FINAL

SANBORN-UPPER STEVENS CREEK COUNTY PARKS FOREST HEALTH PLAN

MAY 2023

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SANTA CLARA COUNTY PARKS

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
amsl	above mean sea level
ANSI	American National Standards Institute
BAAQMD	Bay Area Air Quality Management District
BMP	Best Management Practices
CCC	California Conservation Corps
CAL FIRE	California Department of Forestry and Fire Protection
CDFW	California Department of Fish and Wildlife
CDFA	California Department of Food and Agriculture
CDPR	California Department of Pesticide Regulation
CEQA	California Environmental Quality Act
CAL-IPC	California Invasive Plant Council
CNPS	California Native Plant Society
CNDDB	California Natural Diversity Database
CFI	Continuous Forest Inventory
CWPP	Community Wildfire Protection Plan
EPA	Environmental Protection Agency
EHR	Erosion Hazard Rating
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FPR	Forest Practice Rules
GIS	Geographic Information System
ISA	International Society of Arboriculture
LSF	Late Successional Forest
MSDS	Material Safety Data Sheets
NRMZ	Natural Resource Management Zone
PCA	Pest Control Advisor
QMD	Quadratic Mean Diameter
RPF	Registered Professional Forester
SJCC	San Jose Conservation Corps
SOD	Sudden Oak Death
THP	Timber Harvesting Plan
TRAQ	Tree Risk Assessment Qualification
TPA	Trees Per Acre
USFWS	United States Fish and Wildlife Service
VMP	Vegetation Management Program
WUI	Wildland Urban Interface

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1 INTRODUCTION

This Forest Health Plan (Plan) has been developed to guide forest management activities at Sanborn County Park and Upper Stevens Creek County Park. Sanborn County Park is a 3,433-acre park comprised primarily of redwood and tanoak forest. It is located west of the City of San Jose in the Santa Cruz Mountain range. It is situated between Skyline Boulevard (State Route 35) to the west and the City of Saratoga to the east. There are several other parks and preserves that surround Sanborn County Park managed by State, County and Open Space Districts including: Castle Rock State Park, El Sereno Preserve, and Saratoga Gap Preserve. These parks and preserves connect to make a unique contiguous open space area that roughly follows Skyline Boulevard through this part of Santa Clara County. Sanborn Park is valued for high quality recreational opportunities, most notably year-round walk in and RV camping, day use areas, and miles of multi-use trails for public enjoyment.

Upper Stevens Creek County Park is a 1,280-acre park that consists primarily of redwood and Douglas-fir forest. It is approximately 7 miles northwest of Sanborn County Park and similarly nestled into a network of adjacent open space preserves that create a contiguous open space area along the ridge of the Santa Cruz Mountains. Upper Stevens Creek Park is bordered by Monte Bello Open Space Preserve to the north, Saratoga Gap Open Space Preserve to the south and Long Ridge Open Space Preserve to the west. This Park offers a wilderness experience to visitors and is a popular destination for a variety of trail users including hikers, bicyclists and equestrians. The trails connect seamlessly to adjacent open space preserves enhancing the region's trail-based recreational opportunities.

Park forests are faced with many threats that increase tree stress, including pest and disease infestations, invasive species establishment, and wildfires. Climate change also increases the threat to Park forests through increased temperatures and decreased precipitation. Such threats increase the potential for tree mortality and failure, posing a risk to Park staff and visitors. Additionally, unhealthy forests have the potential for species loss, reduction in species diversity, epidemic levels of pests and disease, air and water quality degradation, and negatively impact wildlife populations, increase wildfire hazard, and reduce recreational benefits.

In more recent years, these Parks have been subject to forest pathogen and pest outbreaks. These events are indicative of broader scale forest health issues driven by biotic factors, such as competition, and abiotic factors, such as drought and forest management policies and practices. Another specific concern is fire and protection of these Parks and neighboring communities from catastrophic wildfire. In most locations the fuel load is extremely heavy and ladder fuels are abundant throughout.

This Plan identifies general practice and project-specific management recommendations to address forest threats in both Parks and acknowledges that trees, vegetation, and forest threats are dynamic, and their management necessitates an adaptive management approach. The goals, objectives, and recommendations identified in this Plan are based on existing field conditions and have been identified to reduce risks to staff and visitors and promote overall forest health, as a healthier forest is more resilient to forest threats. This Plan also identifies Best Management Practices (BMPs) to be implemented during operations and maintenance activities and during implementation of recommended projects to reduce or avoid impacts to Park resources.

1.1 Purpose

Forest health is affected by numerous threats, primarily pests and pathogens, fuel loading and wildfire hazard, drought, and invasive species. The management history of the redwood stands within the Parks, one dominant forest type, has shaped stand density and composition, increasing competition for resources and contributing to emerging forest health issues. Additionally, fire suppression has created unprecedented levels of competition and hazardous fuel accumulations in nearly all areas. Fire suppression has also led to significant losses of oak woodlands, which are outcompeted by Douglas-fir. Climate change represents a threat to these forests and warrants consideration in forest management. Current and potential future threats to forests can increase tree stress, resulting in increased pest and/or disease infestations, tree mortality, fire hazard, and corresponding risk to staff and visitors. Operations and maintenance activities, as well as proposed future development in the Parks, can also contribute to forest health degradation via direct impacts to trees and stands. The purpose of this Plan is to identify forest health issues, management actions and specific projects to minimize the effects of threats and provide a framework for managing them over time. While this Plan is intended to be a stand-alone document, the information and recommendations presented herein are intended to be used by the Department in evaluating forest health management needs on an ongoing basis.

1.2 Plan Scope and Timeframe

The scope of this Plan covers all forested areas within Sanborn County Park and Upper Stevens Creek County Park, as well as any non-forested areas that fall within recommended project areas (e.g., coastal scrub in fuel breaks). This Plan also recognizes that the Park's Natural Resources Program is actively addressing tree risk in high-use areas, such as the Sanborn County Park main entrance, ranger office, campgrounds, and historic sites like the Welch-Hurst House, under its Tree Safety Program, which includes biannual surveys of high-use areas and as-needed tree risk assessments for trees exhibiting signs of poor health or structure. This Plan recommends continuation of that program while implementing the general practice and project-specific management recommendations identified herein. Project recommendations included in this Plan

expand beyond the high-use areas in the Parks, are applicable in all forested areas of the Park, and are recommended for implementation now and during future development activities conducted under the Park Master Plan.

The timeframe for this Plan is 20 years, a timeframe suitable to accomplish this Plan's management recommendations and evaluate their effectiveness in meeting the Plan's goals and objectives. The goals, objectives and recommendations contained herein should be reviewed at the end of the 20-year timeframe, following a re-evaluation of the Park's forestland areas and the success of management activities recommended in this Plan. Following such a review, revisions to Plan goals, objectives and/or recommendations may be necessary to reflect forest conditions within the Park at that time.

1.3 Sanborn and Upper Stevens Creek County Parks Locations

Sanborn County Park is located in the unincorporated portion of Santa Clara County west of the Cities of Saratoga and Los Gatos (Figure 1). The western boundary of the Park roughly follows Skyline Boulevard (State Route 35). The area immediately surrounding the Park is predominately low-density residential, protected open space and agriculture. The County of Santa Clara General Plan (County of Santa Clara 1994) surrounding land use designations include Hillsides (20-160 acres per dwelling unit) and Mountain Residential (10-40 acres per dwelling unit). The surrounding area includes many large estates and vineyards with limited development. The Park is largely undeveloped, with approximately 3,383 acres remaining in an undeveloped, natural state, and approximately 50 acres of developed area with visitor-serving amenities (e.g., campgrounds, picnic areas) and roadways. The Park's legal description is summarized in Table 1.

Upper Stevens Creek County Park is in the unincorporated portion of Santa Clara County approximately 7 miles northwest of Sanborn County Park in (Figure 1). This Park is on the east side of Skyline Boulevard (State Route 35), approximately 3 miles south of Page Mill Road. The area immediately surrounding the Park is predominately low-density residential and protected open space. Similar to Sanborn County Park, the County of Santa Clara General Plan (County of Santa Clara 1994) surrounding land use designations include Hillsides and Mountain Residential. The Park is Largely undeveloped, with approximately 1,280 acres remaining in an undeveloped, natural state. Less than 1 acre is developed with visitor-serving amenities (e.g., trailheads and parking area). The Park's legal description is summarized in Table 2.

Table 1
Sanborn County Park Location

Sections	Township	Range	Acreage
8	8S	2W	1.6
9	8S	2W	168.1
10	8S	2W	103.5
11	8S	2W	2.8
14	8S	2W	8.5
15	8S	2W	572.2
16	8S	2W	558.8
17	8S	2W	219.7
21	8S	2W	187.4
22	8S	2W	525.8
23	8S	2W	401.1
24	8S	2W	40.9
25	8S	2W	282.1
26	8S	2W	283.9
27	8S	2W	1.4
30	8S	1W	75.8
		Total Acreage:	3,433.6

Source: County of Santa Clara, 2019a; Mount Diablo Base and Meridian

Table 2
Upper Stevens Creek County Park Location

Sections	Township	Range	Acreage
01	8S	3W	39.5
06	8S	2W	5.5
25	7S	3W	461.6
26	7S	3W	86.8
30	7S	2W	116.1
31	7S	2W	156.6
36	7S	3W	414.4
		Total Acreage:	1,280.4

Source: County of Santa Clara, 2019a; Mount Diablo Base and Meridian

1.4 Forest Health Plan Goals and Objectives

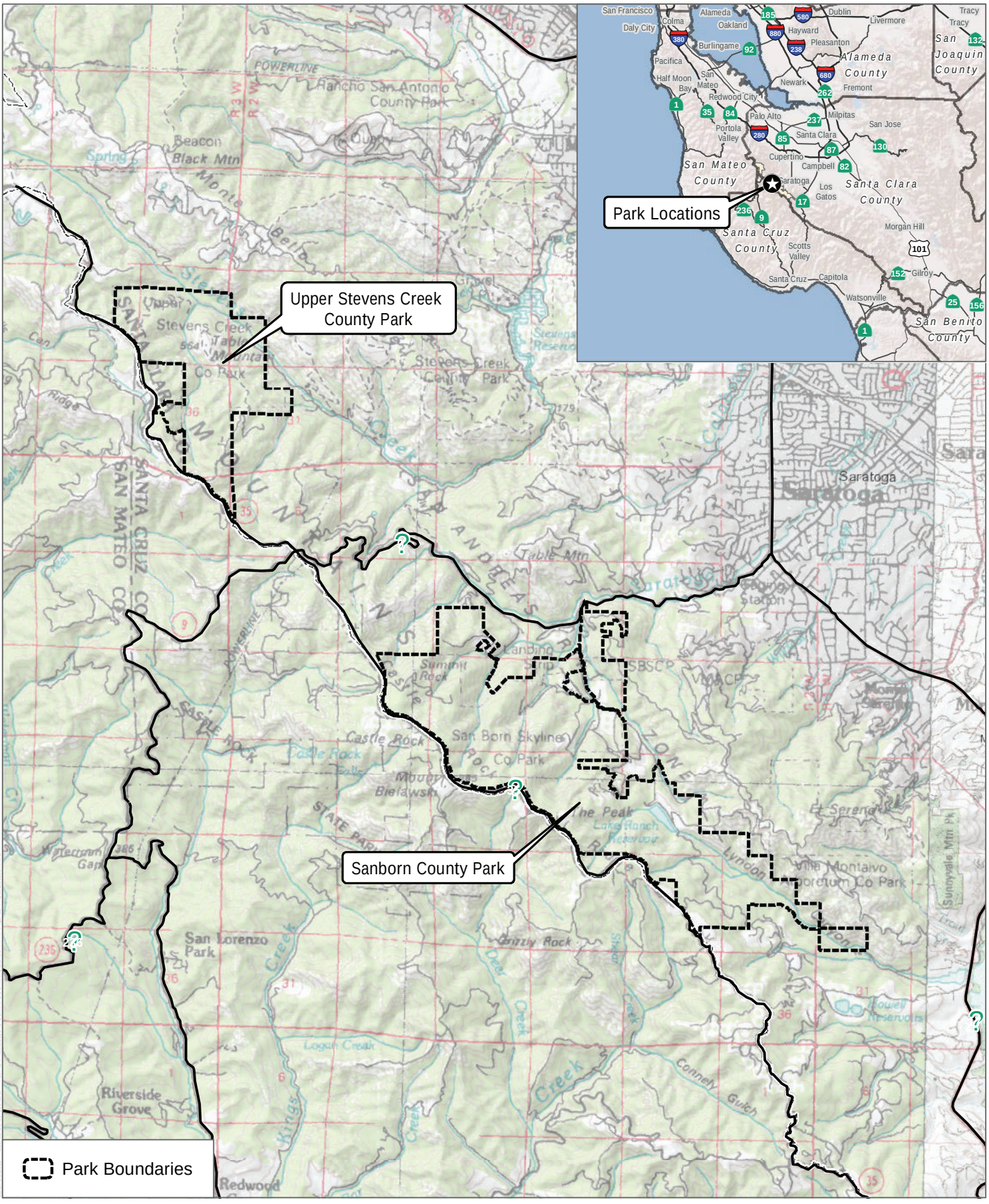
Four primary goals were identified to guide implementation of this Plan. The goals provide a framework under which specific management objectives and recommendations were developed. The goals of this Plan are to:

1. Mitigate hazards to Park users and employees. These are actions taken to reduce or eliminate risks caused by events such as wildfires and/or tree hazards including dead or dying trees, dead parts of live trees, or unstable live trees that are within striking distance of people.
2. Promote forest resiliency to drought, pest and disease infestation, catastrophic wildfire, and climate change.
3. Protect the biodiversity of forested lands within the parks through active management of specialized habitats like grasslands, chaparral and oak woodlands and reducing the risk of loss of forest habits through fire and plant disease.
4. Avoid or minimize impacts to other natural resources and recreational facilities. Impacts may include damages caused by hazard trees to property such as roads, infrastructure, and facilities like campgrounds, trailhead parking, administrative sites, educational sites, historic buildings, and others.

To achieve these management goals, the following objectives were developed to achieve or maintain desired forest conditions in the Parks. The purpose of the objectives is to inform the Plan's project-specific recommendations, recommendations for park operations and maintenance activities that affect individual trees or the forest, and recommendations for minimizing impacts to retained trees and forestland during project activities and future development activities carried out under the Sanborn Park Master Plan. The objectives of this Plan are to:

1. Remove hazards to life and property in and around areas of public use.
2. Monitor threats to forest health.
3. Identify and prioritize potential fuel management activities based on hazard, location, and relationship to regional and local fire hazard reduction efforts.
4. Improve forest stand conditions to minimize the effect of forest threats and promote long-term forest health.
5. Implement BMPs that avoid or minimize potential adverse effects of forest management activities on residual trees, sensitive biological resources, cultural resources, water resources, aesthetics, soils, slope stability, and recreational resources.

6. Outline management recommendations that provide direction to Park staff for operations and maintenance activities in forested areas.
7. Routinely evaluate the effectiveness of forest management activities in the Park towards meeting these objectives.



SOURCE: USGS 2020

FIGURE 1

Sanborn and Upper Stevens Creek Parks Location Map

Sanborn-Upper Stevens Creek Forest Health Plan

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2 PARK DESCRIPTION

2.1 Natural Resource Management Zones

Natural Resource Management Zones (NRMZs) were developed for use in the Santa Clara County Park System and are defined by logical boundaries within the landscape, including, but not limited to drainages, ridgelines, roads, and trails (County of Santa Clara 2019b). The function of NRMZs is to simplify management of natural resources, identify management needs, and act as an instrument of planning for park use, development, prioritization and natural resource protection (County of Santa Clara 2019b). Sanborn County Park contains seven NRMZs, which are summarized in Table 3. For the purposes of this Plan, Upper Stevens Creek County Park was divided into two NRMZs, which are summarized in Table 4. A map of the Natural Resource Management Zones for both Parks is provided in Figure 2.

This plan retains the existing seven NRMZs in Sanborn County Park and proposes creation of two NRMZs for Upper Stevens Creek County Park, as none existed previously for this Park. Management recommendations contained in this Plan are identified by NRMZ.

Table 3
Sanborn County Park Natural Resource Management Zones

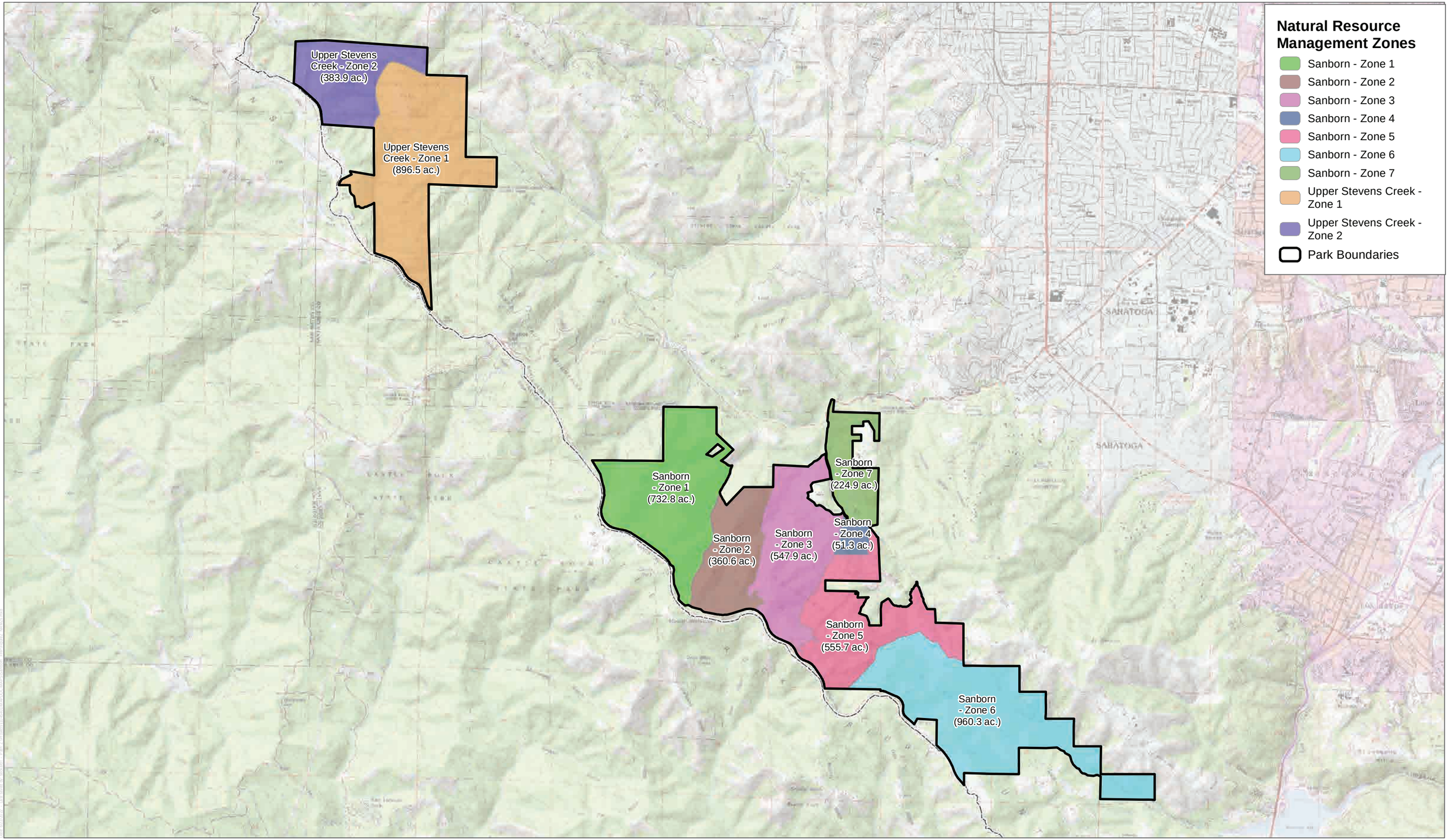
NRMZ	Acreage	Description	Watershed/Name
1	732.8	Moderate use, 90% forested, redwood and mixed evergreen forest dominated, special interest areas include Summit and Indian Rock	Bonietti-McElroy
2	360.6	Moderate use, dominated by second growth redwood forest, trail use, sensitive riparian habitat along Todd Creek has been impacted by trail use	McElroy-Todd
3	547.9	High use, visitor and outdoor centers, youth hostel, trails, areas dominated by invasive plants, Monterey Pine, redwood, Douglas-fir, mixed oak and bay	Todd-Sanborn
4	51.3	High use, contains the developed portion of the park, campgrounds (RV and walk-in), picnic areas, ranger station, education center, trails and trailheads present, redwood grove, tanoak and California bay	Developed
5	555.7	Low use, dense forest with ladder fuels, some riparian zones, forests dominated by tanbark oak, Douglas-fir, California bay, and black oak with some exotics.	Sunnyvale Mountain
6	960.3	Low use, south facing slopes include chemise redshank chaparral and manzanita, other cover includes exotic trees (silver fir and blue gum eucalyptus), redwood, Douglas-fir, coast live and tanbark oak	Lyndon Canyon
7	224.9	Low use, former working nursery site, two ponds, two Native American cultural sites, no access, Douglas-fir, redwood forest and mixed oak woodland dominated	Old Nursery

Source: Smith 2012; County of Santa Clara 2019b

Table 4
Upper Stevens Creek County Park Natural Resource Management Zones

NRMZ	Acreage	Description	Watershed/Name
1	896.5	Low use, forested, oak-madrone mixed hardwood, Douglas-fir, riparian, mixed chaparral, and annual grassland; special interest areas include Table Mountain which is site of former Christmas tree farm	Table Mountain
2	383.9	Low use, forested, oak-madrone mixed hardwood, Douglas-fir, riparian, mixed chaparral, and annual grassland	Grizzly Flat

Source: Brady and Associates 1993



SOURCE: USGS 2020; Santa Clara County GIS (2019)

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FIGURE 2

Sanborn and Upper Stevens Creek Parks Natural Resource Management Zones (NRMZs)

Sanborn-Upper Stevens Creek Forest Health Plan

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2.2 Physical Environment

This section describes the physical environment for both Parks that contributes to and influences tree growth and forest dynamics, including a discussion of water resources that may be affected by recommended management actions and the history of tree harvesting and the relative lack of wildfire in the Parks, both of which have contributed to current forest stand compositions. A more detailed description forest resources is provided in Section 3.

2.2.1 Climate

The climate for both Parks is influenced by their locations near the Pacific Ocean. This landscape is frequently under the influence of a seasonal, migratory, subtropical high-pressure cell known as the Pacific High (WRCC 2020). Wet winters and dry summers with mild seasonal changes generally characterize the Santa Cruz Mountains. This climate pattern is occasionally interrupted by heat waves, cold snaps, isolated thunderstorms, fog, or dry easterly winds (WRCC 2020). In general, the climate in both Parks is relatively mild with an average annual temperature of 56 degrees Fahrenheit, although some variance in temperatures occurs due to the influence of elevation and aspect (solar exposure). In Sanborn County Park, the temperatures from May to October range from 62 to 85 degrees Fahrenheit and from November to April the average temperatures range from 42 to 70 degrees Fahrenheit (Santa Clara County Parks 2019). Similar temperature would be experienced in Upper Stevens Creek County Park.

The regional prevailing wind pattern is from the west (onshore), though shifts to the northeast during late summer and early fall. In Upper Stevens Creek County Park, the winds commonly come up the canyon from below Montebello Ridge from the northwest (Young 1984). The summit exposure, coastal fog, and accompanying onshore breezes can affect temperatures in short periods of time. The growing season lasts approximately 225 to 250 days per year, with the last frost typically occurring near the end of March each year (Smith 2012). The mean annual precipitation for Sanborn County Park was 48-52 inches (1906 to 1956), with the wettest years receiving 90 inches and the driest 20-35 inches (Smith 2012).

2.2.2 Topography

Both Parks are in the central part of the steep, coastal Santa Cruz Mountains. Topography affects several factors that influences forest growth, including soil type, solar exposure, rainfall, and fog drip, amongst others. In Sanborn County Park, the terrain is varied with elevations ranging from 840 to 3,160 feet (Santa Clara County Parks 2019). Within the park, the topography varies greatly from gentle to steep slopes. In Upper Stevens Creek County Park, Table Mountain (elevation 1,842 feet) is a notable Park feature, though not the Park's highest point. Additional prominent

peaks/ridgelines include one near the junction of Charcoal Road and Skyline Boulevard (approximately 2,400 feet) and one along Grizzly Flat Trail near Skyline Boulevard (approximately 2,800 feet) (Brady and Associates 1993).

Topography affects air temperature, solar exposure, and precipitation, each of which affect vegetation composition and distribution. Cooler temperatures and higher rainfall totals are found at higher elevations. Aspect (the direction a slope faces) influences solar exposure and therefore vegetation type and/or density. All slope aspects are represented in the Parks. South and west-facing slopes are subject to more thermal heating from the sun and consequently have higher temperatures and are typically dominated by lighter vegetation types (brush, grasses). North and east-facing slopes receive less solar exposure and are therefore cooler and are typically dominated by tree/forest cover. Tables 5 and 6 summarize elevation ranges in each of the Parks by NRMZ.

Table 5
Sanborn County Park Elevation Ranges, by NRMZ

NRMZ	Minimum Elevation (ft.)	Maximum Elevation (ft.)	Range (ft.)
1	1,360	3,120	1,760
2	1,640	3,080	1,440
3	1,040	3,000	1,960
4	1,280	1,680	400
5	1,320	3,000	1,680
6	880	2,680	1,800
7	840	1,640	800

Source: County of Santa Clara 2019c

Table 6
Upper Stevens Creek County Park Elevation Ranges, by NRMZ

NRMZ	Minimum Elevation (ft.)	Maximum Elevation (ft.)	Range (ft.)
1	1,200	2,500	1,360
2	1,240	2,320	1,080

Source: County of Santa Clara 2019c

Slope is also an important component in erosion potential and the ability to conduct forest management operations. Tables 7 and 8 summarize slope ranges in both Parks, by NRMZ.

Table 7
Sanborn County Park Slope Ranges, by NRMZ

Slope Range (percent)	Acres (by NRMZ)							Total
	1	*2*	*3*	*4*	*5*	*6*	*7*	
0-4%	23	7	16	5	22	60	26	159
5-15%	97	36	83	35	88	150	63	552
16-30%	295	179	248	10	257	413	63	1465
31-40%	266	125	182	1	173	303	59	1109
41-50%	51	14	18	0	16	33	14	146
51% +	1	1	1	0	1	1	1	6
Total	733	362	548	51	557	960	225	3437

Source: USGS 2019

Table 8
Upper Stevens Creek County Park Slope Ranges, by NRMZ

Slope Range (percent)	Acres (by NRMZ)		Total
	1	*2*	
0-4%	41	14	55
5-15%	142	44	186
16-30%	456	196	652
31-40%	245	122	367
41-50%	12	8	20
51%+	1	1	2
Total	897	385	1280

Source: USGS 2019

Topography also affects wildfire movement and spread. Steep terrain typically results in faster up-slope fire spread due to pre-heating of uphill vegetation while flat areas typically result in slower fire spread, absent of windy conditions. Topographic features such as saddles, canyons, and chimneys (land formations that collect and funnel heated air upward along a slope) may form unique circulation conditions that concentrate winds and funnel or accelerate fire spread. Figure 3 and 4 presents the topography and water resources for both Parks.

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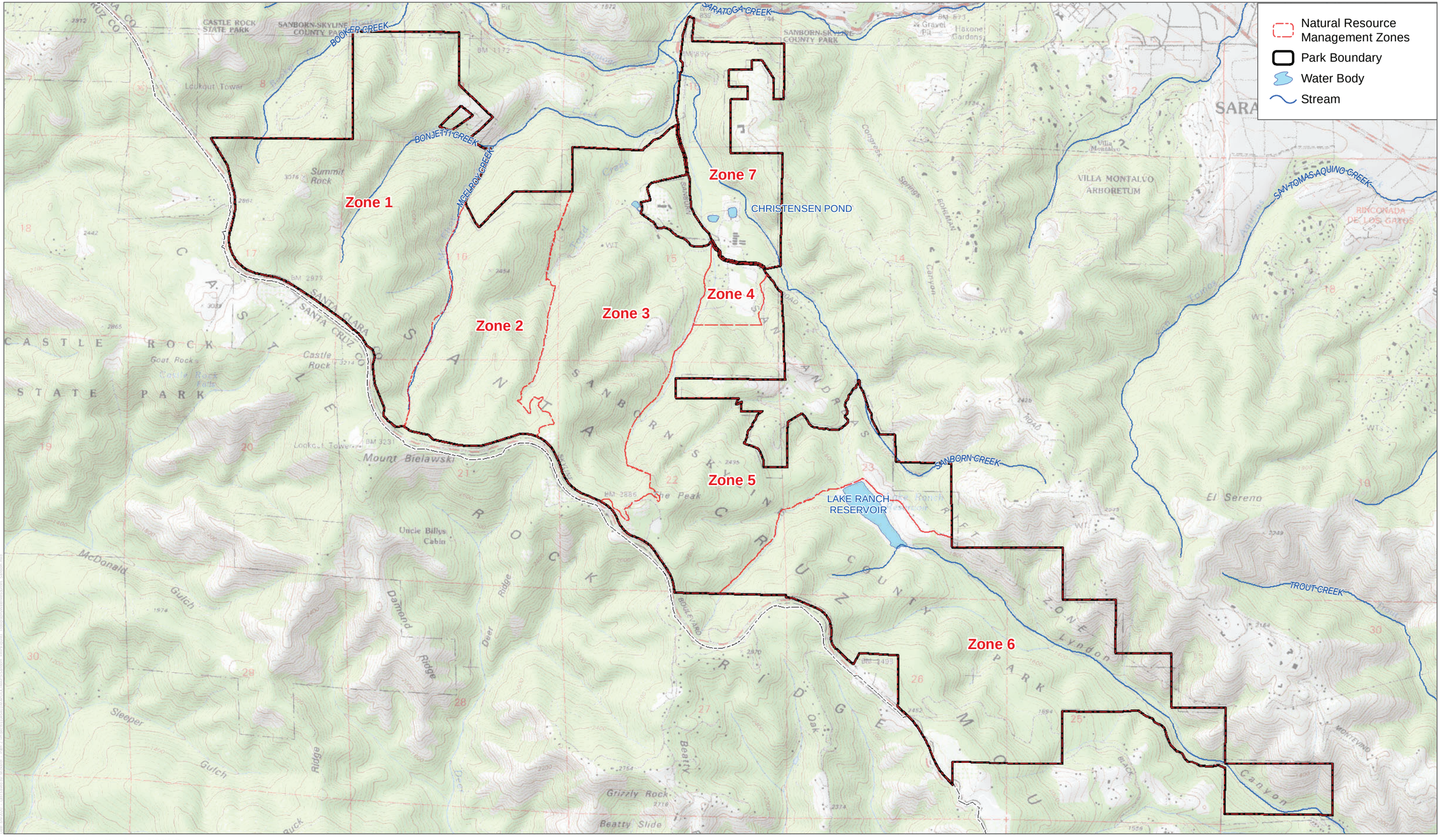

SOURCE: USGS 2020; Santa Clara County GIS (2019)

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FIGURE 3

Sanborn County Park Topography and Water Resources

Sanborn-Upper Stevens Creek Forest Health Plan

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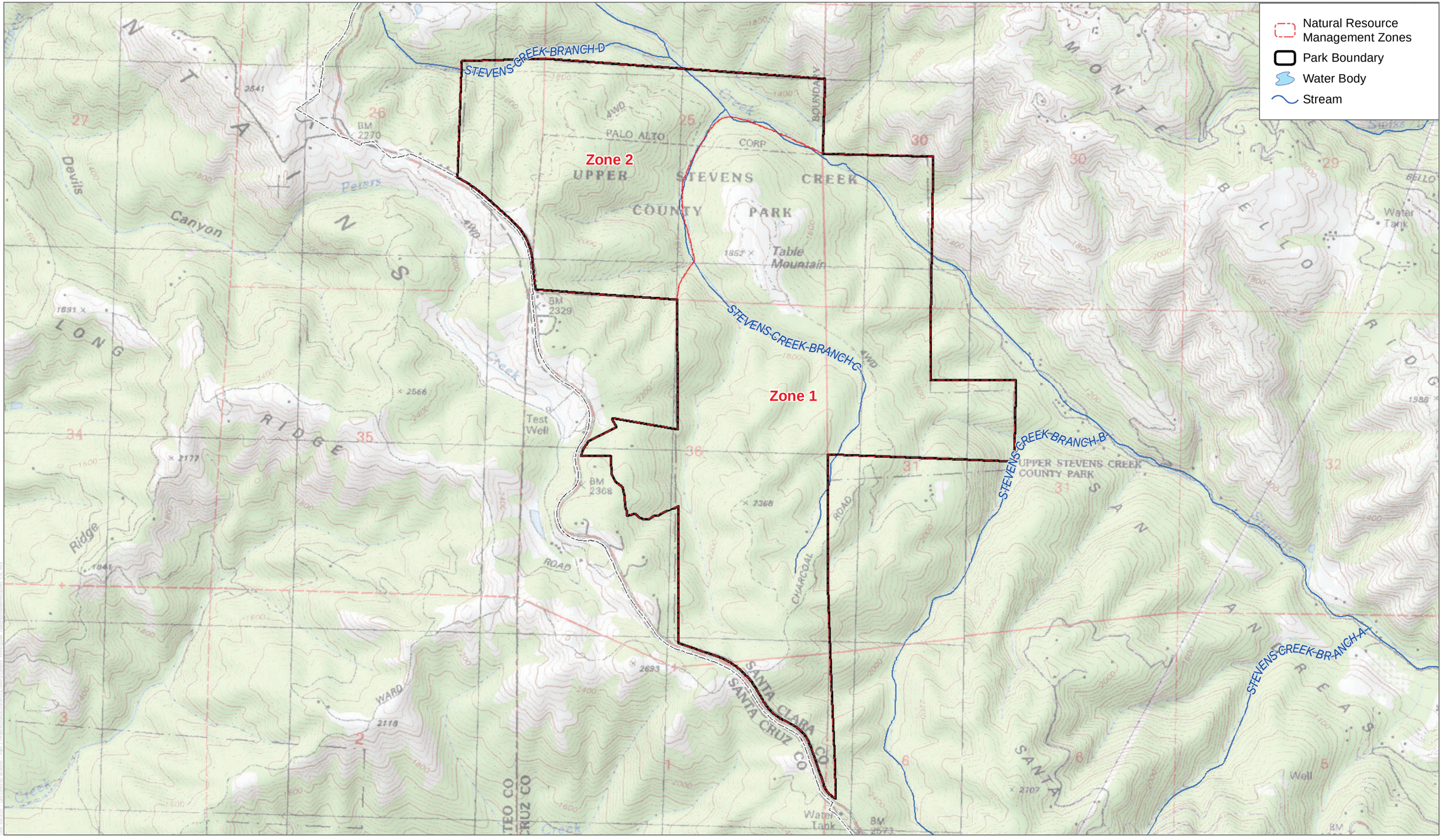

SOURCE: USGS 2020; Santa Clara County GIS (2019)

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0 750 1,500 Feet

FIGURE 4

Upper Stevens Creek County Park Topography and Water Resources

Sanborn-Upper Stevens Creek Forest Health Plan

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2.2.3 Soils and Geology

The primary soils represented at both Sanborn County Park and Upper Stevens Creek County Park are the Ben Lomond-Casrock complex (30 to 50% slopes and 50 to 75% slopes). These soils are deep, well-drained soils formed from weathered sandstone or granite. Sanborn County Park contains unique sandstone features along Skyline Boulevard. Summit and Indian Rocks are sedimentary rock formations similar to those found in Castle Rock State Park located just to the East and are an attraction to park visitors (Smith 2012). In Upper Stevens Creek County Park, the San Andreas Fault traverses through the northeastern portion of the Park, roughly following Stevens Creek (Brady and Associates 1993). Seismic activity has resulted in sag pond formation along the creek upstream from Grizzly Flat near the Park's western boundary with Monte Bello Preserve.

A summary of soils for both Parks is presented in Tables 9 and 10, by NRMZ. Park soils are also presented in Figure 5 and 6.

