct monitoring of property natural resources; assist with site security; remove invasive species; install interpretive signage; repair or remove fencing; and create trails. Volunteers should be recruited for their interest in and understanding of the property and its distinguishing features.

9.2 MANAGEMENT CONSIDERATIONS

Natural Resources

Wright Hill Ranch supports a diversity of native habitats and wildlife which depend on them. Both on its own and in the context of the surrounding landscapes, the property is key to protecting ecological processes at a scale large enough to significantly contribute to native plant and wildlife persistence. The long-term health of the property's habitats, wildlife communities, special-status species, and underlying ecological processes will need to be carefully considered for any proposed uses.

Cultural and Historical Sites

Wright Hill Ranch contains many identified cultural and historical sites that represent some of the property's most interesting and distinguishing features. Specific locations of archaeological sites are confidential. The ranch complex support sensitive wildlife species and disturbance to these species will need to be carefully considered for any public use of the land and building sites. Minimizing the impact on these resources will require proper planning, education, and appropriate public use of the property.

Access to Property and Parking

Because of its remote setting, the property relies on adjacent properties for access. Primary access to the site is by Wright Hill Road from Highway 1 and by trail from Red Hill. Both of these access points create limits on the type and level of use. District-sponsored guided public tours have accessed the property from Red Hill via an old gate (currently locked) on the northern boundary. There is currently no established trail connecting the Red Hill Trail with Wright Hill Ranch (approximately ¼ mile) or encroachment permit in place; however, an informal route exists that is suitable for guided tours and volunteer patrollers.

The portion of Wright Hill Road between Highway 1 (at Carlevaro Way) and the western boundary of Wright Hill Ranch is narrow and moderately steep with few turn-outs to allow oncoming vehicles to pass and the only vehicle access onto the property. Without significant upgrades, vehicle access on the road is appropriate for staff, lessee, and volunteers only. State Parks currently holds an easement with the District for use of the road, which passes through State Park property to the west of Wright Hill Ranch.

A transportation plan addressing future road uses and alignment would need to be developed. This plan would need to project the likely future types of use (e.g., light vehicles only, 4WD, etc.) for each road segment, as well as the likely frequency and seasonality of each type of use, and an evaluation of problematic roads and re-establishment in more appropriate locations. Erosion prevention prescriptions could then be developed to remedy existing erosion issues while also preventing development of future ones.

Access to the property from the road leading east onto Coleman Valley is currently inaccessible through the neighboring property. Access through this adjoining property should be secured in the event there is an emergency.

Informal parking near the ranch complex is adequate for staff and volunteer vehicles. However, this area is not graveled and wet season use would need to be evaluated. Cattle are not currently excluded from this informal parking area. Nearby buildings support sensitive wildlife and warrant protection from any disturbance related to parking and public access.

There is no off-site parking for general public access. There are nearby parking areas at Shell Beach and Carlevaro Way, owned and operated by State Parks. Both of these parking areas would require further discussion with that agency regarding use; they would also require an encroachment permit from Caltrans to allow for public crossing of Highway 1. Safety and legal concerns would need to be addressed related to parking at Carlevaro Way and crossing of Highway 1.

All access points and emergency response planning would be covered in a subsequent analysis of public access once the property is transferred.

Bay grove. A cattle trail is apparent, as is carving on the trunk at right.

Site Security

Responsible public access that includes a public education component has the demonstrated potential to help prevent and displace illicit use; volunteers, staff, and participants can also report on resource management issues. Training could enable volunteers and staff to monitor cultural and natural resource sites as well. Currently, patrols on the property are performed only by the District staff and the grazing lessee.

10 MANAGEMENT AND MONITORING RECOMMENDATIONS

Situated within a complex of protected lands that are rich in both native habitats and human history, Wright Hill Ranch is an alluring destination. There are many types of resources here to protect. The goal of this plan is to provide guidance for balancing natural, cultural, and historical resource protection, and support of one of the last remaining livestock operations on the Sonoma Coast. Achieving these multiple goals will require protecting ecological processes, monitoring changes to the property where impacts may occur, and adjusting management strategies over time. There is potential for a range of recreational and educational activities on the property. However, balancing low-intensity public outdoor recreation with the stated objectives for conservation of the land will be a central challenge for the long-term management of the property.

Key natural resources to protect on Wright Hill Ranch include diverse and self-sustaining native plant and animal communities, migratory and dispersal corridors for wildlife, water quality and soil resources. Conserving ecological processes is a vital component of resource protection and climate change adaptation. Maintaining or restoring natural hydrology, for example, protects the soil and benefits the health of plants and wildlife on the property itself, as well as that of downstream waterways and aquatic life. Vegetation communities, many of which have been altered by human uses and face ongoing stresses such as climate change, will require some management to ensure that they are self-sustaining and continue to support the wildlife species that depend on them. Managed fire, historically used to manage vegetation, may have a limited role on the property, but overall fire risk should be reduced to protect the buildings. Continued grazing will serve as an important disturbance tool to help maintain grassland diversity on Wright Hill Ranch while honoring the County's farming history. However, grazing will require careful management to protect natural resources and a number of infrastructure improvements to maintain or improve the ranching operation.

Wright Hill Ranch's cultural and historical resources provide a window to the property's historic importance for both Native Americans and early settlers, and the preservation of these resources has both intrinsic and educational value. Protecting these resources to minimize vandalism or incidental damage, and public education, will be key components of managing these resources.

Like all natural systems, the Wright Hill Ranch landscape will change over time, especially with new land uses. Effective long-term natural resource management of the property will require observing and understanding those changes, and making decisions about how to adjust management strategies accordingly. Monitoring can provide information on the impacts of Preserve use and grazing, the effectiveness of restoration or protection efforts, and the local effects of larger ecological changes. Adaptive management will also entail staying informed of current research on relevant resource management issues and methods.

All of the monitoring tasks listed in Table 10-1 are important to inform stewardship of Wright Hill Ranch. However, the most critical are noted with an asterisk and include:

- Developing and updating a vegetation map of the property so that any decreases in native habitat extent can be addressed;
- Monitoring wildlife corridor use and species presence to determine appropriate Preserve uses and locations and to document wildlife response to changing land uses;
- Mapping invasive plant species to detect any increases or new populations;
- Monitoring active erosion areas and culvert crossings to identify needed repairs and protect aquatic resources; and
- Monitoring lessee compliance with contract conditions to ensure that grazing intensity is compatible with resource protection.

The objectives, actions, and monitoring tasks in the table below (Table 10-1) are designed to support natural processes and to enhance the property's ecological role in the larger landscape while also allowing continued grazing, and the preservation of cultural and historical resources. Overarching objectives are provided for all of the management areas of concern, with specific

actions for each. Management actions are assisted time frames for implementation and broken down into short term (1–5 years), long term (6+ years), and ongoing. Short term actions are the highest priority management actions that should be undertaken by the District or land management entity overseeing the property. Long term actions should be implemented as funding is available and after completion of the higher priority actions.

Monitoring tasks, which follow the objectives and actions, are targeted to provide the most useful information to land managers to address the effects of public uses and livestock grazing on the property's resources. The monitoring tasks will need to be prioritized based on the availability of resources (e.g., funding, staff time) with which to carry them out. Management actions are ongoing. Objectives, actions, and monitoring recommendations are provided for biological resources (both property-wide and habitat-specific), hydrology and erosion control, fire management, livestock grazing, cultural and historical resources, and public uses. Many of the recommendations provided are interrelated and should be considered throughout the Preserve. More detailed information specific to invasive plant species management, gully erosion, infrastructure needs for the livestock operation, and building and property maintenance, is provided in table format in Appendix G. These tables will need to be evaluated and updated periodically to address current property conditions and completed actions.

In addition to the monitoring efforts listed in Table 10-1, which are the most essential to stewardship, there are a number of other variables that could be investigated on the property. These could address both ongoing land management and use, and the property's role in the larger ecological community. For example, a volunteer marbled murrelet survey could be completed with the local birding community to establish whether this endangered seabird is using the property's older forests. Collaboration with non-profit conservation groups like Point Blue and educational institutions like Sonoma State University, University of California Cooperative Extension, as well as other local grassland researchers and managers would be valuable partnerships for testing different grassland management approaches; identifying strategies for controlling the spread of invasive species such as hairy oatgrass; and evaluating Douglas-fir and shrub encroachment — where it's happening, how far it is likely to spread, and what constrains it. These are just a few examples of larger-scale and volunteer efforts that could be undertaken on Wright Hill Ranch with the oversight of District staff.

Table 10-1. Management and Monitoring Recommendations for Wright Hill Ranch

PROPERTY-WIDE NATURAL RESOURCE MANAGEMENT	
Objectives	
1. Prevent fragmentation of native habitats. 2. Promote land management practices and public uses that support the persistence of the property's native plant and wildlife communities. 3. Maintain minimum setbacks for sensitive habitats to protect plant and wildlife communities and ecological functions.	
Management Actions	**Time Frame**
Minimize the development of new trails and roads. The most appropriate areas for development are those that are already disturbed by previous uses and which also do not pose long-term management concerns. Development should minimize fragmentation and soil disturbance and avoid the following habitats: • Wildlife movement corridors • Grassland areas of high use by grassland wildlife specialist species • Native grasslands • Rock outcroppings • Riparian drainages and wetlands • Old bay grove • Areas of unstable soils (e.g., gullies, slumps)	**Ongoing (Avoidance Measure)**
Implement soil protection measures where ground disturbance occurs. Measures include seeding or planting promptly with appropriate native species and covering with weed-free straw mulch, and/or installing biodegradable erosion control fabric on slopes. See *Native Habitat Revegetation and Enhancement* below.	**Ongoing (Avoidance Measure)**
Provide vegetated buffers between sensitive resources and Preserve development. Buffers should be at least: • 100 feet from the top of bank/edge for riparian and wetland habitats for low to medium impacts. • 300 feet from the top of bank/edge for riparian and wetland habitats for high impacts. • 25 feet from the edge of native grasslands, rock outcrops, and viola patches for low to medium impacts. • 50 feet from the edge of native grasslands, rock outcrops, and viola patches for high impacts. Variations from the recommended buffer will require a more thorough assessment and mitigation to ensure natural resources protection.	**Ongoing (Avoidance Measure)**
Ensure continued inclusion of Wright Hill Ranch in Madrone Audubon's annual Christmas Bird Count.	**Ongoing**
*__Develop a wildlife habitat use study__ to assess key corridors of movement on the property and determine species composition. The study would strengthen the scientific foundation for identifying what public uses and infrastructure are appropriate, and where to locate them.	**Short Term**
Monitoring Tasks	
*__Develop a baseline map of Wright Hill Ranch vegetation communities__ based on District-led county-wide vegetation mapping, with the addition of sensitive plant communities (i.e., alliances labeled with an asterisk in Table 4-1). Update every 3 to 5 years through a combination of on-the-ground monitoring and aerial image interpretation. If decreases in native habitat extents are detected, evaluate possible causes and adjust management strategies as appropriate.	
Monitor changes in wildlife use of the property in accordance with the wildlife habitat use study so that management strategies and uses can be adjusted as needed. See *Cultural and Historical Resources Monitoring* tasks for bat recommendations.	
Monitor annual Christmas Bird Count data collected by Madrone Audubon to document trends in recorded species. If changes are detected, evaluate possible causes and adjust management strategies as appropriate. If non-native species are detected, evaluate the need for management. See *Invasive Animal Species Management* below.	

See also *Hydrology and Erosion Control Monitoring* for tasks related to trails, and *Fire Management Monitoring* for tasks related to illegal uses.

GRASSLAND AND SCRUB HABITAT MANAGEMENT

Objectives

4. Retain intact native grassland. Avoid alteration of the soil surface from new trails, Preserve infrastructure, and other human activities in native grasslands.

5. Manage livestock grazing to benefit grassland habitats and native wildlife communities.

6. Protect native grassland plant assemblages and special-status species.

Management Actions	***Time Frame***
Avoid developing new trails and Preserve infrastructure through native grasslands.	**Ongoing (Avoidance Measure)**
To support property management:: • **Map and identify American badger habitat** and burrow density. • **Map current locations of western dog violet** and complete periodic focused adult Myrtle's silverspot butterfly surveys. • **Avoid areas of high wildlife use.**	**Short Term (Avoidance Measure)**
Prior to ground-disturbing activities such as trail development, fencepost installation, or erosion mitigation, perform focused surveys for badger burrows. Map current burrow locations and protect them from disturbance. Establish appropriate setbacks in consultation with a qualified wildlife biologist. Setback distances will be dependent on the proposed activity, and the density and activity level of the burrows.	**Ongoing (Avoidance Measure)**
Maintain a livestock stocking rate that is compatible with resource protection and informed by ongoing monitoring. See *Livestock Grazing* below.	**Ongoing (Avoidance Measure)**
Limit livestock use of coastal scrub areas via placement of water sources or other attractants away from these areas.	**Ongoing (Avoidance Measure)**
Incorporate Myrtle's silverspot larval host and native nectar plants into revegetation efforts.	**Short Term**

Monitoring Tasks

Monitor long-term effects of livestock grazing on native grassland vegetation. Formal, quantitative monitoring will be most informative, but may be costly to implement unless done in collaboration with existing research efforts by others.

- Formal monitoring would entail establishment of paired plots of similar grazed and ungrazed (i.e., fenced) grassland. Within each plot, quantitatively assess species composition and abundance each spring.
- If formal monitoring is not feasible, make annual qualitative observations of species composition and abundance in established grazed locations.

If declines in native diversity or abundance are observed, and declines may be linked to grazing practices, alter grazing regime and implement further monitoring to identify grazing practices that will support native species.

Monitor the following special grassland plant and wildlife populations:

- Rock outcrop flora (where accessible), harlequin lotus, and western dog violet populations to determine whether their extent or composition is changing over time. Use GPS equipment to map, record qualitative descriptions or lists of species present, and/or population size estimates as appropriate. After baseline conditions are established, monitor every 3 to 5 years, at the same time each monitoring year, in spring or summer.
- American badger populations to determine whether habitat use and density is changing over time. Use GPS equipment to map and record burrow locations to determine density and population size estimate as appropriate. After baseline conditions are established, monitor every 3 to 5 years. The monitoring program should be implemented by a qualified biologist.

If declines in special grassland plant or wildlife populations are observed, investigate to determine potential causes. Human recreational use, livestock use, and/or climate change all have potential to influence these populations. Installation of exclusionary fencing or educational signage may be needed to protect populations from recreational or livestock use. Monitoring will also be important if grazing is removed from the property, which could result in changes to invasive and native species populations.

Monitor coyote brush and Douglas-fir seedlings within patches of native-dominated grassland. Every 3 to 5 years, map with GPS equipment, and/or use aerial imagery if feasible. Currently these woody native species primarily occur outside of native grasslands; if there is any encroachment into native patches, remove by hand. If large-scale removal is needed, methods may include targeted grazing or prescribed burning.

RIPARIAN AND WETLAND HABITAT MANAGEMENT

Objectives

7. Avoid development in riparian and wetland habitats and provide adequate setbacks for any proposed activities to protect plant and wildlife resources and water quality.

8. Manage livestock grazing to protect riparian and wetland habitats.

9. Protect special-status and common riparian and wetland species.

Management Actions	Time Frame
Avoid developing new trail crossings over or through gullies, riparian areas, and wetlands and maintain appropriate setbacks.	**Ongoing (Avoidance Measure)**
Conduct a formal wetland delineation for areas that would be permanently or temporarily disturbed to confirm location, extent, and regulatory status of wetland and water features within the management activity area. Delineations should follow U.S. Army Corps of Engineers and California Coastal Commission guidelines.	**Ongoing (Avoidance Measure)**
Assume presence of California red-legged frog in all drainage and wetland habitats. If future activities are proposed within 500 feet of any drainage or wetland, focused surveys will need to be completed and avoidance and/or mitigation measures will need to be developed in consultation with USFWS and CDFW.	**Ongoing (Avoidance Measure)**
Create a Riparian Protection Area in Pasture 7.	**Short Term**
Strategically place water sources and/or supplements away from sensitive aquatic habitats to reduce livestock uses of these areas.	**Short Term**
Modify livestock water structures to protect water quality, minimize erosion, and protect wildlife.	**Long Term**

Monitoring Tasks

Visually monitor riparian and wetland areas twice annually, in spring and summer, to ensure that livestock grazing is not resulting in denuded (i.e., bare soil visible) or invasive plant infested areas. If so, confer with grazing lessee to reduce or eliminate grazing pressure on these areas and, if needed, treat invasive populations. See *Livestock Grazing Monitoring* for related tasks.

Monitor for invasive plant infestations in Riparian Protection Zone in Pasture 7 each spring for first 5 years after the zone is established, and then every 3 to 5 years thereafter. If invasive plant populations are increasing, implement short-term grazing as needed for weed control.

FORESTED HABITAT MANAGEMENT	
Objectives	
10. Minimize the fragmentation of forests and woodlands to maintain habitat connectivity and protect wildlife resources. 11. Manage livestock grazing to protect forest and woodland habitats and native wildlife communities. 12. Minimize the spread of *Phytophthora ramorum*, the pathogen that causes Sudden Oak Death, to preserve ecosystem health and ensure public safety.	
Management Actions	**Time Frame**
Avoid developing new trails and infrastructure in native forests and woodlands.	**Ongoing (Avoidance Measure)**
Prohibit additional trail development in old bay grove and redwood forests to protect them from soil disturbance and compaction and encourage regeneration (see Figures 5 and 10). Install signage along existing trails adjacent to or within these sensitive locations to encourage visitors to stay on trails.	**Ongoing (Avoidance Measure)**
Assume presence of northern spotted owl and Sonoma tree vole in Douglas-fir (tree vole), redwood, and mixed hardwood habitats on the property. If future activities are proposed within these habitats, focused surveys will need to be completed to determine species presence and activity centers and avoidance measures and/or mitigation measures will need to be developed in consultation with USFWS and/or CDFW.	**Ongoing (Avoidance Measure)**
Limit livestock use of forest and woodland habitats via placement of water sources or other attractants away from these areas.	**Long Term**
Establish a forest protection zone in Pasture 4 (see Figure 10).	**Short Term**
Implement Contaminant and Pathogen Control actions described below.	**Ongoing (Avoidance Measure)**
Monitoring Tasks	
Visually monitor for negative impacts (i.e., soil compaction, vegetation trampling, loss of natural regeneration) of livestock grazing or informal trail development on forests. Monitor annually, in summer. If negative impacts are detected, install wildlife-friendly exclusion fencing or signage as appropriate.	
See also *Contaminant and Pathogen Control Monitoring*.	
INVASIVE PLANT MANAGEMENT	
Objectives	
13. Prevent new infestations of invasive plants[7], and eradicate or control existing invasive plants on the property.	
Management Actions	***Time Frame***
Work with the grazing lessee when a new grazing license is issued to prevent the introduction and spread of noxious weeds, including via introduced feed, livestock themselves, and lessee vehicles.	**Ongoing (Avoidance Measure)**
To prevent weed seed dispersal, clean plant material and soil from the tires and undercarriage of vehicles and equipment (e.g., mowers) that have traveled through weed-infested areas, before they leave those areas. Cleaning can be done with a hose if water is available, and/or with a scrub brush or stiff broom (see CIPC 2012).	**Ongoing (Avoidance Measure)**
Limit ground-disturbing activities in extent and duration. Grading, disking, digging, and removal of plant cover provide ideal conditions for most invasive species to establish. When ground alteration occurs, revegetate promptly with an appropriate suite of native species. Among species native to the habitat type, consider including natives that grow rapidly, and/or those that have growth habits and seasonal timing similar to potential invaders, to help suppress invasive populations. Supplemental manual control may still be needed to fully control invasive plants.	**Ongoing (Avoidance Measure)**

[7] Invasive plants include those listed in Table G-1 in Appendix G as high or moderate priority for management and any species identified by Cal-IPC as invasive. Table G-1 is based on current 2015 conditions and will need to be updated.

