Gaviota Coast Community Wildfire Protection Plan

February 2023

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The California Department of Forestry and Fire Protection awarded a Fire Prevention Grant to the Santa Barbara County Fire Safe Council to develop the Community Wildfire Protection Plan for the Gaviota Coast communities. The Fire Prevention Grants are part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
BMPs	best management practices
CAL FIRE	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CalVTP	California Vegetation Treatment Program
CCD	Channel Coast District
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CERT	Community Emergency Response Team
CFC	California Fire Code
community	Gaviota Coast community
County	County of Santa Barbara
CWPP	Community Wildfire Protection Plan
DPR	California Department of Parks and Recreation
EIR	Environmental Impact Report
ESH	Environmentally Sensitive Habitat
FEMA	Federal Emergency Management Agency
FHSZ	Fire Hazard Severity Zone
GCP	Gaviota Coast Plan
GIS	geographic information system
HFRA	Healthy Forest Restoration Act
IFTDSS	Interagency Fuel Treatment Decision Support System
LBP	Landscape Burn Probability
MRF	Materials Recovery Facility
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NWCG	National Wildfire Coordinating Group
PRC	California Public Resources Code
RAWS	Remote Automated Weather Station
SBC Fire	Santa Barbara County Fire Department
SBCFSC	Santa Barbara County Fire Safe Council
SBC Sheriff	Santa Barbara County Sheriff's Department
SDI	Suppression Difficulty Index
SRA	State Responsibility Area
USFS	United States Forest Service
WUI	wildland urban interface

Executive Summary

The Santa Barbara County Fire Safe Council, in coordination with the Santa Barbara County Fire Department, is proposing implementation of this comprehensive, coordinated Community Wildfire Protection Plan (CWPP) for the Gaviota Coast community (community). The community covered by this CWPP encompasses 106,002 acres along the Gaviota Coast (Plan Area), and includes a broad range of land uses, including agriculture, ranching, recreation, residential, conservation, and industrial. Land in the Plan Area is 52% privately owned, with the remainder publicly owned or otherwise dedicated for conservation purposes. The Plan Area is predominately rural agriculture that has been operated by generations of farmers and ranchers. Communities within the Plan Area are small and dispersed, owing to the Plan Area's rich agricultural and ranching history.

The Plan Area exhibits a complex wildfire environment that presents a significant wildfire risk due to steep and varied terrain, a mosaic of different vegetation types, and a wildland-urban intermix development pattern that can exacerbate wildfire risk. The Plan Area, situated along the southern flank of the Santa Ynez Mountains, has a significant history of large and damaging wildland fires, including a few over the past several years: the 2016 Sherpa Fire (7,465 acres), the 2017 Whittier Fire (18,412 acres), and the 2021 Alisal Fire (16,970 acres). Post-fire effects are also a real and recurring risk to life, property, and Plan Area resources. The Santa Barbara County Fire Safe Council and the Santa Barbara County Fire Department recognize the catastrophic impact of wildfire in the Gaviota Coast community and are committed to reducing hazards and risk through implementation of this CWPP.

Development of this CWPP included an assessment of wildfire hazard, which involved modeling burn probability, fire intensity, and spotting (ember) potential under extreme wind and weather conditions, consistent with those experienced during Sundowner wind events. Other wildfire hazard variables were also evaluated for the Plan Area, including terrain, vegetation (fuels), vegetation age, suppression difficulty, fire and ignition history, and development patterns. Community values were also evaluated to understand their potential wildfire risk exposure. These values included houses/structures, life safety, critical infrastructure (roads, transportation networks, communications facilities, waste management facilities, weather stations, transmission lines, oil and gas infrastructure, and public and water services), economics, ranching and agriculture, recreation, and cultural and natural resources.

CWPP development also involved community and stakeholder outreach, including regular communication and coordination amongst the Project Team members, and routine meetings with the broader Development Team, which included community representatives from different parts of the Plan Area and various land management agencies/entities. Additionally, two community meetings were held to discuss the CWPP, an online survey was created to solicit community feedback, and a dedicated webpage was created on the Santa Barbara County Fire Safe Council website to facilitate delivery and sharing of CWPP-related information. Finally, five field visits were conducted over the course of CWPP development to better understand field conditions, which also allowed for meetings with various stakeholders to better understand community concerns related to wildfire.

This CWPP includes an Action Plan that presents a series of recommendations intended to guide implementation of the CWPP. The recommendations focus on vegetation management, structural ignitability, community outreach and education, access and evacuation, funding, infrastructure and communications, and post-fire recovery. Vegetation management recommendations include identification of management types, standards, and techniques, and include best management practices to avoid or minimize resource impacts. The recommendations included in this CWPP are intended to achieve the stated goals of protecting lives, property, natural resources, and other values threatened by wildland fire while considering the unique nature of the Gaviota Coast community.

1 Introduction

Upper Refugio Canyon following the 2021 Alisal Fire.

The Gaviota Coast community (community) is an unincorporated area within Santa Barbara County. The landscape that comprises the Gaviota Coast exhibits a complex wildfire environment that presents a significant risk to communities, public and firefighter safety, land use practices, and the built and natural environments. This portion of Santa Barbara County has been subject to numerous damaging wildland fires, is influenced by local extreme wind and weather conditions (including Sundowner wind events), has steep and varied terrain with a mosaic of different vegetation types and ages, and is characterized predominantly by a wildland-urban intermix development pattern that can exacerbate wildfire risk. The area, situated along the southern flank of the Santa Ynez Mountains, has a significant history of large and damaging wildland fires, including a few in the past several years: the 2016 Sherpa Fire (7,465 acres), the 2017 Whittier Fire (18,412 acres), and the 2021 Alisal Fire (16,970 acres) (CAL FIRE 2022b, 2022c). Post-fire debris flows in the Plan Area are a real and recurring risk to life, property, and resources.

As a key component of the Healthy Forest Restoration Act of 2003, a Community Wildfire Protection Plan (CWPP) serves as a mechanism for community input and identification of areas presenting high wildfire risk, as well as identification of potential projects intended to mitigate such risk. Further, the CWPP process is intended to provide the community a forum for identifying values at risk from wildfire, which may include people, property, natural resources, agricultural lands, cultural resources, economic interests, and infrastructure. The identification of these values at risk strongly influences the potential wildfire hazard mitigation projects identified in this CWPP.

This CWPP was developed by the Santa Barbara County Fire Safe Council (SBCFSC), in coordination with the Santa Barbara County Fire Department (SBC Fire), for the Gaviota Coast (Plan Area) community, with input and direction from stakeholders, agency representatives, and community members. The purpose of this collaboratively prepared CWPP is to serve as a fire protection planning document that presents the community's physical characteristics, wildfire hazard, assets at risk from wildfire, wildfire risk reduction approaches, vegetation/fuel management projects, and goals and action items intended to reduce wildfire risk in the Plan Area. The goal of this CWPP is to protect lives, property, assets, and Plan Area resources threatened by wildland fire.

1.1 Purpose and Need

The Gaviota Coast community and the County of Santa Barbara (County) recognize the potential for significant loss of life, property, and resources from wildland fire. The County, through SBC Fire, has a history of proactively addressing wildfire risk reduction through implementation of various pre-fire programs. Additionally, the SBCFSC has taken on a lead role in furthering plans and programs throughout Santa Barbara County intended to mitigate wildfire risk to communities. Through coordination and collaboration in recent years, SBC Fire and the SBCFSC have identified the need for a CWPP for the Gaviota Coast.

Additionally, the County's Gaviota Coast Plan (GCP) (County of Santa Barbara 2016a), adopted by the County Board of Supervisors in 2016, called for the County to research and respond to hazards threatening the Gaviota Coast. The GCP directed the County to seek grant funding for projects and programs that address hazards, including wildfire. As such, the GCP identified the need to develop a CWPP for the Gaviota Coast Plan Area through Action LU-10. Further, in 2016, SBC Fire began collaborating with Gaviota Coast community members regarding the CWPP development process.

This CWPP fulfills Action LU-10 of the GCP, which identifies the need for a CWPP for at-risk communities on the Gaviota Coast. The intended result is a comprehensive, coordinated plan to mitigate the impact of wildland fire in the Plan Area. This CWPP evaluates the Plan Area's fire environment and the risk posed by wildland fire, identifies actions to reduce the threat to the community from wildland fire, and identifies and prioritizes vegetation management projects to reduce wildfire threat. Intended users of this CWPP include the Gaviota Coast community, the SBCFSC, SBC Fire, and other agencies that own or manage land in the Plan Area.

1.2 Plan Goals and Objectives

The following goals were identified during development of this CWPP:

- Reduce wildfire hazard within the Plan Area to enhance community and firefighter safety.
- Enhance protection of values at risk from wildfire, including structures, infrastructure, agricultural resources, recreational resources, and natural and cultural resources.
- Integrate fire and fuels management activities with land management priorities.
- Increase community awareness and education about practices to reduce wildfire risk, including defensible space, fuels reduction, and structural hardening.
- Encourage communication and coordination of fire and fuels management activities with affected stakeholders.

1.3 Community Wildfire Protection Plan Planning Process

The CWPP planning process was collaborative and engaged stakeholders and community members. This planning process was used to identify the CWPP goals, define community values and assets at risk from wildfire, and identify wildfire risk mitigation projects to achieve the CWPP's goals. The process also used wildfire hazard modeling to better understand wildfire threat in the Plan Area. The action items included in this CWPP were developed to incorporate community feedback and address wildfire risk along the Gaviota Coast. The CWPP planning process identifies how and where landowners, land managers, residents, community groups, and government agencies can implement wildfire mitigation actions within the Plan Area.

This CWPP complies with the requirements for CWPPs, as defined by the 2003 Healthy Forests Restoration Act:

- **Collaboration**: CWPPs must be collaboratively developed. Local and state officials must meaningfully involve federal agencies that manage the land in vicinity of the community, other interested parties, and non-governmental stakeholders.
- **Prioritized Fuel Reduction:** The CWPP must identify and prioritize areas for fuel reduction treatments on federal and non-federal lands. The CWPP must recommend types and methods of treatments that, if completed, would reduce the wildfire risk to the community.
- **Treatment of Structural Ignitability:** The CWPP must recommend measures that homeowners and communities can undertake to reduce the ignitability of structures throughout the Plan Area.

1.3.1 Initial Planning Efforts

In 2016, SBC Fire staff began collaborating with Gaviota Coast community members, local stakeholder groups, and County staff to initiate the CWPP development process. This effort arose out of interest expressed by community members to manage wildfire risk along the Gaviota Coast. In late 2017, residents of the Gaviota Coast formed a steering committee to begin the process of developing a CWPP. Multiple community meetings were held to educate residents and encourage engagement in the CWPP development process. In summer 2019, this steering committee approached the SBCFSC about assisting with development of the CWPP. The SBCFSC Board of Directors voted unanimously to sponsor the CWPP and seek grant funding to support it. SBCFSC applied for the 2019 California Climate Investments Fire Prevention Grant and was awarded grant funding in August 2020 to develop a CWPP for the Gaviota Coast community.

1.3.2 County of Santa Barbara CWPP Process

The County Board of Supervisors approved a CWPP development process for the County that identifies the need to engage with interested parties and to collaborate with applicable federal and state agencies. The development process includes eight steps that describe the standardized approach for developing CWPPs in the County. The following summarizes the eight steps identified in the County's CWPP development process, with additional information regarding meetings and collaboration provided in the following sections.

