

WILDWOOD CONSERVATION FOUNDATION

2020 FOREST MANAGEMENT PLAN

Sonoma County, California



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Introduction

In 2020, Matt Greene Forestry & Biological Consulting was commissioned to develop a Forest Management Plan (Plan or FMP) for Wildwood Conservation Foundation (Foundation), a 501(c)(3) California nonprofit corporation, on its 210-acre Retreat Center (Wildwood) located between Cazadero and Guerneville in western Sonoma County.

The purpose of the Forest Management Plan is to provide the owners and Forest Managers with current data about the property’s resources (including a forest inventory), as well as the necessary information and guidelines needed to meet the owners’ multiple goals, which include: implementation of forest improvement projects, habitat enhancement, and general resource management. This plan is not an end all and be all to the multiple management goals, but a launching point for the long-term management necessary to maintain a healthy and diverse forest resilient to pests, disease and wildfire.

This Forest Management Plan is also meant to meet the requirements of the California Forest Improvement Program (CFIP), Natural Resource Conservation Service (NRCS) and can be used to apply for CFIP and EQIP cost shares projects. As funds become available (at both the State and Federal level) projects can, and should, be implemented at Wildwood.

Definitions

Anadromous: Refers to fish that are born and reared in freshwater, move to the ocean to mature, and then return to freshwater to spawn; these species are steelhead, chinook and Coho salmon in the Russian River Watershed.

Anthropogenic: Caused by humans. Anthropogenic use of fire is purposefully ignited by humans.

Basal Area: The cross-sectional area of tree stems (trunks) measured in square feet per acre; a measure of the level of tree stocking.

Board feet: A unit of measure of timber products; a sawn board 1-inch X 12 inches X 12 inches (often written as BD FT).

Buckskin Log: is a log from an old growth tree that was harvested and left in the woods. Sometimes these logs are decaying at such a slow rate that they can still be milled for lumber. Although a mill would not likely take a buckskin, a landowner could use it make boards with a portable mill.

Buffer (nest tree): means the area of protection surrounding a nest tree in which timber operations must be conducted in accordance with the provisions set forth in these regulations. A buffer area does not constitute a special treatment area. Buffer zones for watercourses discussed below.

Cable Yarding: means that system of skidding (transporting) logs by means of cable (wire rope) to the yarding machine (yarder) or a landing while the yarder remains stationary.

Canopy: Branch and leaf structure of a tree. Shade created from tree canopy can be a factor in stream temperatures.

CDFW: The California Department of Fish and Wildlife; until 2012, the California Department of Fish & Game. Manages and protects the state's diverse fish, wildlife, plant resources, and their native habitats. Oversees permits for streambed alteration required during road upgrading and in-stream restoration work.

Class I Watercourse: A watercourse that is used for domestic water supplies or a watercourse that supports fish for at least part of the year.

Class II Watercourse: A watercourse that supports aquatic (non-fish) species (i.e. frogs, salamanders, and other aquatic species). Must have continuous running water for at least 3 months of the year.

Class II Standard Watercourse: A Class II Standard watercourse is a watercourse that supports aquatic (non-fish) species (i.e. frogs, salamanders, and other aquatic species) and has continuous running water for at least 3 months of the year.

Class II Large Watercourse: A Class II Large Watercourse is a watercourse that has running water into July of any normal year. In addition, any class II watercourse within 1,000 feet of a class I that is connected is considered a Class II Large for 1,000 feet from the confluence with the Class I watercourse.

Class III Watercourse: A watercourse that has the potential to deliver sediment to a class I or II watercourse and has no associated aquatic (including non-fish) species.

Conifer: Generally, an evergreen (non-deciduous) tree with a cone for a fruiting body. In the North Coast Ranges, these commonly include Redwood (*Sequoia sempervirens*) and Douglas-fir (*Pseudotsuga menziesii*). Also present in Western Sonoma County are grand fir (*Abies grandis*), sugar-pine (*Pinus lambertiana*) and California nutmeg (*Torreya californica*).

Cord: A unit of measure of fuelwood; 128 cubic feet (4ft. x 4ft. x 8ft.)

Corduroy Road: is a historic logging feature where small logs were laid on the surface of the haul road (often the middle of a small watercourse) and sometimes covered in grease to minimize friction while dragging merchantable logs to a landing or mill-site.

CSDS: This is a water quality term and means a *controllable sediment discharge site* or more commonly called an erosion site.

DBH: Diameter at Breast Height; Tree diameter in inches, measured outside the bark at a point 4.5 ft. above the ground.

Equipment Exclusion Zone (EEZ): Is an area where heavy equipment associated with equipment operations is totally excluded for the protection of water quality, the beneficial uses of water, and/or other forest resources.

Equipment Limitation Zone (ELZ): Is an area where heavy equipment associated with equipment operations is limited for the protection of water quality, the beneficial uses of water, and/or other forest resources.

Erosion control structure: A drainage facility in roads, landings, or skid trails that assists in proper road drainage (waterbars, berms, & rolling dips). Rolling dips should be used on roads under 8% in grade. Waterbars should be installed on steeper roads and on skid trails.

Erosion Hazard Rating (EHR): This is the rating derived from measurement designed to evaluate the susceptibility of the soil within a given location to erosion. *The EHR is mostly Moderate on Wildwood, however areas with the Maymen type have an Extreme rating.*

Fire Protection Zone: This is a zone within 100 feet (30.48 m) as measured along the surface of the ground, from the edge of the traveled surface of all public roads and railroads; and within 200 feet (60.96 m) as measured along the surface of the ground, from permanently located structures currently maintained for human habitation. This area should be cleaned of slash to reduce fire hazards to residences and roads.

Forest Canopy or Crown Cover: More or less continuous cover of foliage formed collectively by the crowns of adjacent trees.

Fuelwood: Firewood, usually hardwood trees. In the Coast Ranges, these are commonly Pacific madrone (*Arbutus menziesii*), tanoak (*Notholithocarpus densiflorus*) and other oaks (*Quercus spp.*). Hardwoods are commonly mixed with Douglas-fir, a softwood, and sold as a firewood mix.

Girdling: Method of creating a snag by cutting a ring through the bark around the tree.

Green Snag: A tree that is still alive, but has been affected by disease and/or defect in such a way that it is no longer merchantable.

Hardwoods: These are usually broad-leaved, deciduous trees. Species in the Coast Ranges include; tanoak (*Notholithocarpus densiflorus*), California bay (*Umbellularia californica*), Pacific madrone (*Arbutus menziesii*), red alder (*Alnus rubra*), big-leaf maple, (*Acer macrophyllum*), vine maple (*Acer circinatum*), coast live oak (*Q. agrifolia*), interior live oak (*Q. wislizeni*), California black oak (*Quercus kelloggii*), Oregon white oak (*Q. garryana*), and Buckeye (*Aesculus californica*).

Inner Gorge: A geomorphic feature formed by coalescing scars originating from land sliding and erosional processes caused by active stream erosion. The feature is identified as that area beginning immediately adjacent to the stream channel below the first break in slope.

Ladder Fuels: Trees, shrubs and other vegetation capable of carrying a ground fire up into the tree canopy. See figure 1, right.



Figure 1: Ladder Fuels

Lop and Scatter or Lopping and Scattering: Severing and spreading of slash so that no part of it remains more than 30 in. (76.2 cm) above the ground.

LTO: Licensed timber operator, logger. Responsible for falling and hauling timber for an approved THP, but required by some agencies for implementing forest improvement projects.

Mature: Definition of tree age;

Economic maturity: conifer trees over 18 inches DBH and 40 to 60 years old.

Physiological maturity: conifer trees 28 to 36 inches DBH and 60 to 150 years old.

MBF: thousand board feet. A value for measuring timber.

Merchantable: Sound conifer trees 18 in. or greater DBH.

Midden: An archeological term for a mound or deposit containing shells, animal bones, and other refuse that indicates the site of a human settlement. For archeological surveys performed in this area; dark colored, silty, soil is indicative of prehistoric occupation sites. These sites may contain quantities of ash, soot, and broken fire cracked rocks. Dry midden soil has a sooty feel and sticks to the hand.

Net volume: Log volume remaining after deductions have been made for defect and operations damage.

NOAA-NMFS: National Ocean and Atmospheric Administration-Nation Marine Fisheries Service. Assesses and predicts the status of fish stocks, ensures compliance with fisheries regulations, and works to end wasteful fishing practices. NMFS has land use and permitting jurisdiction and over the inland habitat of anadromous species.

Northern Sonoma County Air Pollution Control District (NSCAPCD): Regulates the emissions of air pollution from "stationary sources" that could be detrimental to the health, safety, and welfare of the public. This agency regulates burn permits for rural Sonoma County.

NTMP: Non-industrial Timber Management Plan

Old Growth: A tree that meets most or all of the following criteria:

- 1) a diameter at breast height (DBH) of at least 60"
- 2) a growth rate that indicates a probable age of 200 years or greater
- 3) a dominant or co-dominant role in the forest structure
- 4) thick pleated bark
- 5) a flat top
- 6) ecological function of late seral stages
- 7) little or no anthropogenic disturbance

Perched fill: Dirt and spoils from road construction that are left on the outside edge of the road.

Productive Potential: The maximum a forest system can sustainably produce when functioning at its peak.

Pruning: Cutting of the lower branches of a tree at an early age to produce knot-free wood or to reduce fuel ladders.

Regeneration: The new growth of redwood and Douglas fir trees. Trees less than 12” in diameter.

Regional Water Quality Control Board (also, Water Quality, RB1 or NCRWQCB): The property is located in Region 1 (North Coast or RB1). Formed by the state and charged with protecting the surface, ground, and coastal waters. The North Coast Regional Board developed the Gualala River and Russian River TMDLs (basin plans). RB1 also governs requirements and issues waste discharge permits, takes enforcement action against dischargers who violate permits or otherwise harm water quality in surface waters. RB1 periodically monitors water quality in the main stem and tributaries of the Gualala and Russian River watersheds, as well as, Coastal tributaries in accordance to a waterbodies’ 303(d) listing under the Federal Clean Water Act.

Residual tree: A tree, which was growing during the initial harvesting of the old growth forest, but either was too young (small) to be harvested or was a suppressed tree in the initial forest. In some cases, residual trees have obvious defects that discouraged their initial harvest.

RPF: Registered Professional Forester. This is a person knowledgeable in a wide range of studies such as biology, ecology, entomology, geology, hydrology, dendrology, silviculture, engineering, business administration, forest economics, and other natural resource subjects. RPFs use their well-rounded education and experience to maintain the sustainability of forest resources like timber, forage, wildlife, water, and outdoor recreation to meet the needs of the people while protecting the biological integrity and quality of the forest environment.

Sag Pond: A sag pond is a body of water collected in the lowest parts of a depression formed between two sides of an active strike-slip fault zone.

Selection Method: Harvesting or regeneration method where individual or small groups of trees are removed and regeneration occurs in their place.

Shaded Fuel Break: Strip of vegetation managed to reduce fuel load and continuity usually adjacent to a road. It is made by removing ladder fuels and fuel concentrations.

Site Index: Describes the relative productivity of a particular site or location. The capacity of an area to produce forest crops related to climate and soil factors; expressed by a value based on the height of trees at a certain age in an area.

Site Class: A grouping of site indexes. There are five groups ranging from I to V, with I being the best site group and V being the poorest.

Silviculture: Is the art and science of controlling the establishment, growth, composition, health, and quality of trees to meet the diverse needs and values of the landowner.

Snag: A dead tree that is still standing. Some snags may be considered a fire hazard, but larger snags often have habitat value for wildlife.

Special Treatment Areas: Are specific locations that contain one or more of the following significant resource features that may be at risk during equipment operations:

- a. Within 200 feet of the watercourse transition line of federal or state designated wild and scenic rivers;
- b. Within 200 feet of national, state, regional, county, or municipal park boundaries;
- c. Key habitat areas of federal or state designated threatened, rare, or endangered species;
- d. Coastal Commission special treatment areas;
- e. Within 200 feet of state designated scenic highways or within scenic corridors.

Stand: Community of trees possessing sufficient uniformity in composition or structure to be distinguished from adjacent forest communities.

Stand Density or Stocking: The area occupied by a number of trees; the density of trees in a given area.

Sub-merchantable: A sound conifer tree 12-16" diameter at 4.5 ft. height (DBH).

Thinning: Harvesting trees with the goal of redistributing growth potential or improving the quality of the remaining trees.

Understory: The area near the forest floor under the forest canopy.

WLPZ: Watercourse & Lake Protection Zone. An area is designated by the Forest Practice Rules for protection of streamside canopy and erosion control. This area depends on the class and size of the watercourse and slope of the landscape.

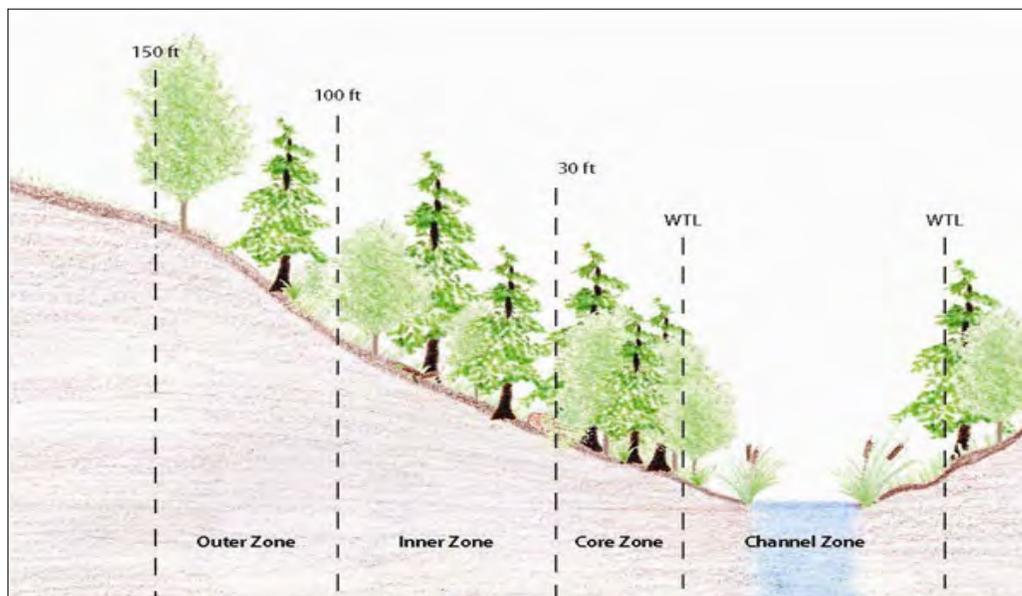


Figure 2: Example of WLPZ, Courtesy California Board of Forestry

General Property Description

Wildwood is located approximately 20 miles (as the crow flies) northwest of Santa Rosa in Sonoma County. The property is bordered by private parcels to the north, south, and west; and by Austin Creek State Recreation Area on the east. The property is accessed via Old Cazadero Road from River Road (Hwy. 116). Wildwood varies in terrain with elevations ranging between 112 feet to over 1,200 feet above sea level.

The property is owned in fee by the Wildwood Conservation Foundation, a 501(c)(3) California nonprofit corporation. Wildwood (originally held in two (2) parcels) was merged in 1994 to create a 210-acre parcel 106-230-008 (referred to as APN 008). This has not been updated in County records; according to the Sonoma County Recorder's Office, they still exist as 106-230-008 (94 acres) and 106-230-007 (16 acres). The Sonoma County Assessor's Parcel Maps are located in book 106, page 30. The legal description of the property is; portions of projected Section 15 in Township 8 North, Range 11 West according to the USGS 7.5-minute Cazadero Quadrangle.

Both parcels are zoned "RRD B6 160, RC50/50". RRD is Resources and Rural Development, B6 160 is the Combining District; the number indicates the average allowable residential density (1 unit per 160 acres). The second Combining District zoning is "RC50/50"; "RC" is a Riparian Corridor Combining Zone with the minimum streamside conservation area (50 feet) and the minimum setback for agricultural cultivation 50 feet; this regulation has to do with development and crop type agriculture and is not related to the Forest Practice Rules. The current use is recreation and habitat conservation. The Foundation is working to change the zoning to Timber Production. Given the forest coverage and merchantable volume calculated during development of this Plan, a zoning of TP is appropriate for this property.

A Conservation Easement (Easement or CE) was developed by the Golden State Land Conservancy; recorded May 07, 2003. A copy of this Conservation Easement is attached in the Appendix of this FMP. This Conservation Easement will be discussed in more detail under applicable categories of this FMP.

There are four (4) vegetation types on the property; two (2) conifer mixed-hardwood forest types, a hardwood type, and a grassland type. There are forest types that have merchantable timber and they will be discussed in more detail in the Vegetation Types and Location and Stand Description of Vegetation Types sections, below. Sonoma County Veg Mapping Project broke out the hardwood typing into several more types, but for the purpose of this FMP, we have combined them into one type for simplicity.

Wildwood is located in the East Austin Creek (1114.120003) Calwater watershed. The water resources associated with the property consist of portions of the East Austin Creek (class I), six (6) class II watercourses (including Branscomb Creek), and at least 40 small class III watercourses. All of the watercourses on the property drain into East Austin Creek, to Austin Creek, to the Russian River, and to the Pacific Ocean at Jenner.

The Russian River and its tributaries are currently 303(d) listed; federally designated pollution categories that are enforced by the Federal Clean Water Act. The 303(d) listing is regulated on the state level by the Water Quality Control Policy for developing California's Clean Water Act Section 303(d) Listing Policy. The State and Regional Water Boards assess water quality data for California's waters every two years to determine if they contain pollutants at levels that exceed protective water quality criteria and standards. This biennial assessment is required under Section 303(d) of the Federal Clean Water Act.

A common listing on this area is for temperature. This means the water temperatures are artificially high and will degrade potential salmonid habitat. Lack of canopy cover (tree branches and leaves overhanging the watercourse) is one cause for excessive temperatures. Canopy cover is more critical in the upper reaches of a watercourse; it provides shade that aids in maintaining temperatures in the smaller tributaries. The temperature listing commonly occurs in many North Coast waterbodies in conjunction

with the sediment listing. The sediment listing occurs when the level of non-point source sediment (dirt and gravels from roads and landslides) in the waterbody exceeds the Total Maximum Daily Load (TMDL). Sediment artificially raises the streambed causing shallow pools or pools that are completely filled in. Shallow pools and waterbodies cannot maintain temperatures as cool as deep pools can. Lack of pools will disaffect fish and other aquatic species from a waterbody and excess sediment will smother eggs further endangering salmonids.

The Russian River Watershed is mapped by NOAA as potential habitat for steelhead, Coho and Chinook, however the East Austin Creek is not considered critical habitat. Due to the slope and seasonal nature of the watercourses on Wildwood, it is likely only the section of East Austin Creek seasonally supports anadromous fish species on the property.

Wildwood is part of a larger area that are the ancestral lands of the Pomo people. The ecology of these ancestral lands was influenced by the land use and management tools applied by the Pomo people. There is more on this in Land and Timber History, below. There may be recorded Native American archaeological sites on Wildwood. These sites would likely have been identified during previous timber harvests. There are thousands of sites known and documented in western Sonoma County. Accordingly, there is a likelihood of unrecorded Native American cultural sites on Wildwood.

As early as 1812, Russians arrived on the coast to build settlements for extracting resources. Later Spanish Mexico divided the land into Ranchos and logging and livestock production began to extend across Pomo people's ancestral lands. As early as the 1850s, European immigrants began arriving overland. A legacy to this era are several historic buildings that still stand on the former Grider Ranch footprint. There is at least one historic site, and there is a high likelihood of unrecorded historic-period cultural resources on Wildwood. More on the significance of cultural and historical items will be discussed under Native American Cultural and Historical Resources, below.

In western Sonoma County, the original forest was harvested by the Russians or successive lumbermen sometime between the 1820s and 1920s. Subsequent land uses included agricultural development, livestock grazing, recreation, and residential development. Commercial harvesting of old growth forest occurred along streambanks and easily accessible areas from 1850 through the early 1920s. A second round of old growth harvesting in the steeper areas occurred from the 1940s to 1970s. In the 1950's the area was likely heavily logged for Douglas-fir. There are no recent records of THPs on file with CalFire. The Wildwood Conservation Foundation has never commercially logged the property; however, they have implemented forest improvement projects since taking ownership in 1999.

The past management activities have likely created one to three age classes of trees on the property: a few residual stands of lightly managed oak woodland; trees between 50 and 70 years; 0 to 50-year-old trees that have regenerated since the 1970s. Additionally, Forests Unlimited has planted 3,000 redwood seedlings in 3 cohorts over the last ten years. The January 2019 planting benefitted from six months of rain.

This area has been heavily shaped by fire in the past. Pomo people, like most early inhabitants of the Coast Ranges, used fire as a management tool. As was surrounding lands, Wildwood was cleared and burned repeatedly for sheep in the late 1800s to the mid-1900s. No wildfires have been recorded for this area. More on this in Land and Timber Resource History, below.

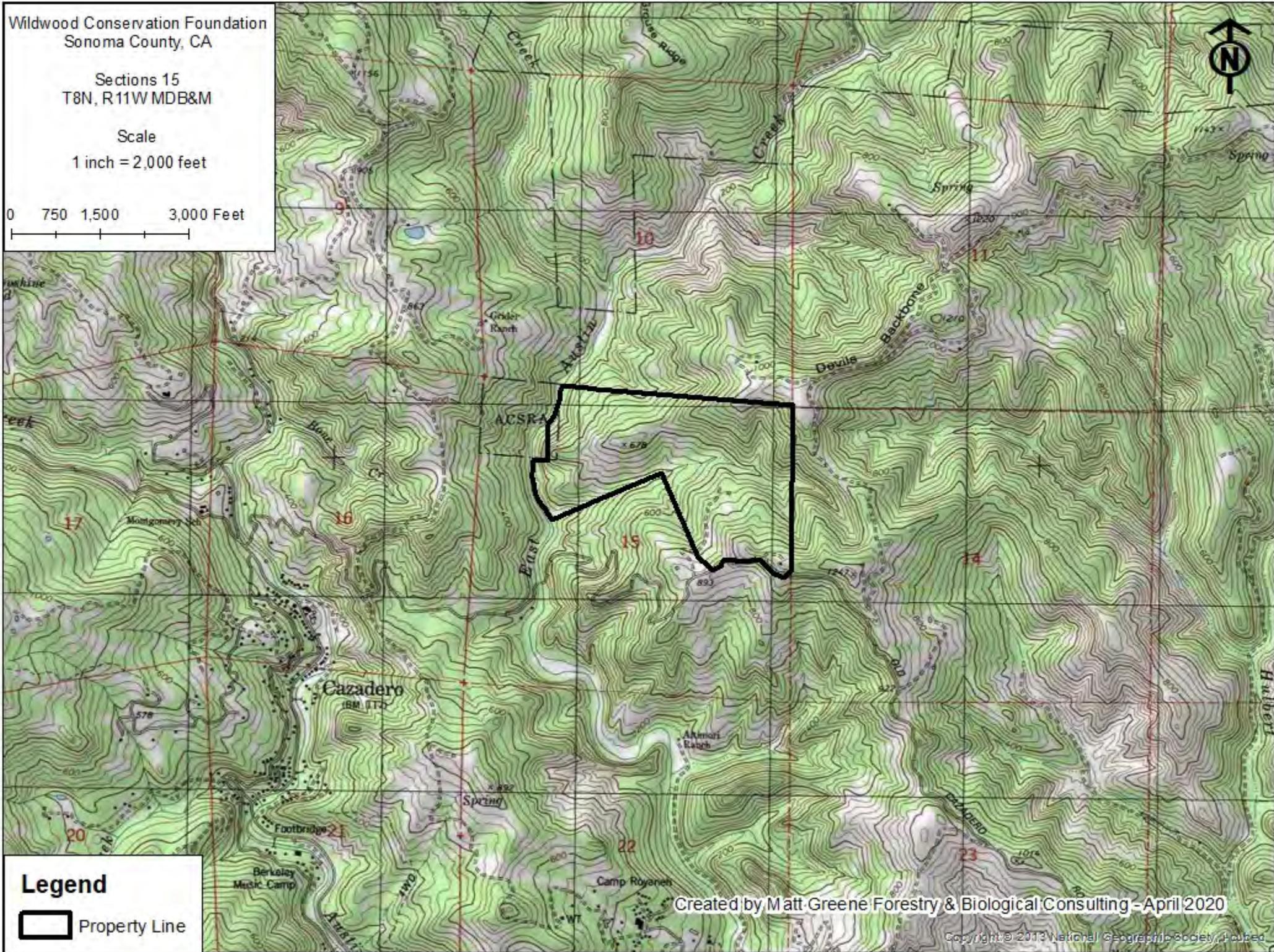
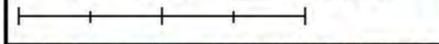
Location Map

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 2,000 feet

0 750 1,500 3,000 Feet



Legend

 Property Line

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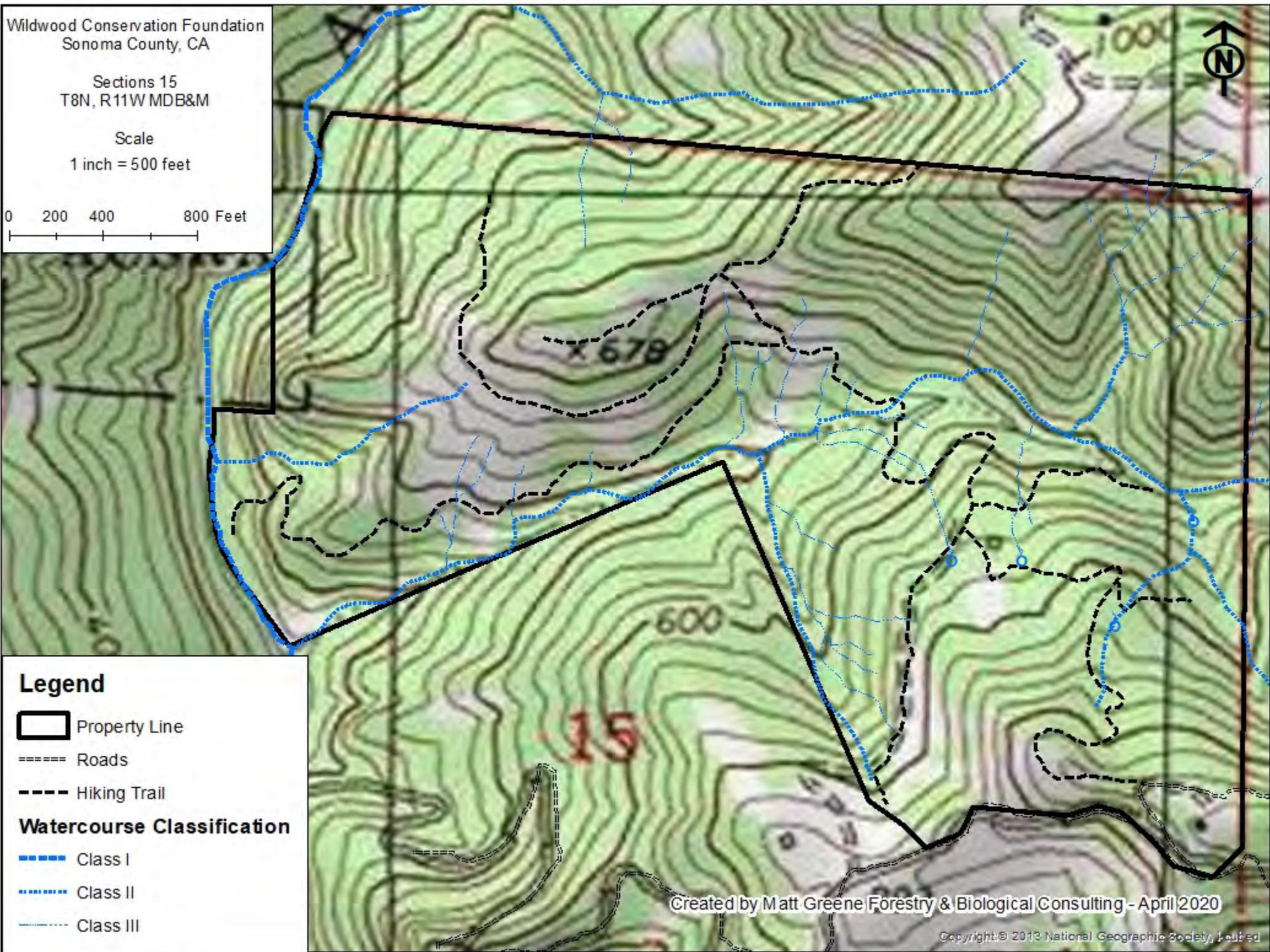
Base Map

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 500 feet

0 200 400 800 Feet



Legend

- Property Line
- Roads
- Hiking Trail

Watercourse Classification

- Class I
- Class II
- Class III

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Air Photo

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 500 feet

0 200 400 800 Feet



Legend

 Property Line

 Roads

 Hiking Trail

Watercourse Classification

 Class I

 Class II

 Class III

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

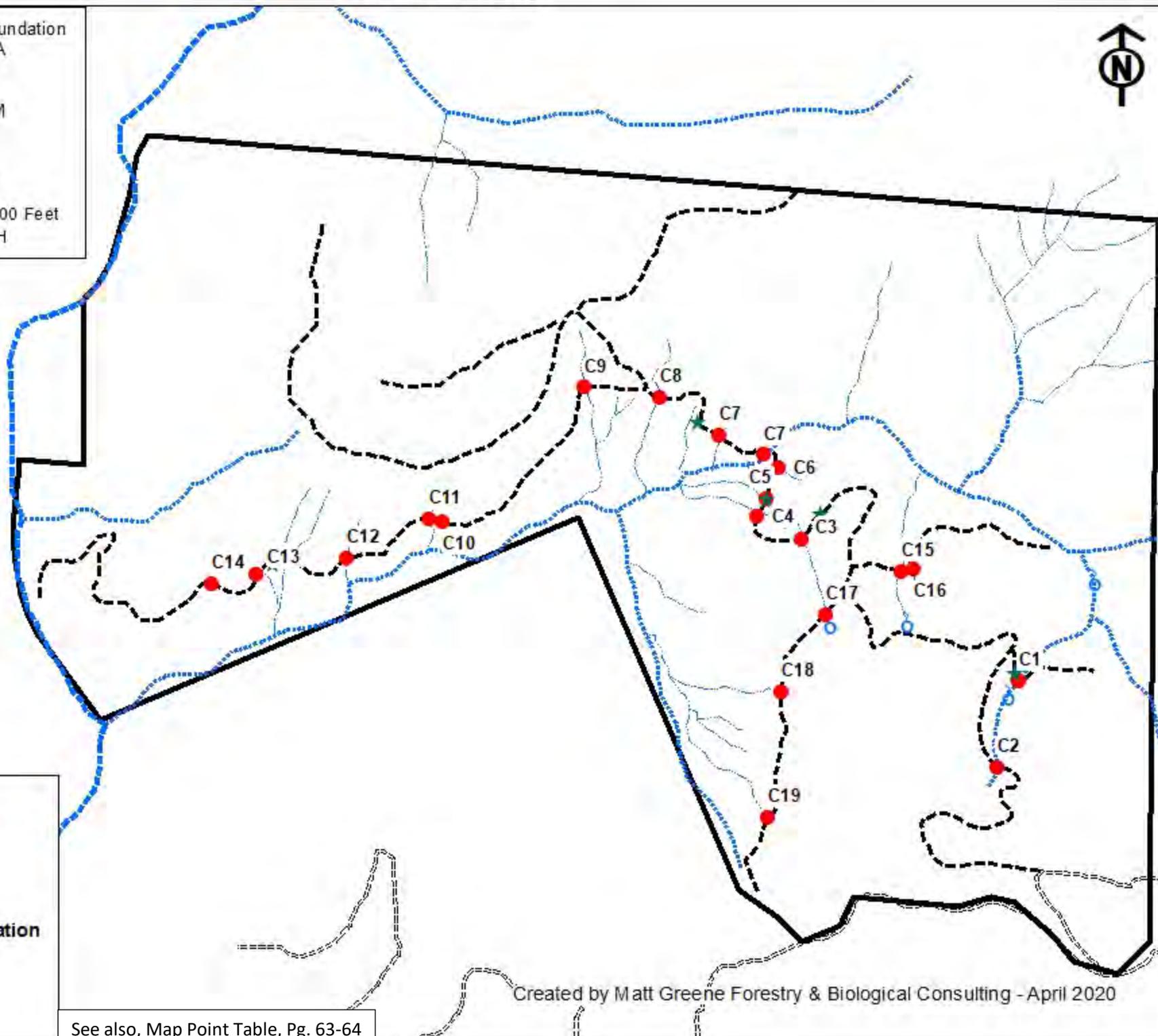
Planameric Map

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 500 feet

0 200 400 800 Feet



Legend

Property Line

Roads

Hiking Trail

Watercourse Classification

Class I

Class II

Class III

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See also, Map Point Table, Pg. 63-64

Conservation Easement and Forest Management

Wildwood will be managed in connection with the Conservation Easement (Easement) held by the Golden State Land Conservancy (GSLC) since 2003. The Foundation will be incorporating best management practices when conducting forestry related activities permitted under this Easement (or as cited in the Baseline Report) to protect the conservation values important to their members and the GSLC. Below are portions of the easement that pertain to Forest Management activities outlined in this Plan. The original bullets are used for reference to the Easement.