Use only species native to Sonoma County for restoration and erosion control. Plants and seeds should be of local provenance — from the lower Russian River watershed or coastal Sonoma County with similar environmental conditions. See *Native Habitat Revegetation and Enhancement* actions for climate change considerations.	**Ongoing (Avoidance Measure)**
Train staff and Preserve volunteers to recognize invasive species and report new infestations promptly. Hikers, staff, and/or volunteer trail watchers can serve as valuable eyes on the landscape to spot new infestations. Volunteer work days are also a great opportunity for engaging the public with removal of invasive plant species, with the exception of any treatment requiring herbicide application. Many resources are available for learning to identify invasive species, including The California Invasive Plant Council (www.cal-ipc.org) and CalFlora (www.calflora.org/).	**Ongoing (Avoidance Measure)**
Eradicate infestations of high-priority species with currently limited occurrences on the property; control or eradicate those that are more common. Focus on new occurrences, plants at the edge of an existing infestation, or infestations within high-quality native habitat. In large patches, work from the edges inward. Limit the use of herbicides to spot treatments of high-priority infestations or stump treatments of medium-priority infestations. For herbicide specifications, consult with a licensed pest control advisor (PCA). • During invasive removal, avoid damage to existing native plants, which, if left intact, may help suppress the invasive species. • Remove all invasive plant material with any potential to germinate (e.g., seeds, rhizomes, stem fragments for stoloniferous species) and burn or dispose of in a landfill. If complete removal from the site is not feasible, propagules may be killed in place (e.g., by covering with plastic to heat or eliminate light) with careful follow-up to ensure success. After removal, plant or seed disturbed sites with genetically appropriate native species as promptly as possible. See *Native Habitat Restoration and Enhancement* for more information.	**Short Term for Species with Limited Occurrences; Ongoing for Common Species**
Monitoring Tasks	
* **Update map of invasive plant species populations throughout the property annually**, using GPS equipment. Include areas of ground disturbance and horticultural plantings near the ranch complex. If new populations are found or existing infestations are growing, develop and implement control strategies promptly. Update Appendix G, Table G-1 annually to identify any new species of moderate or high priority for management.	
Visually assess the results of invasive species removal/control efforts annually to determine effectiveness and identify follow-up needs. In some cases, more detailed, quantitative monitoring may be needed for specific treatment locations to see how density, abundance, and plant community composition has responded to treatment.	
INVASIVE ANIMAL SPECIES MANAGEMENT	
Objectives	
14. Prevent the establishment and monitor/control existing populations of invasive animal species on the property.	
Management Actions	***Time Frame***
Establish a regular monitoring program to evaluate the establishment of new invasive animals and changes in population size of existing populations and manage accordingly.	**Long Term**
Monitoring Tasks	
Monitor invasive wildlife population changes and establishment through visual surveys of all habitats on the property. Monitor year-round as part of regular patrols. Also monitor by a qualified biologist annually to provide recommendations to the land managers on existing site conditions, species present, and recommended actions. This monitoring effort could also be conducted in part by volunteers. Volunteers could be educated about the key invasive wildlife species of concern, signs to watch out for, and reporting requirements. If invasive species are becoming established, participate in local management program(s) (e.g., for wild turkeys and feral pigs) and/or develop a property-specific eradication program.	

BIOLOGICAL SURVEYS AND TRAININGS	
Objectives	
15. Protect native wildlife during any development and/or maintenance activities on the property.	
Management Actions	***Time Frame***
Work outside of the critical breeding bird period (March 1 through August 31) and over wintering season for burrowing owls (approx. mid-November to April; in suitable grassland habitats) for construction projects and during ongoing land management (e.g., vegetation removal, etc.). If activities must occur during this period, work areas should be surveyed by a qualified biologist prior to commencing. Surveys would be required for all human-related ground disturbance activities in natural habitats, and for vegetation trimming and removal. For ongoing land management (e.g., trail clearing, vegetation removal, mowing, building retrofits), trained Preserve staff would be qualified to complete the surveys. If active nests, occupied burrows, or behavior indicative of nesting or burrowing are encountered, those areas plus a 50-foot buffer for small nesting songbirds, 250-foot buffer for larger nesting birds (e.g., owls, raptors), and 160 feet around burrowing owl habitat should be avoided until the area has been vacated. If the work areas are left unattended for more than one week following the initial surveys, additional surveys should be completed.	**Ongoing (Avoidance Measure)**
Complete presence/negative finding bat surveys prior to disturbance of any trees potentially supporting bat roosts. Surveys should be completed by a qualified biologist. These would include surveys of any trees subject to removal or significant trimming. Because each individual bat species may use different roosts seasonally and from night to day, surveys must be conducted by a qualified biologist at the appropriate times. If active tree roosts are identified on the property, appropriate avoidance measures should be developed. This may include seasonal limitations on work when roosts are unoccupied.	**Ongoing (Avoidance Measure)**
Consult with CDFW regarding the presence of Townsend's big-eared bat in the ranch house and implement temporary measures outlined in Wildlife Research Associates (2015) until formal protection measures are established. No work on the ranch house should occur prior to discussions with CDFW and/or a qualified biologist to ensure bat resources are being protected. See additional management recommendations under *Public Uses Management* below.	**Short Term**
Complete focused surveys for American badger, Sonoma tree vole, Myrtle's silverspot butterfly, California red-legged frog, and northern spotted owl for any work proposed in their respective habitat. Establish protection standards in consultation with CDFW and/or USFWS to minimize/avoid impacts.	**Ongoing (Avoidance Measure)**
Perform preconstruction surveys prior to significant ground disturbance within all native habitats, year-round. Surveys (on the day preceding work and/or ahead of the construction crew) should be performed by qualified staff or consultant to ensure no special-status species or common wildlife are occupying the area. If wildlife species are observed within the work area or immediate surroundings, these areas must be avoided until the animal(s) has (have) vacated the area, and/or, upon approval by the regulatory agencies, the animal(s) must be relocated out of the area by a qualified biologist.	**Ongoing (Avoidance Measure)**
Install temporary wildlife exclusionary fencing (e.g., silt fence) during construction around work areas (trails excluded), year-round. This fencing will preclude animals from entering the work area and prevent construction debris, sediment and workers from entering adjacent habitats. Fencing should have one-way escape routes to allow animals to exit the work area and prevent them from re-entering the site. Construction access areas can be left unfenced.	**Ongoing (Avoidance Measure)**

Conduct a training session for all construction crew personnel before any significant ground disturbance or building work, year-round. The training should be conducted by a qualified biologist and should include a discussion of the sensitive biological resources on the property and the potential presence of special-status species. This must include a discussion of special-status species' habitats, protection measures to ensure species are not impacted by project activities, project boundaries, and biological conditions outlined in the project permits, as applicable.	**Ongoing (Avoidance Measure)**
Monitoring Tasks	
Not applicable.	
CONTAMINANT AND PATHOGEN CONTROL	
Objectives	
16. Prevent the introduction of contaminants and the spread of plant diseases including Sudden Oak Death on the property.	
Management Actions	***Time Frame/***
Use pesticides with caution to prevent contaminated runoff. This is particularly important for all road and ditch maintenance activities and invasive plant species treatments completed by property staff or other county crews.	**Ongoing (Avoidance Measure)**
Employ Best Management Practices for staging, maintenance, fueling, and spill containment of all potentially hazardous materials used on the property.	**Ongoing (Avoidance Measure)**
Before purchasing any nursery stock for restoration plantings, confirm that the nursery follows current Best Management Practices for preventing the spread of SOD (consult the California Oak Mortality Task Force, www.suddenoakdeath.org, for current standards). Inspect all plant materials for symptoms of SOD before bringing onto the property.	**Ongoing (Avoidance Measure)**
Train Preserve staff on host species, symptoms, and disease transmission pathways for Phytophthora ramorum and other *Phytophthora* species, and on Best Management Practices to prevent the spread of SOD, including: • Clean equipment after working in forest and woodland habitats, including chainsaws, boots, and truck tires (spray with a 10% bleach solution or other disinfectant, then rinse). • Work in forest and woodlands in the dry season instead of the wet season when spores are being produced and infections are starting. Avoid or minimize pruning oak, tanoak, and bays in wet weather. • Leave potentially infected downed trees on site instead of transporting the material to an uninfected area. Where infection is already known to be present, leaving *P. ramorum*-infected or killed trees on site has not been shown to increase the risk of infection to adjacent trees (COMTF 2008). Removal from the property is only recommended if fire risk is high, or for aesthetic, safety, or other reasons. If infected material is removed from site, dispose of at an approved and permitted dump facility within the quarantine zone encompassing the 14-county infected quarantine zone. If necessary to reduce safety or fire hazards, infected trees can be cut, branches chipped, and wood split. Avoid working in wet weather. Clean equipment after work is completed. Do not leave cut wood and chips in an area where they might be transported to an uninfected location.	**Ongoing (Avoidance Measure)**

Educate Preserve users about measures to prevent the spread of SOD. Include signage at major trailheads explaining that SOD occurs on the property, showing typical symptoms and explaining that it can be spread by Preserve users, especially in wet winters, during rainy and windy weather. This may be based on existing public educational materials such as those developed by the California Oak Mortality Task Force (COMTF 2008). Request that park visitors: • Avoid entering areas that appear to be diseased, especially in wet, muddy conditions. If avoidance is not possible, follow the sanitation practices described below. • Stay on established trails and respect trail closures. • Avoid transporting SOD on shoes, vehicles, or other transport methods (e.g., bike tires or horses, if allowed). After traveling through an infected area, clean up and disinfect. For instance, hikers should remove mud from shoes using an old screwdriver, stiff brush, and/or towel. Further disinfect shoes by washing with soap and water or spraying with a 10% bleach solution.	**Ongoing (Avoidance Measure)**
Monitoring Tasks	
Monitor the spread of SOD on the property and oak regeneration in infected areas. Establish baseline map of SOD infestation with GPS mapping in areas with high concentrations of symptoms. Update the maps every 3 to 5 years to determine if additional actions are needed. Evaluate sanitation practices and/or implement trail closures if spreading.	
In conjunction with SOD mapping, assess infected areas for oak regeneration to determine whether active regeneration is needed to facilitate recovery of woodlands.	
Participate in the annual SOD Blitz sponsored by the California Oak Mortality Task Force and UC Extension to identify and monitor progression of SOD throughout the Sonoma County. The Preserve would serve as a good location to participate in the Blitz to complete a rapid assessment of SOD presence and to train staff and volunteers to monitor the Preserve for SOD.	
NATIVE HABITAT REVEGETATION AND ENHANCEMENT	
Objectives	
17. Restore a more continuous corridor of riparian vegetation within the riparian protection zone west of the ranch complex to benefit wildlife and protect soil and water quality. 18. Plant an understory of native vegetation in the forest protection zone to hasten site recovery and reduce chances of invasive establishment. 19. Revegetate invasive removal sites promptly with native species to reduce chances that invasive plants will re-establish and to help protect disturbed soil. 20. Establish perennial species along eroded drainages and wetlands in areas used heavily by cattle to help protect soil from further erosion. 21. Restore decommissioned trails and roads with native species to enhance habitat and reduce the occurrence of weedy species. 21. Implement native grassland restoration in demonstration or experimental areas to improve habitat and test approaches to restoration. 23. Improve habitat conditions for wildlife during restoration efforts and ongoing land management.	

Management Actions	*Time Frame*
Develop habitat-specific revegetation plans prepared by a qualified staff or consultant. Include site preparation methods (soil treatments and invasive species control) as needed, planting locations, plant species composition, plant collection and propagation protocols, plant protection methods, maintenance and watering protocols, monitoring, and success criteria. Plan for a mixture of plant lifeforms (e.g., shrubs, vines, perennials, and herbaceous species as well as trees) appropriate to the habitat. The maintenance of structurally diverse habitats is especially important for birds. Target plant types should include: • Riparian and wetland protection zone — willows and riparian shrubs • Forest protection zone — understory herbs, perennials, and shrubs • Invasive species removal sites — species with similar life history traits to invasive plants, and/or which establish and spread readily • Erosion sites in drainages and wetlands — perennial rushes, sedges, native perennial grasses, and other rhizomatous species • Trail and road decommissioning sites — species appropriate to surrounding habitat • Grasslands — native grasses, annual and perennial forbs	**Ongoing** **(Avoidance Measure) for disturbed sites; Long Term for others**
For plantings, use seed or container stock of local origin. Seed or propagules for revegetation should be collected from the property itself if a viable source is present. Where this is not possible, propagules should be from within the lower Russian River watershed or coastal Sonoma County, with exceptions being made only after review by a qualified staff or consultant. Within these geographic parameters, collections should be made with the goal of capturing natural genetic variation (e.g., collect from a range of elevations and from plants exhibiting varied phenology).	**Ongoing** **(Avoidance Measure)**
Install educational signage to describe restoration efforts at each location.	**Short Term**
Retain decaying and dying trees, limbs, snags, and debris piles for wildlife habitat, and other downed wood within streams and upland habitats, unless they pose a threat to public safety. If a downed tree crosses over a trail, cut and move to the side. These features are fundamental ingredients of both terrestrial and aquatic ecosystems.	**Ongoing**
Use brush piles or large downed limbs around native plantings as an alternative browse protection method that will also provide course woody material for upland wildlife species.	**Ongoing**
Remove non-critical fencing and install wildlife friendly-fencing in appropriate areas.	**Ongoing**
Monitoring Tasks	
Monitor restoration plantings to determine plant establishment and success. Depending on the nature of the restoration effort, this should include survival counts, plant health and growth assessments, photo monitoring, and/or species composition assessments. Based on the proposed planting type and location, success criteria will vary, but should be established in discussion with a qualified restoration specialist. If success is low, follow with analysis of possible causes and adjust maintenance or plantings. Formal monitoring should occur annually for 5 or more years after planting. Woody plantings should be monitored in fall. Herbaceous plantings should be monitored in spring. In addition, informal inspection should occur monthly during the growing season in the first 1 to 3 years after planting.	
HYDROLOGY AND EROSION CONTROL	
Objectives	
24. Protect soil and water resources by maintaining native vegetative cover and avoid developing any new road crossings. 25. Protect water quality within and beyond Wright Hill Ranch by minimizing future sediment delivery to aquatic habitats from roadways, trails, and upland gullies.	

Management Actions	*Time Frame*
Avoid developing new trail crossings over or through gullies, riparian areas, or wetlands.	**Ongoing (Avoidance Measure)**
Complete an updated inventory of the entire road network to evaluate the condition of documented erosion sites and identify new ones.	**Short Term**
Develop and implement treatment plans for high priority road and gully erosion sites that threaten access, water quality, and native habitats. See Appendix G, Table G-2.	**Short Term**
Develop and implement treatment plans for lower priority road and gully erosion sites that threaten access, water quality, and native habitats. See Appendix G, Table G-2.	**Long Term**
If fresh erosion is visible or existing problem areas are rapidly worsening, seek consultation from a qualified professional experienced in backcountry roads and conditions, in collaboration with an ecologist, to evaluate and design a repair. Headcuts that are active or threaten trail crossings and critical wetland habitat should be stabilized with biotechnical methods. Depending on the scale and location, methods could include small willow walls, brush protection, and sloping the headcut with hand tools, protecting it with erosion control blanket, and replanting with willow sprigs and herbaceous vegetation. All treatments must be performed in a manner to protect sensitive ecological resources.	**Ongoing (Avoidance Measure)**
See also *Public Use Management* for tasks related to trail and transportation plan development.	—
Monitoring Tasks	
*__Monitor active erosion areas, road drainage outfalls, and culvert crossings__ during periodic storms and each spring and following large storm events to detect critical changes from PWA-reported baseline. Implement repairs as needed.	
Twice annually, in winter and spring, complete surveys of all trails by a resource manager. Implement seasonal closures of chronically wet trails if soil compaction and/or erosion is evident and remediation is not practical. Install "seasonal closure" signage at each entry point of the closed section of trail.	
In conjunction with trail erosion monitoring, monitor for unauthorized trails. If found, decommission promptly by installing physical barriers (e.g., rock piles, downed logs, native thicket- or bramble-forming plants) at each entry point and multiple points along the trail to discourage use. Post signage to inform the public of the closure and the sensitivity of the habitat. Develop and implement a restoration plan for disturbed areas in consultation with a restoration specialist (see *Native Habitat Revegetation and Enhancement* above). Monitor for trespass of the closure area and restoration success.	
FIRE MANAGEMENT	
Objectives	
26. Manage fire to protect natural, tribal cultural, and historical resources and ensure public safety.	
Management Actions	***Time Frame***
Consider a prescribed burn feasibility study in conjunction with CalFire, FireSafe Sonoma, and the Northern Sonoma County Air Pollution Control District to evaluate its use as an effective and practical vegetation management tool.	**Long Term**
Maintain livestock grazing at moderate level to manage thatch build-up and reduce fuel loads.	**Ongoing (Avoidance Measure)**
Manage the spread of Sudden Oak Death to control the build-up of heavy fuel loads.	**Ongoing (Avoidance Measure)**
Work to develop an access agreement with property to southeast to provide additional emergency access to allow for prompt fire response.	**Short Term**
Provide adequate barriers and fences at trail heads and access points that would keep non-authorized motorized vehicles off the property, especially motorcycles.	**Ongoing (Avoidance Measure)**
Institute a no-smoking policy on the property and provide educational signage at each access point.	**Short Term**
Prevent the establishment of and control invasive plant species that can increase the risk for fire.	**Ongoing**
Create and cultivate a Volunteer Patrol. Determine how they would gain access to the property and ensure coordination with the lessee.	**Short Term**

Follow rigorous fire safe standards around structures.	**Ongoing**
For all fire protection-related efforts, follow invasive species guidelines to avoid the introduction or spread of invasive species, especially where ground disturbance, off-road vehicle travel, and/or reseeding occur.	**Ongoing (Avoidance Measure)**
Monitoring Tasks	
Monitor the property for illegal camp fires, firearm use, marijuana cultivation, non-authorized motor vehicle, and smoking. Monitoring should be completed as part of ongoing, year-round patrols and should include walking the entire property including remote locations where illegal activities may be focused. All areas accessible by trails should be surveyed weekly. Backcountry areas should be visited on a regular basis. If widespread or recurring problems are found, develop a strategy to reduce these illicit behaviors. If marijuana cultivation is found, alert authorities and, if possible, provide GPS locations. Develop and implement an immediate clean-up and/or restoration plan for disturbed areas.	
See *Livestock Grazing*, *Invasive Plant Species*, and *Containment and Pathogen Control* for additional monitoring actions related to fire.	
LIVESTOCK GRAZING MANAGEMENT	
Objectives	
27. Maintain current cow-calf operation at a stocking rate that is compatible with resource protection and target RDM levels.	
28. Continue year-round grazing throughout all pasture while protecting cultural and natural resources from adverse impacts.	
29. Secure property boundaries and create pastures for effective management of livestock distribution.	
30. Modify livestock water structures to provide at least one source per pasture, protect water quality, and minimize erosion.	
31. Improve ranch infrastructure to be wildlife-friendly.	
32. Develop lease conditions that encourage grazing lessee investment and specify resource protection needs.	
Management Actions	
Specify an initial stocking rate of 105 AUs and average RDM levels of 1,200 lbs/acre in lease conditions, with stocking rate adjusted based on monitoring results.	**Ongoing**
Ensure lease conditions describe recommended grazing seasonality.	**Ongoing**
Place attractants in underutilized areas.	**Short Term**
Repair or install high priority boundary and cross fencing, as indicated in Appendix G, Table G-3.	**Short Term**
Repair or install moderate to low priority boundary and cross fencing, as indicated in Appendix G, Table G-3.	**Long Term**
Repair high priority water sources as defined in Appendix G, Table G-4. Retain a rural water system specialist to provide cost estimates for priority repairs and complete the repairs as funding allows.	**Short Term**
Repair moderate to low priority water sources as defined in Appendix G, Table G-4.	**Long Term**
Consider a rainwater harvesting system on the barn roof to serve as supplemental water storage.	**Long Term**
Create riparian protection zone in Pasture 7.	**Short Term**
Fence out spring at W4a and others as appropriate, in consultation with a rangeland specialist.	**Short Term**
Install habitat protection fencing according to priority, as described in Appendix G.	**Short Term**
Install wildlife-friendly water troughs during upgrades.	**Long Term**
Coordinate with grazing lessee to develop EQIP (Environmental Quality Incentives Program) contract with NRCS for infrastructure improvements.	**Short Term**
Monitoring Tasks	
Monitor forage availability each spring to determine whether the planned stocking rate is appropriate for the year. If forage production appears to be significantly lower than average, discuss reduction of stocking rates with lessee. Monitor RDM each fall to determine average across the property. If RDM levels fall below 1,200 lbs/acre, require grazing lessee to adjust stocking rates for next season.	
Monitor water trough structures quarterly to ensure wildlife area not being harmed. If accidental drowning are noted, make necessary adjustments.	
Monitor lessee compliance with contract conditions quarterly for any new licenses including stocking rates and fence maintenance.	
See *Riparian and Wetland Habitat Monitoring* for related tasks.	