1. **Convene the CWPP Development Team** – The Development Team is discussed in Section 1.3.2.1.
2. **CWPP Development Team Involves Applicable Federal and State Agencies** – CWPP agency representatives are discussed in Section 1.3.2.2.
3. **CWPP Development Team Engages Interested Parties** – CWPP development communications are discussed in Section 1.3.3.
4. **Establish a Community Base Map and Boundary Area** – The extent of the Plan Area and associated maps are presented in Section, Plan Area Description.
5. **Develop a Community Risk Assessment** – The risk assessment completed for this CWPP is presented in Section 5, Values at Risk.
6. **Recommend Community Hazard Reduction Priorities and Measures to Reduce Structural Ignitability** – Hazard reduction and structural ignitability recommendations are presented in Section 6, Action Plan.
7. **Develop Draft CWPP** – A draft CWPP was prepared and completed in July 2022 and posted to the CWPP's web page for community and stakeholder review and comment.
8. **Finalize and Submit the CWPP** – Following the community and stakeholder review and comment period, the CWPP was finalized and signed, as noted in Section 1.5, Signatories.

1.3.2.1 Development Team

The Development Team members were selected by the County Fire Marshal and CWPP Project Manager and consisted primarily of individuals involved in the Gaviota Coast steering committee established in 2017. Given the large size of the Plan Area, Development Team members served as representatives of their respective communities or neighborhoods. In many cases, Development Team members represented a relatively large geographic area due to agricultural or open space land uses that resulted in low housing densities. Many Development Team members were also active community representatives during preparation of the GCP. These members include individuals who are at risk to wildland fire or who would be impacted by implementation of the CWPP. The Development Team was responsible for engaging with and representing their communities; attending CWPP meetings; providing feedback on CWPP drafts; providing recommendations for projects; and, in some cases, facilitating or hosting field assessments. Development Team meetings were held as identified below:

Development Team meeting at El Capitan Canyon on June 25, 2021.

- **June 25, 2021:** Meeting held at El Capitan Canyon to introduce the CWPP concept and solicit preliminary feedback regarding wildfire risk reduction in the Plan Area.
- **August 13, 2021:** Meeting held via Zoom to discuss the fire risk present in the Plan Area, present Plan Area base maps, discuss Plan Area statistics and preliminary wildfire hazard modeling results, discuss the CWPP development process, and solicit feedback from the Development Team.
- **March 24, 2022:** Meeting held via Zoom to discuss the results of the wildfire hazard assessment and solicit input from Development Team members on priority projects to be included in the CWPP.
- **May 2, 2022:** Meeting held via Zoom to review the draft list of recommendations and projects identified for inclusion in the CWPP, and to solicit feedback from Development Team members on additions or modifications to the list.

Table 1 identifies the members of the CWPP Development Team.

Table 1. Development Team Members

Members	Role/Representation
Scott Coffman	Project Manager, Santa Barbara County Fire Safe Council
Rob Hazard	Fire Marshal, Santa Barbara County Fire Department
Paul Van Leer	President, Santa Barbara County Fire Safe Council Representative, Las Varas Ranch
Moses Katkowski	Representative, The Nature Conservancy (Dangermond Preserve)

Table 1. Development Team Members

Members	Role/Representation
Glenne Tietzer Nat Cox Scott Anderson Tyson Butzke	Representatives, California Department of Parks and Recreation
Micah Salazar	Representative, Reagan Ranch
Josh Farberow Jackson James	Representatives, Hollister Ranch
Guner Tautrim	Representative, Gaviota Coast Conservancy, Venadito Canyon
Jay Ruskey	Representative, Farren Road Community
Jim Swoboda	Representative, El Capitan Estates
John Warner	Representative, Arroyo Hondo Preserve
Larry Miller	Representative, El Capitan Canyon Resort
Teddy Travers	Representative, Dos Pueblos Canyon
Nic Elmquist	Secretary, Santa Barbara County Fire Safe Council
Scott Eckardt	Consultant, Dudek

A subset of the Development Team (Project Team) met and communicated regularly throughout development of the CWPP. This Project Team was responsible for coordinating and facilitating CWPP meetings, conducting field assessments, coordinating with landowners and agencies, facilitating CWPP communications, and drafting the CWPP. The Project Team consisted of Scott Coffman (SBCFSC), Rob Hazard (SBC Fire), Paul Van Leer (SBCFSC), and Scott Eckardt (Dudek).

1.3.2.2 Agency Representatives

On March 1, 2022, an agency meeting was held to introduce the CWPP planning process and solicit input. The meeting was held and facilitated by the Project Team and was attended by 21 individuals representing the following federal, state, and local agencies:

- California Department of Fish and Wildlife
- California Department of Forestry and Fire Protection
- California Department of Parks and Recreation
- California Department of Transportation (Caltrans)
- Natural Resources Conservation Service
- Santa Barbara County Executive Office
- Santa Barbara County Fire Safe Council
- Santa Barbara County Office of Emergency Management
- Santa Barbara County Planning Department
- Santa Barbara County Public Works
- United States Forest Service (USFS), Los Padres National Forest
- Vandenberg Air Force Base (VAFB), Fire Department

Issues identified by agency representatives during the CWPP development process included the extent of the wildland-urban interface (WUI) boundary for the CWPP, cross-boundary coordination, utilization of the Good Neighbor Authority with the USFS, CWPP wildfire hazard assessment as it relates to the County's General Plan Safety Element update, funding opportunities and constraints, evacuation, communication issues in the Plan Area with farm and ranch workers, the impact of wildfire on insurance rates, ecological restoration approaches to fuel management, and the need to protect sensitive species in the Plan Area.

1.3.2.3 Working Group

The Working Group consisted of representatives from SBC Fire, County Planning and Development, the County Executive Officer, and the California Department of Forestry and Fire Protection (CAL FIRE) Regional Forester. The Working Group provided guidance during the CWPP development process to ensure the County was engaged in CWPP development. The County Fire Marshal was part of the Project Team and thus provided guidance throughout development of the CWPP. A meeting with the Working Group is forthcoming.

1.3.3 Plan Development Communications

Several approaches were undertaken to communicate with the Gaviota Coast community and solicit input regarding the CWPP and the CWPP development process, including creation and hosting of a CWPP web page, development of an online survey, and hosting community meetings. Several meetings were also held in the field with landowners and land managers, coinciding with assessments of field conditions. Because COVID-19 prohibited some in-person meetings, those meetings were held remotely via Zoom. A discussion of communication efforts conducted in support of CWPP development is presented in the following sections.

1.3.3.1 Web Page

During the CWPP development process, a CWPP-specific web page was created and hosted on the SBCFSC website. This web page hosted CWPP information, maps, a link to the community survey, calendar items, videos of web-based meetings and presentation materials, and the draft CWPP, and was maintained for the duration of the CWPP development process. The web page allowed for community members, stakeholders, and the public to access CWPP-related information, sign up for email alerts, provide written feedback or comments on the Draft CWPP and the CWPP development process, and to express overall concerns or input regarding wildfires in the Plan Area.

The web page is located at https://sbfiresafecouncil.org/gaviota-coast-community-wildfire-protection-plan/

1.3.3.2 Survey

As a component of CWPP development, an online survey was developed to solicit input from residents, landowners, and community stakeholders about wildfire concerns in the Plan Area. The survey was intended to provide another avenue for interested parties to provide feedback for the CWPP development process. The survey included questions regarding demographics, risk awareness, wildfire preparedness, wildfire concerns, and reducing wildfire risk. A total of 28 survey responses were received. Survey respondents were mostly Plan Area residents (18), and most of those had lived in the Plan Area for 10 or more years (14). The following summarizes the survey findings:

- Primary wildfire risk concerns included fuels on the respondent's property (21), distance from the nearest fire station (16), fuels on a neighboring property (15), and poor road access (15).

- Most respondents (23) had completed defensible space vegetation management activities on their properties.
- Primary fire concerns identified included evacuation (19), structure losses (16), and environmental damage (11).
- Respondents felt that the most important activities to address wildfire risk were creating/maintaining defensible space (20) and managing vegetation on their property (19) and on neighboring properties (19).
- The vegetation management activities most supported by respondents included creating/maintaining defensible space (26), conducting roadside vegetation treatments (24), and creating/maintaining fuel breaks (20).
- The vegetation management techniques most supported by respondents included grazing (25), hand/manual treatment (21), mechanical treatment, and prescribed fire (14).

Results from the survey are presented in Appendix A.

1.3.3.3 Public Workshops

The initial public workshop took place on September 28, 2021, via Zoom. Approximately 16 property owners, representatives from local agencies, homeowners and groups, and environmental groups attended. The meeting was also attended by interested members of the public. The presentation included introductions, goals, and objectives for the workshop and a PowerPoint presentation. The PowerPoint presentation provided a description of the CWPP planning process, draft CWPP goals and objectives, major CWPP components, an overview of wildfire history, and an initial wildfire hazard and risk assessment.

A second public workshop took place on August 16, 2022, via Zoom. This workshop was held following release of the Draft CWPP on July 27, 2022. Approximately 16 property owners, representatives from local agencies and interested members of the public attended. The presentation included introductions, and a PowerPoint presentation summarizing the CWPP development process, CWPP goals, an overview of the Plan Area and wildfire hazard assessment efforts, identification of key issues identified by the community, Plan Area values at risk from wildfire, and management actions recommended in the Draft CWPP.

A third public workshop took place on September 20, 2022, via Zoom. Approximately 15 property owners, representatives from local agencies, and interested members of the public attended. The presentation included introductions, and a PowerPoint presentation summarizing the CWPP development process, CWPP goals, an overview of the Plan Area and wildfire hazard assessment efforts, identification of key issues identified by the community, Plan Area values at risk from wildfire, and management actions recommended in the Draft CWPP.

All three meetings were recorded, and links to the PowerPoint slides and videos for each meeting are available online at the Gaviota Coast CWPP web page (link above in Section 1.3.3.1, Web Page).

1.3.3.4 Field Meetings

During field assessments conducted in support of this CWPP, the Project Team met with various landowners and land managers. These meetings were held to coordinate access to portions of the Plan Area and to discuss local perspectives related to wildfire risk and potential wildfire risk mitigation projects. Table 2 summarizes the field meetings conducted during CWPP development.

Table 2. Field Meetings

Date	Attendees	Locations
March 9, 2021	R. Hazard S. Coffman P. Van Leer G. Tautrim J. Ruskey S. Eckardt	Tajiguas Landfill/Materials Recovery Facility Refugio Road Reagan Ranch (Rancho del Cielo) Venadito Canyon El Capitan Ranch Estates Las Varas Ranch Dos Pueblos Ranch/Canyon Farren Road Community
March 16, 2021	R. Hazard S. Coffman M. Katkowski B. Leahy S. Eckardt	Cojo-Jalama Ranch/Dangermond Preserve Jalama Beach County Park
March 17, 2021	R. Hazard S. Coffman J. Farberow J. James S. Eckardt	Hollister Ranch
May 28, 2021	R. Hazard S. Coffman L. Wells J. Menzies S. Eckardt	Baron Ranch Arroyo Hondo Arroyo Quemada Corral Canyon (Exxon Property)
November 15, 2021	R. Hazard S. Coffman A. Parkinson S. Eckardt	Alisal Fire Area Refugio Road Tajiguas Landfill/Materials Recovery Facility

In addition to the field meetings identified in Table 2, additional meetings and communications were conducted with Hollister Ranch community members to discuss the CWPP and efforts related to Hollister Ranch's Firewise Community application. The following summarizes these meetings:

- January 15, 2022: Hollister Ranch Board of Directors meeting approving working with the SBCFSC and cooperating with CAL FIRE on moving forward with the Firewise Community application process. This meeting also included formation of the Hollister Ranch Firewise Committee.
- January 29, 2022: Gaviota Coast Conservancy meeting introducing the CWPP, future grant funding opportunities, and the Firewise Community concept.
- February 19, 2022: Hollister Ranch Board meeting on the Firewise Community application with CAL FIRE and the National Fire Protection Association.
- February 26, 2022: Gaviota Coast Conservancy meeting on the layout of Firewise Community requirements and the newly appointed Firewise Committee.
- March 19, 2022: Hollister Ranch Board meeting accepting the Firewise designation as California's 500th Firewise Community.