Purpose of the Easement:

- (a) Maintain Wildwood's forestland in a natural state and condition.*
- (b) Maintain the Baseline Report for Wildwood.*
- (c) Maintain Wildwood in no more than one parcel and prohibit subdivision.*

Prohibited or Restricted Uses Pertaining to Forest Management:

- (b) No grading or construction of new trails or roads outside of Abode or Homestead Areas is allowed without prior written permission from Grantee.*
- (c) The "Julie Andrews Point Area" shall be maintained in its current condition.*

Reserved Rights Pertaining to Forest Management:

- (a) The right to engage in agriculture, forestry...[Given notice to and approval by GSLC] prior to commencing any action, or when applying for any permit, that could cause construction, timber harvesting, grading, vegetation clearing or any change in the physical environment that may have a significant adverse impact on conservation values or the Purpose of this EASEMENT;*
- (e) All water rights a part of and appurtenant to Wildwood, including, but not limited to, the right to use all available water resources on Wildwood for any permitted land uses*
- (f) The right to engage in construction and maintenance of existing roads or trails using best management practices; and new road or trail construction that is necessary or useful for activities on Wildwood, with specific siting of any new roads or trails to be approved in writing in advance by GRANTEE;*
- (g) To maintain, improve, replace, relocate, construct and repair, using best management practices, structures, housing, fences, roads, trails, ditches, and other improvements...*
- (h) To develop and maintain water resources on Wildwood... as are necessary or convenient for permitted land uses on Wildwood; and any stream impoundments or diversions on Wildwood that require a government agency permit also requires prior notice to GRANTEE, but not prior approval by GRANTEE;*
- (j) To engage in controlled burn programs, subject only to the requirements of applicable laws and regulations. GRANTOR shall have no liability in respect to this EASEMENT and the conservation values described herein for any damage incident to a permitted controlled burn and has no obligation to take corrective action to repair such damage, and GRANTEE shall have no remedy with respect thereto other than restoration activities conducted by GRANTEE with the expressed permission of the GRANTOR, and requires prior notice to GRANTEE.*

Notice of Intention to Undertake Certain Actions.

11) *The purpose of requiring GRANTOR to notify GRANTEE prior to undertaking certain actions or activities...is to ensure that any such activity is planned and carried out in a manner consistent with the terms, conditions, or Purpose of this EASEMENT...The notice shall describe the nature, scope, design, location, timetable, and any other material aspect of the proposed action, use or activity in sufficient detail to permit GRANTEE to make an informed judgment as to the proposed action, use or activity's consistency with the terms, conditions, or Purpose of this EASEMENT.*

Landowner Goals and Objectives

The Wildwood Conservation Foundation *“seeks to conserve the beauty and tranquility of Wildwood Retreat Center, and to use the land to nourish the physical and emotional human spirit. To conserve the 210-acres of land in its rural, natural state, the Foundation created a conservation easement to preserve this unspoiled wilderness from development in perpetuity.”*

From the Wildwood Land Committee:

“Wildwood has forest that has not been well- husbanded. The result is not only a huge tangled mess of explosive fire danger, but also one where the species that Wildwood members and supporters cherish have not been given the optimal encouragement or nurturing to realize their full potential.”

Priorities for Wildwood:

- Keep fire roads open
- Reduce fire fuel load
- Nurture Jewel Species
- Keep natural springs running
- MOOP removal (garbage, litter, non-organic matter)

Objectives for Land Management on Wildwood:

- Fulfill our stewardship commitments to our land and the Golden State Land Conservancy.
- Encourage Focus Species (Redwoods, Madrones & Live Oaks)
- Enhance Trails, Vistas & Views

GSLC Sanctioned Forestry Related Land Uses on Wildwood:

- Cutting of firewood for domestic use.
- Moderate clearing of brush, trees and accumulated fuel on the periphery of the Abode Area.
- Thinning of trees and reduction of fuel loads in the forested areas of the property.
- Removal or treatment of diseased or unsafe trees.
- Removal of noxious weeds and plants.
- Cutting of down trees for lumber or for access purposes.
- Reforestation activities, including planting of trees, thinning, misc. harvest.
- Occasional harvest of trees for on-site construction purposes.

Land and Timber Resource History

Carbon dating of sites along the Sonoma and Mendocino Coast show historical use by Native Americans for at least 13,000 years. The land use philosophy of the local Pomo people is intertwined with their beliefs. Ancestral people worked to maintain the health and abundance of resources for the animals and plants with which they shared their territory.

One of the tools ancestral people used for this purpose was treating areas with fire. Pomo people, along with many other ancestral people in the Coast Ranges, burned for several reasons, including; maintenance of vegetation types to provide high quality food, materials and tools (e.g. basket making materials); small scale crop production; maintenance of hunting grounds; to see approaching predators and people; to maintain transportation corridors. Lightning was (and continues to be) a periodic source of ignition, however it was the sustained, anthropogenic (purposefully started by humans) use of fire that shaped the vegetation, helped to preserve abundant flora and fauna populations, and maintain transportation corridors that were critical for trade.

Most of the ancestral people lived in small groups that had defined territories. In general, the ancestral Pomo peoples primarily built dwellings and structures made from redwood bark, or split wood, near a source of water. They would move from time to time, for various reasons, including: death and bad luck, availability of resources, migration of game, or due to seasonal (weather) changes. It is understood by historians that most of the time moves were a mile or less in distance.

The Pomo people had a diet that consisted of mammals, birds, fish, mollusks, seaweed, acorns, grass, seeds, nuts, and bulbs. Areas of meadow were cultivated and or burned to improve harvests and crop health. Coastal groups would often trade with inland groups for items, which were not readily available on the coast, and likewise for the inland groups. This is how obsidian from Lake County or Annandale arrived to this area.

Pomo people are known to be superb bead and basket makers. Beads made of shell and bone were used in trade and as offerings of peace, as well as other uses. Ancestral Pomo peoples also used rock art as a means of communication; directions, warnings, boundaries, written history and location of game. Most of this art is in the form of carving into stone and boulders. For non-native historians, the purpose for many of these sites are either speculative or unknown.

Most of this part of Sonoma County has been logged over two or three times and many sites have been heavily disturbed. House pits and other infrastructure is sometimes still visible, but most have been destroyed. Harvesting and development have disturbed many of the sites located within this part of the county. A large portion of the early roads, logging camps, houses and other Russian, Mexican Land Grant, and later post-European infrastructure were built on Native American trails and sites. Wildwood lies north of Old Cazadero Road, a road mapped as early as 1877.

California became a U.S. state in 1850. Wildwood and surrounding lands went through a series of landowners between 1880 and 1893. They included the following: William Wallace, Oliver Wescott, Benjamin F. Branscom, James P. Miller, Samuel A. Nay and William



Figure 3: 1877 Survey Map of Sonoma County. Old Cazadero Road is mapped. Courtesy David Rumsey Historical Map Collection.

J. Nay, John A. Brown, John Ducker, W.B. Sanborn, James D. Boyer, and Charles Roberts. In 1893 Roberts, Farly's father-in-law, sold to "Joseph E. Farly".

One of the earliest known maps of the Wildwood area (1889) indicates J. B. "Farly" (Farley) owned a 1,128-acre holding of and around Wildwood. Farley is known to have ran a large ranch west of Petaluma, so he was likely a land-grant investor. In 1897 "Joseph B. Barley" and "Lizzi P. Farly, His Wife", sold to Milton Elliott.

In 1900, Newton J. Grider purchased 1,148 acres of and around Wildwood from Milton and Mattie Elliott.

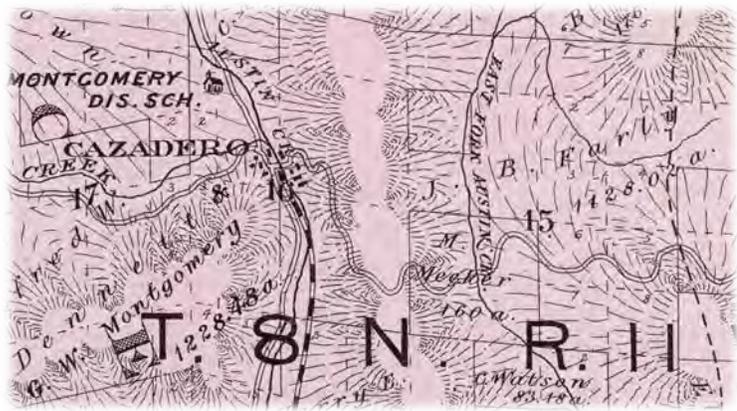


Figure 4: 1889 Survey Map of portion of T8N 11W. 1128 acres of and around Wildwood is owned by J. B. Farley. Courtesy David Rumsey Historical Map Collection.

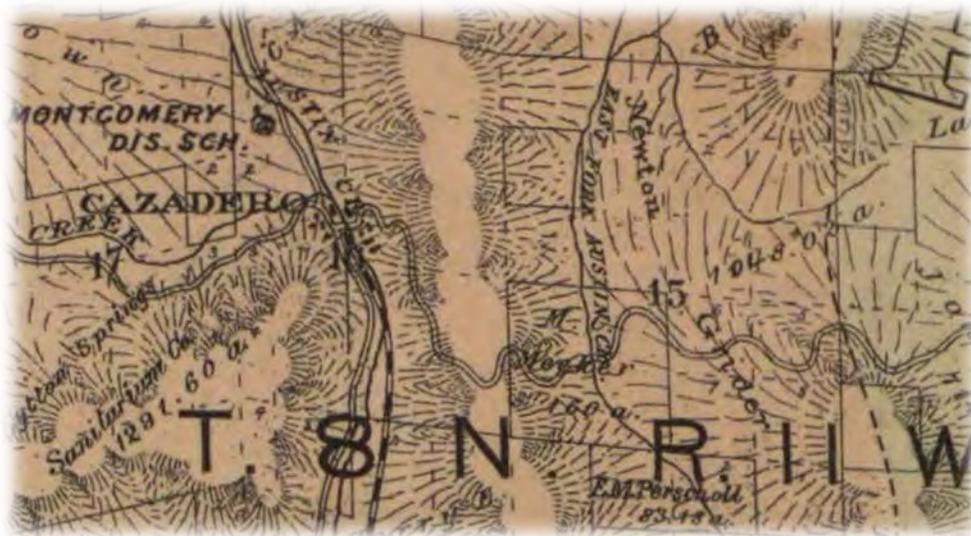


Figure 5: Sonoma County, 1900. Newton Grider owns Wildwood and 938 acres of surrounding land. Courtesy David Rumsey Historical Map Collection.

Grider had arrived to California, as child from Iowa in a covered wagon, in 1868. In 1911 Grider owned, "a ranch of nine hundred and seventy-eight acres in Sonoma County, the tract containing considerable timber and pasture, also twenty acres of meadow and a family orchard." A portion of the Grider Ranch is still owned by decedents of Newton Grider.

It is unclear when the ranch was subdivided, but land sales back and forth between the Griders and the Purdys occurred between 1920 and 1938. A Grider decedent sold land to Vernon and Juanita Corley in 1954, and the Corleys sold to James and Edith Keegan in 1968. In 1972, the Wildwood retreat was first envisioned when the property was sold to Jerry Geller and Ken Sullivan. Nicholaas Hocke became the owner in 1977, and he expanded both the conservation ethic and the cultural standard for the property.

In 1979, the Wildwood Conservation Foundation purchased the property with the following mission: "Wildwood is a sanctuary created and sustained by gay men for healing, transformation, and spiritual

growth.” They have maintained development on a small portion of the property, less than 5 acres, while maintaining a “natural state” on the remaining acreage.

In 2003, the Golden State Land Conservancy created a conservation easement for the Foundation with the priority to preserve this unspoiled wilderness from development in perpetuity.

TIMBER AND FIRE HISTORY

By 1860, the current town of Guerneville was established as “Stumptown.” This and other flat, low-lying floodplains in the County were the first to be commercially harvested and then developed. Beginning in 1850, the interior lands were selectively harvested by homesteaders and ranchers. Again, harvesting of old growth forest occurred along streambanks and easily accessible areas from 1850 through the early 1920s. The best and straightest trees were harvested throughout the area and likely on the property through the 1920s. During that time, it appears that split products (rails and pickets) were the most desired lumber products. Other uses of forest products included lumber for housing, and tanoak bark (used for tanning of leather) was shipped to tanneries in the Bay Area and beyond.



Figure 6: Sonoma County, about 1905. Unidentified men loading fire wood onto horse drawn wagons possibly in Cazadero. Courtesy Sonoma County Library.

Initially logs were hauled by oxen on corduroy roads, riverbeds and flat areas with a “road” made of horizontally laid logs packed with dirt. Later logs were likely skidded via steam donkey and hauled by rail or log trucks to several mills throughout the county. In many areas of Sonoma County, rivers were dammed to raise the water level and float logs downstream to the mills and landings. Most of the commercially harvested lumber was probably shipped by schooner to the Bay Area.

In the 1800s, many of the logs in this area were probably logged and used on site, however some have been dragged down to small local sawmills or sold to a sawmill in the town of Cazadero or Duncan’s Mill. Duncan’s Mill was established in 1876 and ran until 1935. Most of the lumber was shipped by rail to the Bay Area. Cazadero was initially a private hunting camp and recreation area, so many of the original old growth and residual redwood trees that were not straight or had too much defect, were not cut during this period. The forestlands in this area were probably not subjected to high volume harvesting again until after World War II, when the housing boom increased the value of Douglas-fir and mechanized logging was more readily available. The Cazadero mill was built in downtown Cazadero by the Berry Family. It ran from 1941 until 1979 and was later rebuilt where it stands today at the junction of Highway 116 and Austin Creek Road. There were also “gyppo” sawmills operating in the 1960s and 1970s.

After WWII, timberland in this area was downhill logged with war-era tractors. This logging was done with little regard to the land. Roads and trails were built in places with no concern for long-term stability or the effects of erosion. Spoils from this activity were left on the side slopes and often slid downhill and into watercourses. Roads were built by pushing dirt downhill and over the edge or directly into watercourses to create flat areas for easy operations. Many streams and rivers in California are still recovering from this era of logging.

In 1973, the Forest Practice act (and subsequent Forest Practice Rules) began regulation of timber harvesting in California. Landowners are now required to hire a state licensed Registered Professional Forester (RPF) to plan a timber harvest in compliance with State regulations. The State requires timber harvest plans (THPs) to comply with the California Endangered Species Act (CESA) and California Environmental Quality Act (CEQA) through a functionally equivalent CEQA process. This process now involves a series of reviews by state and federal agencies directed to protect endangered or sensitive species (CDFW, NOAA-NMFS, CNPS), water quality (WQCB or Waterboard), geologic stability (CGS), and forest health and productivity (Cal Fire). More on these agencies under Definitions at the beginning of this Forest Management Plan.

Since the Forest Practice Rules were developed there may have been commercial timber harvests implemented (by the previous owners) on Wildwood, however, there are no records of harvest available on-line.

The existing forest is comprised of multi-species, uneven aged stands of redwood, Douglas-fir, oaks, and other hardwoods. Harvests of low intensity may have occurred from the 1850s through the 1900s. The Grider family may have logged for mostly personal use after 1900. By the 1950s commercial logging probably occurred and focused on harvesting the Douglas-fir in the more moderately sloped areas.

There are several vegetation types on the property: grassland, redwood and Douglas-fir mixed-hardwood forest, Douglas-fir mixed-hardwood forest, and hardwood forest. The conifer forest types have been further divided into forest types that are defined by their conifer density, species composition, and the size of their trees. They are discussed in more detail in Forest Type Location and Descriptions, below.

A mounting level of research has more recently developed data that documented pre-European residents of redwood/Douglas-fir forests in the Coast Ranges aided in creating a fire regime of frequent, recurrent surface fires (Brown, 2007). As mentioned above, the ancestral Southern Pomo people employed seasonal burning. Post settlement there was a continuation of anthropogenic burning for use in expanding and maintaining grazing land and ease logging of the old growth forests.

Wildwood is in CalFire's State Responsibility Area (SRA) and is listed as High for Fire Hazard Severity. Portions of the property show a history of wildland fire started unintentionally. The following is from a September 1910 article in the San Francisco Call; "Forest fires are raging in this vicinity, and the air is heavy with smoke, making it hot and uncomfortable for miles in all directions. The fire started on the Stewart ranch and is burning fiercely in the Red Slide district and gradually working its way toward County Supervisor William King's ranch." Another fire documented in the Sotoyome Scimitar in July 1933 stated that it started at the Bohan Ranch (burning down a 4-room house) and burned to the Grider Ranch.

CalFire's GIS Database, shows fires occurred within miles of Wildwood in 1943, 1945, 1961, 1965, and 1978. The following map was created using the CalFire database.

In discussions with local historians, they mentioned that the 1961 fire made it to Old Cazadero Road; however, this is not shown in the Cal Fire records. These old maps are largely hand drawn and not necessarily accurate. We cored several trees that have indications a fire burned on the property between 58 and 62 years ago. This would coincide with local historian's fire records.

Fire History Map

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 4,167 feet

0 2,100 4,200 8,400 Feet



1949

2007

1959

2011

1978

1945

1961

1946

1965

Legend

 Property Line

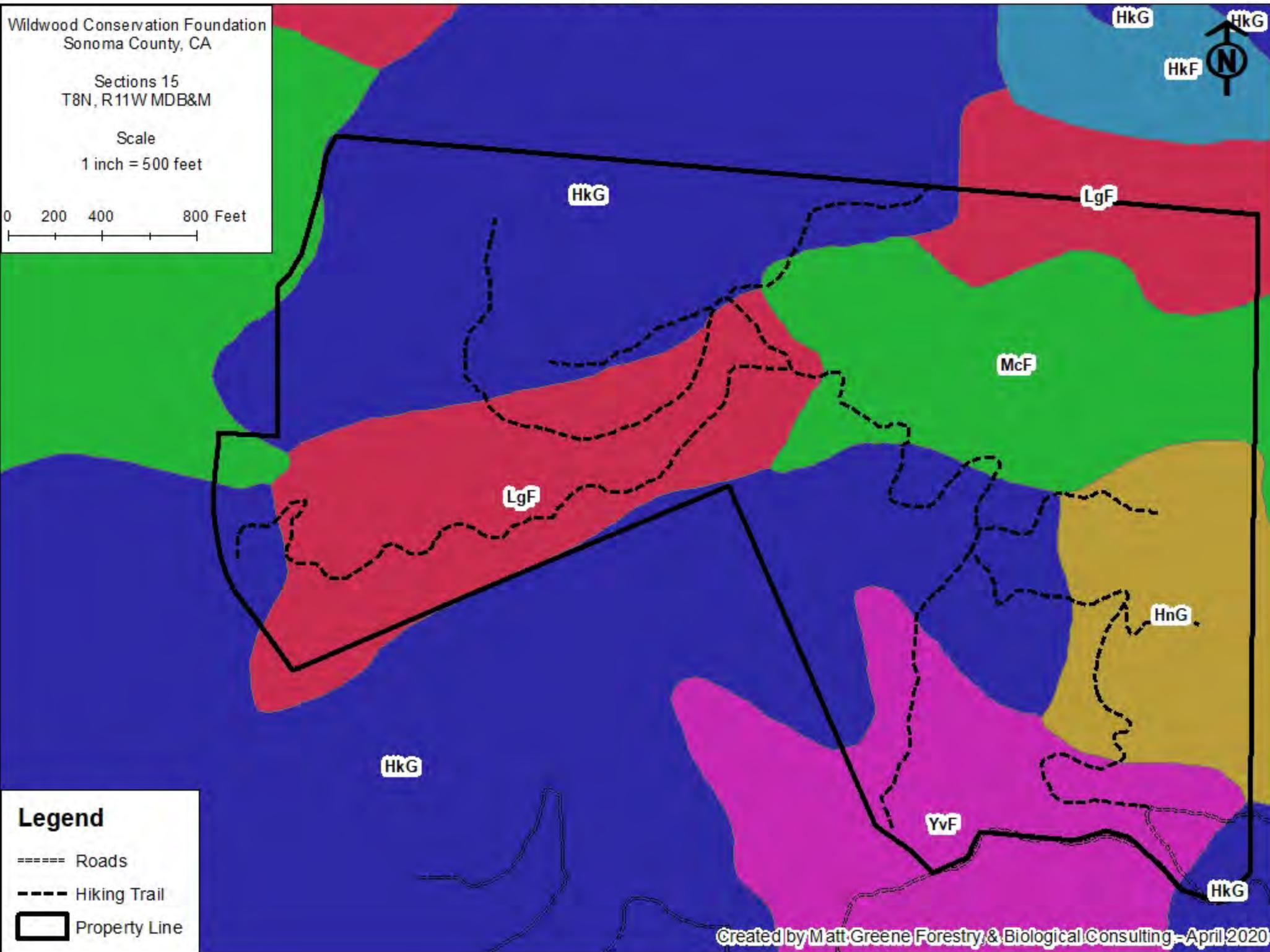
Soils Map

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 500 feet

0 200 400 800 Feet



Legend

- ==== Roads
- Hiking Trail
- ▭ Property Line

Soils and Geology

There are five (5) main soil types within Wildwood. They are: HkG - Hugo very gravelly loam, 50 to 75 percent slopes; HnG-Hugo-Josephine complex, 50 to 75 percent slopes; LgF-Laughlin loam, 30 to 50 percent slopes; McF-Maymen gravelly sandy loam, 30 to 50 percent slopes; and YvF-Yorkville-Laughlin complex, 30 to 50 percent slopes. See Soil Map, above or in Appendix 5 for the full report.

The forestland at Wildwood Conservation Foundation is, according to soil maps, mostly site Class IV ground for redwood and site III to IV ground for Douglas-fir. The data below comes from the Soil Survey of Sonoma County, which was updated in 2014.

Hugo very gravelly loam, 50 to 75 percent slopes (HkG)

This soil type is located on about 80 acres; mostly in the northwest and eastern southwest hardwood or Douglas-fir dominate areas. The Hugo series consists of well-drained very gravelly loams that have a gravelly sandy clay loam subsoil. At a depth of 30 to 60 inches the soils are underlain by weathered, fine-grained sandstone and shale. These soils are on very steep mountainous uplands. The primary use of this soil type is timber production, with areas cleared for grazing. This soil type supports site Class IV timberland. Fertility is moderate. Permeability is moderate in the subsoil of this Hugo soil. Runoff is very rapid, and the hazard of erosion is moderate to very high.

Hugo-Josephine complex, 50 to 75 percent slopes (HnG)

This soil type is located on about 25 acres; mostly in the southeast in redwood dominate forest type. These soils are found on mountainous uplands. The complex is about 2 percent Atwell soil, 60 percent Hugo very gravelly loam and about 40 percent Josephine loam. This soil type consists of gravelly surface particles with a loam subsoil. They are formed in material weathered from sandstone, shale, schist, and conglomerate. At a depth of 30 to 60 inches, these soils are underlain by paralithic bedrock. The primary use of this soil type is timber production, and they are also cleared for range and pasture. This soil type supports site class IV timberland for Douglas-fir and redwood. Runoff is very rapid and the erosion hazard is very high.

Laughlin loam, 30 to 50 percent slopes (LgF)

This soil type is located on approximately 50 acres in the grasslands on the west side. The Laughlin series consists of well-drained loams that have a sandy clay loam subsoil. At a depth of 20 to 30 inches, the soils are underlain by fine-grained sandstone and shale. These soils are on mountainous uplands and ridgetops. The primary use of this soil type is rangeland. Runoff is rapid, and the hazard of erosion is high. Fertility is moderately low. This soil is used mainly for range.

Maymen gravelly sandy loam, 30 to 50 percent slopes (McF)

This soil type is located on approximately 35 acres of mostly northeast Douglas-fir dominate forest type. The Maymen series consists of well-drained gravelly sandy loams that have a shallow bedrock. At a depth of 10 to 20 inches, the soils are underlain by sandstone and shale. These soils are on very steep mountainous uplands. The primary use of this soil type is wildlife habitat with areas of limited grazing. Fertility is very low. Runoff is rapid, and the hazard of erosion is moderate to high.

Yorkville-Laughlin complex, 30 to 50 percent slopes (YvF)

This soil type is located in the southwest corner and on about 20 acres mostly in the southeast grasslands. Yorkville soils are 55% of this type and often found on convex slopes with water seepage on lower toe slopes. The steeper slopes are hummocky or gently undulating. The soil is moderately deep, typically 40 to 60 inches. These clay loam and clay soils are derived from material weathered from glaucophane schist, serpentinized igneous rocks and metamorphosed graywacke. The Laughlin series are 33% of this type and consist of well-drained loams that have a sandy clay loam subsoil. At a depth of 20 to 40 inches, the soils

are underlain by fine-grained sandstone and shale. These soils are on mountainous uplands and ridgetops. The primary use of this soil type is rangeland. The primary use of this soil type is as range for sheep and cattle grazing. Fertility is moderately low. Vegetation is primarily grass with shrubs and scattered oaks and madrone. Seeps and springs are often found in the Laughlin soil type. Surface runoff is rapid and erosion hazard is high and prone to slippage. The tendency to slip is possibly due to very slow permeability in the heavy clay subsoil in the Yorkville series.



Table 1: Soil Type Summary

Soil Type	HkG Hugo very gravelly loam, 50 to 75 percent slopes	HnG Hugo-Josephine complex, 50 to 75 percent slopes	LgF Laughlin loam, 30 to 50 percent slopes	McF Maymen gravelly sandy loam, 30 to 50 percent slopes	YvF Yorkville-Laughlin complex, 30 to 50 percent slopes
Approximate Coverage	38%	11%	23%	17%	11%
Location	Mostly northwest and eastern southwest hardwood or Douglas-fir dominate.	Mostly southeast redwood dominate forest type.	Mostly grasslands on the west side.	Mostly northeast Douglas-fir dominate forest type.	Mostly southeast grasslands.
Use	timber production, DF cleared for grazing	timber production cleared for grazing	rangeland	wildlife habitat limited grazing	grazing
Vegetation	mixed conifer-hardwood forest Douglas-fir, redwood tanoak, madrone understory of shrubs	see Hugo left California black oak	Naturalized and native vegetation annual grasses, perennial grasses open stands of oak small amounts of brush	open stands of chaparral chamise, Manzanita, ceanothus scrub or dwarf oak scattered small trees in protected sites	Naturalized and native vegetation annual grasses, perennial grasses open stands of oak madrone
Site Class	IV redwood III for Douglas-fir	IV redwood IV for Douglas-fir		IV for Douglas-fir	
Runoff	Very Rapid	Very Rapid	Rapid	Rapid	
Erosion	High	Very High	High	High	
Notes	These soils are also on very steep backslopes and sideslopes of mountain uplands.	found on mountainous uplands	mountainous uplands and ridgetops	very steep mountainous uplands	hills and mountains with unstable slopes
Warnings	Seedling mortality is severe. Plant competition is moderate to severe on these soils.				Prone to slippage The tendency to slip is possibly due to very slow permeability in the heavy clay subsoil in the Yorkville series.

Unstable Area Map

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 500 feet

0 200 400 800 Feet



Legend

 Property Line

 Roads

 Hiking Trail

Watercourse Classification

 Class I

 Class II

 Class III

 Unstable Area

LANDSLIDES AND UNSTABLE AREAS

An unstable area is characterized by mass movement of soil and the accompanying layer of vegetation. Certain soil types are defined as unstable in their characteristics and create hummocky (bumpy) topography, tension cracks, slope scarps, headwall and lateral scarps and irregular bowl-shaped slopes indicating an historical slope failure in the area. Leaning trees are another indicator of active slope instability. Unstable soils combined with springs and seeps will create slope instability that can lead to landslides.

The North Coast Ranges are known for unstable geology. According to the California Geological Survey (CGS) Landslides and Relative Slope Stability-Sonoma County, there are over 100 potential landslides (both historic and active) on the Cazadero USGS Quad alone. The 2020 field review confirmed at least seven (7) potential unstable areas on Wildwood (see map, above). They are in steep portions of the upper watercourse areas. Heavy equipment activities should be limited in those areas as to not trigger any future movement of the unstable areas. Water should be directed away from these areas and onto slopes that are not as susceptible to mobilizing. If new types of activities involving heavy equipment are proposed, an engineering geologist may be required to review operations on unstable areas.

The CGS maps for California are filled with land movements that are projected based on soil type, topography, and aerial photographs. Some unstable areas possibly occurred some time ago and are slowly healing. Special care must be paid to equipment working in these areas. From this map there does not appear to be active land movement, however an improperly drained road or skid trail could easily trigger a large-scale problem.