CULTURAL AND HISTORICAL RESOURCE MANAGEMENT	
Objectives	
33. Prevent public contact with tribal cultural resources. Work in coordination with Native American Tribes to develop strategies to protect tribal cultural resources. 34. Preserve and maintain the ranch complex to ensure public safety and wildlife protection. 35. Preserve and maintain the historic values of the ranch complex.	
Management Actions	***Time Frame***
Avoid developing new trails and public access infrastructure near identified cultural sites. All new trails should maintain a minimum setback of 100 feet from known archeological sites. Variances from this setback with additional avoidance measures should be approved by SHPO and Native American Tribes as interested.	**Ongoing (Avoidance Measure)**
Install educational signage at all trailhead locations that includes general information about the cultural significance of the property and the need to respect resources on the property.	**Long Term**
Collect, catalog, and rebury items from lithic scatter Site 6 and isolate findings. Work should be completed by a qualified archeologist and tribal monitor.	**Short Term**
Involve a qualified archeologist and tribal monitor during any ground-disturbing activities within 100 feet of identified Native American sites.	**Ongoing (Avoidance Measure)**
Protect sensitive bats utilizing the ranch house and surrounding buildings. Consult with CDFW and/or a qualified biologist prior to completing repairs or renovations to the ranch house and all of the surrounding structures. Visitation and repairs to the ranch house should be minimized until resource protection measures are developed.	**Ongoing (Avoidance Measure)**
Develop and implement a plan to remove discarded barbed wire and other debris from deposit sites.	**Long Term**
Develop a historic structures report to define the distinguishing features of the ranch complex, evaluate the existing condition, and develop detailed recommendations for maintenance and repair. See Appendix G, Table G-5.	**Long Term**
Implement interim maintenance actions to protect ranch complex from deterioration and unauthorized access. See Appendix G, Table G-5. See also bat protection measures.	**Short Term**
Provide non-permanent site caretaker accommodations until property is under new management/ownership to allow for regular monitoring of the property to ensure the protection of natural and cultural resources.	**Short Term**
Monitoring Tasks	
Monitor existing known cultural sites twice a year or more often if vandalism or other adverse conditions are observed to ensure that the public access and ongoing grazing are not having a detrimental impact of the resources. Implement immediate resource protection measures if detrimental impacts are observed.	
Monitor ranch complex during all routine patrols.	
Monitor bat populations at the ranch house and surrounding outbuildings to ensure the long-term survival and use of these structures. If populations decline are detected or habitat use changes, evaluate possible causes and adjust management strategies as appropriate.	

11 DATA GAPS

The following information would be useful to more effectively develop specific management recommendations for Wright Hill Ranch:

- Map locations of refuse disposal sites and prioritize removal.
- Monitor key wildlife movement corridors through the use of remote cameras to more accurately determine key areas for conservation.
- Qualitative assessment of American badger habitat utilization to more accurately determine key areas for conservation.
- Focused surveys for Myrtle's silverspot butterflies during adult flight season and mapping of western dog violet, the larval host plant, within all grassland habitats and rock outcrops.

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FIGURES

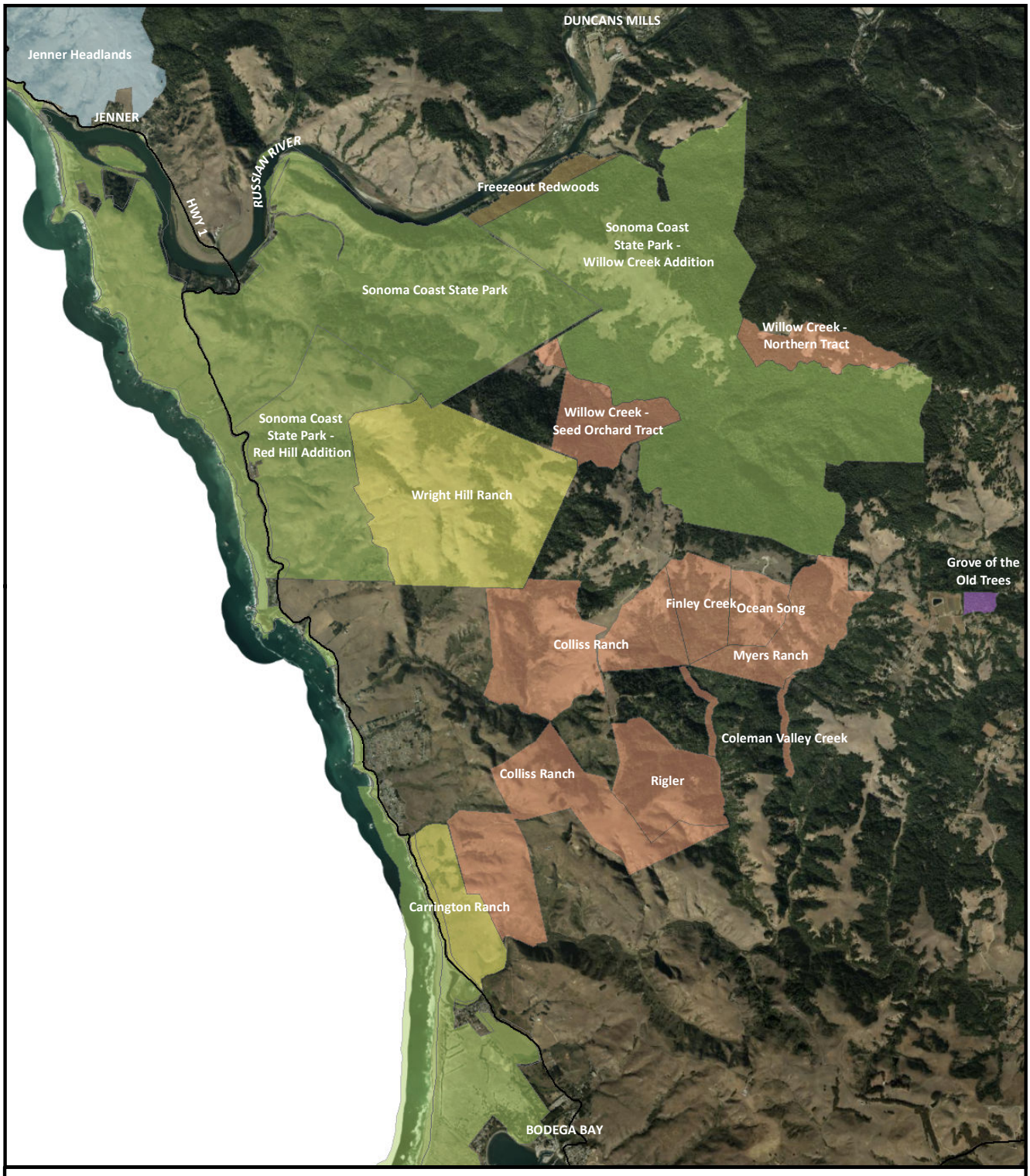


Figure 1. Wright Hill Ranch Location and Adjacent Protected Lands

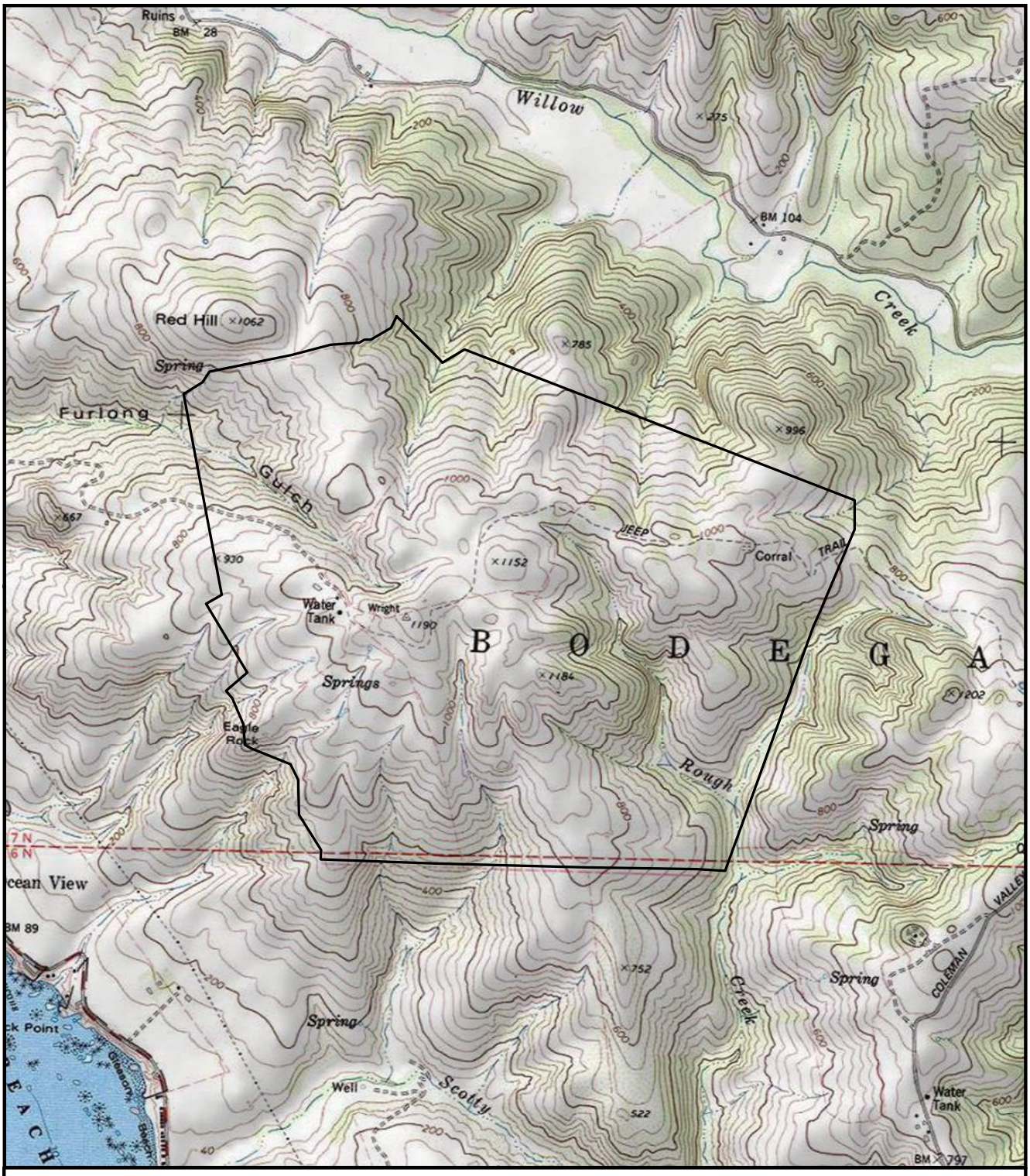


Figure 2. Wright Hill Ranch Topography

Topography: Copyright:© 2013 National Geographic Society, i-cubed

0 0.125 0.25 0.5 Miles

N

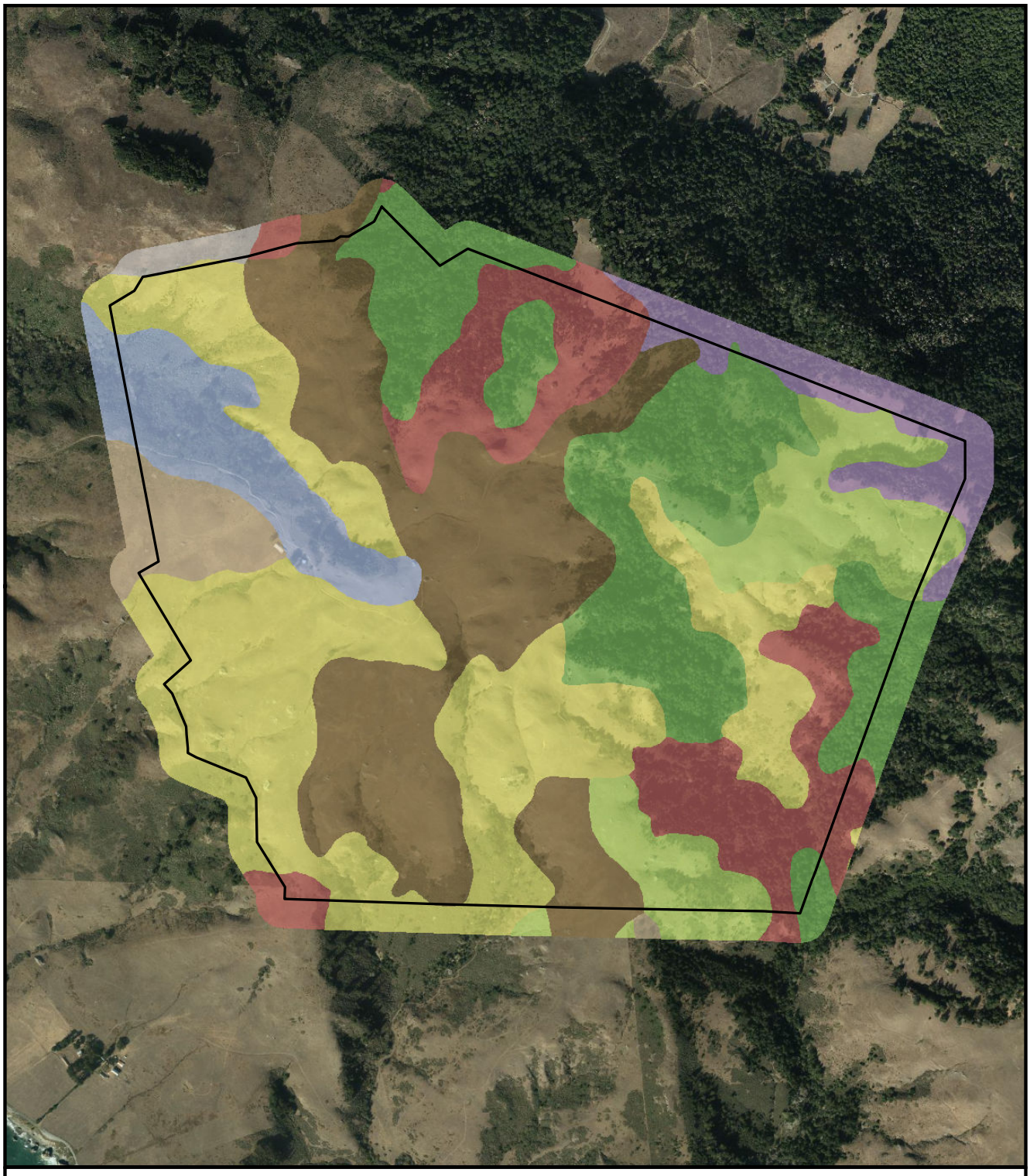


Figure 3. Wright Hill Ranch Soils

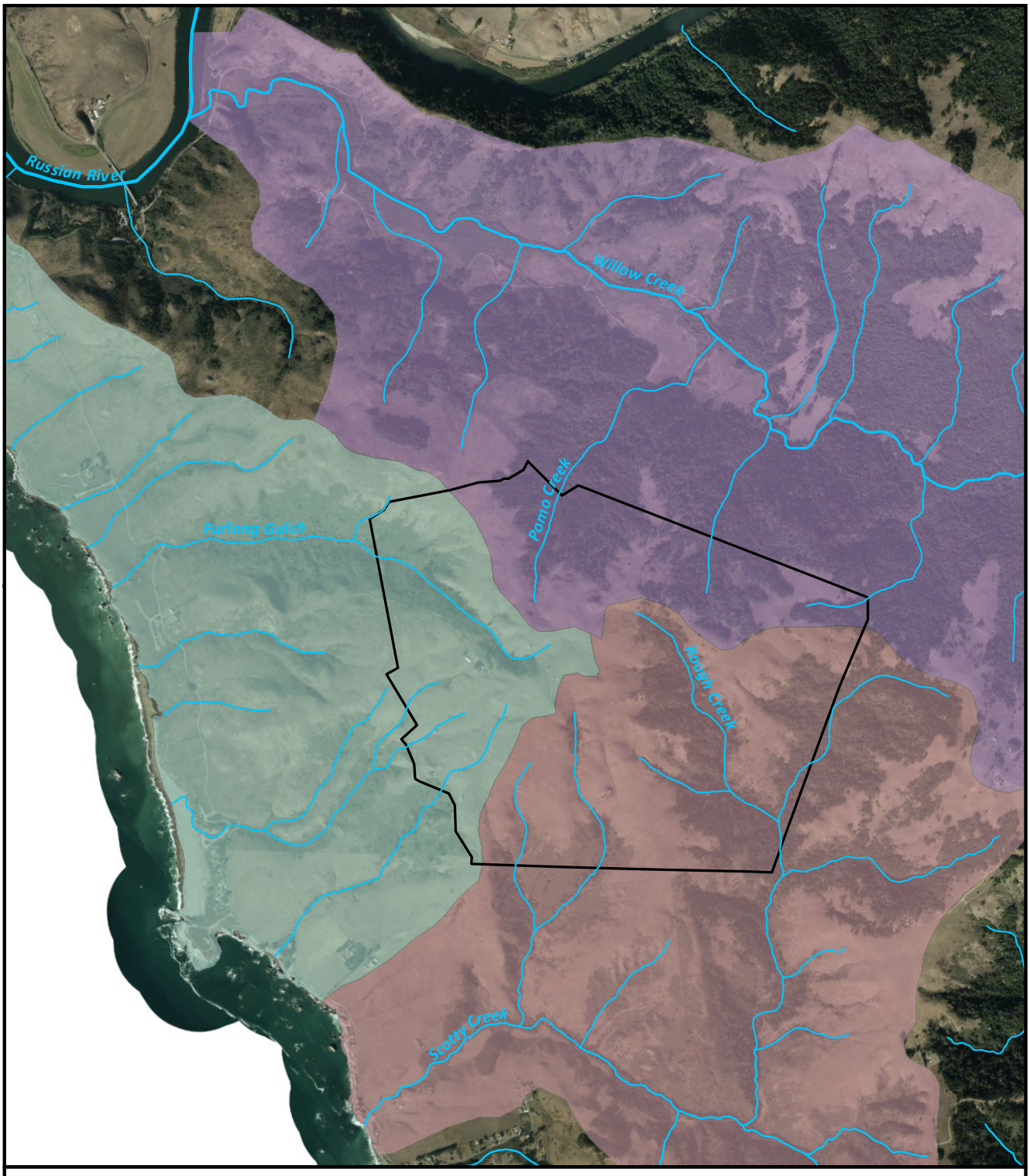


Figure 4. Wright Hill Ranch Watersheds

Furlong Gulch & other coastal watersheds
Scotty Creek
Willow Creek

Hydrology: CalWater
2013 Aerial Imagery: Sonoma County Vegetation Mapping and LiDAR Consortium, NASA, University of Maryland, Watershed Sciences, Inc., Tukman Geospatial LLC