- **Aptos:** Moderately deep, well drained soils that formed in material weathered from sandstone, mudstone, or shale. Aptos soils are on uplands and have slopes 15 to 75 percent (USDA 2018).
- **Ben Lomond:** Deep, well drained soils that formed in material weathered from sandstone or granitic rocks. Ben Lomond soils are on uplands and have slopes of 5 to 75 percent (USDA 2018).
- **Casrock:** Moderately deep, well drained soils that formed in residuum from sandstone. Casrock soils are on mountains. Slopes range from 8 to 30 percent (USDA 2018).
- **Katykat:** Very deep, well drained soils that formed in residuum weathered from sandstone and mudstone. The Katykat soils are on foothills and mountain slopes and summits. Slopes range from 8 to 75 percent (USDA 2018).
- **Madonna:** Moderately deep, well drained soils that formed in material weathered in residuum from sandstone and shale. Madonna soils are on uplands and have slopes of 15 to 75 percent (USDA 2018).
- **Maymen:** Shallow, somewhat excessively drained soils formed from shale, schist, greenstone, sandstone and conglomerate. These are mountain soils with slopes ranging from 5 to 100 percent. Dominant vegetation includes open stands of chaparral consisting of chamise, manzanita, ceanothus, scrub oak, and scattered small trees (USDA 2018).
- **Mouser:** Deep and very deep, well drained soils that formed in residuum weathered from sandstone, mudstone and greenstone. The Mouser soils are on summits and side slopes of mountains and hills. Slopes range from 8 to 75 percent (USDA 2018).

- **Sanikara:** Very shallow and shallow to lithic contact, well drained soils that formed in residuum weathered from sandstone and greenstone. The Sanikara soils are on hills, mountain slopes and summits. Slopes range from 8 to 100 percent (USDA 2018).

Table 9
Sanborn County Park Soil Types, by NRMZ

Soil Type	Acres (by NRMZ)							Total
	1	*2*	*3*	*4*	*5*	*6*	*7*	
Aptos loam, warm, 15 to 30 percent slopes	0	0	1	0	25	0	0	25
Ben Lomond sandy loam, 5 to 15 percent slopes	1	0	0	0	0	0	0	1
Ben Lomond gravelly sandy loam, 15 to 30 percent slopes	59	0	16	34	10	116	81	315
Ben Lomond-Casrock complex, 30 to 50 percent slopes	148	210	192	18	374	296	1	1,239
Ben Lomond-Casrock complex, 50 to 75 percent slopes	506	143	297	0	114	251	0	1,313
Casrock-Skyridge-Rock outcrop complex, 8 to 30 percent slopes	19	7	42	0	3	0	0	72
Katykat-Mouser-Sanikara complex, 30 to 50 percent slopes	0	0	0	0	0	0	1	1
Katykat-Sanikara complex, 8 to 30 percent slopes	0	0	0	0	0	0	17	17
Madonna loam, 15 to 30 percent slopes	1	0	0	0	0	52	0	53
Maymen gravelly sandy clay loam, 50 to 75 percent slopes	0	0	0	0	0	20	0	20
Mouser-Katykat-Sanikara complex, 50 to 75 percent slopes	0	0	0	0	26	8	0	33
Sanikara-Mouser-Rock outcrop complex, 50 to 75 percent slopes	0	0	0	0	3	201	124	329
Water	0	0	0	0	0	16	0	16
Total	734	360	548	52	555	960	224	3,434

Source: USDA 2018

Table 10
Upper Stevens Creek County Park Soil Types, by NRMZ

Soil Type	Acres (by NRMZ)		Total
	1	*2*	
Aptos loam, warm, 15 to 30 percent slopes	19	7	25
Aptos loam, warm, 30 to 50 percent slopes	1	0	1
Ben Lomond gravelly sandy loam, 15 to 30 percent slopes	45	0	45
Ben Lomond-Casrock complex, 30 to 50 percent slopes	535	98	633
Ben Lomond-Casrock complex, 50 to 75 percent slopes	234	252	486
Ben Lomond-Felton complex, 30 to 75 percent slopes	39	0	39
Sanikara-Footpath complex, 30 to 75 percent slopes	26	0	26
Sanikara-Mouser-Rock outcrop complex, 50 to 75 percent slopes	24	1	25
Total	923	358	1,280

Source: USDA 2018

Soil types also contribute to erosion potential. A discussion of erosion hazard ratings (EHR) and identification of BMPs for minimizing erosion potential are presented in Section 8.3. Slope instability areas are landslide hazard zones mapped within the unincorporated areas of Santa Clara County and depict an unstable condition arising from the presence or likely future occurrence of slope failure (County of Santa Clara 2020). Table 11 summarizes the areas within both Parks classified as landslide hazard zones, by NRMZ. These areas are also depicted in Figures 5 and 6.

Table 11
Sanborn and Upper Stevens Creek County Parks Slope Instability Areas, by NRMZ

NRMZ	Acreage	Percentage of NRMZ
Sanborn County Park		
1	495	67.5%
2	239	66.2%
3	452	82.5%
4	15	30.2%
5	502	90.3%
6	915	95.2%
7	111	49.5%
Upper Stevens Creek County Park		
1	549	61.3%
2	288	74.9%

Source: County of Santa Clara 2020.

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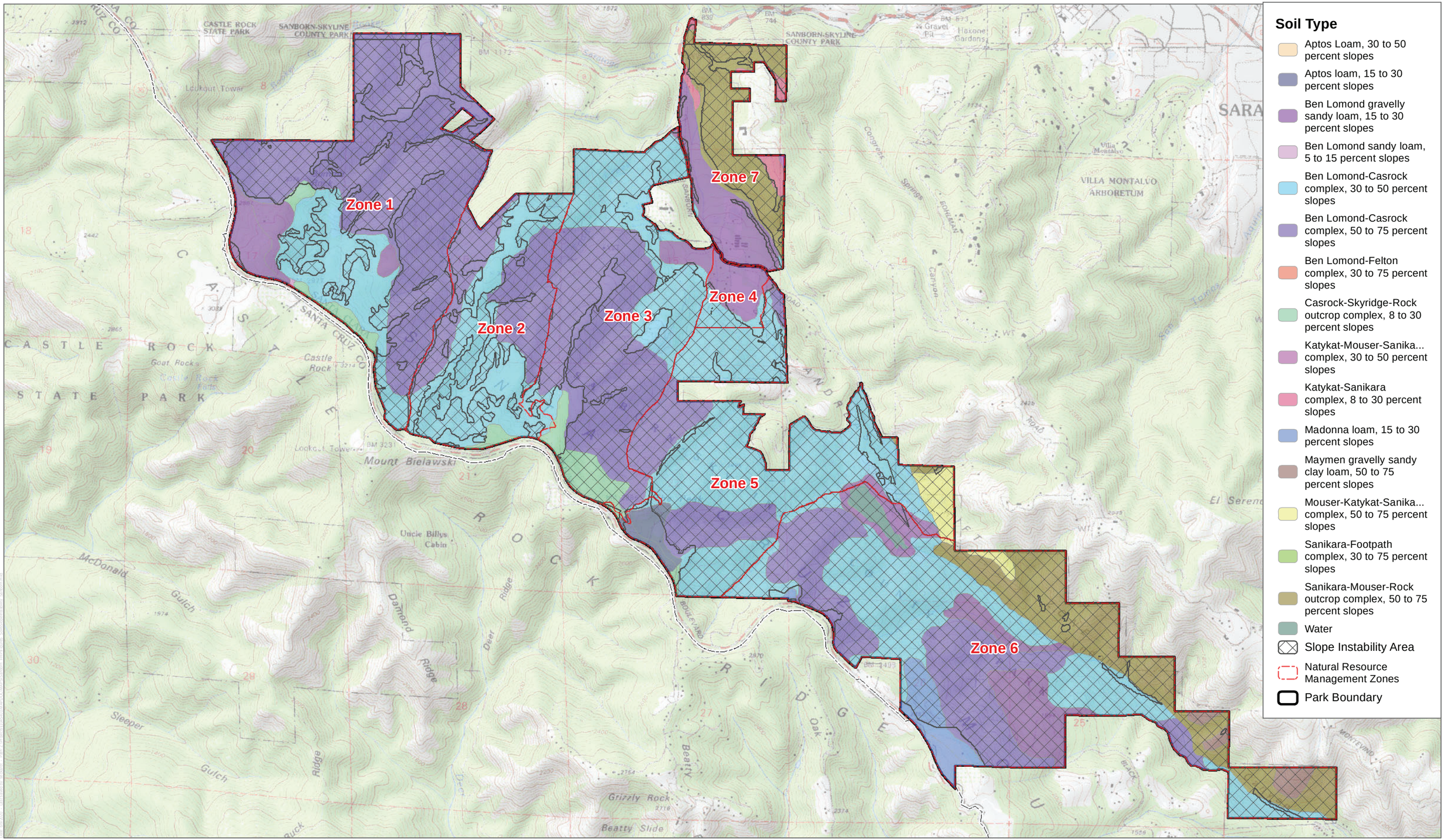

SOURCE: USGS 2020; USDA 2018; Santa Clara County GIS (2019)

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0 1,050 2,100 Feet

FIGURE 5

Sanborn County Park Soil Types and Slope Instability Areas

Sanborn-Upper Stevens Creek Forest Health Plan

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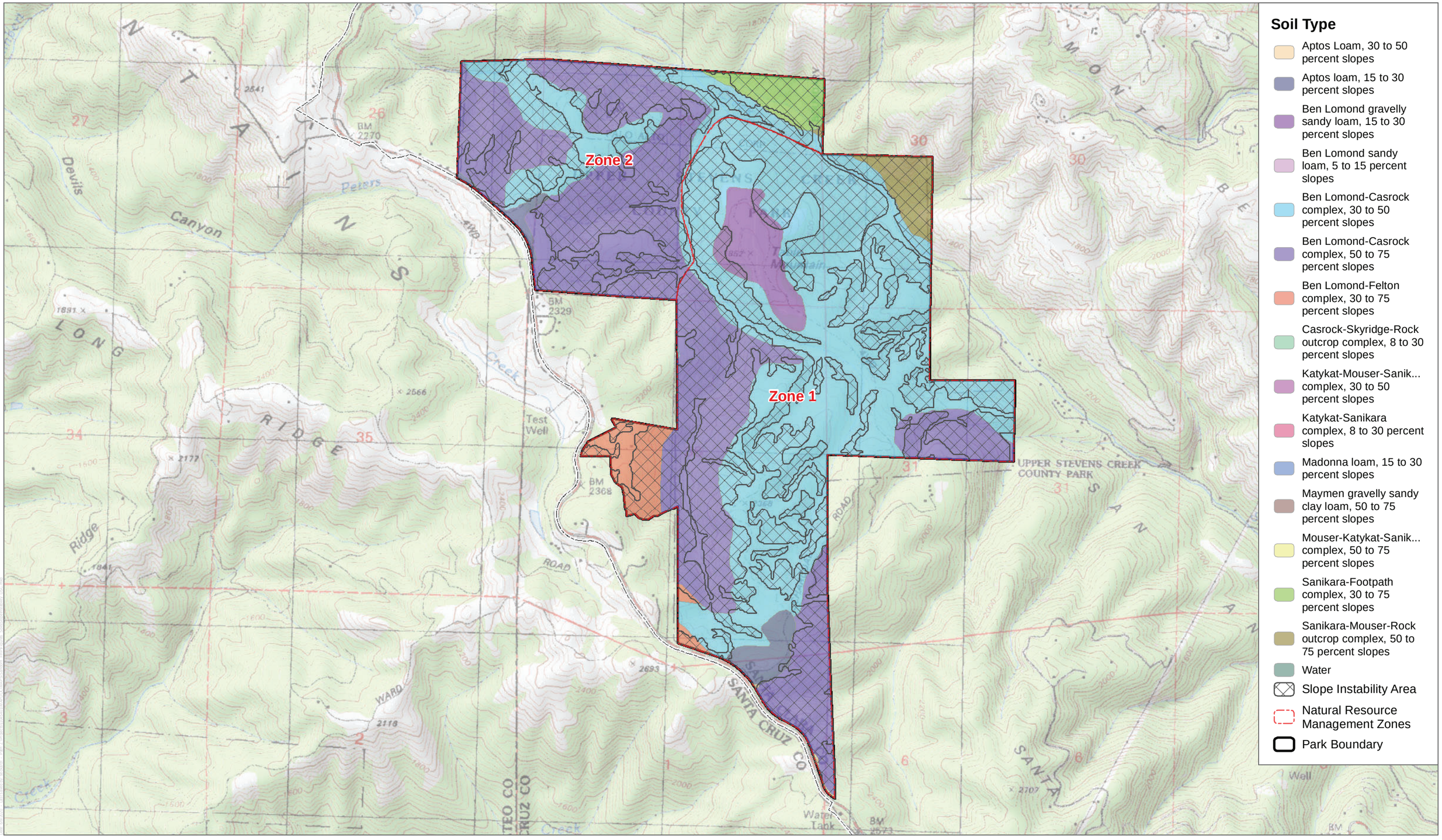

SOURCE: USGS 2020; USDA 2018; Santa Clara County GIS (2019)

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FIGURE 6

Upper Stevens Creek County Park Soil Types and Slope Instability Areas

Sanborn-Upper Stevens Creek Forest Health Plan

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2.2.4 Water Resources

Sanborn County Park contains a man-made reservoir called Lake Ranch Reservoir (approximately 14 acres) which is drained by Lyndon Canyon Creek toward Lexington Reservoir. There are also three man-made ponds in the park, including two lined ponds near the old nursery site and one near the youth hostel. Saratoga Creek is one of the water courses through the Park. While there are several creeks that flow through, including Sanborn Creek, they are all tributaries to Saratoga Creek (Smith 2012). While good fish habitat exists along Sanborn Creek, it is not known if fish are present in it or any of the other creeks in the Park (Smith 2012). Other creeks that run through the park include Booker, Bonietti, McElroy, Todd, San Andreas, Congress Spring, and San Thomas Aquino (Smith 2012).

Stevens Creek bisects the northeast corner of Upper Stevens Creek County Park. This stream is perennial and has flow year-round. Stevens Creek at one time had very good steelhead trout habitat. However, insufficient flow, debris and sediment have impacted the population. It is not known or documented if they are still present in Upper Stevens Creek County Park. There are several other unnamed seasonal and perennial creeks which flow directly and indirectly into Stevens Creek. The watershed for Stevens Creek is mainly contained within the Park.

The California Forest Practice Rules (California Code of Regulations, Title 14, Section 916.5) define Class I, II, III, and IV waterbodies. Class I waterbodies are those where fish are always or seasonally present onsite. Saratoga Creek and Stevens Creek could be classified as a Class I stream as it supports spawning and rearing by steelhead. Sanborn, Booker, Bonietti, McElroy, Todd, San Andreas, Congress Spring, and San Thomas Aquino may have portions of their reaches that would be classified as Class I, II, or III. Other, unnamed intermittent streams and tributaries exist throughout the Parks and may be classified as Class II, Class III, or unclassified streams. There are no known manmade watercourses, class IV, originating within the Park boundaries. Figures 3 and 4 graphically portrays the water resources for both Parks.

These Parks are also located in the CALWATER Planning Watersheds summarized in Table 12. CALWATER provides a standard nested watershed delineation scheme using the State Water Resources Control Board numbering scheme. Its standardized boundary delineation, coding, and naming of California watersheds is used by government agencies in evaluating mapping, and documenting water resources and water quality information and regulations and evaluating a project's cumulative impacts. Each of these watersheds is subject to the Coastal Anadromy Zone Forest Practice Rules.

Table 12
Sanborn and Upper Stevens Creek County Parks CALWATER Planning Watersheds

Name	Number	Acres
Sanborn County Park		
Bear Creek	3304.1203	22
Lexington Reservoir	2205.400202	894
Redwood Grove	3304.120101	2
Redwood Grove	3304.120102	29
Upper Saratoga Creek	2205.5005	2,487
Upper Stevens Creek County Park		
Stevens Creek	2205.500302	1,279
Pescadero	2202.400102	2

Source: CALWATER 2.2.1 (2016)

2.2.5 Vegetation Communities/Land Cover Types

This section summarizes the dominant vegetation communities/land cover types present in the Parks. The dominant plant found in the overstory defines a vegetative series (Smith 2012). Dominant overstory species are those species that contribute the greatest amount of cover. Series reflect large-scale environmental conditions such as climate, elevation, or geology. As outlined in Smith (2012) and presented in GIS mapping data for the Parks, the following vegetative series are found within the Parks:

- Bare ground
- Black oak
- Broom
- California annual grassland
- California bay
- California sagebrush
- Canyon live oak
- Chamise
- Christmas tree farm
- Coast live oak
- Coyote brush
- Douglas-fir
- Douglas-fir – tanoak
- Eucalyptus
- Misc. orchard
- Mixed oak
- Mixed sage
- Mixed scrub oak
- Mosquito Fern
- Poison oak
- Redwood
- Tanoak
- Urban/Park grasses
- Urban/Park hardscape
- Water
- Woolyleaf manzanita

A summary of the most common series found in Sanborn and Upper Stevens Creek County Parks is included in the following sections.

2.2.5.1 Redwood Series

The Redwood (*Sequoia sempervirens*) is the dominant tree in the canopy. California bay (*Umbellularia californica*), Douglas-fir (*Pseudotsuga menziesii*), madrone (*Arbutus menziesii*), and tanoak (*Notholithocarpus densiflorus*) may be present. Other plant species that could be present include bigleaf maple (*Acer macrophyllum*) and several species of ferns including chain (*Woodwardia fimbriata*), bracken (*Pteridium aquilinum*), and sword fern (*Polystichum munitum*). Redwoods in Sanborn County Park encompass 190.3 acres and are interspersed along riparian zones such as along Todd and McElroy Creeks and Lyndon Canyon. No redwood cover is mapped for Upper Stevens Creek County Park.

2.2.5.2 Douglas-Fir/Douglas-fir-Tan Oak Series

These vegetative series are where Douglas-fir and tanoak trees are dominantly or co-dominant in the tree canopy. California bay, madrone, canyon live oak (*Quercus chrysolepis*), and black oak (*Quercus kelloggi*), are also found in this series. Other plants include bracken, sword fern, and poison oak (*Toxicodendron diversilobum*). These series encompass 1,654.3 acres and are the dominant forest cover types in Sanborn County Park. These series encompass 208.8 acres in Upper Stevens Creek County Park.

2.2.5.3 Coast Live/Canyon Live Oak Series

Coast live oak (*Quercus agrifolia*) or canyon live oak are the dominant tree. Other species that might be present include bigleaf maple, California bay, madrone, chamise (*Adenostoma fasciculatum*), poison oak, and toyon (*Heteromeles arbutifolia*). Ground cover is usually bare or grassy. These series encompass 646.9 acres in Sanborn County Park. These series are not represented in Upper Stevens Creek County Park.

2.2.5.4 Mixed Oak Series

For a stand to be classified as a member of the mixed oak series, no single oak can dominate (Smith 2012). Black oak, blue oak (*Quercus douglasii*), coast live oak, and/or valley oak (*Quercus lobata*) are the oaks that may be present in this series. Other plants found in the mixed oak woodland include California buckeye (*Aesculus californica*), Douglas-fir, madrone, poison oak, and toyon. This series encompasses 463.1 acres in Sanborn County Park and 745.2 acres in Upper Stevens Creek County Park, which makes it the dominant cover type in this Park.

2.2.5.5 California Bay Series

California bay is the dominant tree. Coast live oak, redwood, and madrone may also be present. This series encompasses 147.4 acres in Sanborn County Park and 91.0 acres in Upper Stevens Creek County Park.

2.2.5.6 Chamise Series

Chamise and red shank (*Adenostoma sparsifolium*) are the dominant species. Other species that might be present include cupleaf ceanothus (*Ceanothus gregii*), big berry manzanita (*Arctostaphylos glauca*) and scrub oak (*Quercus berberidfolia*). This series is found on the south facing slopes. This series encompasses 86.0 acres in Sanborn County Park and 63.8 acres in Upper Stevens Creek County Park.

Table 13 and 14 summarizes vegetation habitat types in the Parks, by NRMZ.

Table 13
Sanborn County Park Vegetation Types, by NRMZ

Vegetation Type	Acres (by NRMZ)							Total
	1	*2*	*3*	*4*	*5*	*6*	*7*	
Bare ground	1.2	0.5	1.2	0.4	0.5	3.3	1.3	8.4
Black oak	—	—	—	—	2.5	—	—	2.5
Broom	—	—	2.3	—	2.0	0.9	—	5.2
California annual grassland	10.9	1.4	5.9	5.1	4.0	10.7	8.3	46.3
California bay	30.9	19.6	28.8	0.4	40.2	23.1	4.4	147.4
California sagebrush	—	—	—	—	—	2.8	—	2.8
Canyon live oak	260.1	141.8	84.9	—	79.8	70.6	—	637.2
Chamise	2.7	—	1.5	0.8	4.8	63.1	13.1	86.0
Christmas tree farm	—	—	—	—	—	14.3	—	14.3
Coast live oak	—	—	1.9	1.4	0.3	—	6.1	9.7
Coyote brush	8.2	0.4	2.6	2.6	3.6	6.8	6.7	30.9
Douglas-fir	102.9	38.5	72.2	4.9	27.3	101.2	5.6	352.6
Douglas-fir – tanoak	216.9	139.6	197.6	16.6	206.9	383.8	140.3	1,301.7
Eucalyptus	—	—	—	—	0.4	—	—	0.4
Misc. orchard	—	—	—	—	—	—	2.6	2.6
Mixed oak	43.0	—	101.6	3.8	161.2	148.2	5.3	463.1
Mixed sage	0.2	—	1.1	0.5	0.5	22.7	0.7	25.7
Mixed scrub oak	—	—	—	—	—	—	21.4	21.4
Mosquito Fern	—	—	—	—	—	1.1	—	1.1
Poison oak	4.3	—	—	—	—	—	—	4.3
Redwood	29.2	15.3	38.5	2.9	19.3	81.1	4.0	190.3

Table 13
Sanborn County Park Vegetation Types, by NRMZ

Vegetation Type	Acres (by NRMZ)							Total
	1	*2*	*3*	*4*	*5*	*6*	*7*	
Tanoak	17.9	3.5	7.0	1.0	2.5	15.9	3.8	51.6
Urban/Park grasses	—	—	—	8.1	—	0.1	—	8.2
Urban/Park hardscape	—	—	0.5	2.9	—	—	—	3.4
Water	—	—	0.3	—	—	10.8	1.7	12.8
Woolyleaf manzanita	4.3	—	—	—	—	—	—	4.3
Total	732.8	360.6	547.9	51.3	555.7	960.3	225.3	3,433.9

Source: Smith 2012

Table 14
Upper Stevens Creek County Park Vegetation Types, by NRMZ

Vegetation Type	Acres (by NRMZ)		Total
	1	*2*	
Bare ground	2.9	0.1	3.0
Black oak	81.6	56.5	138.1
California annual grassland	13.6	2.5	16.1
California bay	51.8	39.2	91.0
Chamise	52.7	11.2	63.8
Coyote brush	3.8	0.1	3.9
Douglas-fir	152.0	56.0	208.0
Douglas-fir – tanoak	0.8	—	0.8
Eucalyptus	6.2	—	6.2
Mixed oak	526.9	218.3	745.2
Mixed scrub oak	2.6	—	2.7
Purple needlegrass	1.6	—	1.6
Total	896.5	383.9	1,280.4

Source: Smith 2012

As presented in Table 13, within Sanborn County Park, the dominant vegetation type is Douglas-fir/Douglas-fir-tanoak (48% of the Park), with significant cover of canyon live oak, mixed oak, and redwood. Figure 7 presents the distribution of the different vegetation habitat types in Sanborn County Park.

Table 14 shows the dominant vegetation type in Upper Stevens Creek to be mixed oak (58% of the Park), with significant cover of black oak and Douglas-fir. Figure 8 presents the distribution of the different vegetation habitat types in Upper Stevens Creek County Park.

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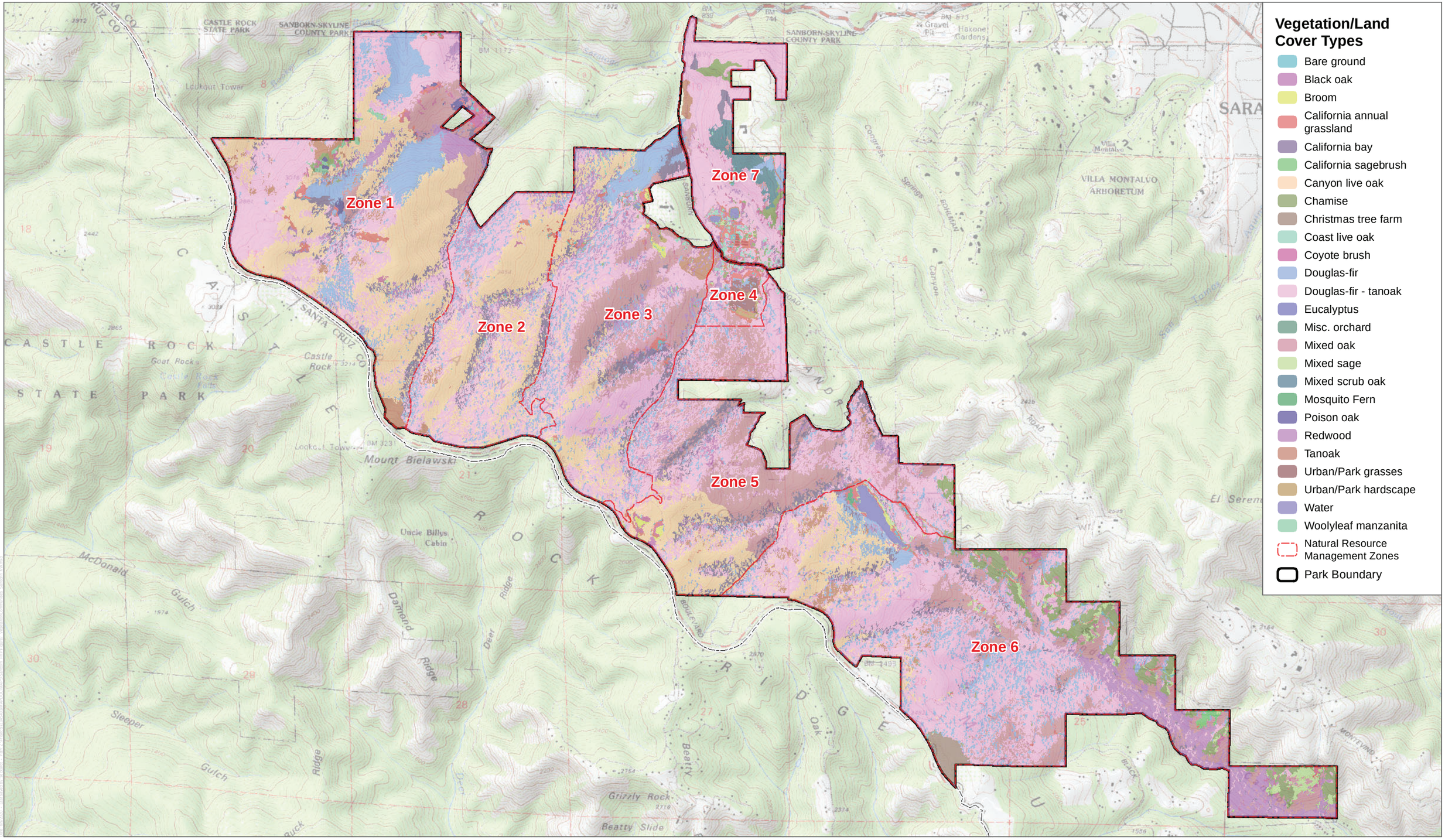

SOURCE: USGS 2020; Smith 2012; Santa Clara County GIS (2019)

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0 1,050 2,100 Feet

FIGURE 7

Sanborn County Park Vegetation Communities

Sanborn-Upper Stevens Creek Forest Health Plan

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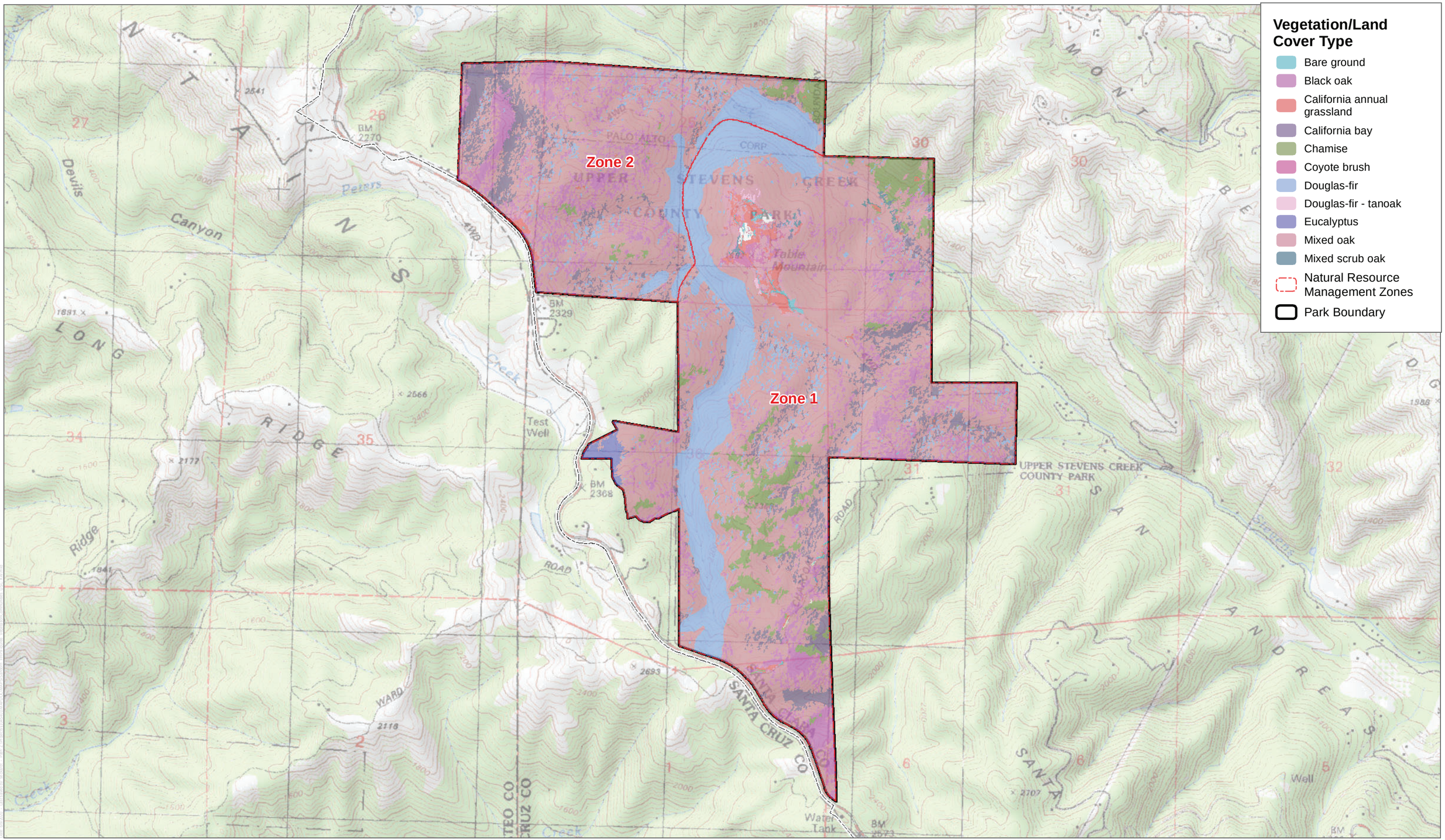

SOURCE: USGS 2020; Smith 2012; Santa Clara County GIS (2019)

DUDEK

0 750 1,500 Feet

FIGURE 8

Upper Stevens Creek County Park Vegetation Communities

Sanborn-Upper Stevens Creek Forest Health Plan

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2.2.6 Fire and Logging History

Throughout the latter part of the nineteenth century, logging was a critical commercial activity in the Santa Cruz Mountains and portions of the land that now comprise the Parks were logged. Redwood and tanoak trees were harvested from Sanborn County Park in the 1800's. Due to changes in land ownership and a shift away from commercial logging in the area, subsequent logging did not occur. The result is that the majority of the Parks' forests are second growth forests, resulting in a different, denser stand structure. The remains of an old logging camp can be found in Sanborn County Park, along McElroy Creek, and the remains of skid roads are found throughout the Park (Smith 2012).

The history of wildfires in and near the Parks is also an important component in understanding existing site conditions and potential threats to the Park's forests. Wildfires are a regular and natural occurrence in most of California. However, the numbers of fires and acres burned annually has increased over the last decade. These wildfires are mostly human caused, suggesting that the historic fire interval has been artificially affected across large areas. In addition, wildfire suppression efforts over the last century may have aided in the accumulation of fuels in some natural communities (Minnich 1983; Minnich and Chou 1997) resulting in larger and more intense wildfires. Large wildfires have had, and will continue to have, a substantial and recurring role in native California landscapes (Keeley and Fotheringham 2003), in part because (1) native landscapes become highly flammable each fall, (2) the climate in the region has been characterized by fire climatologists as the worst fire climate in the United States (Keeley 2004) with high winds occurring during autumn after a 6-month drought period each year, and (3) ignitions via human sources have increased or are increasing in many wildland or wildland urban interface (WUI) areas.

Fire history is also an important component in understanding fire frequency, fire type, significant ignition sources, and vulnerable areas. The topography, vegetation, and climatic conditions associated with the Santa Cruz Mountains combine to create a unique situation capable of supporting large-scale, high-intensity, and sometimes damaging wildfires. The history of wildfires burning within 5 miles of the Park boundary is presented in Table 15 and graphically depicted in Figure 9.

Table 15
History of Wildfires within 5 Miles of Sanborn and Upper Stevens Creek County Park

Year	Name	Acres	Cause[1]
1985	Lexington	13,128	Arson (4,500 people evacuated, 44 structures destroyed)
~1993	Unnamed grass fire near Grizzly Flat	unknown	Human activity
2007	Stevens	166	Power Line
2008	Castle	19	Unknown/Unidentified
2017	Bear	317	Arson
2019	Deer	9	Debris
2020	CZU Lightning Complex	86,553	Lightning
2021	Panther Ridge	20	Power Line

Source: CAL FIRE 2022; Brady and Associates 1993

In addition to the fires listed in Table 15 and presented in Figure 9, other notable large wildfires in similar locations along the ridge of the Santa Cruz Mountains have occurred, as summarized below:

- **Austrian Gulch Fire (1961):** Burning in July 1961, this fire burned nearly 9,100 acres and was ignited by a fallen electrical line (CAL FIRE 2020a).
- **Leib Fire (1962):** Burning in January 1962, this fire burned over 1,300 acres (CAL FIRE 2020a).
- **Summit Fire (2008):** Burning in May 2008, this fire burned 4,270 acres in the upper portion of the Soquel and Corralitos Creek watersheds. A total of 35 houses and 64 outbuildings were destroyed (CAL FIRE 2014).
- **Loma Fire (2009):** Burning in October 2009, this fire burned 485 acres within the Soquel Creek watershed. One trailer and two outbuildings were destroyed (CAL FIRE 2014).
- **Loma Fire (2016):** Burning in September and October 2016, this fire burned a total of 4,474 acres. Twelve residences and 16 outbuildings were destroyed (CAL FIRE 2018).

No wildfires in the recorded database (CAL FIRE 2020a) have burned in either Park; however, there is documentation of smaller fires occurring in Upper Stevens Creek County Park (Brady and Associates 1993) and wildfire ignitions have been documented along State Route 35 (County of Santa Clara 2016). It is likely that both Parks have experienced at least small fires in the past.

The relative lack of fire activity in the Park has helped to shape the distribution and condition of its forests. A natural fire return interval in the area is approximately 10 to 20 years (CAL FIRE

[1] Fire cause is assigned by CAL FIRE. Miscellaneous refers to fires ignited by events or activities not classified as arson, campfire, debris burning, equipment use, lightning, playing with fire, powerline, railroad, smoking, vehicle, or undetermined. Undetermined refers to fires that have been investigated or are under investigation although there is insufficient information to classify them further or the fire cause has not yet been investigated.