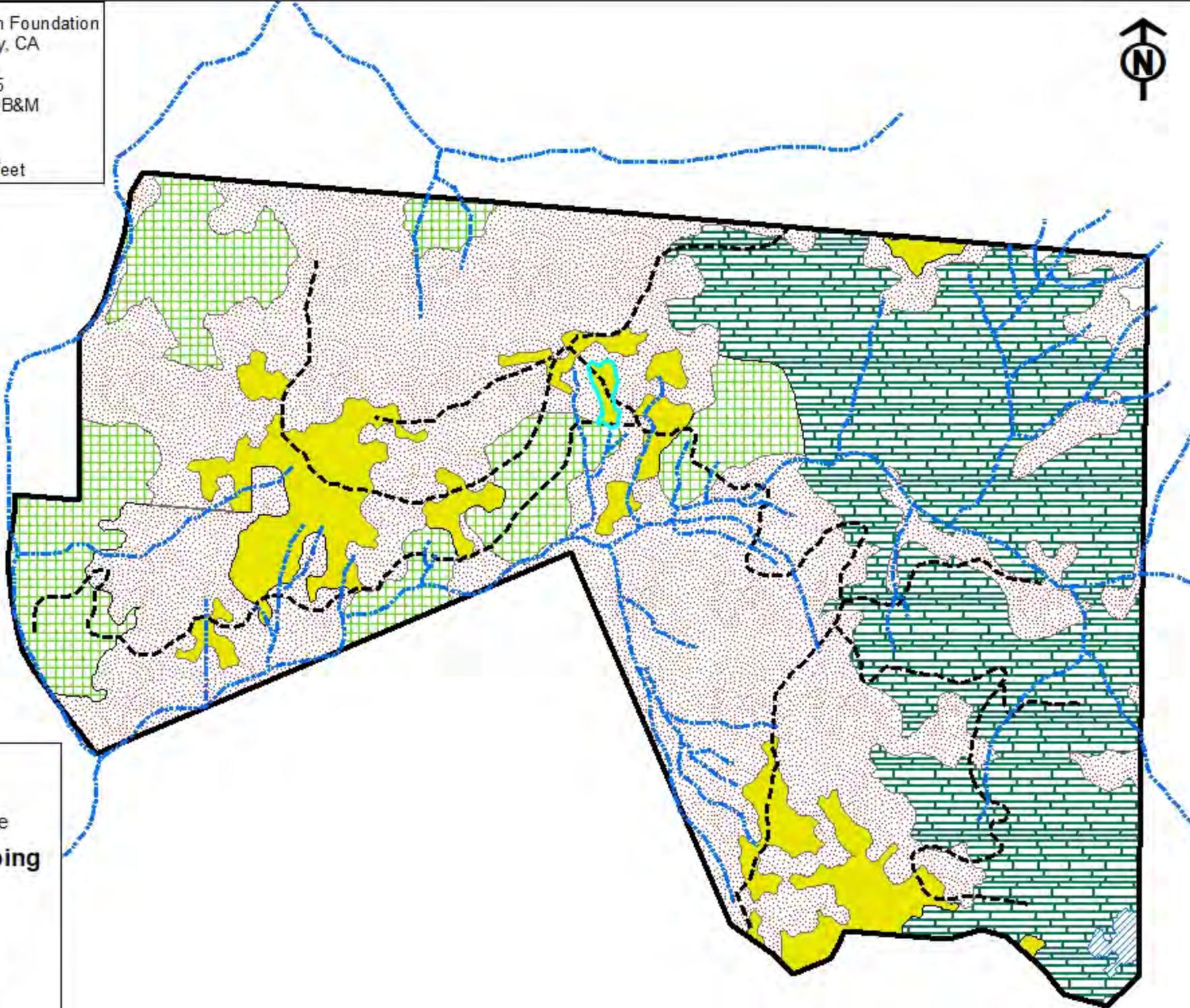


Photo 1: Poor road drainage placement (as seen on the Orange Trail) exacerbates this highly erosive landscape.

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 500 feet



Legend

 Property Line

Vegetation Typing

 RD33

 D32

 Hardwood

 Grassland

 Developed

0 300 600 1,200 Feet

Vegetation Types

There are three general vegetation types on the property. Please see the map above for the location of these vegetation types: a grassland, oak woodlands, and two conifer forest stands; RD33 and D32. The Oak woodlands (HW) have California bay, and multiple oaks (*Quercus*). The conifer forestlands have mostly Douglas-fir, redwood with some hardwoods. All the vegetation types have a riparian component.

Table 2: Vegetation Types on Wildwood

Vegetation Types	Approximate Acres
Forest Type D32	18
Forest Type RD33	65
HW (Oak woodlands)	109
Grasslands	18
Total	210

The two (2) conifer stands (Forest Types) have the potential to produce timber and have characteristics specific to this property. These Forest Types vary in age, species composition, density, and number of hardwood trees per acre. They are named RD33 and D32. They and are outlined further in the section titled: LOCATION AND STAND DESCRIPTION OF FOREST TYPES. This section describes a current snapshot (2020) of the stand structure and volume.

In the table above, nomenclature is used to simplify discussions. R stands for redwood and D stands for Douglas-fir. HW is the code used to refer to hardwoods in general. The order in which the letter appears signifies which species is dominant. A species must contain 10% volume (of the total) to be included in the nomenclature. Thus, an RD22 means that the forest type contains both redwood and Douglas-fir and that redwood is more dominant (by volume per acre) than Douglas-fir.

The numbers at the end describe two things; the density of the stand and its maturity:

- 1 means 80 to 100% canopy closure
- 2 means 60 to 79% canopy closure
- 3 means 35 to 59% canopy closure
- 4 means 10 to 35% canopy closure
- 5 is less than 10% canopy closure

The two numbers also are important as they are meant to discuss merchantable (first number) sub-merchantable (second number) trees.

Thus, D32 describes a forest that is dominated by Douglas-fir (D in the first position), and has a merchantable tree component with a canopy closure that occupies between 35 and 59% of the forest (3 as the first number). All the trees combine (merchantable and sub-merchantable) have a canopy cover between 35 to 59% in that forest types (3 as the second number).

This system is used for many things including discussions about forest types maturity, density, potential owl habitat (and usage), stand complexity. Generally, the lower the number the better the forest from the standpoint of commercialization.

General descriptions for the vegetation types that are native to western Sonoma County and found on the property are described below.

Grasslands, Meadows and Pastures

There are approximately 18 acres of this vegetation type on Wildwood; they are mostly located on the Yorkville and Laughlin soil series. Some areas may have been planted as pasture with a variety of pasture-mix plants, and consequently have native and non-native grassland species. The scope of this plan did not allow for survey of the grassland species.

Areas of native dry grasslands are scattered throughout the Coast Ranges. The meadows on Wildwood are a result of a combination of soil type and historical clearing of forest, through annual fires and grazing. Grasslands are important areas of habitat for many native plant and animal species. North, east, and west facing meadows created by removal of forest cover may, over time, revert to a hardwood or Douglas-fir forest type. Native bunch grasses originally occupying the natural grasslands have been converted to a mixture of residual natives, European grasses, and forbs. Common species present in grasslands in the North Coast Ranges region include native and introduced annual grasses such as brome (*Bromus* spp.), Blue-eyed grass (*Sisyrinchium bellum*), Checkerbloom (*Sidalcea malvaeflora*), Coast angelica (*Angelica hendersonii*), Coast calif. Poppy (*Eschscholzia californica*), Coast wallflower (*Erysimum concinnum*), Cow parsnip (*Heracleum lanatum*), Douglas iris (*Iris douglasiana*), Helen's flower (*Helenium bolanderi*), Nootka reed grass (*Calamagrostis nutkaensis*), Purple needle grass (*Stipa pulchra*), Red fescue (*Festuca rubra*), Sea thrift (*Armeria maritima*), Tufted hairgrass (*Deschampsia caespitosa*), White yarrow (*Achillea millefolium*).



Photo 2: Blue Eyed Grass in a nearby Coastal Meadow.

Coast Range Mixed-Conifer Forests

These forest types vary on Wildwood due to competing vegetation, slope, soil, and availability to water. The redwood community is found primarily in the swales and drainages, north facing slopes, and near spring sites. Because of the thick tree canopy and layer of acidic duff in the redwood forest, the diversity of plants is restricted. Associated trees include Douglas-fir (*Pseudotsuga menziesii*), tanoak (*Notholithocarpus densiflorus*) and other hardwoods.

Douglas-fir (growing on a high-quality site) is one of the most important and valuable timber trees. The latitudinal range of Douglas-fir is the greatest of any commercial conifer of western North America. Douglas-fir reaches its best growth on well-aerated, deep soils with a pH range from 5 to 6. It will not thrive on poorly drained or compacted soils. It is mixed in with the redwood and hardwoods in much of Sonoma County. Most of Wildwood Conservation Foundation has soil types that are well suited to the production of Douglas-fir.

Tanoak is an important evergreen hardwood tree species that contributes food for humans as well as several animal species. The acorns store well due to their high tannin levels. Tannins contain an astringent

type compound that can repel insects. The bark is also high in tannin. In this area, bark was harvested and shipped to commercial tanneries into the early 1900s. Tanoak on the coast has the potential to reach over 100 feet tall with a diameter of over 70 inches (5 feet).

Other trees associated with Sonoma Counties' redwood forest include: California buckeye (in swales and Class II and III watercourses, golden chinquapin, (*Chrysolepis chrysophylla*) and California nutmeg (*Torreya californica*). Plants include ferns, evergreen huckleberry (*Vaccinium ovatum*), trillium (*Trillium ovatum*), and redwood sorrel (*Oxalis oregana*). Not all the shrubs associated in this region were found on Wildwood Conservation Foundation during the survey, however they are typically: ceanothus (*Ceanothus* spp.), coffee berry (*Frangula californica*), evergreen huckleberry (*Vaccinium ovatum*), ground rose (*Rosa spithamea*), hazel (*Corylus cornuta*), manzanita (*Arctostaphylos* spp.), Oregon grape (*Berberis nervosa*), Pacific rhododendron (*Rhododendron macrophyllum*), salal (*Gaultheria shallon*) and western poison-oak (*Toxicodendron diversilobum*).

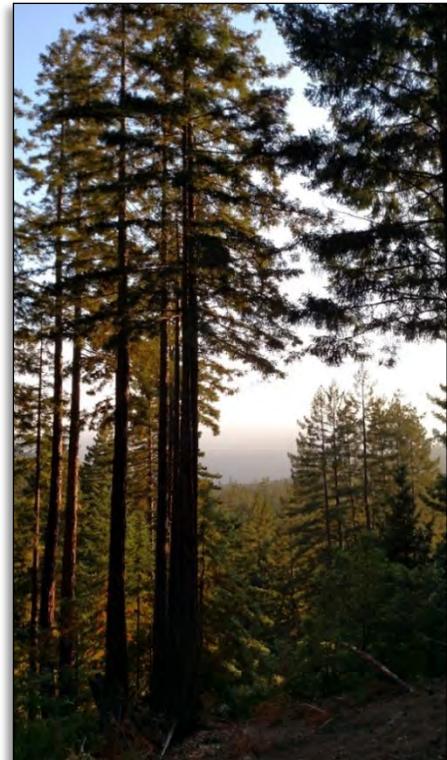


Photo 3: Redwood and Douglas-fir and tanoak growing on the Sonoma Coast.

Riparian Woodlands

A riparian forest is a forested or wooded area of land adjacent to a body of water; such as a river, stream, pond, lake, marshland, estuary, or reservoir. Plant habitats and communities along the edges of these waterbodies are classified as riparian vegetation, and where the watercourse is constantly inundated with water, they are characterized by hydrophilic plants. In our area, watercourses typically reduce to little or no surface flow by July and plants in the riparian area are more typical of what is seen further upslope.

A riparian zone or riparian area is the interface between land and a river or stream. This is an area with special regulations. See WLPZ in definitions.

Trees include hardwoods such as big-leaf maple (*Acer macrophyllum*) and red alder (*Alnus rubra*). Willow (*salix* spp.), thimbleberry (*Rubus parviflorus*), salmon berry (*Rubus spectabilis*), bracken fern (*Pteridium aquilinum*), maiden hair (*Adiantum* spp.), chain fern (*woodwardia* spp.), Sword fern (*Polystichum munitum*), and redwood sorrel (*Oxalis oregana*) are common members of riparian species in the redwood understory. Moss, forb, and grass species can be also be found in riparian areas.

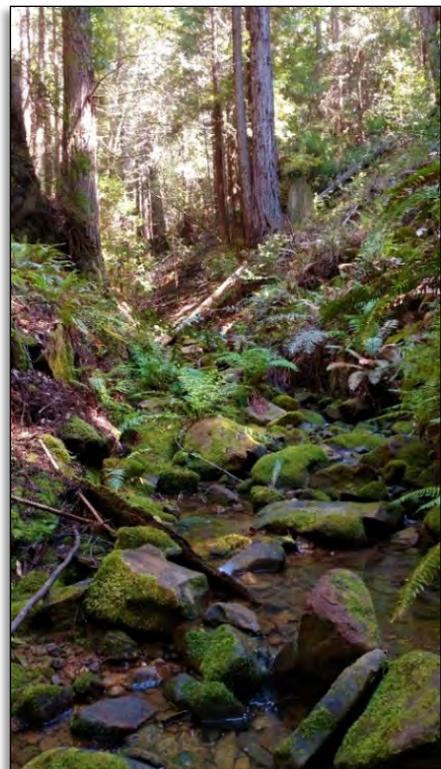


Photo 4: Riparian redwood forest.

Location and Stand Description of Forest Types

The three (3) different forest stand types (Forest Types) that have characteristics specific to this property.

Table 3: Definitions for Tree Class.

Tree Class	Tree Diameter (DBH)
Regeneration (Regen)	< 2"
Seedling	2 – 10"
Sub-Merchantable	12 – 16"
Merchantable	18 – 48" +
Old Growth	at least 60" and at least 200 years

FOREST TYPE D32

Forest Type D32 is located in scattered patches on Wildwood. This type is associated with the Hugo and Laughlin loam soil types. There are approximately 18 acres of this type. Forest Type D32 is comprised of Douglas-fir and several hardwood species.

Conifers in this stand are likely 1 year to over 50 years old given the harvest history and tree diameters. There are approximately 17 snags per acre in this type; 6 Douglas-fir and 11 Hardwoods (mostly black oak and Madrone being shaded out by conifers). There is currently about 27,000 board feet of timber per acre. This area is mostly site class III ground for Douglas-fir. Douglas-fir in this area is growing at a rate of approximately 3% (on average) per year. This forest soil classification can grow at a rate of 2.5 to 3.0% annually.

Volume per Acre, Type D32 (by Species & 2" Diameter Class)					
	12" to 16"	18" to 24"	26" to 34"	36+	Total
Douglas-fir	1,500	8,400	10,400	4,300	24,600
					24,600

Total Standing Volume on 18 acres, Type D32 (by Species & 2" Diameter Class)					
	12" to 16"	18" to 24"	26" to 34"	36+	Total
Douglas-fir	28,000	152,000	188,000	77,000	445,000
					890,000

Trees per Acre in Type D32 (by Species & 2" Diameter Class)						
	2" to 10"	12" to 16"	18" to 24"	26" to 34"	36+	Total
Douglas-fir	191	18	31	13	2	255
California Bay	14	4	1	-	-	19
White Oak	-	3	-	-	-	3
Black Oak	1	6	4	3	1	15
Live Oak	10	8	-	-	-	18
Pacific Madrone	60	10	3	-	-	73
						381

Basal Area (square feet) per Acre, Forest Type D32 (by species)						
DF	B	BO	LO	PM	TOTAL	CONIFER
960	130	60	120	300	1570	960

This information is just a snapshot in time; this type currently has approximately 64 Douglas-fir, 12 inches DBH and greater, per acre. The conifer to hardwood tree per acre ratio in this stand is about 1:1. This is a poor ratio for maintaining good growth in the conifers. The current ratio may be the result of soil types, fire suppression and/or past management practices.

These stands can be periodically thinned of hardwoods (especially 2 to 12 DBH madrone and bay). All the hardwood species in this forest type are commercially valuable as firewood and if local markets are available, this should be considered when planning each forest improvement activity. In lieu of a commercial harvest, a forest improvement project could benefit these stands, by removing some of the hardwood competition and creating a more fire-resistant forest structure.

The ideal management activity in this forest type would be consider reducing competition from the hardwood trees through a fuelwood harvest or forest improvement project. Assisted by forest improvement projects, growth in the Douglas-fir can improve allowing the stand will mature somewhat quicker, and it may begin to resemble the historic forest that would have been growing prior to pasture clearing and/or unintentional wildfire in this area.

FOREST TYPE RD33

Forest Type RD33 is located on the east side of Wildwood. This type is associated with the Hugo and Maymen soil types. There are approximately 65 acres of this type. Forest Type RD33 is comprised of redwood, Douglas-fir, and several hardwood species.

The conifers in this stand are likely one to over 100 years old given the harvest history and tree diameters. There is approximately 1 snag per acre in this type; mostly tanoak that have succumbed to Sudden Oak Death (see Forest Diseases and Problems, below). Half (50%) of the conifers in this stand are merchantable. The remaining 50% of the conifers are natural regeneration or seedlings growing very slowly on a poor soil type or in crowded conditions. There is currently about 18,000 board feet of timber per acre. On the Hugo soil, this area is site class III ground for Douglas-fir and site class IV for redwood. The Maymen soil is mostly Douglas-fir growing on site class IV ground. This forest soil classification can grow at a rate of 2.5 to 3.0% annually.

Volume per Acre, Type RD33 (by Species & 2" Diameter Class)					
	12" to 16"	18" to 24"	26" to 34"	36+	Total
Redwood	600	2,300	3,300	3,200	9,400
Douglas-fir	1,200	800	600	6,000	8,600
					18,000

Total Standing Volume on 65 acres, Type RD33 (by Species & 2" Diameter Class)					
	12" to 16"	18" to 24"	26" to 34"	36+	Total
Redwood	42,000	154,000	216,000	209,000	621,000
Douglas-fir	81,000	53,000	43,000	390,000	567,000
					1,188,000

Trees per Acre in Type RD33 (by Species & 2" Diameter Class)						
	2" to 10"	12" to 16"	18" to 24"	26" to 34"	36+	Total
Douglas-fir	43	12	3	1	3	62
Redwood	69	10	9	4	2	93
California Bay	41	9	1	-	-	51
White Oak	4	1	-	-	-	5
Tanoak	29	6	4	1	1	40
Buckeye	13	-	-	-	-	13
Black Oak	-	1	1	-	-	1
Live Oak	8	4	1	-	-	13
Pacific Madrone	6	-	1	-	-	6
Maple	3	1	2	-	-	6
Wax Myrtle	1	-	-	-	-	1
						291

Basal Area (square feet) per Acre, Forest Type RD33 (by species)									
DF	RW	B	TO	BO	LO	PM	MA	TOTAL	CONIFER
50	60	130	20	30	120	280	5	695	110

This information is just a snapshot in time. This type has approximately 22 conifers (redwood, Douglas-fir), 12 inches DBH and greater, per acre. The conifer to hardwood tree per acre ratio in this stand is about 7:1. Again, this is a poor ratio for maintaining good growth in the conifers. The current ratio may be the result of soil types, slope, fire suppression and/or past management practices.

As with Type D32, these stands can be periodically thinned of hardwoods (especially 2 to 12 DBH tanoak and bay). All the hardwood species in this forest type are commercially valuable as firewood and if local markets are available, this should be considered when planning each forest improvement activity. In lieu of a commercial harvest, a forest improvement project could benefit these stands, by removing some of the hardwood competition and creating a more fire-resistant forest structure.

As with Type D32, the ideal management activity in this forest type would be consider reducing competition from the hardwood trees through a fuelwood harvest or forest improvement project. This stand is also prone to Sudden Oak Death. Assisted by forest improvement projects, growth in the conifers can improve, the stand may mature somewhat quicker, and this type may begin to resemble the historic forest that would have been growing prior to unintentional wildfire in this area.

FOREST TYPE HW

The HW Forest Type for this management plan is a mixture of oak woodlands, pure madrone stands and bay stands scattered around the property. This type is associated with all five soil types. There are approximately 109 acres of this type. Forest Type HW is comprised of California bay (7%), White Oak (62%), Buckeye (seedlings), Black Oak (21%), and Live Oak (10%), with Douglas-fir seedlings in some areas.

The conifers in this stand are likely one to over 100 years old given the harvest history and tree diameters. There are little to no snags in this type at this time.

Trees per Acre in Type HW (by Species & 2" Diameter Class)						
	2" to 10"	12" to 16"	18" to 24"	26" to 34"	36+	Total
Douglas-fir	26	-	-	-	-	26
California Bay	189	4	-	-	-	193
White Oak	106	29	4	-	-	139
Buckeye	28	-	-	-	-	28
Black Oak	30	11	-	-	-	41
Live Oak	4	4	-	1	-	9
						435

Basal Area (square feet) per Acre, Forest Type HW (by species)							
DF	B	WO	BE	BO	LO	TOTAL	CONIFER
30	1110	950	20	240	40	2400	30

This information is just a snapshot in time. This type has 53 hardwoods, 12" or greater, per acre. This type has little to no conifers, 12 inches DBH and greater, per acre, however, there is ingrowth of Douglas-fir due to fire suppression and/or cessation of grazing. The current species composition may also be the result of soil types, slope, aspect, fire suppression and/or past management practices.

As with the other types, the historic structure of these stands developed with periodic fire. Generally, oak woodlands are even-aged to the point where trees begin to die and open up new areas for regeneration. The current stand was subjected to grazing (and possibly prescribed fire) likely until the 1970s. Accordingly, some form of stand management is

Regeneration per Acre in Type HW (by Species & 2" Diameter Class)					
	2"	4"	6"	8"	10"
Douglas-fir	21	1	3	-	1
California Bay	34	35	61	40	19
White Oak	5	30	29	16	26
Buckeye	6	9	11	1	-
Black Oak	-	4	14	9	4
Live Oak	-	1	1	-	1

necessary to maintain the current hardwood stand structure. A sign of insufficient management is the ingrowth of Douglas-fir seedlings. The lack of young oak regeneration is also a sign of the lack of historical disturbance (fire) in these stands; while there are over 130 (mostly white oak) trees per acre in the seedling category, at this time, only five are 2" *Quercus* species. The other side of this coin is that the ingrowth of conifers is part of a natural succession process, however one could argue the cessation of periodic fire is "unnatural."

Continue to monitor the HW type and take action if conifer encroachment is deemed undesirable. As conifers and brush move-in to a hardwood stand, they created ladder fuels reducing the stand's resistance to unintentional wildfire. Prescribed fire may be an option on Wildwood, albeit an expensive one. There is more information on this in Permitting, below. There are several options apart from prescribed fire to consider as management options. The ideal management activity in this forest type would be create small-scale disturbances through a fuelwood harvest or forest improvement projects. Using burn piles to dispose of conifer slash can create a sterilized bare mineral soil bed ideal for oak regeneration. Be aware this can also create habitat for invasive species, so this should be monitored closely.

IN SUMMARY

Wildwood Conservation Foundation is comprised of 210 acres. There are approximately 380 trees per acre growing on 192 acres of forestland. There is approximately 1.6 million board feet of conifer timber growing on 83 acres, in two forest types. Mostly California bay and oaks are growing in 109 acres of the HW type. The remaining 18 acres are grasslands (meadows or pasture) or are areas developed for roads or structures.

There are three age classes of conifers on the property; a few residual trees that are over one hundred years old; trees between 60 and 100 years growing since a 1940/50s harvest; trees between 1 and 60 years growing since the cessation of grazing and/or harvesting.

Wildwood					
2020 Total Net Standing Conifer Volume (bd. ft.) on 83 Acres					
(in Board Feet, by Species & 2" Diameter Class)					
Species	12" to 16"	18" to 24"	26" to 34"	36+	Total Standing
Redwood	42,000	154,000	216,000	209,000	621,000
Douglas-fir	109,000	205,000	231,000	467,000	1,012,000
					1,633,000

Wildwood						
Approximate Trees per Acre across 192 Acres						
(by Species & 2" Diameter Class)						
	2" to 10"	12" to 16"	18" to 24"	26" to 34"	36+	Total
Douglas-fir	47	6	4	2	1	60
Redwood	23	3	3	1	1	32
California Bay	122	6	1	-	-	128
White Oak	62	17	2	-	-	81
Tanoak	10	2	1	0	0	14
Buckeye	20	-	-	-	-	20
Black Oak	17	7	1	0	0	25
Live Oak	6	4	0	1	-	11
Pacific Madrone	8	1	0	-	-	9
Maple	1	0	1	-	-	2
						381

Methods and Procedures

To obtain the data for this plan the sampling utilized a stratified double sampling procedure. Sixteen (16) temporary 1/5-acre circular plots were established using a modified grid pattern across the 192 acres of forestland on the property in 2020. This represents a cruise intensity of approximately 1.7 percent.

Within the standard 1/5 plot, all conifer trees above 12 inches DBH were measured for diameter to the nearest 2 inches and height to a 6-inch top in 16-foot logs. Trees under 12 inches were tallied at each plot. Several conifer trees were measured to attain age and total height in feet to determine site values. The following parameters were additionally measured or estimated at each plot; overstory cover, understory cover and composition, basal area, woody debris, and snag density and quality.

Several conifer trees over 12 inches were cored with an increment borer and the last 10 years' radial growth was recorded to the nearest 1/10th of an inch.

Volumes and other metrics were calculated and the data was synthesized into the orderly tables and narrative contained in this Management Plan. Volume tables were used to calculate a value for each tree measured. These volume tables have been developed for the local area and have been calibrated to reflect our experience in different forest types.



Photo 5: Redwood cores used for growth analysis.

Analysis of Timber Types

Forest managers use several quantitative factors to describe the forest stands. The main factors are stand stocking, stand growth, stand diameter distribution and species composition.

- **Stand Stocking** is typically measured in board feet (1-inch X 12 inches X 12 inches) per acre.
- **Basal Area** is measured in square feet per acre.
- Stand Stocking and Basal Area measurements are expressed as the average site index or site class for the forest type.
- **Stand Growth** is measured both in terms of percent growth and as a volume growth per acre per year figure. Both figures are divided into pre-merchantable and merchantable classes to give a more accurate growth projection.
- **Stand Diameter Distribution** is measured and tallied in the number of trees per acre by diameter class table. This table is useful for doing rough stand projection calculations and identifying stand structure.
- **Stand Species Composition** is recorded in three ways; Trees per Acre Table, Volume per Acre Table and in the Basal Area per Acre Table. Species composition affects stand treatments and stand values.

During the timber cruise portion of the Management Plan development, these factors, (as well as other factors) were measured and compiled into the tables above. These tables are for the timbered areas of Wildwood (192 acres).

Growth

The current growth rates for Wildwood vegetation types average about 1.6% annual growth for conifers. Based on the soil map, thirty-eight percent (38%) of the property is site III lands for Douglas-fir and site class IV for redwood, eleven percent (11%) is site class IV for both species of conifer, seventeen (17%) will likely only support Douglas-fir (site class IV), and thirty-four percent (34%) will likely only support grasslands and open stands of oaks. However, due to the fire damage on the property, the land is currently growing at site class IV rates.

Soil Type	HkG Hugo very gravelly loam, 50 to 75 percent slopes	HnG Hugo- Josephine complex, 50 to 75 percent slopes	LgF Laughlin loam, 30 to 50 percent slopes	McF Maymen gravelly sandy loam, 30 to 50 percent slopes	YvF Yorkville-Laughlin complex, 30 to 50 percent slopes
Approximate Coverage	38%	11%	23%	17%	11%
Site Class	IV redwood III for Douglas-fir	IV redwood IV for Douglas-fir		IV for Douglas-fir	

Defect

There is both internal and external defect in the trees on Wildwood. The internal defect is an expected level reduced volume derived from data collected on several properties in western Sonoma County where commercial harvests occurred. We have no hard data for the property at this time as historic harvest records were not passed along from previous activities. This defect is mostly some type of rot (root or heart), the extent to which is difficult to assess from a live standing tree. Common causes of rot on the North Coast include the following: a pathogen, old fire damage, and poor logging practices. Internal defect is a percentage used across the property and is specific to the species and region.



Photo 6: Internal defect in Douglas-Fir.

The external defect is calculated based on data gathered in the field, tree by tree, considering logs that will not be merchantable due to some obvious external indication; for example, damage and disfiguration due to wind, fire, wildlife, logging or other externally visible signs. When rot has rendered logs unmerchantable, especially in Douglas-fir, it is also able to be assessed on a tree by tree basis by physical indicators.

The external defect on the forest is running between 6% and 40% depending on the forest type and its exposure to fire, pests, and careless use of heavy equipment (mostly from the 40s and 50s). Some of this defect is also from multiple fires that have occurred on the property over time. Special care will need to be taken to continue to remove those trees that are dead, dying, or heavily damaged during forest improvement projects. Trees that are complete snags can be left standing where they are not posing a safety hazard. There is more information on this in WILDLIFE, FISH AND RARE PLANTS, below.

Silviculture

Silviculture is the art and science of controlling the establishment, growth, composition, health, and quality of trees to meet the diverse needs and values of forestland species and the landowners. In a commercial harvest context, a silvicultural prescription is applied to create, or move toward, desired future conditions. In many situations, a suite of silvicultural practices is developed for application over a short and/or long-term planning period. The silvicultural practices will likely be periodically adjusted according to changes in forest condition (e.g. approach to targeted number of trees per acre, unexpected changes including: wildfire, insects, diseases, or mass wasting).

DESIRED FUTURE CONDITIONS

Research shows that our historic forests were much different than they are today. Some of the best research shows that historically, there were 40 to 60 trees per acre in Western Sonoma County forests. The forests were dominated by large redwoods, with fir and hardwoods playing a minor part of the conifer forest types. Of course, this is a very simplified narrative of what those complex forests looked like. There were gaps/openings from fire, wind, landslides, and other disturbances that also caused even larger pockets. These disturbances created a patchwork landscape where small gaps would create a new age class of vegetation.

FOREST IMPROVEMENT PROJECT STANDARDS

The following timber harvesting standards should be followed when any forest improvement activities occur. The trees should be carefully marked for cutting, with attention to: forest health, wildlife value, and aesthetics. Low quality and defective or dying trees that do not fit the criteria for snag recruitment or legacy trees should be selected for removal. The remaining trees to be felled should be selected for balancing spacing, tree size and volume factors. Large, particularly attractive trees can be identified and preserved as specimen trees for wildlife value.

Forest improvement activities must conform to the values and expectations of the property owners, the Conservation Easement, Matt Greene Forestry & Biological Consulting, and (if a cost share program is involved) by the CEQA process required by the California Department of Forestry. These standards include: following the specified measures for watercourse protection zones, carrying out the operation in an orderly fashion (finishing all work in one area before moving on the next), building and maintaining trails, roads and crossings as specified for CEQA compliance, lopping all slash to 30 inches or lower or as additional rules require following operations, installing adequate erosion control measures, minimizing damage to the trees that remain after harvest, and cutting stumps as low as possible.