0 0.25 0.5 1 Miles

N

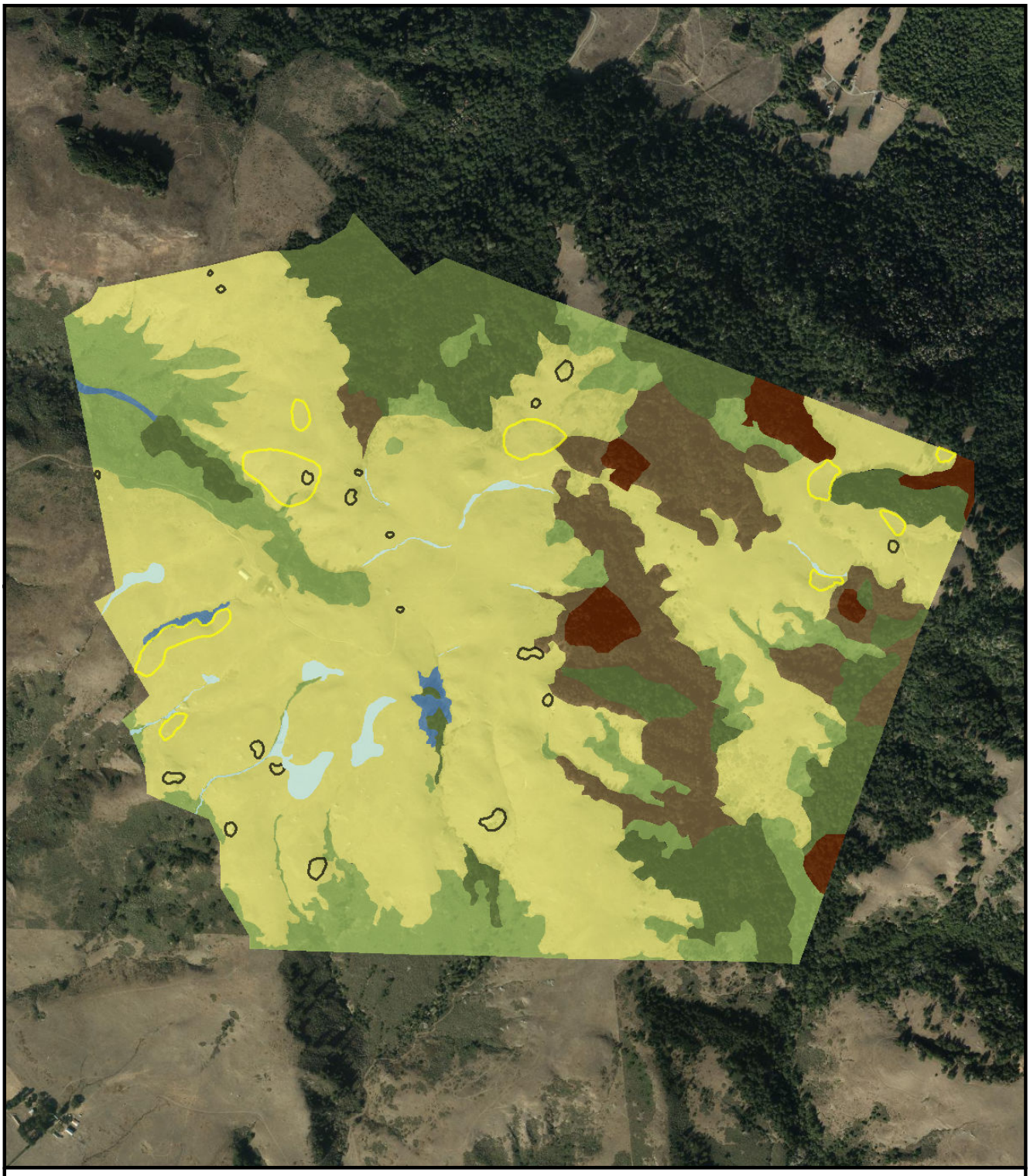


Figure 5. Wright Hill Ranch Vegetation Types

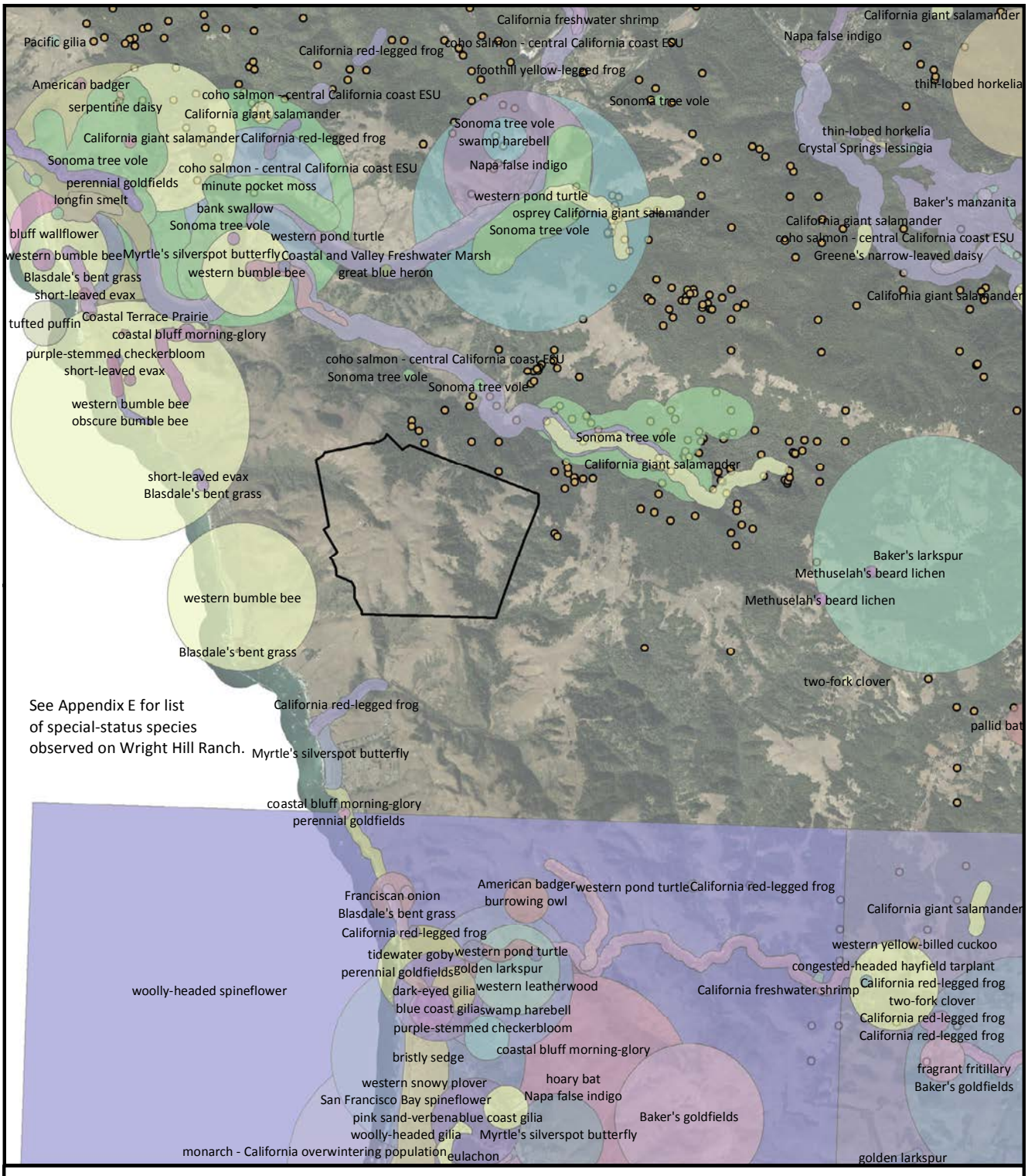


Figure 6. Special-status Species Observations in the Vicinity of Wright Hill Ranch

Northern spotted owl observations

Wright Hill Ranch boundary

Species Occurrence Data: CNDDB, CDFW 2014
2013 Aerial Imagery: Sonoma County Vegetation Mapping and LiDAR Consortium, NASA, University of Maryland, Watershed Sciences, Inc., Tukman Geospatial LLC

0 0.5 1 2 Miles

N

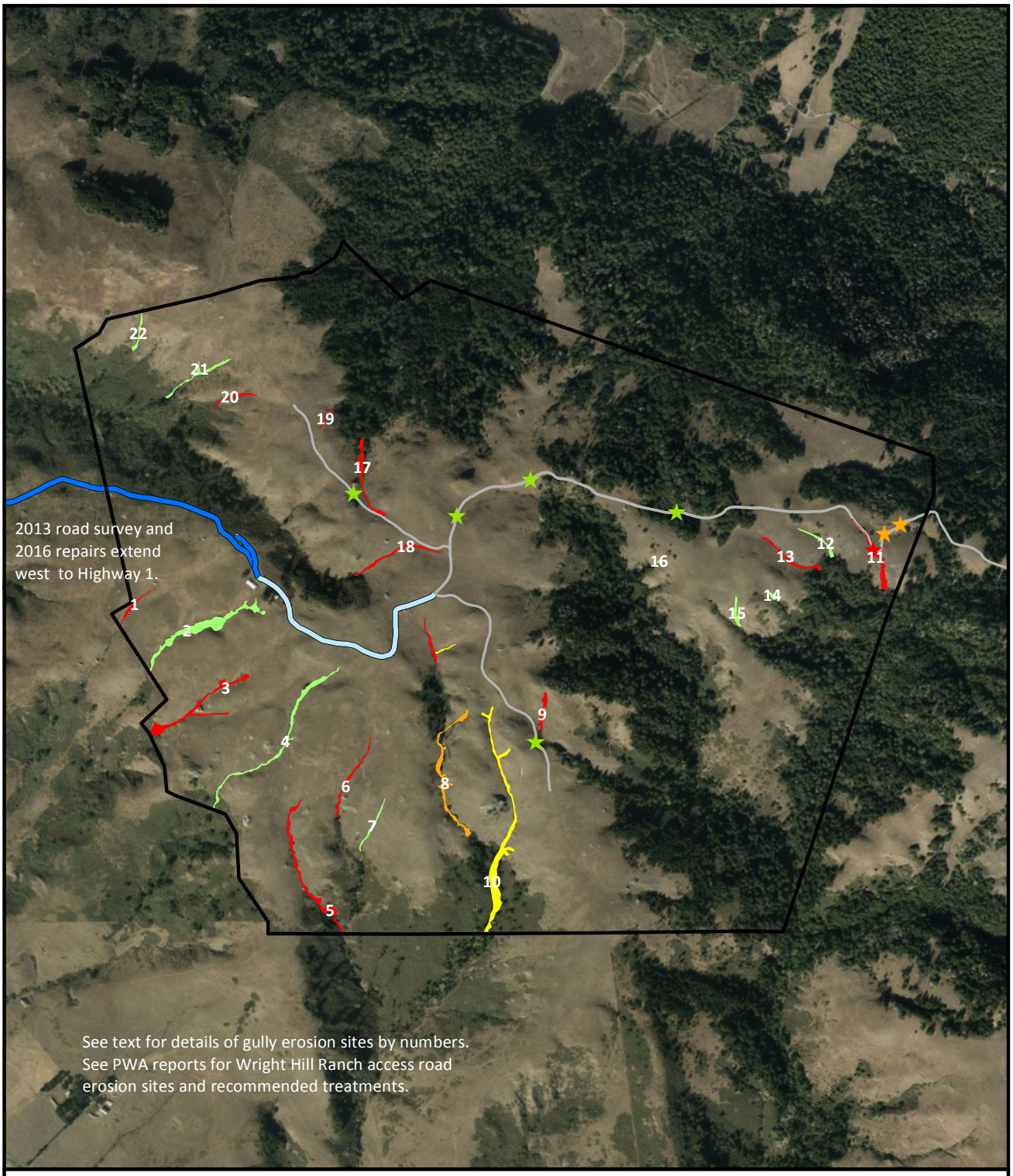


Figure 7. Wright Hill Ranch Erosion Sites

Roads

- Roads - surveyed 2013, repaired summer 2016
- Roads - surveyed 2014, repaired summer 2016
- Other roads

Road erosion sites (2009)

- High priority
- High-medium priority
- Low priority

Gully erosion sites (2009)

- High priority/accessible
- High priority/inaccessible
- Low priority/accessible
- Low priority/inaccessible

Erosion Assessment: PWA 2009, 2013, 2014. 2013 Aerial imagery: Sonoma County Vegetation Mapping and LiDAR Consortium

0 0.25 Miles

N

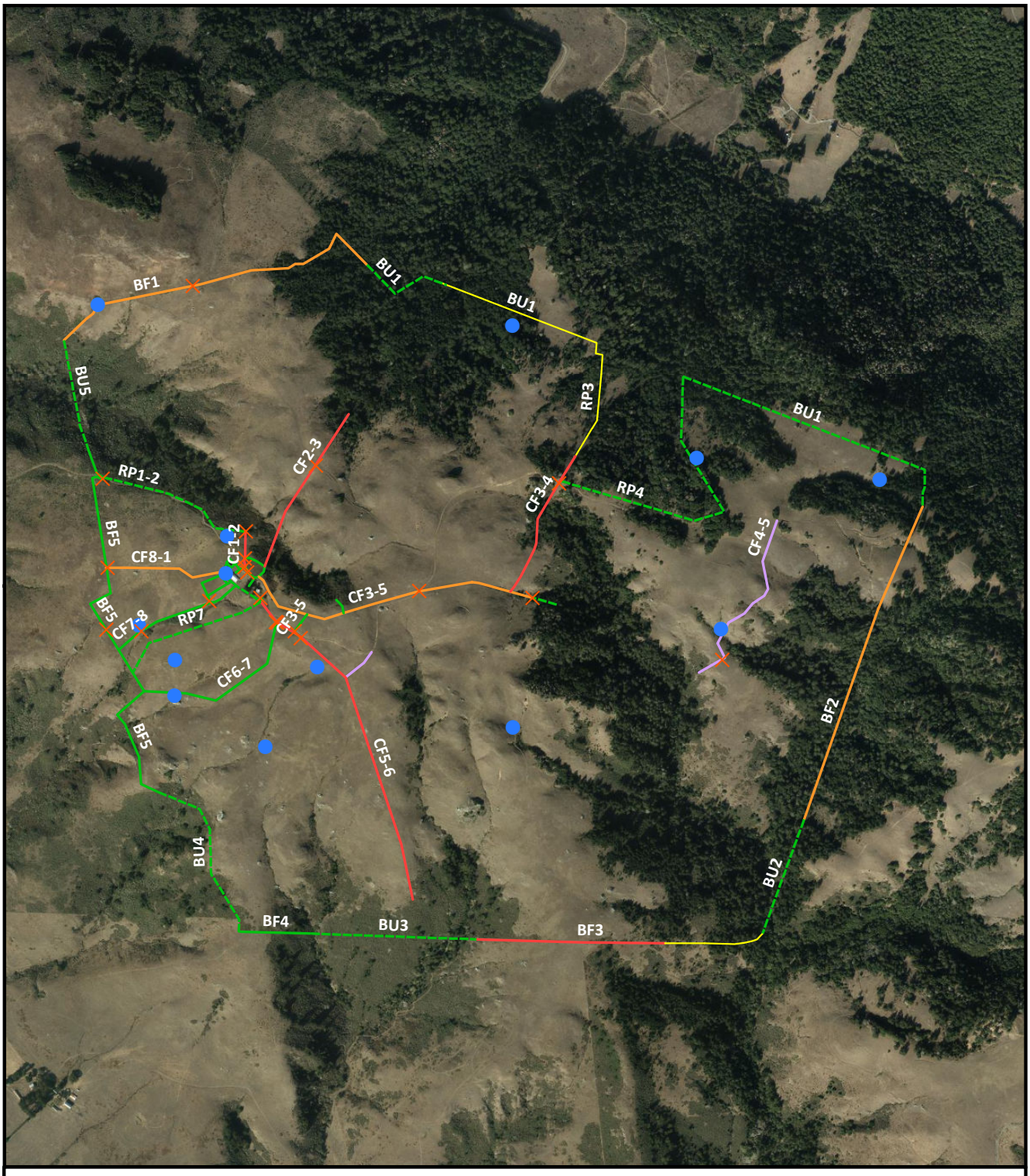


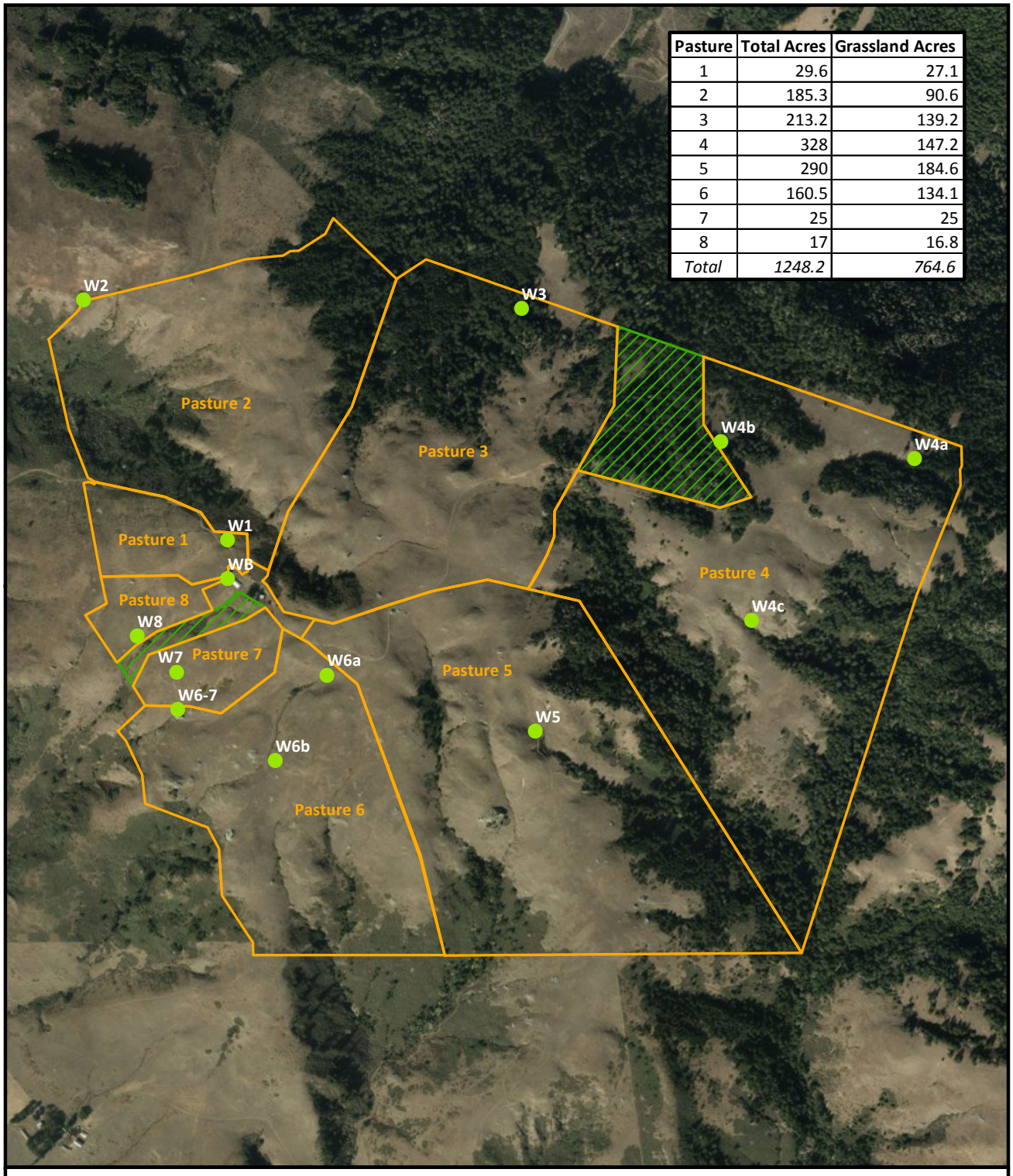
Figure 8. Wright Hill Ranch Existing and Proposed Fencing