- March 26, 2022: Gaviota Coast Conservancy and Firewise Committee meeting addressing future goals and events for the Firewise Community and future grant funding opportunities with the SBCFSC.
- April 15, 2022: Gaviota Coast Conservancy and Firewise Committee meeting on upcoming events.
- April 22, 2022: Firewise Community event and firefighter training, including information from SBC Fire (R. Hazard) and SBCFSC (A. Parkinson) on Firewise and community vulnerability, and actions to manage for wildfires.
- August 20, 2022: Wildfire Preparedness Day event for Hollister Ranch community members, including information from SBC Fire and Santa Barbara County OES on wildfire preparedness and evacuation planning.

1.4 Funding/Grant Management

Funding for the preparation of this CWPP was made available from a CAL FIRE Fire Prevention Grant (Fiscal Year 2019–2020) through the California Climate Investments Program. The grant period started on March 30, 2020 and extends through March 15, 2024. Grant management and reporting are being conducted by the Santa Barbara County Fire Safe Council.

1.5 Signatories

The signatories for the Gaviota Coast CWPP are as follows:

1. Local Government: Das Williams, Chair, Santa Barbara County Board of Supervisors
2. Santa Barbara County Fire Department: Mark Hartwig, Fire Chief
3. California Department of Forestry and Fire Protection (CAL FIRE): John Owens, San Luis Obispo Unit Chief

2 Plan Area Description

2.1 Location

The Gaviota Coast is in the southwestern portion of Santa Barbara County along the California coastline. The Plan Area encompasses 106,002 acres bounded generally by the Pacific Ocean/Point Conception on the west, Farren Road on the east, the ridgeline of the Santa Ynez Mountains on the north, and the Pacific Ocean on the south. U.S. Route 101 and State Route 1 bisect the Plan Area. The Plan Area location is presented in Figure 1.

2.2 Plan Area Communities

The Plan Area includes 1,016 individual parcels averaging 103 acres in size, with a range between less than 1 acre and 2,528 acres. This CWPP collectively covers the Gaviota Coast community, although given its size and the generally wide distribution of residences and other structures, several smaller communities exist within the Plan Area. The Plan Area is predominately rural agriculture that has been operated by generations of farmers and ranchers. Communities within the Plan Area are small, dispersed communities and are primarily not part of planned development (e.g., subdivisions). The largest community within the Plan Area is Hollister Ranch, and the densest is Arroyo Quemada. In addition to the Plan Area communities, there is a transient population that characterizes the Plan Area, notably second homeowners (non-full-time residents), tourists, farm and ranch workers, and motorists. This transient population fluctuates throughout the year, and during different times of year, occupancy within the Plan Area can be much higher. Table 3 provides a brief description of the communities within the Plan Area.

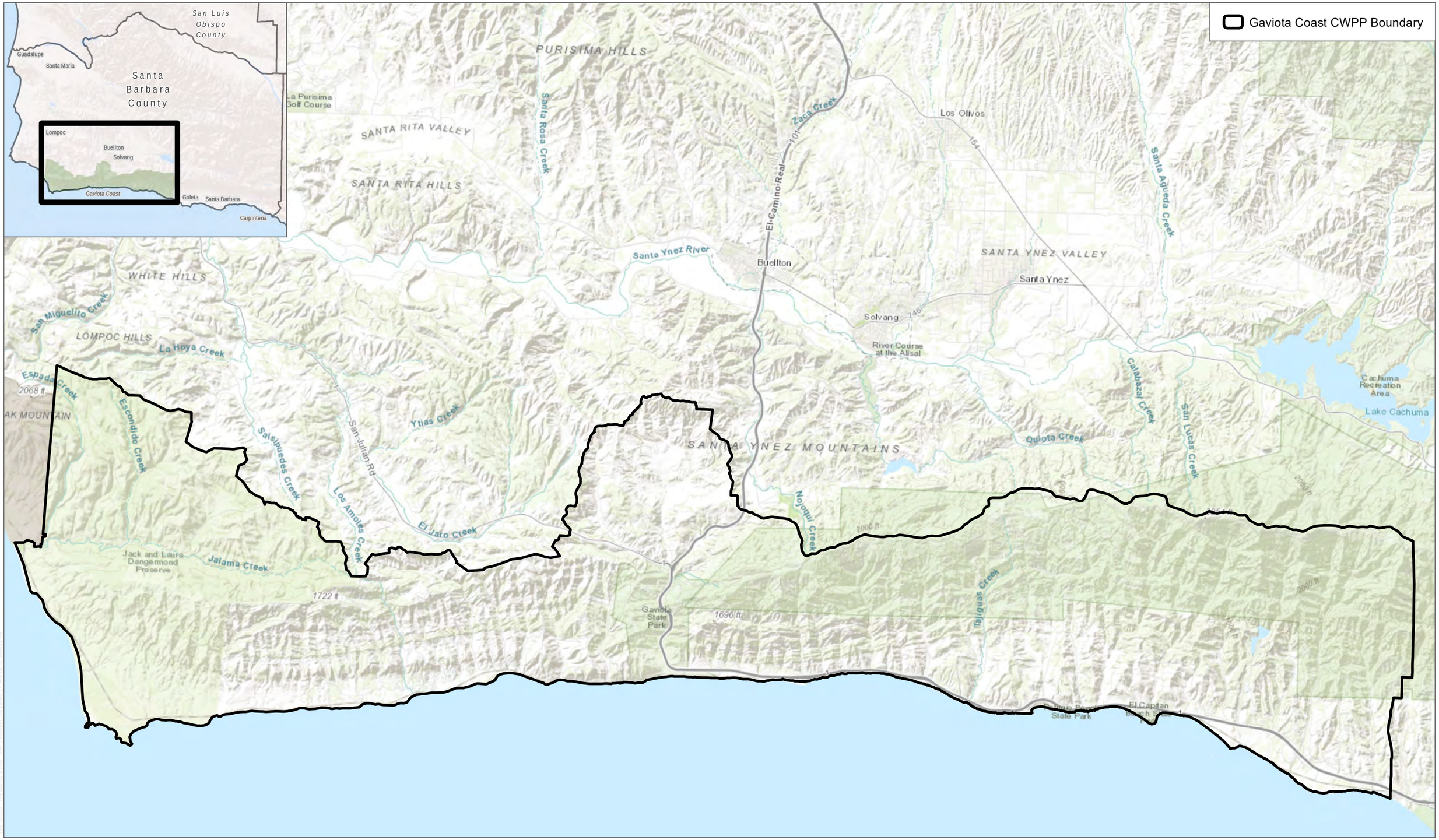
There are scattered structures throughout the Plan Area that are not included in the communities identified in Table 3. Collectively, these and the communities identified below comprise the greater Gaviota Coast community for this CWPP.

Table 3. Plan Area Communities

Plan Area Community	Community Description
Farren Road	Approximately 30 structures concentrated primarily at the upper portion of Farren Road at the east end of the Plan Area. Public parking along lower Farren Road by non-residents is common, which increases potential ignition sources and can cause road blockages that directly affect access/egress capabilities. Heavy vegetation (eucalyptus) exists along Farren Road, also affecting access/egress capabilities. The Santa Barbara County Fire Department (SBC Fire) has identified Farren Road as a community at risk of wildfire.
Dos Pueblos	Approximately 80 structures across approximately 2,000 acres primarily south of Highway 101. Operations include orchards in low-lying areas, cattle grazing, and farming. Infrastructure includes a water tank, hydrant system, reservoirs, and pump stations. Transmission lines cross the area.
Las Varas Canyon	Approximately 50 structures north of Highway 101 in Las Varas Canyon, accessed via Las Varas Canyon Road. Parcels are typically 40 acres and larger and include residential structures and other accessory buildings. Much of the canyon is dedicated to agricultural use (orchards) and structure density is low. Steep canyon walls support chaparral vegetation and access/egress is limited to one road (Las Varas Canyon Road).

Table 3. Plan Area Communities

Plan Area Community	Community Description
El Capitan	Approximately 70 structures in El Capitan Ranch Estates, north of Highway 101 in the Las Llagas Creek drainage. Parcels are approximately 10 acres and primarily include residential structures surrounded by orchards. This area is zoned for agriculture and structure density is low. Approximately 170 structures in El Capitan Canyon, north of Highway 101 and surrounded by El Capitan State Beach. Most structures are temporary cabins and yurts used for recreation purposes. SBC Fire has identified El Capitan as a community at risk of wildfire.
Refugio Canyon	The Refugio Canyon community is split between the lower and upper portions of the canyon. In lower Refugio Canyon there are approximately 25 structures, primarily residential and outbuildings, but also including the Circle Bar-B-Ranch, a facility that includes lodging and a restaurant. Structures in lower Refugio Canyon are older compared with upper Refugio Canyon. In upper Refugio Canyon, there are approximately 70 structures scattered across the upper portion of the canyon and the ridgeline of the Santa Ynez Mountains. Structures in upper Refugio Canyon are primarily residential, although there are other structures (e.g., a church camp, Rancho del Cielo) as well. Upper Refugio Canyon has evacuation problems due to the windy, narrow road, and limitations to access/egress down the north side. A temporary refuge area exists at the top of Refugio Road, and the Camino Cielo fuel break intersects Refugio Road near the summit. SBC Fire has identified Refugio Canyon as a community at risk of wildfire.
Tajiguas	Approximately 45 structures situated in the Tajiguas Creek canyon. Orchards characterize the slopes and portions of the canyon bottom in this area. Tajiguas is identified as a community at risk of wildfire by the California Office of the State Fire Marshal and is listed in the Federal Register as an at-risk community.
Arroyo Quemada	Approximately 20 structures located at the lower end of Arroyo Quemado canyon between the coast and Highway 101. Structures are typically older, with variations in fire resistance. It is the densest residential area in the Plan Area, and access is limited to one way in and out.
Gaviota	The community of Gaviota is generally considered to incorporate the larger Gaviota Coast region, although the community is historically centered near Highway 101 and Calle Mariposa Reina, south and east of Gaviota State Park. The structures in this area are associated with former oil production infrastructure, although SBC Fire Station 38 is situated here. Gaviota is identified as a community at risk of wildfire by the California Office of the State Fire Marshal and is listed in the Federal Register as an at-risk community.
Las Cruces	Approximately 25 structures in Las Cruces, located where Highways 1 and 101 intersect. Structures include agricultural and residential buildings, as well as Las Cruces School.
Hollister Ranch	Approximately 150 structures across the 14,400-acre Hollister Ranch, located west of Gaviota State Park. There are 136 residential parcels on the site, although not all are developed. Approximately 175 people live on Hollister Ranch, although on busy/holiday weekends, the population can reach approximately 500 (200 owners, 200 guests, 100 staff). Hollister Ranch is active in fire prevention and mitigation efforts, is active in grazing operations, and has its own fire company.
Cojo-Jalama Ranch	Owned and managed by The Nature Conservancy, the Cojo-Jalama Ranch (now the Dangermond Preserve) is the largest privately owned ranch on the Gaviota Coast. It is located between Hollister Ranch and Point Conception. Approximately 25 structures exist, concentrated in two locations. Structures support ranching operations that continue following dedication of the property as a preserve.



SOURCE: ESRI World Topographic Map

DUDEK

0 1 2 Miles

FIGURE 1

Plan Area Location

Gaviota Coast Community Wildfire Protection Plan

2.3 Fire Hazard Areas

2.3.1 State Fire Hazard Severity Zones

Fire Hazard Severity Zones (FHSZs) are geographical areas designated pursuant to California Public Resources Code (PRC) Sections 4201 through 4204; they are classified as Very High, High, or Moderate in State Responsibility Areas (SRAs), or as Local Responsibility Area Very High FHSZ designated pursuant to California Government Code Sections 51175 through 51189. PRC Sections 4201–4204 and Government Code Sections 51175–51189 direct CAL FIRE to map areas of significant fire hazard based on fuels, terrain, weather, and other relevant factors. The resulting FHSZs define the application of various mitigation strategies to reduce the risk associated with wildland fires (OSFM 2022). The model used to determine the extent of FHSZs is based on an analysis of potential fire behavior and fire probability predicated on the frequency of fire weather, ignition patterns, expected rate of spread, ember (brand) production, and past fire history (OSFM 2022). Structures built in FHSZs are subject to more stringent fire-hardening requirements than those that are not.