Areas of high use, historical value, archaeological significance, unique wildlife value, or particular interest should be identified prior to activities and a plan developed which will protect these areas. Large trees with many large limbs can have high wildlife habitat value and certain ones should be selected for retention as legacy trees to become snags and large woody debris. Soil and residual vegetation should be minimally disturbed. Log landing areas should be clean of slash and seeded to a species of grass that will be effective at stabilizing the soils following each use in order to make these areas usable after project activities conclude. This can be native grass, or a seed mix containing non-native



Photo 7: Photo of a landing 1-year, post-h

annual grasses that are not included on Cal-IPC's invasive or "watch" inventory list (<https://www.cal-ipc.org/plants/profiles/>).

A written agreement should be developed for each forest improvement activity detailing the specific requirements and performance standards to be met by the contractor and their operators. The following items must be addressed: the payment schedule, down payment, cash performance bond, insurance certificates. Forest improvement activities should be overseen by a licensed Forester.

Permitting

Many land management operations are subject to Federal, State, County, and/or community group rules and restrictions. The following information is provided to help inform the regulatory aspect of land management activities in Sonoma County.

In order to sell (or trade) commercial forest products, the California Forest Practice Rules require a harvest plan be developed. CalFire is the lead agency for the purposes of timber harvesting. A multi-agency review is required to meet the functional equivalent of a CEQA review. This includes a public comment period, which is open to all members of the public.

Although commercial harvest on Wildwood is not prioritized under the conservation easement, other permissible land management activities may require a permit. Replacing culverts, grading roads, prescribed fire, modifying major vegetation types, creating a quarry, or any other potential ground disturbing activities. Permits are often under the purview of different agencies, so coordinating efforts is critical for compliance.

NON-COMMERCIAL OPTIONS

Several Timber Stand Improvement (TSI) projects can be performed on the property to enhance timber and wildlife value and to reduce the risk of damage from wildfire. These projects are described in more detail in the following pages, under Forest Improvement.

Additionally, the Wildwood Conservation Foundation could utilize the non-commercial species as well as the non-merchantable commercial species for construction and repair of facilities on Wildwood. These harvest activities, being non-commercial, are sometimes mistakenly considered excused from the State Regulatory process (Forest Practice Rules). There are, however limitations, based on the species harvested and the scale of the project.

- Projects falling even a single tree may require some type of "exemption" permit from the State and will potentially need approval from the Open Space District.
- Commercial species in Cal Fire's Coast Forest District are defined as:
- *"species found in group A and those in group B that are found on lands where the species in Group A are now growing naturally or have grown naturally in the recorded past."*

Group A:

coast redwood (<i>Sequoia sempervirens</i>)	western redcedar (<i>Thuja plicata</i>)
incense cedar (<i>Calocedrus decurrens</i>)	Jeffrey pine (<i>Pinus jeffreyi</i>)
Douglas-fir (<i>Pseudotsuga menziesii</i>)	bishop pine (<i>Pinus muricata</i>)
Port Orford cedar (<i>Chamaecyparis lawsoniana</i>)	ponderosa pine (<i>Pinus ponderosa</i>)
grand fir (<i>Abies grandis</i>)	Sitka spruce (<i>Picea sitchensis</i>)
California red fir (<i>Abies magnifica</i>)	sugar pine (<i>Pinus lambertiana</i>)
western hemlock (<i>Tsuga heterophylla</i>)	western white pine (<i>Pinus monticola</i>)
white fir (<i>Abies concolor</i>)	

Group B:

tanoak (<i>Notholithocarpus densiflorus</i>)	Oregon white oak (<i>Quercus garryana</i>)
golden chinkapin (<i>Castanopsis chrysophylla</i>)	California black oak (<i>Quercus kelloggii</i>)
red alder (<i>Alnus rubra</i>)	Pacific madrone (<i>Arbutus menziesii</i>)
pepperwood (<i>Umbellularia californica</i>)	Monterey pine (<i>Pinus radiata</i>)
white alder (<i>Alnus rhombifolia</i>)	

Specific retention rates, by species, are outlined in the Forest Practice Rules for each type of “exemption” permit.

- Riparian protection, as defined in the Forest Practice Rules, (sometimes specific to the “exemption” permit) is required.
- Road work required to access areas during non-commercial projects may still be subject to State Fish and Wildlife or County grading ordinances. This is explained under the Roads and Access section below.
- The project cannot involve conversion of “timberland” to another use without a “conversion” permit; for example, forestland converted to pasture, building site, or use timber production. Timberland, as defined by the Forest Practice Rules is defined as:
- “pursuant to PRC § 4526, means land, other than land owned by the federal government and land designated by the board as experimental forest land, which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species, on a district basis, is defined in 14 CCR § 895.1.”

PRESCRIBED FIRE AND PILE BURNING

There are generally three things that must be done in order to use fire during land management activities. Approval from the GSLC, burn permits must be obtained, and activities must comply with the Air Resources Board. If just piles of slash are proposed for burning, then the following items will be needed to be completed prior to ignition:

- Forest Management activities that may include prescribed burning (including those under a Vegetation Management Program (VMP) contract with Cal Fire), pile burning, or other use of fire may require prior approval by GSLC.
- Obtain a Cal Fire Burn Permit from the local Cal Fire Unit at Hilton or in Santa Rosa.
- Submit a permit application with the Northern Sonoma County Air Pollution Control District: <https://www.nosocoair.net/permits.html>
- Follow the permits instructions for building piles.
- On the day before the burn is to occur, call in after 5 PM to see if it is a burn day or not. That number is (707) 565-2876.
- You must then register your burn with Cal Fire at (707) 565-1700 the day of the fire (prior to lighting).

If you are going to do a prescribed burn, where fire will be broadcasted across the landscape, many additional steps are necessary. It will be important to work with Cal Fire and their Vegetation Management Program (VMP). Cal Fire can help with training of staff on how to use fire, train personnel on fighting fire, and also take the lead on burning. These items will all be important in getting a burn program established. This Forest Management Plan can be the basis for a VMP project.

There are many potential uses of fire on Wildwood. The following is a brief list of some of the uses that are known as this time, but it is very likely that this list will grow with time:

- Burning of debris and slash
- Management of oak woodlands
- Maintenance of grasslands.

ROAD WORK

Approval from GSLC is necessary prior to constructing new trails or reconstructing, realigning, or expanding existing roads.

If done outside of a Timber Harvest Plan, roadwork may require a permit with Sonoma County PRMD and if a crossing is involved, CDFW.

The following is from Sonoma County PRMD's web page (<https://sonomacounty.ca.gov/PRMD/Eng-and-Constr/Grading-and-Storm-Water/Grading-Permits/>):

Grading permits are required in order to:

- *Maintain standards for grading activities.*
- *Prevent and minimize hazards to life and property.*
- *Protect life and property from flooding and drainage hazards.*
- *Protect the safety, use, and stability of public rights-of-way and watercourses.*
- *Protect against the destruction of archeological and biotic resources.*
- *Protect against soil loss and pollution of watercourses.*
- *Protect streams, lakes, ponds, and wetlands.*

A grading permit is required prior to commencing any grading or related roadwork, including preparatory site clearing and soil disturbance, except where exempted from permit requirements by [Sonoma County Code section 11.04.010.A](#). A grading permit is required when any of the following conditions apply:

- Cut or fill exceeding 50 cubic yards.
- Cut or fill greater than 3 feet in depth.
- Cut creating a cut slope greater than 5 feet in height and steeper than 2 units horizontal to 1 unit vertical.
- Fill intended to support a structure or surcharge greater than 1 foot in depth or placed on terrain with a natural slope steeper than 15 percent.

As mentioned above if a culvert (or bridge) is involved or needs to be replaced CDFW must be consulted with for the need of a Lake & Streambed Alteration Agreement (also called a 1600 permit). This is a special permit within CDFW. There is a fee associated with this process. The notification and development of a 1600 permit takes a minimum of 60 days, so planning is important to this process.

QUARRYING

There is a potential for year-round use of the roads on Wildwood. Over time, it is going to be important to rock roads for year-round access. The closest quarry open to the public is in Cazadero, and rock is very expensive, so it might be easiest to develop a source of rock on Wildwood. To develop a quarry would

require approval from the GSLC, as well as County, and SMARA permitting. SMRA permitting stems from The Surface Mining and Reclamation Act of 1975.

OTHER USES

There are land management practices that, in addition to standard CEQA permitting, are governed by other State and County regulations. Specifically, the Sonoma Counties Riparian Ordinance must be considered when planning CFIP projects on Wildwood. As it may change in the future, please check the following website for changes: <https://sonomacounty.ca.gov/PRMD/Regulations/Riparian-Corridors/>.

The Sonoma County Riparian Ordinance currently reads as follows:

The following activities and uses may be allowed within a streamside conservation area, if allowed by the base zone and any combining zones, subject to any required permits and the standards specified in this section. These activities and uses shall also be conducted and maintained in compliance with any prohibitions, permits, approvals, or authorizations required by applicable resource agencies.

- A. *Stream maintenance and restoration carried out or overseen by the Sonoma County Water Agency.*
- B. *Levee maintenance.*
- C. *Invasive plant removal, such as Himalayan blackberry (*Rubus armeniacus*), giant reed (*Arundo donax*), salt cedar (*Tamrix sp.*), and star thistle (*Centaurea solstitialis*), not exceeding five (5) acres in disturbed area, principally involving hand labor and not using mechanized equipment.*
- D. *Streamside maintenance and small riparian habitat restoration not exceeding five (5) acres of disturbed area, principally involving hand labor and not using mechanized equipment, as described by State CEQA Guidelines Section 15333, subject to a zoning permit.*
- E. *Stream dams and stream-related water storage systems, subject to a zoning permit.*
- F. *Road and utility line crossings in compliance with county road construction standards and maintenance guidelines, subject to a zoning permit.*
- G. *Fencing and maintenance of existing outdoor activity areas, such as yards, gardens, and landscaped or natural vegetation, associated with a legally established structure or use and not involving further encroachment into existing riparian vegetation.*
- H. *The following agricultural activities, provided that they are conducted and maintained in compliance with agricultural best management practices developed or referenced by the agricultural commissioner, or defined in a farm or ranch water quality plan acceptable to the agricultural commissioner. The agricultural commissioner shall determine the applicable agricultural best management practices and shall enforce the provisions of this subsection.*
 - 1 *Grazing and similar agricultural production, not involving cultivation or structures. Livestock control fencing and watering facilities are allowed.*
 - 2 *Agricultural cultivation and related access roads, drainage, planting, seeding, fertilizing, weeding, tree trimming, irrigation, and harvesting that do not involve the removal of existing contiguous riparian vegetation within two hundred feet (200') of the top of the higher bank, and are located as follows:*
 - a) *No closer than one hundred feet (100') from the top of the higher bank in the 200-foot riparian corridor for the Russian River;*
 - b) *No closer than fifty feet (50') from the top of the higher bank in the 100-foot riparian corridors designated in the General Plan and the upland areas of the 50-foot riparian corridors; or*

Reporting Income from Cost-share Programs

There are numerous issues surrounding the subject of taxation regarding Wildwood; 501c3 status, applying for state and federal cost shares, harvesting timber, purchasing and selling land, estate planning, and working on improving the property.

Wildwood is currently zoned “RRD B6 160, RC50/50”. The Foundation is in the progress of changing the zoning to TP, Timber Production Zone. The tax rate you pay is based on this zoning.

All income/reimbursement received from the state through the CFIP Program for future projects must be reported on State and Federal income reports. The same will apply for projects that are funded by the NRCS through EQIP. Wildwood Conservation Foundation should keep all invoices from contractors and make sure that this information is present in the annual taxes. We would strongly recommend that you talk with a CPA about this issue if you file your own paperwork. It can be a very complex situation.

The Forest Service has published a series of helpful publications on forest taxation:

<https://www.timbertax.org/publications/aghandbook731/>

https://www.timbertax.org/taxpolicy/FS_Landowners_Tax_Guide.pdf

<https://www.timbertax.org/publications/fs/EstatePlanningforForestLandowners/>

Please remember that rules and regulations regarding timber taxation can change annually.

Records of Forest Activities

Keeping accurate records of forest stand data and forest treatments is a key component of good forest management. These records will map the management activities used to meet restoration goals and will also provide evidence that management activities comply with the standards and requirements of the Conservation Easement. These records will contain sensitive information about the property, including location of protected sites and proprietary practices used by the land managers. This information should not be made available to the general public.

A large portion of this management plan is focused on organizing and documenting current stand condition and related information. Our office keeps records and maps of various management activities. Forest landowners should keep records of forest management activities including: planting areas and numbers of trees planted; areas where TSI has been done; areas pruned; firebreak construction locations. See Appendix 2a – Management Activity Decisions, Schedule & Tracking for template for record keeping.

Government Cost-Sharing Programs

Some forest improvement projects are eligible for cost sharing from the California Forest Improvement Program (CFIP) or the NRCS through EQIP Funding. When funds are available, current rates pay up to 75 percent of projects costs of planting, thinning and release, pruning and stream restoration. Actual cost share percentages and rates per acre range from year to year. The California Department of Forestry or a Consulting Forester should be contacted for current information.

As a forestland owner, the roadwork mentioned above could be offset by a cost share, as the improvements would reduce erosion, increase fire protection activities, and access. Additionally, many forest health improvements; fuel reduction, or planting projects would also qualify for CFIP or EQIP funding.

Table 4: Agency Assisted Forest Improvement Projects

CFIP FIP Projects- Prioritized	Description	2018-2019 Estimated Cost (per acre)	NRCS-EQIP Ranking Category Practice Code
<p align="center"><u>TSI Projects</u> RELEASE PRE-COMMERCIAL THINNING SITE-PREP PRUNING (Shaded Fuel Break when combined with FOLLOW-UP treatment)</p>	<p align="center"><u>Project size minimum 5 acres under the CFIP program</u></p> <p>Mechanical treatment to fall, buck and lop or chip dead and dying conifers or hardwoods. See forestry assistance management recommendations, below.</p> <p>Remove all dead and dying trees. Chip slash material to increase soil moisture retention and reduce erosion (Follow-up). Treat with planting and/or other follow-up projects for increased project effectiveness (see follow-up, below).</p> <p>Shaded Fuel Break attained through a combination of treatments along main roads and ridgelines. For at least 30 feet on each side of the roads, trails and ridgetops: remove brush, dead or dying or overstocked trees (Release and/or Pre-commercial thinning), pruning limbs up to 16 feet and thin thickets of small trees (Pruning), both conifers and hardwoods. All debris generated should be treated with a follow-up practice; piled and burned, lopped to the ground, or chipped (See Follow-up, below).</p>	<p align="center">\$700-\$2,400</p>	<p align="center">7a, 8 & 10a 666</p>
<p align="center">FISH and WILDLIFE IMPROVEMENTS</p>	<p>Road upgrades and re-opening is best executed with assistance from NRCS-EQIP Correction of road drainage problems, including rocking, out sloping, berm removal, waterbar installation, and ditch repair:</p> <p>Install waterbars, spaced between 50 and 150 feet depending on percent slope of the road and according to the Forest Practice Rules.</p> <p>Replace undersized culverts with those of appropriate diameter and length (See Road Assessment, below).</p>	<p align="center">Waterbars: \$4,300-\$6,000</p> <p align="center">Culverts: \$5,900-\$8,900</p>	<p align="center">2c 560</p> <p align="center">2c 578</p>
<p align="center">PLANTING</p>	<p>The purchase of tree seedlings or seeds, the costs of transporting and storage of seedlings, and the planting costs are all eligible.</p> <p>Inter-plant (a minimum of 5 acres or 300 trees) where dead and dying trees are removed. Plant (or inter-plant) native conifers and/or hardwoods grown from seed developed for your zone (095) on a 12x12 spacing and apply a follow-up project within five years to determine survival.</p>	<p align="center">\$600-\$1,500</p>	<p align="center">6a 612</p>
<p align="center">FOLLOW-UP</p>	<p>Category 1) follow-up for release: Treat slash by chipping, pile and burn or mastication.</p> <p>Category 1) follow-up shaded fuel break or Planting in 3-4 years to ensure project success.</p>	<p align="center">\$375-\$1,150</p>	<p align="center">11a 384, 315</p>

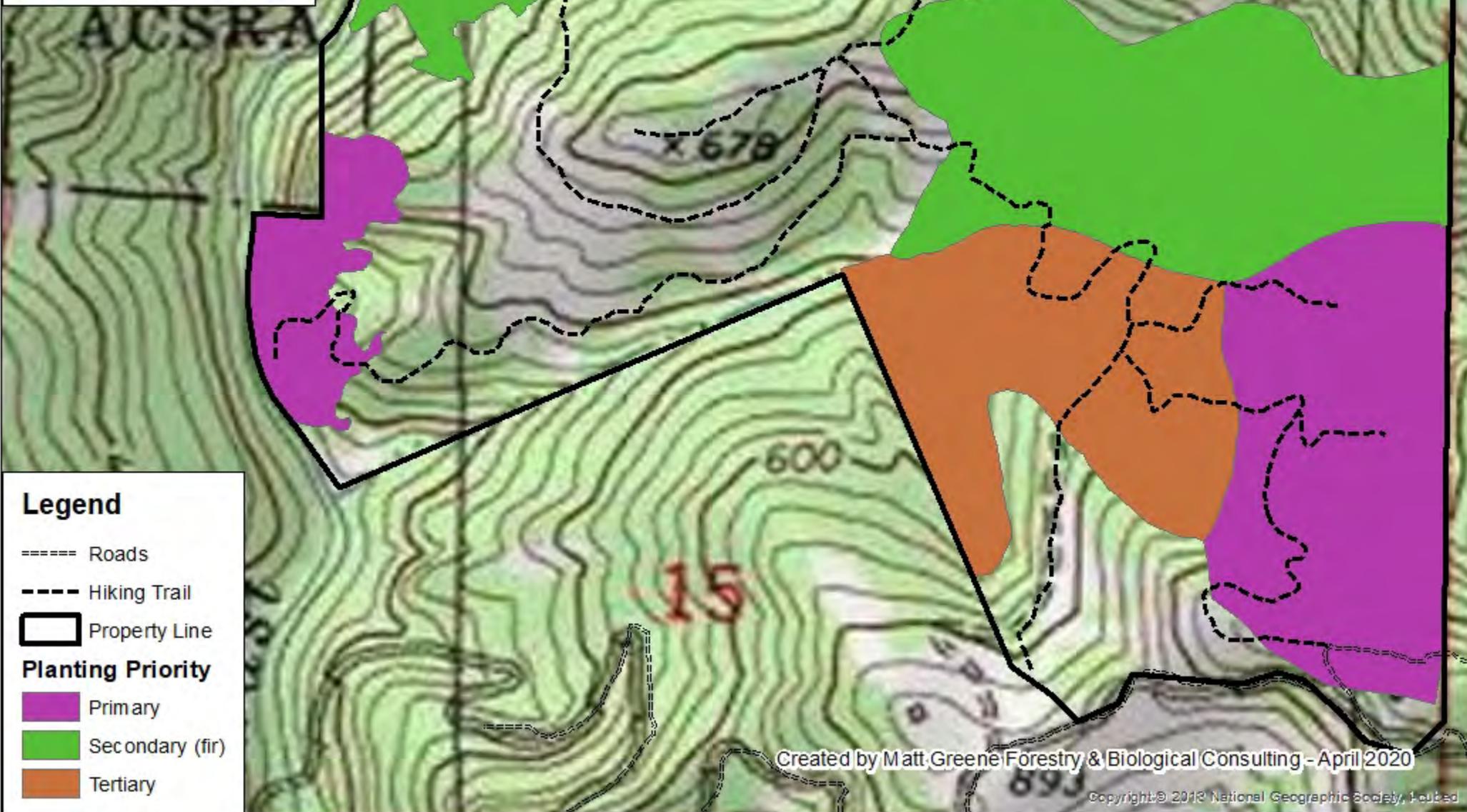
Planting Map

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 500 feet

0 200 400 800 Feet



Legend

----- Roads

----- Hiking Trail

Property Line

Planting Priority

Primary

Secondary (fir)

Tertiary

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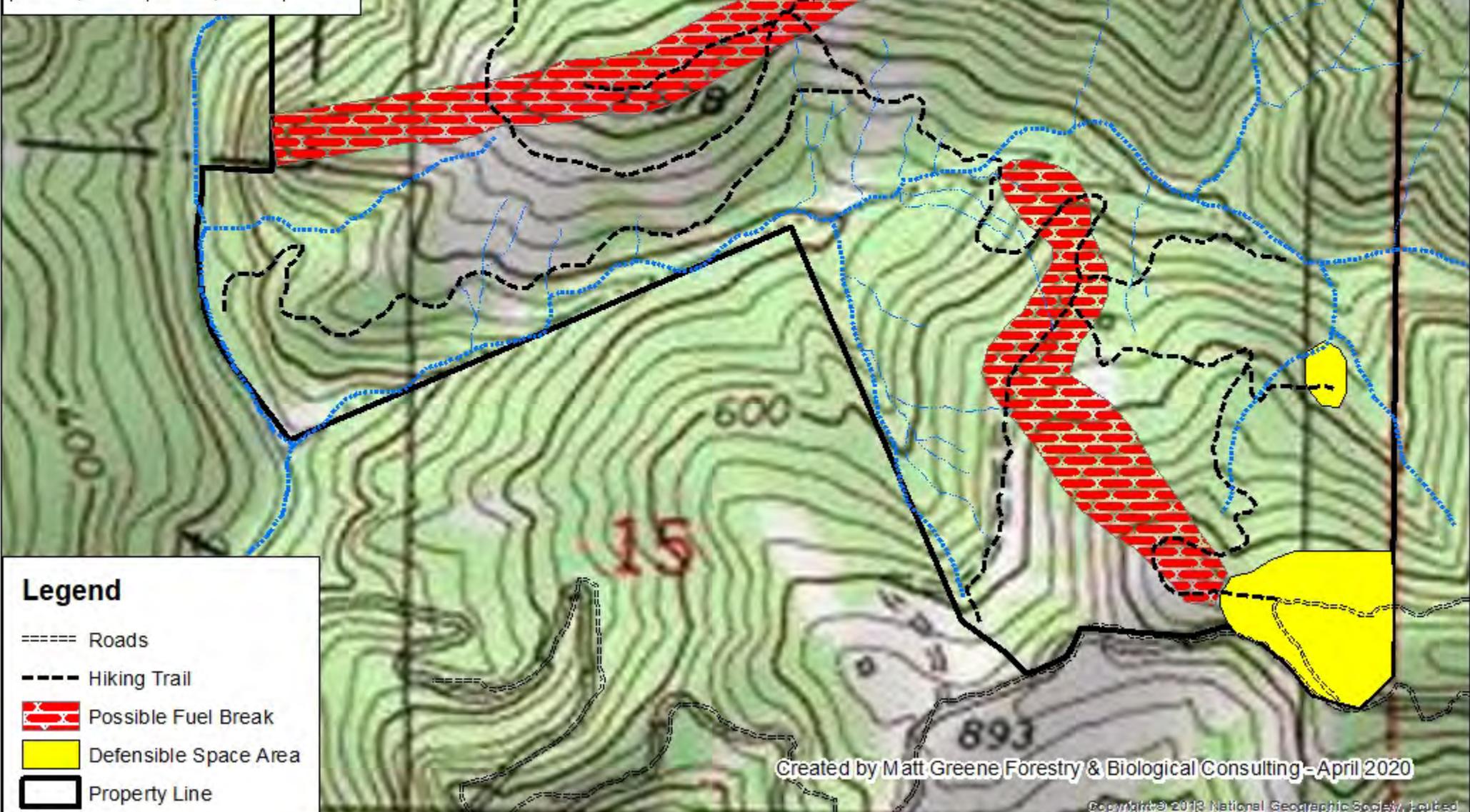
Fuel Break Maps

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 500 feet

0 250 500 1,000 Feet



Legend

- ==== Roads
- Hiking Trail
-  Possible Fuel Break
-  Defensible Space Area
-  Property Line

Created by Matt Greene Forestry & Biological Consulting - April 2020

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Forest Improvement Projects

Timber Stand Improvement (TSI) work increases the growth of the preferred trees and improves the overall quality of the timber stands. These practices are also beneficial for fuel reduction measures, adjusting species composition, improving access to the property (and thus recreational opportunities as well), improving wildlife habitat, as well as improving water quality.

TSI work is normally performed by hand, with chain saws and/or other tools. Sometimes heavy equipment is used to complete this work. Products from these small-scale projects generally have low economic value and will be best used on the property. Occasionally some of the cut trees can be salvaged for use as firewood.

Five (5) acre or larger projects that include Release, Pre-commercial Thinning, Pruning, Site-Prep, and Follow-up practices qualify for cost-share assistance from CFIP or EQIP. These practices can be implemented to both improve forest health and reduce fuel for protection from wildfire. The following TSI practices are defined to CalFire's standards, but can also be adapted for EQIP, or to meet the objectives of the CE:

RELEASE OR THIN AND RELEASE

Release involves removal of non-commercial tree species, shrubs/brush or grasses that are competing with previously planted or existing commercial tree species.

Small hardwood trees competing with the conifers should be removed during this TSI project. These trees can be lopped in place and left to decompose or piled in a safe place to burn. When planted trees are about 3 to 5 years old it is a good time to remove the hardwood competition. Generally, by the time the hardwood sprouts grow back again the conifers can more easily out compete them, however in this area hardwoods have been a dominant component for decades and follow-up practices may be necessary to ensure successful conifer regeneration. Removal of tanoak should be carefully considered due to anticipated significant decline of this species due to SOD.

Cost share rates for CFIP funding vary depending on terrain and density. Sites that are on gentle slopes with moderate stocking versus densely stocked and/or very steep sites. Because of the stand density and slope, Wildwood Conservation Foundation qualifies for the higher rate.

PRE-COMMERCIAL THINNING

When thinning stands of conifer trees that are growing too close together, the most vigorous and best formed of the young trees are selected as leave trees. Less vigorous and poorer quality trees are removed. When this practice is implemented in young stands, the trees should not be thinned to more than 8 to 10 feet apart. Later when the trees are 6 to 10 inches in diameter, they can be thinned to 12 to 14 feet apart.

In uneven-aged managed stands it has been shown that early thinning of stump sprouts (within 2 years) will not provide much benefit. It is better to wait 4 or 5 years to thin redwood stump sprouts. At that time, the sprouts could be thinned to the best 2 or 3 sprouts around each stump. Trees growing directly out of the top of old stumps should also be removed. These trees have a weak connection to the root system, often have slower growth, and are the most vulnerable to falling over before they reach maturity.

PRUNING

In high use and high aesthetic value areas, pruning the lower limbs to as high as 20 feet greatly improves aesthetics. Trees as small as 3 inches in diameter can be pruned. Pruning will raise the economic value

of trees when they become fully-grown and will increase fire protection by reducing ladder fuels. No more than 50 percent of the tree crown by volume or one-third by height should be removed at one time. Remove the highest branches you wish to remove prior to pruning the lower branches. This prevents over pruning. Limbs should be cut flush to the bark or limb collar, but not into the bark or limb collar.

Even when hardwoods are outcompeting conifers, causing the conifers to be suppressed, the goal for forest improvement should not be to remove most hardwoods. All tree species 24 inches in diameter and larger will help maintain an overstory. This overstory is important to reduce evaporation from the soil surface keeping conditions cool and moist for conifer seedlings. Pruning the larger trees left in the stand will open the understory decreasing ladder fuels and opening space for conifers to grow.

Pruning may be funded through CFIP in conjunction with Site Preparation, Pre-Commercial Thinning, or Release. Rates increase based on the minimum number of trees pruned per acre.

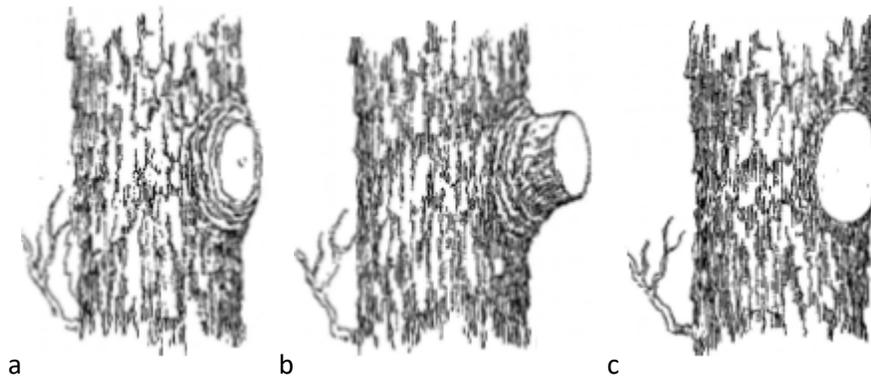


Figure 7: Redwood should be pruned as shown in (c) above. For all other species a properly executed cut (a) is made close to the trunk but does not disturb the branch collar. Other species cannot heal itself if the final cut results in a stub (b) or is made too close to the trunk (c).

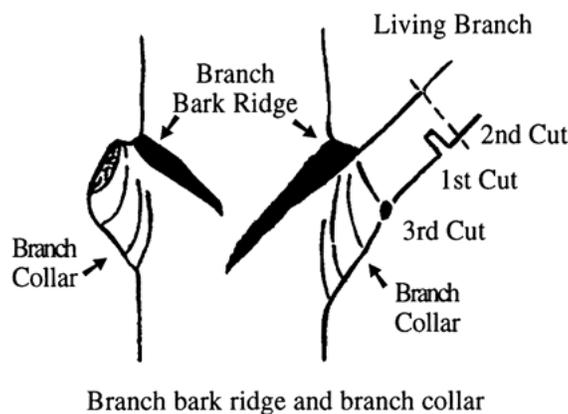


Figure 8: To remove heavy branches that might tear the bark below the branch collar, make three cuts in the order indicated.



Photo 8: A larger redwood with ladder fuels pruned.

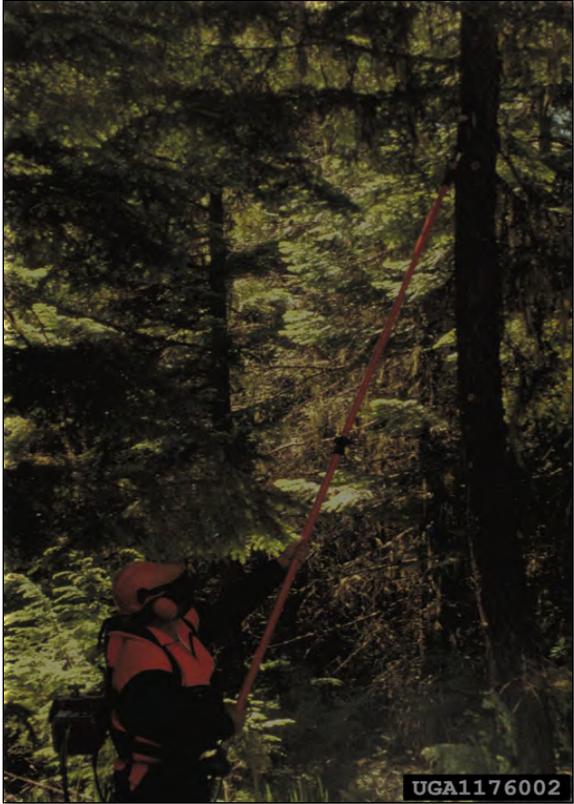


Photo 9: Pruning a smaller Douglas-fir. Courtesy USDA and Chris Schnepf, University of Idaho.