2014) in the absence of suppression activities. Natural fires at this interval serve to eliminate surface and ladder fuels, allowing for lower intensity burns when they do occur. However, the relative lack of fire in the Park, combined with the lack of active fuel management, has resulted in hazardous fuel accumulations that could result in higher-intensity wildfires (e.g., crown fires), should they occur. The potential for a wildfire to occur in the Park is considered high, considering potential ignition sources (e.g., State Route 35, Park visitors) and current fuel loading conditions. Additionally, the Park occurs within an area classified by CAL FIRE as a High Fire Hazard Severity Zone. California Public Resources Code Sections 4201–4204 and Government Code Sections 51175–51189 direct CAL FIRE to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. The resulting FHSZs define the application of various mitigation strategies to reduce risk associated with wildland fires (CAL FIRE 2020). The model used to determine the extent of FHSZs is based on an analysis of potential fire behavior, fire probability predicated on frequency of fire weather, ignition patterns, expected rate of spread, ember (brand) production, and/or past fire history (CAL FIRE 2020).

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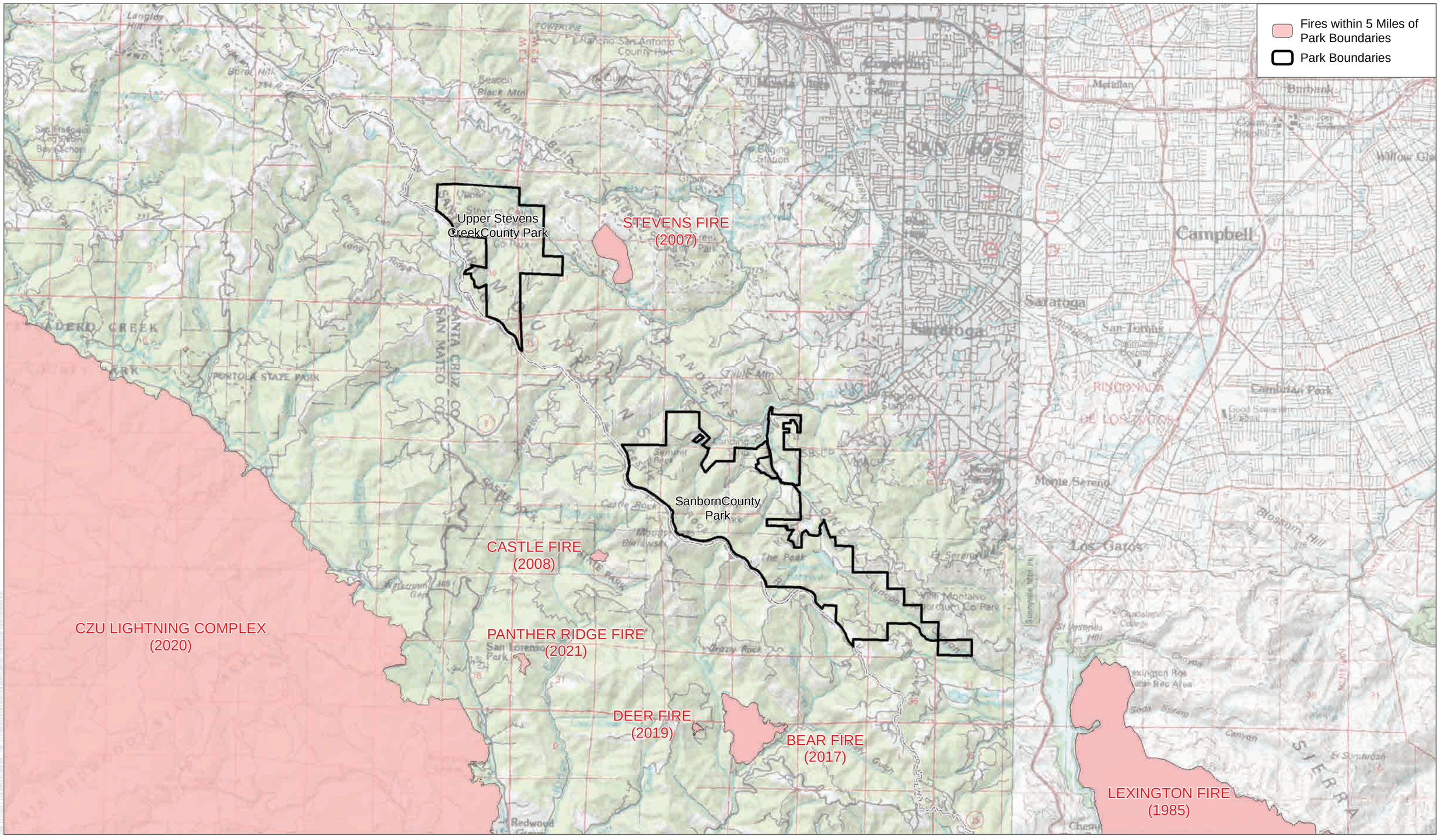

SOURCE: USGS 2020; CAL FIRE 2022; Santa Clara County GIS (2019)

DUDEK

0 3,450 6,900 Feet

FIGURE 9

Historic Wildfires in the Vicinity of Sanborn and Upper Stevens Creek County Parks

Sanborn-Upper Stevens Creek Forest Health Plan

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2.3 Built Environment

Sanborn County Park provides numerous recreational amenities that draw visitors to the Park. The core use area of the Park covers approximately 50 acres near the main entrance off Sanborn Road (Santa Clara County Parks 2019). This section summarizes the amenities provided in Sanborn County Park, most of which are concentrated in NRMZs 3, 4, and 7.

Upper Stevens Creek County Park is more densely vegetated, steep and remote. Amenities provided in this park include 12.6 miles of multi-use trails and a parking area near the Grizzly Flat Trailhead (Brady and Associates 1993, Santa Clara County Parks 2020).

2.3.1 Camping and Day-Use Areas

Sanborn County Park contains popular day-use and campground facilities. There are three group picnic areas, all are available by reservation only. Near the group picnic site, the Park offers horseshoe pits and volleyball courts. As well, there are two amphitheaters, one near a group picnic site and the other located near the walk-in campground. In total there are 48 camp sites within the Park. This includes 33 walk-in tent camping sites open from spring to fall. Within the walk-in area there is a youth group site that is also available. In addition, there are 15 RV camp sites that are available year-round.

2.3.2 Roads and Trails

Access to Sanborn County Park is primarily obtained from California State Route 35, commonly known as Skyline Boulevard, which roughly defines the western edge of the Park. State Route 9 runs north of the Park as a main access from the nearby town of Saratoga. Sanborn Road meets State Route 9 about 3 miles west of the town. Sanborn Road provide access to most of the developed sites in the Park, including the ranger offices, maintenance, campgrounds and day-use sites. Black Road runs through the southwest part of the park providing access to the Old Christmas Tree Farm. Other paved and un-paved service roads are used within the Park.

There are 19 miles of existing trails within Sanborn County Park that are open to hikers and equestrians. The Sanborn Trails Master Plan, developed in 2008, proposed adding new trail use for mountain bikers and on-leash dogs. They proposed expanding the trails system to include 38 miles of trails for multiple users (SCCDPR 2007). Upper Stevens Creek is most readily accessed from Skyline Boulevard (State Route 35) which runs along the western edge of the Park. On the east side of the park, there is access from Stevens Canyon Road. There are 12.6 miles of trails within the Park. These trails connect seamlessly to adjacent open space preserves creating a large network of multi-use recreational trails in the region.

2.3.3 Environmental Education Centers

Sanborn County Park houses two environmental education centers. The Youth Science Institute (YSI) that operates from the Casino House (existing Ranger Station). There is also the Walden West Outdoor Education Center, which is based outside of the park but uses the park for outdoor programing (Santa Clara County Parks 2019).

2.3.4 Park Buildings and Facilities

In the core use area of Sanborn County Park there are operational facilities such as a park maintenance office and ranger station. Other important facilities within the park include Dyer House, Welch-Hurst House and various within the Former Nursery Area. The first floor of the Dyer House is open to the public. A staff resident is living in the Christianson home. A staff residence structure is also present in the core use area.

2.3.5 Historic Resources

Within Sanborn County Park, the Dyer House, Welch-Hurst House and the Former Nursery Area all have important historic significance in the park. The Dyer House is eligible for the National Register of Historic Places. The Welch-Hurst House and property is listed on the National Register of Historic Places and is a California Point of Interest (Santa Clara County Parks 2019). The Welch-Hurst Area was the former vacation home of State Superior Court Judge James R. Welch. It consists of 800 acres of land with a house designed in a "rustic revival" style using indigenous materials including redwood and local stone. The County acquired the property in 1977 and it was operated as a youth hostel from 1978 until 2010. Since that time, the property has not been in use and is not open to the public (Santa Clara County Parks 2019).

2.3.6 Christmas Tree Farms

Sanborn County Park and Upper Stevens Creek both contain remnant Christmas tree farms. Within Upper Stevens creek the farm was located on the flat mountain top at Table Mountain. At Sanborn County Park, a remnant Christmas Tree Farm is located at the south part of the park at the intersection of Black Road and State Route 35.

2.4 Planned Development

Planned development within Sanborn County Park was developed during a recent Master Planning process. The Sanborn County Park Master Plan (Santa Clara County Parks 2019) was developed to provide integration of new areas and uses, maintain the success of existing park features and programs, improve financial sustainability and increase visitor satisfaction and public support

(Santa Clara County Parks 2019). The goal and objectives of the master plan address recreation, education and interpretation, natural resources preservation, circulation and access, cost recovery and revenue generation, and land use. The Master Plan identifies four focus areas where robust analysis and public input was carried out. These include the Sanborn Core Use Area, Former Nursery Area, Welch-Hurst Area, and the Former Christmas Tree Farm Area. The first phase of planned development will focus on mainly on improvements in the Sanborn Core Use Area followed by improvements in the Former Nursery Area and the Welch-Hurst Area in collaboration with partners. Proposed improvements identified in the Master Plan may require tree removal or have the potential for impacting retained trees. Best management practices identified for minimizing impacts to trees are presented in Section 8.9.

For Upper Stevens Creek County Park, there is not documentation of defined planned development.

Implementation projects proposed to achieve these goals are listed in Table 16.

Table 16
Sanborn County Park Master Plan Implementation Projects

Phase	Timeline	Projects	Zone
1	1-5 years	1. Dyer House improvements (infrastructure improvements, staff offices, visitor center). 2. Continue to stabilize historic Welch-Hurst House. 3. Repurpose the existing ranger station for Park staff use or use associated with the Peterson Grove Reservation Area (weddings, special events). 4. Pursue Partnerships for all focus areas and conduct additional studies or site plans as needed. 5. Install small pump track or skills area in Sanborn Core Use Area.	4
2	5-10 years	1. Develop Former Nursery Area primarily for camping in collaboration with future partner. 2. Install small pump track or skills area in Former Nursery Area. 3. Develop Welch-Hurst Area in collaboration with future partner. 4. Relocate 15 existing RV campsites to Former Nursery Area. 5. Relocated 23 existing upper walk-in campsites in Sanborn Core Use Area and retain 10 lower walk in campsites.	7
3	To Be Determined	1. Implement any remaining Plan recommendations, depending on the availability of funding, partnerships and future unknown conditions.	All

Source: Santa Clara County Parks 2019

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3 PARK FOREST RESOURCES

This section summarizes Sanborn and Upper Stevens Creek County Parks' forest resources. The following components summarize the forest health evaluation efforts conducted in support of this Plan:

- **Field Assessments:** Conducted to identify and assess Park forest conditions, including qualitative assessments of stand conditions (species composition, density, tree conditions), fuel loading, presence of insects and or disease, terrain, and access. Field assessments involved ground-based evaluations by a Registered Professional Forester (RPF) of each NRMZ. A total of eight days were spent on site between November 2019 and February 2020 conducting forest health field assessments. A survey of Upper Stevens Creek Park was performed on November 25th, 26th, and 27th 2019. The survey of Sanborn Park occurred on January 9th and February 17th- 20th, 2020. Generally, surveys proceeded from North to South, beginning at the Grizzly Flat trailhead. Time and effort were focused near park access points such as trailheads, gates, and other undefined access points. Infrequent cross-country trekking was used if the surveyor noted a feature of interest, such as an unmapped road, nearby property corner, or vegetation type change. A significant portion of Sanborn Park lacks roads or trails, and these areas were only evaluated by analyzing current and historic aerial imagery. Documentation of field conditions was conducted using GPS waypoints. Waypoints include a brief description documenting the surveyor's observations and included georeferenced photographs that captured symptoms of forest health problems, hazardous fuel conditions, and other notable features in the Parks.
- **Geographic Information Systems (GIS) Analysis:** Conducted to evaluate Park conditions, including terrain, vegetative cover, soils, water resources, NRMZs, developed uses, sensitive biological resources, fire history, and the extent of Park roads and trails. GIS data was acquired from Park staff, or other publicly available sources (e.g., County of Santa Clara, the California Department of Forestry and Fire Protection, CDFW). All GIS data was managed and evaluated using ArcGIS 10.7.1 and used to generate many of the data tables and maps included in this Plan. Data sources are cited in the appropriate sections in this Plan.
- **Research:** Conducted to evaluate existing site conditions, potentially occurring special-status species and other sensitive biological resources in the Park, and the history of tree/forest health issues facing the Park. Research was also conducted to better understand the planning and regulatory environment affecting potential forest management activities in the Park, including a review of existing master plans, management plans and programs (e.g., Sanborn County Draft Park Master Plan, Park Tree Safety Program), regulations (e.g., County Tree Preservation and Removal Ordinance), Park staffing and available equipment, and current Park management practices associated with or affecting trees or forests.

The following sections provide more detailed information about the Parks forestland, forest health issues, sensitive biological resources, and cultural resources that are a component of the Park's forestland.

3.1 Forest and Woodland Types

As described in Section 2.2.5, the Parks consist of numerous vegetation communities/land cover types, including several forest and woodland types. The type of forest and woodland types in the Parks is typical of their locations along the eastern/north-eastern flank of the Santa Cruz Mountains. This section describes the Park's existing forest and woodland types, as identified in Section 2.2.5, their distribution within the Park, and current observed conditions. Acreages of each forest and woodland type, by NRMZ, are presented in Tables 13 and 14 in Section 2.2.5.

Quantitative stand density values measured in trees per acre, basal area, or quadratic mean diameter (QMD) are not identified in this Plan, nor are other calculations typically derived from statistical plot sampling such as timber volume, growth rate, carbon storage and sequestration, age, diameter range, heights, ingrowth, species distribution, and crown cover or density. Statistical sampling, in the form of a forest resources inventory, is recommended as a preliminary step in implementing landscape forest health and resilience projects outlined in Section 7.1.4. Common forest resource inventory sampling methods vary from continuous forest inventory (CFI), strip cruise, 3P, variable-radius plots, and others.

3.1.1 Oak Woodland

Oak woodlands are drought tolerant, fire-adapted, and able to regenerate via stump sprouting after cutting or fire. Potential threats to oak woodlands include high-intensity wildfire, air pollution, development impacts, competition with invasive species, conifer encroachment, and the spread of pests and pathogens, notably the sudden oak death pathogen (further described in Section 6.1). In Sanborn County Park, proposed development occurs outside of oak woodlands under the Draft Park Master Plan. In general, the oak woodlands in the Park were observed to be in decline. A significant portion of oak woodlands along Skyline Boulevard have been overtopped by encroaching Douglas-fir. Additionally, sudden oak death (SOD) is apparent throughout both Parks and is causing a high rate of tree mortality.

In Sanborn County Park, oak woodlands are located primarily in upper and mid-slope locations on east-facing slopes. This land cover type is widely distributed through the Park (1,112.5 total acres) and is represented in all NRMZs, with higher concentrations in NRMZs 1, 2, 3, and 5. In Upper Stevens Creek County Park, oak woodlands are located at upper and mid-slope locations on various aspects. This land cover type is widely distributed through the Park (883.3 total acres) and is represented In both NRMZs.

3.1.2 Redwood

In Sanborn County Park, redwood is located primarily at lower elevations along drainages (Lyndon Canyon, Todd Creek, McElroy Creek) and north-facing slopes. Redwood is lightly represented in this Park (190.3 total acres), and is in all NRMZs, with higher concentrations in NRMZs 1, 2, 3, 5 and 6. It is not mapped in Upper Stevens Creek County Park.

Typical associated overstory species associated with redwood forest include tanoak, Pacific madrone, and California bay. Understory species include poison oak, coffeeberry, toyon, coyote brush, ceanothus, and manzanita. Densities range from sparsely scattered overstory trees on poor sites to nearly closed canopies on good quality sites.

The Park's redwood trees are generally healthy, with little mortality. Field observations noted relatively few trees exhibiting symptoms of water stress and related secondary pests, such as dead tops, chlorotic leaves, and branch dieback. It is likely that old-age redwood trees exist in various locations within the Park, and their presence tells the story of "high-grading" silvicultural practices conducted in the early 20th century. This practice left trees with lower commercial value uncut, while trees with premium commercial value were harvested. Presence of late-successional forests (LSF), as defined by the California Forest Practice Rules (California Code of Regulations, Title 14, Section 895.1), is unknown at this time and further study is needed to confirm if any stands meet this definition. Observations during field evaluations found no indication that LSFs existed within the Park boundaries. The clear-cut of the redwood forests in the early 20th century would also support the conclusion that there is little, if any, LSF within the Park. Field observations also found very low quantities of late-seral elements such as snags, downed woody debris, basal hollows, multiple canopy layers, and trees with complex structure which are functional elements of late seral stage redwood forests.

Most redwood stands in the Park would be characterized as very dense, although specific stand density measurements, such as trees per acre, are unknown at this time. This is often the case in second growth redwood stands, due to their capacity for sprouting multiple trees from one stump (Lindquist 2007). This is compounded by the successional stage of the Park's redwood stands, which exhibit a once-dominant tanoak component (that grew vigorously post-harvesting) that is now being overtaken by redwoods. The condition of these stands was confirmed by visual estimation during field evaluations. Additionally, the lack of significant disturbance in the Park's redwoods following the initial clear-cut, such as wildfire, insects or diseases, blowdown, or harvesting trees , allows disproportionately high tree densities to occur compared to redwood stands that are regularly thinned by these disturbances. Such high stand density conditions increase competition and reduce tree vigor, predisposing trees to stress from drought, nutrient deprivation, and poor lighting. Secondary agents, the pests and pathogens in the forest, take advantage of a

tree's weakened defenses. Throughout western forests, catastrophic tree die-off events are occurring due to wildfire, pests and disease outbreaks, and/or the stress associated with climate change. Forest health and resilience projects, as recommended in Section 7.1.4 of this Plan, are intended to restore balance to the system and mimic disturbances such that stressors are kept in check by a healthy, vigorous forest.

As with other forest types, threats to the health of redwood stands include abiotic factors such as wildfire, air pollution, and drought, and biotic factors including competition, poor regeneration, and, to a lesser degree, insects and disease. A recent trend showing measurable decreases in fog inundation, even in years with normal rainfall, suggest that the threat of drought to redwood stands began before, and continues beyond, the 2011-2017 drought. The redwood forests in the Parks are also the location of pathogen outbreaks primarily affecting its other dominant overstory trees, tanoak and madrone. A more detailed discussion of the pathogen issues facing Park trees is included in Section 6.1.

3.1.3 Douglas-fir/Tanoak

In Sanborn County Park, Douglas-fir, Douglas-fir-tanoak, and tanoak types are located primarily in upper and mid-slope locations on north and northwest-facing slopes. These land cover types are widely distributed through the Park (1,705.9 total acres) and is represented in all NRMZs. In Upper Stevens Creek County Park, Douglas-fir and Douglas-fir-tanoak types are located at lower elevations along drainages flowing to Stevens Creek. These land cover types are concentrated primarily in NRMZ 1 and encompass 208.8 acres of the Park.

Douglas-fir and tanoak are best adapted for cool and moist sites such as drainages, north and east facing slopes, and locations where fog inundates and persists. SOD related mortality in tanoak was commonly observed and the pathogen appears to have established wherever hosts are available and conditions favor successful attacks. Douglas-fir throughout the Park were observed to be generally healthy, however, pockets of mortality in Douglas-fir were observed near ridgetops. This mortality was likely induced by the recent 5-year drought from 2011-2016 and is indicative of the species' drought intolerance. Douglas-fir was also observed encroaching into oak woodland forest types. The shade tolerance of Douglas-fir and the exclusion of wildfire or grazing disturbance enables it to successfully seed in beneath the oak canopy. Various stages of encroachment were observed, from early establishment to complete forest type conversion.

Threats to the health of these stands include abiotic factors such as wildfire, air pollution, and drought, and biotic factors including competition, poor regeneration, insects, and disease. Typical associated overstory species associated with montane-hardwood-conifer forest include tanoak, Pacific madrone, and California bay. Understory species include poison oak, blackberry,

coffeeberry, toyon, coyote brush, ceanothus, and manzanita. Densities range from sparsely scattered overstory trees on poor sites to nearly closed canopies on good quality sites.

3.2 Special-Status Plant and Wildlife Species

Special-status biological resources present or potentially present in the Parks were identified through a records search using the following sources: U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (iPaC); Trust Resource Report (USFWS 2020); CDFW California Natural Diversity Database (CNDDB) (CDFW 2020b); and the California Native Plant Society (CNPS) online Inventory of Rare and Endangered Vascular Plants (CNPS 2020). Records searches were conducted for the United States Geological Survey 7.5-minute Castle Rock Ridge and Mindego Hill quadrangles and the surrounding eight quadrangles. Following review of these search results, the potential for each species to occur within the Parks was determined based on a review of vegetation communities and land cover types, habitat types, soils, and elevation preferences, as well as the known geographic range of each species. For example, if the Parks were within the elevation range of a particular plant species, but a specific soil type for the species is not present, the species is considered to have low potential to occur in the Parks. Also, species were not expected to occur when the Parks were clearly outside of the known geographic or elevation range of the species.

Special-status species and habitats with moderate to high potential to occur, or which have been previously recorded at Sanborn and/or Upper Stevens Creek County Parks, are presented in Table 17. All special-status species identified during the records search conducted for this Plan are presented in Appendices A and B. Practices to avoid and/or minimize impacts to sensitive species are included in Section 8.6.

Table 17
Protected Species and Habitats with Moderate to High Potential, or Previously Recorded, at Sanborn and Upper Stevens Creek County Parks

Scientific Name	Common Name	Status
		Federal/State/CRPR or Other
Special-status Plant Species		
Arctostaphylos andersonii	Anderson's manzanita	None/None/1B.2
Arctostaphylos regismontana	Kings Mountain manzanita	None/None/1B.2
Dirca occidentalis	western leatherwood	None/None/1B.2
Eriophyllum latilobum	San Mateo woolly sunflower	FE/SE/1B.1
Fissidens pauperculus	minute pocket moss	None/None/1B.2
Malacothamnus arcuatus	arcuate bush-mallow	None/None/1B.2
Monolopia gracilens	woodland woolythreads	None/None/1B.2

Table 17
Protected Species and Habitats with Moderate to High Potential, or Previously Recorded, at Sanborn and Upper Stevens Creek County Parks

Scientific Name	Common Name	Status
		Federal/State/CRPR or Other
Piperia candida	white-flowered rein orchid	None/None/1B.2
Senecio aphanactis	chaparral ragwort	None/None/2B.2
Trifolium buckwestiorum	Santa Cruz clover	None/None/1B.1
Special-status Wildlife Species		
Accipiter cooperii (nesting)	Cooper's hawk	None/WL/None
Actinemys marmorata	western pond turtle	None/SSC/None
Aneides flavipunctatus niger	Santa Cruz black salamander	None/SSC/None
Asio otus (nesting)	long-eared owl	None/SSC
Brachyramphus marmoratus (nesting)	marbled murrelet	FT/SE
Corynorhinus townsendii	Townsend's big-eared bat	None/SSC
Dicamptodon ensatus	California giant salamander	None/SSC/None
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	None/SSC
Rana boylii	foothill yellow-legged frog	None/SSC, PST
Thamnophis sirtalis tetrataenia	San Francisco garter snake	FE/FP, SE
Taricha rivularis	red-bellied newt	None/SSC
Protected Vegetation Communities		
Serpentine Bunchgrass	Serpentine Bunchgrass Grassland	G2/S2.2/None
Sequoia sempervirens Alliance	Redwood Forest	G3/S3/None
Umbellularia californica Alliance	California Bay Forest	G4/S3/None

Sources: CNPS 2020, CDFW 2020, USFWS 2020.
Notes: CRPR = California Rare Plant Rank.
Federal Status:
FE = federal endangered species
FT = federal threatened species
State Status:
CE = California endangered species
CSS = California species of special concern
FP = Fully protected
G2 = Imperiled – At high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors
G3 = Vulnerable – At moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors
S2 = Imperiled – Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 of fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.
S3 = Vulnerable – Vulnerable in the state due to restricted range, relatively few populations 9often 80 of fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
WL – A watch list species
PST – Proposed State Threatened
CRPR:
1B = plants rare, threatened, or endangered in California and elsewhere
2B = Plants rare, threatened, or endangered in California but more common elsewhere
Threat Ranks:
.1 = seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 = moderately threatened in California (20%–80% of occurrences threatened/moderate degree and immediacy of threat)

3.3 Cultural Resources

The following cultural resources have been identified in Sanborn County Park (Santa Clara County Parks 2019):

- Bedrock mortars and associated Guemelento Ohlone tribe settlement sites, located throughout the Park.
- The Welch-Hurst House (CA-SCL-393H), which is the only resource that has been formally recorded and/or evaluated for eligibility for inclusion on the California Register of Historic Places (CRHP) or the National Register of Historic Places (NRHP) (Santa Clara County Parks 2019).
- The Dyer House, which is eligible for listing on the National Register of Historic Places and California Register of Historic Resources, is included in the County of Santa Clara Heritage Resource Inventory and is a registered County Landmark.
- The Christensen House, which was evaluated for historic significance, though found not to be significant.

The remainder of Sanborn County Park and Upper Stevens Creek County Park have the potential to contain unknown historic, pre-historic, or paleontological resources. Measures to minimize impacts to cultural resources are included in Section 8.7.

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4 PARK FOREST MANAGEMENT

This section describes existing land or resource management plans and programs relevant to implementation of this Plan as well as a summary of Park staffing, and equipment and current practices implemented in or near trees and forestland.

4.1 Planning and Regulatory Environment

4.1.1 County Plans, Programs, and Ordinances

4.1.1.1 Santa Clara County General Plan

The Santa Clara County General Plan (General Plan) (County of Santa Clara 1994) was adopted in December 1994 to address major challenges and opportunities facing Santa Clara County during its growth and development. The Resource Conservation Element of the County's General Plan is the official policy document addressing the protection and management of natural and heritage resources within the County. This General Plan element includes policies addressing water conservation, habitat protection and restoration, preservation of agricultural resources, mineral resource acquisition, heritage resource protection, and scenic view preservation, among others. Regarding tree and forest management, the General Plan discusses improving the current knowledge and awareness of habitats and natural areas, habitat protection and restoration, and biotic resource education.

4.1.1.2 Santa Clara County Parks Strategic Plan

The Santa Clara County Department of Parks and Recreation recently adopted an updated Strategic Plan (SCCDPR 2018). The Strategic Plan is intended to identify and prioritize current and future outdoor recreation values and needs, ensure that the Department's mission and guiding vision remain relevant, provide for great customer experiences, foster a nimble learning organization with engaged and empowered employees, and make progress towards a fiscally sustainable future. The Plan includes a focus on natural resource protection that balances conservation, habitat value, climate resiliency, reducing the likelihood of catastrophic wildfires, improving water quality, and protecting wildlife. The strategies and actions relating to natural resource management include preparing and implementing plans to better manage natural resources, includes oak woodlands and forests.

4.1.1.3 Santa Clara Countywide Trails Master Plan

The Santa Clara Countywide Trails Master Plan (County of Santa Clara 1995) was adopted in November 1995 to direct the County's trail implementation efforts by providing a trails route map and policies for a countywide trail system. These policies are designed to guide future planning,

define trail implementation processes, identify priorities, mitigate environmental impacts, and direct trail design, operations and management. Strategy 2 of this plan incorporates policies that aim to provide public trail needs in accordance with environmental and landowner concerns. Relevant policies included in this strategy involve trail route location, design, and development in consideration of sensitive natural resources and hazards, and protection of sensitive species and habitats. Strategy 4 of the plan includes policies that encourage adequate operation and maintenance of trails. These policies include closure of trails during unsafe conditions or environmental damage, controlling levels-of-use and types-of-use on trails, developing a monitoring program, performing ongoing maintenance, and providing trail signage and marking.

4.1.1.4 Santa Clara County Community Wildfire Protection Plan

The Santa Clara County Community Wildfire Protection Plan (CWPP) (County of Santa Clara 2016) provides goals for reducing wildfire hazards and risk in the wildland-urban interface areas of Santa Clara County and describes specific issues and projects to meet strategic goals. The CWPP was prepared in accordance with the federal Healthy Forests Restoration Act of 2003 and meets its requirements by identifying and prioritizing fuel reduction treatments within the County, and addressing structural ignitability, and including collaboration with stakeholders. The CWPP aims to prevent and mitigate the occurrence and effects of wildfire to protect human life and reduce property loss through a collaborative approach that includes cooperation within and between communities. In order to achieve this, the plan includes recommendations related to general planning projects, public outreach and education, structural ignitability, firefighting capabilities, and fuel reduction treatments. These recommendations are supported by summaries that identify specific implementation steps, implementing agencies, benefits, timelines, priorities and available resources. Annex 18 of the CWPP is specific to land owned by Santa Clara County Parks and provides additional details regarding firefighting capabilities, a summary of hazardous fuel conditions, locations of firefighting infrastructure in parks, and identification of recommended fire prevention projects on County Parks land. Where applicable, these recommended projects have been incorporated into this Plan.

An update to the Santa Clara County Community Wildfire Protection Plan was started in late 2022 and was underway at the time of preparation of this Plan. Implementation of the Sanborn –Upper Stevens Creek Forest Health Plan will be included in update to the County's CWPP Annex.

4.1.1.5 Santa Clara County Tree Preservation and Removal Ordinance

The Santa Clara County Code of Ordinances Division C16 was enacted to preserve the County's trees on private and public property in order to establish and maintain the County's tree cover, protect property values, preserve aesthetic quality, prevent erosion and reduce flood and landslide

hazards, counteract air pollutants, protect from high winds, provide shade and climatic balance, offer wildlife habitat and protect historical and community assets. The ordinance regulates tree removal, identifies protected trees, specifies the permit process required for removal of protected trees, and describes restrictions on commercial and heritage tree removal.

Any tree removal or pruning for the maintenance, operation, or development of County Parks property under established policies or procedures approved by the Director of the Parks and Recreation Department are exempt from the review and permitting requirements of Ordinance Code Division C.16.

4.1.1.6 Santa Clara County Integrated Pest Management and Pesticide Use Ordinance

The Santa Clara County Integrated Pest Management and Pesticide Use Ordinance was established to protect the health and safety of County employees and the general public, the environment, and water quality and to provide sustainable solutions for pest control on County property. The ordinance aims to reduce pesticide use within the County to the maximum extent possible and give preference to non-pesticide alternatives. The ordinance applies only to property owned by Santa Clara County and describes regulations related to the County's Integrated Pest Management program, and allowances, restrictions, posting, and record keeping and reporting of County pesticide use.

4.1.2 Regional or State Plans, Programs, and Regulations

4.1.2.1 California Forest Practice Rules

The California Department of Forestry and Fire Protection (CAL FIRE) enforces the California Forest Practice Act (California Code of Regulations, Title 14, Chapters 4, 4.5 and 10) which regulate commercial timber harvesting on non-federal lands in California. A Timber Harvesting Plan (THP), Exemption, or Emergency Notice must be prepared by a Registered Professional Forester for timber harvesting on non-federal lands in the state. THPs are prepared for timber operations and must be consistent with applicable laws and regulations, including, but not limited to, the California Environmental Quality Act (CEQA). THPs have been certified to serve as a functional equivalent of an Environmental Impact Report under CEQA, require public noticing and solicitation of public input, and include feasible mitigation measures and an evaluation of alternatives which would lessen or avoid adverse environmental impacts. Timber operations conducted under this Plan would require preparation of a THP, Exemption, or Emergency Notice by an RPF prior to operations. Timber operations include cutting/removal of trees for commercial purposes (where the resulting material would be sold, bartered exchanged, or traded). Timber

operations would not include removal of smaller trees for fuel management or non-commercial purposes, with specific criteria outlined in California Public Resources Code Section 4527(b).

4.1.2.2 CAL FIRE/Santa Clara Unit Strategic Fire Plan

The CAL FIRE/Santa Clara Unit Strategic Fire Plan is produced on an annual basis for the coming fire season. The Plan includes an assessment of the fire situation in the Santa Clara Unit (which includes Santa Clara County), stakeholder contributions and priorities, and strategic targets for pre-fire solutions developed by people who reside and work in the local fire problem area. The Unit Strategic Fire Plan is designed to achieve the goals and objectives of the 2021 Strategic Fire Plan for California under the direction of the Unit's Pre-Fire Engineer. After identifying and evaluating existing wildfire hazards, the Plan supports collaboration between stakeholders in the implementation and development of actions to reduce potential for a wildfire and ensure adequate response in the event of a wildfire.

4.2 Park Plans and Programs

4.2.1 Sanborn County Park Master Plan

The Sanborn County Park Draft Master Plan was completed in 2019 (Santa Clara County Parks 2019). The Master Plan development process included a review of existing conditions, the development of alternatives, stakeholder and public feedback, drafting of the plan and approval of the recommendations. The Master Plan includes recommendations for four focus areas: Sanborn Core Use Area, Former Nursery Area, Welch-Hurst Area, and Former Christmas Tree Farm Area. The overall goal of the plan is to provide thoughtful integration of new area and uses, maintain the success of existing park features and programs, improve financial sustainability, and increase visitor satisfaction and public support.

4.2.2 Sanborn-Skyline County Park Interim Natural Resource Plan

Developed in 2012, this Plan (Smith 2012) outlines a series of achievable tasks necessary to implement a natural resource management program for Sanborn-Skyline County Park. It was developed by County Parks staff to provide Park Rangers and other Staff with tasks, goals and objectives and Best Management Practices to address short-term, targeted issues within the Park. The Plan outlined management goals and objectives, includes a general description of the Park, including the historical, cultural, natural and geological resources known to be present, identifies resource management strategies for fire, wildlife, riparian habitats, and exotic species, and outlines management zones and associated recommended management actions.

4.2.3 Sanborn County Park Trails Master Plan

Developed in 2008, this Sanborn County Park Trails Master Plan outlined an expanded trail system that was focused on meeting the recreational and interpretive need of a diverse and growing population. The plan proposed adding nearly double the existing miles of trails from the current (at the time) 19 miles to the proposed 38 miles. Plan identifies both long-term and short-term goals for implementing the plan's vision. Some areas of focus include identifying staging areas for all users and introducing multi-use trails into the Park that meet regional trail goals and the countywide trails master plan.

4.2.4 Upper Steven Creek Park Resource Management Plan

This plan was developed in 1993. The Upper Stevens Creek County Park is a neighboring property to Sanborn County Park. The main goals outlined in the plan include: improving biodiversity, reducing fire hazard, encourage land use practices which maintain and enhance park resources, enhance views, carry out implementation project commensurate with park staffing limitations.

4.2.5 Tree Safety Program

The Santa Clara County Department of Parks and Recreation (Santa Clara County Parks) Tree Safety Program (SCCDPR 2003) guides management of trees within Santa Clara County Parks in all areas where visitors and park staff congregate and remain stationary for periods of time. The Tree Safety Program reasonably manages trees, particularly in developed areas, to sustain their health, to maintain a representation of the natural ecosystem, and to identify and minimize problems that might result in tree failure, visitor or park staff injury, or property damage. The Tree Safety Program has documented processes and procedures for detection, monitoring, evaluation, and treatment of potentially hazardous trees. In general, native trees outside of designated public use areas will not be managed under the Tree Safety Program.

The implementation of the Tree Safety Program is the responsibility of the Parks' Natural Resource Management program. A formal safety inspection of all trees in each public use area within the Santa Clara County Park system is conducted by a trained Park Natural Resource Management program staff on a bi-annual basis. The formal inspections are augmented through informal observations of potentially hazardous trees by park unit staff and visitors throughout the Santa Clara County Park system. Trees with significant defects that pose a threat to public safety are identified by a numbered tag by a trained Park Natural Resource Management program staff. All significant tree defects, including environmental conditions such as soil conditions and wind exposure, are recorded and a treatment(s) to abate a hazardous situation is recommended. Treatments are completed by park unit staff or licensed contractors, and Natural Resource

Management program staff confirms that treatment has been completed. At the time of preparation of this Plan, County Parks was transitioning to the use of an asset management program to manage the care of approximately 12,000 trees included in the Tree Safety Program. The database includes the size, species and condition of each tree, and assigns and tracks maintenance of each tree.