The Plan Area is in SRA Very High (51,472 acres), High (34,744 acres), and Moderate (1,491 acres) FHSZs, as defined by CAL FIRE. No Local Responsibility Area is in the Plan Area. The Plan Area also includes lands (Los Padres National Forest) classified as a Federal Responsibility Area, where the federal government is responsible for fire protection. SBC Fire is the responsible agency for fire protection within the Plan Area. The State Fire Hazard Severity Zoning designations are presented in Figure 2[1].

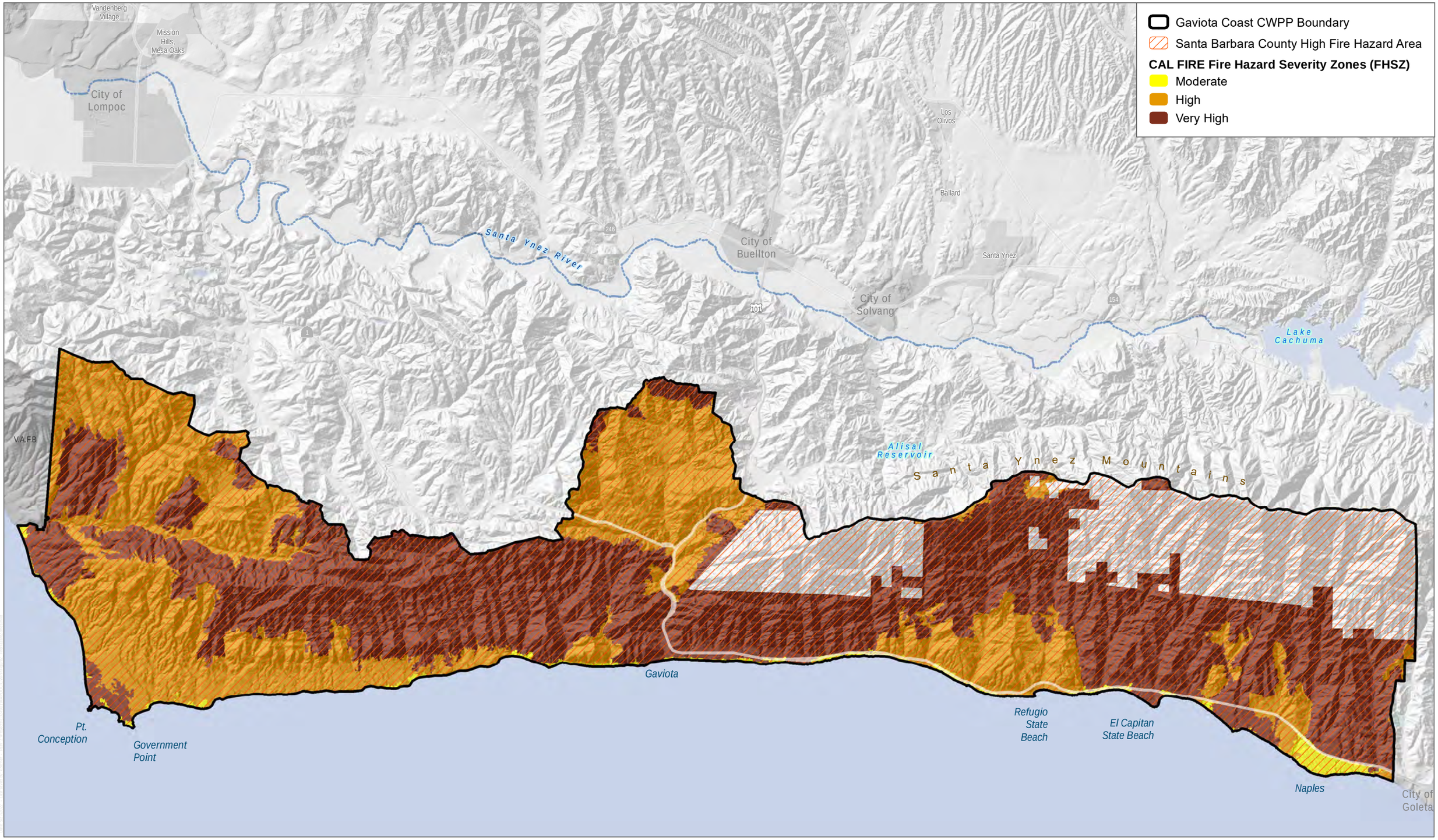
2.3.2 County High Fire Hazard Area

During its adoption of the 2019 California Fire Code, SBC Fire added the "High Fire Hazard Area" map, which was adopted under Chapter 10 of the Santa Barbara County Code. Specifically, Section 702A of the California Building Code was amended for the County by adding the following definition:

> High Fire Hazard Area is an area of the County of Santa Barbara designated by the Building Official as having a high propensity for wildfire due to the existence of excessive wild brush fuel, lack of adequate water for fire suppression, or lack of adequate access to firefighting equipment and is shown on a map entitled "High Fire Hazard Area Map" on file in the County of Santa Barbara Building and Safety Division of the Planning and Development Department. This area is to be considered a Wildland-Urban Interface Area.

All of the Plan Area is within the County's High Fire Hazard Area. The County High Fire Hazard Area designation is presented in Figure 2, Fire Hazard Areas.

[1] Currently adopted FHSZs were delineated in 2007. In December 2022, CAL FIRE released updated SRA FHSZ maps for public review and comment. Review of these updated FHSZ maps for the Plan Area indicates that most areas mapped as High or Moderate FHSZ were re-classified to Very High FHSZ, with some exceptions (primarily in the upper elevations on the Dangermond Preserve).



SOURCE: USGS, County of Santa Barbara, CAL FIRE

DUDEK

0 1 2 Miles

FIGURE 2

Fire Hazard Areas

Gaviota Coast Community Wildfire Protection Plan

2.4 Climate

The climate in the Plan Area is characterized by warm summers and mild winters with relatively dry weather. Climate in the area is influenced by the semi-permanent subtropical high-pressure cell off the Pacific Coast. This cell creates typically warm, dry summers and wet winters (WRCC 2022a). Fog is also frequently experienced in the Plan Area due to the humid marine air coming into contact with the warmer air over land. This atmospheric condition usually occurs in the early morning or evening, and particularly during late spring and early summer. Fog regulates moisture content in the low-lying atmosphere, plants, and soils, and thus is inherently connected to fire hazard (Emery et. al. 2018).

The majority of precipitation in the Plan Area occurs during the winter months due to the migration of mid-latitude cyclonic storms (fronts) arriving along the California coast. Rainfall amounts generally increase with elevation along the Santa Ynez Mountains due to orographic lifting and cooling processes. Inversions, or the trapping of a stable layer of cool air below warmer air, is caused in part by the Santa Ynez Mountains in the northern portion of the Plan Area. Surface and upper-level wind flow varies seasonally and geographically, and lack of wind and the right meteorological conditions can lead to an inversion. Surface temperature inversions occur between 0 and 500 feet above the ground surface and are most common during the winter. During an inversion, warmer air is held above cooler air; the normal temperature profile with altitude is inverted (WRCC 2022a).

Live fuel moisture content, a measure of the relative mass of water and indicator of ignitability, for most vegetation in the Santa Ynez Mountains reaches the driest point in the late summer or early fall. Seasonal drying of vegetation produces conditions that can result in fuel-driven wildfires and fire-associated climatic changes. This condition is referred to as a plume-dominated wildfire. Plume-dominated wildfires are fires where the energy produced by the fire, in conjunction with atmospheric instability, creates significant convective forces and increased wind speeds. Such fires are incredibly unpredictable, spread in various directions simultaneously, and exhibit extreme fire behavior.

The average annual high temperature calculated from January 2015 through December 2021 for the Plan Area was 88.8°F, with higher temperatures occurring in the summer and early fall (June through September), reaching up to an average high of 100.4°F. The average annual low temperature is 45.1°F and can reach an average low temperature of 37.5°F. The average annual precipitation for the area is 23.56 inches, with the most rainfall concentrated in December (2.62 inches), January (7.37 inches), February (4.23 inches), March (5.18 inches), and April (1.34 inches). Rainfall is much less during June (0.09 inches), July (0.02 inches), and August (0.02 inches) (WRCC 2022b).

2.4.1 Sundowner Winds

The regional prevailing wind pattern for the southern coast of Santa Barbara County is a flow from the west or northwest. In the Plan Area, the prevailing wind pattern is from the west at El Capitan and from northwest elsewhere. The Plan Area also periodically experiences significant downslope wind and warming events. These strong, downslope winds are referred to as “Sundowner” winds because they often begin in the late afternoon or early evening. Sundowner winds are typically associated with a rapid rise in temperature and a decrease in relative humidity. Sundowner winds switch direction at El Captain Point, and at Refugio Point the wind is cut off and creates a break in the wind pattern. Perennial Sundowner winds occur west of El Capitan Point and are less frequent east of the point. In the most extreme Sundowner wind events, wind speeds can be gale-force or higher, and temperatures over the coastal plain can rise to above 100°F. These winds typically manifest in midsummer to midfall as a result of hot temperatures; however, recorded midwinter, mild temperature Sundowner winds have occurred. Sundowner winds have historically resulted in significant property damage, as well as extreme fire danger (UCLA 1998).

Dry Sundowner winds promote the ignition and rapid spread of wildfires by drying fuels and fanning the flames of fires once they are started. The wind's greatest effect on fire tends to be in autumn when vegetation has been desiccated after a long dry summer and before the onset of the winter rainy season. However, large fires have occurred during Sundowner conditions as late as February. Surface winds can also be influenced locally by topography and slope variations (Westerling et. al. 2004). Daily timing of Sundowner winds (late afternoon/early evening) can create challenges for firefighting efforts especially if ignitions occur late in the day or at night as suppression actions using aircraft to limit initial spread are limited or impossible.

Downslope Sundowner winds during the 2017 Whittier Fire (EDHAT 2019).

The fire season in the Plan Area has historically occurred June through October as the fog recedes earlier in the day and vegetation begins to dry out from regular, dry, offshore winds. The fire season has historically ended in November with the onset of winter rainfall, cooler temperatures, and higher relative humidity, with fires less common from December through April. However, climate change effects are extending the fire season throughout the state, and the fire season in the Plan Area may ultimately be year-round, as observed with the 2017 Thomas Fire (December), the 2009 Jesusita Fire (May), and the 2008 Tea Fire (November), all fires burning in the Santa Ynez Mountains. The greatest fire danger for the Plan Area coincides with the period when the Sundowner winds are at their strongest.

Micro-climates are also present in the Plan Area due to significant variations in topography. Micro-climates vary from low-elevation, wind-sheltered, and damp locations with northerly or easterly aspects, to high-elevation, wind-exposed, and dry locations with southerly or westerly aspects. Microclimate conditions can greatly affect fire hazard and should be considered when determining vegetation treatment priorities and implementation timing. Such conditions are often not captured in weather station datasets or recorded in easily referenced weather almanacs, but are usually well known to landowners, land managers, and local fire agency personnel.

Certain weather conditions can increase wildfire risk, resulting in the declaration of a Red Flag Warning by the National Weather Service. A Red Flag Warning means warm temperatures, very low humidity, and strong winds are expected to combine to produce an increased risk of fire danger. The Plan Area is located in three Fire Weather Zones: CA349, CA351, and some minor portions of CA347, CA348, and CA350 (National Weather Service 2022). The County Red Flag Warning Program enables firefighting agencies within Santa Barbara County to manage critical resources and prepare suppression responses to protect life and property. Red Flag Warnings are typically issued 24 hours in advance of the fire weather. The Santa Barbara Office of Emergency Management, in conjunction with local fire officials, manages the text messaging system for alerting residents of Red Flag Warning Days. High-Risk Days are defined as days when there is a minimum 20% chance of either a new large fire occurring or significant growth of an existing fire within the South Coast Area.