CONIFER PLANTING

The small openings created by forest improvement activities, within the conifer forest types, should be planted with conifer seedlings where stocking is not sufficient. (Stocking is the ecologically viable number of trees per acre for a given site.) Planting should be done the first winter after operations are completed.

Other openings on the property, created by legacy timber harvest, or mortality should be considered for planting to expand and diversify the conifer distribution. These areas should be closely analyzed prior to clearing or planting to determine if the site will support conifers and, if so, which species should be planted.

Seedlings should be genetically matched to the site and be grown from a local seed source. Fifteen to 17 inch plugs sourced from Sonoma or Marin Counties (seed zone 095 or 360) is preferred for redwood and Douglas-fir on Wildwood. If bare rootstock cannot be found, then the largest plug stock that can be found should be purchased. In addition, seed from local seed stock should be planted. Seed from further north will not grow nearly as well or possibly, not at all, as Wildwood is drier and warmer than areas further north.



Photo 10: A 1-year old plug redwood tree.

It is becoming increasingly difficult to contract and grow these trees, however it is important to plan these reforestation efforts with CalFire and your forester and avoid planting generic stock of an unknown origin. Matt Greene Forestry & Biological Consulting annually contracts the growing of seedlings. If we know there is a need for seedlings in January or February, we can get trees growing for your projects to plant the following year.

A good tree-planting program will expand the acreage covered in conifer (particularly redwood) and will increase the percentage of redwood in the stand. Seedlings are planted at a rate of 300 per open acre (12 by 12-foot spacing).



Photo 11: Eight-year-old redwood trees growing in a converted grassy opening. These trees have also been pruned once and are growing in a 12-foot X 12-foot spacing.

Oak seed is best sourced while still on the tree, but harvested as the acorns begin to fall. This will minimize insect damaged seed stock. Seeds can be sprouted in sterile soil, in tall narrow containers, and planted with the ground tree guards at 2 years of age.

More on oak regeneration at US Forest Service Pacific Northwest Research Station website:

https://www.fs.fed.us/pnw/pubs/pnw_gtr804.pdf

SHADED FUELBREAKS

All main truck roads and some skid trails can be treated as shaded fuelbreaks. This involves removing brush and dead or dying trees, pruning limbs up to 20 feet and thinning thickets of small trees, both conifers and hardwoods. All of these activities should be done for 30 to 150' feet on each side of the road. All debris generated should be piled and burned, lopped, to the ground, or chipped. Roads adjacent to watercourses should have specialized prescriptions to account for WLPZ regulations.



Photo 12: Roadside fuelbreak on a driveway into a residence, completed two years earlier. All of the trees have been pruned and there is still a continuous canopy overhead to limit sprouting.

In a WLPZ, the shaded fuel break cannot be implemented with heavy equipment (such as a masticator) but can be implemented with a hand crew. The treatment is limited to reduction of brush and dead trees and should not affect overall canopy. Pruning, chipping and burning of material should be limited in this area, and woody debris must not be allowed to enter the watercourse.

The benefit of a shaded fuelbreak is the reduction of a fire hazard by breaking the continuity of fuels on the lower portion of the canopy. This provides a place where a fire can be slowed down and then contained where fire equipment has access. Aesthetic benefits are also achieved by creating a shaded fuelbreak, a more open and park-like stand.

As discussed above, shaded fuelbreak can be implemented as a CFIP project through a combination of TSI practices; Pre-Commercial Thinning if the trees under 24 inches are conifers or Release understory is mostly hardwoods and/or brush. Lop and Scatter is the expected slash treatment rolled into the cost-share for these projects. A Follow-up/Slash Disposal treatment can be added to the project to include pile and burn or chipping to process the slash. This Follow-up activity will increase project cost, but may be desirable in areas with high scenic value.

The map on the following page shows several logical, potential locations for shaded fuel breaks.

Shaded fuel breaks should be maintained so that roads can be kept open and passable for fire protection. Clearing of shrubby re-growth and pruning of trees that have grown into the 3" BDH category should occur approximately 3 to 5 years after the shaded fuelbreak is installed and then about every five years.

The following before and after photos demonstrate two (2) examples of fuels reduction projects in the neighboring area.



Photo 13: Heavy combustible fuels prior to treatment, Stand A.



Photo 14: Heavy combustible fuels prior to treatment, Stand B.



Photo 15: Stand A (in photo 19) after treated with a shaded fuelbreak.



Photo 16: Stand B (in photo 20) after treated shaded fuelbreak.

TREATMENT OPTIONS AND COST

Mechanical Thinning-Chainsaw:

Using a chainsaw to reduce overstory tanoak by 50% and most all of the understory tanoak and brush. The result of this treatment is slash left on the forest floor.

Cost: About \$800 an acre for initial thinning.

Mechanical Thinning-Mastication:

Using a machine called a masticator to reduce wood fiber to smaller pieces by crushing tree limbs and smaller trunks through two rotating steel drums. The result is a mulch like material that covers the forest floor and is a drastic reduction in the standing fuel load. The masticator can only work on slopes up to 30% and it will take longer to process denser vegetation. Existing skid trails (with slopes under 30%) will increase masticator capability.

Cost: \$1,500 – \$2,500 an acre depending on terrain, access and vegetation density.

Slash Treatment Options

Pile and burn: This method would require an agricultural burn permit from the Northern Sonoma County Air Pollution Control District (NSCAPCD). (See information in LOCAL AGENCY AND ORGANIZATION ASSISTANCE.) Pile size and burn days are limited to the requirements of the permit. Char produced from burn piles can increase water holding capacity and nutrient value in soils. Burn piles can also sterilize the soil killing seeds of invasive species or pathogens. Pile burns can result in a release of volatile compounds so care should be taken to omit noxious plants such as poison oak.

Lop and scatter: Severing and spreading of slash so that no part of it remains more than 30 in above the ground. Slash will break down adding organic nutrients to the soil.

Chipping: Using a machine to chip all material and spread on site. This is an expensive option if purchase or rental of a commercial grade chipper is necessary. Chips can aid in erosion control by protecting exposed soil from rainfall. Chips will break down adding organic nutrients to the soil.

Summary

As seen above, mechanical thinning of hardwoods is labor intensive, expensive, and time consuming. The costs of mechanical treatments can range from \$500 per acre (where the ground is flat and the vegetation is light) to up over \$2,000 per acre to treat depending on topography, tree density and size, and access.

Unfortunately, a single mechanical thinning treatment will not ensure an increase in forest health because tanoak stumps will re-sprout when cut. Follow up activities will be required every 3 to 5 years to maintain the natural balance of conifer and hardwood trees per acre if treatment includes using only mechanical means until such a time, as the conifers grow large enough to shade out the sprouts.

PRESCRIPTIVE GRAZING

An alternative to traditional vegetation control (especially for fire safety) is to implement prescriptive grazing on the property. This is a historic land use, but may be prohibited by the GSLC.

This type of project generally utilizes sheep and goats as the grazers and browsers. The type of grazing proposed is high occupancy, low duration and involves constant movement of animals restricted with portable fencing. It is fairly labor intensive, and infrastructure for this project can be costly and requires maintenance, so you might consider combining resources with your neighbors to initiate a cooperative grazing program on neighboring ranches. Wildwood Conservation Foundation could generate extra income by developing the infrastructure, then leasing the operation to nearby ranches (or possibly the State Park).

The benefits to including grazing livestock on forested landscapes include: Reduction of ladder fuels that contribute to crown fire danger; a less noisy and fossil fuel consuming alternative to mowing, improved pasture health: livestock produce nitrogen rich manure encouraging the grasses root deeper into the soil where they will stay green longer into the summer and green up earlier in the fall (decreasing fire danger); carbon sequestration; production of local, chemical free, healthy meat; potential to provide a more historic carbon cycle creates a habitable environment for native plants; an increase in native plants may lead to an increase in wildlife that will utilize the grass lands and forest edges.

A project of this type may qualify for match funding for water tanks, fencing, pasture seeding and water troughs. This is an agricultural grant through NRCS-EQIP (Environmental Quality Incentives Program); implementing grazing with EQIP protocols, qualifies agriculture producing landowners for these funds for “improving” the land. There is an NRCS office in Petaluma, which could offer assistance. The contact information if you are interested in listed below in the Local Agency and Organization Assistance section of this FMP.

A very good resource is Sonoma County RCD’s Grazing Handbook which is available online at: [Http://sonomarc.org/wp-content/uploads/2017/06/Grazing-Handbook.pdf](http://sonomarc.org/wp-content/uploads/2017/06/Grazing-Handbook.pdf)



EXOTIC SPECIES CONTROL

There are several undesirable plant species in the North Coast forest. These species are non-native and they often compete with native vegetation and degrade wildlife habitat. Many have the propensity to spread rapidly. Below is a list of the most common exotic plants found in or adjacent to forestlands:

- Algerian ivy (*Hedera canariensis*)
- Bailey acacia (*Acacia baileyana*)
- English ivy (*Hedera helix*)
- French broom (*Cytisus monspessulanus*)
- German ivy (*Senecio mikanoides*)
- Gorse (*ulex europaea*)
- Monterey pine (*pinus radiata*)
- pampas grass (*Cortaderia jubata*)
- periwinkle (*Vinca major*)
- Scotch broom (*Cytisus scoparius*)
- Star Thistle (*Centaurea solstitialis*)

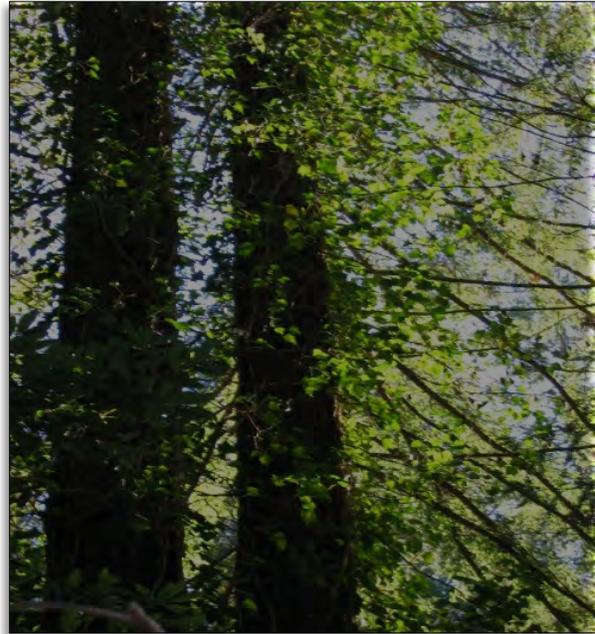


Photo 17: German Ivy growing in a redwood tree. This is on a nearby property.

None of the species above was observed during the 2020 surveys for this Plan; however, that does not mean they will not be found in the future.

Forestlands, grasslands, and wildlife heath can be severely burdened by invasive species. You should



Photo 18: Pampas grass in the center surrounded by French broom on a coastal property.

attempt to manually or chemically clear as many of these plants as possible; especially broom and pampas grass on forest edges. Where manually clearing is not feasible, herbicide application (by a licensed applicator) may be appropriate. See above for discussion of use of herbicides. These plants and their seeds are also located on nearby properties. It can take decades of active management to eliminate these exotics, so it is best to survey as much of the property as you can annually and remove these invasive as soon as you find them. They are easiest to remove by hand when small and after the first couple of good rainstorms each fall. Do not confuse pampas grass with native sedge grass or bear grass. See the California Invasive Plant Council or California Native Plant Society for photos to help ID and control these plants;

<https://www.cal-ipc.org/>

<http://www.cnps.org/>

Roads and Access

Access is the key to almost all recreation and management activities. Roads are also valuable for fire suppression. Road maintenance must be performed regularly to insure their long-term stability and benefit. Road maintenance work includes:

- install, replace and maintain culverts as needed
- maintain waterbars, ditches and rolling dips
- eliminate road berms
- clear bank slumps on roads
- close secondary roads in the winter that are susceptible to vehicle damage

All encroachments should be gated and posted "No Trespassing" to control unwanted uses of Wildwood Conservation Foundation and protect the property owners' rights against trespassers. The Easement allows, "signs, including 'no trespassing' and 'no hunting' signs, that do not exceed two (2) square feet in size each".

Exterior gates and fences must be maintained. Gates should be kept closed and locked. Sonoma County sheriff's department has developed a program to help landowners who are victims of rural crimes including trespassing, theft of agricultural and forest products, vandalism, etc. and should be contacted if such events occur.

ROAD CONDITION

Some of the current road infrastructure is not sufficient in the event that you decide to use heavy equipment (i.e. fire truck for prescribed fire). The roads will need to be repaired or upgraded in several areas. The existing roads should have been built with an out sloped shape and have erosion control structures (with proper spacing) installed. Roads should not have been built near watercourses unless it was to cross the watercourse. Roads should act as firebreaks as well.

It is very important to work to prevent excess sediment from entering your watercourses. They all lead to important habitat for several endangered species. Reducing sediment will increase water quality in your watercourses and the coastline keeping these areas healthy and habitable for several aquatic and terrestrial species.

The following pages contain the road inventory for Wildwood; it is a list of things that will should be done in order to keep the current road usable and to avoid excess erosion. Each point corresponds to a point on the map on the following page. Additionally, a few loads of rock could also be placed on the roads to help reduce erosion and maintain long-term access and use of Wildwood.

Road fixes can require a county grading permit if more than 50 cubic yards of soil are moved and the work is conducted outside of a harvest notification. Some repairs might qualify for a NRCS-EQIP cost-share grant. If a culvert is replaced, it could require a Department of Fish and Wildlife Lake and Streambed Alteration Agreement. We have tried to note where we think this will be an issue; however, it is not always a sure thing when dealing with the Department of Fish and Wildlife.



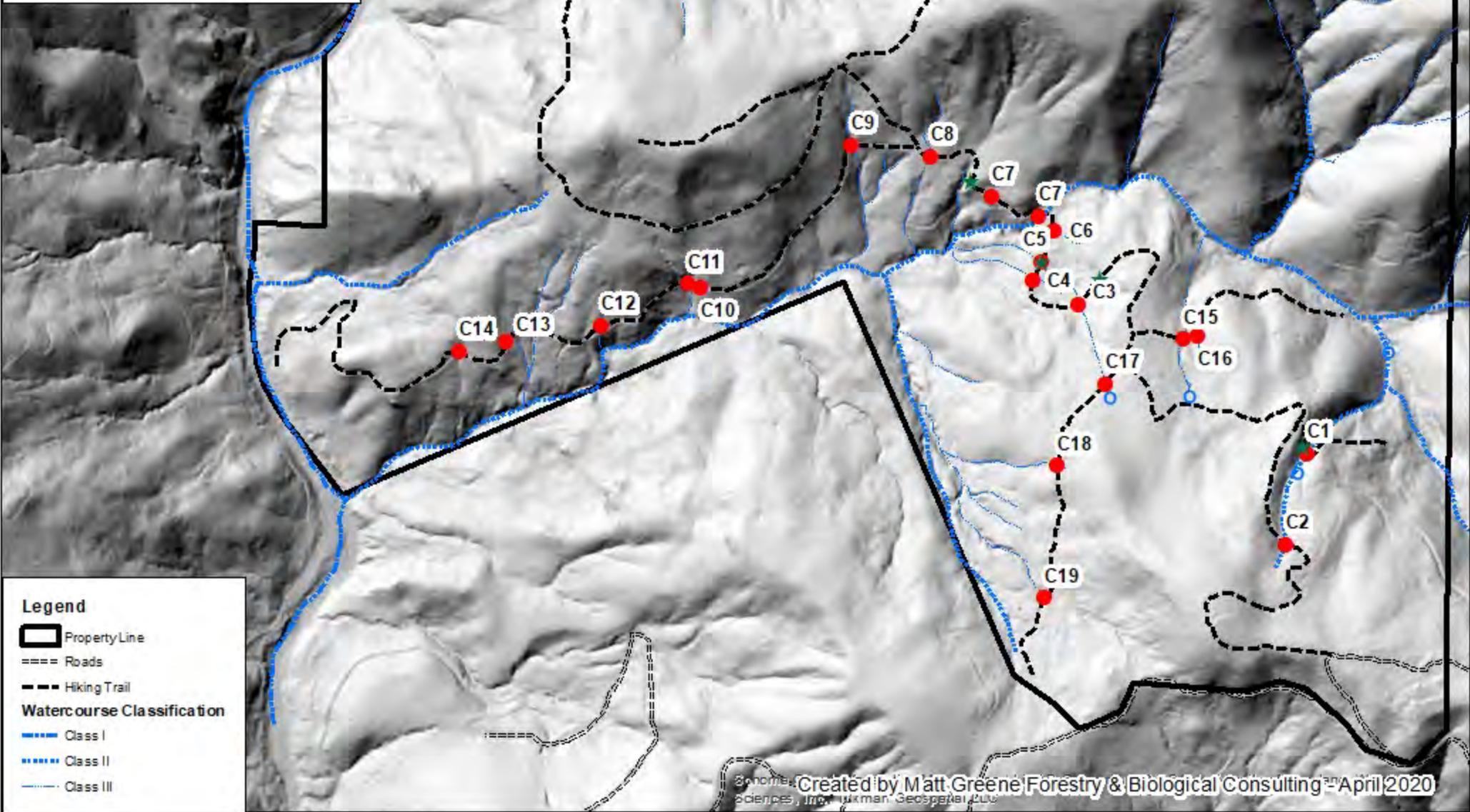
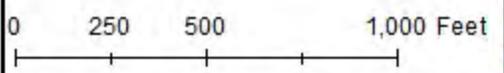
Photo 19: Example of posted "No Trespassing"

Erosion Control Points Map

Wildwood Conservation Foundation
Sonoma County, CA

Sections 15
T8N, R11W MDB&M

Scale
1 inch = 500 feet



Legend

- Property Line
- Roads
- Hiking Trail
- Watercourse Classification**
- Class I
- Class II
- Class III

MAP POINT/WORK ORDER TABLE KEY

(Note: Table and map follow)
In the table, identify all that apply

SITE DESCRIPTION

OK Functional Site
CSDS Controllable Sediment Discharge Site
UA Unstable Area
O Other descriptors than below
(describe under Measures on table)

ROADS/SKID TRAILS

CRN Critical dip needed
CUTF Cutbank failure
FF Fill failure
FP Fill perched
G Gully
L Landing
IDE Inside ditch eroding
RA Road abandonment
RC Road construction
RR Road reconstruction
RD Rolling dip
SK Skid Trail
WB Waterbar

WLPZs and WATERCOURSES

AP Alternative practice
FB Fish barrier
HE Habitat enhancement
IL In lieu practice
WD Water drafting
WCD Watercourse diversion

WDP Woody debris project

CROSSING TYPES

B Bridge
CR Crossing site
CRF Crossing Failure
CRP Crossing--existing permanent
CRT Crossing—existing temporary
C Culvert (also see below)
F Ford
HCR Humboldt Crossing
LSB Log stringer bridge
RRD Rocked Rolling Dip
SCR Spittler Crossings

CULVERT CONDITION

CAM Attachments missing (e.g. trash rack, downspout, etc.)
CD Damaged inlet or outlet
CDR Ditch relief needed
CF Failed/Failing
CFB Fish barrier
CFD French Drain
CNA Not aligned
CNG Not installed to grade
CE Outlet erosion
CS Outlet shotgunned
CP Plugged
CU Undersized

IMPLEMENTATION PRIORITY (IP)

High Mitigation applied in: 1st year after THP approval, 1st NTO, or as described in plan.
Med Mitigation applied concurrent with operations affecting site.
Low Mitigation applied prior to THP completion, or as specified in NTMP.

POTENTIAL SEDIMENT DISCHARGE

If located in the region of the North Coast Regional Water Quality Control Board, provide the following information in the associated table for each Controllable Sediment Discharge Source (CSDS) map point

- Potential Sediment Discharge (PSD): express in total cubic yards

4-25-13 VERSION

MAP POINT (MP) Identifier	SITE DESCRIPTION (SD) (See Key)	Watercourse CLASS (WC) or feature	EXISTING Culvert Diameter Size (EC)	PROPOSED Culvert Diameter Size (PC)	Geologist used? Yes or No	1600? Yes or No	Potential Sediment Discharge (PSD) in cu. yds.	Implementation Priority (IP) (See Key)
---------------------------	---------------------------------	-----------------------------------	-------------------------------------	-------------------------------------	---------------------------	-----------------	------------------------------------------------	----------------------------------------

MITIGATION AND/OR MANAGEMENT MEASURES: If needed, provide additional details of site; and/or describe proposed treatment

*NOTE: Write "NA" or "---" if a box is not applicable to the map point

MP: C1	SD: C	WC: III	EC: 8" perf pipe into 24" galvanized culvert	PC: 24"x20'	Geo Used? No	1600? No	PSD: 4 cu yd	IP: Moderate
--------	-------	---------	----------------------------------------------	-------------	-----------------	-------------	--------------	--------------

Mitigation/Management Measures: The existing culvert isn't a long-term solution. Should replace with new culvert or rock ford.

MP: C2	SD: C	WC: III	EC: 12" x 20'	PC:	Geo Used? No	1600? No	PSD: 2 – 4 cu yds	IP: Moderate
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Mitigation/Management Measures: Need to armor outfall.

MP: C3	SD: C	WC: III	EC: 6" plastic pipe	PC: Rocked ford or 18" pipe	Geo Used? No	1600? No	PSD: 2-4 cu yd	IP: Moderate
--------	-------	---------	---------------------	-----------------------------	-----------------	-------------	----------------	--------------

Mitigation/Management Measures: This culvert is too small. Should be replaced with an 18" culvert or larger or a rock ford.

MP: C4	SD: F	WC: III	EC: rock & concrete	PC:	Geo Used? No	1600? No	PSD: 4 cu yds	IP: Moderate
--------	-------	---------	---------------------	-----	-----------------	-------------	---------------	--------------

Mitigation/Management Measures: Need to armor outfall.

MP: C5	SD: F	WC: III	EC: rock & concrete	PC:	Geo Used? No	1600? No	PSD: 4 cu yds	IP: Moderate
--------	-------	---------	---------------------	-----	-----------------	-------------	---------------	--------------

Mitigation/Management Measures: Need to armor outfall.

MP: C6	SD: F	WC: II	EC: Rocked ford	PC: Bridge	Geo Used? No	1600? No	PSD: 0 cu yds	IP: Low
--------	-------	--------	-----------------	------------	-----------------	-------------	------------------	---------

Mitigation/Management Measures: Ultimately, this need to be a bridge that keeps vehicles out of the creek.

MP: C7	SD: F	WC: III	EC: dirt ford	PC: rock	Geo Used? No	1600? No	PSD: 4 cu yds	IP: Moderate
--------	-------	---------	---------------	----------	-----------------	-------------	---------------	--------------

Mitigation/Management Measures: This ford should be rocked in the future.

MP: C8	SD: F	WC: III	EC: dirt ford	PC: rock	Geo Used? No	1600? No	PSD: 2 to 4 cu yds	IP: Moderate
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Mitigation/Management Measures: This ford should be rocked in the future.

MP: C9	SD: F	WC: III	EC: dirt ford with logs on outside edge	PC: Rocked ford or 18" culvert	Geo Used? No	1600? No	PSD: 4 to 6 cu yds	IP: High
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Mitigation/Management Measures: This crossing needs to be upgraded to either a culvert or rock ford to make sure the road doesn't wash away.

MP: C10	SD: F	WC: III	EC: dirt ford	PC: rocked ford	Geo Used? No	1600? No	PSD: 4 cu yds	IP: Moderate
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Mitigation/Management Measures: This ford should be rocked in the near future.

MAP POINT (MP) Identifier	SITE DESCRIPTION (SD) (See Key)	Watercourse CLASS (WC) or feature	EXISTING Culvert Diameter Size (EC)	PROPOSED Culvert Diameter Size (PC)	Geologist used? Yes or No	1600? Yes or No	Potential Sediment Discharge (PSD) in cu. yds.	Implementation Priority (IP) (See Key)
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MITIGATION AND/OR MANAGEMENT MEASURES: If needed, provide additional details of site; and/or describe proposed treatment

*NOTE: Write "NA" or "---" if a box is not applicable to the map point

MP: C11	SD: C	WC: III	EC: 12" culvert	PC: 18" minimum	Geo Used? No	1600? No	PSD: 4 to 5 cu yds	IP: Low
Mitigation/Management Measures: This culvert is too small. In the future, it should be replaced with a minimum of an 18" culvert.								
MP: C12	SD: F	WC: III	EC: dirt ford	PC: rocked ford	Geo Used? No	1600? No	PSD: 4 to 6 cu yds	IP: Moderate
Mitigation/Management Measures: This ford should be rocked in the near future.								
MP: C13	SD: F/log bridge	WC: III	EC: log bridge	PC: 18 to 24" culvert	Geo Used? No	1600? No	PSD: 4 to 8 cu yds	IP: High
Mitigation/Management Measures: This crossing is piping under the logs and they will wash out soon. Need to improve this crossing.								
MP: C14	SD: F	WC: III	EC: dirt ford	PC: rocked ford	Geo Used? No	1600? No	PSD: 4 cu yds	IP: Moderate
Mitigation/Management Measures: Need to armor outfall and rock crossing.								
MP: C15	SD: C	WC: III	EC: 12"x20'	PC: 18"x20'	Geo Used? No	1600? No	PSD: 4 to 6 cu yds	IP: Moderate
Mitigation/Management Measures: This crossing is undersized and should be replaced in the future with a larger crossing.								
MP: C16	SD: F	WC: III	EC: dirt ford	PC: rocked ford	Geo Used? No	1600? No	PSD: 4 to 5 cu yds	IP: Moderate
Mitigation/Management Measures: Need to rock crossings and outfall.								
MP: C17	SD: F	WC: Spring	EC: dirt ford	PC: rock ford	Geo Used? No	1600? No	PSD: 2 to 4 cu yds	IP: High
Mitigation/Management Measures: This is the spring to try and develop. The ford should be rocked and a watertank can be placed nearby to pick up water.								
MP: C18	SD: F	WC: Spring	EC: dirt ford	PC: rock ford	Geo Used? No	1600? No	PSD: 2 to 6 cu yds	IP: High
Mitigation/Management Measures: This is the spring to try and develop. The ford should be rocked and a watertank can be placed nearby to pick up water.								
MP: C19	SD: F	WC: III	EC: dirt ford	PC: rocked ford	Geo Used? No	1600? No	PSD: 4 to 6 cu yds	IP: High
Mitigation/Management Measures: Need to rock ford.								

The current road infrastructure has been developed for ranching and historic timber harvests. The main roads have had some minor work done with regard to installing and maintaining erosion control structures (rolling dips, water bars, and other structures used to control runoff). In some cases, these structures are aging or were poorly maintained and will need some work to maintain access. Proper road maintenance is critical to long term reductions in erosion. Rocking roads where needed can also cut down on erosion, drainage and access problems. These roads and the above mitigations will work for ATV and side X side access. If future use includes vehicles (light trucks) or fire trucks, significant upgrading above and beyond is going to be needed for access. The main roads are 6 to 8 feet in width and will need to be 12 feet wide to facilitate access for these types of equipment. At this time (2020), property wide, there are 19 crossings; 5 crossings that should be re-installed and 11 crossings that need other maintenance.

As part of future management activities, additional tasks should be considered to maintain and/or improve the road and trail network; especially when heavy equipment is on the property. This will include rocking additional sections of your roads, installing rolling dips, critical dips, and out slopping sections of road in the areas where projects and equipment mobilization occur. Some of these structures may require CDFW Lake and Streambed Alteration Agreements (1600 permit). This is sometimes included with a project grant. On their own, the permitting cost is roughly \$2,500 per crossing.

The erosion hazard rating (EHR) for Wildwood was calculated during our field investigation. There are five soil types on the property as identified by the Soil Survey of Sonoma County, USDA; These soils two different erosion hazard ratings four that are moderate and one is extreme.

Soil Type	Erosion Hazard Rating
Hugo very gravelly loam, 50 to 75 percent slopes	Moderate
Hugo-Josephine complex, 50 to 75 percent slopes	Moderate
Laughlin loam, 30 to 50 percent slopes	Moderate
Maymen gravelly sandy loam, 30 to 50 percent slopes	Extreme
Yorkville-Laughlin complex, 30 to 50 percent slopes	Moderate

A High erosion hazard rating requires installing erosion control structures at a spacing of no further than 150 feet apart on most roads (300 feet for a Low erosion hazard rating). Many of the structures are in place, but need to be rebuilt or cleaned periodically out in order for them to work properly.

ANNUAL ROAD MAINTENANCE AND EROSION CONTROL MONITORING

Upon completion of each operation, roads and trails need be shaped and erosion control structures installed. Roads should be out slopped and perched fill should be reincorporated back into the road surface. Roads with a grade of 8% or less should have rolling dips installed and skid trails and steeper roads (greater than 8%) should have waterbars installed at a minimum of Forest Practice Regulations. In some places, it may be necessary to have erosion control structures at closer spacing.

Table 5: MAXIMUM distances between waterbars by road grade.

Gradient of Logging Road or Tractor Skid Trail				
EHR Rating	0-10%	11-25%	26-50%	>50%
	<i>(Most roads)</i>	<i>(Some roads)</i>	<i>(most tractor ground)</i>	<i>(cable & exceptions)</i>
Extreme	100'	75'	50'	50'
High	150'	100'	75'	50'
Moderate	200'	150'	100'	75'
Low	300'	200'	150'	100'

Annual road maintenance should include the following:

- Clean out culverts, this includes trash racks, downspouts and any other energy dissipation device.
- Make sure that rolling dips and waterbars are open and properly functioning.
- Clean out inside ditches.
- An annual road maintenance evaluation and monitoring program should be implemented.



Photo 20: Evidence of rutting, reeling and erosion on the road surface is a sign of non-existent or improperly spaced erosion control features.

The Forest Practice Rules require the landowner to maintain erosion control structures for 3 years following timber harvest. The California Department of Forestry and Fire Protection (CalFire) and the California Geological Survey (CGS) have found that most of the erosion in North Coast watersheds comes from roads and skid trails that are not properly maintained. An annual monitoring program should address the following issues:

- Inspect, clean and/or open up all erosion control structure (rolling dips, waterbars, culvert and berms) of leaves, sticks and debris, and sediment that have accumulated prior to the onset of winter.
- During the winter inspections should be made 2 or 3 times during peak events to ensure that erosion control structures are properly functioning.
- The need for any additional structures or facilities should be assessed (like culverts, downspouts, & trash racks).
- Clean up any slides or failures that may occur.