- Installation/repairs completed
- Functional
- Functional but needs repair
- Needs repair
- Proposed, wildlife friendly
- Unnecessary
- Gates
- Developed water sources

2013 Aerial Imagery: Sonoma County Vegetation Mapping and LiDAR Consortium, NASA, University of Maryland, Watershed Sciences, Inc., Tukman Geospatial LLC

0 0.125 0.25 0.5 Miles

N



Pasture	Total Acres	Grassland Acres
1	29.6	27.1
2	185.3	90.6
3	213.2	139.2
4	328	147.2
5	290	184.6
6	160.5	134.1
7	25	25
8	17	16.8
Total	*1248.2*	*764.6*

Figure 9. Wright Hill Ranch Proposed Pastures

Developed water sources

Proposed pastures

Habitat Protection Zone - livestock exclusion; see Figure 11

2013 Aerial imagery: Sonoma County Vegetation Mapping and LiDAR Consortium, NASA, University of Maryland, Watershed Sciences, Inc., Tukman Geospatial LLC

0 0.125 0.25 0.5 Miles

N

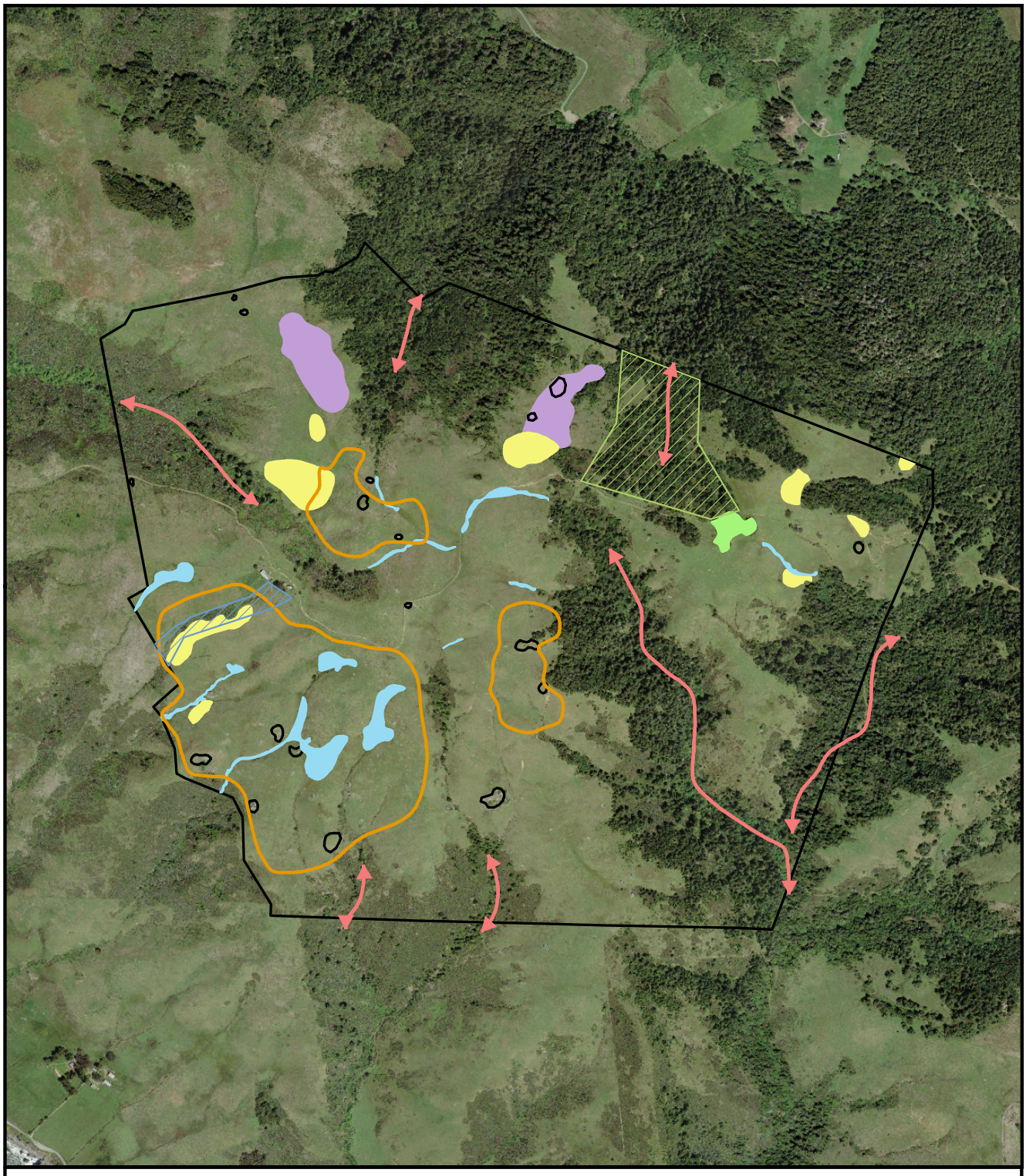


Figure 10. Wright Hill Ranch Key Natural Resource Areas

2011 Aerial Imagery: USGS, County of Sonoma, SCAPOSD, and Sonoma County Water Agency

Figure 11. Wright Hill Ranch Complex

2011 Aerial Imagery: USGS, County of Sonoma, SCAPOSD, and Sonoma County Water Agency

0 12.5 25 50 Feet

N

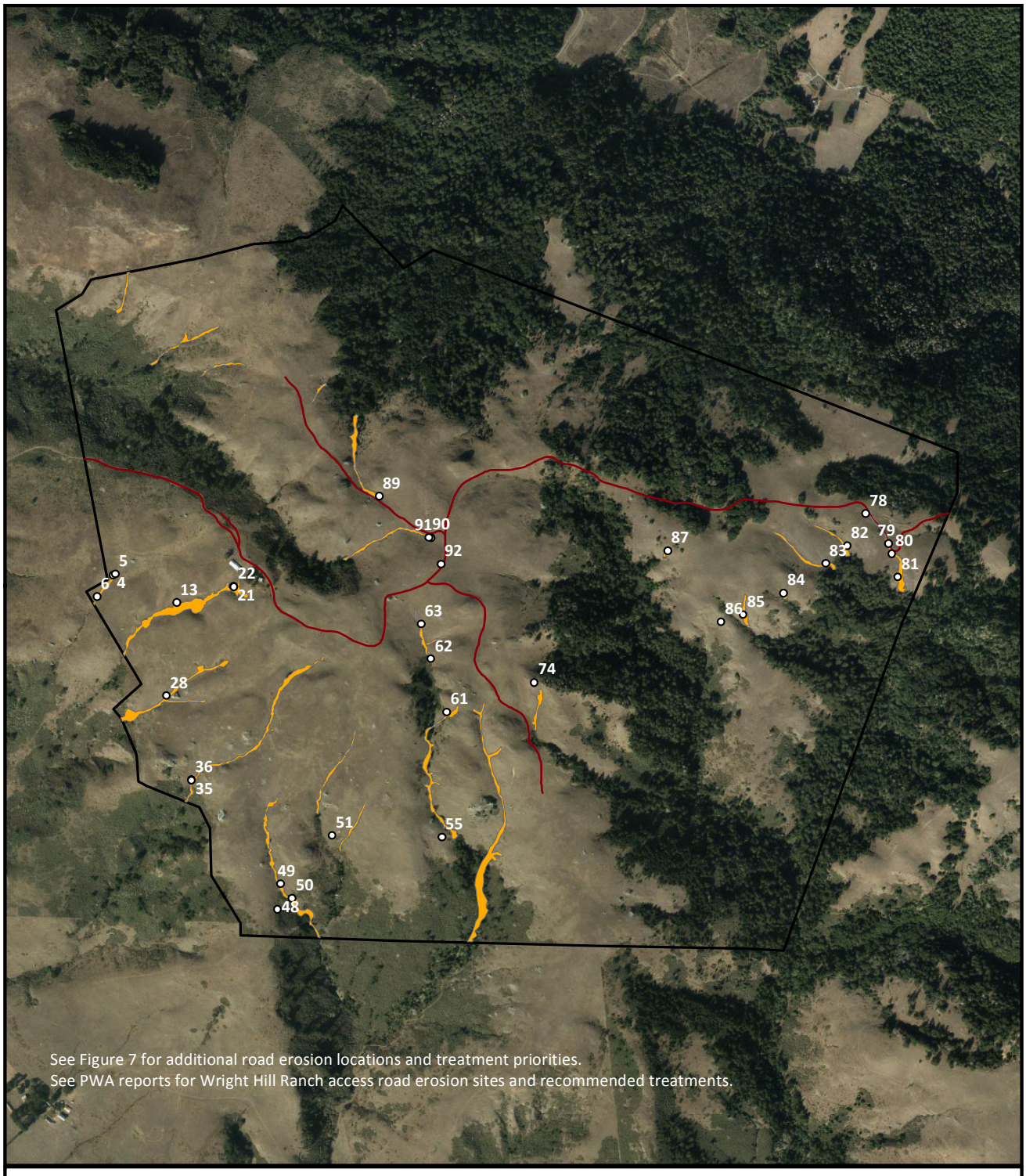


Figure 12. Wright Hill Ranch Erosion Photopoint Locations

Photopoints - gully erosion

Gully erosion sites

Roads

Erosion Assessment: PWA, 2009
2013 Aerial Imagery: Sonoma County Vegetation Mapping and LiDAR Consortium, NASA, University of Maryland, Watershed Sciences, Inc., Tukman Geospatial LLC

0 0.125 0.25 0.5 Miles

N

APPENDICES

APPENDIX A: BIOGRAPHY OF JACK POFF

The following is a biography of Jack Poff, written by his best friend Jerry Lites.

Charlie and May Poff on the right. The young boys are Harold (left) and Jack (right) on the King Ridge Ranch in the 1920s.

Jack Poff was born in Guerneville on March 9, 1915 to Charlie and May Poff. (Charlie Poff and May Von Arx were married in 1910) Charlie's dad, Anthony Poff, was born on the Atlantic Ocean on the way to America. He later married Mary Goddard from the Healdsburg area. They moved to the Plantation area, a small coastal community in the hills north of Jenner. Anthony acquired the land for the ranch on King Ridge Road in the 1870s.

When Anthony was too old to work the ranch, it was turned over to his son Charlie since he was the only boy in the family. The Poff family was ranchers and raised a variety of livestock. They also raised apples which they dried in the family dryer. To earn extra money, they would trap small animals such as rabbits and skunks and sell the skins to fur companies. Jack had one sibling, Harold, who was born in 1912. The boys attended the little one-room school which is on the family ranch. Jack's grandfather Anthony gave a small portion of land to the county for the school. Many years later when the school closed, the family was able to get the land deeded back to the ranch. The old schoolhouse is in very poor shape and is barely standing today.

Harold attended college in Santa Rosa when he was 20. Jack stayed on the ranch, but he later worked in the logging business in an area which is now under water at Lake Sonoma. When World War II broke out, Jack and Harold both joined the Navy, and served in Hawaii. Jack became an airplane mechanic and spent most of his time there in Hawaii. After the war, both boys returned home and Jack worked on the ranch. Harold became a tile maker and would only work on the ranch on weekends.

In July 1953, Jack, Harold and Charlie purchased the ranch on Wright Hill, and each one paid equal shares. It was known as the Big Buckhorn Ranch at that time. It was acquired from the estate of Sarah Giffen, whose maiden name was Robertson. Her mother's maiden name was Wright, and she was from the Wright family, one of the richest families in Sonoma County at that time. The new Poff Ranch on Wright Hill had a total of 1,235 acres. About 700 acres is pasture, and the rest is in brush and trees.

Initially, the ranch was being leased, but the lease ran out within a couple of years. The Poffs took up ranching for a while, but eventually, they leased it out for a few years. Jack and Harold bought out the share owned by their dad, and the boys owned it together. However, Harold continued working in the tile business in the Bay Area, while Jack did most of the ranching. Harold would come home on some weekends and they would work on the ranch together. They raised sheep, and eventually had about 700 sheep on the ranch.

The ranch had no electricity or telephone access. Jack prepared his meals on the old wood stove which is still in the house. Water was pumped with a gasoline engine from the well to a tank on the hill overlooking

the house. From there, the water was gravity flow, giving them running water in the house. They purchased a propane refrigerator in the 1950s. It is still in the house. For light in the evening, he installed gas lights—one over the kitchen table and one over the table in the living room. He would turn on the propane and light the filament with a match. Jack loved to read and he kept up on political matters. He very often would write letters to politicians to give his perspective on matters.

In 1955, their mom, May, died. In 1967, when their dad, Charlie, died Jack and Harold inherited the ranch on King Ridge Road. Now they had two ranches, but they leased out the old family ranch from that point on. In 1976, Jack got married for his first and only time. He married Irene who came from Europe many years ago. They had met in San Francisco through some mutual friends. In 1977, Harold died and Jack inherited both of the Poff ranches. He continued to work the Wright Hill Ranch until 1992 when he was 78 years old.

Jack would work the sheep mostly by himself. Irene would help him round up the sheep on horseback. He rode the horse until he was almost 78. When he sold the sheep, he sold the horses. He called me one evening (from a pay phone along the coast), and said that he was selling the horses, and wanted to know if I wanted to go for one last ride. We met a few days later and rode over the entire ranch for a few hours. The next week the horses were gone, and that was Jack's last time on a horse. He leased the ranch to Jim Furlong, whose family ranched this very same land at the turn of the last century, although they never owned it. Jim still leases the ranch as of this writing.

Jack was an incredible man—one of a kind. He was hard-working, extremely honest and always paid his debts. It was said about Jack that if he owed you a penny and you lived in New York, and the only way to get it to you was to walk, he would take it to you.

He was very opinionated, but would listen to the opinions of others. He had a way of telling stories about his life that only Jack Poff could tell. Occasionally, I would try to hurry him up a bit when he was taking too long to tell the story. He would stop me and say very sternly, but with a smile on his face, "Listen Mister, I'm telling this story." From that point on, I would keep my mouth shut and let him tell the story his way.

Jack also had his own way with words, such as "stove lumber" when talking about getting firewood. He referred to San Francisco as "Hippie City." When asked where he was born, he said, "I was hatched in Guerneville." When he referred to the "loadin' dock," he was talking about where he would go to mount his horse. Because of his age, he would lead the horse to a

hillside and then mount the horse from the uphill side to make it easier. There were many other words and phrases that I should write down someday.

Jack Poff celebrating his birthday in 1975 at his kitchen table on the property.

There were a couple of things Jack loved the most: One was that he loved to visit his friends and neighbors, or have them come visit him. Many times, he would tell me, "Jerry, thanks for coming; I love your company." Another thing Jack loved was his Lord. He was very dedicated to God and in studying the Bible. Inside of his old Bible that he read daily are papers listing all of the chapters he read from 1978 through about April 2002 when his eyesight grew so bad he could no longer read. That was a sad day for him.

My visits with Jack were some of my most memorable times. We would work with the sheep in the fields or in the barn, and then at noon, we would go to the house for lunch. From the kitchen table we could see Jenner and beyond, with a spectacular view of the hills and ocean from our elevation of about 1,000 feet above sea level, and two miles from the ocean. While eating our lunch, we would always listen to Paul Harvey on Jack's battery operated radio. After that, it was back to the barn to finish the day working with the sheep while continuing with our visit. I often thought that we would have been able to get twice as much work done if we had not talked so much, but then neither of us would have ever wanted that to happen.

Jack would always pay me for my work. I told him many times to not pay me, because I loved being there so much I didn't do it for pay. I looked forward to being there on the ranch, and considered it as a good introduction to what Heaven would be like. But, Jack always paid his debts. He was always honest in all his dealings. A few days later, my "paycheck" would arrive in the mail. After taking out any required government deductions, I would receive a check for something like "$27.32."

When Jack was a young man, he had hurt his back pretty bad. From then on he always had a back problem and had to be careful wherever he sat down. In church, he would always get one of the metal folding chairs, because of the hard seat and back, which gave him support. He would lean back a little bit and rock back and forth during most of the service. In the vehicles, he had small boards that he placed under him and behind his back for support. While walking around, he always had his one-legged stool so that he could stop wherever he was and sit on it. When around the ranch, he had his monocular for checking the livestock and to look for predators that might hurt the livestock. It was a common sight to see Jack sitting on his one-legged stool looking through the monocular. Everyone who knew Jack could always picture him with that stool.

Yes, Jack was a very unique man, and one of the most special friends I've ever had. I'll always miss those times we had together—two people who thoroughly loved the company of each other. He died on December 6, 2006, and was buried in the old Cooper Cemetery only one-quarter mile from the old family ranch where he grew up; the same cemetery where his parents and both sets of grandparents are buried. I will always miss my friend Jack!