4.3 Park Staffing and Equipment

The staff in the Sanborn/Stevens Creek Unit are responsible for services and programs at Sanborn County Park as well as at Stevens Creek County Park, Upper Stevens Creek County Park, and the staging area along State Route 35 (Skyline Boulevard) (Santa Clara County Parks 2019). Park staff splits time between these parks, but the percentage of time spent in each park varies based on seasonal visitor use, maintenance requirements, and public events. The Park Maintenance and Operations staff are responsible for the day-to-day operation and maintenance of the Parks while various other County Parks Programs, such as Natural Resources Management, identify and complete projects and provide guidance on program-related issues. The permanent staff allocations responsible for the Sanborn/Stevens Creek Unit are provided in Table 18.

Table 18
Sanborn/Stevens Creek County Park Staff

Program Area	Staff Allocations and Positions
Park Maintenance	(2) Senior Park Maintenance Worker (5) Park Maintenance Worker (2) Extra Help Park Maintenance
Park Operations	(1) Senior Park Ranger (4) Park Ranger (1) Park Services Attendant (1) Extra Help Park Service Attendant
Natural Resources Management	(1) Natural Resource Coordinator*

Source: SCCSMP, 2019
* Also responsible for natural resources at other County Parks units within its Region

The Park Maintenance staff provide clean and safe amenities to the public at Sanborn, Stevens Creek and Upper Stevens Creek County Parks. The Park Maintenance staff is responsible for the maintenance of campgrounds, day-use areas, and groups sites throughout the park. The Park Maintenance staff also provides safe drinking water and clean restroom facilities. In addition to the public use areas of the park, the Park Maintenance staff maintain the grounds, vegetation, and aesthetics of the park, including maintenance of the trail and service road systems.

The Park Operations staff focus on public safety, interpretation, and resource management within the Parks. The Park Rangers provide a safe environment to allow visitors a safe day-use and

camping experience. The Park Rangers enforce County ordinances and routinely patrol the park to keep a pulse on the activities within the park. The Park Rangers also provide Search and Rescue response, medical aide, and fire safety necessary. The Park Service Attendants greet visitors coming into the park, collect fees, and provide users with information to enhance the experience.

The Sanborn/Stevens Creek Unit staff collaborate with the Natural Resources Management program to preserve, conserve and enhance the park'' natural resources and ecological processes. The Natural Resources Management program uses scientific data and management plans to implement management strategies that conserve and improve natural resources throughout the County Parks system. The Natural Resources Management program provides park staff with guidance to protect, enhance, or restore the park through effective vegetation, fire, wildlife, riparian, wetland, and exotic species management. The Natural Resources Management program also provides direction for implementation of best management practices, Integrated Pest Management, and environmental compliance. As projects described in the Sanborn County Park Master Plan (Santa Clara County Parks 2019) are implemented, additional staffing may be required. Equipment available for conducting Park management and maintenance tasks is summarized in Table 19.

Table 19
Equipment Available for Sanborn and Upper Stevens Creek County Park

Location	Equipment
Sanborn County Park	ATV (2) Flail Mower Tractor Trucks (4) Chipper (shared between both Parks)
Stevens Creek County Park	ATV Flail Mower Tractor Trucks (2) Fire pumper and 50-gallon tank Chipper (shared between both Parks)
Central Yard	Takeuchi Excavator NorAm Grader Tractor/Loader/Backhoe (multiple) Front Mower (multiple) McConnell PA93M Flail Mower Water Truck Water Tank Trailer Fire pumper and 75-gallon tank Chippers Laymor Towable Sweeper 8HC

Table 19
Equipment Available for Sanborn and Upper Stevens Creek County Park

Location	Equipment
	Dump Trucks S220 Air Curtain Burner
Natural Resources Management/Trail Crew	SWECO Trail Dozer John Deer 790 MFWD Tractor Bearcat Chipper John Deere Compact Excavator 27D John Deer Landscape Loader Kubota Tractor B3200HSD Kubota Land Pride Boxscraper B335SU Sutter 500 Trail Dozer Type 6 Engine

In addition to Park staff, in 2020 County Parks extended agreements with two agencies that provide skilled labor for fuel reduction projects [the California Conservation Corps (CCC) and the San Jose Conservation Corps (SJCC)]. Both of these agencies can engage in fuel reduction projects on Parks lands and their agreements extend through 2020. Additionally, at the time of preparation of this report, Santa Clara County Fire was operating a grant-funded fuel reduction program that included the operation of a fuel reduction work crew.

4.4 Current Park Forest Management Practices

Currently, proactive forest management practices conducted in the Park include the Park's Tree Safety Program, treatment or removal of hazard trees identified during this effort and implementing shaded fuel breaks with regional partners. As noted, a formal safety inspection of all trees in each public use area within the Santa Clara County Park system is conducted by a trained Park Natural Resource program staff on a bi-annual basis. Park Maintenance staff are then responsible for carrying out any necessary tree trimming or removal work under the Tree Safety Program. Currently, tree removal in the parks resulting from assessments conducted under the Tree Safety Program are limited in quantity. Additionally, trees are removed each year from the perimeter of former Christmas tree farm during power saw training classes.

Beyond these efforts, forest management efforts in the Park have been reactive in nature, treating fallen trees that prohibit access to or use of recreation areas (e.g., campgrounds, roads, trails) and maintaining defensible space around the campground at Sanborn County Park. Current practices involve felling or cutting trees to clear them from Park facilities such that access is regained. In most cases, material is cut to sizes that allow it to be moved out of use areas or from trails and roads, and it is left to decompose in large, intact sections. These management actions contribute

negatively to forest health in the Park, by increasing fuel loads and potential host material for forest pests/pathogens. Although done in previous years, pile burning efforts in the Park have been curtailed due to air quality concerns and permitting requirements.

For the Upper Stevens Creek County Park property, several thousand trees were removed after land acquisition by County Parks (Young 1984). A non-native tree removal project was also conducted in the Table Mountain portion of the Park to enhance oak, madrone, and Douglas-fir forest regeneration. Understory vegetation was also cleared in this area in the mid- to late-1980s (Young 1984).

County Parks has also implemented fuel breaks on Park property through cooperative efforts with CAL FIRE and the South Skyline FireSafe Council. Two fuel breaks have been implemented in the past five years, one occurring at Sanborn County Park (Black Road Shaded Fuel Break) and the other at Upper Stevens Creek County Park (Charcoal Road – Table Mountain Shaded Fuel Break). More information about these projects is presented in Section 7.1.1.1.

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5 PUBLIC ENGAGEMENT

Stakeholder and public engagement was conducted to support development of this Plan and its associated environmental review document under CEQA. The target audience for the stakeholder engagement effort included County elected officials, local stakeholder organizations, landowners, immediate neighbors, and the general public. Plan information was distributed via direct mail, email, and at two meetings held via Zoom – a stakeholder meeting on October 6, 2022, and a public meeting on October 27, 2022. Prior to these meetings, the Plan was reviewed with local Fire Agencies on June 30, 2022. Feedback on the Plan was collected via email and public comments submitted at or following stakeholder and public meetings.

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6 FOREST THREATS

This section summarizes biotic and abiotic threats to forest health observed in the Park, or which have a high likelihood to occur in the Park. Also included is a discussion of historic pathogen outbreaks that have affected Park trees. Given the Park's location, and frequent public use, the introduction of more and/or new forest pests or invasive species in the future is likely. Project-specific recommendations included in this Plan are intended to address some forest threats directly (shaded fuel breaks) and indirectly (forest health thinning to increase tree vigor), while BMPs are provided to minimize the potential negative effects of Park practices to forest health. Park forest monitoring recommendations are intended to allow for detection of new/introduced threats.

6.1 Forest Pests

Forest pests, such as insects, fungi, other microbes, and vertebrates, are a natural component of California's native forests. Populations of pests are dynamic and fluctuate in response to climatic and environmental changes such as drought, stand density, fire, and other site disturbances. Healthy, vigorous trees are typically able to withstand pest attacks, when pest populations are at endemic levels. When stressors exist in forests (e.g., overstocking, shading, drought), tree vigor is reduced and tree susceptibility to pest attacks and infestations increases. Park management actions (e.g., root and soil disturbance, trunk damage) can also contribute to pest and pathogen spread (Glaeser and Smith 2010, USFS and CAL FIRE [no date]).

The primary issues facing Park trees are fungal pathogen outbreaks, drought stress, and conifer encroachment into oak woodlands. Heavily stressed or dead Douglas-fir trees observed during field observations show signs of bark beetle insect infestation, however, the attacks are likely secondary to drought induced stress. No significant insect infestations, aggressive primary attacks or widespread secondary attacks have been documented in the Park. The history of fungal pathogen outbreaks in the Park is presented in the next section, while identification of potential regional pests is presented in Section 6.1.2.

6.1.1 History of Park Forest Pests

There is little Park-specific recorded history of forest pest related issues. Broader accounts of pests on a regional scale are available in reports and data from government agencies such as the United States Department of Agriculture, United States Forest Service (USFS), CAL FIRE, California Department of Food and Agriculture, and the Santa Clara County Agricultural Commissioner, and non-governmental organizations such as the California Forest Pest Council, the California Oak Mortality Task Force, and the California Invasive Plant Council.

A review of the USFS Region 5 Forest Health Monitoring Aerial Detection Survey for 2019 shows large areas of severe tanoak mortality in NRMZ 6 in the drainages above Lyndon Canyon Creek, extending from the creek/reservoir up to the park boundary at Skyline Boulevard. A large area of moderate tanoak mortality is shown in NRMZ 5 within drainages leading to Sanborn Creek and the area encompassing John Nicholas Trail. Several more large areas of both moderate and severe tanoak mortality are shown in NRMZs 2 and 3, following Sanborn Trail. Lastly, a large area of low tanoak mortality was observed extending into the park along Charcoal Road in Upper Stevens Creek Park. Observations during preparation of this plan confirm these detections, however, the USFS detections may only reflect the most recent mortality and not include tanoak mortality in more advanced states of decay. Older tanoak mortality would be less obvious in surveys that rely strictly on aerial imagery.

6.1.2 Potential Forest Pests

A significant number of pests may impact forests in the Santa Cruz Mountains, including the Parks. This section summarizes host/agent associations for diseases and insects that have been observed in the Parks or which have a high likelihood of affecting Park trees, given their locations. Future forest monitoring efforts should document presence and relative levels of these pests, as well as others that may be introduced in the future.

The Park is located within the Pitch Canker Zone of Infestation (CAL FIRE 1998), although no observations of pitch canker have been documented in the Parks. Presence of SOD has been confirmed in the Park during surveys for the UC Berkeley SOD Blitz program and the USFS Region 5 Forest Health Monitoring Aerial Detection Survey. The Park is within the SOD Zone of Infestation (CAL FIRE 2005) and the "Regulated Area" for SOD as designated by the California Department of Food and Agriculture (CDFA), which covers the same area as the Zone of Infestation (CAL FIRE 2014). Section 8 of this Plan discusses best management practices to minimize pest/pathogen spread, and Section 9 discusses forest health monitoring recommendations for pest and disease presence.

The insects and pathogens presented in Tables 20 and 21 are those that, within the timeframe of this Plan, will likely require some form of control through active Park intervention. The insects and pathogens in the list are either primary or secondary disease agents. Primary agents are of higher concern to Park management. Trees have inherently lower immunity to primary agents. Primary agents of disease are typically non-native organisms and are not considered healthy components of the forest. Secondary agents, although an important consideration for Park management, pose less of a threat to forest health. Trees generally have higher immunity to secondary agents, given favorable environmental conditions. Secondary agents act opportunistically on already weakened trees, are typically native organisms, and considered a

healthy component of the forest. When secondary agents are observed, it is important to note the scale of the disease impacts and determine whether the observations confirm a healthy forest's balance of growth and mortality, or if observations deviate significantly from this balance. Disease observed in multiple trees, or appearing suddenly, warrants further investigation into contributing environmental factors. Drought (water stress), competition, and mechanical injury are the most influential factors predisposing the Park's forests to these opportunistic attacks.

Pathogen-infected firewood brought into Sanborn County Park from other areas is also a significant threat to the Park's forests.

Table 20
Potential Forest Pathogens

Agent	Host Tree						
	Redwood	*Douglas-fir*	*Tanoak*	*Madrone*	*Coast live oak*	*Black oak*	*Bigleaf maple*
Root disease							
Annosus root disease (*Heterobasidion annosum*)		x					
Black stain root disease (*Leptographium wageneri*)		x					
Armillaria root rot (*Armillaria mellea* or *A. gallica*)		x	x	x	x	x	x
Phytophthora spp.		x	x	x	x		
Cankers							
Douglas-fir canker (*Diaporthe (Phomopsis) lokoyae* and *Dermea pseudotsugae*)		x					
Madrone canker (*Botrysphaeria dothidea*)				x			
Seiridium canker (*Seiridium* spp. (usually *S. cardinale*)	x						
Sudden oak death (*Phytophthora ramorum)*			x	x	x		
Decays							
Brown cubical rot (Sulfur fungus) (*Laetiporous sulphureus*)			x	x	x		x
Red ring rot (*Phellinus* spp.)		x	x	x	x		x
Red-Brown Root & Butt Rot (Schweinitzii root & butt rot) *(Phaeolus schweinitzii)*		x					
Brown trunk rot (*Fomitopsis officinalis*)		x					

Aggressive insect infestations are not commonly reported issues in the Parks. Native insects are generally at endemic levels and therefore tend to not cause major damage in the Park's forests. Table 21 presents those invasive and damaging insects that have the potential to pose a threat to the health of the Park's forests in the event of an infestation. None of these aggressive insects have been detected in the Parks to date, but their distribution is expanding to new regions every year.

Asian gypsy moth has been detected nearby in Santa Cruz County and light brown apple moth has been detected in Santa Clara County. Observing the damage that these insects cause in other regions supports this Plan's recommendations for employing best management practices provided in Section 8 to minimize potential impacts from insect infestation. Park staff should monitor for signs of insect damage and seek to positively identify the insects, as recommended in Section 9.

Table 21
Potential Forest Insect Pests

Insect	Host Species						
	Redwood	*Douglas-fir*	*Tanoak*	*Madrone*	*Coast live oak*	*Black oak*	*Bigleaf maple*
Asian gypsy moth (*Lymantria dispar asiatica)*	2017 and 2018 detections in Santa Cruz County. Currently being monitored. Unknown effects.						
Asian longhorned beetle (*Anoplophora glabripennis)*	Not currently found in California. Prefers deciduous trees and shrubs.						
Polyphagous and Kuroshio shot hole borers (*Euwallacea* spp.*)*	Currently only known in southern California. Prefers coast live oak and other hardwoods.						
Gold spotted oak borer (GSOB)*	Currently only known in southern California. Prefers coast live oak and black oak and kills other oaks at lower levels.						
Light brown apple moth (*Epiphyas postvittana)*					x	x	x
Douglas-fir beetle (*Dendroctonus pseudotsugae*)		x					
Flatheaded fir borer (*Melanophila drummondi*)		x					
Mediterranean oak borer (*Xyleborus monographus*)						x	x

* Park is in the potential spread area of GSOB (Coleman et al. 2017)

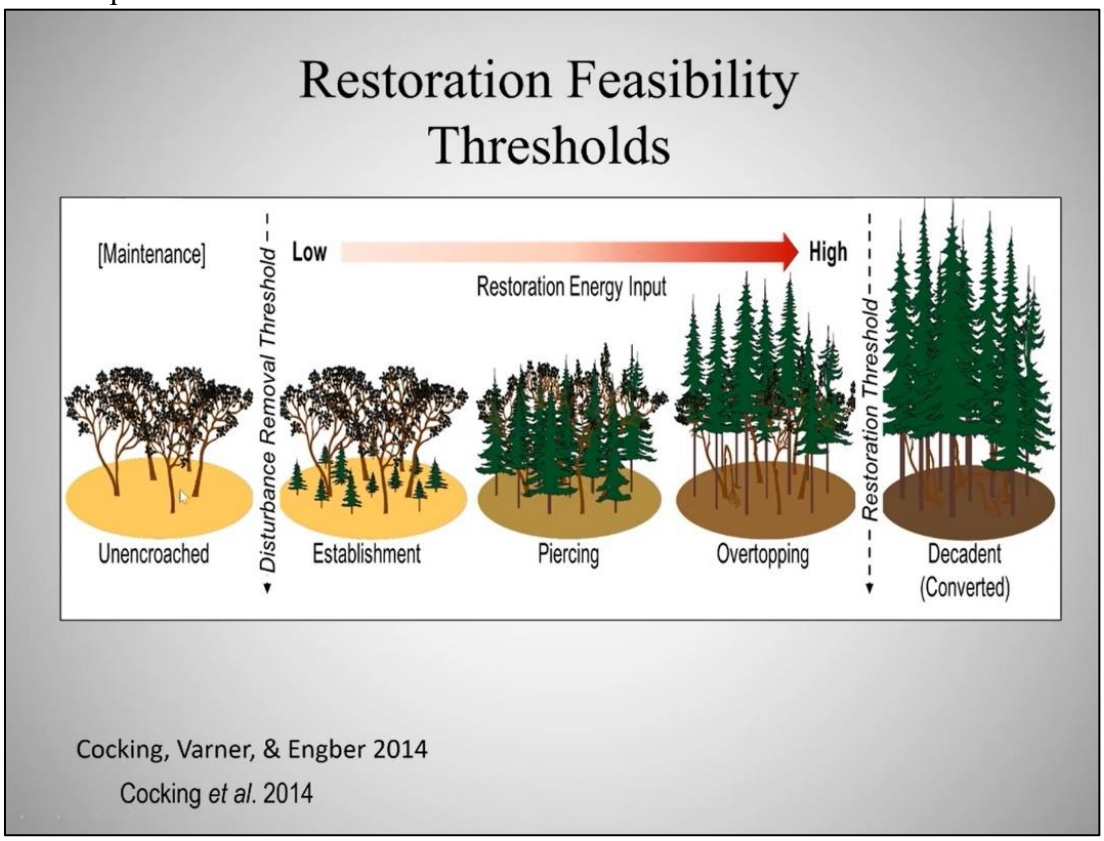
Mistletoe (and dwarf mistletoe) infestations are not a commonly reported problem within the Parks. The parasitic plants usually have little impact on healthy oak trees. Animal damage is also not a commonly reported problem within the Park, although is common in forests in the Santa Cruz Mountains. Deer browsing may contribute to losses of seedlings and saplings of various tree species. The dusky-footed woodrat is known for stripping bark from young redwood trees and pocket gophers feed voraciously on young tree roots. Wild boar can create excessive ground disturbance and consumes large quantities of acorn mast, competing with the native species for this important food source and limiting oak regeneration potential. Section 9 discusses forest health monitoring recommendations for pest and disease presence.

6.2 Douglas-fir Encroachment

The shade tolerance of Douglas-fir and the exclusion of disturbances (wildfire and grazing) from sites that support oak woodlands has enabled far reaching establishment and pioneering of Douglas-fir into the oak woodlands. While tree encroachment is a successional process in the

absence of disturbances, the resulting shifts in oak woodland ecosystem structure and composition are likely outside of the historical range of variability in many portions of the Parks. When wildfires are excluded from these ecosystems, changes can be drastic, with Douglas-fir invading openings, outcompeting grasses and forbs, and leading to more densely stocked woodlands. Figure 10 illustrates the progression of conifer encroachment in oak woodlands. The unencroached condition was largely limited to exposed slopes with southwest aspects. Establishment, piercing, overtopping, and decadent conditions are very common along the upper elevations of the Parks and following Skyline Boulevard. Conifer encroachment has been documented in a range of oak woodland types in northwestern California. Douglas-fir encroachment ultimately results in increased stand densities, increased ladder fuels, and increased fuel loads and fire hazard conditions. Encroachment may also reduce oak vigor thereby reducing oak woodland resilience to pests and disease.

Figure 10. Representation of Conifer Encroachment into Woodlands



6.3 Invasive Plant Species

Invasive plants can threaten the health of the Park's forests by outcompeting native trees for light, water, and nutrients, thereby displacing them, inhibiting their growth, or reducing overall tree or stand vigor. Invasive plants can also increase fire hazard by increasing fuel loads or introducing more flammable and/or more readily ignitable vegetative material into the forest ecosystem (Brooks et al. 2004). Invasive species in the Park may occur within any of the identified vegetation community/land cover types. Common invasive plants in the Santa Cruz Mountains are presented in Table 22.

Table 22
Common Invasive Plant Species in the Santa Cruz Mountains

Common Name	Scientific Name
Eupatory	*Ageratina adenophora*
Bur-chevril	*Anthriscus caucalis*
Giant reed	*Arundo donax*
Soft chess	*Bromus hordeaceus*
Italian thistle	*Carduus pycnocephalus*
Yellow star thistle	*Centaurea solstitialis*
Sticky chickweed	*Cerastium viscosum*
Bull thistle	*Circium vulgare*
Poison hemlock	*Conium maculatum*
Field bindweed	*Convovulus arvensis*
Broadleaf fleabane	*Conyza sumatrensis*
Jubata grass	*Cortaderia jubata*
Scotch broom	*Cytisus scoparius*
Orchard grass	*Dactylis glomerata*
Common teasel	*Dipsacus fullonum*
Blue gum	*Eucalyptus globulus*
French broom	*Genista monspessulana*
Cutleaf geranium	*Geranium dissectum*
English ivy	*Hedera helix*
Rough cat's-ear	*Hypochaeris radicata*
Italian ryegrass	*Lolium multiflorum*
Forget me not	*Myosotis latifloria*
Olive	*Olea europaea*
Bermuda buttercup	*Oxalis pes-capre*
Harding grass	*Phalaris aquatica*
Fiddle dock	*Rumex pulcher*
Milk thistle	*Silybum marianum*
Spiny sowthistle	*Sonchus asper*

Table 22
Common Invasive Plant Species in the Santa Cruz Mountains

Common Name	Scientific Name
Common chickweed	*Stellaria media*
Subterranean clover	*Triflorium subterraneum*
Periwinkle	*Vinca major*

Source: CAL FIRE 2014, Smith 2012

French and Spanish broom are the primary invasive plant species observed in the Park and are widely distributed. Best management practices to reduce the spread of invasive species are provided in Section 8. As invasive species can be introduced and establish over the Plan timeframe, monitoring and adaptive management are recommended to address changes in species, locations, and populations in the Park (Section 9).

As noted, French and Spanish broom are identified as an invasive species by Cal-IPC (Cal-IPC 2020a, 2020b). French broom displaces native plant species, makes reforestation difficult, and is a strong competitor that can dominate a plant community, forming dense monospecific stands. Given its rapid growth rate, it can also shade out seedlings (Cal-IPC 2020b). French broom spreads by prodigious seed production and may also sprout from the root crown (Bossard 2000) or upper stem (Boyd 1995) when above-ground parts are removed by cutting, freezing, or fire. From a wildfire hazard perspective, dense broom stands can produce large amounts of dry matter and can serve as a highly flammable understory ladder fuel that increases crown fire potential in invaded areas (Bossard 2000).

6.4 Wildfire

Wildfire, like insects and disease, is an important disturbance in forests. Repeated low to moderate severity wildfires, like those that were more common prior to the onset of wildland fire suppression policies, can improve or maintain forest health by consuming surface fuels and small, understory trees, thereby reducing competition and reducing fuels loads that contribute to high-intensity, large-scale conflagrations. High-intensity fires typically result in significant mature tree mortality, pose a high risk to public safety, and often precede large-scale soil loss from subsequent landslides. Fire hazard in the Parks is considered high and is influenced by several factors summarized below:

- **Fire History:** As noted in Section 2.2.6, no fires have been recorded in either Park. Large scale fires are not uncommon in the Santa Cruz Mountains, with numerous large wildfires occurring near the Parks in the past 30 years. A fire history project in the Santa Cruz Mountains identified a regional fire return interval of 12 years, and a grand mean fire return interval for single trees in the sample equal to 16.3 years (Stephens and Fry 2005). The fire

return interval for the Parks well exceeds these numbers. There is no record of stand-replacing wildfires in the Park.

- **Stand Density and Fuel Loading:** Given the relative lack of fires and minimal forest and fuels management in the Park, current forest conditions are overly dense, as exhibited in the high stocking levels (high number of trees), high fuel loading, and the presence of ladder fuels that can facilitate ground fire spread to tree canopies (crown fire). Buildup of vegetative debris along forest road shoulders from road clearing, minimal treatment of downed trees in remote Park areas, and numerous dead and dying trees also contribute to high fuel loading.
- **Invasive Species:** Dense broom stands can produce large amounts of dry matter and can serve as a highly flammable understory that increases crown fire potential in invaded areas (Bossard 2000).
- **Drought:** Recent drought conditions in the region also exacerbate fire hazard in the Park by reducing fuel moisture. Drought stress is also a contributing factor to tree mortality. Droughts are cyclical and may pose a threat to the Park's forests in the future.
- **Ignition Potential:** The Park is subject to high ignition potential, as noted in Section 2.2.6. Potential ignition sources include, but are not limited to, campfires, powerlines, lightning, vehicles, discarded cigarettes, and sparks from equipment operations.

Recommendations for minimizing fire hazard at the project or operational level are presented in Section 7. Additionally, fire protection BMPs are provided in Section 8.

6.5 Other Abiotic Factors

Abiotic factors are caused by non-living, non-infectious agents that impact trees. They are results of stresses, either natural or man-induced, that occur in the environment. Other potential threats to the forestland in the Parks are summarized below:

- **Windthrow:** Trees in the Parks have the potential to be subject to windthrow (being blown down by wind), given the Parks locations along the summit of the Santa Cruz Mountains. No significant observations or reports of windthrow have occurred, although one windthrown tree observed in field assessments conducted in support of this Plan. Windthrown trees contribute to fuel loads, but can also act as beneficial coarse woody debris, especially when incidents are low. Blown-out tree tops were also observed in the Park, which result in flattened structures that form complex canopy structures. Windthrow is currently not a primary driver of forest health degradation in the Parks, but the potential

for windthrow can increase following severe wildfires or management actions that expose previously wind-sheltered trees.

- **Climate Change:** Climate change affects forests in several ways. Warmer temperatures may affect wildfire frequency and severity and increase tree mortality potential by decreasing soil moisture. Warmer temperatures also stress forests, making them more susceptible to air pollutants, pest and disease outbreaks and invasive plant infestation and spread (Marshall et al. 2017). Temperatures are anticipated to increase by an average of 2 degrees (Celsius) annually in the future period (2060-2069) as compared to the baseline period (1985-1994). Precipitation decreases are unknown, but, even with an increase in precipitation, the rate of evapotranspiration is expected to increase due to increased temperature. Additionally, increases in temperature and precipitation will likely increase the presence of SOD and other *Phytophthora* diseases. Fog inundation (a decline of 33% since the early 20th century) is also expected to decrease, thereby reducing water availability (Marshall et al. 2017).
- **High Temperatures and Drought:** High temperatures increase tree water demand and therefore increase tree stress, diminish vigor, and reduce productivity. Drought, caused by insufficient precipitation, can be problematic when trees are growing in soil with a low moisture holding capacity. All of these factors increase tree stress, which increases susceptibility to pest/disease infestation. High temperatures and solar radiation can also result in redwood needle scorch, which only seriously affects sprout growth, as branches of mature trees will regrow needles in affected areas.
- **Landslides:** Steep slopes, thin soils, and heavy rains can result in landslides that can damage downslope forests. Earthquakes can also trigger landslides. As noted, much of the area of both Parks is classified as being in a landslide hazard zone (County of Santa Clara 2020). Landslides also have increased potential to occur following severe wildfires or management actions that remote protective vegetative cover or expose soil surfaces.
- **Mechanical Damage:** Trunk, limb, and root damage can occur as a result of equipment use near trees or via abuse in public areas resulting from firewood gathering, burl harvesting, power line clearance trimming, and underground utility installation. Injuries can serve as entry points for pests and pathogens.
- **Soil Compaction:** Soil compaction can result from heavy equipment use and through public use of the Parks (foot traffic, vehicles parking off pavement, use of campsites). Compacted soil can impair root air exchange, causing impacts to tree health and increasing susceptibility to pests and pathogens.
- **Lightning:** Lightning can damage or kill trees. Damaged trees are often weakened, making them more susceptible to pest and disease infestation. Dead or weakened trees are also more

susceptible to windthrow, although less likely with redwood trees. In some instances, trees are ignited, increasing fire risk. Lightning strikes in the Parks are uncommon, but possible.

- **Air pollution:** Air pollution (e.g., ozone, sulfur dioxide, nitrogen oxide) can cause damage to hardwood leaves and conifer needles. Air pollution damage can increase tree stress, making them more susceptible to pest and disease infestation. The likelihood of air pollution impacts to the Parks forests is low due to prevailing onshore winds.

7 FOREST MANAGEMENT RECOMMENDATIONS

This section outlines forest management recommendations to reach identified goals and objectives for improving and maintaining forest health in the Park. This section identifies the Plan goals and objectives and provides recommendations for specific projects, general operations and maintenance practices affecting trees/forests, and for potential future development activity affecting trees/forests.

7.1 Project Recommendations

In this section, the Plan proposes specific forest health projects to meet the identified Plan goals and objectives. A description of the different project types and general treatment prescriptions are provided in the following sections, and a summary of recommended projects, by location and NRMZ, is presented in the table in Section 7.1.4.

The general treatment prescriptions identified in the following sections are intended to guide specific project planning efforts. Given the variability and dynamic nature of forestland conditions in the Park, the practices (Section 7.3) by which these recommendations are implemented may not be consistent from project to project. This Plan anticipates that the identification of specific forest management practices will be conducted at the project planning stage, along with identification of any necessary resource protection measures (Section 8). Section 9 outlines the necessary components of the appropriate project planning stage (e.g., plans, permits).

The following recommendations are based on current observations of forest health conditions. Additional projects may be necessary based on changing forest conditions over the Plan timeframe. It is anticipated that such projects would be identified during Park forest monitoring efforts, incorporated into annual forest health work plans, and conducted using one or more of the forest management practices presented in this Plan.

7.1.1 Fuel Breaks

Fuel breaks, including shaded fuel breaks, are areas of land where vegetation has been modified to minimize ignition potential, slow the spread of a wildfire, reduce potential fire intensity, and reduce the likelihood of crown fire transition. The locations of fuel breaks recommended in this Plan are around Park structures, along paved Park access roads, and along key roadways where the creation of fuel breaks compartmentalize fuels and contribute to regional wildfire prevention efforts (Section 7.1.4). Fuel breaks do not involve complete removal of vegetation. Rather, they increase the horizontal spacing between retained vegetation, increase the vertical separation between surface fuels and overstory tree canopies, and modify surface fuels (grasses, shrubs, debris) to reduce fire intensity and flame lengths. Recommended fuel breaks vary in total width

depending on terrain, vegetation, and proximity to developed uses, and may range between 20 and 400 feet.

The useful life of a shaded fuel break is the estimated amount of time (in years) that the mitigation action will be effective and is based on several factors including vegetation type, treatment location, and weather conditions. In general, fuel breaks in grasslands have a lower useful life (1 year), those in brush-dominated areas have a moderate useful life (2-4 years), and those in forested areas have a longer useful life (3 to 20 years). Maintenance of fuel breaks over time is necessary to maintain their utility in reducing fire hazard. Annual forest health field evaluations should identify shaded fuel break maintenance needs. It is anticipated that maintenance of shaded fuel breaks would be necessary every 2-3 years, although conditions may warrant maintenance more often.

The cost of establishing and maintaining fuel breaks is primarily provided by County Parks. In addition to conducting CEQA review and obtaining necessary permits, County Parks pays for the labor of CCC or SJCC crews, and conducts work with its own crews. In some instances, CAL FIRE crews and/or private contractors can be utilized for fuel break construction and maintenance. Local FireSafe councils may also implement fuel reduction projects on or adjacent to Parks' lands. Grant funds from CAL FIRE or other sources may help offset the cost of fuel break projects. Fuel break creation and maintenance should be coordinated with CAL FIRE and FireSafe councils, to the extent practicable, to create an effective network of fuel breaks in the region.

7.1.1.1 Existing Fuel Breaks

The following summarizes fuels breaks that have been established in the Parks:

Black Road Shaded Fuel Break

The Black Road Shaded Fuel Break was constructed along Black Road in 2016, between Skyline Boulevard and Lakeside Elementary School. The overall fuel break extends 3.1 miles. Of this, 1.25 miles occurred within Sanborn County Park (NRMZ 6). Vegetation treatment occurred within approximately 30 feet of both sides of the road. The objective of the fuel break was to make a safer escape route for the community and allow better access for fire crews. Maintenance of this shaded fuel break is planned for 2022 as a project by the Santa Clara County FireSafe Council. Phase 2 fuel break maintenance is planned to occur in the Park in July[2]. This fuel break should be maintained every 3-10 years.

[2] https://sccfiresafe.org/projects/black-road/

Charcoal Road – Table Mountain Shaded Fuel Break

The Charcoal Road – Table Mountain Shaded Fuel Break was created along the ridgeline occupied by Charcoal Road from Skyline Boulevard, along Table Mountain Road to the far end of Table Mountain (2.3 miles including the loop road on Table Mountain), then continuing 0.3 miles to near the junction of Stevens Creek and Grizzly Flat Trail. This fuel break was established in 2017 within Upper Stevens Creek County Park (NRMZ 1), with the exception of a 0.3-mile section that occurs on Midpeninsula Regional Open Space District property. The project served as a component of larger "box" fuel break network, forming a wall on the southeast side/downcanyon to prevent fire spread in that direction. Prevailing winds in this area are from the north. The total treatment area was 7.4 acres, and treatment width varied between 100 and 150 feet for the length of the project. The objective of the fuel break was to control wildfire spread from the Upper Stevens Creek Canyon. Maintenance of this fuel break is identified as a project in the 2021 SCU Unit Fire Plan (CAL FIRE 2021). This fuel break should be maintained every 3-10 years. Maintenance of this shaded fuel break is planned for 2022, to be conducted as a project by the Santa Clara County FireSafe Council.

7.1.1.2 Proposed Fuel Breaks

The following summarizes fuels breaks proposed under this Plan. Specific locations of recommended fuel break projects are identified in Section 7.1.4 and Figures 12 and 13.

Skyline Boulevard Shaded Fuel Break

This 400-foot-wide fuel break is proposed along Skyline Boulevard for a distance of approximately 4.2 linear miles. This fuel break is a component of the Santa Clara County CWPP and is identified as a project in the CAL FIRE SCU Unit Fire Plan (CAL FIRE 2021). A portion of the fuel break would extend up to 200 feet from the edge of the road into the Parks, and the remaining 200 feet is proposed on the opposite side of Skyline. The South Skyline Fire Safe Council completed an initial treatment of the Caltrans ROW in approximately 2010. Signs of cutting and vegetation removal are still noticeable near the Charcoal Road gate. The objective of this fuel break is help control the spread of wildfire from the northeast side of Skyline Boulevard toward the residential communities to the south and west. Prevailing winds are out of the northeast during late summer and early fall. This recommendation covers the area on County Parks land only. Coordination with Caltrans is recommended during project planning to coordinate fuel break treatments, where feasible.

Sanborn Road Shaded Fuel Break

This 200-foot-wide fuel break is proposed along Sanborn Road for a distance of approximately 1.5 miles. This is a component of the Santa Clara County CWPP and is identified as a Pre-fire Project in the CAL FIRE Santa Clara Unit Fire Plan. A portion of the fuel break would extend up to 100 feet from either side of the road into the Parks. The proposed treatment area also includes the property of neighboring landowners. There are no records of previous fuel break treatments for this area, however, routine power line clearance occurs for the removal of hazard trees and to maintain clearance for transmission lines. The objective of the fuel break is to make a safer escape route for the community and park visitors and allow better access for fire crews. This road segment was assessed for wildfire risk within the CWPP and is rated as posing High Risk.

Evacuation Routes Shaded Fuel Breaks

These 200-foot-wide fuel breaks are located along primary and secondary evacuation routes in the Parks – along Pick Road (approximately 0.3 miles in length), Lake Ranch Road (approximately 2.8 miles in length), and an Unnamed Access Road (heading south from Sanborn Park's main entrance; approximately 0.5 miles in length). These evacuation routes are identified in the Sanborn County Park Field Emergency Response and Incident Command Plan. The objective of the fuel breaks is to make a safer escape route for the community and park visitors and allow better access for fire crews. Additionally, establishing a Temporary Refuge Area (TRA) at lower end of Lake Ranch Reservoir within the roadside treatment area where it doubles back to create a 300-foot-wide area is recommended. Maintaining this TRA with prescribed burn treatments is also recommended.