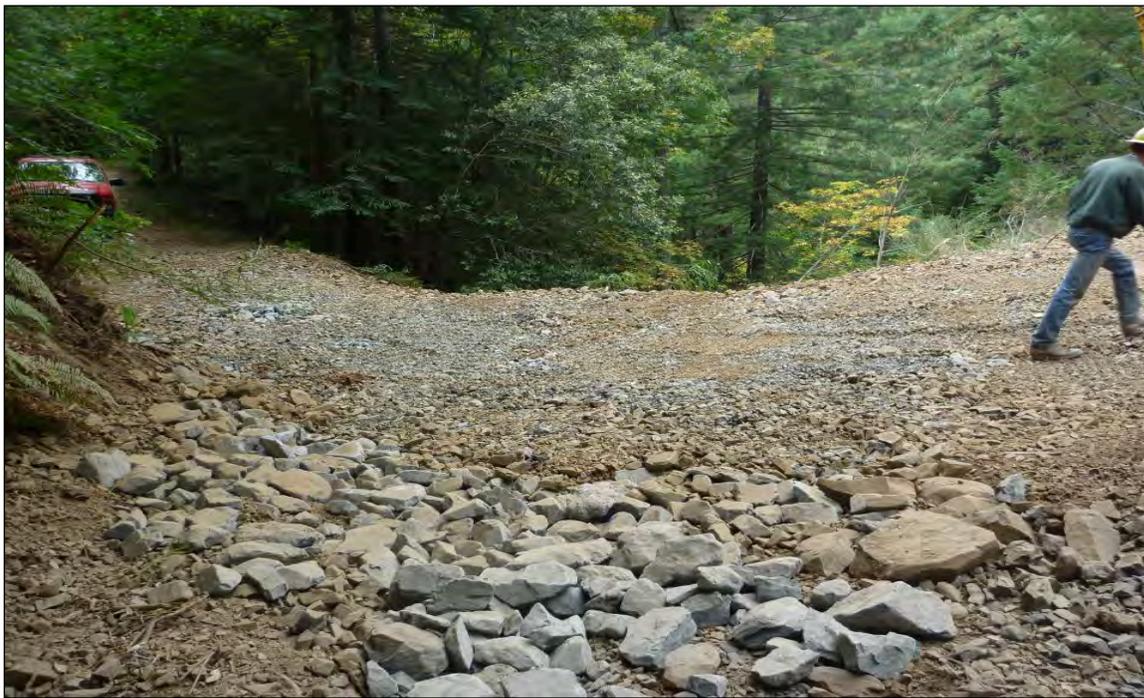


Photo 21: A properly built rolling dip used to route water off road surface.

A great resource for landowners is the Mendocino County Ranch Road Manual; the manual is relevant for all Coast Ranges forestlands, has recently been updated, and is invaluable for helping people understand the importance of proper road and trail maintenance. It can be found at: http://www.pacificwatershed.com/sites/default/files/roadsenglishbookapril2015b_0.pdf



The photo above shows a crossing of a small class III watercourse in which the outside edge of the road is eroding and washing away. If correction measures are not taken, the landowners could lose this section of road over time.



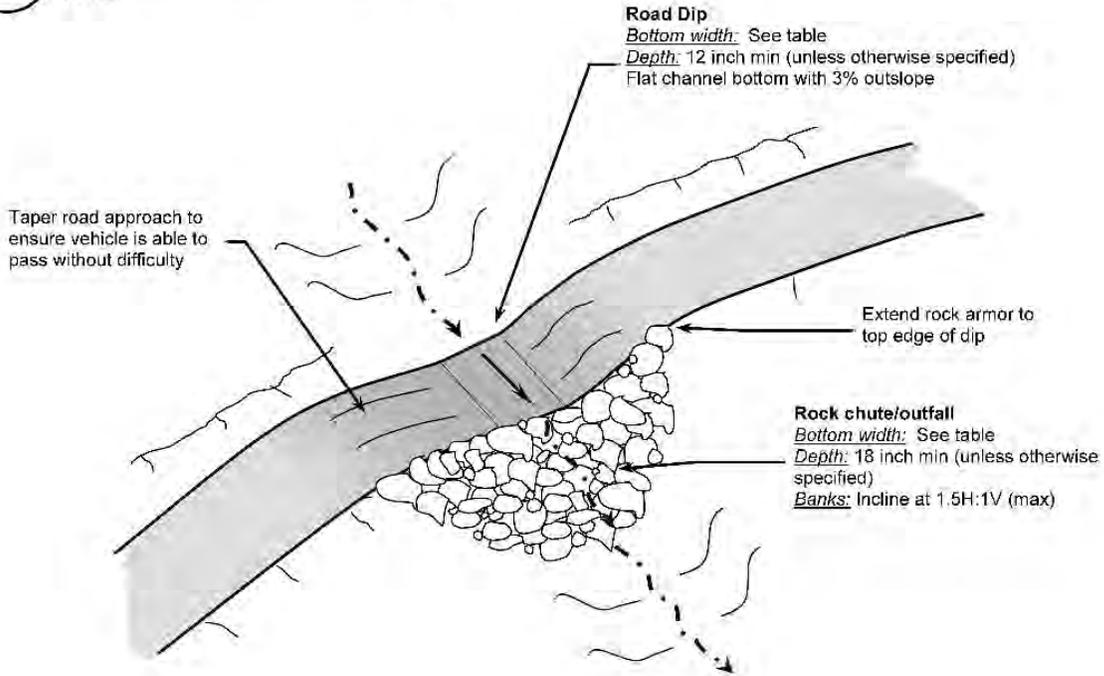
The photo above is of a properly built rock ford crossing for a small class III watercourse.

The following diagram discuss the size of rock and the shape that is needed for these crossings depending on the size of each watercourse.

5C

ROCK FORD – FOREST ROAD

NTS

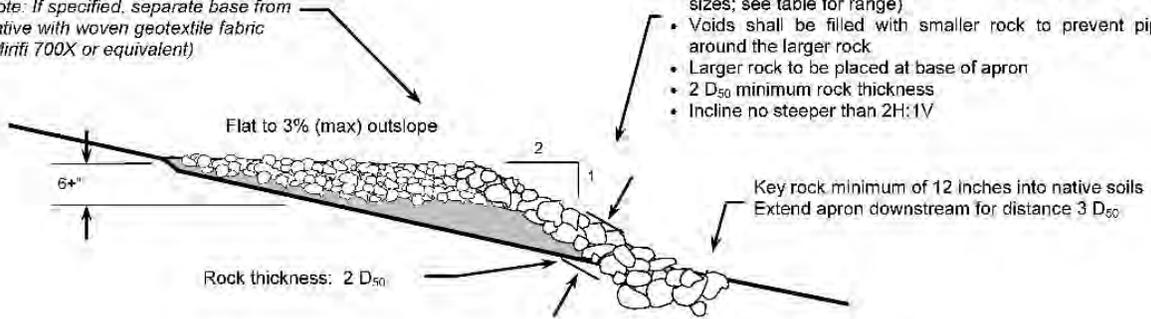


AGGREGATE ROAD BASE:

- See table for rock size
- Place rock minimum 6 inches deep
- Note: If specified, separate base from native with woven geotextile fabric (Mirifi 700X or equivalent)

OUTFALL ARMOR:

- See table for D_{50} rock size (unless otherwise specified)
- Rock rip-rap shall consist of approved sound durable angular rock
- Rock should generally be well-graded (incorporating mix of sizes; see table for range)
- Voids shall be filled with smaller rock to prevent piping around the larger rock
- Larger rock to be placed at base of apron
- 2 D_{50} minimum rock thickness
- Incline no steeper than 2H:1V



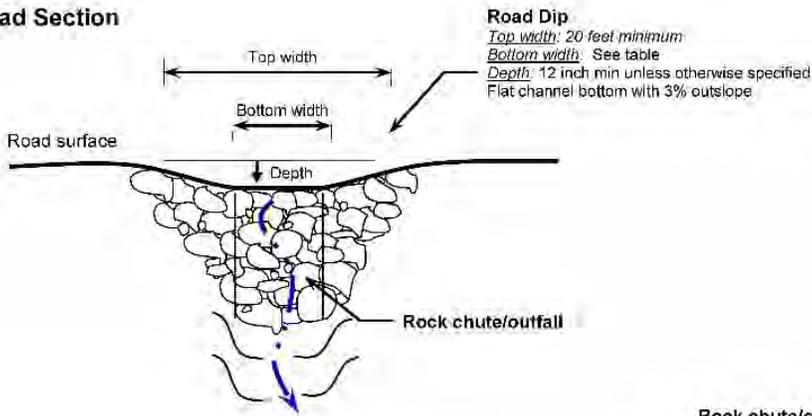
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**ROCK FORD – FOREST ROAD
TYPICAL SPECIFICATIONS**

Standard Detail 5C-1

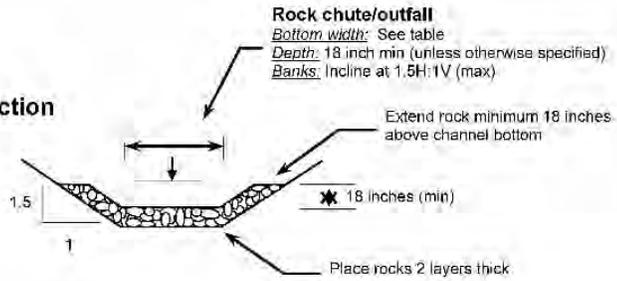
Date: March 6, 2013

Road Section



Road Dip
 Top width: 20 feet minimum
 Bottom width: See table
 Depth: 12 inch min unless otherwise specified
 Flat channel bottom with 3% outslope

Chute section



Rock chute/outfall
 Bottom width: See table
 Depth: 18 inch min (unless otherwise specified)
 Banks: Incline at 1.5H:1V (max)

TABLE 1
CHANNEL WIDTH AND ROCK SIZE

Peak Discharge Q (Cfs)	Minimum Channel Bottom Width (ft)	Rock Chute/outfall		Road surface
		Median rock diameter D ₅₀ (in)	Range D ₁₀ - D ₈₅ (in)	Median Rock diameter D ₅₀ (in)
2	2'	6"	5" - 8"	3" minus
5	2'	9"	6" - 12"	3" minus
10	2'	12"	10" - 16"	3" minus
15	2'	14"	10" - 18"	3" minus
20	4'	14"	10" - 18"	3" minus
30	4'	16"	12" - 20"	3" - 6"
40	4'	18"	12" - 24"	3" - 6"
>40	Site-specific design required			

NOTES

- Details are typical and intended for use as a guideline. Adjustments may be required to local site conditions.
- It is the responsibility of the RPF or design professional to ensure the applicability of these specifications at any given site.
- Specifications apply to low to moderate gradient watercourses where the outfall of the ford is inclined no steeper than 2H:1V (50%) and where the maximum discharge is less than 40 cfs.
- Rock fords are not recommended on roads steeper than 15% grade due to the difficulty in installing an adequate sized dip.
- The design specifications here are based on *Design of Rock Chutes* (Robinson et al., 1998), US Forest Service publications *Low-water Crossings: Geomorphic, Biologic and Engineering Design Considerations* (Clarkin et al., 2006) and *Low-Volume Roads Engineering: Best Management Field Guide* (Keller and Sherar, 2003).



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ROCK FORD - FOREST ROAD TYPICAL SPECIFICATIONS

Standard Detail 5C-2

Date: March 6, 2013

Neighbor Relations

Wildwood has several neighboring landowners, including, a state park with trails, and a County road (Old Cazadero Rd.), all of which allow for direct access to the property. Care should be taken not to alienate these landowners, County and Park representatives, but rather to work with them. The boundary with Austin Creek State Recreation Area requires special management consideration. There may be a tendency for Park or County Road users to want to hike into the forest on your property, which may warrant friendly signage or other outreach and education efforts.

Public areas have a high value at risk from natural disasters (fire, trees falling, etc.). Neighboring properties may also pose a risk by being a potential source of fire ignition (fireplaces, BBQs, vehicles, electricity, etc.). The establishment of shaded fuel breaks and maintenance of all other fuelbreaks will help to keep the area safe by providing access for fire suppression efforts, and may protect your neighbor's property as well.

There are many things that can be done to maintain good relations with neighbors adjacent to the forest improvement operations, including:

- Flag approximate property lines and maintain signs at the boundary gates. Each gate currently has an intact sign.
- Keep gates closed and locked.
- Talk with neighbors at their request concerning operations near the property line so they know what to expect.
- Cooperate with neighbors to cut certain trees and retain certain trees near the property line when appropriate.
- Agree on reasonable hours of operation and adjust as appropriate.
- Have a good working relationship with neighbors to coordinate land management activities where appropriate.
- Develop road maintenance plans for maintaining private roads commensurate with use.
- Post warning signs for neighbors to let them know that large trucks with heavy equipment may be on the roads.
- Utilizing water to treat roads for dust prevention at sufficient intervals to keep dust down.

Hazard Trees

Trees around/among the main structures, ancillary structures, and high use areas have the potential for causing severe damage if they fall over or if big limbs fall off. Dying or diseased trees can be uprooted and fall over, especially during big storms or high winds. Trees that lean, trees with defect, big, broken limbs or other deformities present a hazard to existing structures, people especially in high use areas. Such trees should be continually evaluated and removed as needed.

Removal of hazard trees will also help break up fuel ladders and fuel continuity to decrease fire hazard. Hazard tree removal will help the remaining stand maintain health and vigor. Larger trees in the stand will become more visible and smaller trees will be encouraged to grow making the stand more aesthetically pleasing.

Hazard trees in the residential, public use, and recreation areas should be continually evaluated in order to eliminate their risk before any damage is done. Hazard tree removal should be combined with forest

improvement operations when possible. Between activities, individual trees in public use areas may need to be pruned, removed, or monitored for any increased hazardous characteristics.

Wildlife, Fish and Rare Plants

Wildlife habitat diversity and improvement is an important consideration in all forest management activities. Opportunities for improving habitat should be exercised when possible. Habitat improvement is a by-product of other forest management activities at little or no extra cost. Additional wildlife habitat projects can be budgeted and carried out as the need is identified, such as stream habitat improvement projects.

The vegetation types at Wildwood provide an excellent mosaic of diverse habitat for wildlife. They certainly provide habitat for black-tailed deer (*Odocoileus hemionus columbianus*), dusky-footed woodrats (*Neotome fuscipes*), Western gray squirrel (*Sciurus griseus*), brush rabbits (*Sylvilagus bachmani*), raccoon (*Procyon lotor*) band-tailed pigeons (*Columba fasciata*), California valley quail (*Callipepla californica*), osprey (*Pandion haliaetus*), red-tailed hawks (*Buteo jamaicensis*), red shouldered hawk (*Buteo lineatus*), American kestrel (*Falco sparverius*), turkey vulture (*Cathartes aura*), acorn woodpeckers (*Melanerpes formicivorus*), flickers (*Colapetes auratus*), Northern mockingbird (*Mimus polyglottos*), Steller's jay (*Cyanocitta stelleri*), scrub jay (*Aphelocoma coerulescens*), common raven (*Corvus corax*), American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*), dark-eyed junco (*Junco hyemalis*), nuthatches, chickadee, thrushes, and owls. Species likely seen in the meadow could include blackbirds, swifts, swallows, sparrows, finches, and flycatchers. Less commonly seen may be coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), golden eagles (*Aquila chrysaetos*), bobcat (*Felis rufus*), striped (*Mephitis mephotos*) and spotted skunks (*Spilogale gracilis*) and mountain lions (*Felis concolor*).



Photo 22: An Osprey Nest in Sonoma County

Wild turkeys (*Meleagris gallopavo*) utilize nearby meadows at various times of the year. Common species like red-tailed hawks, golden eagles, American kestrels (*Falco sparverius*), coyotes, grey fox, striped skunk, brush rabbit (*Sylvilagus bachmanii*), woodrat and other species will utilize the grassland habitat for foraging. Grasslands and the surrounding forested edges are where a majority of wildlife species congregate. The edge is also a very important refuge to animals that utilize grassy openings. It provides a quick escape from predators and from extreme weather.

Wildlife species can also be destructive when choice food is not available. Deer rely on browse during the dry season when grass and forbs are not available, and will browse on seedlings and saplings. Gray squirrels and rats can girdle redwood saplings. Several activities can ensure an adequate supply of browse. The creation of new sprouts from hardwood stumps, particularly live oak, supplies deer with needed sprouts during the dry season. Some forest improvement activities provide small openings and an edge effect, which are beneficial to wildlife and provide a more variable landscape promoting a diversity of species.

Erosion control seeding following soil disturbing activities provides forage for wildlife. Planting small patches of perennial grass near springs and wet areas provides improved forage for wildlife.

Quail, small mammals and songbirds rely on dense cover to escape from predators. Dead brush is preferred over live, especially by quail. Brush and slash piled over a log or rock makes effective inexpensive shelters. These types of brush piles can be found in the post-project areas.

Snags are dead standing and sometimes decaying trees. (See photo, right.) Many animals den in snags, raptors use them for perching, and woodpeckers feed on insects associated with them. Where snags are lacking, they can be created by girdling hardwoods or conifers.



Photo 23: Large Douglas-fir snag

Typically, during a forest improvement project, snags are only cut when necessary for fire prevention, to protect the safety of people or structures (including neighboring buildings), where they are near fuel breaks, or when forest worker's safety is an issue. Large cull trees with big limbs are generally left in the stand for live habitat and to provide large snags in the future.

The inventory in 2020 indicates a moderate, occurrence of snags on Wildwood; a little over 6 douglas-fir or hardwood snags per acre, on average, over 192 forested acres.

Three snags per acre is reasonable; especially trees with cavities and deformities, as well as downed woody debris, and other components of a late seral forest. Accordingly, dead trees can be left in the stand, especially large trees with high wildlife value. Sudden Oak Death is still a threat in the area, and more extensive snag removal under unique circumstances such as mass mortality from disease (or to prevent injury) should continue at Wildwood. Snags should also be considered for falling to avoid property damage and/or to control disease.

Hardwood trees are an important component of the forest for wildlife use. Rotten cavities in large hardwood trees are excavated by woodpeckers and used by small birds and mammals as denning sites. Hardwood trees provide potential for cavity nesting species including several owl species, woodpeckers, and other birds, which require cavities. Raptors, like sharp shinned hawks (*Accipiter striatus*), and Cooper's hawks (*Accipiter cooperii*), often nest in hardwood trees and hardwood stands.

Hardwood forests are home to many different types of songbirds, mice and rats, and other animals on which raptors depend for survival. Hardwood trees themselves provide a major food source for many of the animals that inhabit the forest. Tanoak acorns are an important food for most all forest herbivores and omnivores. These animals include deer, squirrels, woodpeckers, turkeys, many songbirds and several other animals. Madrone berries provide another very important food source as well. The periodic removal of select hardwood trees creates a new cohort of trees that represent the future of hardwood forests.

Downed logs are referred to as woody debris. Reptiles, amphibians and small wildlife live and feed around old downed logs. Wildlife value is proportional to log diameter and length. Logs on the contour are utilized more than logs parallel to the slope. Large woody debris is increased by leaving material scattered

throughout the forest during forest improvement operations. Limbs, small logs, and slash are left scattered in the woods along with large woody debris of conifers and hardwood species.

Similar species may be observed using both hardwood and coniferous forest, but the animals may be using each type for different things. Certain fish and wildlife species receive special consideration when conducting forest improvement activities with the potential for disturbance to these species. These include anadromous fish as well as raptors (like spotted owls), red-legged frogs, foothill-yellow-legged frogs, western pond turtles, and marbled murrelets. Surveys are conducted for these species when necessary.

Many species of special concern could potentially exist in Wildwood's forestlands. Within the ecosystem there are several different habitats available. There are a few old growth trees and numerous old large residual (legacy) trees spread throughout the watershed. There may be the potential for these areas to support late-seral wildlife species including marbled murrelet (*Brachyramphus marmoratus*), and northern spotted owls (*Strix occidentalis*). However, it is now accepted that these species do not require late seral forests to survive.

During development of this Forest Management Plan (April, 2020) a query of the Cazadero Quadrangle and eight surrounding quads in the California Natural Diversity Data Base (CNDDDB) listed fifty-three (53) animal species considered rare, endangered or threatened with extinction in the area (please see CNDDDB list in appendix). Thirteen (13) animals are listed as Threatened or Endangered (or are candidates for listing) by State or Federal agencies: California tiger salamander (*Ambystoma californiense*), williamsoni unarmored threespine stickleback (*Gasterosteus aculeatus*), bald eagle (*Haliaeetus leucocephalus*), coho salmon (*Oncorhynchus kisutch*), steelhead (*Oncorhynchus mykiss irideus*, pop 8 & 16), Chinook (*Oncorhynchus tshawytscha*), California red-legged frog (*Rana draytonii*), Myrtle's silverspot butterfly (*Speyeria zerene myrtleae*), longfin smelt (*Spirinchus thaleichthys*), northern spotted owl (*Strix occidentalis caurina*), and California freshwater shrimp (*Syncaris pacifica*). Several other species on the list are considered rare, species of special concern or watch list species that require special treatment during land management activities and may or may not be listed as Threatened or Endangered in the future. The following animals are species that have active protocols for survey and/or protection.

NORTHERN SPOTTED OWLS (*STRIX OCCIDENTALIS*)

On privately owned California forestlands, Northern spotted owl (NSO) surveys must be conducted if a landowner conducts a commercial harvest. Six surveys must be conducted during the breeding season, which is March through June, with at least one survey occurring in June. These surveys must be done for two consecutive years before a harvest can be carried out.

There are several NSO activity centers located in the Austin Creek Watershed. The closest activity center, SON0097, is less than 1 mile west of Wildwood. An activity center requires a 1,000-foot setback where little to no operations will be allowed to occur. NSOs do move from time to time and could have moved somewhere else. This can occur when barred owls move into NSO territory (more on that below). The only way to know for sure where an owl's activity centers are is to conduct surveys.

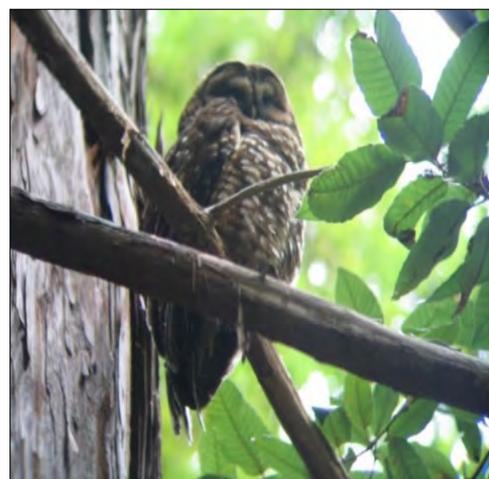
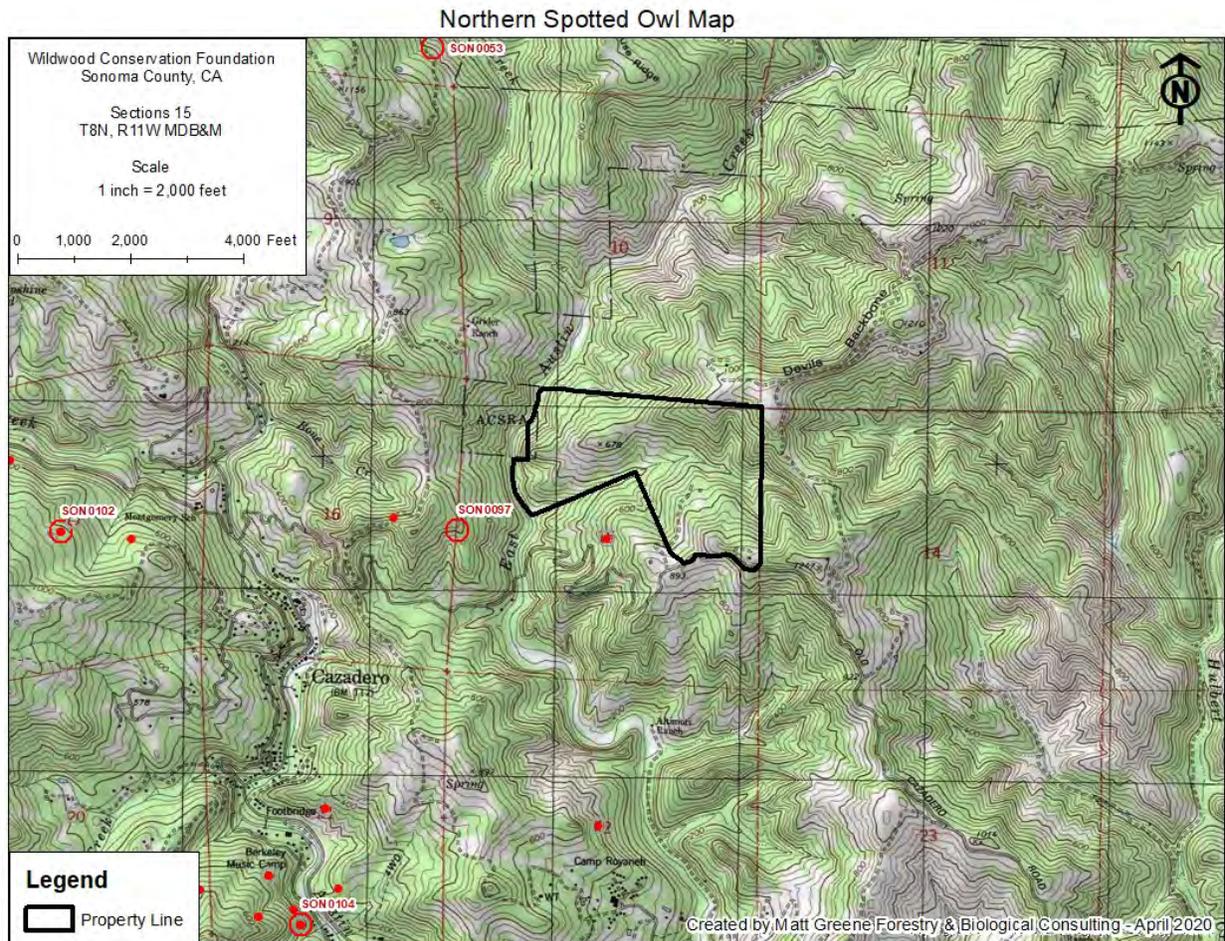


Photo 24: A male Northern Spotted Owl sitting in a redwood tree in Sonoma County.

During the past century, barred owls (*S. varia*) expanded their range from forests east of the Great Plains to forests throughout most of central and western North America, entering California as early as 1976. The US Fish and Wildlife Service have determined that the range expansion into the Pacific Northwest and subsequent competition from the barred owls poses a significant and complex threat to the northern spotted owl. At this time, there are no mitigation requirements beyond reporting the detection if a barred owl is sighted on or near a property. If barred owls are on or near the property it is likely NSO will not be detected as they have been driven out or will remain undetectable to avoid a negative exchange with the barred owls.



Photo 25: A barred owl. Courtesy Wikimedia



RED TREE VOLE (*ARBOCIMUS POMO*)

This species of rodent is listed as a federal species of special concern. A nest was observed during surveys for this Plan in Forest Type D32.

It lives in old growth and other Douglas-fir and redwood forest types. It is a tree nester, that may rest as high as 150 feet on a branch in a nest made of needles. Red tree voles breed year around.

They also provide an important food source for the Northern spotted owl. The red tree vole is believed to be more common than its listing implies.



Photo 26: A red tree vole found on neighboring property.

CALIFORNIA RED-LEGGED FROG (*RANA DRAYTONII*)

California red-legged frogs (RLFs) are considered a threatened species by federal regulatory agencies. They inhabit natural and artificial ponds, rivers, creeks, reservoirs, deep-water marshes, and coastal freshwater lagoons. Breeding pools must be at least 2 feet deep throughout the breeding season. Following the first rain of the year (usually requiring more than ¼ inch of rain) the frogs will leave the water and move upslope in search of breeding partners. This dispersal can be as great as 2 miles, but most frogs are found within 300 feet of water during this time.



Photo 27: A California red-legged frog.

California Red-legged frogs are found within the Russian River Watershed. It is possible that they exist in on the property around East Austin or Branscomb Creek. Any work in and around watercourses should be carefully considered before work begins.

FOOTHILL YELLOW-LEGGED FROG (*RANA BOYLII*)

The Foothill Yellow-legged frog (FYLF) is a State candidate as a threatened species; however, due to its prevalence in this area, it is not likely to be listed in the North Coast.

FYLFs are usually found near water and are mostly active during daylight. FYLFs visit rocky streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands. They are sometimes found in isolated pools, vegetated backwaters, and deep, shaded, spring-fed pools. FYLF vocalization is rarely heard, as these frogs mostly communicate under water.



Photo 28: A Foothill Yellow-legged frog.

The reproductive cycle is similar to that of most North American Frogs and Toads. Mating and egg-laying occurs exclusively in streams and rivers (not in ponds or lakes) from April until early July, after streams have slowed from winter runoff. In California, researchers have found egg masses between April 22nd and July 6th, with an average of May 3rd.

MARbled MURRELET (*BRACHYRAMPHUS MARMORATUS*)

It is questionable as to the presence of marbled murrelets in the area. Marbled murrelets require dense, structurally large trees. Surveys have been conducted in the Gualala and Russian River watersheds with only one positive result being noted at Clipper Mill Bridge. However, there is habitat in your forest at this time. There are 2 or 3 trees which offer suitable limb platforms. The primary requirement for marbled murrelet habitat is limb size. They require limbs at least 4" in diameter to nest.

The actual breeding season is from April to August. Five surveys (for two straight years) must be conducted during this time period to determine presence. In the event presence is determined, as many as 10 surveys must be conducted to determine the level to which the habitat is being used. The different uses include: active nesting, occupancy with no breeding, and use of habitat as a flyway corridor. The information available on the marbled murrelets is very limited, but is increasing.



Photo 29: A pair of Marbled Murrelets (in breeding plumage) in flight.



FISHERIES

On Wildwood, the main-stem section of East Austin Creek supports seasonal habitat for anadromous fish. CDFW surveys in this stream occurred in 1947, 1962, 1968, 1977, and 1996. During those surveys, six species of native fish and several frog and salamanders were observed, including: California Roach, Sacramento pikeminnow, Sacramento Sucker, Sculpin, Steelhead Trout, and Three-spined Stickleback. In 1996 American Shad, an introduced species was identified. Prior to 2005 no hatchery stocking, transfers or known rescues had occurred in East Austin Creek. Hatchery-raised coho salmon have since been released on adjacent State Park lands. In 2019 snorkel surveys determined coho and steelhead young of the year (yoy) stocking to be 42 and 2,214 fish, respectively. This section of Austin Creek was second only to Grey Creek in terms of the yoy population in that year.