Jerry Lites
July 1, 2009

APPENDIX B: OBSERVED VASCULAR PLANTS

FAMILY	SCIENTIFIC NAME	COMMON NAME
Ferns and Allies		
Equisetaceae	*Equisetum arvense*	common horsetail
	Equisetum telmateia ssp. braunii	giant scouring-rush
Blechnaceae	*Woodwardia fimbriata*	chain fern
Dennstaedtiaceae	*Pteridium aquilinum var. pubescens*	bracken fern
Dryopteridaceae	*Dryopteris arguta*	wood fern
	Polystichum munitum	western sword fern
Polypodiaceae	*Polypodium californicum*	California polypody
	Polypodium scouleri	Scouler's polypody
Pteridaceae	*Pellaea andromedifolia*	coffee fern
	Pentagramma triangularis	goldback fern
Woodsiaceae	*Athyrium filix-femina*	lady fern
Conifers		
Cupressaceae	*Sequoia sempervirens*	coast redwood
Pinaceae	*Pseudotsuga menziesii*	Douglas-fir
Flowering Plants		
Adoxaceae	*Sambucus racemosa var. racemosa*	coast red elderberry
Agavaceae	*Chlorogalum pomeridianum*	soaproot
Alliaceae	*Allium dichlamydeum*	coast onion
Amaryllidaceae	*Amaryllis belladonna*[1]	naked-ladies
Anacardiaceae	*Toxicodendron diversilobum*	poison-oak
Apiaceae	*Angelica hendersonii*	Henderson's angelica
	*Anthriscus caucalis**	bur chervil
	*Conium maculatum**	poison-hemlock
	Daucus pusillus	dwarf annual carrot
	Heracleum maximum	cow parsnip
	Ligusticum apiifolium	lovage
	Lomatium utriculatum	bladder parsnip
	Oenanthe sarmentosa	swamp parsley
	Osmorhiza berteroi	sweet cicely
	Sanicula arctopoides	footsteps-of-spring
	Sanicula bipinnatifida	purple sanicle
	Sanicula crassicaulis	Pacific snakeroot
	*Scandix pecten-veneris**	shepherd's needle
	*Torilis arvensis**	hedge parsley
	*Torilis nodosa**	hedge parsley
Apocynaceae	*Nerium oleander*[1]	oleander
Araceae	*Zantedeschia aethiopica*[1]	calla lily
Araliaceae	*Hedera helix**	English ivy

FAMILY	SCIENTIFIC NAME	COMMON NAME
Arecaceae	*Washingtonia sp.*[*,J]*	fan palm
Asteraceae	*Achillea millefolium*	yarrow
	Adenocaulon bicolor	trail plant
	Anaphalis margaritacea	pearly everlasting
	Anisocarpus madioides	woodland madia
	*Anthemis cotula**	dog fennel
	Artemisia douglasiana	mugwort
	Baccharis glutinosa	marsh baccharis
	Baccharis pilularis	coyote brush
	*Bellis perennis**	English lawn daisy
	*Carduus pycnocephalus**	Italian thistle
	*Centaurea melitensis**	tocalote
	Cirsium brevistylum	Indian thistle
	*Cirsium vulgare**	bull thistle
	Delairea odorata(syn: Senecio mikanioides)*	Cape-ivy
	*Senecio minimus**	Australian fireweed
	Eriophyllum lanatum var. arachnoideum	woolly sunflower
	Eurybia radulina	rough-leaved aster
	Gamochaeta ustulata	purple everlasting
	Gnaphalium ramosissimum	pink-flowering cudweed
	*Hedypnois rhagadioloides**	Crete weed
	Hemizonia congesta ssp. lutescens	yellow hayfield tarweed
	Hesperevax sparsiflora ssp. sparsiflora	evax
	Heterotheca sessiliflora ssp. bolanderi	golden-aster
	Hieracium albiflorum	hawkweed
	*Hypochaeris glabra**	rough cat's-ear
	*Hypochaeris radicata**	smooth cat's-ear
	Lasthenia californica ssp. californica	California goldfields
	*Leontodon saxatilis**	hawkbit
	*Logfia gallica**	herba impia
	Madia elegans	elegant madia
	Madia exigua	slender tarweed
	Madia gracilis	common madia
	Madia sativa	coast tarweed
	*Matricaria discoidea**	pineapple weed
	Pseudognaphalium californicum	ladies' tobacco
	Psilocarphus tenellus	woolly marbles
	*Silybum marianum**	milk thistle
	Solidago elongata	Canada goldenrod
	Solidago spathulata	coast goldenrod
	*Soliva sessilis**	field burweed

FAMILY	SCIENTIFIC NAME	COMMON NAME
Asteraceae (continued)	*Sonchus asper ssp. asper**	prickly sow-thistle
	*Sonchus oleraceus**	common sow-thistle
	Symphyotrichum chilense	California aster
	*Taraxacum officinale**	dandelion
	Wyethia angustifolia	narrow-leaved mule's ears
Berberidaceae	*Berberis pinnata*	coast barberry
Betulaceae	*Alnus rubra*	red alder
	Corylus cornuta ssp. californica	California hazelnut
Boraginaceae	*Cynoglossum grande*	hound's-tongue
	*Myosotis discolor**	forget-me-not
	Nemophila heterophylla	hillside nemophila
	Nemophila menziesii var. atomaria	white baby blue-eyes
	Nemophila menziesii var. menziesii	baby blue-eyes
	Nemophila pedunculata	pedunculate nemophila
	Phacelia californica	California phacelia
	Phacelia distans	fernleaf phacelia
	Plagiobothrys bracteatus	bracteate popcorn flower
	Plagiobothrys nothofulvus	common popcorn flower
Brassicaceae	*Capsella bursa-pastoris**	shepherd's purse
	Cardamine californica	milk maids
	Cardamine oligosperma	bitter-cress
	*Lepidium didymum**	swinecress
	Lepidium nitidum	pepper-grass
	Nasturtium officinale	watercress
	*Sisymbrium officinale**	hedge mustard
Buxaceae	*Buxus sp.*[1]	boxwood
Caprifoliaceae	*Lonicera hispidula*	hairy honeysuckle
	Lonicera involucrata	twinberry
	Symphoricarpos albus var. laevigatus	snowberry
Caryophyllaceae	*Cerastium sp.*	chickweed
	*Cerastium glomeratum**	mouse-ear chickweed
	*Silene gallica**	windmill pink
	*Spergula arvensis**	sand-spurrey
	*Spergularia rubra**	red spurrey
	Stellaria crispa	chickweed
	*Stellaria media**	common chickweed
Convolvulaceae	*Calystegia purpurata ssp. purpurata*	coast morning-glory
	Calystegia subacaulis	short-stemmed morning-glory
	*Convolvulus arvensis**	field bindweed
	Dichondra donelliana	dichondra
Cornaceae	*Cornus sericea ssp. sericea*	red osier; creek dogwood

FAMILY	SCIENTIFIC NAME	COMMON NAME
Crassulaceae	*Crassula connata*	pygmy stonecrop
	Dudleya farinosa	coast live-forever
	Sedum spathulifolium	stonecrop
Cucurbitaceae	*Marah fabacea*	California manroot
	Marah oregana	Oregon manroot
Cyperaceae	*Carex leptopoda*	slender-footed sedge
	Carex gynodynama	wonder-woman sedge
	Carex harfordii	Harford's sedge
	Carex pachystachya	thick-headed sedge
	Carex praegracilis	field sedge
	Carex subbracteata	short-bracted sedge
	Carex tumulicola	foothill sedge
	Cyperus eragrostis	tall cyperus
Ericaceae	*Arbutus menziesii*	Pacific madrone
	Vaccinium ovatum	blue huckleberry
Fabaceae	*Acmispon americanus*	Spanish lotus
	Acmispon brachycarpus	hairy lotus
	Acmispon glaber	deerweed
	Acmispon parviflorus	rosy lotus
	Acmispon wrangelianus	Wrangel's lotus
	Astragalus gambelianus	dwarf locoweed
	Hosackia gracilis	harlequin lotus
	*Lotus angustissimus**	narrow-leaved lotus
	*Lotus corniculatus**	bird's-foot trefoil
	*Lupinus arboreus**	bush lupine
	Lupinus bicolor	dove lupine
	Lupinus nanus	sky lupine
	Lupinus variicolor	variable-colored lupine
	*Medicago polymorpha**	California bur-clover
	Trifolium albopurpureum	white-tipped clover
	*Trifolium dubium**	little hop clover
	*Trifolium glomeratum**	clustered clover
	Trifolium microcephalum	small-head clover
	*Trifolium striatum**	striped clover
	*Trifolium subterraneum**	subterranean clover
	Trifolium willdenovii	tomcat clover
	Trifolium wormskioldii	cow clover
	Vicia americana	American vetch
	Vicia gigantea	coast vetch
	*Vicia hirsuta**	hairy-fruited vetch
	*Vicia lathyroides**	pea vetch

FAMILY	SCIENTIFIC NAME	COMMON NAME
Fabaceae (continued)	*Vicia sativa ssp. nigra**	spring vetch
	*Vicia tetrasperma**	4-seed vetch
Fagaceae	*Notholithocarpus densiflorus var. densiflorus (syn: Lithocarpus densiflora var. d.)*	tanoak
	Quercus agrifolia	coast live oak
	Quercus garryana	Oregon white oak
Gentianaceae	*Cicendia quandrangularis*	Oregon timwort
	Zeltnera davyi	centaury
Geraniaceae	*Erodium botrys**	broadleaf filaree
	*Erodium cicutarium**	redstem stork's-bill
	*Erodium moschatum**	white-stemmed filaree
	*Geranium core-core**	New Zealand geranium
	*Geranium dissectum**	cut-leaf geranium
	*Geranium molle**	dove geranium
	Pelargonium sp.[1]	garden geranium
Grossulariaceae	*Ribes menziesii*	Menzies's gooseberry
	Ribes sanguineum var. glutinosum	pink-flowering currant
Hydrangeaceae	*Philadelphus sp.*[1]	mock-orange
	Whipplea modesta	yerba de selva; modesty
Iridaceae	*Iris douglasiana*	Douglas iris
	*Romulea rosea var. australis**	Guilford-onion
	Sisyrinchium bellum	blue-eyed grass
	Sisyrinchium californicum	yellow-eyed grass
Juncaceae	*Juncus bufonius var. bufonius*	toad rush
	Juncus dubius	Mariposa rush
	Juncus effusus ssp. pacificus	Pacific rush
	Juncus patens	gray rush
	Juncus phaeocephalus	dark-headed rush
	Luzula comosa	hairy woodrush
Lamiaceae	*Clinopodium douglasii*	yerba buena
	*Mentha pulegium**	pennyroyal
	Monardella villosa ssp. villosa	hairy coyote mint
	Prunella vulgaris var. lanceolata	self-heal
	Salvia greggii[1]	sage
	Stachys chamissonis	coast hedge-nettle
	Stachys rigida var. rigida	hedge-nettle
Lauraceae	*Umbellularia californica*	California bay
Liliaceae	*Clintonia andrewsiana*	bead lily
	Prosartes hookeri	Hooker's fairy bells
	Prosartes smithii	Smith's fairy bells
	Fritillaria affinis	checker lily

FAMILY	SCIENTIFIC NAME	COMMON NAME
Liliaceae (continued)	*Narcissus sp.*[*1]	daffodil
Linaceae	*Linum bienne**	flax
Lythraceae	*Lythrum hyssopifolia**	hyssop-leaved loosestrife
Malvaceae	*Sidalcea malviflora ssp. malviflora*	checkerbloom
Melanthiaceae	*Trillium chloropetalum*	giant trillium
	Trillium ovatum	western wake robin
Montiaceae	*Calandrinia menziesii*	red maids
	Claytonia perfoliata	miner's lettuce
	Claytonia sibirica	candy flower
Myricaceae	*Morella californica*	Pacific wax-myrtle
Myrsinaceae	*Lysimachia arvensis**	scarlet pimpernel
	Lysimachia latifolia	starflower
Myrtaceae	*Eucalyptus globulus**[1]	Tasmanian bluegum
Onagraceae	*Taraxia ovata*	sun cups
	Clarkia purpurea[2]	winecup clarkia
	Epilobium ciliatum	hairy willow-herb
	Epilobium densiflorum	dense-flowerd willow-herb
	*Fuchsia sp.**	garden fuchsia
Orchidaceae	*Calypso bulbosa*	calypso orchid
	Spiranthes romanzoffiana	hooded ladies' tresses
Orobanchaceae	*Castilleja subinclusa ssp. franciscana*	Franciscan paintbrush
	Orobanche fasciculata	clustered broom-rape
	Triphysaria pusilla	dwarf owl's-clover
Oxalidaceae	*Oxalis pilosa*	hairy wood sorrel
	Oxalis oregana	redwood sorrel
Papaveraceae	*Eschscholzia californica*	California poppy
	Platystemon californicus	cream cups
Phrymaceae	*Mimulus aurantiacus*	sticky monkeyflower
	Mimulus guttatus	common monkeyflower
Plantaginaceae	*Plantago erecta*	California plantain
	*Plantago lanceolata**	English plantain
	Veronica americana	American brooklime
Platanaceae	*Platanus sp.**[1]	sycamore
Poaceae	*Agrostis exarata*	spike bentgrass
	Agrostis hallii	Hall's bentgrass
	Agrostis pallens	leafy bentgrass
	*Aira caryophyllea**	silver European hairgrass
	Anthoxanthum occidentale	vanilla grass
	*Avena barbata**	slender wild oat
	*Brachypodium distachyon**	false brome
	*Briza maxima**	large quaking grass

FAMILY	SCIENTIFIC NAME	COMMON NAME
Poaceae (continued)	*Briza minor**	small quaking grass
	Bromus carinatus var. carinatus	California brome
	*Bromus diandrus**	ripgut brome
	*Bromus hordeaceus**	soft chess
	*Bromus madritensis ssp. rubens**	red brome
	Bromus pseudolaevipes	hairy woodland brome
	*Bromus sterilis**	poverty brome
	Calamagrostis nutkaensis	coast reed grass
	*Cortaderia jubata**	pampas grass
	*Cynosurus echinatus**	hedgehog dogtail
	*Dactylis glomerata**	orchard grass
	Danthonia californica	California oatgrass
	Deschampsia cespitosa	tufted hairgrass
	Deschampsia elongata	slender hairgrass
	Elymus californicus	California bottlebrush grass
	Elymus glaucus ssp. glaucus	blue wildrye
	*Festuca arundinacea**	tall fescue
	*Festuca bromoides**	brome fescue
	Festuca californica	California fescue
	Festuca idahoensis	Idaho fescue
	*Festuca myuros**	rat-tail fescue
	Festuca occidentalis	western fescue
	*Festuca perennis**	perennial ryegrass
	*Glyceria declinata**	weak mannagrass
	*Holcus lanatus**	velvet grass
	Hordeum brachyantherum	meadow barley
	*Hordeum marinum ssp. gussoneanum**	Mediterranean barley
	*Hordeum murinum ssp. leporinum**	foxtail barley
	Koeleria macrantha	Junegrass
	Melica bulbosa	onion grass
	Melica californica	Cailfornia melic
	Melica geyeri	Geyer's melic
	Melica harfordii	Harford's melic
	Melica torreyana	Torrey's melic
	*Phalaris aquatica**	Harding grass
	*Poa annua**	annual bluegrass
	Poa secunda ssp. secunda	pine bluegrass
	*Rytidosperma penicillatum**	hairy oat grass, wallaby grass
	Stipa lepida	foothill needlegrass
	*Stipa manicata**	Andean tussockgrass
	Stipa pulchra	purple needlegrass

FAMILY	SCIENTIFIC NAME	COMMON NAME
Poaceae (continued)	*Trisetum canescens*	nodding oatgrass
Polemoniaceae	*Leptosiphon bicolor*	small baby stars
	Navarretia squarrosa	skunkweed
Polygalaceae	*Polygala californica*	milkwort
Polygonaceae	*Eriogonum latifolium*	coast buckwheat
	Eriogonum nudum ssp. oblongifolium	naked-stemmed buckwheat
	*Polygonum aviculare ssp. depressum**	door knotweed
	*Rumex acetosella**	sheep sorrel
	*Rumex conglomeratus**	clustered dock
	*Rumex crispus**	curly dock
	*Rumex obtusifolius**	bitter dock
Primulaceae	*Primula hendersonii*	Henderson's shooting-star
Ranunculaceae	*Actaea rubra*	baneberry
	Aquilegia formosa	western columbine
	Delphinium nudicaule	scarlet larkspur
	Delphinium sp.	larkspur
	Ranunculus californicus	California buttercup
	*Ranunculus muricatus**	stick-seed buttercup
	Thalictrum fendleri	meadow-rue
Rhamnaceae	*Ceanothus thyrsiflorus*	blue blossom
	Frangula californica	coffeeberry
Rosaceae	*Acaena pinnatifida*	California acaena
	Aphanes occidentalis	western lady's mantle
	Chaenomeles sp.[1]	flowering quince
	Drymocallis glandulosa	sticky cinquefoil
	Fragaria vesca	wood strawberry
	Heteromeles arbutifolia	toyon
	Holodiscus discolor	ocean spray; creambush
	Horkelia californica	California horkelia
	Oemleria cerasiformis	oso berry
	Rosa californica	California rose
	Rosa sp.[1]	rose
	Rosa gymnocarpa	wood rose
	Rosa nutkana var. nutkana	nootka rose
	*Rubus armeniacus *	Himalayan blackberry
	Rubus leucodermis[2]	blackcap raspberry
	Rubus parviflorus	thimbleberry
	Rubus spectabilis	salmonberry
	Rubus ursinus	California blackberry
	Spiraea sp.[1]	spiraea
Rubiaceae	*Galium aparine*	goosegrass

FAMILY	SCIENTIFIC NAME	COMMON NAME
Rubiaceae (continued)	*Galium californicum*	California bedstraw
	*Galium divaricatum**	wall bedstraw
	Galium porrigens var. porrigens	climbing bedstraw
	Galium triflorum	sweet woodruff
	*Sherardia arvensis**	field madder
Ruscaceae	*Maianthemum racemosum*	fat false Solomon's-seal
	Maianthemum stellatum	slim false Solomon's-seal
Salicaceae	*Populus candicans**[1]	balm of Gilead
	Salix lasiolepis	arroyo willow
	Salix lasiandra ssp. lasiandra	Pacific willow
	Salix scouleri	Scouler's willow
	Salix sitchensis	Sitka willow
Sapindaceae	*Acer macrophyllum*	bigleaf maple
	Aesculus californica	California buckeye
Saxifragaceae	*Heuchera micrantha*	alumroot
	Lithophragma affine	woodland star
	Micrantha californica	California saxifrage
	Tellima grandiflora	fringe cups
Scrophulariaceae	*Buddleja sp.**[1]	butterfly bush
	Scrophularia californica	bee plant
Solanaceae	*Solanum americanum*	American nightshade
Themidaceae	*Brodiaea elegans*	elegant brodiaea
	Brodiaea terrestris	ground brodiaea
	Dichelostemma capitatum	blue dicks
	Dichelostemma congestum	ookow
	Triteleia laxa	Ithuriel's spear
	Triteleia peduncularis[2]	marsh triteleia
Urticaceae	*Hesperocnide tenella*	western nettle
	Urtica dioica	stinging nettle
Valerianaceae	*Plectritis congesta ssp. brachystemon*	short-stamened longspur
Violaceae	*Viola adunca ssp. adunca*	western dog violet
	Viola glabella	smooth violet

* non-native

[1] horticultural

[2] identified by CNPS-Milo Baker Chapter on 13 June 2009, not confirmed during botanical assessment

APPENDIX C: OBSERVED BIRD SPECIES ON WRIGHT HILL RANCH

Common Name[1]	*Scientific Name*	Audubon[2]	CBC[3]	PCI[4]	2009 Breeding Bird Survey[5]
California quail	*Callipepla californica*		x	x	PR
wild turkey (non-native)	*Meleagris gallopavo*		x		PO
turkey vulture	*Cathartes aura*	x	x	x	PO
osprey	*Pandion haliaetus*			x	PO
white-tailed kite	*Elanus leucurus*		x		
northern harrier	*Circus cyaneus*	x	x		
sharp-shinned hawk	*Accipiter striatus*	x			
Cooper's hawk	*Accipiter cooperii*		x		O
red-tailed hawk	*Buteo jamaicensis*	x	x		PO
ferruginous hawk	*Buteo regalis*		x		
killdeer	*Charadrius vociferus*		x		
band-tailed pigeon	*Patagioenas fasciata*	x	x	x	PR
mourning dove	*Zenaida macroura*				O
barn owl	*Tyto alba*	Observed during a Land Paths outing Oct 2009			
great horned owl	*Bubo virginianus*		x		O
Anna's hummingbird	*Calypte anna*		x	x	PR
Allen's hummingbird	*Selasphorus sasin*				PO
acorn woodpecker	*Melanerpes formicivorus*		x	x	PO
red-breasted sapsucker	*Sphyrapicus ruber*	x	x		
downy woodpecker	*Picoides pubescens*				PO
hairy woodpecker	*Picoides villosus*				PO
northern flicker	*Colaptes auratus*	x	x	x	
pileated woodpecker	*Dryocopus pileatus*				PO
American Kestrel	*Falco sparverius*	x	x	x	PO
peregrine Falcon	*Falco peregrinus*		x		
western wood-pewee	*Contopus sordidulus*				O
Pacific-slope flycatcher	*Empidonax difficilis*			x	PO
black phoebe	*Sayornis nigricans*		x		PO
Say's phoebe	*Sayornis saya*		x		PO
ash-throated flycatcher	*Myiarchus cinerascens*				PO
Cassin's vireo	*Vireo cassinii*				PO
Hutton's vireo	*Vireo huttoni*		x		PO
warbling vireo	*Vireo gilvus*				PO
Steller's jay	*Cyanocitta stelleri*		x	x	PR
western scrub-jay	*Aphelocoma californica*	x	x	x	CO
American crow	*Corvus brachyrhynchos*	x			
common raven	*Corvus corax*	x	x	x	PR
horned lark	*Eremophila alpestris*		x	x	PR
tree swallow	*Tachycineta bicolor*				PO
violet-green swallow	*Tachycineta thalassina*				PR
cliff swallow	*Petrochelidon pyrrhonota*				PO
barn swallow	*Hirundo rustica*			old nests; x	CO