2.4.2 Climate Change

California faces a dramatic increase in the number and severity of wildfires, with 15 of the 20 most destructive fires occurring since 2015 (CAL FIRE 2022a). The state's major study on climate impacts, the Fourth Climate Assessment (OPR et. al. 2019), projects that California's wildfire burn area is likely to increase by 77% by the end of the century. As identified in Governor Newsom's Strike Force report (State of California 2019), the growing risk of catastrophic wildfires has created an imperative for the state to act urgently and swiftly to expand fire prevention efforts. Current research has also identified that the frequency of autumn days with extreme fire weather has more than doubled in California since the early 1980s, a result of human-caused climate change. Such fire weather exhibits strong offshore winds (e.g., Sundowner winds) and is coincident with unusually dry vegetation resulting from warm conditions over the summer months prior to the onset of autumn precipitation (Goss et. al. 2020).

Climate change is expected to make landscapes more susceptible to extreme wildfires by altering temperatures (Hayhoe et. al. 2004) and the availability and aridity of fuels (Abatzoglou and Williams 2016). Anthropogenic climate change has emerged as a driver of increased fire activity, a trend that is expected to continue (Abatzoglou and Williams 2016). All analyses completed for fire occurrence and severity into the future predict more frequent fires, a greater number of fires, and higher fire severity under climate change scenarios (Fried et. al. 2004; Lenihan et. al. 2008; Westerling 2018; Westerling et. al. 2011).

A changing climate, combined with anthropogenic factors, has already contributed to more frequent and severe wildfires in the western United States (Abatzoglou and Williams 2016; Mann et. al. 2016; Westerling 2016), with the number of human-caused fires being much higher in more populated regions of the state. Recently, the area burned by wildfires has increased consistent with increasing air temperatures (OEHHA 2018). Increased wildfire risk and severity are vulnerabilities that are anticipated throughout California (Krawchuk et. al. 2009; Westerling 2018). Increased fire occurrence and severity under climate change would secondarily affect other areas of vulnerability, as noted below:

- **Increased Fire Risk:** Warmer air temperatures are expected to lengthen the fire season, drying out vegetation more quickly and increasing fire risk. Based on high- and low-emissions climate change scenarios, increases in the number of high-severity wildfires are anticipated (Westerling 2018). Multi-year severe drought is supported as a factor in increasing fire size and severity, as is tree mortality (Crockett and Westerling 2018). On interannual and shorter time scales, climate variability affects the flammability of live and dead forest vegetation (Westerling 2016). Fire size in the Central Coast area also increases with both air temperature in the month of ignition and with low precipitation in the preceding 12-month period (Westerling 2018). Additionally, the frequency of extreme fire weather in the fall months has increased over the past 40 years, a trend that is expected to continue under climate change models (Goss et. al. 2020).
- **Greater Fuel Loads:** Years with widespread fires are historically preceded by wet years, which influence greater vegetation growth, especially in the understory. Highly flammable species, which often populate disturbed areas quickly, may have a competitive advantage over other species, typically resulting in a higher, more flammable fuel load. Drought may result in increased tree mortality, which contributes to higher fuel loading and wildfire size and severity (Crockett and Westerling 2018). Increasing fire size and severity and tree mortality are linked to increasing temperatures and aridity (Crockett and Westerling 2018). Increased prevalence of dead or desiccated fuels resulting from drought effects is conducive to crown fires, which require ladder fuels to move from volatile grasses to the less volatile mid-level forest to the dry and volatile canopy cover (Crockett and Westerling 2018). increased fuel aridity contributes to larger forest areas experiencing increased periods of high fire potential (Abatzoglou and Williams 2016).

- **Ecological Impacts:** Increased fire severity is expected to amplify and accelerate the ecological impacts of climatic change. Drought years may increase the vulnerability of tree populations to insects and disease, and the lower occurrence of extended freezing periods in the winter allow higher insect survivability. Climate-induced changes in fire behavior and frequency influence species distribution, migration, and extinction (Flannigan et. al. 2000). Greater occurrence of fires increases the amount of carbon and particulates released into the atmosphere (Westerling and Bryant 2008).
- **Social Impacts:** Increased expenditures for fire suppression are anticipated, and the amount of burned property (in total area and monetary value) in coastal Southern California communities increases substantially under global climate models' high-emissions scenarios due to greater fire risk (Levy 2018; Westerling and Bryant 2008). In areas with the highest fire risk, wildfire insurance is estimated to see costs rise by 18% by 2055, and the number of properties insured lowered (Westerling 2018). Wildland fire smoke exposure is a growing risk to public health (Domitrovich et. al. 2017). Secondary effects of increased fire, such as loss of recreational amenities, area closures, and excessive smoke, can have serious financial effects on regional business interests and local economies.

The management recommendations included in this CWPP include fuel management actions to reduce fuel loads, minimize ignitions, and reduce the potential for extreme fire behavior.

2.5 Terrain

Plan Area as viewed from the upper portion of Refugio Road.

The Plan Area is topographically diverse, including steep slopes and drainages, rolling hills, valleys, coastal terraces, streams, coastal bluffs, estuaries, sandy beaches, and rocky shorelines. The foothills and canyons meet the coastal plain in the southern portion of the Plan Area and slope upward to the east/west-trending Santa Ynez Mountains. The uplifted mesa steeply slopes from the coastal plain to form a high sheer cliff face, with a significant elevation difference between the coast and the summit of the Santa Ynez Mountains over a relatively short distance (4,200 feet of elevation gain over approximately 5 linear miles). Notable peaks along the ridgeline of the Santa Ynez Mountains include Condor Point, Broadcast Peak, Santa Ynez Peak, Bald Mountain, Gaviota Peak, and Palo Alto Hill. Canyons and associated drainages bisect the Plan Area terrain, generally flowing north to south from the Santa Ynez Mountains to the Pacific Ocean, with the notable exception of Jalama Creek, which flows westward along the northern side of the Santa Ynez Mountains to the Pacific Ocean at Jalama Beach County Park. Prominent canyons and drainages within the Plan Area, listed in a generally east to west order, are Eagle Canyon, Dos Pueblos Canyon, Las Varas Canyon, Gato Canyon, Las Llagas Canyon, El Capitan Canyon, Las Flores Canyon, Venadito Canyon, Refugio Canyon, Tajiguas Canyon, Arroyo Quemado, Arroyo Hondo, Calle del Molino, Cañada San Onofre,

Cañada de la Gaviota, Agua Caliente, Cañada de Alegria, Cañada del Sacate, Arroyo Bulito, Cañada del Cojo, and Jalama Canyon. Tributaries of these canyons/drainages converge into larger creeks near or along the coastal plain before ultimately discharging into the Pacific Ocean.

Terrain affects wildfire movement and spread. Steep terrain typically results in faster upslope fire spread due to the pre-heating of uphill vegetation. Flat areas typically result in slower fire spread when 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. For example, fire generally moves slower downslope than upslope. Terrain may also buffer, shelter, or redirect winds away from some areas based on canyons or formations on the landscape. Saddles occurring at the top of drainages or ridgelines may facilitate the migration of wildfire from one canyon to the next. Various terrain features can also influence fire behavior, as summarized in Table 4.

Table 4. Effects of Topographic Features on Fire Behavior

Topographic Feature	Effect
Narrow Canyon	Surface winds follow canyon direction, which may differ from the prevailing wind; wind eddies/strong upslope air movement expected, which may cause erratic fire behavior; radiant heat transfer between slopes facilitates spotting/ignition on opposite canyon side.
Wide Canyon	Prevailing wind direction not significantly altered; aspect significant contributor to fire behavior. Wide canyons are not as susceptible to cross-canyon spotting except in high winds.
Box Canyon/ Chute	Air is drawn in from canyon bottom; strong upslope drafts. No gaps or prominent saddles to let heated air escape. Fires starting at the canyon bottom can move upslope very rapidly due to a chimney-like preheating of the higher-level fuels and upslope winds.
Ridge	Fires may change direction when reaching ridge/canyon edge; strong air flows likely at ridge point; possibility for different wind directions on different sides of the ridge. Ridges experience more wind. Fires gain speed and intensity moving toward a ridge. Fires burning at a ridge can exhibit erratic fire behavior. Strong air flows can cause a whirling motion by the fire. As the wind crosses a ridge it usually has a leeward eddy where the wind rolls around and comes up the leeward side.
Saddle	Potential for rapid rates of fire spread; fires pushed through saddles faster during upslope runs. Winds can increase when blowing through saddles due to the funneling effect of the constricted pass. On the other side, winds will slow, but erratic winds potentially occur at the saddle due to eddies.

Sources: NFPA 2011; Teie 1994.

Within the Plan Area are significant topographic features and major drainages through canyons. There are four major mountain peaks within the Plan Area: Condor Point (2,945 feet elevation), Broadcast Peak (4,021 feet elevation), Santa Ynez Peak (4,279 feet elevation), and Bald Mountain (2,618 feet elevation). The ridgeline making up the northern boundary of much of the Plan Area is well over 3,000 feet in elevation. As the Plan Area extends to the Pacific Ocean there is a significant elevation difference, ranging from over 3,000 feet to sea level. This results in major drainages, canyons, and creeks that primarily flow north/south from the mountains to the Pacific Ocean. The narrow drainage and sub-drainage topographic features of the Santa Ynez Mountains have the capability to funnel winds, increase wind speeds, erratically alter wind direction, facilitate fire spread, and promote extreme fire behavior. This is especially true during Sundowner wind events when strong northerly winds are aligned with the downslope direction of the canyons and watersheds of the Santa Ynez Mountains. The topography of the Plan Area is, therefore, capable of producing wind conditions that promote extreme wildfire behavior.

2.6 Vegetation and Fuels

Vegetation types (fuels) present in the Plan Area and their contribution to fire hazards are summarized in this section. Hazardous fuels include live and dead vegetation that exists in a condition that readily ignites, transmits fire to adjacent structures or ground surface or overstory vegetation, and/or is capable of supporting extreme fire behavior.

2.6.1 Vegetative Fire Hazard

The following sections summarize vegetative fire hazards of dominant vegetation types that occur within the Plan Area. All vegetation burns, but some plants exhibit characteristics that make them more flammable than others. Flammability can be defined as a combination of ignitability, combustibility, and sustainability. Ignitability is the ease or delay of ignition, combustibility is the rapidity with which a fire burns, and sustainability is a measure of how well a fire continues to burn with or without an external heat source (White and Zipperer 2010). Flammability is influenced by several factors that can be classified into two groups: physical structure (e.g., branch size, leaf size, leaf shape, surface-to-volume ratio, retention of dead material) and physiological elements (e.g., volatile oils, resins, and moisture content) (Moritz and Svihra 1998; UCCE 2016; UCFPL 1997; White and Zipperer 2010). Plants that are less flammable have low surface-to-volume ratios, high moisture contents, and minimal dead material or debris. Examples of such plants include agave, oleander, and olive trees. More flammable species have high surface-to-volume ratios, exhibit low moisture contents, contain volatile oils, and have high levels of dead material or debris (Moritz and Svihra 1998; UCFPL 1997; UCCE 2016; White and Zipperer 2010). Examples of such plants include pampas grass, juniper, and pine. Plant condition and maintenance is also an important factor in flammability potential. Some plants that have more flammable characteristics can become less flammable if well maintained and irrigated. Conversely, plants can be explosively flammable when poorly maintained, or situated on south-facing slopes, in windy areas, or in poor soils (Moritz and Svihra 1998).