Defensible Space

Fuel breaks for defensible space purposes are proposed around the outward edge of all park buildings (to 100 feet from buildings) and existing and planned campgrounds (to 100 feet from the outward edge of the developed camping area). Defensible space areas total 83.9 acres for Sanborn County Park and 1.4 acres for Upper Stevens Creek County Park. The intent of these treatment areas is reducing the potential for structural ignitions resulting from a wildfire, reduce the potential for wildland fire ignitions resulting from camping or other activities associated with building use, and to facilitate firefighter access in the event of a wildfire in the Parks. Defensible space around park buildings should follow the standards outlined in California Public Resources Code (PRC) 4291 which includes standards for vegetation clearance distances from structures and outlines treatment intensity within 3 distinct zones (Zone 0 (Ember Resistant Zone, 5 feet from structures), Zone 1 (Lean, Clean, and Green Zone, 30 feet from structures), and Zone 2 (Reduced Fuel Zone, 100 feet from structures)).

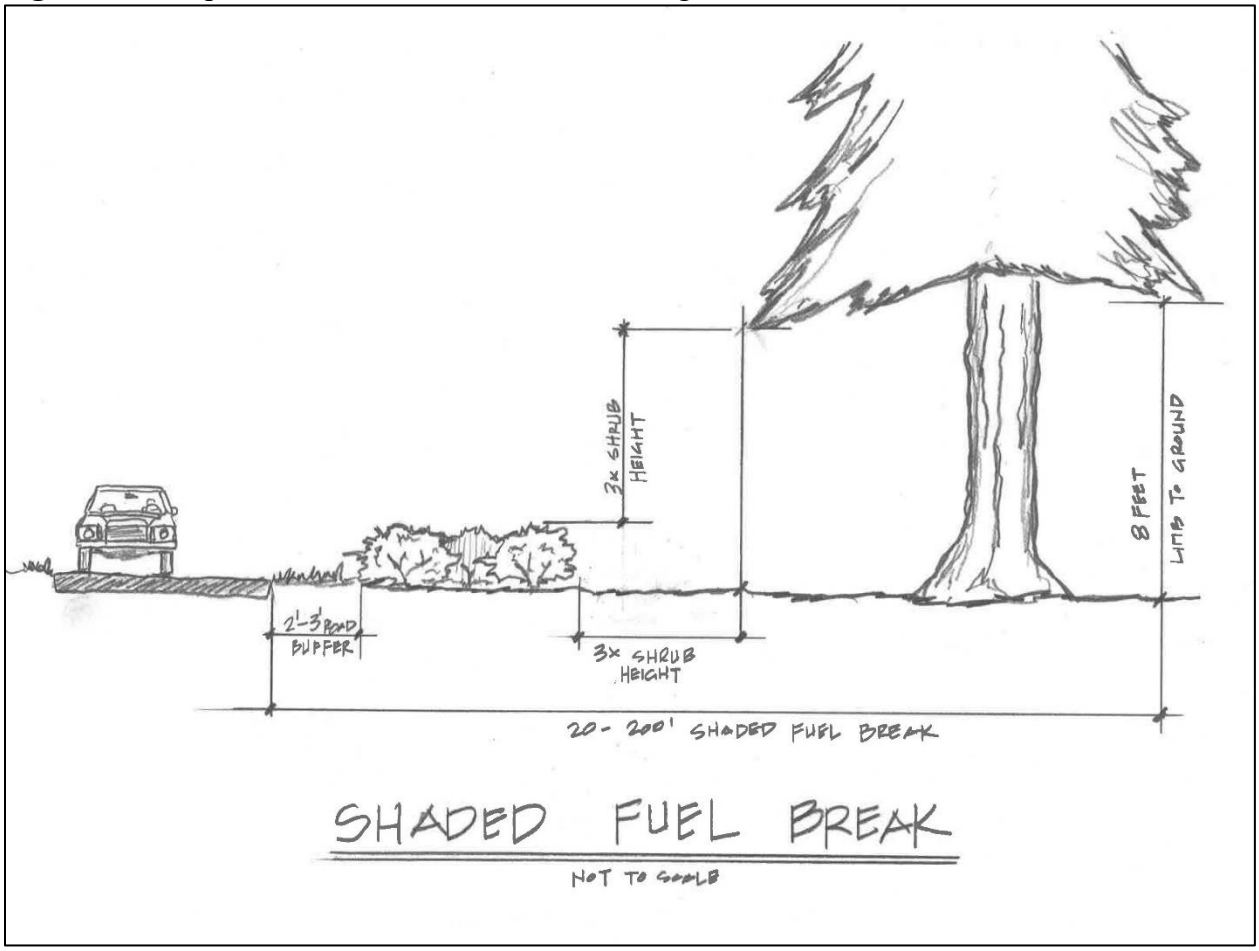
7.1.1.3 Fuel Break Treatment Recommendations

The following provides shaded fuel break management recommendations for the dominant land cover types within recommended treatment areas. A sample diagram of the spacing standards outlined below is provided in Figure 11. Specific locations of recommended fuel break projects are identified in Section 7.1.4 and Figures 12 and 13.

- **Redwood:** Redwood stands provide optimal conditions for shaded fuel breaks. Desired conditions are a closed canopy stand of mature redwood trees with well-spaced tanoak and madrone trees. In mature, closed-canopy redwood stands with duff and leaf litter understories, the vertical separation between the top of surface fuels and the lowest tree branch should be at least eight (8) feet. Young redwood crown sprouts and sapling growth should be thinned to achieve this standard. Where such stands abut brush or chaparral, provide horizontal spacing between the outward canopy edge and the nearest shrub equal to three (3) times the adjacent shrub height. In more open redwood stands where small trees, shrubs, and grasses exist beneath tree canopies (surface fuels), the vertical separation between the top of surface fuels and the lowest tree branch should be at least three (3) times the height of the surface fuels. Encourage development of a dense tree canopy by prioritizing removal/treatment of understory shrubs, grass, or small trees rather than pruning tree canopies. Preserve small trees in forest openings so they can contribute to the future forest canopy. Prioritize removal of invasive species, where present.
- **Oak Woodland:** Oak stands are also excellent candidates for implementing shaded fuel breaks. Closed canopy mature oak stands with little to no surface vegetation (ladder fuels) are not typically conducive to extreme fire behavior. In mature, closed-canopy oak woodlands with duff/leaf litter understories, the vertical separation between the top of surface fuels and the lowest tree branch should be at least eight (8) feet. Where such stands abut brush/chaparral, provide horizontal spacing between the outward oak canopy edge and the nearest shrub equal to three (3) times the adjacent shrub height. In more open oak woodlands where small trees, shrubs, and grasses exist beneath tree canopies (surface fuels), the vertical separation between the top of surface fuels and the lowest tree branch should be at least three (3) times the height of the surface fuels. All encroaching Douglas-fir should be targeted for removal, unless removal is not feasible without damage to retained oaks, or if removal is cost prohibitive. Figure 10 illustrates the range of expected encroachment conditions and feasibility thresholds for treatment. Encourage development of a dense oak tree canopy by prioritizing removal/treatment of understory shrubs, grass, or small trees rather than pruning tree canopies. Prioritize removal of invasive species, where present.

- **Douglas-fir/Tanoak:** Hardwood-conifer mixed stands provide optimal conditions for shaded fuel breaks. Desired conditions are a closed-canopy stand of mature Douglas-fir trees with well-spaced tanoak and madrone trees. In mature, closed canopy stands with duff and leaf litter understories, the vertical separation between the top of surface fuels and the lowest tree branch should be at least eight (8) feet. Young Douglas-fir seedling and sapling growth should be thinned to achieve this standard. Where such stands abut brush or chaparral, provide horizontal spacing between the outward canopy edge and the nearest shrub equal to three (3) times the adjacent shrub height. In more open stands where small trees, shrubs, and grasses exist beneath tree canopies (surface fuels), the vertical separation between the top of surface fuels and the lowest tree branch should be at least three (3) times the height of the surface fuels. Encourage development of a dense tree canopy by prioritizing removal/treatment of understory shrubs, grass, or small trees rather than pruning tree canopies. Preserve small trees in forest openings so they can contribute to the future forest canopy. Prioritize removal of invasive species, where present. Douglas-fir stands should be incrementally thinned to minimize potential for windthrow and sunscald and to maintain appropriate live crown ratios in retained trees.
- **Chaparral/Coastal Scrub:** Chaparral and scrub vegetation types are the most hazardous fuels in the Park. Brush stands are typically intermixed with forested or woodland cover types, though some larger, pure stands occur on south- and west-facing slopes in the eastern portions of the Parks (Sanborn County Park NRMZs 6 and 7 and Upper Stevens Creek County Park NRMZs 1 and 2). Brush is typically intermixed with redwood, Douglas-fir, tanoak and coast live oak stands where gaps in the canopy allow more light to reach the forest floor. The priority in constructing fuel breaks in chaparral/scrub fuels is to break up horizontal continuity and to maintain surface fuels to a maximum depth of 4 inches in the open areas between retained shrubs. Retained shrub crowns should be horizontally separated from adjacent shrubs, shrub groupings, or trees by at least two times the height of the shrub crown. Groupings of shrubs may be retained such that the grouping does not exceed eight (8) feet in diameter. Shrub groupings should be horizontally separated from adjacent shrubs, shrub groupings, or trees by at least two times the height of the shrub crown. Sprouting species should be cut as low as possible to minimize regrowth from stumps. Prioritize removal of invasive species, where present.

Figure 11. Sample Roadside Shaded Fuel Break Diagram



The following recommendations are provided to clarify fuel treatments in specific locations:

- Fuel breaks adjacent to structures (defensible space) should extend outward from the structure to a distance of up to 100 feet and should incorporate the 5-foot, 30-foot and 100-foot defensible space standards outlined in PRC 4291[3];
- Portions of tree crowns near structures should be pruned back to maintain a minimum horizontal clearance of 10 feet;
- Fuel breaks along paved Park access roads (roadside fuel breaks) should extend outward from both sides of the road to a distance of up to 20 feet;

[3] https://www.fire.ca.gov/programs/communications/defensible-space-prc-4291/

- Fuel breaks around campsites and barbeque areas should extend outward from the developed area to a distance of up to 20 feet while accommodating the need for screening and privacy between sites;
- Designated fuel breaks (shaded fuel breaks) along interior Park roads and trails should extend outward from both sides of the road/trail to a distance of up to 200 feet. The designated fuel breaks will be coordinated with CAL FIRE to establish driving routes and effective firefighting positions. For regional fuel breaks (e.g., Skyline Boulevard) the break may extend up to approximately 200 feet, however 50 to 100 foot widths will be most common;
- Feathering out the outward edge of fuel breaks (gradually reducing thinning intensity along the outer fuel break edge to eliminate abrupt changes in stand structure) is recommended to reduce potential visual impacts, where appropriate.
- Portions of tree crowns above vehicle access roads should be pruned to maintain at least 13.5 feet of vertical clearance above the road surface;
- Avoid the use of mechanical equipment on slopes steeper than 65 percent or on slopes steeper than 50 percent where the erosion hazard rating is high or extreme.
- Where soil erosion is a concern, stumps should be left intact, but cut low to minimize regrowth;
- All cut material should be removed or treated (e.g., chipped and spread on site or burned) as practical; logs greater than 8 inches in diameter (small end) may be retained on the soil surface; and
- All chipped material should be spread to an average depth no greater than six (6) inches.

7.1.2 Landscape Forest Health and Resilience

Project recommendations for the Park's forested areas included in this section are intended to address overall forest health, which has the benefit of increasing tree vigor, reducing susceptibility to pests and pathogens, increasing tolerance to drought and climate change, and reducing the threat of high-severity wildfire. Current forest conditions in the Park are largely shaped by historic old-growth logging and fire suppression practices. These practices have resulted in an increase in understory trees and vegetation (ladder fuels), higher stand densities, and have created a dense, "second-growth forest" defined as a "relatively young forest that has been regenerated naturally or artificially after some drastic interference such as extensive cutting, wildfire, insect or disease attack, or blowdown (SAF 2018)". In the time that has passed since old-growth logging occurred in the Parks, disturbances (e.g., wildfire, insect or disease attack, blowdown) have not occurred at levels significant enough to alter forest structure and composition. The result is a nearly homogenous, mid-seral stage forest with high tree density. A seral stage is a temporal and

intermediate stage in the process of succession, the gradual supplanting of one community of plants by another (SAF 2018). Homogenous forest structures lack diversity across different seral stages.

As noted, the Park's forests are characterized by unnaturally high densities of trees per acre, are comprised of younger, smaller trees of similar ages, and have a single overstory canopy layer with few openings. These conditions also include high levels of understory trees and vegetation that act as ladder fuels. Where SOD exists, dead fuel loads can also be high. Such forest conditions also typically lack an abundance of wildlife habitat elements, such as downed logs, standing snags, and a diversity of forest floor plants. High tree densities increase competition between trees for finite resources (e.g., water, soil nutrients), thereby increasing the potential for tree stress. Healthy forests are characterized by lower stand densities (fewer trees overall than unhealthy stands) and have a mosaic of successional stages and a greater diversity of tree structure. In turn, healthy stands have a greater diversity of wildlife habitats, and are comprised of vigorous trees that are more resistant to pest and disease outbreaks than those in overcrowded stands.

7.1.2.1 Proposed Landscape Forest Health and Resilience Projects

The following summarizes the four proposed landscape forest health and resilience projects. Specific locations of project areas are identified in Section 7.1.4 and Figures 12 and 13.

Los Gatos Creek Watershed Collaborative Project

Santa Clara County Parks is a partner in the Los Gatos Creek Watershed Collaborative (with San Jose Water, Santa Clara County FireSafe Council, and Midpeninsula Regional Open Space District). The Collaborative (Los Gatos Creek Watershed Collaborative 2022) is planning and implementing landscape level vegetation treatments to address threats to forest health – notably altered fire regimes, increased fuels loads, and hardwood displacement affected by climate change. The Collaborative has identified treatment areas focused on increasing forest health and vigor. Selected treatment areas also considered connectivity to recent and planned projects to create an ever-increasing network of forest health, fuel break, and evacuation route projects in Santa Clara County.

Treatment will include understory thinning, mastication of trees up to ~8 inches in diameter, removal of dead and dying trees (predominantly resulting from sudden oak death), control of invasive species, and removal of Douglas-fir trees encroaching into hardwood woodlands. Treatment areas identified in the Parks total 268.2 acres (206.8 in Sanborn County Park and 61.4 acres in Upper Stevens Creek County Park). The treatment areas are summarized below. In some cases, these treatment areas overlap with existing or proposed project areas.

- **Sanborn County Park:** Eighteen individual treatment areas are identified with twelve situated along or adjacent to Skyline Boulevard (typically extending along the top of

smaller ridgelines perpendicular to Skyline Boulevard). Two treatment areas are located along the lower portion of Black Road, three within Lyndon Canyon, and one along Sanborn Road near the former nursery site. Treatment areas are generally on slopes less than 30 percent. Treatment may include mechanical and/or hand labor techniques to meet treatment objectives.

- **Upper Stevens Creek County Park:** Four individual treatment areas are identified along Charcoal Road and Table Mountain. All treatment areas are within and adjacent to the Charcoal Road – Table Mountain Shaded Fuel Break and encompass the former Table Mountain Christmas Tree Farm site. Treatment areas are generally on slopes less than 30 percent. Treatment may include mechanical and/or hand labor techniques to meet treatment objectives.

Christmas Tree Farm Maintenance

This area is included in the Los Gatos Creek Watershed Collaborative project (discussed below), which is focused on landscape level vegetation treatments to address threats to forest health – notably altered fire regimes, increased fuels loads, and hardwood displacement affected by climate change. That project will include understory thinning, mastication of trees up to ~8 inches in diameter, removal of dead and dying trees, and control of invasive species (where present). In addition to that work, this Plan recommends selective tree removal to maintain clearance between the former tree farm and adjacent native forest and to maintain clear corridors through the plantation for emergency vehicle access. Targeted removal of select farmed trees is also recommended to promote growth of native tree species. Over time, it is recommended to continue to reduce the perimeter of the tree plantation to promote the reestablishment of native tree species. This may take multiple treatments as native tree species establish and grow and additional clearance is necessary. Previous thinning treatment occurred in 2018 which utilized County Park's staff, CCC, and SJCC crews. County Parks also uses the non-native trees in the tree farm for power saw training classes and allows other agencies (West Valley Community College, Santa Clara County Fire) to also use the site for saw training to help maintain perimeter clearances. Continued use of this site for training purposes is recommended.

Lyndon Canyon Creek and Lake Ranch Reservoir Wildfire Resiliency Projects

In order to increase forest resilience to threats and stressors, this Plan recommends establishing a mosaic of successional stages within the Park's forests through selective thinning. Selective thinning that removes only a portion of trees in a stand mimics small-scale disturbances allowing for a reduction in the number of trees per acre while promoting the growth of retained trees and their canopy. Selective thinning should be implemented to influence the mosaic of successional stages in the Park's forests and should seek to include elements of early-, mid-, and late-seral

stages. A variety of silvicultural prescriptions, or a planned series of stand thinning projects designed to change a current forest stand structure and composition, should be considered. In addition to selective thinning, treatment of understory vegetation (ladder fuels), removal of dead and dying trees, and control of invasive species (where applicable) should be integrated into treatment prescriptions. Stand thinning projects would need to have detailed treatment prescriptions developed and would need to be planned, evaluated, and permitted under the California Forest Practice Rules, as described in Section 9.2.1.

Two forest health and resilience project areas have been identified under this Plan, both of which focus on treatment and removal of Douglas-fir trees that are displacing live oak and tanoak stands. As described, Douglas-fir shade tolerance and the exclusion of disturbances (wildfire, grazing) have enabled encroachment of Douglas-fir trees into hardwood woodlands resulting in a shift in forest composition density, and woodland ecosystem health. Encroachment of Douglas-fir in these woodlands has resulted in increased stand densities, increased ladder fuels, and increased fuel loads resulting in increased fire hazard conditions. Encroachment also has the potential to reduce hardwood tree vigor thereby reducing resilience to pests and disease. The high density of drought intolerant Douglas-fir predisposes the forests in these two project areas to the effects of climate change. Treatment at this time will be much less costly than the environmental impacts of widespread drought mortality or high severity wildfire. Treatment may include ground, cable, or aerial based logging to thin dense stands of Douglas-fir.

A common guide for determining the spacing of retained (residual) trees in a stand is the D+ (D-plus) rule. This “rule” specifies that the average spacing between retained trees will equal the average stand diameter plus a constant. For example, if the average diameter of retained trees in a stand is 16 inches, a D+4 rule would result in an average spacing of 20 feet (resulting in 109 trees per acre). This “rule” is not arbitrary, so there would be some variation in retained tree spacing based on tree location and vigor, but it provides a general framework for how a post-treatment stand may look (Emmingham and Elwood 1983). The appropriate prescription for thinning stands of Douglas-fir will be developed as a part of detailed project planning and should consider this approach as well as the potential for windthrow, sunscald, and live crown ratios in retained trees. Additionally, consideration should be given to areas presenting high levels of red ring rot (*Phellinus pini*) in Douglas-fir trees when developing treatment prescriptions. It may be preferred to let infected trees die off in these areas and focus treatment on dead tree removal, rather than retaining infected trees in a thinned stand.

Treatment prescriptions for these two areas would also need to be modified (or treatment avoided) in Watercourse and Lake Protection Zones (WLPZs) and areas with unstable slopes. This plan also recommends avoiding the use of mechanical equipment on slopes steeper than 65 percent or on slopes steeper than 50 percent where the erosion hazard rating is high or extreme. Following stand

thinning, additional treatments may be necessary to reduce surface fuel loading, treat dead trees, and remove ladder fuels. To maintain lower stand density, follow-up treatments to manage Douglas-fir regeneration (seedlings, saplings) would be required.

These two projects have several anticipated challenges.

1. Harvesting and selling of Douglas-fir requires a willing buyer. There is limited capacity at local lumber mills to handle Douglas-fir as they primarily source redwood. An alternative may be to grind the material and market as a pulp wood product for use in biofuel or laminated timber products. Additional market research and development is needed to match forest landowners with wood products industries.
2. Except for the John Nichols Trail, these areas are largely roadless and access is limited. A review of LiDAR from the Northern California GeoEarthScope LiDAR Hillshades in Google Earth found no evidence of unmapped roads, skid trails, or landings. Creation of temporary roads, skid trails, and landings may be necessary to enable harvesting operations. Use of previously established roads and skid trails is encouraged, where feasible.
3. The LiDAR review also uncovered several unstable areas and landslides. Operations may be restricted due to the erosion hazard.

The treatment areas are summarized below. In some cases, these treatment areas overlap with existing or proposed project areas.

- **Lyndon Canyon Creek Project:** This proposed project area encompasses 330 total acres and is located in the southeast portion of Sanborn County Park. It is bounded by portions Skyline Boulevard to the southwest, Black Road to the southeast, and Lyndon Canyon Creek to the north and east. This project area includes the majority of the Black Road Shaded Fuel Break project (7.7 acres), a portion of the Skyline Boulevard Shaded Fuel Break project (2.2 acres), and 5 individual treatment areas for the Los Gatos Creek Watershed Collaborative project (totaling 33.0 acres). This area sees frequent vehicle use along Black Road and park visitors along John Nicholas Trail. This area is rated as Moderate Fire Hazard Severity Zone by CAL FIRE and neighboring communities to the south are at risk from wildfires driven by dry northeasterly winds. Under dry, windy conditions, a wildfire would quickly exceed the capacity of Parks personnel or initial attack wildland fire resources to quickly contain the fire. A wildfire in this area also poses a risk to the Black Road escape route. Although an existing shaded fuel break has increased the defensibility of the Black Road escape route, extreme fire behavior may make the route impassable.
- **Lake Ranch Reservoir Project:** This proposed project area encompasses 312 total acres and is located in the southeast portion of Sanborn County Park. It is bounded by portions

Skyline Boulevard to the southwest, Lyndon Canyon Creek to the southeast, Lake Ranch Reservoir to the northeast, and an unnamed tributary to the northwest. This project area includes a portion of the Skyline Boulevard Shaded Fuel Break project (12.2 acres), and a portion of one individual treatment area for the Los Gatos Creek Watershed Collaborative project (1.9 acres). This area sees frequent park visitor use along John Nicholas Trail. This area is rated as Moderate Fire Hazard Severity Zone by CAL FIRE and neighboring communities to the south of Skyline Boulevard are at risk from wildfires driven by dry northeasterly winds. Under dry, windy conditions, a wildfire would quickly exceed the capacity of Parks personnel or initial attack wildland fire resources to quickly contain the fire. Extreme fire behavior would make the Skyline Boulevard escape route impassable.

7.1.3 Burning Program

The reintroduction of prescribed fire into the Parks is recommended. Prescribed fire is a highly effective and inexpensive tool for reducing fuel loads and treating residual woody material generated during forest treatments. When used to reduce fuel loads or treat woody material, prescribed fire can help reduce the potential for catastrophic wildland fires. Other benefits of prescribed fire include accelerated nutrient cycling, reduction of brood material for pests and pathogens, reduced competition from underbrush, and reduced risk of pathogen spread via material transport.

Prescribed fire treatments include pile burning and broadcast burning. Small burn piles can be created at or near the site of treatment while large burn piles are located in larger cleared areas. Piles are ignited when regulatory and weather conditions permit. County Parks has also purchased an air curtain burner, which may be employed for burning activities. Air curtain burners allow for more complete combustion of wood waste and were developed to reduce the particulate matter (PM), or smoke, which results from burning. Using a technology called an "air curtain," the smoke particles are trapped and reburned, resulting in a cleaner (less PM) burn. Broadcast burning includes surface fire ignition within a treated, controlled forest area with a targeted management objective (e.g., fuels reduction, forage production, invasive species eradication).

Both types of prescribed burning are rarely employed as a standalone fuel or wood waste reduction measure, but rather compliment other management recommendations (e.g., shaded fuel break construction, hazard tree removal). Preceding burning practices with mechanical or manual treatment alters the arrangement of fuels and provides managers with better control over fire behavior. Seasonally timing burning operations with regional weather patterns, such as burning in the late fall prior to rainfall and during extended dry periods in winter, can allow managers to achieve a high level of fuel consumption with less risk of escape. Prescribed burns should use existing fire breaks, roads, and trails as the boundaries for fire control whenever possible to reduce

costs. Weather is a critical variable in prescribed burning operations and burn plans should define the range of acceptable weather conditions under which a plan should be executed.

Pile burning is recommended as a management practice to be re-initiated in the Parks to strategically reduce cut or treated woody material. Small pile burning at treatment areas is recommended where transport of cut or treated material is infeasible, would promote pest/pathogen spread, or would increase the risk of damage to other Park resources. Where removal of cut or treated material is feasible and desirable (e.g., near developed uses), transport to a designated burn area with appropriate defensible space buffers is recommended. The use of County Park's air curtain burner is recommended to dispose of wood waste. Air curtain burners can be temporarily sited at different locations in the Parks, depending on project needs. Air curtain burners should not be placed on paved surfaces during use. Another option for burning cut or treated woody material is the use of metal kilns (biochar kilns) to produce biochar. Biochar results biomass is fired to temperatures ranging from 400 to 600 degrees C. Biochar has high porosity and surface area and, when added to soil, it increases water-holding capacity therefore making moisture it available to plants over an extended period of time (McAvoy and Dettenmaier 2019). Utilization of metal kilns to generate biochar from burned materials is recommended, where feasible. More information can be found here: https://forestry.usu.edu/files/utah-forest-facts/hazardous-fuels-reduction-using-flame-cap-biochar-kilns.pdf. More detailed recommendations for implementation of burning in the Park is include in Section 7.3.4.

Broadcast burning is discussed in greater detail in Section 7.3.4 and should also be considered as a management tool during implementation or maintenance of other forest health projects. CAL FIRE's Vegetation Management Program (VMP) offers cost sharing for prescribed fire operations to support fuels reduction and other resource management objectives. CAL FIRE provides crews for implementation and can assist in project permitting and planning. This Plan recommends enrollment in the VMP program to maximize the benefits of prescribed fire in the Park.

7.1.4 Recommended Project Locations

A summary of recommended projects, by location, priority, and NRMZ, is presented in Tables 23 and 24. Figures 12 and 13 also presents recommended project locations. This Plan provides only high-level descriptions of projects that will serve to meet the goals and objectives over the life of the Plan. Priorities may change as a result of unforeseen events (e.g., wildfire, new pest outbreak) or policy changes (i.e., park management policies). The Plan provides adaptation strategies in Section 9.4 to guide this process. Finally, acreage, location, and description are anticipated to be adjusted during the project design phase. Recommended projects may be removed or modified, and new projects may be created within the life of the Plan.

Table 23
Recommended Forest Health Projects for Sanborn County Park

Priority	Project Number/Name	Goal and Objective	NRMZ	Location	Project Type	Distance or Area*	Description
Defensible Space							
High	Defensible Space	Goal: 1, 3 Objective: 1, 3	1, 3, 4, 5, 7	Park Structures and Campgrounds	Fuel Break - Defensible Space	83.9 acres	Create defensible space around the outward edge of all park buildings and around the outward edge of existing and planned campgrounds. Treatment prescription to follow the general standards outlined in Section 7.1.1.
Hazard Trees							
Medium	Tree Safety Program	Goal: 1, 3 Objective: 1, 2, 4, 7	1, 6	High Use Areas	Tree Safety Program	n/a	Continue the Park's inspection, pruning and removal protocols outlined in the existing Tree Safety Program.
Fuel Breaks							
Medium	Black Road Shaded Fuel Break	Goal: 1, 3 Objective: 1, 3	6	Along both sides of Black Road where it passes through the Park (approx. 1.2 linear miles)	Fuel Break - Shaded Fuel Break	8.0 acres	Maintain shaded fuel break along both sides of Black Road, out to 30 feet from road hinge point. Treatment prescription to follow the general standards outlined in Section 7.1.1.
Medium	Skyline Boulevard Shaded Fuel Break	Goal: 1, 3 Objective: 1, 3	1, 2, 3, 5, 6	Within 200 feet of Skyline Blvd. (approx. 4.2 linear miles)	Fuel Break - Shaded Fuel Break	65.4 acres	Create shaded fuel break along north-east side of Skyline Blvd (up to 200 feet from road edge). Treatment prescription to follow the general standards outlined in Section 7.1.1.
Medium	Sanborn Road Shaded Fuel Break	Goal: 1, 3 Objective: 1, 3	3, 4, 5, 7	Within 200 feet of Sanborn Road (approx. 1.5 linear miles)	Fuel Break - Shaded Fuel Break	48.9 acres	Create shaded fuel break along north-east side of Sanborn Road (up to 200 feet from road edge). Consider connectivity with adjacent landowners and other existing or planned fuel breaks. Treatment prescription to follow the general standards outlined in Section 7.1.1.

Table 23
Recommended Forest Health Projects for Sanborn County Park

Priority	Project Number/Name	Goal and Objective	NRMZ	Location	Project Type	Distance or Area*	Description
High	Evacuation Routes Shaded Fuel Break	Goal: 1, 3 Objective: 1, 3	3, 4, 5, 6	Within 100 feet of Pick Road, Lake Ranch Road, and Unnamed Access Road (heading south from the Park's main entrance)	Fuel Break - Shaded Fuel Break	81.1 acres	Create shaded fuel break along primary and secondary access routes identified in the Park's Emergency Response and Incident Command Plan (up to 100 feet from road edge). Where feasible, connect to Highway 35 through Lake Ranch Reservoir Project area. At lower end of Lake Ranch Reservoir, establish a Temporary Refuge Area (TRA) within the roadside treatment area where it doubles back creating a 300-foot-wide area. Treatment prescription to follow the general standards outlined in Section 7.1.1.
High	Roadside Treatment	Goal: 1, 3 Objective: 1, 3	3, 4, 5	Paved Park Access Roads and Parking Lots	Fuel Break - Roadside Fuel Treatment	1.6 miles (7.6 acres)	Treat flashy fuels, dead and dying vegetation, and ladder fuels along both sides of all paved park access roads and parking lots. Maintain annually. Treatment prescription to follow the general standards outlined in Section 7.1.1.
Landscape Forest Health and Resilience							
High	Los Gatos Creek Watershed Collaborative Projects	Goal: 1, 2 Objective: 4	1, 2, 3, 5, 6, 7	Select areas on slopes along Skyline Blvd., lower portions of Lyndon Canyon, along Sanborn Road, and at the former nursery site	Forest Health/Resilience	206.8 acres	Treatments to remove middle to large diameter non-commercial trees infected with the SOD pathogen and large diameter Douglas-fir trees encroaching into oak/hardwood woodlands. Treatments to include mechanical (on slopes less than 30%) and hand labor treatments.

Table 23
Recommended Forest Health Projects for Sanborn County Park

Priority	Project Number/Name	Goal and Objective	NRMZ	Location	Project Type	Distance or Area*	Description
Medium	Christmas Tree Farm Maintenance	Goal: 1, 3 Objective: 1, 3	6	Former Christmas Tree Farm along Skyline Blvd., south of Black Road	Forest Health/Resilience	9.8 acres	Maintain clearance between tree farm and native forest. Maintain clear corridors through tree plantation and maintain emergency vehicle access. Remove select farmed trees to promote growth of indigenous trees. Continue to reduce the perimeter of the tree plantation to allow reestablishment of native vegetation. Continue to use of the site for training purposes. Utilize chippers to treat cut material. All chipped material should be spread to an average depth no greater than six (6) inches.
Low	Lyndon Canyon Creek Wildfire Resiliency Project	Goal: 1, 2 Objective: 4	6	Southern portion of Park, along both sides of Black Road	Forest Health/Resilience	330 acres	Conduct crown thinning and surface fuel reductions to achieve target stand conditions as defined in Section 7.1.2.
Low	Lake Ranch Reservoir Wildfire Resiliency Project	Goal: 1, 2 Objective: 4	5, 6	On slopes between Lake Ranch Reservoir and Skyline Blvd.	Forest Health/Resilience	312 acres	Conduct crown thinning and surface fuel reductions to achieve target stand conditions as defined in Section 7.1.2.
Burning Program							
Medium	Pile Burn	Goal: 2 Objective: 1, 3, 4	All	All Park Treatment and Maintenance Areas	Burn Pile	n/a	Implement use of air curtain burner, burn piles, and biochar kilns where material transport is not practical.
Medium	Broadcast Burn	Goal: 2 Objective: 1, 3, 4	All	Hardwood-Conifer Stands, Redwood Stands, Oak Woodlands	Prescribed Burn	n/a	Explore VMP and conduct maintenance burns in coordination with local fire agencies.

Table 24
Recommended Forest Health Projects for Upper Stevens Creek County Park

Priority	Project Number/Name	Goal and Objective	NRMZ	Location	Project Type	Distance or Area	Description
Defensible Space							
High	Defensible Space	Goal: 1, 3 Objective: 1, 3	1	Park Structures	Fuel Break - Defensible Space	1.4 acres	Create defensible space around the outward edge of the repeater station and tank house. Treatment prescription to follow the general standards outlined in Section 7.1.1.
Hazard Trees							
Medium	Tree Safety Program	Goal: 1, 3 Objective: 1, 2, 4, 7	2	Parking Area (Skyline Blvd.) and Grizzly Flat trailhead	Tree Safety Program	< 1 acre	Continue the Park's inspection, pruning and removal protocols outlined in the existing Tree Safety Program.
Fuel Breaks							
High	Charcoal Road – Table Mountain Shaded Fuel Break	Goal: 1, 3 Objective: 1, 3	1	Within 60 feet of edge of Charcoal Rd./Table Mtn. Fire Rd. and including former Christmas Tree Farm and portions of Los Gatos Creek Watershed Collaborative project.	Fuel Break - Shaded Fuel Break	56.8 acres	Maintain existing shaded fuel break along both sides of Charcoal Road and Table Mountain Fire Road, including the Table Mountain loop. Create a temporary Landing Zone in the middle of the Table Mountain loop measuring at least 100' x 100'. Also include an extension from the northern edge of the Table Mountain loop downhill to Stevens Creek and expand to include all of the former Christmas tree farm and Los Gatos Creek Watershed Collaborative project where it occurs on Table Mountain. Treatment prescription to follow the general standards outlined in Section 7.1.1. Consider pile burning for treatment of cut material in this area. Consider broadcast burning as a treatment option within the Table Mountain loop.

Table 24
Recommended Forest Health Projects for Upper Stevens Creek County Park

Priority	Project Number/Name	Goal and Objective	NRMZ	Location	Project Type	Distance or Area	Description
Medium	Skyline Boulevard Shaded Fuel Break	Goal: 1, 3 Objective: 1, 3	1, 2	Within 200 feet of Skyline Blvd. (approx. 1.3 linear miles)	Fuel Break - Shaded Fuel Break	26.1 acres	Create shaded fuel break along north-east side of Skyline Blvd (up to 200 feet from road edge). Treatment prescription to follow the general standards outlined in Section 7.1.1.
Landscape Forest Health and Resilience							
High	Los Gatos Creek Watershed Collaborative project - Charcoal Road	Goal: 2 Objective: 3, 4	1	Within and extending beyond either side of the Charcoal Road – Table Mountain Shaded Fuel Break, within approximately 2,000 feet of Skyline Blvd.	Fuel Break - Shaded Fuel Break	14.6 acres	Treatments to include understory thinning, mastication of trees up to ~8 inches in diameter, removal of dead and dying trees (predominantly resulting from SOD), control of invasive species, and removal of Douglas-fir trees encroaching into hardwood woodlands. Treatments to include mechanical (on slopes less than 30%) and hand labor treatments. Consider pile burning for treatment of cut material in this area.
Burning Program							
Medium	Broadcast Burn	Goal: 2 Objective: 1, 3, 4	1, 2	Hardwood-Conifer Stands, Redwood Stands, Oak Woodlands	Prescribed Burn	n/a	Explore VMP fuel treatment options with CAL FIRE.
Medium	Pile Burn	Goal: 2 Objective: 1, 3, 4	1, 2	All Park Treatment and Maintenance Areas	Burn Pile	n/a	Implement use of air curtain burner, burn piles, and biochar kilns where material transport is infeasible.