Common Name[1]	*Scientific Name*	Audubon[2]	CBC[3]	PCI[4]	2009 Breeding Bird Survey[5]
chestnut-backed chickadee	*Poecile rufescens*	x	x	x	PR
common bushtit	*Psaltriparus minimus*			x	CO
red-breasted nuthatch	*Sitta canadensis*		x		PR
white-breasted nuthatch	*Sitta carolinensis*		x		PR
pygmy nuthatch	*Sitta pygmaea*		x		PR
brown creeper	*Certhia americana*		x	x	PO
winter wren	*Troglodytes troglodytes*		x	x	
Bewick's wren	*Thryomanes bewickii*				PO
golden-crowned kinglet	*Regulus satrapa*		x		
ruby-crowned kinglet	*Regulus calendula*	x	x	x	
wrentit	*Chamaea fasciata*	x	x	x	CO
western bluebird	*Sialia mexicana*	x	x		PR
Swainson's thrush	*Catharus ustulatus*			x	PR
hermit thrush	*Catharus guttatus*	x	x	x	O
American robin	*Turdus migratorius*		x	x	PR
varied thrush	*Ixoreus naevius*		x		
European starling (non-native)	*Sturnus vulgaris*	x	x		CO
American pipit	*Anthus rubescens*	x	x		
cedar waxwing	*Bombycilla cedrorum*		x		PO
orange-crowned warbler	*Oreothlypis celata*				PO
yellow warbler	*Setophaga petechia*				O
yellow-rumped warbler (Audubon's)	*Setophaga coronata*	x	x	x	PO
Townsend's warbler	*Dendroica townsendi*	x			
Wilson's warbler	*Cardellina pusilla*			x	CO
spotted towhee	*Pipilo maculatus*		x	x	PO
California towhee	*Pipilo crissalis*		x	x	PR
chipping sparrow	*Spizella passerina*				PR
lark sparrow	*Chondestes grammacus*				CO
savannah sparrow	*Passerculus sandwichensis*	x	x		PR
grasshopper sparrow	*Ammodramus savannarum*			x	PO
fox sparrow	*Passerella iliaca*		x		PO
song sparrow	*Melospiza melodia*		x	x	PO
white-crowned sparrow	*Zonotrichia leucophrys*		x		PR
golden-crowned sparrow	*Zonotrichia atricapilla*	x	x	x	O
dark-eyed junco	*Junco hyemalis*	x	x	x	CO
black-headed grosbeak	*Pheucticus melanocephalus*				PR
lazuli bunting	*Passerina amoena*			x	PO
western meadowlark	*Sturnella neglecta*	x	x	x	PR
Brewer's blackbird	*Euphagus cyanocephalus*	x	x	x	PR
brown-headed cowbird (non-native)	*Molothrus ater*				PO
house finch	*Haemorhous mexicanus*	x	x	x	PR
purple finch	*Haemorhous purpureus*				PO
pine siskin	*spinus pinus*		x		
American goldfinch	*Spinus tristis*				CO
Total	**86**	**26**	**45**	**23**	**55**

APPENDIX D: OBSERVED AND POTENTIALLY OCCURRING REPTILES, AMPHIBIANS, AND MAMMALS ON WRIGHT HILL RANCH

COMMON NAME	SCIENTIFIC NAME
Reptiles	
northern rubber boa	*Charina bottae*
North American racer	*Coluber constrictor*
sharp-tailed snake	*Contia tenuis*
ring-necked snake	*Diadophis punctatus*
California kingsnake	*Lampropeltis californiae*
gopher snake	*Pituophis catenifer*
aquatic garter snake	*Thamnophis atratus*
western terrestrial garter snake	*Thamnophis elegans*
common garter snake	*Thamnophis sirtalis*
northern alligator lizard	*Elgaria coerulea*
southern alligator lizard	*Elgaria multicarinata*
coast range fence lizard	*Sceloporus occidentalis bocourtii*
western skink	*Plestiodon skiltonianus*
Amphibians	
California giant salamander	*Dicamptodon ensatus*
black salamander	*Aneides flavipunctatus*
arboreal salamander	*Aneides lugubris*
California slender salamander	*Batrachoseps attenuatus*
ensatina	*Ensatina eschscholtzii*
rough-skinned newt	*Taricha granulosa*
red-bellied newt	*Taricha rivularis*
California newt	*Taricha torosa*
western toad	*Anaxyrus boreas*
Sierran treefrog	*Pseudacris (=Hyla) sierra*
California red-legged frog	*Rana draytonii*
[6]American bullfrog*	*Lithobates catesbeianus*
Mammals	
Virginia opossum*	*Didelphis virginiana*
vagrant shrew	*Sorex vagrans*
ornate shrew	*Sorex ornatus*
fog shrew	*Sorex sonomae*
Trowbridge's shrew	*Sorex trowbridgii*
shrew-mole	*Neurotrichus gibbsii*
broad-footed mole	*Scapanus latimanus*
California bat	*Myotis californicus*
little brown bat	*Myotis lucifugus*
fringed myotis	*Myotis thysanodes*
long-eared myotis	*Myotis evotis*
long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
sliver-haired bat	*Lasionycteris noctivagans*
big brown bat	*Eptesicus fuscus*
western red bat	*Lasiurus blossevillii*
hoary bat	*Lasiurus cinereus*
Townsend's big-eared bat	*Corynorhinus townsendii*
pallid bat	*Antrozous pallidus*
brush rabbit	*Sylvilagus bachmani*
black-tailed jackrabbit	*Lepus californicus*
American porcupine	*Erethizon dorsatum*
Botta's pocket gopher	*Thomomys bottae*
California kangaroo rat	*Dipodomys californicus*
western harvest mouse	*Reithrodontomys megalotis*
deer mouse	*Peromyscus maniculatus*
brush mouse	*Peromyscus boylii*
dusky-footed woodrat	*Neotoma fuscipes*
western red-backed vole	*Clethrionomys californicus*
Sonoma tree vole	*Arborimus pomo*
California vole	*Microtus californicus*
yellow-cheeked chipmunk	*Tamias ochrogenys*
Sonoma chipmunk	*Tamias sonomae*
western gray squirrel	*Sciurus griseus*
Douglas' squirrel	*Tamiasciurus douglasii*
Pacific jumping mouse	*Zapus trinotatus*
coyote	*Canis latrans*
gray fox	*Urocyon cinereoargenteus*
ringtail	*Bassariscus astutus*
raccoon	*Procyon lotor*
ermine	*Mustela erminea*
long-tailed weasel	*Mustela frenata*
American badger	*Taxidea taxus*
western spotted skunk	*Spilogale gracilis*
striped skunk	*Mephitis mephitis*
mountain lion[7]	*Puma concolor*
bobcat	*Lynx rufus*
black-tailed deer	*Odocoileus hemionus*

APPENDIX E: DESCRIPTIONS OF SPECIAL-STATUS PLANT AND ANIMAL SPECIES

COMMON NAME[8] *SCIENTIFIC NAME*	LISTING STATUS[9] USFWS/CDFW/CNPS	GENERAL HABITAT/POTENTIAL FOR OCCURRENCE
Plants		
California bottle-brush grass *Elymus californicus*	—/—/4.3	This perennial grass grows at elevations between 15-450 meters in broadleafed upland forest, cismontane woodland, north coast coniferous forest and riparian woodland. It blooms from May to November. This species is a California endemic and is found in Marin, San Mateo, Santa Cruz and Sonoma counties. This species was observed just north of the property boundary.
harlequin lotus *Hosackia gracilis*	—/—/4.2	This perennial herb grows at elevations between 0-700 meters in wetlands, roadsides, broadleafed upland forest, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal prairie, coastal scrub, meadows and seeps, marshes and swamps, north Coast coniferous forest, valley and foothill grassland. It blooms between March and July. This species is present within the property.
western dog violet *Viola adunca*	—/—/CBR	The western dog violet is the larval host for the federally endangered Myrtle's silverspot butterfly. It grows at elevations between 0-3,566 meters along stream-banks and in meadows. This species is found in yellow pine forest, red fir forest, lodgepole forest, redwood forest, mixed evergreen forest, subalpine forest, alpine fell-fields, and wetland-riparian communities. The western dog violet blooms between April and August. This species is present on the property.
Invertebrates		
San Bruno elfin butterfly *Callophrys mossii bayensis*	FE/—/—	Coastal, mountainous areas with grassy ground cover. All known locations restricted to San Bruno Mountain, San Mateo County. Host plant is Pacific sedum (*Sedum spathulifolium*). The property is outside of the range of this species.
monarch butterfly *Danaus plexippus*	—/—/—	Winters in coastal California where it utilizes wind-protected tree groves (e.g., eucalyptus, Monterey pine and cypress) along the coast. Roosts site typically located close to nectar and water sources. The small cluster of eucalyptus trees near the homestead presents suitable roosting habitat for this species.
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*	FE/—/—	Historically, occupied coastal dune, prairie habitat, and bluffs from San Mateo County north to the Russian River in Sonoma County. Four remaining populations occur in western Marin County and southwestern Sonoma County. Larvae typically feed on violets (*Viola adunca*) where eggs are laid. Adults known to use a number of nectar plants [i.e. gum plant, yellow sand verbena, mints (*Monardella* spp.) seaside daisy, and non-native bull thistle and false dandelion. Suitable larval host plants are known to occur on the property and there are multiple (historical) documented occurrences for this species along the Sonoma County coast.
Marin hesperian *Vespericola marinensis*	—/—/—	Moist coastal spots in coastal brush and chaparral vegetation in Marin County. Microhabitat includes seeps, leaf mold along streams, and alder and mixed evergreen forests. The property is outside of the range of this species.

COMMON NAME[8] *SCIENTIFIC NAME*	LISTING STATUS[9] USFWS/CDFW/CNPS	GENERAL HABITAT/POTENTIAL FOR OCCURRENCE
Amphibians		
California red-legged frog *Rana draytonii*	FT/SSC/—	Breeding habitat includes marshes, streams, lakes, reservoirs, ponds, and other water sources with plant cover. Breeding occurs in deep, slow-moving waters with dense, shrubby, or emergent vegetation. Breeds November through April depending on location. During the non-breeding season, California red-legged frogs can remain at the breeding site (in the presence or absence of water) or move into surrounding non-breeding habitats. Radio tracking of frogs in Marin County by Fellers and Kleeman (2007) noted the dispersal of frogs at a median distance of 150m from breeding sites (range of 30 to 1,400 meters). They also noted year-round small-scale (<30m) movements around breeding sites. These results indicate the importance of uplands for non-breeding season and migratory corridor habitat. Suitable breeding habitat for this species is largely absent from the property. However, they may the property as seasonal foraging and aestivation habitat.
Reptiles		
northern western pond turtle *Actinemys marmorata*	Under review for listing/SSC/—	The only native turtle in the San Francisco Bay region. Occurs in or near permanent or semi-permanent water sources (e.g., ponds, lakes, rivers, streams) with suitable basking sites and underwater retreats. There are no documented occurrences for this species within close proximity to the property and limited habitat for this species is present on the property.
Birds		
tricolored blackbird *Agelaius tricolor*	BCC/SSC (nesting colony)/—	Colonial-nesting bird in fields, pastures, and wetlands. Nests in tules, cattails, and to a lesser degree willow and brambles. Breeding occurs from mid-April into late July. Typically forage on the ground in large flocks. Year-round resident in Sonoma County, more common in winter. There are no recently reported sightings within close proximity to the property. Marginally suitable breeding habitat occurs on the property and they may forage over the site if nesting in adjacent areas.
grasshopper sparrow *Ammodramus savannarum*	—/SSC (nesting)/—	A small, open-country sparrow named for its buzzy insect-like song. Forages for insects and seeds and prefers "short to moderate-height, moderately open grasslands with scattered shrubs" (Shuford and Gardali 2008). Summer resident in Sonoma County in ungrazed or lightly grazed grasslands. Grasshopper sparrows are known to occur on the property and were observed during the breeding season.
great blue heron *Ardea herodias*	—/—/—	Great blue herons feed primarily in saline and freshwater habitats. Their diet is comprised primarily of fish, but they will also take smaller animals. Colonial nests are built in large trees or snags, often in association with great egrets. For herons and egrets, pre-laying and courtship can begin as early as January to March with the nesting season extending into June to August or later (Kelly, et al. 2006). Year-round resident in Sonoma County. There are no known rookeries within close proximity to the property; however, herons may forage on the property.

COMMON NAME[8] *SCIENTIFIC NAME*	LISTING STATUS[9] USFWS/CDFW/CNPS	GENERAL HABITAT/POTENTIAL FOR OCCURRENCE
burrowing owl *Athene cunicularia*	BCC/SSC (burrowing and some wintering sites)/—	A small, ground-dwelling species of grasslands, prairies, rolling hills, and ranchlands. They are active both day and night and can frequently be seen standing at burrow entrances during the day. They are subterranean nesters and utilize abandoned burrows of ground squirrels and other mammals. They feed on a variety of prey items, including ground insects and small vertebrates. Burrowing owls occur in the county during the winter months; this species no longer breeds in Sonoma County. Suitable habitat for this species is present on the property.
marbled murrelet *Brachyramphus marmoratus*	FT/SE (nesting)/—	Seabird that nests inland in old-growth coast redwood and Douglas-fir forests, 150 feet above ground. A solitary or semicolonial nester. Does not touch land. Forages for small fish by diving in the nearshore ocean and harbor entrances. There are no confirmed observations of marbled murrelet in nearby watershed (B. O'Neil pers. comm. 2014); however, comprehensive surveys have not been completed. Potentially suitable breeding habitat is present on the property.
northern harrier *Circus cyaneus*	—/SSC (nesting)/—	An open-country hawk characterized by its low flight pattern. Flies low to the ground foraging on small mammals, birds, amphibians, and reptiles. Nests on the ground within dense or tall vegetation. Year-round resident in Sonoma County in marshes, fields, and grasslands. Northern harriers are known to occur on the property and were observed during winter.
yellow-billed cuckoo *Coccyzus americanus*	FT, BCC/SE (nesting)/—	Historically nested in Sonoma County but is currently extirpated from the county. It was last noted as breeding in Sonoma County in 1944. Currently, it occurs as isolated populations in the Central Valley. Nests in riparian forests along the broad, flood-plains of large river systems. Suitable habitat for this species does not occur on the property.
olive-sided flycatcher *Contopus cooperi*	BCC/SSC (nesting)/—	Flycatcher of mixed coniferous forests. Forages by sallying for insects from high canopy perch. Nests primarily in conifers; however, can be found in a variety of habitats during migration. Nests constructed on a horizontal branch far from trunk. Known for its call — quick-three-beers. Summer resident in Sonoma County. Olive-sided flycatchers are known to occur on the property and were observed during the breeding season.
black swift *Cypseloides niger*	BCC/SSC (nesting)/—	Forages in open sky, preferring mountain country and sea cliffs. Breeds in these habitat types often behind waterfalls in deep canyons and sea-bluffs above the surf. Suitable breeding habitat does not occur within the property; however, swifts may forage over the property.
yellow warbler *Setophaga petechia*	BCC/SSC (nesting)/—	A bright yellow bird of riparian woodlands with willows, alders and/or cottonwoods. Typically nests along stream courses but can occur in a variety of habitats during migration. Nests constructed in fork of a tree or small shrub. Gleans vegetation for insects. Summer resident in Sonoma County in particular along riparian groves. Yellow warblers were observed in low numbers on the property during the breeding season. There is limited habitat present.
white-tailed kite *Elanus leucurus*	—/FP (nesting)/—	Raptor of semi-open areas. Forages for mostly small rodents by hovering and diving. Nests in trees and tall bushes. Year-round resident in Sonoma County in open woodlands, bottomlands, and agricultural grasslands. Suitable habitat for this species is present on the property.

COMMON NAME[8] *SCIENTIFIC NAME*	LISTING STATUS[9] USFWS/CDFW/CNPS	GENERAL HABITAT/POTENTIAL FOR OCCURRENCE
osprey *Pandion haliaetus*	—/WL (nesting)/—	Occupies lakes, reservoirs, rivers, estuaries, and open seacoast. Forages exclusively for fish. Nests on exposed treetops or other man-made structures from 10 to 250 feet above ground. Year-round resident in Sonoma County. Suitable breeding habitat is present on the property, but foraging habitat absent. Osprey were observed on the property.
northern spotted owl *Strix occidentalis caurina*	FT/SSC, Candidate ST/—	Dense forest habitats in northern California. Requires multi-layered canopy cover for roosting sites. Breeding sites include tree or snag cavities or broken tops of large trees. Nocturnal hunter eating mostly small mammals. Year-round resident in Sonoma County where it is known from breeding occurrences in old-growth and mixed forest habitats. Suitable habitat for this species occurs on the property and there are multiple documented spotted owl territories in the Willow Creek watershed.
Mammals		
pallid bat *Antrozous pallidus*	—/SSC/—	Grassland, shrubland, forest, and woodland habitats at low elevations up through mixed coniferous forests. A social species forming small colonies. Roosting sites include caves, mines, crevices, buildings, and hollow trees during day, more open sites used at night. At low elevations, locally common in California. Pallid bats may forage on the property and use the existing habitats and structures for roosting. They are documented nearby.
Sonoma tree vole *Arborimus pomo*	—/SSC/—	A climbing vole which inhabits coastal coniferous forests. Highly specialized feeders eating only conifer leaves. Within California, feed exclusively on Douglas-fir leaves. Nests constructed 6 to 150 feet above ground, typically in conifers. Suitable habitat for this species occurs within the property and there are multiple documented occurrences of this species in close proximity.
Townsend's big-eared bat *Corynorhinus townsendii*	—/SSC, Candidate ST/—	Low to mid-elevation mesic habitats including riparian, mixed forest, coniferous forest, prairies, and agricultural lands. Utilizes edge habitat for foraging. Roosting sites include caves, mines, tunnels, buildings, and other man-made structures. Occurs throughout California but distribution not well known. This species may forage on the property and use the existing habitats and structures for roosting. A large colony of Townsend's big-eared bat was recently documented along the Sonoma Coast in an abandoned building to the south of Wright Hill Ranch (K. Marsh pers. comm. 2014). Species observed near the ranch complex (Wildlife Research Associates 2015).
hoary bat *Lasiurus cinereus*	—/—/—	Occurs in open habitat or habitat mosaics. Requires medium to large trees for cover and habitat edges and/or open areas for foraging habitat. Tend to be solitary roosting in trees and foliage. Widespread in California except patchy in desert regions. This species may forage on the property and use the existing habitats and structures for roosting.
long-eared myotis *Myotis evotis*	—/—/—	Occurs in woodland and forest habitats but will also use chaparral, coastal scrub, and other shrub habitats. Roosts singly or small groups under bark, bridges, rocks, in buildings, hollow trees, mines, etc. Widespread but uncommon. Species (probable) observed near the ranch complex (Wildlife Research Associates 2015).