Age of fuels can also affect their vegetative fire hazard. In general, chaparral 30 years and older and sage scrub 15 years and older present greater hazard due to accumulation of dead material within shrub canopies. Fires in these older fuels tend to burn hotter and spread faster compared to fires burning in younger fuels.

The County has a list of desirable plant species for use in landscaping around homes and structures (SBC Fire 2021a). These plants have the ability to store water in leaves or stems and withstand drought, produce limited dead and fine material, are prostrate or prone in form, have extensive root systems for controlling erosion, can withstand severe pruning, have high levels of salt or other compounds that contribute to fire resistance, have low levels of volatile oils or resins, and/or can resprout after a fire. The County has also developed a list of plants that are undesirable for use in landscaping around homes and structures (SBC Fire 2021a). These plants are considered to be unacceptable in the landscape due to their flammable characteristics, which include large amounts of dead material retained within the plant, rough or peeling bark, production of profuse amounts of litter, and the presence of volatile substances such as oils, resins, wax, and pitch. Certain native plants species contain these characteristics (e.g., sage, buckwheat, and coyote bush).

Insects, fungi, other microbes, and vertebrates are a natural component of California native plant communities. 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 plants are typically able to withstand pest attacks when pest populations are at low to moderate levels. When stressors exist (e.g., overstocking, shading, drought), plant vigor is reduced, and susceptibility to pest attacks and infestations increases. Infestations of pitch canker

(*Fusarium circinatum*) and sudden oak death (*Phytophthora ramorum*) have been reported within Santa Barbara County (Pitch Canker Task Force 2012; University of California 2004). Eucalyptus longhorned borer (*Phoracantha semipunctata* and *Phoracantha recurva*) has also been documented within Santa Barbara County (California Agriculture 1996). These diseases/pests can contribute to wildfire hazards by increasing dead surface fuel loads and hindering firefighting efforts.

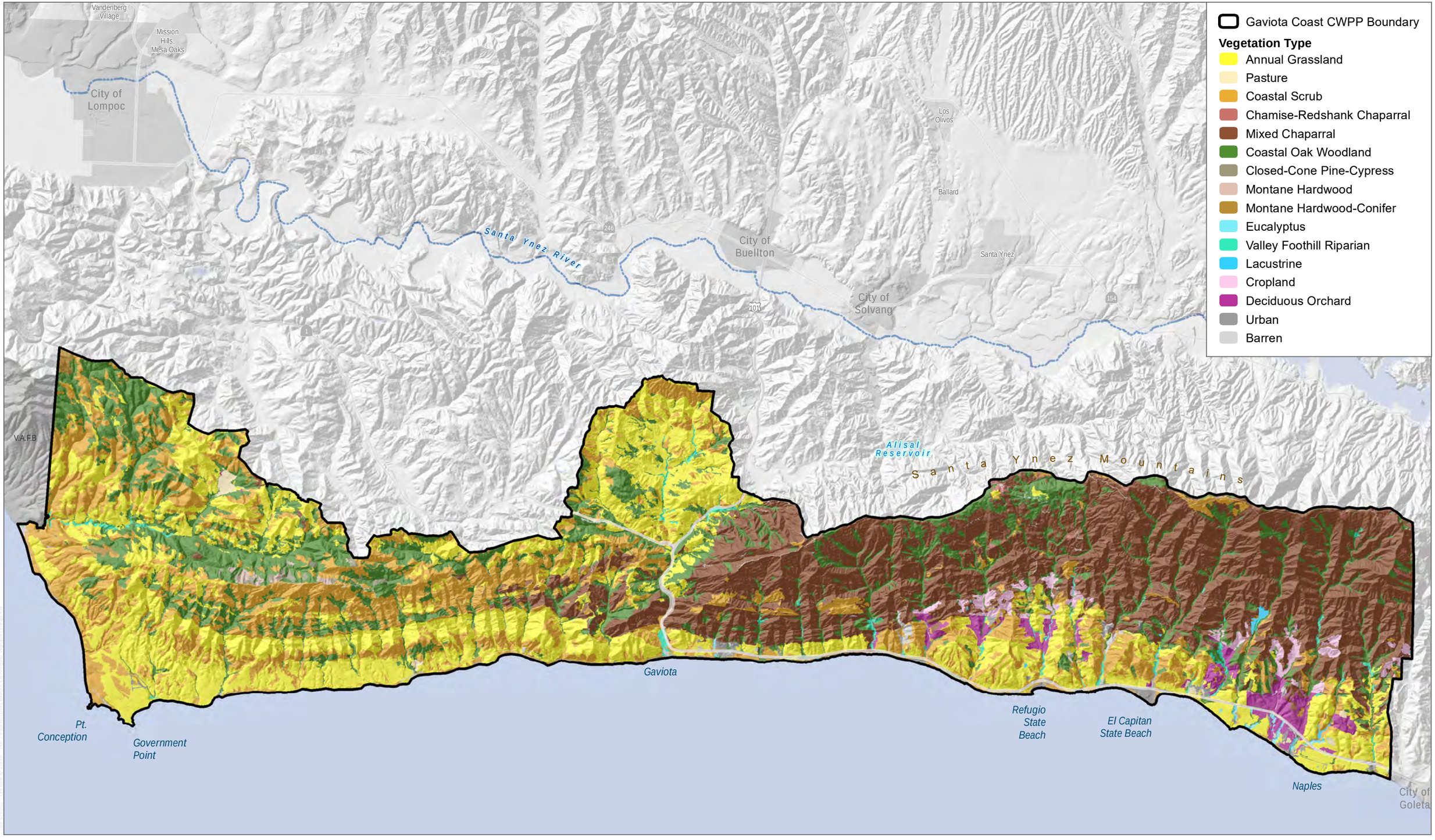
2.6.1.1 Vegetation Types

The following sections describe the existing vegetation types present in the Plan Area and their associated contribution to fire hazards. Portions of the Plan Area have been mapped as urban land cover. Urban land cover typically represents noncombustible material (e.g., pavement) or developed and maintained landscapes (e.g., buildings, turf), although some areas may be disturbed lands characterized by annual or perennial grass cover. Ornamental landscape vegetation also characterizes portions of areas mapped as urban land cover. Such vegetation is a combination of native and introduced ground cover with grass, shrub, and tree species. Some ornamental vegetation may increase fire hazards due to plant composition and structure (as described above) and the lack of irrigation and maintenance. Table 5 summarizes the different vegetation types identified and mapped in the Plan Area, and Figure 3 presents the distribution of vegetation types in the Plan Area.

Table 5. Vegetation Types in the Plan Area

Vegetation Type	Acres	Percent Cover
Herbaceous Dominated		
Annual Grassland (AGS)	27,531	26.0%
Pasture (PAS)	233	0.2%
Shrub Dominated		
Chamise-Redshank Chaparral (CRC)	137	0.1%
Coastal Scrub (CSC)	21,975	20.7%
Mixed Chaparral (MCH)	30,296	28.6%
Tree Dominated		
Coastal Oak Woodland (COW)	19,478	18.4%
Closed-Cone Pine-Cypress (CPC)	192	0.2%
Eucalyptus (EUC)	144	0.1%
Montane Hardwood (MHW)	174	0.1%
Montane Hardwood-Conifer (MHC)	142	0.1%
Valley Foothill Riparian (VRI)	707	0.7%
Aquatic		
Lacustrine (LAC)	220	0.2%
Developed		
Cropland (CRP)	1,128	1.1%
Deciduous Orchard (DOR)	1,734	1.6%
Urban (URB)	1,013	1.0%
Non-Vegetated		
Barren (BAR)	898	0.8%

Source: USFS 2018.



SOURCE: USGS, County of Santa Barbara, USFS FRAP Vegetation

DUDEK

0 1 2 Miles

FIGURE 3

Plan Area Vegetation

Gaviota Coast Community Wildfire Protection Plan

2.6.1.1.1 Herbaceous Dominated

Herbaceous-dominated fuels in the Plan Area are represented primarily by annual grassland (26.0% of Plan Area), with a smaller distribution of pastureland (0.2% of Plan Area). Grassland is found throughout the Plan Area, although is concentrated at lower elevations in the eastern portion of the Plan Area and distributed more evenly elsewhere. The Plan Area's history of ranching and grazing has affected the distribution of grasslands in some areas. In some locations where grazing activities had historically occurred but no longer do, grasslands have converted to shrublands. An example of this is seen in Arroyo Quemado; acquisition of property in Arroyo Quemado by the County and the associated cessation of grazing activities has resulted in a conversion of grassland to shrubland.

Herbaceous vegetation on the Dangermond Preserve.

Grassland types may include scattered and widely spaced trees and/or shrubs, although grasses are the dominant cover type. Grasses are fine fuels that are loosely compacted with a low fuel load.[2] Grasses have a high surface-area-to-volume ratio, requiring less heat to remove fuel moisture and raise the fuel to ignition temperature. They are also subject to early seasonal drying in late spring and early summer. Live fuel moisture content in grasses typically reaches its low point in early summer, and grasses begin to cure soon after. Due to these characteristics, grasses have the potential for a high rate of spread, rapid ignition, and facilitation of extreme fire behavior. Grasses are the vegetation type in the Plan Area with the highest risk for wildfire ignition. Their low overall fuel loads typically result in faster moving fires with lower flame lengths and heat output. Untreated grasses can help spread a fire into other adjacent surface fuel types (e.g., shrubs) or facilitate surface to crown fire[3] transition where they exist beneath tree canopies.

2.6.1.1.2 Shrub Dominated

Shrub-dominated fuels in the Plan Area are represented by the chaparral and coastal scrub vegetation types. These vegetation types dominate the Plan Area, with chaparral covering 28.7% and coastal scrub covering 20.7%. Both chaparral and coastal scrub vegetation types may include scattered and widely spaced trees, small patches of grass/herbaceous vegetation, or grass herbaceous vegetation occurring beneath shrub canopies, although shrubs are the dominant cover.

2 The amount of available and potentially combustible material, usually expressed as tons per acre (NWCG 2022).
3 A crown fire is a forest fire that advances, often at great speed, from tree top to tree top.

2.6.1.1.2.1 Chaparral

Chaparral is found primarily in the mid and upper elevations of the Plan Area east of Cañada de la Gaviota. Chaparral is considered a moderately fine fuel that is loosely compacted and has a moderate to high fuel load, depending on age. Chaparral has a high surface-area-to-volume ratio, requiring less heat to remove fuel moisture and raise the fuel to ignition temperature. Chaparral is subject to early seasonal drying in the late spring and early summer but does not fully cure in the way that grasses do. The live fuel moisture content reaches its low point in the late summer and early fall months. Dead fuels consist mainly of 1-hour and 10-hour fuel sizes, or twigs and small stems ranging from 0.25 inches to 1 inch in diameter. Chaparral has the potential for a high rate of spread, rapid ignition, and extreme fire behavior given its high content of volatile organic compounds.

Chaparral vegetation in the upper portion of Eagle Canyon.

Fire regime of chaparral communities is mostly stand-replacing crown fires. Fire frequency interval is moderate and ranges depending on the dominate species. Fire return intervals can range from 33 to 125 years (Fire Effects Information System n.d.). Mature chapparal stands are more flammable compared to younger chaparral stands. Older chapparal stands are more flammable due to their ability to accumulate more dead material. As noted, chaparral 30 years and older presents a greater hazard due to accumulation of dead material within shrub canopies. Of the 30,433 acres of chaparral in the Plan Area, 10,333 acres (34%) is older than 30 years. This older chaparral is concentrated outside of recent fire perimeters. The location of 30-plus-year-old chaparral is presented in Figure 4, Plan Area Vegetation Age.