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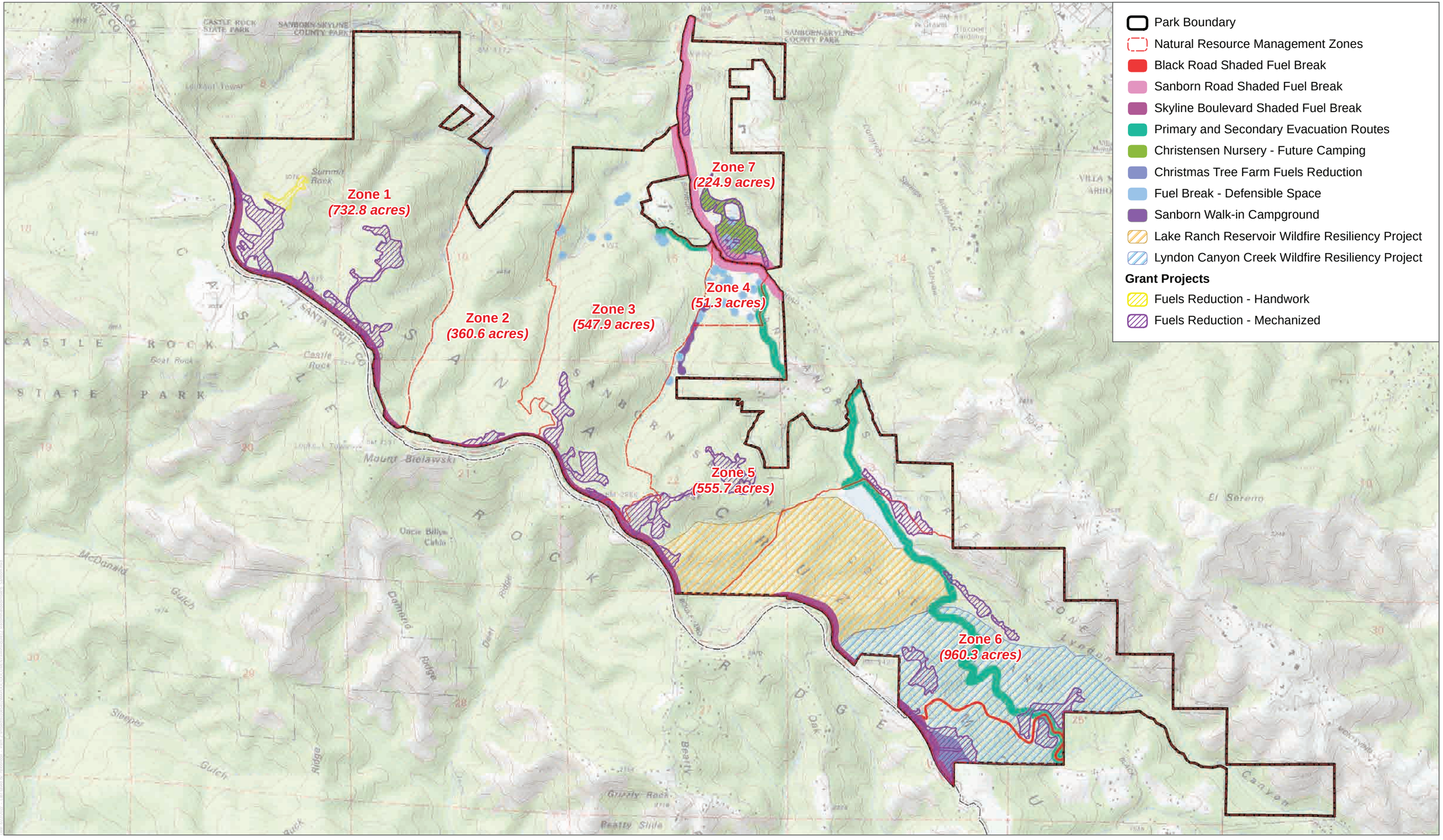

SOURCE: USGS 2020; Dudek 2020; Santa Clara County GIS (2019)

DUDEK

0 1,050 2,100 Feet

FIGURE 12

Sanborn County Park Recommended Project Locations

Sanborn-Upper Stevens Creek Forest Health Plan

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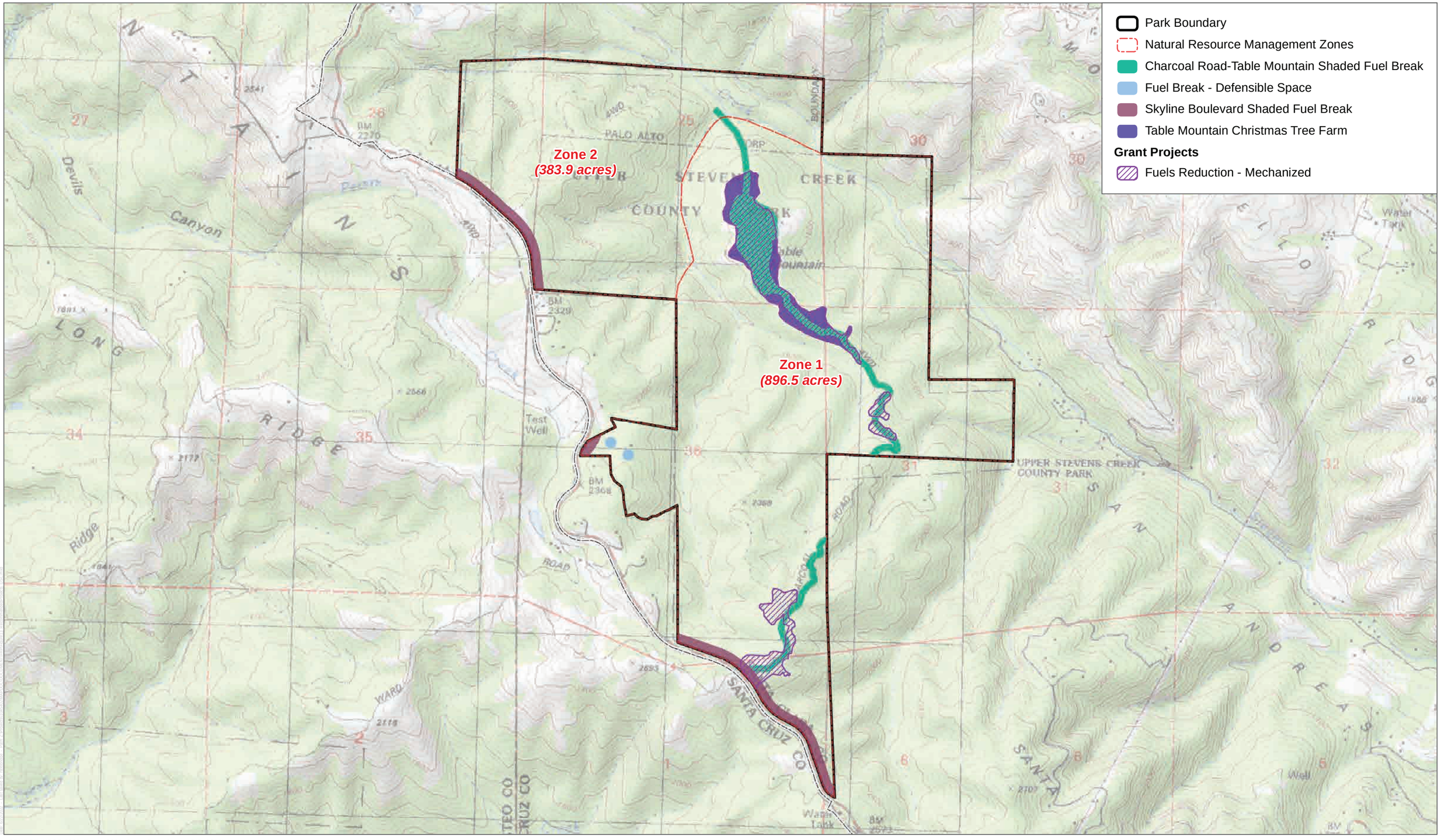

SOURCE: USGS 2020; Dudek 2020; Santa Clara County GIS (2019)

DUDEK 0 750 1,500 Feet

FIGURE 13

Upper Stevens Creek County Park Recommended Project Locations

Sanborn-Upper Stevens Creek Forest Health Plan

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7.2 General Practice Recommendations

The following provides management recommendations for actions that are conducted in forested areas of the Parks or otherwise affect Park trees. These recommendations are provided in addition to the specific project recommendations in the previous section. The following management practices are also recommended for implementation during development activities conducted under the Sanborn Park Master Plan (Santa Clara County Parks 2019), some of which have the potential to impact trees or other forest resources. These general practice management recommendations include:

- **Implement a forest health monitoring protocol.** Conduct routine monitoring of the Parks forests to evaluate current stand conditions, presence and levels of pests and pathogens, maintenance needs for previously treated areas (e.g., shaded fuel breaks), presence and levels of invasive species, and other forest damage that necessitates management action (e.g., windthrow, vandalism, illegal cutting). Monitoring results should drive annual forest health work plan development. A discussion of forest health monitoring recommendations and frequencies is presented in Section 9.3.
- **Plan and conduct operations to minimize negative effects on residual forest/trees**. Park maintenance and management operations conducted in forested areas should adhere to the tree protection recommendations included in Section 8.9. Avoidance of impacts helps minimize tree stress and potential entry points for pests/pathogens.
- **Treat downed trees and woody material**. During field assessments for this Plan, it was observed that treatment of downed trees and woody material was not consistently practiced in clearing remote roads and trails (and on roads and trails near Park development in a few instances). Where downed trees or limbs/branches require clearing from developed Park areas (e.g., roads, trails, picnic areas), Park staff should remove and/or further treat the material to accelerate breakdown and decomposition and minimize fuel load buildup. Treatment should include lop and scatter, chipping, and/or burning. Where applicable, downed woody material can be salvaged or re-used for Park purposes (e.g., bumper logs). All chipped material should be spread to an average depth no greater than six (6) inches.
- **Continue to implement County Parks' Tree Safety Program.** County Parks' Tree Safety Program has been successful in identifying hazard trees within or near high-use recreation areas. This Plan recommends continuation of this program. It is also recommended that this program be expanded into areas of Sanborn Park that are developed under the Master Plan. To support this effort, continued training and certification of responsible Park staff in tree risk assessment is also recommended. At least one Parks' Natural Resource Program staff should complete and maintain the International Society of

Arboriculture (ISA) Tree Risk Assessment Qualification (TRAQ) certification. Alternatively, the County could contract with consulting arborists to assist in this role.

- **Sudden Oak Death Mitigation–**Sudden oak death (SOD) (*Phytophthora ramorum*) has been observed in all areas of the Park resulting in high levels of mortality in tanoak (*Notholithocarpus densiflorus*) and coast live oak (*Quercus agrifolia*). This results in degradation to habitat, increased fuel loading, and presence of hazard trees near high usage locations in the Parks. New infections and spread of SOD remain a threat to the Park's forests and are discussed in detail in Section 6. The presence of the SOD co-host bay laurel (*Umbellularia californica*) can significantly increase chances of successful SOD attacks on tanoak and coast live oak. It is not uncommon to find stands of bay laurel occupying areas once dominated by oak woodland. Bay laurel are also known for their volatile organic compounds and are major contributors to wildfire hazard. Forest health and fuels reduction projects should incorporate methods to reduce densities of bay laurel, and target complete bay laurel removal within 60 feet of retained tanoak and coast live oak trees. To minimize potential spread of the SOD pathogen, the measures identified in Section 8.2, including County Parks' Sudden Oak Death Prevention Field Guide, should be followed.

  The high rate of tree mortality has resulted in numerous standing dead tanoak and coast live oak near high use areas of Sanborn Park. Hazard tree removal is warranted and recommended when life, property, or services are threatened. This Plan recommends continuation of County Park's Tree Safety Program to addresses targeted removal of hazard trees in public use areas to mitigate risks to the public or Park resources.

- **Minimize transport of infected material and implement quarantine and sanitation practices in order to reduce the potential for introducing pathogens and invasive species.** The practice of transporting material generated within the Park to disposal locations within the Park will need to be evaluated on a case-by-case basis. Generally, the threat of new infestations of pests and pathogens is low with intra-Park transport, but not always. For example, if transporting French broom from an infestation site to a burn pile, there is a high potential for seed dispersal along the transportation route if the load is not properly covered and secured. In contrast, intra-Park transport of downed tanoak material infected by a ubiquitous canker rot fungi would not threaten a new disease outbreak. Care should always be taken to consider the potential for the material to host a newly introduced pathogen. Should a newly introduced pathogen be suspected, a forest pathologist should be consulted to develop an appropriate treatment for quarantine and possible eradication.

  This Plan recommends that quarantine practices, particularly the 'Buy it Where You Burn It' program[4], be promoted, to visitors, specifically campers, in Sanborn Park to prevent the

[4] http://www.firewood.ca.gov/

spread of invasive pests and diseases. If Park projects entail importing vegetative material, such as oak seedlings for restoration projects, only that material that has been produced in conformance with the latest horticultural standards in pest and disease avoidance and sanitation should be allowed. Sanitation of tools and equipment within the Parks may help to reduce the spread of pests and diseases following treatments of areas of known infestation. If soil is collected on the equipment, rinsing the equipment on site with a portable water tank or water truck, or at a designated rinsing station, can remove soil-borne pathogens and prevent transport to new sites. Equipment sanitation may not always be necessary for equipment that stays within Parks boundaries, but it is always recommended for contracted or rented equipment arriving from outside the Parks.

- **Treat invasive plants while young and easy to manually remove or pull by Park staff, volunteers or contractors**. This practice is intended to prevent the spread and establishment of invasive plant species to new areas of the Park. Section 6.3 identifies known invasive plant species which should be considered during project planning, implementation, and monitoring. Removal of invasive plants, when young and with shallow roots, can usually be accomplished with less effort or site disturbance. Park staff training is recommended to assist in identification of known invasive plants in the Park and the greater region. French and Scotch broom were observed to be the primary invasive species in the Parks, notably in treated fuel break areas. During the implementation of the recommended projects identified in Section 7.1.4, it is recommended to remove Scotch and French broom where it is observed in concentrations. Care must be taken in treating and removing broom as it can propagate rapidly and colonize disturbed areas. Hand pulling can be effective for removing seedlings and small shrubs but weed wrenches or other extraction tools are necessary for larger plants. It is best to remove the plant's entire root system, and best results are achieved when soil is moist. Cutting broom should be conducted in the spring months, prior to seed set. Re-sprouts from cutting are common, so herbicide treatment following cutting may be necessary. All use of herbicide should be coordinated in accordance with the County's IPM Policy. Prescribed burning of uncut broom may also be an effective treatment if conducted in late spring or early summer.
- **Incorporate invasive plant surveys and treatment strategies into forest management projects**. During the forest management planning process, conduct a site assessment to identify invasive plants currently present in the project area, develop a treatment strategy specific to those identified species, and implement the treatment as a component of the forest management project (e.g., shaded fuel break). The treatment strategy should include a schedule of treatment actions over time including, pre-treatment and incremental treatments in the site as appropriate for each species. The strategy should also identify

considerations, actions, and best management practices to minimize the risk of spreading invasive plants.

- **Implement BMPs for forest pests and pathogens**. Pest and pathogen Best Management Practices, discussed further in Section 8.2, should be incorporated where applicable within the Park. These practices encompass both protection of the residual stand from mechanical damage, and quarantine and sanitation practices highlighted above. Outbreaks of known invasive pathogens such as SOD, well known for its detrimental impacts to the tanoak and true oak populations along the west coast, and unknown pests and pathogens pose a significantly large threat to the Park's forests. Worldwide, pest and disease outbreaks are on the rise, creating large-scale changes in forest composition and degradation of forest health. Proactive management to restore forest resilience is a first step is mitigating these impacts and specific actions are recommended in Section 7.1.4 to help accomplish this goal.
- **Maintain partnership opportunities for fuel reduction work**. Maintain working relationships with the Santa Clara County FireSafe Council, the South Skyline FireSafe Council, and CAL FIRE to implement strategic fuel reduction projects in the Parks, where appropriate. The FireSafe Council is also a valuable teaming partner in obtaining grant funds for project work. In addition, where appropriate, work with neighboring landowners and other entities (e.g., Pacific Gas and Electric (PG&E), Midpeninsula Regional Open Space District, other County Departments) to facilitate fuel reduction work on or adjacent to Park boundaries.

7.3 Forest Management Practices

Forest management is the practice of thinning, pruning, removing or otherwise altering trees or other forestland vegetation in order to achieve desired results. Forest management practices are designed by RPFs and implemented by licensed timber operators (LTOs). Different forest management practices can be utilized, depending on forest type, location, condition, and management prescription. Given the dynamic nature of vegetation, a single treatment technique or management prescription may not be appropriate for one site over time and a combination of techniques is likely necessary for each project. Therefore, an adaptive approach that allows for selection of management practices is needed to achieve the Plan's goals and objectives. For recommended projects, forest management techniques will be identified during project planning efforts. For maintenance of treated areas and implementation of general practice recommendations, Park staff will identify forest management techniques on an as-needed basis and/or during annual forest health work planning efforts.

In general, forest management practices can be classified into five categories:

- Hand Labor (e.g., hand pulling, cutting, planting)
- Mechanical (e.g., mowing, masticating, felling, yarding)
- Biological (e.g., grazing)
- Prescribed Fire (e.g., burn piles, broadcast burning)
- Chemical (e.g., herbicide)

The following sections summarize the different types of forest management practices that may be implemented in the Parks, including identification of BMPs. Selection of qualified and trained contractors, appropriate staff training, scheduling, and supervision to carry out forest management activities are also key components of an effective forest management program. Further, the standards and regulations of the California Forest Practice Rules apply to many of the practices outlined below. Preparation of the appropriate planning documents, obtaining necessary permits, and adherence to these standards will be necessary.

7.3.1 Hand Labor

Hand labor involves pruning, cutting or removal of trees or other forest vegetation by hand or using hand-held equipment. Other hand labor treatments involve removing dead wood, piling material, lop and scatter, and spreading chips/mulch. Lopping and scattering is the process of breaking down vegetative material into smaller pieces, usually with a chainsaw, and scattering (as opposed to concentrating) the material across the forest floor. Hand labor is most effective in small treatment areas or areas with difficult access where the use of heavy equipment is infeasible. Hand labor also allows for selective management or removal of targeted vegetation and is typically used in conjunction with other techniques. Proper training and supervision of hand labor forces is necessary to reduce the dangers to workers using sharp tools on steep and/or unstable terrain, or where other environmental hazards exist. Hand tools include, but are not limited to, shovels, Pulaski hoes, McLeod fire tools, line trimmers, weed wrenches, chain saws, pruning shears, and loppers. Personal protection equipment typically includes long pants and long- sleeved shirts, gloves, safety goggles, hard hats, chaps, and sturdy boots.

7.3.1.1 Best Management Practices for Hand Labor

The following BMPs should be implemented, where feasible, when utilizing hand labor. In all circumstances, tools and equipment should be utilized only for their intended use. Additional BMPs are provided in Section 8.

- Ensure equipment operators and project personnel have appropriate personal protective equipment and are properly trained in equipment use;
- Ensure that appropriate fire safety measures are implemented (see Section 8.1);
- For safety purposes, provide necessary signage alerting the public to active operations;
- Ensure that vehicles and equipment arrive at the treatment area clean and weed-free;
- Prune trees according to ISA and American National Standards Institute (ANSI) A300 standards;
- Protect retained trees and vegetation from tool and equipment damage;
- Sanitize tools between project areas to prevent the spread of pathogens;
- Service and fuel tools only in areas that will not allow grease, oil, fuel, or other hazardous materials to pass into streams or retained vegetation;
- Remove from the treatment area and properly dispose of all refuse, litter, trash, and non-vegetative debris resulting from vegetation treatment operations, and other activity in connection with vegetation treatment operations;
- When lopping and scattering, the goal is for each piece to lay flat and as close as feasibly possible to the duff layer of the forest floor. Pieces that are left elevated have a much slower rate of decomposition and will be contribute to the fuel loading; and
- All chipped material should be spread to an average depth no greater than six (6) inches.

7.3.2 Mechanical

Mechanical practices include all methods that employ motorized heavy equipment to remove or alter vegetation. Mechanical practices rearrange vegetation structures, compact or chip material, and move material to landings, staging areas, or burn piles. Mechanical equipment is usually equipped with either rubber tires or tracks, although skids and cables are also used. In some instances, two or more pieces of heavy equipment will work in concert to achieve a management standard. Mechanical equipment includes, but is not limited to, masticators, tractors, chippers, grinders, skidder, and cable yarding systems.

Constraints to mechanical equipment use include steep slopes, dense tree cover that prohibits travel, saturated soils, and dry, high fire hazard weather conditions where equipment use could result in ignition. Use of mechanical equipment may also result in damage to retained vegetation. Use of mechanical equipment should consider the terrain, access, forest type, and treatment recommendation to effectively treat vegetation and minimize impact potential. Supervision and specialized training are also necessary. The use of mechanical equipment is often done in conjunction with other treatment techniques, particularly hand labor (prior to mechanical treatment) and prescribed fire (following mechanical treatment.)

7.3.2.1 Best Management Practices for Mechanical Practices

The following BMPs should be implemented, where feasible, when utilizing mechanical practices. In all circumstances, equipment should be utilized only for its intended use. Additional BMPs are provided in Section 8.

- Use low ground-pressure equipment, to the extent feasible;
- Ensure equipment operators and project personnel are properly trained in equipment use;
- Ensure that appropriate fire safety measures are implemented (see Section 8.1);
- For safety purposes, provide necessary signage and patrol alerting the public to active operations and area closures;
- Ensure that vehicles and equipment arrive at the treatment area free of soil, weeds, and seeds;
- Control fugitive dust resulting from equipment use by watering disturbed areas;
- Protect retained trees and vegetation from potential damage resulting from heavy equipment use through the use of tree protection devices, training of equipment operators, and designing projects to reduce potential impacts, among other methods;
- Where soil stability is a concern, leave stumps from removed trees and shrubs intact. Where feasible, re-use existing roads, trails, skid trails, and predesignated routes for equipment travel;
- Limit the size and quantity of equipment to that which is necessary to meet the identified vegetation management standard;
- Re-grade or re-contour any areas subject to soil disturbance from heavy equipment, including dragging or skidding of trees or other material. Install soil stabilization structures and devices as needed;
- Avoid heavy equipment use on unstable slope areas, documented slope instability areas, and slopes with gradients exceeding 50%.

- Service and fuel heavy equipment only in areas that will not allow grease, oil, fuel, or other hazardous materials to pass into streams or riparian vegetation;
- Remove from the treatment area and properly dispose of all refuse, litter, trash, and non-vegetative debris resulting from vegetation treatment operations, and other activity in connection with vegetation treatment operations;
- Ensure that hazardous materials spill kits are available on all heavy equipment.
- For cable yarding, install, operate, and maintain cable lines so that retained trees will not incur unreasonable damage. Retained trees should not be used for rub trees, corner blocks, rigging or other cable ties unless effectively protected from damage.
- To the fullest extent possible and with due consideration given to topography, lean of trees, utility lines, local obstructions, and safety factors, trees should be felled away from streams, sensitive biological resources areas, and retained trees. Cabling, sectional removal, or other felling techniques should also be employed, where feasible, to minimize impacts to streams, sensitive biological resource areas, and retain trees.

7.3.3 Biological

Biological management includes using grazing as a method to treat grasses, shrubs, and small trees. County Parks currently uses goat and cattle grazing in other parks to strategically, efficiently, and cost-effectively treat vegetation. Grazing is an effective management tool for maintaining areas previously treated with hand labor or mechanical practices. It is also effective in preventing the expansion of brush and small trees into meadows. Livestock each have different grazing habits and not all livestock are ideally suited for grazing treatments in all areas. Goats are an effective option as they will consume live or dead, tough, woody plant material.

Grazing within Santa Clara County Parks is governed by the County's Parkland Range Management Policy (County of Santa Clara 1992). Grazing is typically conducted in the late spring, when growth of annual grasses has slowed, and continues through the summer to reduce fine fuels prior to the onset of peak fire season. Development of site-specific grazing management plans should be completed for proposed grazing treatments in the Park and should be consistent with the requirements outlined in the Parkland Range Management Policy. Management plans should identify goals and implementation techniques to ensure that grazing treatments meet vegetation management standards and to minimize impacts to natural resources. Grazing management plans should also identify the optimal stocking rate and grazing duration, typically measured in pounds per acre of residual dry matter. Acceptable residual dry matter levels should be consistent with those identified in the Parkland Range Management Policy. Control of livestock movements and preventing overgrazing is also important for successful implementation.

7.3.3.1 Best Management Practices for Grazing

Neither Sanborn nor Upper Stevens Creek park support cattle grazing. The following BMPs should be implemented, where feasible, if using grazing as a forest management tool in the future. Measures addressing the BMPs below should be incorporated into grazing plans, including the temporary use of goats for vegetation removal. Additional BMPs are provided in Section 8.

- Identify and assess streams and watercourses in potential grazing areas prior to turn-out and install exclusionary fencing where necessary;
- Routinely monitor grazing activities in riparian areas to minimize the potential for stream bank damage, soil compaction, and soil deposition into streams and watercourses;
- Prior to grazing in riparian areas, identify thresholds that would trigger a cessation of grazing activity;
- Avoid grazing in unstable slope areas or implement measures to minimize impacts to slope stability (e.g., reducing herd size to retain vegetation, avoiding grazing where saturated soil conditions exist);
- Consider the timing and level of grazing practices to promote plant recruitment (e.g., timing prior to seed set of annual grasses to promote perennial species establishment);
- Minimize the spread of invasive plants and pathogens through the use of quarantine periods, holding areas, clean stock water, and personnel, equipment and vehicle sanitation.

7.3.4 Prescribed Fire

Prescribed fire can be used to burn piles of cut vegetation (pile burns), or over a designated prepared area (broadcast burn). Burning can also include the use of an air curtain burner, which can be placed near a project area. Material is then transported to the air curtain burner for burning. Broadcast and pile burning are often implemented in conjunction with hand labor and mechanical treatment methods as a means of treating residual materials, or in advance of an herbicide treatment to enhance the effectiveness of the application. Prescribed burning also serves to rapidly break down vegetative material and convert it to soil nutrients, reduces brood material for pests and pathogens, controls invasive species, and reduces surface fuel buildup and the threat of severe wildfires. All burning activities should adhere to the standards outlined by the Bay Area Air Quality Management District (BAAQMD):

https://www.baaqmd.gov/~/media/dotgov/files/rules/regulation-5/documents/20191120_r0500_final-pdf.pdf?la=en

Small pile burning is conducted at or near the treatment area. Piles should be constructed by hand and should be free of dirt, debris, and stumps. Material should be piled soon after cutting with the butt end of branches and limbs toward the outside of the pile so that branches are overlapping and forming a series of dense layers. The top of the pile should be covered with a small sheet of heavy paper (e.g., butcher paper) to keep the pile interior dry. One or two limbs should be placed atop the paper to keep it in place. The dry interior portion of the pile should be ignited at the appropriate time using a weed burner or other igniting tool. Alternatively, tractors or hand crews can create piles of material on flat or gently sloping ground that can be burned during wet conditions (pile burn), although the volume of fuel in the piles can produce localized heat which may impact adjacent retained vegetation.

Large pile burning is conducted at a cleared area, or at the location of the air curtain burner. Material should be collected during operations, piled, and burned when weather and air quality conditions allow. The size of the pile should be contained at a level where safe burning can be conducted. Another option is the use of the County's air curtain burner, which can be utilized to cleanly burn large piles. Air curtain burners can be moved to different areas of the Parks to facilitate wood waste disposal and minimize the need to transport material. Clearance of up to 100 feet may be necessary around an air curtain burner. Benefits of air curtain burners include lower smoke emissions compared to pile or broadcast burning, capability of burning a greater variety of materials, minimizes the need for transporting material, and fires are contained and more easily extinguished, if necessary. For burning conducted under an approved THP or exemption, burning of both small and large piles should be accomplished not later than April 1 of the year following their creation, or for piles created on or after September 1, not later than April 1 of the second year following creation.

Broadcast burns are usually done where a maximum amount of fuel treatment can take place and can be used to control invasive species and treat cut material (slash) on the ground surface or reduce surface and/or ladder fuels beneath tree canopies in shaded fuel breaks. Treatment boundaries are often roads, trails, or other non-burnable features, reducing the number of firebreaks that need to be created. This approach reduces labor costs and preparation time and minimizes soil disturbance and the potential for soil erosion. Broadcast burns can be used in all forest types, where conditions allow for effective control.

Broadcast burning may occur throughout the year; however, it is usually conducted during the late spring months when the ground is still wet or during fall or winter after plants have completed their yearly growth cycle and their moisture content has declined. Fall burns are more closely aligned with the natural fire cycle found in California. Piles of vegetation may be burned any time after the vegetation has dried. Hand held tools, such as drip torches, propane torches, and flares, may be used for igniting prescribed fires.

Broadcast burns must be conducted by trained fire protection personnel, or Parks staff with appropriate training for burns less than 10 acres. Utilizing personnel and equipment from CAL FIRE provides the added benefit of joint training under prescribed rather than emergency conditions. Timing is critical to the use of this treatment technique due to variances in weather conditions and the necessity to time treatments to minimize impacts to plant and animal species. Fuel moisture content must be determined to assess if the treatment area is safe to burn. There are typically more appropriate burn days in the spring and early summer months when there is a greater chance of atmospheric conditions conducive to smoke dilution and dispersion.

Prescribed burning requires proper planning and the development and approval of a prescription or burn plan, which is typically developed by the local fire protection district in consideration of forest management requirements, local weather conditions, and available resources for fire management. Utilizing prescribed fire as a management tool should consider the following:

- **Burn Plan/Prescription:** A site-specific prescription and burn plan is developed that establishes goals and procedures for the prescribed burn and considers unique site characteristics. The prescription identifies geographic burn units, limits of the burn area, locations of control lines, acceptable fuel moisture ranges and weather conditions, required personnel and equipment, and evaluates potential impacts to resources in compliance with CEQA. This may be prepared in coordination with CAL FIRE.
- **Smoke Management Plan:** The BAAQMD requires preparation of a smoke management plan detailing the location of sensitive receptors and measures to be implemented to maximize smoke dilution and minimize smoke production. Burning for management of forests receives special accommodation under BAAQMD Regulation 5 (BAAQMD 2019). In addition to the preparation and approval of a smoke management plan, the BAAQMD requires notification of the burn and that burning is conducted on a permissive burn day.
- **Pre-Broadcast Burn Site Preparation:** Hand labor or mechanical treatment techniques are often required prior to initiation of a prescribed burn to remove and treat larger material (trees, shrubs, slash). Treatment of larger material is done to reduce its size and spatial arrangement and to remove ladder fuels that may allow for crown fire transition. Site preparation also includes the establishment of fire lines needed to control the fire if they do not already exist.
- **Burn Notification:** Notifying the local or surrounding communities, CAL FIRE, local fire departments, the media, and the BAAQMD or MBAQMD is recommended to avoid potential misinterpretation of the prescribed burn as a wildfire.
- **Post Burn Follow-up and Evaluation:** Following completion of the prescribed burn, the results are evaluated to determine if the need exists for additional treatment based on

established prescriptions and whether erosion control BMPs are necessary. The burn plots should also be monitored and evaluated for invasive species establishment and long-term effectiveness in achieving the goals for each individual burn plot.

7.3.4.1 Best Management Practices for Prescribed Fire Practices

The following BMPs should be implemented, where feasible, when utilizing prescribed fire. In all circumstances, equipment should be utilized only for its intended use. Additional BMPs are provided in Section 8.

- Ensure equipment operators and project personnel are properly trained in equipment use;
- Ensure that appropriate fire safety measures are implemented (see Section 8.1);
- For safety purposes, provide necessary signs and patrols alerting the public to active operations and area closures;
- Protect retained trees and vegetation from potential damage by pre-treating adjacent fuels;

7.3.5 Chemical

Herbicides are used to kill vegetation or prevent growth and do not remove any vegetation from a treatment area; therefore, treated material remains unless otherwise managed. Application of herbicides is typically performed by hand and can include sponging, spraying, or dusting chemicals onto vegetation. Hand application provides flexibility and is ideally suited for small treatment areas. Roadside application of herbicides may employ equipment affixed to or towed behind a vehicle.

Herbicide application requires specific storage, training and licensing to ensure safety. Only personnel with the appropriate license are allowed to use chemicals to treat vegetation. Herbicide application is also only applied per a prescription prepared by a licensed Pest Control Advisor (PCA). Personal protection equipment is required to limit personnel exposure to chemicals, and includes long pants and long-sleeved shirts, gloves, safety goggles, hard hats, sturdy boots, face masks and, in some instances, respirators.

The application of herbicides may be used on its own or as a secondary vegetation treatment technique following hand labor or mechanical treatments. Herbicide use typically results in high kill rates and can prevent treated plants from setting seed. Herbicides are broadly classified into two basic types: pre-emergent and post-emergent. Pre-emergent herbicides are sprayed directly onto the ground and prevent plants from germinating and/or growing. As such, they have a larger potential to impact native seeds remaining in the soil, and often have longer persistence times. Post-emergent herbicides are applied directly onto the plants, killing them. With proper equipment and training, herbicides can be applied selectively, minimizing impacts to native seeds in the soil. If target

vegetation is intermixed with desired vegetation, the chance of affecting desired vegetation is increased. Systemic herbicides (as opposed to contact herbicides) are likely the most effective for control of invasive species due to their ability to spread via translocation into root tissue.

Herbicide application should be used following removal of all species that have the ability to regenerate from root fragments. Herbicide use should be limited to localized applications rather than foliar applications to eliminate the possibility of drift and impacts to neighboring desirable vegetation. A wide range of herbicides are available for such types of treatment. Herbicide labels and material safety data sheets (MSDS) list susceptible target plant species and provide proper direction in the use and handling of the products. Herbicides should be applied in accordance with state and federal law.

Another application technique, cut and daub, is recommended for larger invasive plants (e.g., blue gum eucalyptus) to control regrowth and kill the portion of the plant remaining belowground. Cut and daub involves the cutting of trunks and then the direct application of an appropriate systemic herbicide directly to the cambium layer of the freshly cut stump. Other related methods include drilling into the trunk of a tree and injecting herbicide, applying an herbicide-soaked rag directly to freshly cut stumps, or direct application to cuts in the trunk (frill injection, hypo-hatchet). It is important that the herbicide treatment occur immediately after the trees are cut so that the herbicide is carried into the plant tissue. If enough time elapses to allow the cut surface to dry out, a fresh cut should be made prior to herbicide application.

7.3.5.1 Best Management Practices for Chemical Application

The following BMPs should be implemented, where feasible, when applying herbicide. In all circumstances, equipment should be utilized only for its intended use. Additional BMPs are provided in Section 8.

- Use of chemical herbicides or pesticides should be conducted in accordance with the County's IPM Policy;
- Park staff should consult with a state-licensed Pest Control Advisor (PCA) to identify the appropriate site-specific herbicide application approach to meet vegetation management standards;
- Consider the timing of herbicide applications to minimize impacts to adjacent retained vegetation and nearby resources, and for maximum effectiveness (typically between June 15 and November 15, with a potential extension through December 31 or until local rainfall greater than 0.5 inch is forecasted within a 24-hour period from planned application);

- Only herbicides and surfactants that have been approved for aquatic use by the United States Environmental Protection Agency (EPA) and are registered for use by the California Department of Pesticide Regulation (CDPR) should be used for aquatic vegetation control work;
- Herbicide application should be consistent with Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label instructions and use conditions issued by the United States EPA and CDPR;
- The lowest recommended rate to achieve vegetation management objectives of both herbicides and surfactants should be utilized to achieve desired control;
- An indicator dye should be added to the tank mix to help the applicator identify areas that have been treated and better monitor the overall application;
- No application to plants whose base is submerged in stream channels;
- Follow safe procedures for transporting, mixing, loading, and proper disposal of herbicides; and
- Minimize the use of foliar (spray) applications, prioritizing localized or direct applications.

8 RESOURCE PROTECTION

In addition to the BMPs identified for the forest management practices identified in this Plan, this section outlines additional practices intended to avoid or minimize potential impacts associated with tree or vegetation treatment or removal.