COMMON NAME[8] *SCIENTIFIC NAME*	LISTING STATUS[9] USFWS/CDFW/CNPS	GENERAL HABITAT/POTENTIAL FOR OCCURRENCE
fringed myotis *Myotis thysanodes*	—/—/—	Variety of habitats including deserts, grassland, and woodland habitats. Maternity colonies include caves, mines, crevices, and buildings. Widespread in California except Central Valley and desert regions. This species may forage on the property and use the existing habitats and structures for roosting.
American badger *Taxidea taxus*	—/SSC/—	Occurs in a variety of habitat types (e.g. herbaceous, shrub or forest habitats) with dry, friable soils. Badgers are carnivorous and dig their own burrows. They are active year-round, although less active in winter. Young are typically born in early spring. American badgers are known to occur on the property.

Footnotes

1 Bold species identified as special animals (CDFW 2011) and discussed throughout document. DFG Watch List (nesting) — Cooper's hawk, sharp-shinned hawk, and osprey; DFG Watch List — California horned lark; California Species of Special Concern (nesting) — northern harrier, olive-sided flycatcher, yellow warbler, and grasshopper sparrow; Fully Protected (nesting) — white-tailed kite.

2 Observed during fall site visit by Madrone Audubon Society (Ken Wilson and Bob Speckels), November 13, 2008.

3 Observed during West Sonoma County Christmas Bird Counts, January 4, 2009, January 3, 2010, January 2, 2011, and January 1, 2012.

4 Observed during winter 2009 and summer 2014 site assessments by PCI.

5 Observed during April and May, 2009 breeding bird survey, O = observed, but no evidence of breeding, PO = possible breeding, PR = probable breeding, and CO = confirmed breeding. Most inclusive code indicated.

6 Bold = species was observed during wildlife surveys

* = non-native

7 Mountain lion scat was observed during a Land Paths outing October 2009

8 Plant and wildlife species identified within the region based on literature review and field surveys.

9 STATUS CODES:

FEDERAL

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

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

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

BCC = U.S. Fish and Wildlife Service Bird of Conservation Concern

STATE OF CALIFORNIA

SE = Listed as endangered by the State of California

ST = Listed as threatened by the State of California

SSC = California Species of Special Concern

Candidate SE = Candidate for listing as endangered by the State of California

Candidate ST = Candidate for listed as threatened by the State of California

FP = Fuly protected

WL = Watch list

CALIFORNIA NATIVE PLANT SOCIETY

CBR = Considered as a rare plant, but rejected

4 = California Rare Plant Rank 4: Plants of limited distribution

1.1 = Seriously threatened in California

1.2 = Fairly threatened in California

1.3 = Not very threatened in California

APPENDIX F: EROSION SITE PHOTO-DOCUMENTATION

The following erosion sites were identified by Pacific Watershed Associates during the 2009 erosion inventory. The locations of the sites are identified on Figure 12, with accompanying photographs. See Section 5, *Erosion Assessment* for further information. Additional road related erosion and repair site are indicated on Figure 7.

Photopoint 4. Upslope of gully 1

Photopoint 6. Gully 1 at property line

Photopoint 28. Gully 3

Photopoint 5. Downslope of gully 1

Photopoint 21. Upslope of gully 2 to headcut

Photopoint 35. Gully 4

Photopoint 22. Downslope of gully 2

Photopoint 36. Downslope of gully 4

Photopoint 48. Upslope gully 5

Photopoint 49. Downslope gully 5

Photopoint 50. Downslope gully 5

Photopoint 55. Gully 8

Photopoint 51. Upslope gully 5

Photopoint 61. Upslope gully 8

Photopoint 62. Upslope gully 8

Photopoint 63. Headcut gully 8

Photopoint 74. Gully 9 headcut looking downslope

Photopoint 78. Erosion along road-gully 11.

Photopoint 79. Gully 11 looking downslope.

Photopoint 80. Gully 11 looking downslope

Photopoint 81. Gully 11 looking downslope.

Photopoint 83. Gully 13 looking upslope.

Photopoint 82. Gully 12 looking downslope

Photopoint 85. Gully 15 looking downslope with water source

Photopoint 84. Gully 14 looking upslope.

Photopoint 86. Sloughing area.

Photopoint 87. Gully 16 looking downslope.

Photopoint 89. Gully 17 along minor road

Photopoint 90. Headcut of Furlong Gulch.

Photopoint 91. Headcut of Furlong Gulch looking downslope.

Photopoint 92. Erosion along road.

APPENDIX G: PROJECT-SPECIFIC MANAGEMENT RECOMMENDATIONS

Evaluation during the management plan development resulted in the identification of site-specific projects across the Wright Hill Ranch property. The tables below provide information about the specific recommendations and including anticipated priorities. These tables will need to be evaluated and updated periodically to address current property conditions and completed actions.

INVASIVE SPECIES MANAGEMENT

A number of invasive plant species are present on Wright Hill Ranch. The table below lists those species present on the property which are high or moderate priority for removal. The locations within the property and treatment actions are listed. Herbicide-based treatments are not included here or strongly recommended. Treatments should first include manual or mechanical methods. If herbicide is to be used, consult with a licensed Pest Control Advisor.

Table G-1. Invasive Species Management

LATIN NAME	COMMON NAME	LIFE FORM	DISTRIBUTION ON WRIGHT HILL RANCH	ACTIONS
High Priority				
Cortaderia jubata	jubata grass	Perennial grass	Limited; riparian habitat	ERADICATE. Previously mapped in two locations along drainages. Remove by digging out.
Delairea odorata	Cape ivy	Vine	Limited; scrub habitat	ERADICATE. Prioritize locations where native trees are threatened or spreading is evident. Remove manually, using caution to avoid leaving plant fragments on-site, or treat with herbicide. Dispose of off-site, or by deep burial or composting on site with careful follow-up to ensure success.
Hedera helix	English ivy	Vine	Limited; forest	ERADICATE. Previously mapped at edge of fir forest in eastern part of property, just north of road. Remove manually; cut any stems climbing trees. Remove all plant parts from property.
Rubus armeniacus	Himalayan blackberry	Shrub	Common; riparian and scrub habitats	CONTROL. Small infestations may be dug out by hand. For large infestations, use of machinery and/or herbicides may be appropriate. If cuttings were made before seed set, debris may be left in piles for wildlife habitat or chipped; otherwise, remove from the property.
Medium Priority				
Carduus pycnocephalus	Italian thistle	Annual herb	Common; disturbed areas of high livestock use in grassland, bay grove, near barn	CONTROL. Manual removal of dense infestations, ensuring root is severed at least several inches below ground.
Conium maculatum	Poison hemlock	Perennial herb	Limited; scrub, riparian	CONTROL. Remove manually, prioritizing isolated infestations or those in high quality native habitat.
Eucalyptus sp.	eucalyptus	tree	Limited; near house and barn	MONITOR. If seedlings are observed, remove manually and consider removal of mature trees.

LATIN NAME	COMMON NAME	LIFE FORM	DISTRIBUTION ON WRIGHT HILL RANCH	ACTIONS
Prunus sp.	Wild cherry, plum	Tree	Limited; scrub	ERADICATE. While infestations are still limited, remove by pulling seedlings or cutting below soil level and treating freshly cut stumps with herbicide or covering with black plastic.
Rosa sp.	Ornamental rose	Shrub	Limited; near house and barn	MONITOR. If seedlings are observed, remove both seedlings and mature shrubs, including roots.
Rytidosperma penicillatum, and other non-native grasses	Hairy oat grass	Perennial grass	Widespread; grassland	CONTROL. This is a dominant grass in the grasslands, and, like a number of other non-native grasses present, unlikely readily controlled. Consider experimental control via prescribed burns, focused grazing, or herbicide application (or a combination of these methods) followed by seeding or planting in a limited area; if successful, apply to additional areas.
Silybum marianum	Milk thistle	Annual herb	Common; disturbed areas of high livestock use in grassland, including bay grove, near barn, at edges of isolated tree canopies	CONTROL. Manual removal of dense infestations, ensuring root is severed at least several inches below ground.

GULLY AND EROSION SOURCES

PWA (2009) identified a number of erosion problems on Wright Hill Ranch. These sited were identified and prioritized for stabilization or restoration to protect natural resources and water quality.

Table G-2. Gullies and other Erosion Sources

GULLY #	GULLY LENGTH (FT)	AVG. WIDTH (FT)	AVG. DEPTH (FT)	KNICK-POINTS (#)
Short-term Treatments (Highest Priority)				
9	400	30	7	0
1	1100	15	4	7
3	1700	7	2	4
6	1000	25	3	4
11	1000	15	10	7
13	750	10	2	7
17	1000	30	6	3
18	1000	15	5	4
19	250	20	4	3
20	100	30	5	2
8A	750	12	3	8
Long-term Treatments (Lower Priority)				
2	1500	30	10	0
4	2300	3	1	0
5	1800	25	2.5	0
7	700	10	3	0
12	500	8	3	1

GULLY #	GULLY LENGTH (FT)	AVG. WIDTH (FT)	AVG. DEPTH (FT)	KNICK-POINTS (#)
14	150	15	3	3
21	700	30	3	3
22	300	10	2	0

WRIGHT HILL RANCH FENCING AND WATER SOURCES

To support the continued grazing operation on Wright Hill Ranch, a number of infrastructure improvements are needed to maintain an efficient operation and protect natural and cultural resources. The following tables list fencing needs, recommended pastures, and water source improvements.

Table G-3. Wright Hill Ranch Fencing Needs

REACH	SECTION LOCATION	APPROX. LENGTH IN FEET	PRIORITY[1]	COMMENTS
Unfenced Boundary Sections				
BU1	Northern boundary	7,365	**High**	No boundary fence existing, cattle are able to leave the Wright Hill Ranch; construct fencing *Approximately 2,000 feet of fencing constructed in summer 2016 along a portion of BU1*
BU2	Southern and SE Boundary	2,135	**High**	No boundary fence existing, cattle are able to leave the Wright Hill Ranch; construct fencing
BU3	Southern boundary	1,890	Low	Unfenced sections are steep and brushy, cattle cannot leave property; fencing not necessary
BU4	Western boundary, north of access road	2,035	Low	Unfenced sections are steep and brushy, cattle cannot leave property; fencing not necessary
BU5	Western boundary, just north of SW corner	1,560	Low	Brushy and steep, adjacent to State Park; cattle do not leave the Wright Hill Ranch in this opening due to steep slopes and dense woody vegetation; fencing not necessary
	Total	**14,985**		
Existing Boundary Fencing				
BF1	Northwestern boundary	3,980	**Medium**	Old and in poor condition but functional; replace after high priority fencing is completed
BF2	Eastern boundary	3,795	Low	Portions are in fair condition and portions are in poor condition, but fence is apparently functional; will eventually need to be replaced
BF3	Southern boundary, just west of SE corner	2,595	**High**	Poor condition and only partially intact; not reliably functional; high priority for replacement
BF4	Southern boundary, toward west of SW corner	785	**Medium**	Intact and functional; replace after high priority fencing is completed
BF5	Western boundary	4,220	**Medium**	Intact and functional; replace after high priority fencing is completed
	Total	**15,375**		
Cross Fencing				
CF2-3	Between Pastures 2 and 3	1,985	Low	Only a remnant remains of the original fence (?)
CF3-4	Between Pastures 3 and 4	1,405	**Medium**	Not functional; should be replaced to create effective pastures

REACH	SECTION LOCATION	APPROX. LENGTH IN FEET	PRIORITY[1]	COMMENTS
CF3-5	Between Pastures 3 and 5	3,640	**Medium**	Intact and functional but in poor condition; should be replaced and extended into the steep canyon of Rough Creek to effectively separate Pastures 4 and 5
CF4-5	Between Pastures 4 and 5	2,195	NA	Not functional and not necessary
CF5-6	Between Pastures 5 and 6	3,930	Low	Not functional; should be replaced for pasture creation
CF5-6b	Between Pastures 5 and 6	1,300	**Medium**	Not functional; should be replaced
CF6-7	Between Pastures 6 and 7	2,030	Low	Functional and in fair condition
CF7-8	Between Pastures 7 and 8	1,540	Low	Functional and in fair condition
CF8-1	Between Pastures 8 and 1	1,370	Low	Possibly remove and create one larger pasture
	Total	**19,395**		
Resource Protection Fencing				
RP7	South side of Pasture 7 drainage	1,740	**High**	Needed to protect riparian area
RP4	Northwest corner of Pasture 4	6,665	**Medium**	For protection of forest and woodland to allow understory regrowth
CF3-4 and RP3	Between Pasture 3 and forest conservation area	1,320	**Medium**	Not functional; should be replaced to limit cattle from forest conservation area *Approximately 1,000 of fencing repaired on east side of Pasture 3 and forest conservation area in summer 2016*
	Deeply cut livestock trail in Pasture 4 near spring W4a	200	**Medium**	May be needed to redirect livestock traffic from deeply cut trail; reassess if spring is redeveloped and trough is moved
RP1-2	South side of Furlong Gulch	1,900	**High**	Needed to protect Furlong Gulch from cattle entry
	Various springs	1,000	**High**	Some of the springs that feed troughs should be fenced after livestock water sources are repaired and/or redeveloped
	Total	**12,825**		

[1] Medium and high priority fence replacement and repairs are noted in bold. For these priority fences, approximately 23,515 feet of new fencing is needed and 15,330 feet of fencing needs to be remove.

Table G-4. Livestock Water Source Recommended Actions

WATER TROUGH LOCATION	REPAIR PRIORITY	ACTIONS
W1	Medium	Inspect and possibly clean spring box; remove tub and pipe; install new pipe and Rubbermaid 300 gallon trough on rock pad, extending a minimum of two feet out from trough; move trough location lower and away from spring to old road; check adjacent fenced spring with blackberries if water in main spring is inadequate
W2	High	Redevelop spring, including replacing spring box; move trough location about 150 feet southwest away from the fence; replace trough with Rubbermaid 300 gallon trough on a rock apron and either pipe overflow to a second trough or back into drainage
W3	Medium	Move trough out of the channel; if elevation drop and budget allow, move trough location out to grassland (this would require about 700 feet of pipe) and reset it on a rock pad, if constraints don't allow this, cut a pad in the woods with a small bobcat, build a rock pad and move the trough to this location; could also add a tank for water storage; if so, add float valve to trough to prevent overflow; overflow from tank should be drained into brushy area

WATER TROUGH LOCATION	REPAIR PRIORITY	ACTIONS
W4a	Medium	Overflow from trough has created muddy area; fence whole spring area; move trough to grassland across drainage near Douglas-fir and bay tree cluster, suspend pipe across drainage; could also add a tank for water storage; if so, add float valve to trough to prevent overflow; overflow from tank should be drained into brushy area
W4b	Medium	Move trough away from the drainage — spring flows around it, creating muddy area where cattle drink; improve water collection by replacing spring box or installing gravel and filter fabric wrapped perforated pipe in a V shape across slope; install water tank about 150 feet below current trough location, and pipe spring water to tank; reset trough on a gravel pad in open grassland — about 400 feet from current location, following cattle trail; add float valve to trough to prevent overflow; overflow from tank should be drained into brushy area
W4c	Medium	Measure flow; if adequate, high priority for redevelopment by moving trough to flat ridge below it; this would help eliminate the deeply incised cattle trails that fan through this area
W5	High	Restore spring by excavating and removing old cutoff wall, rebuilding a new one, and replacing the pipe; old bathtub should be replaced with a Rubbermaid trough outfitted with a wildlife escape ramp
W6a	Highest	Replace spring box; redevelop spring
W6b	Low	Has been dug out, and renovated with drain rock, plastic and new hose
W6/7	Low	Replace trough with Rubbermaid 300 gallon trough pipe overflow to another trough or into drainage; reset trough and add rock apron
W7	Low	Use existing trough but move it downhill, off the spring and add rock pad; pipe overflow back into waterway.
W8	Medium	Side hill spring/well needs to be re-drilled or look at options to redevelop with perforated pipe or box for collection and trough as described for W1
WBarn	Medium	Possibly substitute with roof catchment system from barn

CULTURAL RESOURCES

The Ranch Complex will require both short-term and long-term maintenance to ensure the historic nature of the buildings and surrounding landscape retains character. The table below describes the recommended maintenance measures for short-term and long-term implementation. These measures should be designed to meet the standards of preservation The *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (Weeks and Grimmer 1995). The standards are listed below:

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces, and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.
2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

Table G-5. Building and Property Maintenance Recommended Actions

RESOURCE	SHORT-TERM MAINTENANCE ACTIONS	LONG-TERM MAINTENANCE ACTIONS AND TIMEFRAMES	MITIGATION MEASURES
Qualifications	All work on the ranch complex buildings or landscaping will be completed in consultation with and under the direction of a Historic Archaeologist, Historian, or Historic Preservationist. The Historic Archaeologist, Historian, or Historic Preservationist will meet the Secretary of the Interior's Professional Qualification Standards.		
House, Shed, and Garage	Discourage arson or vandalism of buildings prior to preservation work beginning (i.e., erecting protective fencing, if necessary). Repair rather than replace windows when feasible. Secure buildings from the elements to minimize deterioration of existing structures. Repair using in-kind materials or materials chosen by the Historic Archaeologist, Historian, or Historic Preservationist.	For long-term planning a Historic Structures Report, identifying the character defining elements of the ranch complex, the existing structural condition of the buildings, and detailed requirements for maintenance and repair should be prepared.	The existing condition of the house will be evaluated to determine the appropriate level of maintenance needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture. No new construction should be undertaken without determining the potential impact to the historical significance of the complex. Minimizing disturbance of terrain around buildings or elsewhere on the site, thus reducing the possibility of destroying or damaging important landscape features or archeological resources. Protect archeological resources.
Foundations	Inspect and repair foundations, as needed. Repairs to foundations will be made using in-kind materials. Drain water away from the buildings during storm events, and minimize potential for erosion on the landscape.	For long-term planning a Historic Structures Report, identifying the character defining elements of the ranch complex, the existing structural condition of the buildings, and detailed requirements for maintenance and repair should be prepared.	Minimize disturbance of terrain around foundations to reduce the possibility of destroying or damaging important landscape features or archeological resources.

RESOURCE	SHORT-TERM MAINTENANCE ACTIONS	LONG-TERM MAINTENANCE ACTIONS AND TIMEFRAMES	MITIGATION MEASURES
Landscaping	Preserve important landscape features including ongoing maintenance of historic plant materials. Maintain the garden area at the front of the house to establish clear visibility of the building. Existing trees and shrubs will be pruned, as appropriate. Other ornamental plants currently in the yard will be retained; however, those that are overgrown will be thinned, pruned, or otherwise restrained without impacting the historical integrity of the complex. Minimize disturbance around the buildings.	For long-term planning a Historic Structures Report, identifying the character defining elements of the ranch complex, the existing structural condition of the buildings, and detailed requirements for maintenance and repair should be prepared.	No new edging, beds, or walkways should be installed until a Historic Structures Report has been completed identifying appropriate treatment within the garden. Minimize disturbance of terrain around landscaping to reduce the possibility of destroying or damaging important landscape features or archeological resources.
Corrals, Fencing, Feeders, Troughs	Maintain corrals and fencing with materials similar to the existing fences. Maintain feeders and troughs with materials similar to the existing features.	For long-term planning, a Historic Structures Report, identifying the character defining elements of the ranch complex, the existing structural condition of the buildings, and detailed requirements for maintenance and repair should be prepared.	Minimize disturbance of terrain around historic ranching resources to reduce the possibility of destroying or damaging important landscape features or archeological resources.