2.6.1.1.2.2 Coastal Scrub

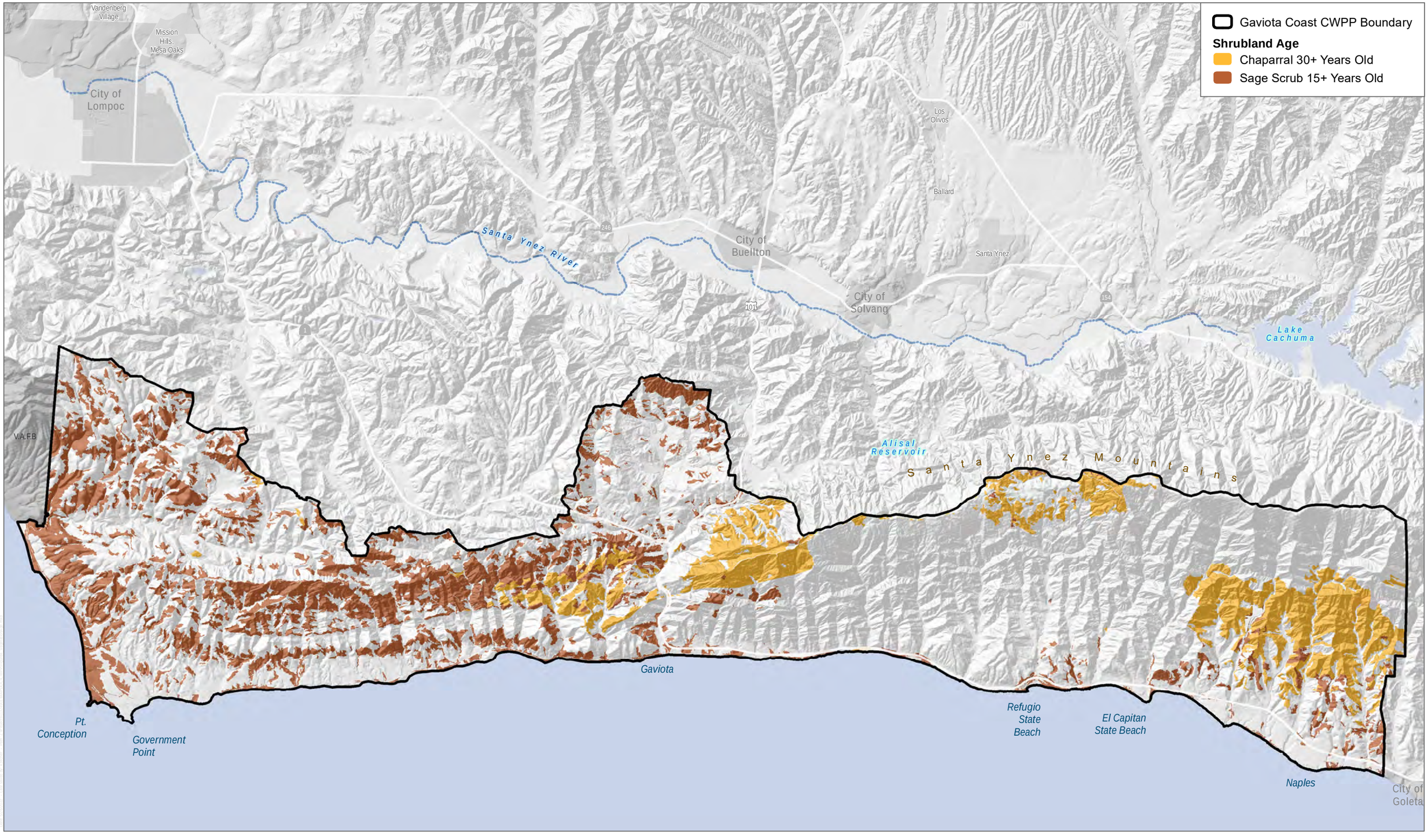
Coastal scrub vegetation (foreground) on the Hollister Ranch.

Coastal scrub is found primarily at mid-elevations in the eastern portion of the Plan Area (east of Cañada de la Gaviota) between chaparral (higher elevations) and grassland (lower elevations) vegetation types. In the western portion of the Plan Area (west of Cañada de la Gaviota), coastal scrub is more widely distributed and intermixed with grasslands and oak woodlands from ridgelines down to the ocean. Coastal scrub is considered a moderately fine fuel that is loosely compacted with a moderate fuel load. Coastal scrub has a high surface-area-to-volume ratio, requiring less heat to remove fuel moisture and raise the fuel to ignition temperature. It is subject to early seasonal drying in the late spring and early summer but does not fully cure in the way that grasses do. Compared to chaparral, coastal scrub tends to have a lower content of volatile organic compounds. The live fuel moisture content reaches its low point in the late summer and early fall. Dead fuels consist mainly of 1-hour and 10-hour fuel sizes, or twigs and small stems ranging from 0.25 inches to 1 inch in diameter. Coastal scrub has the potential for a high rate of spread, rapid ignition, and extreme fire behavior.

As noted, coastal scrub 15 years and older presents a greater hazard due to accumulation of dead material within shrub canopies. Of the 21,795 acres of coastal scrub in the Plan Area, 18,665 acres (86%) is 15 years and older. This older chaparral is concentrated outside of recent fire perimeters. The location of 15-plus-year-old coastal scrub is presented in Figure 4.

2.6.1.1.3 Tree Dominated

Tree-dominated fuels in the Plan Area are represented primarily by coastal oak woodland (18.4%), with a smaller distribution of closed-cone pine cypress (0.2%), eucalyptus (0.1%), montane hardwood (0.1%), and valley foothill riparian (0.7%). Tree-dominated types may also include scattered shrubs or shrub groupings, small patches of grass/herbaceous vegetation, or shrub and grass herbaceous vegetation occurring beneath tree canopies, although trees are the dominant cover.



SOURCE: USGS, County of Santa Barbara, CalFIRE

DUDEK

0 1 2 Miles

FIGURE 4

Plan Area Vegetation Age

Gaviota Coast Community Wildfire Protection Plan

2.6.1.1.3.1 Coastal Oak Woodland

Coastal oak woodland along Camino Cielo.

Oak woodlands are found in Plan Area drainages and canyons and along north-facing slopes and comprised primarily of coast live oak (*Quercus agrifolia*). Oak stands are composed of fuel structures ranging from fine to heavy. In closed canopy stands, a sparse understory of grass, leaves, twigs, branches, and bark litter may be present. In open stands, the understory may include grass, shrubs, leaves, twigs, branches, and bark litter. Fuel buildup typically occurs very slowly in oak woodland stands in California (USFS 2022a), and litter forms a thick, compacted mat resulting in very low surface fuel loads. In closed-canopy oak woodlands, understory fuel loads are low. The reduction of fire as an ecosystem process in oak woodlands, however, allows for an accumulation of fuels that had previously been consumed during regular, low-intensity fires. This can cause a build-up of woody vegetation in the understory, including significant increases in dead and downed woody material and ladder fuels connecting ground vegetation to tree canopies. As a result, some oak woodlands are more susceptible to severe, crown-consuming fires (McCreary 2004).

Oak trees are highly flame-resistant because the leaves do not readily catch fire. Fires in oak stands tend to smolder in the duff and consume surface fuels without generating enough heat to carry fire into the oak canopy (USFS 2022a). Oaks also do not spread fire crown-to-crown readily like many conifers (Sonoma Veg Map 2018). Oak woodland litter does little to facilitate fire spread because it has a low surface-area-to-volume ratio and requires high heat levels to remove fuel moisture and raise the fuel to ignition temperature. Oak woodland litter is subject to seasonal drying in the late summer and early fall months, but fog drip, solar shading, and the windbreak provided by oak canopies can sustain high fuel moisture content in the summer when fog is present. Oaks have a low content of volatile organic compounds, and the lack of highly combustible oils further reduces the fire hazard associated with oaks and oak woodlands.

Dead fuels consist of 1-hour[4] (litter and duff smaller than 0.25 inches in diameter), 10-hour (twigs and small stems 0.25 inches to 1 inch in diameter), 100-hour (branches 1 inch to 3 inches in diameter), and 1,000-hour (large stems and branches greater than 3 inches in diameter) sizes. Oak woodlands are mostly lacking in features that promote fire spread, but weather and topography have a strong influence on fire behavior. Given extreme fire weather and steep terrain, oak woodlands have the potential for a moderate rate of spread, torching and crown fire, and extreme fire behavior, especially those with higher surface fuel loads and ladder fuels. Fire behavior in oak woodlands and forests is typically much less intense than wildfires burning in chaparral and coastal scrub communities. Low, compacted leaf litter understory, canopy shading of ground fuels, and wind velocity reduction from tree canopies significantly reduce the intensity and spread rates of surface fires in oak woodlands. The transition from ground to canopy fire increases fire intensity, spotting, and tree mortality potential.

[4] Fuel moisture in these fuels can change within 1 hour according to environmental factors (e.g., temperature, humidity, shade).

2.6.1.1.3.2 Closed Cone Pine – Cypress

Closed cone pine–cypress has a limited distribution in the Plan Area (192 acres) on the north side of the Santa Ynez Mountains near and immediately east of Palo Alto Hill (above San Julian). This vegetation type is dominated by bishop pine (*Pinus muricata*), native to the Santa Ynez Mountain range. Bishop pine is frequently dominant in closed-cone pine forests, and stands are open with little or no understory on dry, rocky sites, with a denser understory on moist sites. Bishop pine also occurs in mesic border areas of woodlands and savannas (USFS 2022b).

Closed cone pines retain their seeds in serotinous cones. These cones remain on branches and are fire dependent. Fire can occur at any phase of the community, and the heat causes the cones to release seeds. These seeds fall on bare mineral soils, and the open post-fire stands provide excellent seedling establishment. This environment promotes dense, even-aged stands. Fire-following herbaceous species is also common in the early stages after a fire. Stand lifespan varies based on species type; however, stand life span and fire frequency are not known for all species. Fire frequency can vary from 35 to 50 years to more than 100 years. These trees are often growing with highly flammable vegetation such as chaparral. The stands typically burn in stand-replacing fires with higher intensity.

2.6.1.1.3.3 Eucalyptus

Eucalyptus stands and individual trees in the Plan Area are predominantly blue gum (*Eucalyptus globulus*) and sugar gum (*E. cladocalyx*). Eucalyptus in the Plan Area are concentrated primarily near the coast at the bottom of Las Varas and Dos Pueblos Canyons, near Calle Mariposa, scattered between the railroad tracks and the ocean near the bottom of Tajiguas Canyon, and along the upper portion of Farren Road. Scattered individual trees or small stands can also be found elsewhere, but primarily at lower elevations and close to the coast.

Eucalyptus stands are composed of fuel structures ranging from fine to heavy and may include an understory of grass; brush; eucalyptus seedlings, saplings, and small trees; and eucalyptus leaf, twig, branch, and bark litter. Eucalyptus litter is generally moderately compacted with heavy to very heavy fuel loads; fuel loads in eucalyptus stands can reach between 45 and 100 tons per acre (Agee et. al. 1973). Fuel buildup in blue gum eucalyptus stands is very rapid, exceeding that of other tree species, and its litter (dead leaves and debris) is especially flammable (Agee et. al. 1973; NPS 2006; Wolf and DiTomaso 2016). Fuel reduction programs in eucalyptus stands are typically recommended to maintain low fuel load levels (USFS 2022c).

Eucalyptus stand near Mariposa Reina.

The leaves of blue gum eucalyptus may be moderately resistant to combustion under some circumstances (Dickinson and Kirkpatrick 1985); however, these trees are considered highly flammable because the bark catches fire readily, and deciduous bark streamers and lichen epiphytes tend to carry fire into the canopy, which tends to

produce embers that can be carried by strong winds. These flying embers are carried downwind and result in the development of spot fires that ignite in receptive fuel beds in advance of the fire's leading edge (Ashton 1981; USFS 2022c). Peeling bark is typical of many other eucalyptus species and contributes to ground-based fuels (litter) when it falls. Peeling bark is also retained for a period of time on tree trunks, where it can facilitate ground to canopy fire transition (ladder fuel). Eucalyptus litter has a moderate surface-area-to-volume ratio, requiring moderate heat to remove fuel moisture and raise the fuel to ignition temperature. Eucalyptus litter is subject to seasonal drying in the late summer and fall, but fog drip, solar shading, and windbreaks provided by the eucalyptus canopy can sustain high fuel moisture content in the summer when fog is present.