8.1 Fire Protection

All operations conducted in the Parks associated with recommended project implementation shall adhere to the fire protection standards outlined in Title 14, California Code of Regulations, Chapter 4, Subchapters 4, 5, and 6, Article 8 (Fire Protection). County Parks signed a Memorandum of Understanding (MOU) with CAL FIRE in 2012 to standardize procedures to be followed when Park staff are engaged in activities with potential to ignite wildfires. Based on this MOU, Park staff are required to take precautions to reduce the chance for ignitions, including checking fire forecast conditions, monitoring weather, maintaining spark arrestors, and having fire guards with appropriate suppression equipment on hand. Under particularly dangerous conditions, all activities with a risk of wildfire ignition are halted. The following fire protection BMPs are provided to augment current practices:

- During Park operations that involve the use of any vehicle, machine, tool or equipment powered by an internal combustion engine operated on hydrocarbon fuels, provide and maintain suitable and serviceable tools for firefighting purposes. Equipment should be located at a point accessible in the event of a fire and should include one backpack pump-type fire extinguisher filled with water, two axes, two McLeod fire tools, and a sufficient number of shovels so that each employee at the operation can be equipped to fight fire;
- Ensure that all equipment with an internal combustion engine using hydrocarbon fuels is equipped with a spark arrestor, as defined in California Public Resources Code Section 4442;
- Establish internal Park communication procedures for reporting fires, or call 911 in emergencies;
- Restrict the use or timing of use of tools or equipment with the potential to generate heat or sparks during Red Flag Warnings and High to Extreme Fire Danger days;
- Identify staging areas prior to initiating operations. Staging areas should be contained within already disturbed areas or non-vegetated areas (e.g., roads, parking lots) and should account for vehicle parking and tool/equipment storage;
- Existing dirt roads within the Park should be routinely monitored and maintained to allow for emergency vehicle access. Such roads should be closed to the public during extreme fire weather conditions.
- Park access gates should be equipped with a fire department or Knox lock;

- Utilize fire resistant building materials and implement defensible space for any new Park buildings.

8.2 Pest/Pathogen Management

Measures to reduce the potential for introducing pathogens and invasive species into the Parks are identified in Section 7.2. Other measures the Parks should consider to reduce the spread of pests and diseases include banning importing firewood (Sanborn County Park), posting public information via posters and disseminating literature regarding the importance of such practices, and entering into MOUs with PG&E and other Park operators to minimize the potential for introducing pests/pathogens and invasive species into the Parks. Additionally, certain pathogen-specific measures have also been developed to deal with regional pathogens, namely pitch canker and SOD. These measures should be implemented in the Park, where applicable:

- SOD: Santa Clara County Parks Sudden Oak Death Field Prevention Guide
- SOD: http://ipm.ucanr.edu/PMG/PESTNOTES/pn74151.html
- Pitch canker: https://ufei.calpoly.edu/pitch_canker/management.lasso

8.3 Slope Stability, Erosion Control, and Water Quality

Management practices identified in this Plan have the potential to affect soil stability. Soil stability may also be indirectly affected by the removal of overstory vegetative cover, which may reduce rainfall interception and thereby increase its surface erosion potential. This may result in the detachment and transportation of soil particles across the soil surface. Soil stability may also be directly affected by through the use of heavy equipment, tools, and hand crews, all of which can loosen, dislodge, or compact soils. This too can increase the potential for detachment and transportation of soil particles across the soil surface.

Equipment operation conducted when saturated soil conditions exist also have the potential to dislodge soil resulting in sediment transport. Saturated soil conditions are those where:

> *Soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing material during timber operations, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials (*California Code of Regulations, Title 14, Section 895.1*).*

A procedure has been developed by the California State Board of Forestry (California State Board of Forestry 1990) to estimate a surface soil erosion hazard rating (EHR) that considers soil characteristics (texture, depth to restrictive layer, percent of coarse surface fragments), slope, vegetative cover, and precipitation. The hazard rating is designed to evaluate the susceptibility of the soil within a given location to erosion. EHR should be determined and considered on a site-specific basis when determining the needs for erosion control BMPs associated with forest management activities identified in this Plan. In general, operations should not be conducted on saturated soils that may produce sediment in quantities sufficient to cause a visible increase in turbidity of downstream waters in receiving Class I, II, III or IV waters or that violate water quality requirements.

BMP Practices and Devices

There are various erosion control practices and devices available for slowing the rate of erosion. Recent research indicates that mechanical rehabilitation treatments, including straw mulch, hay bales, jute rolls, or rolled erosion control blankets are more predictable for reducing soil erosion and post-fire hydrological problems than seeding (Robichaud et al. 2010). Mulching may introduce exotic/invasive species seeds (Kruse et al. 2004) if brought in from offsite (as opposed to chipped on-site material), so erosion potential should be high before the decision to use this material is finalized. All chipped material should be spread to an average depth no greater than six (6) inches.

Numerous BMPs have been developed for use in erosion and sediment control, as identified in the California Stormwater BMP Handbook (originally published by the California Stormwater Quality Association). This handbook presents detailed information regarding the implementation, maintenance, suitability, and limitations of different BMPs. The need for BMPs should be determined based on EHR, project implementation timing (season), project location, and the history of on-site erosion. County Parks staff should implement BMPs, as necessary, during typical operations and maintenance activities that impact soil stability. Project-specific plans prepared in support of the projects identified in this Plan (e.g., Timber Harvesting Plans) shall identify applicable BMPs to be installed and maintained for project purposes. Table 25 identifies the different BMP types for erosion and sediment control, as provided by the County of Santa Clara Clean Water Program (County of Santa Clara 2018). Detailed information can be found at the following address:

https://www.sccgov.org/sites/cwp/pages/construction.aspx

Table 25
Erosion and Sediment Control BMPs

Erosion Control		Sediment Control	
Hydraulic Mulch	Velocity Dissipation Devices	Silt Fence	Sandbag Barrier
Hydroseeding	Slope Drains	Sediment Basin	Straw Bale Barrier
Soil Binders	Streambank Stabilization	Sediment Trap	Storm Drain Inlet Protection
Straw Mulch	Compost Blankets	Check Dam	Active Treatment Systems
Geotextiles and Mats	Soil Roughening	Fiber Rolls	Temporary Silt Dike
Wood Mulching	Non-Vegetation Stabilization	Gravel Bag Berm	Compost Socks and Berms
Earth Dikes and Drainage Swales		Street Sweeping and Vacuuming	Biofilter Bags

In the event that a wildfire event occurs in the Park, stabilization of soils in the burn area is a primary concern, especially in areas with steep slope gradients, moderate or high EHRs, or within identified slope instability areas. Erosion control BMPs should be installed as soon as possible and prior to the onset of the winter period (November 15 to April 1).

Un-Surfaced Access Roads

In areas where existing dirt access roads will be used and will be retained, waterbreaks and drainage structures should be constructed to minimize erosion potential. All waterbreaks and drainage structures should be installed no later than the beginning of the winter period (November 15 to April 1). Outside the winter period, waterbreaks and drainage structures should be installed prior to sunset if the National Weather Service forecast is a "chance" (30% or more) of rain within the next 24 hours. Waterbreaks should be constructed immediately upon conclusion of use of access roads that do not have permanent and adequate drainage structures. Distances between waterbreaks should adhere to the standards outlined in Table 26. Access roads should be closed to all public vehicle travel.

Table 26
Maximum Distance between Waterbreaks

Erosion Hazard Rating	Road Slope Gradient (percent)			
	≤10	*11-25*	*26-50*	*>50*
Extreme	100	75	50	50
High	150	100	75	50
Moderate	200	150	100	75

Table 26
Maximum Distance between Waterbreaks

Erosion Hazard Rating	Road Slope Gradient (percent)			
	≤10	*11-25*	*26-50*	*>50*
Low	300	200	150	100

Source: California Code of Regulations, Title 14, Section 923.5(f)

In addition to the BMPs and access road erosion control features identified above, project-specific planning and permitting efforts (e.g., Timber Harvesting Plan preparation) shall identify measures to minimize erosion and sediment transport potential resulting from forest management activities that utilize roads and skid trails or that otherwise impact soils.

8.4 Air Quality

The following BMPs should be implemented, where feasible, to minimize potential negative effects on air quality:

- Control fugitive dust resulting from equipment use by watering disturbed areas;
- Limit the size and quantity of equipment to that which is necessary to meet the identified vegetation management standard;
- Limit traffic speeds on dirt roads to 15 miles per hour;
- Clean construction vehicles and equipment to prevent dust, silt, mud and dirt from being tracked onto paved roadways;
- Limit vehicle idling time to a maximum of 5 minutes for vehicles and equipment, except where idling is required for the equipment to perform its task; and
- Develop and implement a burn plan and associated smoke management plan for prescribed burning activities, as identified in Section 7.3.4.

8.5 Reforestation/Revegetation

Reforestation or revegetation of areas subject to tree removal or other vegetation treatment can help re-establish native tree cover (e.g., in invasive species removal areas) and minimize the potential for erosion by stabilizing soils. Reforestation or revegetation is recommended only in areas where disturbed and/or bare soil exists following management operations as a measure to stabilize soils or if areas become subject to large-scale tree mortality during the Plan timeframe. In general, treatment areas and areas of disturbance in the Park should be allowed to regenerate on their own as long as endemic species, rather than invasive species, are regenerating.

Reforestation/revegetation needs should be determined during project design, during annual forest health work plan development, or during monitoring efforts and should consider slope, soil type, access, maintenance needs, and other BMPs being implemented on site. County Parks should consult with qualified professionals (e.g., foresters, revegetation specialists) to develop site-specific reforestation/revegetation plans, as appropriate. Efforts include hydroseeding, direct seeding, or container plant installation. Plant species selection should be consistent with reforestation/revegetation goals and should consider erosion protection value. Container or bare root stock used for reforestation/revegetation in the Parks should be from nurseries with a SOD Compliance Agreement in place.

8.6 Special-status Plant and Wildlife Species

Management actions in the Park have the potential to impact special-status plant or wildlife species via ground disturbance, vegetation removal or management, the use of vegetation management tools and equipment, or by increasing human presence within or adjacent to occupied areas. The special status plant and wildlife species with the potential to occur in the Park are presented in Section 3.2. In order to minimize the potential for impacts to special-status plant and wildlife species, the measures identified below should be implemented. County Parks should use qualified biologist to facilitate implementation of these measures.

Special-status Plants:

- All vehicles and equipment shall be inspected and cleaned of weed seed prior to entering the project site to reduce the spread of noxious weed seed.
- Conduct pre-construction surveys for rare plants prior to vegetation clearing during the appropriate time of year when target species are evident and identifiable. If no rare plants are noted in the project area during the survey, no further rare plant avoidance or minimization measures will be necessary. If rare plant populations are observed during the survey, all populations will be documented and flagged for avoidance. Flagging may include high visibility pin flag or tape, or orange mesh construction fencing, will be temporary, and will include all individuals of the rare plant population observed. Vegetation management crews will be educated on the purpose and need of avoidance of all habitats within exclusion zones.

Special-status Wildlife:

- For the protection of nesting birds, including raptors, limit vegetation clearing to the non-nesting season for birds, generally September 1 through January 31. If vegetation clearing must occur during the bird breeding season (February 1 through August 31), a qualified

biologist will conduct pre-construction surveys for nesting birds no more than one week prior to vegetation clearing activities. If no nests are observed during the survey, no further measures will be necessary. If active nests are observed, avoidance buffers appropriate for the species of bird shall be implemented. Typical avoidance buffers range from 250 to 1,000 feet for raptors, and 50 to 250 feet for passerine species.

- Buffers shall remain in place until the activities are complete, the young have fledged, or if the qualified biologist determines that the proposed activities will not result in impacts to nesting, rearing, or breeding success.
- For the protection of San Francisco dusky-footed woodrat, a biologist familiar with woodrat biology shall conduct a pre-construction survey between 30 and 60 days prior to any brush clearing or ground disturbance. All nests shall be identified, and their locations mapped and flagged to be avoided by a distance of at least 20 feet during vegetation management activities. In the event a woodrat nest cannot be completely avoided, CDFW shall be consulted with one of the two options: (1) if the house appears inactive, dismantle the house and scatter the materials outside the work area; (2) if the nest appears to be active, occupants will be trapped by a qualified biologist or Parks Natural Resource Program staff and houses dismantled. New artificial houses will be constructed outside the work area using the material from the original house and the occupant will be released into the new house, subject to CDFW approval.
- For the protection of Townsend's big-eared bat, avoid all man-made structures and caves that may provide maternal roost habitat for this species.
- To the maximum extent feasible, a 100-foot avoidance buffer shall be implemented around all wetlands, ponds, and drainages. Any activities that could potentially impact the ponds and drainages (ground disturbance, vegetation clearing and management, etc.) within the 100-foot buffer areas will require pre-construction surveys and a biological monitor during project activities even if protected species such as Santa Cruz black salamander, California red-legged frog, California giant salamander, red-bellied newt, San Francisco Garter Snake, and Western pond turtle are not observed within these aquatic habitats during the pre-construction survey. In any event, fencing must be installed around the work zone to prevent species from entering the work zone. If protected species are present within the buffer areas, work should be postponed until either 1) the species move away from that location on their own, or 2) the species are removed and relocated to a safe location by a qualified biologist or Parks Natural Resource Program staff with approval from USFWS (for federally protected species).
- For the protection of upland habitat for Western pond turtle, ground-disturbing activities such as movement of heavy equipment or excavation shall not occur within 100 meters of

suitable aquatic habitat during the late spring through fall nesting period unless pre-construction surveys are conducted to locate any nesting or aestivation sites. If nesting and/or aestivation sites are identified, these areas shall be avoided during vegetation management activities. If avoidance is not possible, the nest and/or turtle shall be removed by a qualified biologist or Parks Natural Resource Program staff and relocated to an appropriate location in consultation with CDFW.

8.7 Cultural Resources

It is anticipated that cultural resources surveys will be conducted prior to implementation of recommended project activities. Artifacts or features identified during surveys should be flagged and equipment excluded. Should exclusion be infeasible, equipment limitations should be implemented (e.g., use of rubber-tired equipment to lift trees off the ground). Exclusion or limitation of equipment should be specified during the specific project planning and permitting stage. A qualified archaeologist should be consulted to approve work area boundaries and allowable work in the vicinity of cultural resources. At the completion of operations, any flagging used for cultural resource site identification should be promptly removed to minimize the potential for discovery and impact.

8.8 Recreation Resources

Temporary impacts to recreation resources in the Parks may result from Plan implementation. This Plan does not recommend actions that would permanently close or prevent recreation activities, but temporary closures or use restrictions may be necessary for the safe operation of equipment and to ensure public safety. To minimize potential negative effects of Plan implementation on recreation resources, the following BMPs have been identified:

- Restore disturbed areas to pre-operation conditions (e.g., clear blocked trails, re-contour damaged trails to minimize the potential for erosion or the creation of unauthorized trails);
- Repair, replace, or reinstall damaged, removed, or relocated Park infrastructure (e.g., signs, bumper logs, gates, picnic tables);
- Minimize the extent or duration of closures by phasing work and/or conducting work outside of peak visitation periods, where feasible;
- Where feasible, conduct operations on weekdays during daytime hours (8 am to 5 pm);
- Control public access by posting detours, installing and maintaining appropriate and adequate signage, using flaggers/monitors where necessary, closing work areas via exclusionary fencing, and providing necessary monitoring/patrolling staff to ensure access control measures are maintained and effective;

- Coordinate with Park reservations staff and campground hosts so Park visitors are aware of planned project activities that may be conducted during their visit.
- Disseminate information regarding planned project activities on the Park website, social media, in-park signage, local newspaper, and via outreach to regular known user groups.

8.9 Protection of Retained Trees

Retained trees in the Parks may be subject to impacts resulting from implementation of the management recommendations included in this Plan, improvements under the Park Master Plan, or from Park operations and maintenance activities. The following protection measures for are provided to minimize impacts to retained trees:

- For construction projects associated with Master Plan implementation or operations and maintenance that require construction activities within the canopy driplines of retained trees, implement the tree protection measures included in Appendix C;
- Where feasible, conduct tree removal operations in mid- to late-summer to minimize pathogen infection potential;
- Any necessary canopy or root pruning should be conducted according to ANSI A300 standards (ANSI 2017).
- For small pile burning activities, site piles a sufficient distance from retained trees to minimize crown and trunk scorching and heat damage to roots;
- For broadcast burning activities, treat surface fuels and/or prune lower limbs of trees such that flame lengths and fireline intensities are low enough to minimize crown and trunk scorching;
- Avoid "skin-ups" on the boles of retained trees caused by contact with equipment, falling trees, or vegetative material being yarded for removal from the site. "Skin-ups" often expose the inner bark and cambium of the residual tree. Such wounds deplete the energy reserves of the tree in order to isolate the injury and create an easy entry point for pests and pathogens.
- Avoid disturbance to tree root zones. Root damage and soil compaction can occur through improper operation of equipment while maneuvering over the root zone. Avoid operation in the root zone under saturated soil conditions and avoid contacting above-ground roots. Reuse old tractor roads or recreational trails where available to reduce soil compaction.
- Avoid piling chips, soil, or other materials against the trunk/bole of retained trees.
- Avoid disturbance to tree crowns during operations, expect where necessary for creation of old-growth characteristics or wildlife habitat. If limb removal is necessary for equipment operation, limbs should be pruned according to ANSI A300 standards.

- For tree removal operations, directionally fell trees away from the retained trees, or in a direction that would cause the least amount of damage to the surrounding tree crowns. Torn branches, like skin-ups, deplete the energy reserves of the tree in order isolate the injury, and create an easy entry point for pests and pathogens.
- Prior to excavation and grading for upgrades, repairs, or new developments near trees, a Tree Protection Plan should be prepared by a, ISA Certified Arborist or RPF and should include specific protection measures for the root zone, bole, and tree crowns.

9 PLAN IMPLEMENTATION

The following sections outline the methods for implementing this Plan over its 20-year timeframe. Plan implementation must be conducted in accordance with the Project-Specific Analysis/Addendum prepared for this Plan. The Project-Specific Analysis/Addendum is the California Environmental Quality Act (CEQA) environmental review document prepared for this Plan and includes Standard Project Requirements (SPRs) and Mitigation Measures (MMs) that guide implementation efforts. Project-Specific Analysis/Addendum Attachment A (Standard Project Requirements and Mitigation Measures Checklist) identifies SPRs and MMs applicable to Plan implementation.

9.1 Roles and Responsibilities

Santa Clara County Parks staff, or their designee, will be responsible for implementing this Plan and will be responsible for the following (primary responsible staff identified in parentheses):

- Assessing field conditions on a routine basis to determine the need for management action implementation (Park Maintenance, Park Operations);
- Developing annual forest health work plans and budgets (Natural Resources Management);
- Conducting all necessary pre-project planning efforts, including implementation of SPRs and MMs and obtaining necessary permits and authorizations (Parks Planning & Compliance);
- Continuing to implement the Tree Safety Program and incorporating work needs into annual forest health work plans (Natural Resources Management, Park Maintenance);
- Providing appropriate training, materials, tools, and equipment to Park staff to implement identified general practice recommendations (Park Maintenance, Park Operations, Natural Resources Management);
- Screening, selecting, and hiring contractors, or directing Park staff, to conduct identified projects (Natural Resources Management);
- Monitoring the implementation phase of forest management actions to ensure that BMPs are being properly implemented (Natural Resources Management); and
- Monitoring project areas following completion of operations to ensure that management standards have been achieved (Natural Resources Management).

9.2 Planning and Scheduling

This Plan recommends development of annual forest health work plans to facilitate implementation of recommended projects and to track observations and implemented actions

associated with the Park's Tree Safety Program. It is anticipated that some recommended projects may be completed in one calendar year, while others will need to be broken into phases that span multiple years. Factors affecting the duration of project implementation include, but are not limited to, project size, impact to Park recreational resources, funding, resource availability, and permit requirements. Annual forest health work plan development should include identification of new project actions (projects that will be started that year), continuing project actions (project that are continuing from the previous year), and previous project areas that require maintenance.

Planning and scheduling of forest health projects is anticipated to be an on-going process conducted throughout most of the calendar year. Most planning and scheduling efforts will be conducted in the winter months for work to be conducted in the upcoming spring, summer, and fall months, although such efforts may occur at different times during the year, depending on project needs.

Concurrent planning and scheduling of different management activities in different areas of the Park is also anticipated, as some activities (e.g., pile burning or prescribed fire) may necessitate a longer planning and scheduling period than others. Planning and scheduling activities will also consider management timing priorities and constraints, available resources, BMPs, and funding. Planning and scheduling tasks will also include coordination with and scheduling of work crews (e.g., CAL FIRE crews, CCC/SJCC crews, volunteers, etc.), private contractors (e.g., licensed timber operators), and/or Park staff. Where necessary, planning and scheduling activities will include preparation of bid specifications and bid packages, contractor screening, selection, and hiring, and developing direction for Park staff.

9.2.1 Plan and Permit Requirements

The projects recommended in this Plan may necessitate the preparation of additional planning documents or applications to obtain necessary permits or authorizations to conduct regulated work. County staff will be responsible for obtaining such permits or authorizations, which may necessitate hiring qualified consultants (e.g., biologists, Registered Professional Foresters, archaeologists). Based on the projects identified in this Plan, it is anticipated that the County may need one or more of the following permits/authorizations in order to proceed with operations:

- Timber Harvesting Plan (THP), THP Exemption, or Emergency Notice approved by CAL FIRE for timber operations. THPs are an environmental review document submitted by landowners to CAL FIRE outlining what timber is planned for harvest, how it will be harvested, and the steps that will be taken to prevent damage to the environment. THP exemptions cover specific activities that are exempt from THP preparation, although harvest practices must adhere to the standards outlined in the California Forest Practice

Rules. Examples of THP exemptions include those for harvesting dead, dying, or diseased trees and removal of trees for eliminating flammable materials and ladder fuels in fuel breaks. Emergency Notices are applicable when emergency conditions exist, such as where dead/dying trees pose a fire hazard or when pathogen-infested trees pose a threat to forest health (e.g., SOD). Timber operations include cutting or removal of trees for commercial purposes (where the resulting material would be sold, bartered exchanged, or traded). Timber operations would not include removal of smaller trees for fuel management or non-commercial purposes, with specific criteria outlined in California Public Resources Code Section 4527(b).

- Burn permits and associated smoke management plan approved by the BAAQMD.
- Agency permits necessary for impacts to regulated species, habitats, or watercourses.

9.2.2 Project Timing

The recommended projects identified in this Plan are anticipated to be conducted primarily during spring, summer, and fall months; however, project activities may be conducted at any time during the year if not otherwise restricted. Factors that may restrict project timing include, but are not limited to, recreation demands, biological resources constraints (e.g., nesting season), fire hazard conditions, and saturated soil conditions. Implementation of the recommendations in this Plan should seek to minimize potential negative effects of project activities by considering the timing of work. Emergency work (e.g., clearing down trees) may need to be conducted at any time of year.

9.2.3 Project Coordination

Park staff will prepare an annual forest health work plan based on identified projects, completed projects (or portions thereof), or other site-specific conditions observed during field evaluations. The annual work plans will identify projects to be implemented, implementation timing, resource needs and availability, permit needs or status, funding sources, and monitoring and documentation needs. This process may involve preparing bid specifications, advertising bids, and evaluating and selecting qualified contractors if identified tasks will not be completed by Park staff. Park staff will coordinate with other County departments, CAL FIRE, and other agencies or landowners, as appropriate, during annual forest health work plan development.

This Plan includes an adaptive management component; therefore, the annual forest health work plan is intended to be an internal document that may be modified throughout the year. Modifications to the annual forest health work plan may be necessary due to various factors, including field conditions, weather, staff or contractor project completion rates, staff and resource availability, permit acquisition needs, and emergency conditions, amongst others.

9.3 Monitoring and Reporting

This Plan recommends that forest health monitoring be conducted as identified below:

- **Routine Monitoring:** Park staff routinely patrol and monitor forested areas of the Park for maintenance purposes and should document forest health issues (e.g., dead trees, invasive species presence) when observed. Documentation should be provided to Park management staff and should include information regarding observed condition, and size of identified area/issue. In addition, a routine monitoring of all areas of the Park should be conducted at least annually, with reporting as described. Monitoring in the spring is recommended so that any potential damage occurring over winter can be documented. Augmentation of this effort with aerial monitoring (e.g., helicopter, plane) is also recommended, where feasible. Documentation should include written observations and photographs of field conditions, with documentation provided to Natural Resource Management staff for inclusion in annual work plans and budgets. If necessary, further analysis of observed issues should be conducted by Park management staff or qualified professionals (e.g., Certified Arborists, RPFs).
- **Project Area Monitoring:** Park staff, or their designee, should conduct annual monitoring of Park forestland where project activities have been conducted within the previous 12 months. All shaded fuel break areas should be monitored annually. Annual monitoring should identify project status (complete, in-process), rate and type of regrowth, presence and coverage of invasive species, signs of new or intensified pathogen effects, and any necessary follow-up maintenance needs, including maintenance of BMPs. Any necessary management or maintenance activities should be included in annual forest health work plans. Where feasible, incorporate photo monitoring with reference gauges to track forest regeneration over time. Photo monitoring may not be necessary annually but should be conducted every 3-5 years. A recommended photo monitoring protocol is provided by Hall:

  https://www.fs.fed.us/pnw/pubs/pnw_gtr526.pdf
- **Forest Health Monitoring:** Dedicated forest health monitoring surveys should be conducted at least every 5-10 years by an RPF. More frequent monitoring may be necessary and should be determined on a case-by-case basis (e.g., regional pest outbreaks affecting Park forestland). The intent of monitoring efforts should be to identify any emerging forest health issues in the Park and should be conducted in consultation with qualified professionals and CAL FIRE. Monitoring should include an assessment of aerial imagery and remotely sensed data as an initial step to identify potential forest health issues. CDFW maintains publicly available, multi-year data sets derived from the National Agriculture Imagery Program (NAIP) that can be useful in evaluating plant stress (e.g., Normalized Difference Vegetation Index (NDVI) data and Color Infrared data) and canopy change.

Other remotely sensed data sets that may be useful in analyzing potential forest health issues include light detection and ranging (LiDAR) data sets, high-resolution aerial imagery, and unmanned aerial vehicle (UAV) imagery, Field monitoring should be conducted in identified areas to determine the cause and extent of issues observed via remotely sensed data. General forest health assessments should also be conducted by the RPF to identify the type and extent of other potential forest threats, including, but not limited to, dead/dying trees, pests/pathogens, slope failures, trespass areas, invasive species, and high fuel loads. It is anticipated that general forest health assessments would include windshield surveys and hiking throughout the Park to identify such issues and that the effort could be conducted in 7-10 days. Forest health monitoring can also be coordinated with inspections conducted under the Tree Safety Program.

Forest health monitoring could include cone collection surveys, conducted in coordination with CAL FIRE. Cone collection in the Park is a good opportunity for storing a stock of seeds from trees within the Park for future use should reforestation efforts be needed. CAL FIRE's Reforestation Services Program is focused on growing trees for the long-term sustainability of the state's forests. A component of this program is seed (cone) collection. Landowners are invited to provide cone crop location information to CAL FIRE, and in some cases collect cones themselves. CAL FIRE also provides training for this program. More information is provided at:

https://www.fire.ca.gov/programs/resource-management/resource-protection-improvement/wildfire-resilience/reforestation-center/

Park staff should prepare an annual internal Park forest health status report summarizing the results project actions, monitoring efforts, identifying and quantifying treatment areas, documenting annual expenditures associated with Plan implementation, identifying any additional resource needs, and summarizing any pertinent issues identified and addressed during Plan implementation. Based on the results of monitoring efforts, the annual report should identify any proposed changes to forest health management activities conducted in the Park.

9.4 Adaptive Management

Adaptive management is an iterative process of implementation, monitoring, and adjustment of management actions based on monitoring results (McEachern et al. 2007). The critical component of the adaptive management process for this Plan is the monitoring effort described in the previous section. The results of monitoring efforts summarized in the annual forest health status reports should be used in annual forest health work plan development efforts and to determine which management activities or practices are effective or ineffective, if there is a need to change or

modify management practices, if additional BMPs need to be employed, or if changes to BMPs are necessary. Monitoring will also allow for consideration of unplanned events (e.g., wildfire burning in the Park) that may have an effect on Plan implementation.

Park staff should document the results of monitoring efforts, as described in the previous section, noting recommended changes to management activities or BMPs. This documentation should then be used by Natural Resources Management staff during subsequent planning and scheduling efforts with recommended changes incorporated into annual forest health work plans.

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APPENDIX A

Special Status Plant Species with Potential to Occur

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Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Acanthomintha duttonii	San Mateo thorn-mint	FE/SE/1B.1	Chaparral, Valley and foothill grassland; serpentinite/annual herb/Apr–June/160–985	**Not expected to occur.** The site is outside of the species' known elevation range.
Agrostis blasdalei	Blasdale's bent grass	None/None/1B.2	Coastal bluff scrub, Coastal dunes, Coastal prairie/perennial rhizomatous herb/May–July/0–490	**Not expected to occur.** The site is outside of the species' known elevation range and there is no suitable coastal bluff scrub, dune, or prairie habitat present.
Allium peninsulare var. *franciscanum*	Franciscan onion	None/None/1B.2	Cismontane woodland, Valley and foothill grassland; clay, volcanic, often serpentinite/perennial bulbiferous herb/(Apr)May–June/170–1,000	**Low potential to occur**. The woodland onsite provides potentially suitable habitat. The nearest documented occurrence is located approximately 4.8 miles north of Upper Steven's Creek County Park (CDFW 2020).
Amsinckia lunaris	bent-flowered fiddleneck	None/None/1B.2	Coastal bluff scrub, Cismontane woodland, Valley and foothill grassland/annual herb/Mar–June/5–1,640	**Not expected to occur**. Although the woodland onsite provides potentially suitable habitat for this species, it has not been previously documented within 5 miles of the project site (CDFW 2020).
Arctostaphylos andersonii	Anderson's manzanita	None/None/1B.2	Broadleafed upland forest, Chaparral, North Coast coniferous forest; openings, edges/perennial evergreen shrub/Nov–May/195–2,490	**High potential to occur**. Forest and chaparral habitat provide suitable habitat for this species. There is a documented occurrence for this

				species within ½ mile of the project site (CDFW 2020).
Arctostaphylos glutinosa	Schreiber's manzanita	None/None/1B.2	Closed-cone coniferous forest, Chaparral; diatomaceous shale/perennial evergreen shrub/(Nov)Mar–Apr/555–2,245	**Not expected to occur**. Although the forest onsite provides potentially suitable habitat, there are no suitable soils onsite. This species has not been previously documented within 5 miles of the project site (CDFW 2020).
Arctostaphylos ohloneana	Ohlone manzanita	None/None/1B.1	Closed-cone coniferous forest, Coastal scrub; siliceous shale/evergreen shrub/Feb–Mar/1,475–1,735	**Not expected to occur**. Although the forest onsite provides potentially suitable habitat, there are no suitable soils onsite. This species has not been previously documented within 5 miles of the project site (CDFW 2020).
Arctostaphylos pajaroensis	Pajaro manzanita	None/None/1B.1	Chaparral (sandy)/perennial evergreen shrub/Dec–Mar/95–2,490	**Not expected to occur**. The project site is outside the known geographic region for this species.
Arctostaphylos regismontana	Kings Mountain manzanita	None/None/1B.2	Broadleafed upland forest, Chaparral, North Coast coniferous forest; granitic or sandstone/perennial evergreen shrub/Dec–Apr/1,000–2,395	**High potential to occur**. The forest and chaparral onsite provide suitable habitat for this species. This species has been previously documented in Stevens Creek County Park, however, the occurrence was observed in the 1920's (CDFW 2020).
Arctostaphylos silvicola	Bonny Doon manzanita	None/None/1B.2	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest; inland	**Not expected to occur**. The site does not contain any suitable sandy inland

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			marine sands/perennial evergreen shrub/Jan–Mar/390–1,965	marine soils.
Arenaria paludicola	marsh sandwort	FE/SE/1B.1	Marshes and swamps (freshwater or brackish); sandy, openings/perennial stoloniferous herb/May–Aug/5–560	**Not expected to occur**. The site is outside of the species' known elevation range and there is no suitable marsh or swamp habitat present.
Astragalus pycnostachyus var. *pycnostachyus*	coastal marsh milk-vetch	None/None/1B.2	Coastal dunes (mesic), Coastal scrub, Marshes and swamps (coastal salt, streamsides)/perennial herb/(Apr)June–Oct/0–100	**Not expected to occur**. The site is outside of the species' known elevation range and there is no suitable coastal dune, scrub, or marsh/swamp habitat present.
Astragalus tener var. *tener*	alkali milk-vetch	None/None/1B.2	Playas, Valley and foothill grassland (adobe clay), Vernal pools; alkaline/annual herb/Mar–June/0–195	**Not expected to occur**. The site is outside of the species' known elevation range.
Calyptridium parryi var. *hesseae*	Santa Cruz Mountains pussypaws	None/None/1B.1	Chaparral, Cismontane woodland; sandy or gravelly, openings/annual herb/May–Aug/1,000–5,015	**Not expected to occur**. Although the woodland onsite provides potentially suitable habitat for this species, sandy or gravelly soils are limited. This species has not been previously documented within 5 miles of the project site (CDFW 2020).
Campanula californica	swamp harebell	None/None/1B.2	Bogs and fens, Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Marshes and swamps (freshwater), North Coast coniferous forest; mesic/perennial rhizomatous	**Not expected to occur**. Although the forest onsite provides potentially suitable habitat for this species, mesic habitat is limited and it has not been previously documented within 5 miles

			herb/June–Oct/0–1,325	of the project site (CDFW 2020).
Carex comosa	bristly sedge	None/None/2B.1	Coastal prairie, Marshes and swamps (lake margins), Valley and foothill grassland/perennial rhizomatous herb/May–Sep/0–2,050	**Not expected to occur**. No suitable coastal prairie or marsh habitat present onsite. This species has not been previously documented within 5 miles of the project site (CDFW 2020).
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	None/None/1B.1	Valley and foothill grassland (alkaline)/annual herb/May–Oct (Nov)/0–755	**Not expected to occur**. The site is outside of the species' known elevation range.
Chloropyron maritimum ssp. *palustre*	Point Reyes bird's-beak	None/None/1B.2	Marshes and swamps (coastal salt)/annual herb (hemiparasitic)/June–Oct/0–35	**Not expected to occur**. The site is outside of the species' known elevation range and there is no suitable marsh or swamp habitat present.
Chorizanthe pungens var. *hartwegiana*	Ben Lomond spineflower	FE/None/1B.1	Lower montane coniferous forest (maritime ponderosa pine sandhills)/annual herb/Apr–July/295–2,000	**Not expected to occur**. There are no suitable sandhill soils onsite. The site is outside the known geographic range of this species.
Chorizanthe pungens var. *pungens*	Monterey spineflower	FT/None/1B.2	Chaparral (maritime), Cismontane woodland, Coastal dunes, Coastal scrub, Valley and foothill grassland; sandy/annual herb/Apr–June (July–Aug)/5–1,475	**Not expected to occur**. Although woodland onsite may provide potentially suitable habitat for this species, sandy soils are limited and this species has not been previously documented within 5 miles of the project site.
Chorizanthe robusta var.	Scotts Valley	FE/None/1B.1	Meadows and seeps (sandy), Valley and foothill grassland (mudstone and	**Not expected to occur**. The site is outside of the species' known elevation

hartwegii	spineflower		Purisima outcrops)/annual herb/Apr–July/750–805	range.
Chorizanthe robusta var. *robusta*	robust spineflower	FE/None/1B.1	Chaparral (maritime), Cismontane woodland (openings), Coastal dunes, Coastal scrub; sandy or gravelly/annual herb/Apr–Sep/5–985	**Not expected to occur.** The site is outside of the species' known elevation range and there is no suitable coastal dune, scrub or maritime chaparral habitat present.
Cirsium andrewsii	Franciscan thistle	None/None/1B.2	Broadleafed upland forest, Coastal bluff scrub, Coastal prairie, Coastal scrub; mesic, sometimes serpentinite/perennial herb/Mar–July/0–490	**Not expected to occur**. The site is outside of the species' known elevation range.
Cirsium fontinale var. *campylon*	Mt. Hamilton thistle	None/None/1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland; serpentinite seeps/perennial herb/(Feb)Apr–Oct/325–2,915	**Not expected to occur**. The site is outside the known geographic region of this species.
Cirsium fontinale var. *fontinale*	fountain thistle	FE/SE/1B.1	Chaparral (openings), Cismontane woodland, Meadows and seeps, Valley and foothill grassland; Serpentinite seeps/perennial herb/(Apr)May–Oct/145–575	**Not expected to occur**. The site is outside of the species' known elevation range.
Cirsium praeteriens	lost thistle	None/None/1A	Unknown/perennial herb/June–July/0–330	**Not expected to occur**. The site is outside of the species' known elevation range.
Collinsia corymbosa	round-headed Chinese-	None/None/1B.2	Coastal dunes/annual herb/Apr–June/0–65	**Not expected to occur**. The site is outside of the species' known elevation range and there is no suitable coastal

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	houses			dune habitat present.
Collinsia multicolor	San Francisco collinsia	None/None/1B.2	Closed-cone coniferous forest, Coastal scrub; sometimes serpentinite/annual herb/(Feb)Mar–May/95–820	**Not expected to occur**. The site is outside of the species' known elevation range.
Dacryophyllum falcifolium	tear drop moss	None/None/1B.3	North Coast coniferous forest; carbonate/moss/N.A./160–900	**Not expected to occur.** The site is outside of the species' known elevation range.
Dirca occidentalis	western leatherwood	None/None/1B.2	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Cismontane woodland, North Coast coniferous forest, Riparian forest, Riparian woodland; mesic/perennial deciduous shrub/Jan–Mar (Apr)/80–1,390	**High potential to occur**. The forest and woodland habitat onsite provide suitable habitat for this species. There are several documented occurrences of this species within 1 mile of the project site (CDFW 2020).
Dudleya abramsii ssp. *setchellii*	Santa Clara Valley dudleya	FE/None/1B.1	Cismontane woodland, Valley and foothill grassland; serpentinite, rocky/perennial herb/Apr–Oct/195–1,490	**Not expected to occur**. Although the woodland onsite may provide potentially suitable habitat for this species, rocky serpentinite outcrops are limited. This species has not been previously documented within 5 miles of the project site (CDFW 2020).
Eriogonum nudum var. *decurrens*	Ben Lomond buckwheat	None/None/1B.1	Chaparral, Cismontane woodland, Lower montane coniferous forest (maritime ponderosa pine sandhills); sandy/perennial herb/June–Oct/160–2,620	**Not expected to occur**. No suitable sandhill habitat present.