In Summary

The protection measures for rare and sensitive animal species that are in place during commercial harvests are changing. In the past, forest improvement and fuels reduction work did not currently require surveys, however CFIP projects have more recently required some level of survey, and/or avoidance mitigation measures.

Other elements that can be found in the coniferous forest, that should be protected and managed to promote wildlife, include the following: woodpecker granary trees, large residual trees (especially Douglas fir which produce good nesting platforms), and snags which provide homes for several species of birds and mammals and will be the future source of large woody debris.

RARE AND ENDANGERED PLANTS

Under CEQA, most ground disturbing activities require a botanical survey be completed. Again, in the past, forest improvement and fuels reduction work did not currently require surveys, however CFIP projects have more recently required some level of survey, and/or avoidance mitigation measures. There are plants that occur locally that are somewhat rare in their range and may need to be protected. Often rare plants benefit from certain types of disturbance, so the identification of these plants does not necessarily lead to a project not moving forward, however it does require implementing protection/avoidance measures for the species.

Plants identified via iNaturalist on Wildwood

Amanita Mushrooms (<i>Genus Amanita</i>)	Japanese Maple (<i>Acer palmatum</i>)
Baldhip Rose (<i>Rosa gymnocarpa</i>)	Japanese Wisteria (<i>Wisteria floribunda</i>)
Bigleaf Maple (<i>Acer macrophyllum</i>)	Manzanitas (Genus <i>Arctostaphylos</i>)
California Bay (<i>Umbellularia californica</i>)	Narrowleaf Sword Fern (<i>Polystichum imbricans</i>)
California Buckeye (<i>Aesculus californica</i>)	Pacific Madrone (<i>Arbutus menziesii</i>)
California Black Oak (<i>Quercus kelloggii</i>)	Pacific Poison Oak
California Golden Chanterelle (<i>Cantharellus californicus</i>)	Pink Jasmine (<i>Jasminum polyanthum</i>)
California Incense-Cedar (<i>Calocedrus decurrens</i>)	Q-Tips (<i>Micropus californicus</i>)
Coast Live Oak (<i>Quercus agrifolia</i>)	Redbuds (Genus <i>Cercis</i>)
Coast Redwood (<i>Sequoia sempervirens</i>)	Redwood Sorrel (<i>Oxalis oregana</i>)
Common Douglas-Fir (<i>Pseudotsuga menziesii</i>)	Spearmint (<i>Mentha spicata</i>)
Deadnettles (Genus <i>Lamium</i>)	Western Blue-eyed Grass (<i>Sisyrinchium bellum</i>)
Dutch Iris (<i>Iris x hollandica</i>)	Western Buttercup (<i>Ranunculus occidentalis</i>)
Greater Periwinkle (<i>Vinca major</i>)	Western Giant Puffball (<i>Calvatia booniana</i>)
	Western Sword Fern (<i>Polystichum munitum</i>)

During development of this Forest Management Plan (2020) a query of the Cazadero Quadrangle and eight surrounding quads in the California Natural Diversity Data Base (CNDDDB) listed seventy-seven (77) vascular plants considered rare or threatened with extinction in the area (please see CNDDDB list in appendix).

Fourty-seven (47) plants listed as California Rare Plant Rank 1B meet the definitions of the California Endangered Species Act of the California Department of Fish and Wildlife Code, and are eligible for state listing. Four (4) plants are listed as Rare Plant Rank 2B, rare, threatened, or endangered in California, but more common elsewhere. Two (2) plants are listed as Rare Plant Rank 3, more information is needed. Twenty-four (24) plants are listed as Rare Plant Rank 4, plants of limited distribution.

Nine (9) of the 1B plants are currently listed as Endangered by Federal and State agencies: *Alopecurus aequalis* var. *sonomensis*, *Chorizanthe valida*, *Cordylanthus tenuis* ssp. *capillaris*, *Delphinium bakeri*, *Delphinium luteum*, *Limnanthes vinculans* *Lupinus tidestromii*, *Pleuropogon hooverianus*, and *Trifolium amoenum*. It is likely most or none of these species is on Wildwood, as they all require specialized habitats that were not identified during surveys for this Plan.

Generally speaking, the following considerations and methodologies that are required during timber harvest can be employed to protect rare plants during other management activities:

- 1 Populations that occur on existing seasonal roads may be disturbed from the proposed operation.
- 2 Populations that occur on existing skid trails may be disturbed from the proposed operation. Because many rare species favor disturbance, it is likely that following operations, there will be greater populations (e.g. *Campanula californica*).
- 3 Populations that occur away from existing trails should have a 10 to 25-foot ELZ established. Trees may be cut within this zone, however the RPF or supervised designee will be onsite to ensure that no individuals are damaged or destroyed by the falling of trees. Once on the ground, logs will be skid out of the zone in the most efficient manner. Equipment will remain outside of the ELZ (except where existing trails exist) and line will be pulled to logs.
 - a) Trees removed in these areas will focus on opening up the canopy in order to develop the necessary light regime for the target species to proliferate.

Phellinus pini (AKA *Fomies pini*, CONK)

This is a heart rot that attacks several tree species on the west coast; in our area, it is common to Douglas-fir. This endemic pathogen enters the tree through living and dead branches. The presence of a fruiting body, or conk, is an indication that a tree is infected. This conk appears at a branch collar as a dark brown mushroom like body. It is usually a sign of tree age or some environmental stressor (e.g. drought, overstocking).

Heartwood of an infected tree begins to deteriorate causing the bole (or stem) to eventually decay (rot); this is a problem when selling Douglas-fir to a sawmill, as the mill worker may scale it as a cull rendering it valueless. Wood quality is one of many things that a mill estimates when scaling volume upon delivery. As a result, defect decreases the price of a log.

Another problem that the infection causes is degradation in wood strength. As they rot, these trees become more susceptible to windfall and other natural events. Infected trees that near structures and other high use public areas are not appropriate for snags and should be monitored and removed when necessary.

For Wildwood, one of the goals is to improve forest health, and removing as many infected trees as possible will not eradicate this disease. It is a natural process in forests that some trees will periodically succumb to this rot.

Trees that are away from public areas can be left to become snags for wildlife, as they will provide excellent habitat for various species who create cavities in punky wood.



Photo 30: A Douglas-fir infected with *Phellinus pini* (aka *Fomies pini*).



Photo 31: Up close view of the conks of *Phellinus pini*.

SUDDEN OAK DEATH (*PHYTOPHTHORA RAMORA*)

This non-native pathogen is a relatively new and very rapidly spreading disease that is currently affecting coast live oak, black oak, tanoak, bay, chinquapin, huckleberry, and rhododendrons. This disease has the capability to destroy entire hardwood forests. It is not fully known how this disease is spread. Trees (primarily tanoak) infected with this pathogen have varied reactions, but most are killed very rapidly. Individual tree immunity is not known at this time. There is more on SOD from the UCCE SOD Mortality Task Force in Appendix 6.

See also www.suddenoakdeath.org



Photo 32: A young tanoak tree killed by Sudden Oak Death.



Photo 33: Weeping or bleeding on the trunk of an oak (tanoak or true oaks) is often a sign of a tree infected by SOD.

This pathogen is in the area, and several things should be done to help improve the forest. With SOD already on Wildwood killing trees there has been an increase in fuels available to spread a wildfire. In Forest Type RD33, dead trees have been cut down to reduce the fuel loads, however they are now sprouting, and the new tanoak shrubs can increase fire spread. Firewood can be made of the remaining trees that are dead or dying. The dead trees are extremely dangerous and can fall at any time. They are susceptible to failure in very hot conditions.

With trees dying, this is an opportunity to plant conifers. Redwood trees may be planted to replace hardwoods in areas where hardwood density exceeds 35 square feet per acre, in historically conifer-dominated sites or sites that will not sustain hardwoods. This will increase the stocking of conifers and help to restore the historic conifer/hardwood ratio on Wildwood and help to establish another age class.

If mature tanoak decline to less than 1%-2% of the stand structure (or if total hardwoods decline to less than 10%), a replanting program should be considered.

Recreation

Recreation within the forest is a potential use of Wildwood guests and staff. The Property is mostly used for low-intensity public outdoor recreational, scientific, and educational purposes such as but not limited to hiking, bird watching, nature study, and other such uses similar in nature and intensity.

Any recreation activity utilizing roads or trails should be addressed in terms of the planned maintenance of erosion control structures. There are many opportunities to use forest management access routes for recreation. Other opportunities exist for developing more recreation trails where desired.

Many of the old logging roads are available to use for hiking, riding, and other uses. Care must be taken to make sure the erosion problems are not being exacerbated. See more in Road Maintenance, above. If roads and trails are going to be used in the winter, it is advisable that they are rocked.

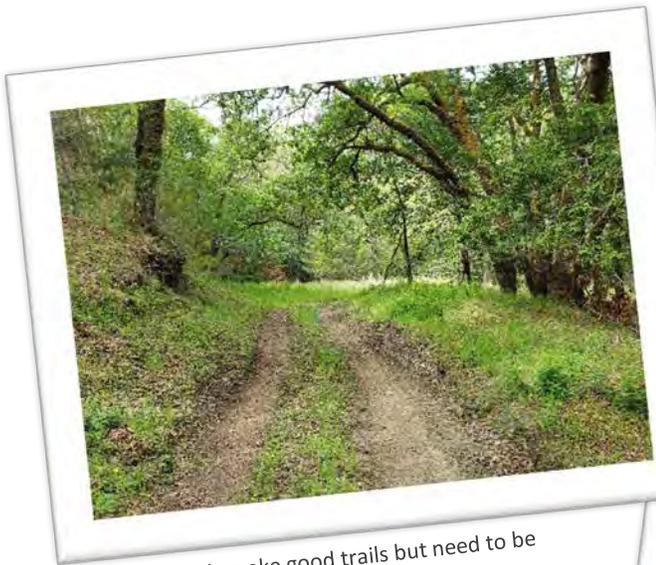
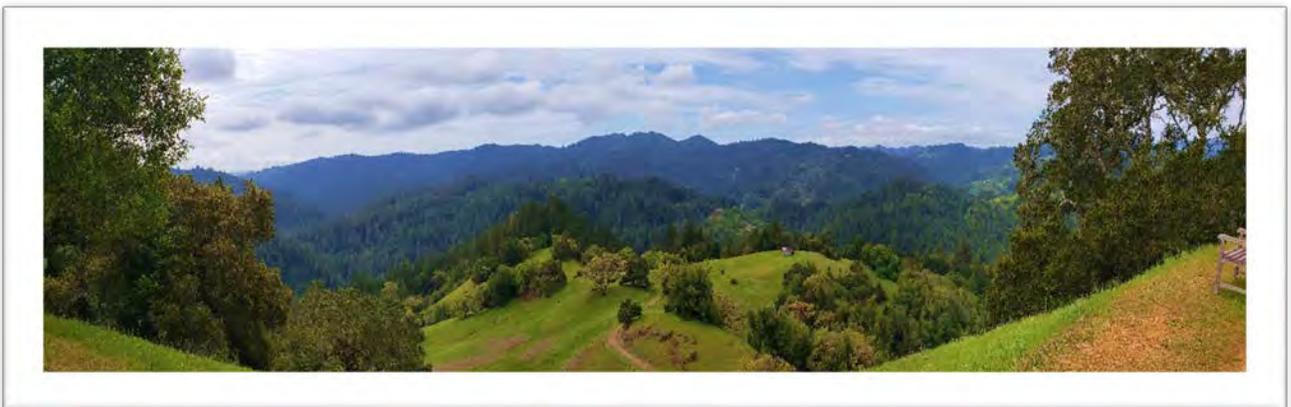


Photo 34: Roads make good trails but need to be maintained as such.



Photo 35: This crossing should be monitored for erosion issues.



Archaeological and Historical Resources

Formal archaeological surveys may have been conducted on Wildwood prior to current ownership. There may be listed sites on the property. That information is confidential and on file at the Northwest Information Center if ground disturbing work is to be conducted in the area. In conducting the fieldwork for this Forest Management Plan no new Native American or historic sites were discovered.



Photo 36: Sonoma and Mendocino County points and flakes.

This and the surrounding lands were developed by European settlers as early as the 1850s and many ancestral artifacts were collected or destroyed over time. It is however, common in this area to find broken stone tools and flakes of chert or obsidian. Rarer are intact points (arrowheads) stone tools, bowls, and mortars.



Photo 38: Example of tools found on the property.



Photo 37: Example of ancestral hand tools.

An object, structure or infrastructure 45 years or older is considered a historical-period cultural resource. Historic sites in this part of the county include old logging equipment, train grades, buildings, and other structures. Other features that are considered historic include old apple orchards and other signs of farming.

Any area proposed for CFIP or some other management activities that involve ground disturbance must be surveyed for cultural resources and historic sites. If a site is discovered, operations are usually restricted within 100 feet of a Native American archeological or historical-cultural site. Both historic and Native American sites that are discovered during operations need to be documented and recorded with the Office of Historic Preservation and possibly with a Tribal Historic Preservation Officer (THPO) as part of some forest improvement activities or major earth-moving projects.



Photo 39: Example of a historic-era fence line found near the Old Homestead.



Photo 40: Example of a historic-era object found near the Old Homestead.

Fire Protection

Potential for wildfire is increased when the forest is adjacent to developed residential areas, parks, public trails, or roadways. The degree of damage a wildfire can do is also increased with valuable land, houses, and people's lives at stake. It is therefore very important to implement all the fire protection measures possible on the property.

We can take many steps to aid in the early and effective suppression of forest fires. This is accomplished through the creation of fire defense improvements. Some of the best tools for a good fire defense are:

- 1 Monitoring

- 2 Pre-suppression including access and fuel modification
- 3 Water Availability

Monitoring the area leads to early detection of fires. The earlier a fire is detected, the easier it will be to extinguish. The presence and observations of owners, renters, neighbors, and forest workers is important.

Access routes are extremely important, whether they be County roads, truck roads, tractor trails or hiking trails; all facilitate the safe and orderly movement of people and/or equipment to a fire front. These access routes typically act as fire suppression points. This is particularly true if they coincide with or intersect natural or man-made fuel breaks also called shaded fuel breaks.

A natural fuelbreak exists where strips of vegetative cover or landscape are un-flammable or less flammable than surrounding vegetation. Such areas are rock outcrops, creeks, lakes, etc. A man-made fuelbreak is a strip of land between 30 and 300 feet or more along which the primary fuel, usually brush or timber, or both, has been reduced in volume to a lighter, less dense fuel type to facilitate fire control. The fuelbreak is a permanent pre-attack facility which includes a road for patrol and firefighting proposes within the fuelbreak where the topography permits. A fuelbreak may be installed around a compartment (an area based on vegetation, terrain, access, etc.) of the property, or around developed areas, or a system of connected fuelbreaks may be constructed to help protect large wildland areas.

Purpose of Fuelbreaks (see also Shaded Fuelbreaks, page 99)

The basic purpose of a fuelbreak is (1) to divide continuous natural fuels into smaller units for easier and safer suppression of wildfires; (2) to help protect recreation sites, communities and other areas of high value from wildfires; and (3) to aid fuel or vegetation management with prescribed burning.

The fuelbreak is designed to provide:

- 1 Road access for patrol vehicles, fire fighting vehicles and equipment, and for fire crews
- 2 Truck trails for access and movement of personnel and equipment during fires
- 3 Reasonable unhindered and safe movement (off-road) of trucks and bulldozers, and of personnel on foot during fires
- 4 A place at which a fire fighting line can be established and at which the fire can be extinguished when it reaches the line
- 5 A place from which a backfire can be set
- 6 Safety zones for fire crews including widened areas at intervals along the strip

FUELBREAK LOCATION

Fuelbreak location within Wildwood must be carefully planned to retain the scenic quality of the landscape. Consideration must be given to the visual effect of the fuelbreak when viewed, not only from within the fuelbreak itself, but also from other places within the unit (roads, trails, overlook points, etc.), and from communities, highways, and other viewpoints outside the unit.

Treatment of the fuelbreak to blend it into the landscape is even more important than fuelbreak location in reducing the visual impact of fuelbreak construction. The fuelbreak should be placed on ridge-tops where, under favorable conditions, the chances for controlling a fire are best. Fuelbreaks also may be placed around homes, in canyons and valleys to take advantage of natural barriers such as roads and streams or to protect facilities in developed areas.

In planning the location of fuelbreaks, forest stands or other vegetative types that have special scenic or scientific value and areas of historic or archaeological value should have special consideration. Herbicides are not used for the construction of fuelbreaks.

ROADS

A single lane dirt road having an 8-foot minimum width and an ideal width of 12 feet of wheel surface for patrol, maintenance, and firefighting purposes, should be within the fuelbreak wherever possible. Turnouts should be installed at reasonable intervals selected by field examination. Roads and turnouts shall be no wider than necessary to provide safe passage of patrol, maintenance, and firefighting equipment. These roads may be routed outside the fuelbreak for short distances when necessary because of topographic, scenic, or other considerations.

The roads should be maintained in a passable condition and free from deep ruts, down trees, and limbs. Adequate erosion control structures (preferable rolling dips on gentle slope and waterbars on skid trails and steep sections of road) and other methods shall be installed and maintained to prevent erosion. A layer of wood chips could be placed on the road to aid in the prevention of erosion in winter and dust in the summer, and to help blend the road into the landscape

Fuelbreaks alone are not intended to stop the head of a hot, fast-moving fire. They must be manned by fire crews, and further clearing during the time of a fire usually must take place if fuelbreaks are to serve effectively as control lines.

FIREBREAKS WITHIN FUELBREAKS

The road within the fuelbreak will in most cases serve as an adequate firebreak. In certain situations, a firebreak will impair scenic qualities, especially where it passes through readily visible grasslands or other areas with low vegetative cover. Therefore, firebreaks cleared to mineral earth may not be desirable in such locations. Instead, low mowing of 6 to 10-foot-wide strips through the grasslands or brush adjacent to roads could be done.

Firebreaks are similar to fuelbreaks in many ways including their optimal location and ultimate use. Firebreaks are narrower with more bare soil than fuelbreaks. Firebreaks are often more compatible with forested lands than fuelbreaks. The existing road system within Wildwood Conservation Foundation functions as a firebreak.

Where truck roads and natural fuelbreaks have not suitably compartmentalized Wildwood Conservation Foundation into fuel units, additional brush removal, mowing, grazing, prescribed burning, and shaded fuel breaks should be considered. The maintenance of firebreaks should be done when equipment is on the property to do other road or trail building or maintenance.

PRE-SUPPRESSION FIRE PLANNING

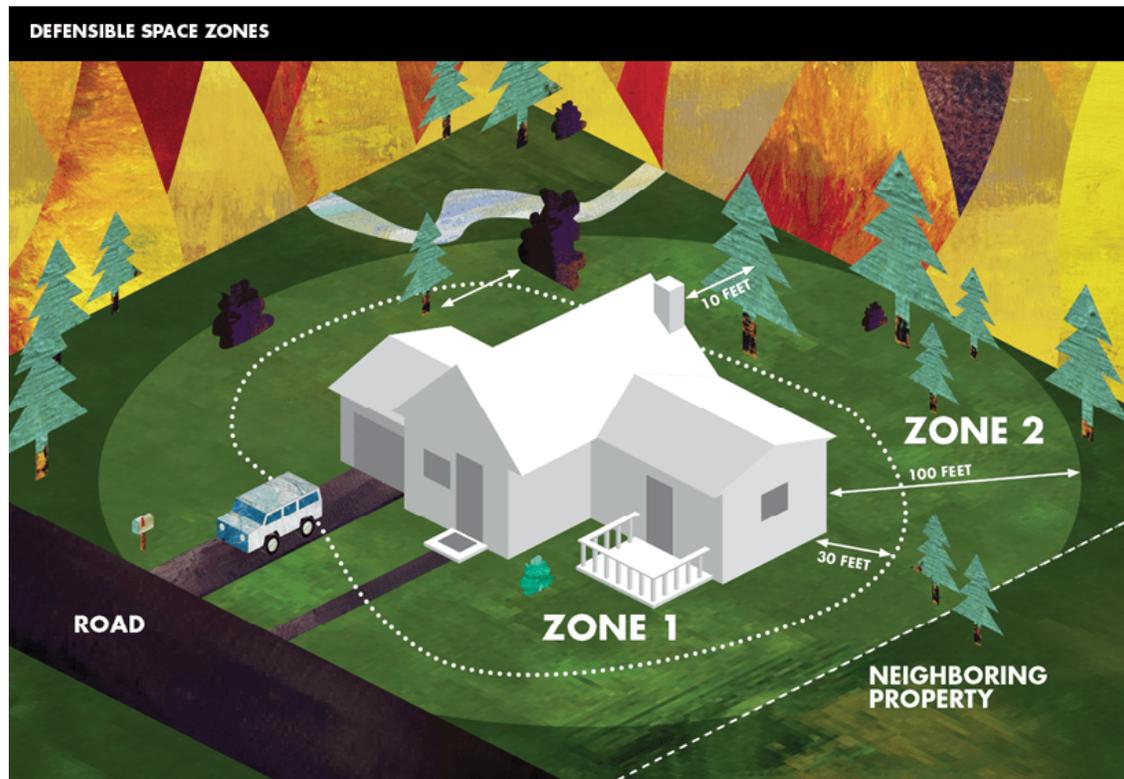
A pre-suppression fire plan should be developed. The forest managers have the ability to develop and maintain such a plan. CalFire has information and expertise for helping to develop a plan. The plan should include narrative and maps covering: access, roads, trails, firebreaks and fuelbreaks, their capabilities and limitations; water sources, access routes to water sources as hydrants, water tanks, and creeks; location of buildings, power lines, and water lines; potential helicopter landing areas and staging areas; street, road and trail names; mileage marker locations, and emergency exit routes.

DEFENSIBLE SPACE AND FIRE SAFE LANDSCAPING

Section 4291 of the California Public Resource Code requires clearing flammable vegetation around structures a minimum of 30 feet, up to 200 feet depending on conditions. According to CalFire, homeowners can substantially increase the chance of their home surviving a wildfire by following these fire safe practices:

- Maintain a "defensible" space around your home by clearing all flammable vegetation a minimum of 100 feet around the structure. Clear dead leaves and branches to leave widely spaced ornamental shrubbery and trees.
- Clean all needles and leaves from the roof, eaves and rain gutters.
- Trim tree limbs within 10 feet of your chimney and trim all dead limbs hanging over your house or garage.
- Cover your chimney outlet or flue with a spark arresting ½ inch mesh screen
- Make sure your address is clearly visible from easy identification in an emergency.
- Make sure you have adequate water storage of at least 2,500 gallons for use in emergency situations.
- Stack woodpiles at least 30 feet from buildings, fences and other combustible materials.
- Clear all vegetation and other flammable materials from beneath your deck. Enclose undersides of elevated decks with fire resistive materials.

Figure 9: Defensible Space and the zone concept, courtesy of CAL FIRE



Roofing material is rated based on its flammability, with Class A being the least flammable. Next to a fire-resistant roof, plant selection, landscape design and maintenance are the most critical in providing for fire

safety around structures. There are many plants that actually attract fire and these plants should not be planted near structures. Many of these plants are also non-native and/or invasive. Some plants to keep away from the defensible space around structures are most conifers, but especially pine and juniper, eucalyptus, acacia, oleander, French and Scotch broom, bamboo and pampas grass.

The zone concept is a practical approach to developing defensible space around structures. The innermost zone within 30 feet of a home should be the "greenbelt" of irrigated, low-growing, fire resistant plants. Dead branches should be pruned out and plants should be periodically sheared or pruned to encourage new succulent growth. Rock, brick and concrete pathways, patios, masonry walls and rock gardens can be incorporated into the landscaping to provide to break up fuel continuity.

The mid-zone, 30 to 70 feet from the house should contain mostly low growing, fire resistant plants. Well-spaced, fire resistant trees can be maintained. Plants should be drought tolerant, although periodic watering can improve their fire resistance. In the outermost zone, 70 to 200 feet native vegetation can be maintained. Dense brush should be cleared and crowded trees thinned. Ideally, trees should be spaced 20 to 40 feet. All lower branches should be pruned and dead branches removed. See Figure above for an illustration of the defensible space and the zone concept.

It can be very confusing when trying to landscape with plants that are not only fire resistant, but also native, drought resistant and/or deer resistant. When selecting landscaping plants select plants that are well adapted to the local climate, microclimate, aspect and slope. Be aware that drought resistant plants should be low growing with limited spread and not woody material that dies back frequently. Plants should be deep rooted and proficient at water uptake. Plants with relatively fire-resistant foliage includes deciduous trees and shrubs, trees and shrubs with large, fleshy leaves, and those lacking volatile chemicals, oils and waxes.

Wildwood presents a few challenges. An influx of guests populate the property in the summer, Austin Creek Redwoods State Park (ACRSP) as is a neighbor to the west, however there is no public access in that part of the park. There is a remote but public road (Old Cazadero Rd.) terminating on the southern boundary. These circumstances present many potential sources of ignition.

The property is closer to Russian River Fire Protection Department, offering a good resource for response to wildfire and multiple roads allowing access to the interior of the property.

In the short term, it is best to focus on shaded fuel breaks along the roads, as they are your ingress and egress routes in country with a history of wildland fire.

We would suggest maintaining communications with the neighbors to try to preserve emergency access in the event that a fire breaks out below the property and the main road out is blocked. It is best to keep track of which roads lead to the safe areas and which are potentially dead ends due to gates, landslides, or erosion past the property line.

Fuels should be reduced within 300 feet of structures, power lines, and at least 100 feet of access roads. (Please see shaded fuelbreaks, page 101). Because of the slope of the property, these widths are wider than flat ground. Please note: This is a potential concept for a fuelbreak on your property. The general idea of a fuelbreak is to provide safety for your assets (structures and forestland), while allowing you to leave in the event of a fire, and give firefighters a chance to defend the property. This design could help with protecting both of those things internally on your own property while also maintaining the vegetation to allow ingress and egress.

Following are some examples of projects implemented nearby which show fuel treatments pre and post project.



Photo 41: Pre-project Fuel Reduction.



Photo 42: Post project, treatment by hand and chipper.



Photo 43: Pre-project fuels reduction, Timber Dell Ranch.



Photo 44: Post Project, mastication.

Water/Spring Development

Water is a limited resource and as such, utilizing what is available is critical. On Wildwood, there are perennial water sources including springs that have been developed to provide water to serve the retreat facilities. There are also several seasonal creeks on the property that are typically dry by April or May.

Springs and even wells can be changeable or dry up completely, so it is good to develop other sources of water for security. Capturing and storing rainfall is a popular solution in our Mediterranean climate. The rainfall and overland flow of fresh water during periodic storm events sheds off the landscape rapidly and is drained into the Russian River and Pacific Ocean, via the multiple tributaries, in a matter of hours.

You can capture one gallon of rainwater on one square foot of surface area when one inch of rain falls. Capturing rainwater during these events is not detrimental to rivers and streams, given any modification to watercourses is developed through permits that require Best Management Practices during project implementation. There are several locations for catching rainwater; for example: a roof, French drains along roadside ditches, catch basins for capturing overland flow, and even through modification of the storage tank itself. Ideally the capture and storage location are at least 40 feet in elevation higher than the delivery point. This will allow for the proper pressure to run drip irrigation or household fixtures without having to use a pump to boost the water pressure.

See the Agency and Organizational Assistance section, below for more information resources about rainwater catchment. There are several resources available on the internet.

Carbon Cycle and Climate Change

Carbon compounds give structure to life processes. These compounds are oxidized to CO₂ (carbon dioxide), and are respired by all plants and animals. Plants also assimilate CO₂ during photosynthesis building new carbon compounds. Humans produce significant amounts of CO₂ by burning of fossil fuels, coal, and other fuels like wood and trash. Some natural sources of CO₂ are wildfire and volcanic episodes. The atmosphere exchanges CO₂ continuously with the oceans and plant life. Regions or processes that principally produce CO₂ are referred to as sources of atmospheric CO₂, while those that absorb and store CO₂ are called sinks. Redwood, Douglas-fir and mixed hardwood forests play an important role as a carbon sink in the North Coast Ranges.

Trees, like other green plants, employ the process of photosynthesis to convert CO₂ into sugar, cellulose and other carbon-containing molecules that they use for food and growth. Trees can store large amounts of carbon in their wood, and continually add carbon as they grow. Half of the weight of dried wood in a tree is carbon, and forest soils store a large amount of carbon as well. Although forests do release some CO₂ during the processes of decay and cellular respiration, a healthy forest typically stores carbon at a greater rate than it releases it. The rate of carbon sequestration will vary with tree species, climate and site. Generally, younger and faster growing forests show higher sequestration rates.

CO₂ is only a very small part of the atmosphere (0.04%) (NOAA), yet it plays an important role in the energy balance of our planet; in the atmosphere, CO₂ is a layer over the planet trapping long-wave radiation, which would otherwise emit heat away from the planet contributing to the greenhouse effect. As CO₂ levels increase, so will the warming effect. CO₂ is the largest contributor to this effect by long-lived gases and its role intensifies each year. At current rates, the planet may warm to a degree aquatic and terrestrial plant and animal populations are adversely affected. Increasing CO₂ in the atmosphere also contributes to harmful acidification in oceans.

Large-scale impacts on global ecosystems due to a warming planet and ocean acidification are not fully understood, however studies in Redwood National and State Parks show that while vegetation losses from second-growth forest restoration treatments and road removals have large carbon costs, they will likely result in net carbon savings over the long-term. For these reasons, it is important not to abandon forest management activities, but to look for management tools and projects that reduce the potential for CO₂ emissions. Several projects in this plan help to mitigate CO₂ emissions and climate change:

Timber Stand Improvement and Fuel Reduction Projects

- Improving forest stands will lead to a vibrant ecosystem resistant to disease and therefore mortality and fire hazard. Encouraging growth will increase capture of CO₂ and storage of carbon, while reducing the risk of catastrophic fire.
- Thinning hardwoods will lead to conifer release that will increase carbon storage and offset CO₂ produced by the equipment used for the fuel break project.
- Forest fires are a huge source of CO₂ and other greenhouse gas emissions. Creating fuel breaks will reduce the risk of catastrophic fire reducing the potential for large-scale CO₂ emissions.

Rainwater Catchment

- Implementing rainwater catchment will reduce the need for electrical or fuel driven pumps (and associated CO₂ production) to move water from the spring to the house site.

Management Recommendations

Land Use

- Focus management on enhancing the quantity and quality of cultural resources that were historically available on the property.
- Continue forest management activities including the prudent use of forest resources on the property.
- Continue forest improvement activities on the property.
- Protect the riparian areas on the property.

Hardwoods

- Consider the use of herbicides in areas where dense tanoak regrowth is crowding conifers and contributing to ladder fuels.
- Retain hardwoods spaced through the stand at a rate of 10-15% of total BA. Do not clear-cut hardwoods.

Forest Improvement

- Interplant redwood seedlings in openings; including areas where Sudden Oak Death has killed hardwoods and where Douglas-fir are dying from age and disease.
- Follow all fuelwood cutting with conifer planting.
- Check conifer regeneration from planting activities at age 4 or 5 for need of thinning and release, particularly in fuelwood areas.
- Develop a shaded fuelbreak program.
- Evaluate and implement desired and appropriate wildlife enhancement projects.
- Prune conifers in high use areas.

- Use government cost share programs to implement projects whenever possible.
- Eradicate exotic species from the forest.

Fire Hazard Reduction and Hazard Trees

- Remove trees that pose a hazard to existing structures in any future forest improvement activity.
- Monitor trees around residences, along roads, near improvements (i.e. water tanks, power lines) for potential hazard and need for removal or modification.
- Implement and maintain defensible space around structures.

Roads and Trails - Erosion Control

- Upgrade and replace failing crossings to the Forest Practice Standards.
- Install and maintain waterbars, culverts, ditches, down spouts, and trash racks on forest roads.
- Annually inspect all roads and trails prior to the onset of winter for needed corrective activities. Culvert should be cleaned out, erosion control structures should be dug open by removing sediment and leaves that have accumulated, and the infrastructure should be evaluated for additionally needed structures.
- Blade and shape roads to maintain the drainage and hard surface as necessary.
- Do not put any type of thin superficial surface (oil and screens, etc.) on any forest road.
- Maintain fire trails within Wildwood Conservation Foundation and expand the integrated fire trail system to include existing skid trails as needed.
- Bare soil areas along roads, trails, landings, etc., should be seeded to native grass or a seed mix containing non-native annual grasses that are not included on Cal-IPC's invasive or "watch" inventory list (<https://www.cal-ipc.org/plants/profiles/>) and/or straw mulched as needed.
- Maintain gates and fences. Post signs to prevent unwanted trespass.
- Rock roads where needed.

Fire Prevention

- Initiate fuel hazard work around structures and along the road and power lines on the property.
- Periodically re-open firebreaks and roads.
- Pursue mutual agreements with neighbors for extending fuelbreaks and alternative points of access.
- Develop shaded fuelbreak program and general road brushing program to facilitate good access and create potential areas to stop fires.
- Develop fire pre-suppression planning and mapping for the residents and local firefighting agencies. Include potential water sources for firefighting, maps of all Wildwood Conservation Foundation roads and trails, potential helicopter landing sites and location of safety zones.

Wildlife and Rare Plants

- Monitor sensitive wildlife and plant species and their habitats.
- Maintain and promote the development of large woody debris and snags for wildlife habitat where needed.

Miscellaneous

- Identify and protect specimen trees and groves, as the landowners' desire.

- Identify and maintain property lines and monuments on the property.
- Update maps and forest management data as needed.
- Maintain a written and mapped record of projects performed on the property.
- Make sure the erosion problems are not being exacerbated when using old logging roads and trails for available to use for hiking, riding, and other uses.
- Maintain good relations with neighbors adjacent to forest improvement operations.

Sources of Information

Professional Resources

A Sampler of Inventory Topics, Kim Iles, 2003.

Assessor's Parcel Maps of Sonoma County

California Forestry Handbook, T. F. Arvola, 1978

California Board of Forestry Rule Book and updates

CLFA Workshop materials: CIA & CEQA Compliance

Forest history books

Land and Timber Owner's knowledge of the property

Maps of past recorded timber sales

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USGS maps, Cazadero 7.5 Minute Quadrangle

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Photo Credits

Matt Greene, photos: 1, 6, 10-18, 20-24, 26, 30-35, panorama pg. 80, 36-38, 41-44

Kirsten Sequoia, photos: 2-5, 7-8, & grazing Pg. 57, 19, 39-40

Chris Schnepf, University of Idaho, photo: 9

Wikimedia, photos: 25, 28

Angela Bernheisel, photo: 27

Sean McAllister, photo: 29

Sean Case, Photo: Steelhead Pg. 76

Agency and Organization Assistance

Links to Educational Video Resources for Forest Landowners (control click to link):

Occidental Arts and Ecology Center Water Institute

<http://oaec.org/our-work/projects-and-partnerships/water-institute/publications/>

State Water Resources Control Board-Stormwater Runoff Series

<http://www.waterboards.ca.gov/stormfilm/>

UC Extension Forest Landowner Series

http://ucanr.edu/sites/forestryonline/Forest_Landowner_Videos_Available/

UC Extension Roads Seminar

http://ucanr.edu/sites/forestry/Webinars/Rural_Roads_Webinar_Series

The **Sonoma County Sheriff's Office** developed the **Rural Crimes Task Force** to help landowner's who are victims of rural crimes including trespassing, theft of agricultural and forest products, and vandalism.

Rural Crimes Task Force

CSO Pat Moffitt

(707) 565-3940

pat.moffitt@sonoma-county.org

Contact **Russian River Fire Protection** and/or the Hilton **CalFire** station to establish property location and access for department personnel in the event of a wildfire or other emergency. Additionally, these organizations can help update the safety of Wildwood from fire and recommend projects to improve firefighter and structure safety during a wildfire.

CalFire Station- Hilton: Seasonal

12604 River Rd
Guerneville, CA 95446
Phone: (707) 887-1770

Russian River Fire Protection

14100 Armstrong Woods Rd
Guerneville, CA 95446
Phone: (707) 869-9089

Fire Safe Sonoma

Santa Rosa, CA 95401
(707) 565-6070
Email: info@firesafesonoma.org

CalFire's **California Forest Improvement Program (CFIP)** and USDA Cooperative programs are administered and implemented through a partnership between the State of California, the USDA Forest Service, and other private and government entities. These programs promote the health and productivity of California's forestlands, rural economies, and urban forests. Emphasis focuses on timber and other forest products, fuels management, wildlife and water resources.

Meghan Reeves
CalFire CFIP Program
135 Ridgway Ave
Santa Rosa Ca 95401
(707) 576-2935 Meghan.Reeves@fire.ca.gov

The **Natural Resource Conservation Service (NRCS)** to determine projects eligible for match funding under the Environmental Quality Incentives Program (EQIP) program. Landowners with a Forest Management Plan and priority projects are able to submit applications for cost share assistance with those projects. NRCS will help eligible participants develop an EQIP plan of operations, which will become the basis of the EQIP contract. EQIP applications will be ranked based on a number of factors, including the environmental benefits and cost effectiveness of the proposal.

Drew Loganbill
NRCS-EQIP Project Manager, Sonoma County-Petaluma Service Center
5401 Old Redwood Highway, Suite 100
Petaluma, CA 94954
(707) 794-1242 ext 3

The **Sonoma Resource Conservation District** provides technical assistance to landowners for conservation planning and project implementation, navigating permitting and regulatory agency requirements. The 98 districts statewide are the center of locally led conservation in their communities and accomplish thousands of practical, hands-on conservation projects every year. Often these projects involve agriculture and private land, and they provide educational opportunities for landowners and the community as well. The RCD's, at times, have funding to match for project implementation.

Sonoma RCD Main Office/Mail
1221 Farmers Lane, Suite F
Santa Rosa, CA 95405
707-569-1448
<http://sonomarc.org/>

The [Sonoma County Forest Conservation Working Group](#) formed in 2005 to address the needs of forest landowners throughout the county. Their mission is, Protecting Forests Across Landscapes and Through Generations. Many forest landowners have an interest in information on fire, ecosystems, wildlife, and sustainability and the Working Group seeks to provide this information through community workshops, seminars and neighborhood meetings and lunchtime 'brownbag' seminars to disseminate information and connect experts, landowners, and resource managers to access technical and financial support.

The **Coast Ridge Community Forest** is a group of private and public landowners who are taking a community-based approach to manage their natural resources effectively. The current efforts focus on a community-wide approach to address the following issues:

- Assist landowners in the development of forest management plans
- Acquire funding to offset costs of implementing forest management activities including:
 - Rainwater catchment and storage for agricultural use and fighting fires
 - Fuel load reduction to reduce catastrophic risks from wildfires
- Help facilitate the formation of a cooperative grazing program

The Coast Ridge Community Forest, established in 2009, is comprised of 43 landowners totaling 3005 acres. This unique model offers landowners a cooperative approach to adaptive forest management that strengthens the community while protecting and enhancing their local forest ecosystems.

The Coast Ridge Community Forest hopes to keep expanding its opportunities by providing community involvement on a number of levels, and by continuing to strengthen the connections between its partners, the land, and its people.

Working partners: Gualala River Watershed Council, Calfire, Natural Resources Conservation Service (NRCS), Sonoma County Forest Conservation Working Group, Coastal Hills Land Trust.

Local partners:

- Fort Ross Volunteer Fire Department, www.frvfd.org
- Gualala Ranch Association
- Coastal Hills Community Project (CHCP), chcp@mcn.org
- Coastal Hills Land Trust
- Navarro Ranch Association

Contact: Judy Rosales or Demetra Markis: jrosales@mcn.org

Established in 1975, **Forest Landowners of California** is the only private nonprofit corporation representing your forest; all 30,000 acres of non-industrial family forest owners. Members own property throughout the state ranging from small five-acre parcels to large ranches. Their belief is, "What unites us is our love for our land and our commitment to promoting, preserving and protecting this precious resource." Forest Landowners of California promotes, preserves and protects family forest in California along with the rights and rewards of caring ownership and stewardship of family forests.

Forest Landowners of California has a vision of healthy, vigorous, satisfying and profitably productive working forests in California and enjoying abundant public approval for it.

Healthy, vigorous and productive working forests are:

- actively managed to maximize forest growth;
- actively protected against fire, insects and disease;
- dynamic and bio-diverse ecosystems that achieve the individual objectives of the landowner including, if desired, family ownership success and onsite residency.

A healthy forest will also protect and enhance the public benefits, such as air and water quality, wildlife, wood products and jobs.

Forest Landowners of California

950 Glenn Drive, Suite 150

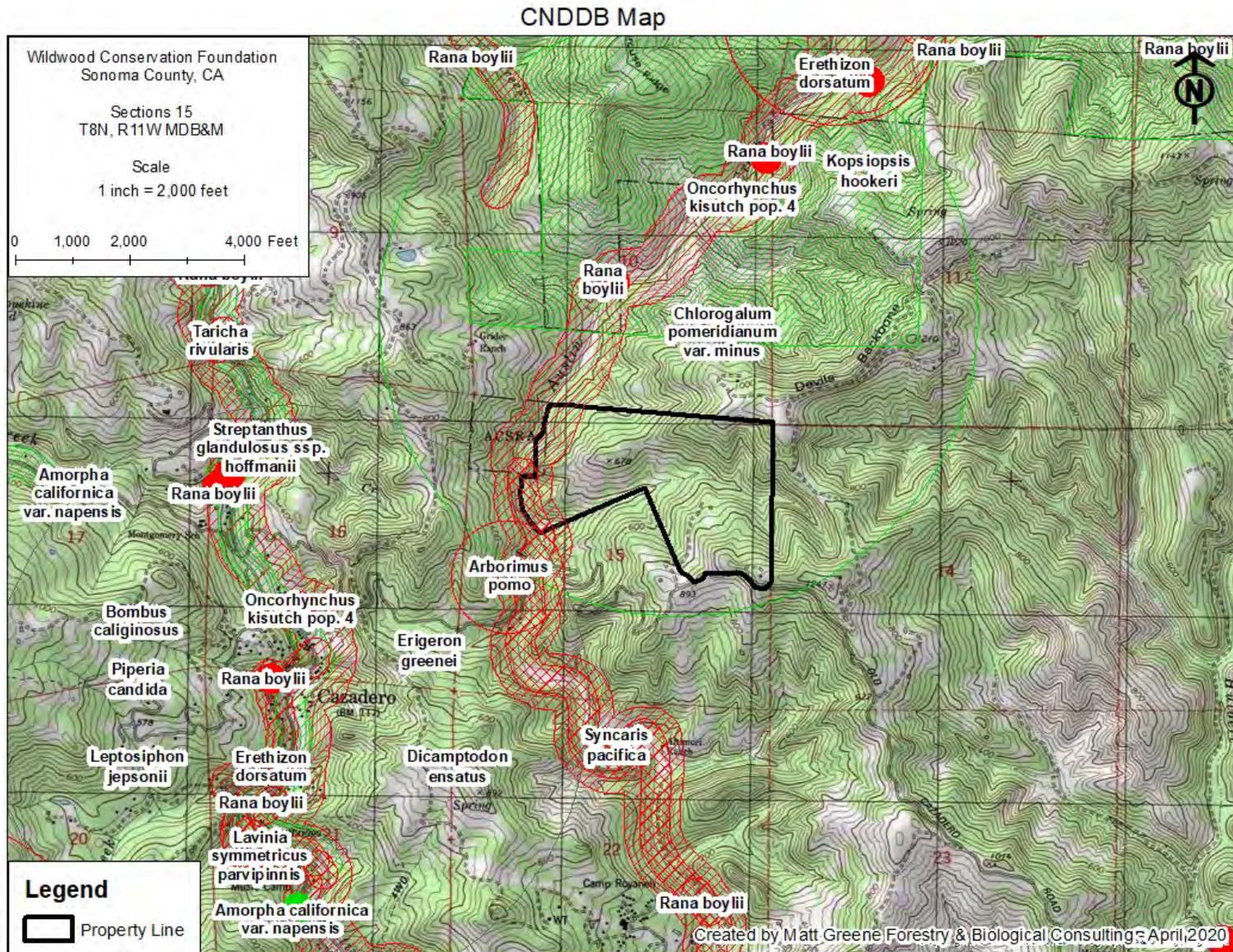
Folsom, CA 95630

(877) 326-3778

info@forestlandowners.org

Appendix 1 - California Natural Diversity Database Query

The following is a map and table for a query from the CNDDDB in April 2020. This table is a list of species that occur within and around the Cazadero Quadrangle:



CDFW Natural Diversity Database-April 2020

Sensitive Animal List for:

Arched Rock, Duncans Mills, Guerneville, Tombs Creek, Warm Springs Dam, Geyserville, Fort Ross, Cazadero, Camp Meeker
USGS Quadrangles

Scientific Name	Common Name	Federal Status	State Status	CDFW Status
Ambystoma californiense	California tiger salamander	Threatened	Threatened	WL
Dicamptodon ensatus	California giant salamander	None	None	SSC
Rana boylei	foothill yellow-legged frog	None	Candidate Threatened	SSC
Rana draytonii	California red-legged frog	Threatened	None	SSC
Taricha rivularis	red-bellied newt	None	None	SSC
Aquila chrysaetos	golden eagle	None	None	FP ; WL
Elanus leucurus	white-tailed kite	None	None	FP
Haliaeetus leucocephalus	bald eagle	Delisted	Endangered	FP
Cerorhinca monocerata	rhinoceros auklet	None	None	WL
Fratercula cirrhata	tufted puffin	None	None	SSC
Ardea alba	great egret	None	None	-
Ardea herodias	great blue heron	None	None	-
Riparia riparia	bank swallow	None	Threatened	-
Icteria virens	yellow-breasted chat	None	None	SSC
Pandion haliaetus	osprey	None	None	WL
Pelecanus occidentalis californicus	California brown pelican	Delisted	Delisted	FP
Phalacrocorax auritus	double-crested cormorant	None	None	WL
Athene cunicularia	burrowing owl	None	None	SSC
Strix occidentalis caurina	Northern Spotted Owl	Threatened	Threatened	-
Syncaris pacifica	California freshwater shrimp	Endangered	Endangered	-
Lavinia exilicauda exilicauda	Sacramento hitch	None	None	SSC
Lavinia symmetricus parvipinnis	Gualala roach	None	None	SSC
Lavinia symmetricus parvipinnis	Gualala roach	None	None	SSC
Lavinia symmetricus ssp. 4	Clear Lake - Russian River roach	None	None	SSC
Mylopharodon conocephalus	hardhead	None	None	SSC
Hysteroecarpus traskii pomo	Russian River tule perch	None	None	SSC

1 of 2

Species on Cazadero Quadrangle are Bold

CDFW Natural Diversity Database-April 2020

Sensitive Animal List for:

Arched Rock, Duncans Mills, Guerneville, Tombs Creek, Warm Springs Dam, Geyserville, Fort Ross, Cazadero, Camp Meeker
USGS Quadrangles

Scientific Name	Common Name	Federal Status	State Status	CDFW Status
Gasterosteus aculeatus williamsoni	unarmored threespine stickleback	Endangered	Endangered	FP
Spirinchus thaleichthys	longfin smelt	Candidate	Threatened	-
Entosphenus tridentatus	Pacific lamprey	None	None	SSC
Lampetra richardsoni	western brook lamprey	None	None	SSC
Oncorhynchus keta	chum salmon	None	None	-
Oncorhynchus kisutch pop. 4	coho salmon - central California coast ESU	Endangered	Endangered	-
Oncorhynchus mykiss irideus pop. 16	steelhead - northern California DPS	Threatened	None	-
Oncorhynchus mykiss irideus pop. 8	steelhead - central California coast DPS	Threatened	None	-
Oncorhynchus tshawytscha pop. 17	chinook salmon - California coastal ESU	Threatened	None	-
Bombus caliginosus	obscure bumble bee	None	None	-
Bombus occidentalis	western bumble bee	None	Candidate Endangered	-
Dubiraphia giulianii	Giuliani's dubiraphian riffle beetle	None	None	-
Danaus plexippus pop. 1	monarch - California overwintering population	None	None	-
Speyeria zerene myrtleae	Myrtle's silverspot butterfly	Endangered	None	-
Erethizon dorsatum	North American porcupine	None	None	-
Arborimus pomo	Sonoma tree vole	None	None	SSC
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	None	None	SSC
Taxidea taxus	American badger	None	None	SSC
Eumetopias jubatus	Steller (=northern) sea-lion	Delisted	None	-
Antrozous pallidus	pallid bat	None	None	SSC
Corynorhinus townsendii	Townsend's big-eared bat	None	None	SSC
Lasiurus blossevillii	western red bat	None	None	SSC
Lasiurus cinereus	hoary bat	None	None	-
Myotis yumanensis	Yuma myotis	None	None	-
Anodonta californiensis	California floater	None	None	-
Gonidea angulata	western ridged mussel	None	None	-
Emys marmorata	western pond turtle	None	None	SSC

2 of 2

Species on Cazadero Quadrangle are Bold

CDFW Natural Diversity Database-April 2020

Special Plant List for:

Arched Rock, Duncans Mills, Guerneville, Tombs Creek, Warm Springs Dam, Geyserville, Fort Ross, Cazadero, Camp Meeker
USGS Quadrangles

Scientific Name	Common Name	Federal Status	State Status	State Rank
Agrostis blasdalei	Blasdale's bent grass	None	None	1B.2
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	Endangered	None	1B.1
Amorpha californica var. napensis	Napa false indigo	None	None	1B.2
Arctostaphylos bakeri ssp. bakeri	Baker's manzanita	None	Rare	1B.1
Arctostaphylos bakeri ssp. sublaevis	The Cedars manzanita	None	Rare	1B.2
Arctostaphylos hispidula	Howell's manzanita	None	None	4.2
Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	None	None	1B.1
Asclepias solanoana	serpentine milkweed	None	None	4.2
Brodiaea leptandra	narrow-anthered brodiaea	None	None	1B.2
Calamagrostis ophitidis	serpentine reed grass	None	None	4.3
Calochortus raichei	The Cedars fairy-lantern	None	None	1B.2
Calochortus uniflorus	pink star-tulip	None	None	4.2
Calystegia collina ssp. oxyphylla	Mt. Saint Helena morning-glory	None	None	4.2
Calystegia purpurata ssp. saxicola	coastal bluff morning-glory	None	None	1B.2
Campanula californica	swamp harebell	None	None	1B.2
Carex comosa	bristly sedge	None	None	2B.1
Carex saliniformis	deceiving sedge	None	None	1B.2
Castilleja ambigua var. ambigua	johnny-nip	None	None	4.2
Ceanothus confusus	Rincon Ridge ceanothus	None	None	1B.1
Ceanothus foliosus var. vineatus	Vine Hill ceanothus	None	None	1B.1
Ceanothus gloriosus var. exaltatus	glory brush	None	None	4.3
Ceanothus purpureus	holly-leaved ceanothus	None	None	1B.2
Chlorogalum pomeridianum var. minus	dwarf soaproot	None	None	1B.2
Chorizanthe valida	Sonoma spineflower	Endangered	Endangered	1B.1
Collomia diversifolia	serpentine collomia	None	None	4.3
Cordylanthus tenuis ssp. brunneus	serpentine bird's-beak	None	None	4.3

1 of 3

Bold Species on the Cazadero Quadrangle

CDFW Natural Diversity Database-April 2020

Special Plant List for:

Arched Rock, Duncans Mills, Guerneville, Tombs Creek, Warm Springs Dam, Geyserville, Fort Ross, Cazadero, Camp Meeker
USGS Quadrangles

Scientific Name	Common Name	Federal Status	State Status	State Rank
Cordylanthus tenuis ssp. capillaris	Pennell's bird's-beak	Endangered	Rare	1B.2
Cypripedium californicum	California lady's-slipper	None	None	4.2
Cypripedium montanum	mountain lady's-slipper	None	None	4.2
Delphinium bakeri	Baker's larkspur	Endangered	Endangered	1B.1
Delphinium luteum	golden larkspur	Endangered	Rare	1B.1
Elymus californicus	California bottle-brush grass	None	None	4.3
Erigeron biolettii	streamside daisy	None	None	3
Erigeron greenei	Greene's narrow-leaved daisy	None	None	1B.2
Erigeron serpentinus	serpentine daisy	None	None	1B.3
Eriogonum cedrorum	The Cedars buckwheat	None	None	1B.3
Eriogonum ternatum	ternate buckwheat	None	None	4.3
Erysimum concinnum	bluff wallflower	None	None	1B.2
Erysimum franciscanum	San Francisco wallflower	None	None	4.2
Erythranthe nudata	bare monkeyflower	None	None	4.3
Fissidens pauperculus	minute pocket moss	None	None	1B.2
Fritillaria liliacea	fragrant fritillary	None	None	1B.2
Gilia capitata ssp. chamissonis	blue coast gilia	None	None	1B.1
Gilia capitata ssp. pacifica	Pacific gilia	None	None	1B.2
Gilia capitata ssp. tomentosa	woolly-headed gilia	None	None	1B.1
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	None	None	1B.2
Hesperevax sparsiflora var. brevifolia	short-leaved evax	None	None	1B.2
Horkelia tenuiloba	thin-lobed horkelia	None	None	1B.2
Hosackia gracilis	harlequin lotus	None	None	4.2
Iris longipetala	coast iris	None	None	4.2
Kopsiopsis hookeri	small groundcone	None	None	2B.3

2 of 3

Bold Species on the Cazadero Quadrangle

CDFW Natural Diversity Database-April 2020

Special Plant List for:

Arched Rock, Duncans Mills, Guerneville, Tombs Creek, Warm Springs Dam, Geyserville, Fort Ross, Cazadero, Camp Meeker
USGS Quadrangles

Scientific Name	Common Name	Federal Status	State Status	State Rank
Lasthenia californica ssp. macrantha	perennial goldfields	None	None	1B.2
Lathyrus palustris	marsh pea	None	None	2B.2
Leptosiphon acicularis	bristly leptosiphon	None	None	4.2
Leptosiphon jepsonii	Jepson's leptosiphon	None	None	1B.2
Lessingia arachnoidea	Crystal Springs lessingia	None	None	1B.2
Lessingia hololeuca	woolly-headed lessingia	None	None	3
Limnanthes vinculans	Sebastopol meadowfoam	Endangered	Endangered	1B.1
Lupinus tidestromii	Tidestrom's lupine	Endangered	Endangered	1B.1
Monardella viridis	green monardella	None	None	4.3
Piperia candida	white-flowered rein orchid	None	None	1B.2
Piperia leptopetala	narrow-petaled rein orchid	None	None	4.3
Pleuropogon hooverianus	North Coast semaphore grass	None	Threatened	1B.1
Ramalina thrausta	angel's hair lichen	None	None	2B.1
Ranunculus lobbii	Lobb's aquatic buttercup	None	None	4.2
Sidalcea calycosa ssp. rhizomata	Point Reyes checkerbloom	None	None	1B.2
Sidalcea hickmanii ssp. viridis	Marin checkerbloom	None	None	1B.1
Sidalcea malviflora ssp. purpurea	purple-stemmed checkerbloom	None	None	1B.2
Streptanthus barbiger	bearded jewelflower	None	None	4.2
Streptanthus glandulosus ssp. hoffmanii	Hoffman's bristly jewelflower	None	None	1B.3
Streptanthus morrisonii ssp. hirtiflorus	Dorr's Cabin jewelflower	None	None	1B.2
Streptanthus morrisonii ssp. morrisonii	Morrison's jewelflower	None	None	1B.2
Trichostema ovatum	San Joaquin bluecurls	None	None	4.2
Trifolium amoenum	two-fork clover	Endangered	None	1B.1
Trifolium buckwestiorum	Santa Cruz clover	None	None	1B.1
Trifolium hydrophilum	saline clover	None	None	1B.2
Usnea longissima	Methuselah's beard lichen	None	None	4.2

3 of 3

Bold Species on the Cazadero Quadrangle

Appendix 2b - Additional CEQA/NEPA Notification for Ground Practices

Any future ground practice to implement this plan using public entity reimbursement funds requires a signed CalFire CFIP Environmental Checklist (CEQA) or an NRCS CPA-52 (NEPA) Checklist. Along with this checklist, a process of “discovery” or survey for unknown values along with a discussion of possible mitigations is required. Additionally, the checklist must be filled out by an RPF or Certified Planner. Archaeological values require an Archaeological Records Check, an entity Archaeologist review and Native American notification for the practice area.

Provide a project notification to the following agencies:

- Sonoma County PRMD: <http://www.sonoma-county.org/prmd/vh/ca-index.htm>
- CA Department of Fish and Wildlife: <https://www.wildlife.ca.gov/Conservation/CEQA/Fees>
- Regional Water Quality Control Board:
http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_certification.shtml

If the project adjoins public land (for example, the US Forest Service, US Fish and Wildlife Service, BLM, National, State, or local parks, etc.) notify that agency.

For ground-disturbing projects, provide a project notification to the following:

- California Department of Forestry and Fire Protection (CAL FIRE) Native American Contact List for Sonoma County: <https://www.fire.ca.gov/media/10473/cal-fire-native-american-contact-list.pdf>
- Native American Heritage Commission: <http://nahc.ca.gov/>

LEGAL DESCRIPTION

Real property in the unincorporated area of the County of Sonoma, State of California, described as follows:

PARCEL ONE: (APN: 106-230-007-000)

WEST 1/2 OF THE NORTHEAST 1/4 OF THE NORTHWEST 1/4 OF SECTION 15, TOWNSHIP 8 NORTH, RANGE 11 WEST, M.D.M.

EXCEPTING ANY PORTION WESTERLY OF THE CENTERLINE OF EAST AUSTIN CREEK.

PARCEL TWO: (APN: 106-230-008-000)

BEING A PORTION OF SECTION 15, TOWNSHIP 8 NORTH, RANGE 11 WEST, M.D.M. , AND PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE CENTER OF THE COUNTY ROAD LEADING FROM GUERNEVILLE TO CAZADERO, SAID POINT IS NORTH 958.0 FEET FROM THE NORTHEAST CORNER OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 15; THENCE FROM SAID POINT OF BEGINNING AND ALONG THE CENTER OF SAID ROAD, SOUTH 45° 39' WEST 170.5 FEET, THENCE NORTH 74° 21' WEST 177.0 FEET; THENCE NORTH 38° 06' WEST 125.0 FEET; THENCE NORTH 48° 38' WEST 194.5 FEET; THENCE NORTH 75° 23' WEST 97.6 FEET; THENCE SOUTH 73° 32' WEST 136.0 FEET; THENCE NORTH 85° 01' WEST 404.0 FEET; THENCE SOUTH 24° 59' WEST 118.8 FEET; THENCE SOUTH 66° 59' WEST 159.9 FEET; THENCE LEAVING THE CENTER OF SAID ROAD, NORTH 45° 01' WEST 123.5 FEET TO AN IRON PIN; THENCE ON THE SAME COURSE 100.0 FEET TO A WHITE OAK TREE 16" IN DIAMETER; THENCE NORTH 55° 16' WEST 189.5 FEET TO A LIVE OAK TREE 16" IN DIAMETER, BLAZED ON FOUR SIDES, SAID TREE STANDS AT THE HEAD OF WHAT IS KNOWN AS "WAGON GULCH"; THENCE ALONG THE CENTER OF SAID GULCH NORTH 23° 25' WEST, 1570.0 FEET TO THE CENTER OF BRANSCOMB CREEK; THENCE DOWN THE CENTER OF SAID CREEK, SOUTH 67° WEST 2290.0 FEET TO THE CENTER OF EAST AUSTIN CREEK, THENCE UP THE CENTER OF EAST AUSTIN CREEK TO THE SOUTH LINE OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 15; THENCE EAST TO THE SOUTHEAST CORNER OF THE WEST ONE-HALF OF SAID NORTHEAST QUARTER OF THE NORTHWEST QUARTER; THENCE NORTH TO THE NORTHLINE OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 15; THENCE EAST TO THE NORTHEAST CORNER OF SECTION 15; THENCE SOUTH TO THE POINT OF BEGINNING.

PARCELS ONE AND TWO ARE PURSUANT TO A NOTICE OF VOLUNTARY MERGER RECORDED AUGUST 4, 1994, BY INSTRUMENT NO. 1994-0093439

PARCEL THREE:

THOSE CERTAIN RIGHTS OF WAY PARTICULARLY DESCRIBED IN THAT CERTAIN DEED MADE BY NEWTON J. GRIDER AND JESSIE GRIDER, HUSBAND AND WIFE, TO CHRISTINE PROSCHOLD DATED OCTOBER 26, 1920 AND RECORDED NOVEMBER 9, 1920 IN LIBER 393 OF DEEDS, PAGE 324, SONOMA COUNTY RECORDS.

PARCEL FOUR:

AN EASEMENT FOR INGRESS AND EGRESS TO THE STATE PARK ON REMAINING LANDS OF VERNON W. CORLEY AND JUANITA CORLEY, HIS WIFE, LYING WITHIN THE WEST 1/2 OF NORTHEAST 1/4 OF THE NORTHWEST 1/4 OF SECTION 15, AND THE SOUTH 1/2 OF THE SOUTHWEST 1/4 OF SECTION 10.

PARCEL FIVE:

AN EASEMENT FOR GENERAL ROAD AND UTILITY PURPOSES OVER THAT PORTION OF THE EASEMENT THAT RUNS OVER THE REMAINING LANDS OF VERNON W. CORLEY AND JUANITA CORLEY, HIS WIFE, WHICH HAS BEEN RESERVED IN THE DEED FROM VERNON W. CORLEY ET UX TO JAMES B. KEEGAN, ET UX, RECORDED JULY 25, 1968 IN BOOK 2343, PAGE 241, UNDER RECORDER'S SERIAL NO. K-86308, OFFICIAL RECORDS OF SONOMA COUNTY.