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Eriophyllum latilobum	San Mateo woolly sunflower	FE/SE/1B.1	Cismontane woodland (often serpentinite, on roadcuts), Coastal scrub, Lower montane coniferous forest/perennial herb/May–June/145–1,080	**Moderate potential to occur**. The woodland and forest onsite provide suitable habitat for this species. There is one documented occurrence within 2 miles of the project site (CDFW 2020).
Eryngium aristulatum var. *hooveri*	Hoover's button-celery	None/None/1B.1	Vernal pools/annual / perennial herb/(June) July (Aug)/5–150	**Not expected to occur**. The site is outside of the species' known elevation range and there is no suitable habitat present.
Eryngium jepsonii	Jepson's coyote thistle	None/None/1B.2	Valley and foothill grassland, Vernal pools; clay/perennial herb/Apr–Aug/5–985	**Not expected to occur.** The site is outside of the species' known elevation range.
Erysimum teretifolium	Santa Cruz wallflower	FE/SE/1B.1	Chaparral, Lower montane coniferous forest; inland marine sands/perennial herb/Mar–July/390–2,000	**Not expected to occur**. There are no suitable inland marine sand soils onsite.
Fissidens pauperculus	minute pocket moss	None/None/1B.2	North Coast coniferous forest (damp coastal soil)/moss/N.A./30–3,355	**Moderate potential to occur**. The forest onsite provides potentially suitable habitat for this species. There is one previously documented occurrence approximately 1 mile west of Upper Steven's Creek County Park (CDFW 2020).
Fritillaria liliacea	fragrant fritillary	None/None/1B.2	Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland; Often serpentinite/perennial bulbiferous herb/Feb–Apr/5–1,345	**Not expected to occur**. Although the woodland onsite may provide potentially suitable habitat for this species, it has not been previously

				documented within 5 miles of the project site (CDFW 2020).
Grimmia vaginulata	vaginulate grimmia	None/None/1B.1	Chaparral (openings); Rocky, boulder and rock walls, carbonate/moss/N.A./2,245–2,245	**Not expected to occur**. Rocky boulder and rock wall habitat is not present within the project site. This species has not been previously documented within 5 miles of the project site (CDFW 2020).
Hesperocyparis abramsiana var. *abramsiana*	Santa Cruz cypress	FT/SE/1B.2	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest; sandstone or granitic/perennial evergreen tree/N.A./915–2,620	**Not expected to occur**. Although the forest onsite may provide potentially suitable habitat for this species, it has not been previously documented within 5 miles of the project site (CDFW 2020).
Hesperocyparis abramsiana var. *butanoensis*	Butano Ridge cypress	FT/SE/1B.2	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest; Sandstone/perennial evergreen tree/Oct/1,310–1,605	**Not expected to occur**. Although the forest onsite may provide potentially suitable habitat for this species, it has been documented from only one occurrence more than 5 miles from the project site (CDFW 2020).
Hesperolinon congestum	Marin western flax	FT/ST/1B.1	Chaparral, Valley and foothill grassland; serpentinite/annual herb/Apr–July/15–1,210	**Not expected to occur**. Although chaparral and grassland onsite may provide potentially suitable habitat, this species has not been previously documented within 5 miles of the project site (CDFW 2020).

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Hoita strobilina	Loma Prieta hoita	None/None/1B.1	Chaparral, Cismontane woodland, Riparian woodland; usually serpentinite, mesic/perennial herb/May–July (Aug–Oct)/95–2,820	**Low potential to occur**. The chaparral and woodland onsite provide potentially suitable habitat, although mesic habitat is limited. The nearest documented occurrence of this species is located approximately 2 miles east of Sanborn County Park (CDFW 2020).
Holocarpha macradenia	Santa Cruz tarplant	FT/SE/1B.1	Coastal prairie, Coastal scrub, Valley and foothill grassland; often clay, sandy/annual herb/June–Oct/30–720	**Not expected to occur**. The site is outside of the species' known elevation range.
Horkelia cuneata var. *sericea*	Kellogg's horkelia	None/None/1B.1	Closed-cone coniferous forest, Chaparral (maritime), Coastal dunes, Coastal scrub; sandy or gravelly, openings/perennial herb/Apr–Sep/30–655	**Not expected to occur**. The site is outside of the species' known elevation range.
Legenere limosa	legenere	None/None/1B.1	Vernal pools/annual herb/Apr–June/0–2,885	**Not expected to occur**. No suitable vernal pool habitat present.
Lessingia arachnoidea	Crystal Springs lessingia	None/None/1B.2	Cismontane woodland, Coastal scrub, Valley and foothill grassland; serpentinite, often roadsides/annual herb/July–Oct/195–655	**Not expected to occur**. The site is outside of the species' known elevation range.
Malacothamnus arcuatus	arcuate bush-mallow	None/None/1B.2	Chaparral, Cismontane woodland/perennial evergreen shrub/Apr–Sep/45–1,160	**High potential to occur**. The chaparral and woodland onsite provide suitable habitat for this species. There is one documented occurrence for this species within 1 mile of the project site (CDFW 2020).

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Malacothamnus davidsonii	Davidson's bush-mallow	None/None/1B.2	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland/perennial deciduous shrub/June–Jan/605–3,740	**Not expected to occur**. The project site is outside the known geographic range for this species.
Malacothamnus hallii	Hall's bush-mallow	None/None/1B.2	Chaparral, Coastal scrub/perennial evergreen shrub/(Apr)May–Sep (Oct)/30–2,490	**Not expected to occur**. The project site is outside the known geographic range for this species.
Microseris paludosa	marsh microseris	None/None/1B.2	Closed-cone coniferous forest, Cismontane woodland, Coastal scrub, Valley and foothill grassland/perennial herb/Apr–June (July)/15–1,160	**Not expected to occur**. The project area is outside the known geographic range for this species.
Monolopia gracilens	woodland woolythreads	None/None/1B.2	Broadleafed upland forest (openings), Chaparral (openings), Cismontane woodland, North Coast coniferous forest (openings), Valley and foothill grassland; Serpentine/annual herb/(Feb) Mar–July/325–3,935	**High potential to occur**. The woodland and forest onsite provide suitable habitat for this species. A historic (1904) documented occurrence of this species overlaps with the southeastern corner of Sanborn County Park (CDFW 2020).
Orthotrichum kellmanii	Kellman's bristle moss	None/None/1B.2	Chaparral, Cismontane woodland; sandstone, carbonate/moss/Jan–Feb/1,125–2,245	**Not expected to occur**. Although woodland and chaparral onsite may provide potentially suitable habitat for this species, suitable soils are limited. This species has not been previously documented within 5 miles of the project site (CDFW 2020).
Pedicularis dudleyi	Dudley's lousewort	None/SR/1B.2	Chaparral (maritime), Cismontane woodland, North Coast coniferous forest,	**Low potential to occur**. The woodland and forest onsite provide potentially

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			Valley and foothill grassland/perennial herb/Apr–June/195–2,950	suitable habitat for this species. The nearest documented occurrence for this species is located approximately 3.5 miles west of Upper Stevens Creek County Park (CDFW 2020).
Pentachaeta bellidiflora	white-rayed pentachaeta	FE/SE/1B.1	Cismontane woodland, Valley and foothill grassland (often serpentinite)/annual herb/Mar–May/110–2,030	**Not expected to occur**. Although the woodland onsite provides potentially suitable habitat for this species, it has not been previously documented within 5 miles of the project site (CDFW 2020).
Pinus radiata	Monterey pine	None/None/1B.1	Closed-cone coniferous forest, Cismontane woodland/perennial evergreen tree/N.A./80–605	**Not expected to occur**. The site is outside of the species' known geographic and elevation range.
Piperia candida	white-flowered rein orchid	None/None/1B.2	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest; sometimes serpentinite/perennial herb/(Mar)May–Sep/95–4,295	**High potential to occur**. The forest onsite provides suitable habitat for this species. There is one documented occurrence for this species within ½ mile of the project site (CDFW 2020).
Plagiobothrys chorisianus var. chorisianus	Choris' popcornflower	None/None/1B.2	Chaparral, Coastal prairie, Coastal scrub; mesic/annual herb/Mar–June/5–525	**Not expected to occur**. The site is outside of the species' known elevation range.
Plagiobothrys chorisianus var. hickmanii	Hickman's popcornflower	None/None/4.2	Closed-cone coniferous forest, Chaparral, Coastal scrub, Marshes and swamps, Vernal pools/annual herb/Apr–June/45–605	**Not expected to occur.** The site is outside of the species' known elevation range.

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Plagiobothrys diffusus	San Francisco popcornflower	None/SE/1B.1	Coastal prairie, Valley and foothill grassland/annual herb/Mar–June/195–1,180	**Not expected to occur**. No suitable coastal prairie onsite. This species has not been previously documented within 5 miles of the project site (CDFW 2020).
Plagiobothrys glaber	hairless popcornflower	None/None/1A	Meadows and seeps (alkaline), Marshes and swamps (coastal salt)/annual herb/Mar–May/45–590	**Not expected to occur**. The site is outside of the species' known elevation range and there is no suitable alkaline seep, marsh, or swamp habitat present.
Sanicula saxatilis	rock sanicle	None/SR/1B.2	Broadleafed upland forest, Chaparral, Valley and foothill grassland; rocky, scree, talus/perennial herb/Apr–May/2,030–3,850	**Not expected to occur**. Although the forest and chaparral onsite may provide potentially suitable habitat for this species, it has not been previously documented within 5 miles of the project site (CDFW 2020).
Senecio aphanactis	chaparral ragwort	None/None/2B.2	Chaparral, Cismontane woodland, Coastal scrub; sometimes alkaline/annual herb/Jan–Apr (May)/45–2,620	**High potential to occur**. The chaparral and woodland onsite provide suitable habitat for this species. This species has been previously documented within ½ mile of the project site (CDFW 2020).
Silene verecunda ssp. *verecunda*	San Francisco campion	None/None/1B.2	Coastal bluff scrub, Chaparral, Coastal prairie, Coastal scrub, Valley and foothill grassland; sandy/perennial herb/(Feb)Mar–June (Aug)/95–2,115	**Not expected to occur**. Sandy soils are limited onsite and this species has not been previously documented within 5 miles of the project site (CDFW 2020).

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Streptanthus albidus ssp. *albidus*	Metcalf Canyon jewelflower	FE/None/1B.1	Valley and foothill grassland (serpentinite)/annual herb/Apr–July/145–2,620	**Not expected to occur**. No suitable habitat onsite and the species has not been previously documented within 5 miles of the project site (CDFW 2020).
Streptanthus albidus ssp. *peramoenus*	most beautiful jewelflower	None/None/1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland; serpentinite/annual herb/(Mar)Apr–Sep (Oct)/310–3,280	**Low potential to occur**. The chaparral and woodland onsite may provide potentially suitable habitat for this species. The nearest documented occurrence for this species is located approximately 3 miles east of Sanborn County Park (CDFW 2020).
Stuckenia filiformis ssp. *alpina*	slender-leaved pondweed	None/None/2B.2	Marshes and swamps (assorted shallow freshwater)/perennial rhizomatous herb (aquatic)/May–July/980–7,050	**Not expected to occur**. No suitable marsh or swamp habitat present.
Suaeda californica	California seablite	FE/None/1B.1	Marshes and swamps (coastal salt)/perennial evergreen shrub/July–Oct/0–50	**Not expected to occur**. The site is outside of the species' known elevation range and there is no suitable marsh or swamp habitat present.
Trifolium amoenum	two-fork clover	FE/None/1B.1	Coastal bluff scrub, Valley and foothill grassland (sometimes serpentinite)/annual herb/Apr–June/15–1,360	**Not expected to occur**. No suitable coastal bluff scrub onsite. This species has not been previously documented within 5 miles of the project site (CDFW 2020).
Trifolium buckwestiorum	Santa Cruz clover	None/None/1B.1	Broadleafed upland forest, Cismontane woodland, Coastal prairie; gravelly, margins/annual herb/Apr–Oct/340–2,000	**Moderate potential to occur**. The forest and woodland onsite provide suitable habitat for this species;

				however, gravelly margins are limited. There is one documented occurrence of this species within 1 mile of the project site (CDFW 2020).
Trifolium hydrophilum	saline clover	None/None/1B.2	Marshes and swamps, Valley and foothill grassland (mesic, alkaline), Vernal pools/annual herb/Apr–June/0–985	**Not expected to occur.** The site is outside of the species' known elevation range.
Trifolium polyodon	Pacific Grove clover	None/SR/1B.1	Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Valley and foothill grassland; mesic, sometimes granitic/annual herb/Apr–June (July)/15–1,390	**Not expected to occur**. Although the forest onsite may provide potentially suitable habitat for this species, mesic habitat is limited. This species has not been previously documented within 5 miles of the project site (CDFW 2020).
Tropidocarpum capparideum	caper-fruited tropidocarpum	None/None/1B.1	Valley and foothill grassland (alkaline hills)/annual herb/Mar–Apr/0–1,490	**Not expected to occur**. No suitable alkaline hill habitat present.

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Status Legend:
FE: Federally listed as endangered
FT: Federally listed as threatened
FC: Federal Candidate for listing
DL: Delisted
SE: State listed as endangered
ST: State listed as threatened
SC: State Candidate for listing
SR: State Rare
CRPR 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere
CRPR 2A: Plants presumed extirpated in California but common elsewhere
CRPR 2B: Plants rare, threatened, or endangered in California but more common elsewhere
CRPR 3: Review List: Plants about which more information is needed
CRPR 4: Watch List: Plants of limited distribution
.1 Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
.3 Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

APPENDIX B

Special Status Wildlife Species with Potential to Occur

Special Status Wildlife Species with Potential to Occur

Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
Amphibians				
Ambystoma californiense	California tiger salamander	FT/ST, WL	Annual grassland, valley–foothill hardwood, and valley–foothill riparian habitats; vernal pools, other ephemeral pools, and (uncommonly) along stream courses and man-made pools if predatory fishes are absent	**Not expected to occur**. No suitable grassland, vernal pool, or other ephemeral pool for breeding and aestivation present. The nearest documented occurrence for this species is located approximately 2 miles east of Upper Stevens Creek County Park (CDFW 2020).
Aneides flavipunctatus niger	Santa Cruz black salamander	None/SSC	Restricted to mesic forests in the fog belt of the outer Coast Range of San Mateo, Santa Cruz, and Santa Clara counties. Mixed deciduous and coniferous woodlands and coastal grasslands. Occurs in moist streamside microhabitats and is found under rocks, talus, and damp woody debris.	**High potential to occur**. The forest and woodlands onsite provide potentially suitable habitat for this species. There are numerous previously documented occurrences of this species within 1 mile of the project site (CDFW 2020).
Dicamptodon ensatus	California giant salamander	None/SSC	Known from wet coastal forests and chaparral near streams and seeps from Mendocino Co. south to Monterey Co. and east to Napa Co. Aquatic larvae found in cold, clear streams, occasionally in lakes and ponds. Adults known from wet forests under rocks and logs near streams and lakes.	**Present**. Streams and forests onsite provide suitable habitat for this species. Multiple previously documented occurrences of this species are present in both Upper Stevens Creek and Sanborn County Parks (CDFW 2020).
Rana boylii	foothill yellow-legged frog	None/SSC, PST	Rocky streams and rivers with open banks in forest, chaparral, and woodland	**High potential to occur**. Streams within the forest and woodland onsite provide potentially suitable habitat. There are multiple previously documented occurrences within 1 mile of the project site; however, these occurrences date from the 1930's and may not be currently accurate (CDFW 2020).
Rana draytonii	California	FT/SSC	Lowland streams, wetlands, riparian	**Low potential to occur**. One pond

	red-legged frog		woodlands, livestock ponds; dense, shrubby or emergent habitat associated with deep, still or slow-moving water; uses adjacent uplands	occurs on Sanborn County Park that may provide potentially suitable habitat for this species. There are multiple documented occurrences of this species within 2 miles of the project site (CDFW 2020).
Taricha rivularis	red-bellied newt	None/SSC	Redwood forests (and sometimes other forest types) along coastal drainages from Humboldt County south to Sonoma County, inland to Lake County. Lives in terrestrial habitats, juveniles generally underground, adults active at surface in moist environments. Will migrate over 1 km to breed, typically in streams with moderate flow and clean rocky substrate.	**Present**. Drainages in the woodland onsite provide suitable breeding habitat for this species. Several documented occurrences for this species are present in Upper Stevens Creek County Park (CDFW 2020).
Reptiles				
Actinemys marmorata	northwestern pond turtle	None/SSC	Slow-moving permanent or intermittent streams, ponds, small lakes, and reservoirs with emergent basking sites; adjacent uplands used for nesting and during winter	**Present**. The pond at Sanborn County Park provides suitable habitat for this species, and it has been previously documented there (CDFW 2020).
Anniella pulchra	northern California legless lizard	None/SSC	Coastal dunes, stabilized dunes, beaches, dry washes, valley–foothill, chaparral, and scrubs; pine, oak, and riparian woodlands; associated with sparse habitat and sandy or loose, loamy soils	**Not expected to occur**. There are no suitable soil substrates for this species. There are no previously documented occurrences of this species within 5 miles of the project site (CDFW 2020).
Thamnophis sirtalis tetrataenia	San Francisco garter snake	FE/FP, SE	Wide range of habitats including grasslands or wetlands adjacent to ponds, marshes, and sloughs	**High potential to occur**. The pond at Sanborn County Park provides potentially suitable habitat for this species. A non-specific area occurrence intersects Upper Stevens Creek County Park (CDFW 2020).
Birds				
Accipiter cooperii	Cooper's hawk	None/WL	Nests and forages in dense stands of live oak, riparian woodlands, or other woodland	**Moderate potential to occur**. Forest and woodland adjacent to the pond at

(nesting)			habitats often near water	Sanborn County Park provide potentially suitable habitat for this species.
Agelaius tricolor (nesting colony)	tricolored blackbird	BCC/SSC, ST	Nests near freshwater, emergent wetland with cattails or tules, but also in Himalayan blackberrry; forages in grasslands, woodland, and agriculture	**Not expected to occur**. There is no suitable nesting or foraging substrates present in the project site.
Aquila chrysaetos (nesting & wintering)	golden eagle	BCC/FP, WL	Nests and winters in hilly, open/semi-open areas, including shrublands, grasslands, pastures, riparian areas, mountainous canyon land, open desert rimrock terrain; nests in large trees and on cliffs in open areas and forages in open habitats	**Not expected to occur**. No suitable nesting or foraging habitat present.
Asio otus (nesting)	long-eared owl	None/SSC	Nests in riparian habitat, live oak thickets, other dense stands of trees, edges of coniferous forest; forages in nearby open habitats	**High potential to occur**. Forest habitat onsite provides potentially suitable habitat for this species. One previously documented occurrence for this species intersects Upper Stevens Creek County Park; however, it was most recently updated in the 1980's (CDFW 2020).
Athene cunicularia (burrow sites & some wintering sites)	burrowing owl	BCC/SSC	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows	**Not expected to occur**. No suitable habitat present.
Brachyramphus marmoratus (nesting)	marbled murrelet	FT/SE	Nests in old-growth coastal forests, forages in subtidal and pelagic habitats	**Moderate potential to occur**. Forest habitat onsite provides potentially suitable habitat for this species. There are several previously documented occurrence of this species approximately 2.5 miles west of Upper Stevens Creek County Park (CDFW 2020).

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Buteo swainsoni (nesting)	Swainson's hawk	BCC/ST	Nests in open woodland and savanna, riparian, and in isolated large trees; forages in nearby grasslands and agricultural areas such as wheat and alfalfa fields and pasture	**Not expected to occur**. No suitable nesting or foraging habitat present.
Charadrius alexandrinus nivosus (nesting)	western snowy plover	FT, BCC/SSC	On coasts nests on sandy marine and estuarine shores; in the interior nests on sandy, barren or sparsely vegetated flats near saline or alkaline lakes, reservoirs, and ponds	**Not expected to occur**. No suitable marine or estuarine habitat present.
Circus hudsonius (nesting)	northern harrier	None/SSC	Nests in open wetlands (marshy meadows, wet lightly-grazed pastures, old fields, freshwater and brackish marshes); also in drier habitats (grassland and grain fields); forages in grassland, scrubs, rangelands, emergent wetlands, and other open habitats	**Not expected to occur**. The site is outside of the species' known geographic range and there is no suitable marsh habitat present.
Coturnicops noveboracensis	yellow rail	BCC/SSC	Nesting requires wet marsh/sedge meadows or coastal marshes with wet soil and shallow, standing water	**Not expected to occur**. No suitable Marsh habitat present.
Cypseloides niger (nesting)	black swift	BCC/SSC	Nests in moist crevices, caves, and cliffs behind or adjacent to waterfalls in deep canyons; forages over a wide range of habitats	**Not expected to occur.** No suitable nesting habitat present.
Elanus leucurus (nesting)	white-tailed kite	None/FP	Nests in woodland, riparian, and individual trees near open lands; forages opportunistically in grassland, meadows, scrubs, agriculture, emergent wetland, savanna, and disturbed lands	**Not expected to occur**. No suitable foraging habitat present.
Falco peregrinus anatum (nesting)	American peregrine falcon	FDL, BCC/FP, SDL	Nests on cliffs, buildings, and bridges; forages in wetlands, riparian, meadows, croplands, especially where waterfowl are present	**Not expected to occur**. No suitable cliff nesting habitat present.
Geothlypis trichas sinuosa	saltmarsh common yellowthroat	BCC/SSC	Nests and forages in emergent wetlands including woody swamp, brackish marsh, and freshwater marsh	**Not expected to occur.** No suitable swamp or marsh habitat present.
Laterallus jamaicensis	California black rail	BCC/FP, ST	Tidal marshes, shallow freshwater margins, wet meadows, and flooded grassy habitat;	**Not expected to occur**. No suitable nesting or foraging habitat present.

coturniculus			suitable habitats are often supplied by canal leakage in Sierra Nevada foothill populations	
Melospiza melodia pusillula	Alameda song sparrow	BCC/SSC	Nests and forages in tidal saltmarsh	**Not expected to occur**. No suitable tidal marsh habitat present.
Pandion haliaetus (nesting)	osprey	None/WL	Large waters (lakes, reservoirs, rivers) supporting fish; usually near forest habitats, but widely observed along the coast	**Not expected to occur**. No suitable foraging habitat present nearby.
Progne subis (nesting)	purple martin	None/SSC	Nests and forages in woodland habitats including riparian, coniferous, and valley foothill and montane woodlands; in the Sacramento region often nests in weep holes under elevated freeways	**Low potential to occur**. Although the woodland and forest onsite provides potentially suitable habitat, this species has not been previously documented within 5 miles of the project site (CDFW 2020).
Rallus obsoletus obsoletus	Ridgway's rail	FE/SE, FP	Coastal salt or brackish marshes	**Not expected to occur**. No suitable coastal marsh habitat present.
Rynchops niger (nesting colony)	black skimmer	BCC/SSC	Nests on barrier beaches, shell banks, spoil islands, and saltmarsh; forages over open water; roosts on sandy beaches and gravel bars	**Not expected to occur**. No suitable beach or saltmarsh habitat present.
Sternula antillarum browni (nesting colony)	California least tern	FE/FP, SE	Forages in shallow estuaries and lagoons; nests on sandy beaches or exposed tidal flats	**Not expected to occur**. No suitable estuary, lagoon, or beach habitat present.
Fishes				
Eucyclogobius newberryi	tidewater goby	FE/SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County, to the mouth of the Smith River	**Not expected to occur**. No suitable brackish water habitat present.
Oncorhynchus kisutch pop. 4	coho salmon - central California coast ESU	FE/SE	Streams and small freshwater tributaries during first half of life cycle and estuarine and marine waters of the Pacific Ocean during the second half of life cycle. Spawns in small streams with stable gravel substrates.	**Not expected to occur**. No suitable stream habitat present.
Oncorhynchus mykiss irideus	steelhead - central	FT/None	Coastal basins from Redwood Creek south to the Gualala River, inclusive; does not include	**Not expected to occur**. No suitable stream habitat present.

pop. 8	California coast DPS		summer-run steelhead	
Spirinchus thaleichthys	longfin smelt	FC/ST	Aquatic, estuary	**Not expected to occur**. No suitable estuary habitat present.
Mammals				
Antrozous pallidus	pallid bat	None/SSC	Grasslands, shrublands, woodlands, forests; most common in open, dry habitats with rocky outcrops for roosting, but also roosts in man-made structures and trees	**Not expected to occur**. No open, dry habitat with rocky outcrops for roosting present.
Corynorhinus townsendii	Townsend's big-eared bat	None/SSC	Mesic habitats characterized by coniferous and deciduous forests and riparian habitat, but also xeric areas; roosts in limestone caves and lava tubes, man-made structures, and tunnels	**Moderate potential to occur**. The forest habitat provides potentially suitable habitat. There are two previously documented occurrences within 2 miles of the project site (CDFW 2020).
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	None/SSC	Forest habitats with a moderate canopy and moderate to dense understory	**Moderate potential to occur**. The forest onsite provides potentially suitable habitat; however, this species has not been previously documented within 5 miles of the project site (CDFW 2020).
Reithrodontomys raviventris	salt-marsh harvest mouse	FE/FP, SE	Saline emergent wetlands, preference for pickleweed saline emergent wetlands; also uses adjacent grasslands	**Not expected to occur**. No suitable saline emergent wetland habitat present.
Sorex vagrans halicoetes	salt-marsh wandering shrew	None/SSC	Saltmarsh inundated daily by tidal waters	**Not expected to occur**. No suitable saline emergent wetland habitat present.
Taxidea taxus	American badger	None/SSC	Dry, open, treeless areas; grasslands, coastal scrub, agriculture, and pastures, especially with friable soils	**Not expected to occur**. No suitable open treeless habitat present.
Invertebrates				
Bombus crotchii	Crotch bumble bee	None/PSE	Open grassland and scrub communities supporting suitable floral resources.	**Not expected to occur**. No suitable scrub habitat present.
Bombus	western	None/PSE	Once common and widespread, species has	**Low potential to occur**. There is limited

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occidentalis	bumble bee		declined precipitously from central California to southern British Columbia, perhaps from disease	nesting and foraging habitat onsite.
Cicindela ohlone	Ohlone tiger beetle	FE/None	Remnant native grasslands with California oatgrass (Danthonia californica) and purple needlegrass (Stipa pulchra) in Santa Cruz County	**Not expected to occur.** No suitable habitat present.
Euphilotes enoptes smithi	Smith's blue butterfly	FE/None	Sand dunes, scrub, chaparral, grassland, and their ecotones	**Not expected to occur**. No suitable sand dune habitat present.
Euphydryas editha bayensis	Bay checkerspot butterfly	FT/None	Serpentine or serpentine-like grasslands	**Not expected to occur**. No suitable habitat present.
Polyphylla barbata	Mount Hermon (=barbate) June beetle	FE/None	Known only from sand hills in vicinity of Mount Hermon, Santa Cruz County	**Not expected to occur**. The project site is outside the known geographic range for this species and there is no suitable habitat.
Speyeria zerene myrtleae	Myrtle's silverspot butterfly	FE/None	Coastal dunes, coastal scrub, and coastal prairie	**Not expected to occur**. There is no suitable coastal dune, scrub, or prairie habitat present.
Trimerotropis infantilis	Zayante band-winged grasshopper	FE/None	Isolated sandstone deposits in the Santa Cruz Mountains (the Zayante Sand Hills ecosystem)	**Not expected to occur**. The project site is outside the known geographic range for this species and there is no suitable habitat.

APPENDIX C

Tree Protection Measures

Tree Protection Measures

The following sections are included as general guidelines for tree protection from construction impacts. The measures presented should be monitored by arborists and enforced by contractors and developers for maximum benefit to the trees.

Tree Protection Measures Prior to Construction

Prior to any grading activity, preserved trees with canopies that fall within 30 feet of construction activity shall be protected by fencing and signage. All contractors shall be made aware of the tree protection measures. A project arborist shall be assigned to monitor tree health and construction activity near retained trees on site. The project arborist shall be an International Society of Arboriculture (ISA) Certified Arborist.

Inspection: Any large tree proposed for preservation on site should be thoroughly inspected for internal or subterranean decay by a qualified arborist prior to construction activity to determine if retention/protection on site is a viable management option.

Site Preparation: Tree removal, pruning, and inspection should be conducted during site preparation activities. Where permitted by the City, tree removal and pruning activity should be conducted according to industry standards (ANSI A300).

Fencing and Signage: A 6-foot high, chain link fence with tree protection signs shall be erected around all trees (or tree groups) to be preserved. The protective fence should be installed at a distance from the trunk that is equal to the dripline radius, or a distance approved by the City Arborist. This will delineate the tree protection zone and prevent unwanted activity in and around the trees in order to reduce soil compaction in the root zones of the trees and other damage from heavy equipment. Fences are to be mounted on two-inch diameter galvanized iron posts, driven into the ground to a depth of at least 2-feet at no more than 10-foot spacing. In areas where fencing is located on paving or concrete that will not be demolished, then the posts may be supported by an appropriate grade level concrete base. Tree protection signs should be attached to every fourth post. The contractor shall maintain the fence to keep it upright, taut, and aligned at all times. Fencing shall be removed only after all construction activities are complete.

Pre-Construction Meeting: A pre-construction meeting shall be held between all contractors (including grading, tree removal/pruning, builders, etc.) and the arborist. The arborist will instruct the contractors on tree protection practices and answer any questions. All equipment operators and spotters, assistants, or those directing operators from the ground, shall provide written acknowledgement of their receiving tree protection training. This training shall include information on the location and marking of protected trees, the necessity of preventing damage, and the discussion of work practices that will accomplish such.

Protection and Maintenance during Construction

Once construction activities have begun the following measures shall be adhered to:

Avoidance: Signs, ropes, cables, or any other items shall not be attached to any preserved tree.

Equipment Operation and Storage: Operating heavy machinery around the root zones of trees will increase soil compaction, which decreases soil aeration and subsequently reduces water penetration in the soil. All heavy equipment and vehicles shall stay out of the fenced tree protection zone, unless where specifically approved in writing by the City Arborist and under the supervision of an ISA Certified Arborist.

Tree Protection Measures

Storage and Disposal: Do not store or discard any supply or material, including paint, lumber, concrete overflow, etc. within the fenced tree protection zone. Remove all foreign debris within the fenced tree protection zone; it is important to leave the duff, mulch, chips, and leaves around the retained trees for water retention and nutrients. Avoid draining or leakage of equipment fluids near retained trees. Fluids such as: gasoline, diesel, oils, hydraulics, brake and transmission fluids, paint, paint thinners, and glycol (anti-freeze) should be disposed of properly. Keep equipment parked outside of the fenced tree protection zone of retained trees to avoid the possibility of leakage of equipment fluids into the soil. The effect of toxic equipment fluids on the retained trees could lead to decline and death.

Grade Changes: Grade changes of more than 2 feet, including adding fill, are not permitted within 30 feet of a tree's drip line, without special written authorization and under supervision by an ISA Certified Arborist. Lowering the grade within 30 feet of a tree's dripline will necessitate cutting main support and feeder roots, jeopardizing the health and structural integrity of the tree(s). Adding soil, even temporarily, on top of the existing grade will compact the soil further, and decrease both water and air availability to the trees' roots.

Moving Construction Materials: Care will be taken when moving equipment or supplies near the trees, especially overhead. Avoid damaging the tree(s) when transporting or moving construction materials and working around retained trees (even outside of the fenced tree protection zone). Above ground tree parts that could be damaged (e.g., low limbs, trunks) should be flagged with red flagging. If contact with the tree crown is unavoidable, prune the conflicting branch(es) using ISA or ANSI A300 standards.

Trenching: All trenching shall be outside of the fenced tree protection zone. Roots primarily extend in a horizontal direction forming a support base to the tree similar to the base of a wineglass. Where trenching is necessary in areas that contain tree roots, prune the roots using a root pruner. All cuts should be clean and sharp, to minimize ripping, tearing, and fracturing of the root system. The trench should be made no deeper than necessary.

Irrigation: Trees that have been substantially root pruned (30% or more of their root zone) will require irrigation for the first twelve months. The first irrigation should be within 48 hours of root pruning. They should be deep watered every two to four weeks during the summer and once a month during the winter (adjust accordingly with rainfall). One irrigation cycle should thoroughly soak the root zones of the trees to a depth of 3 feet. The soil should dry out between watering; avoid keeping a consistently wet soil. Designate one person to be responsible for irrigating (deep watering) the trees. Check soil moisture with a soil probe before irrigating. Irrigation is best accomplished by installing a temporary above ground micro-spray system that will distribute water slowly (to avoid runoff) and evenly throughout the fenced tree protection zone ***but never soaking the area located within 6- feet of the tree trunk, especially during warmer months***. For trees not subject to root pruning activity, the amount of irrigation provided shall not be changed from that which was provided prior to the commencement of construction activity.

Canopy Pruning: All pruning shall be completed under the direction of an ISA Certified Arborist and using ISA guidelines. Only conflicting limbs and dead wood shall be removed from tree canopies.

Washing: Periodic washing of the foliage is recommended during construction but no more than once every two weeks. Washing should include the upper and lower leaf surfaces and the tree bark. This should continue beyond the construction period at a less frequent rate with a high-powered hose only

in the early morning hours. Washing will help control dirt/dust buildup that can lead to mite and insect infestations.

Maintenance after Construction

Once construction is complete the tree protection fencing may be removed and the following measures performed to sustain and enhance the vigor of the preserved trees.

Mulch: Provide a 4-inch mulch layer under the canopy of trees. Mulch should include clean, organic mulch that will provide long-term soil conditioning, soil moisture retention, and soil temperature control.

Pruning: Pruning should *only* be done to maintain clearance and remove broken, dead or diseased branches. Pruning shall only take place following a recommendation by an ISA Certified Arborist and performed under the supervision of an ISA Certified Arborist. No more than 15% of the canopy shall be removed at any one time. All pruning shall conform to ISA or ANSI A300 standards.

Watering: Retained trees on site shall be watered as they were prior to the commencement of construction activity. Supplemental irrigation may be necessary for twelve months following substantial root pruning.

Watering Adjacent Plant Material: All plants near the trees shall be compatible with water requirements of said trees. Watering regime included in the site's landscape plan shall be developed with consideration for the water needs of retained trees.

Spraying: If the trees are maintained in a healthy state, regular spraying for insect or disease control should not be necessary. If a problem does develop, an ISA Certified Arborist should be consulted; the trees may require application of insecticides to prevent the intrusion of bark-boring beetles and other invading pests. All chemical spraying should be performed by a licensed applicator under the direction of a licensed pest control advisor.