Like chaparral, eucalyptus also has a higher content of volatile organic compounds. Eucalyptus leaves produce a volatile (Gabbert 2014), highly combustible oil, and flammable gasses may be released from trees at very high temperatures, further increasing fire hazards (Gross 2013). The live fuel moisture content reaches its low point in the late summer and early fall. Dead fuels consist of 1-hour (litter and duff smaller than 0.25 inches in diameter), 10-hour (twigs and small stems 0.25 inches to 1 inch in diameter), 100-hour (branches 1 inch to 3 inches in diameter), and 1,000-hour (large stems and branches larger than 3 inches in diameter) sizes. Features that promote fire spread include heavy litterfall, flammable oils in the foliage, and open crowns bearing pendulous (i.e., downward hanging) branches, which encourage maximum updraft (USFS 2022c). Given average weather conditions and terrain, eucalyptus has the potential for a high rate of spread, torching and crown fire, and extreme fire behavior.

2.6.1.1.3.4 Montane Hardwood

Montane hardwood is limited in the Plan Area to three small, distinct areas – one east of Broadcast Peak along Camino Cielo and in two locations on the Dangermond Preserve: above Jalama Creek and at the upper portion of Espada Creek. Montane hardwood habitat is typically composed of hardwood tree species (tanoak (*Notholithocarpus densiflorus*) and canyon live oak (*Quercus chrysolepis*)); infrequent, poorly develop shrub stratum; and a sparse herbaceous layer. Tree individuals or clumps of trees may be only 3 to 4 meters apart, but on poorer sites, the spacing increases to 8 to 10 meters. Crowns may be close but rarely overlap. Crowns on mature trees can be approximately 60% of the bole and up to 80%. Tree height within the stands is often uniform, but shorter than conifers. Matures trees on better sites and within canyons can have heights between 10 and 30 meters and reach up to 150 centimeters in diameter. However, on poorer sites, mature tree height is only 10 to 15 meters, and the diameter decreases to 65 centimeters. If stands occur on rocky summits, the tree will have a shrub diameter and is usually shorter than 4 meters in height. Montane hardwood habitats generally are free of snags and downed woody material.

2.6.1.1.3.5 Montane Hardwood-Conifer

Montane hardwood-conifer is found in one location in the Plan Area – on a north-facing slope in the western portion of the Plan Area (near San Julian). These stands are adjacent to closed cone pine–cypress stands and are composed of hardwood tree species (tanoak, canyon live oak) and pines (Bishop pine). Montane hardwood-conifer is characterized by composition of at least one-third hardwood and one-third conifer. Overstory cover is typically dominated by conifers, especially where fire has been absent for a long period of time. Hardwoods comprise a lower layer (10–30 meters) above a shrub layer that can be sparse (in stands with high total canopy cover) to impenetrable (following fire) (North et. al. 2016).

2.6.1.1.3.6 Valley Foothill Riparian

Riparian woodlands are concentrated within the drainages throughout the Plan Area and have a low fire hazard because their high moisture levels limit ignition potential and minimize the potential for wildfire spread. The vegetation within riparian woodlands responds slowly to changes in temperature and moisture, and significant surface shading from tree canopies limits fuel moisture loss. Surface fuels are relatively low in riparian woodlands; however, storm-related high-water streamflow can deposit debris and contribute to fuel buildup as it dries out later in the season. During severe weather conditions, high fuel loads can result in high-intensity burning.

2.7 Wildfire Types and Potential Fire Behavior

Several wildfire types exist, as summarized below.

- **Ground Fire:** A fire burning on the ground or through understory vegetation and not reaching into the canopy (NWCG 2022).
- **Surface Fire:** A surface burning fire with low flame lengths (usually less than 1 meter) that does not result in significant movement into understory or overstory vegetation (NWCG 2022).
- **Crown Fire:** A fire that has burned upward from the ground and into the tree canopy. There are three types of crown fires:
  - ***Passive Crown Fire*:** A crown fire in which individual or small groups of trees torch out, but solid flaming in the canopy cannot be maintained except for short periods. Passive crown fires encompass a wide range of crown fire behavior, from the occasional torching of an isolated tree to a nearly active crown fire. Also called torching (Scott and Reinhardt 2001).
  - ***Active Crown Fire*:** A crown fire in which the entire fuel complex becomes involved, but the crowning phase remains dependent on heat released from the surface fuels for continued spread. Also called running and continuous crown fire (Scott and Reinhardt 2001).
  - ***Independent Crown Fire:*** A crown fire that spreads without the aid of a supporting surface fire (Scott and Reinhardt 2001).

Another component of fire behavior is spotting—the transfer of firebrands (embers) ahead of a fire front—which can ignite smaller vegetation fires (NWCG 2022). These smaller fires can burn independently or merge with the primary fire. Spotting can also result in structural ignitions when transported embers reach a receptive fuel bed (e.g., combustible roofing), especially in wind-driven fires, such as those occurring during Sundowner wind events in the Santa Ynez foothills. Structure fires, as well as vegetation-fueled fires, can generate firebrands. Additionally, landscape features like ridges can dramatically affect fire behavior by changing prevailing wind patterns, funneling air, and increasing wind speeds, thereby intensifying fire behavior.

Spot fires in grassland during the 2021 Alisal Fire (Ford 2021).

Each of the fire types mentioned above may occur within the Plan Area, depending on site-specific conditions. Fire behavior is how a wildland fire reacts to weather, fuels, and topography. The difficulty of controlling and suppressing a wildfire is typically determined by fire behavior characteristics, such as rate of spread, fireline intensity, torching, crowning, spotting, fire persistence, and resistance to control (NWCG 2022). Extreme fire behavior is that which precludes methods of direct control (e.g., flame lengths 8 feet and greater), behaves unpredictably and erratically, and typically involves high spread rates, crowning and spotting, the presence of fire whirls, and a strong convective column.

Fire behavior characteristics are an essential component in understanding fire risk. Flame length—the length of the flame of a spreading surface fire within the flaming front—is measured from midway in the active flaming combustion zone to the average tip of the flames (Andrews et. al. 2008). Although it is a somewhat subjective and nonscientific measure of fire behavior, it is imperative to fireline personnel when evaluating fireline intensity and is worth considering as a vital wildfire variable (Rothermel 1993). Fireline intensity is a measure of heat output from the flaming front and affects the potential for a surface fire to transition to a crown fire. Table 6 presents an interpretation of flame length and its relationship to fire suppression efforts.

Table 6. Fire Behavior Interpretation

Flame Length	Fireline Intensity	Interpretations
Under 4 feet	Under 100 BTU/ft/s	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 feet to 8 feet	100–500 BTU/ft/s	Fires are too intense for a direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 feet to 11 feet	500–1,000 BTU/ft/s	Fires may present serious control problems—torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11 feet	Over 1,000 BTU/ft/s	Crowning, spotting, and major fire runs are probable. Control efforts at the head of fire are ineffective.

Source: Roussopoulos and Johnson 1975.
Note: BTU/ft/s = British thermal units per foot per second.

2.8 Fire History and Ignitions

Fire history is an important component of fire planning and can provide an understanding of fire frequency, fire type and behavior, most vulnerable community areas, and significant ignition sources, among others. Several large-scale fires have occurred in the Plan Area, primarily associated with chaparral fuel beds east of Cañada de la Gaviota. The topography, vegetation, and climatic conditions in the Plan Area combine to create a unique situation capable of supporting large-scale, high-intensity, and sometimes damaging wildfires, such as the 2021 Alisal Fire. The history of wildfires in the Plan Area is summarized in Table 7 and graphically presented in Figure 5.

Table 7. Fire History

Fire Name	Year	Month	Acres
Unnamed	1916	Unknown	527
Unnamed	1921	Unknown	2,911
Unnamed	1922	Unknown	3,785
Refugio	1925	November	485
El Capitan	1925	July	401
Refugio	1926	November	194
Los Cruces	1926	August	4,607
Unnamed	1926	Unknown	928
Unnamed	1926	Unknown	3,036
El Capitan	1931	April	218
San Onofre Canyon	1934	September	194
Gaviota	1944	August	792
Refugio	1955	September	79,429
Hollister #5	1966	October	1,063
Macco Realty Company	1968	September	540
Eagle Canyon	1979	September	3,765
Gaviota	1981	July	90
Oak Mountain	1981	June	8,688
Homestead	1997	September	361
Hondo	2000	October	11
Nojoqui	2000	August	27
Correl	2001	August	29
Sudden	2002	June	7,503
Gaviota	2004	June	7,198
Jalama	2004	July	333
Mariposa	2007	September	188
Gap	2008	July	9,545
West	2010	July	11
Mariposa	2015	July	9
Bar	2016	August	18
Sherpa	2016	June	7,466
Whittier	2017	July	18,412
Cruces	2018	July	78

Table 7. Fire History

Fire Name	Year	Month	Acres
Real	2019	October	421
Hollister	2020	May	157
Alisal	2021	October	16,970
Hollister Incident	2022	March	120

Source: CAL FIRE 2021b.

As presented in Table 7, significant wildfires have burned in the months of July, September, and October. This timeframe coincides with the end of the dry summer season, when vegetation has lower fuel moistures and Sundowner winds are prominent. Although not all the fires shown in Table 7 were associated with Sundowner winds, the largest and most damaging fires have occurred during such winds.

The cause of the majority of fires that burned within the Plan Area are listed as either miscellaneous or unknown. However, fires within the Plan Area have also been directly related to human activity. Mechanized and power equipment use (e.g., mowers) is a potential ignition source with the area. Arson, campfires, and vehicle fires have also been sources of significant wildland fires in the Plan Area, including the Whittier and Gap Fires. However, the largest recorded fire within Santa Barbara County, the Thomas Fire, although outside the Plan Area, ignited as a result of line slap (lines coming into contact with each other, creating an electrical arc, which deposits hot, burning, or molten material onto the ground into a receptive fuel bed).

An analysis of wildfire ignition data can also help to understand where ignitions are occurring and inform wildfire mitigation project development. SBC Fire maintains a data set of wildland fire ignitions occurring throughout Santa Barbara County from 2007 through 2020 (SBC Fire 2021b). This data was analyzed to identify ignitions during this time period occurring in and within 2 miles of the Plan Area boundary. A total of 199 wildfire ignitions occurred within 2 miles of the Plan Area from 2007 through 2020. The results of this analysis are presented in Table 8.

Table 8. Ignition History within 2 Miles of Plan Area (2007–2020)

Cause Type	Ignition Quantity (Number)	Percentage of Total Causes
Campfire	10	5.0%
Cutting, Welding, and Grinding	1	0.5%
Debris, Vegetation Burn	5	2.5%
Electrical Power	23	11.6%
Equipment	11	5.5%
Firearms use	1	0.5%
Fireworks	2	1.0%
Incendiary	12	6.0%
Lightning	3	1.5%
Other	8	4.0%
Playing with Fire	1	0.5%
Railroad	4	2.0%
Smoking	1	0.5%
Spontaneous Combustion	2	1.0%
Undetermined	65	32.7%
Vehicle	50	25.1%

As presented in Table 8, most ignitions are undetermined (32.7%) and caused by vehicles (25.1%), with a smaller number caused by electrical lines (11.6%). Ignition locations are predominantly associated with roads in the Plan Area—specifically along Highways 1 and 101—although some ignitions have occurred in more remote, isolated portions of the Plan Area. Lightning strikes have also ignited wildfires in the western portion of the Plan Area (two of the three occurring on the Hollister Ranch) during monsoon conditions that can occur in late summer.

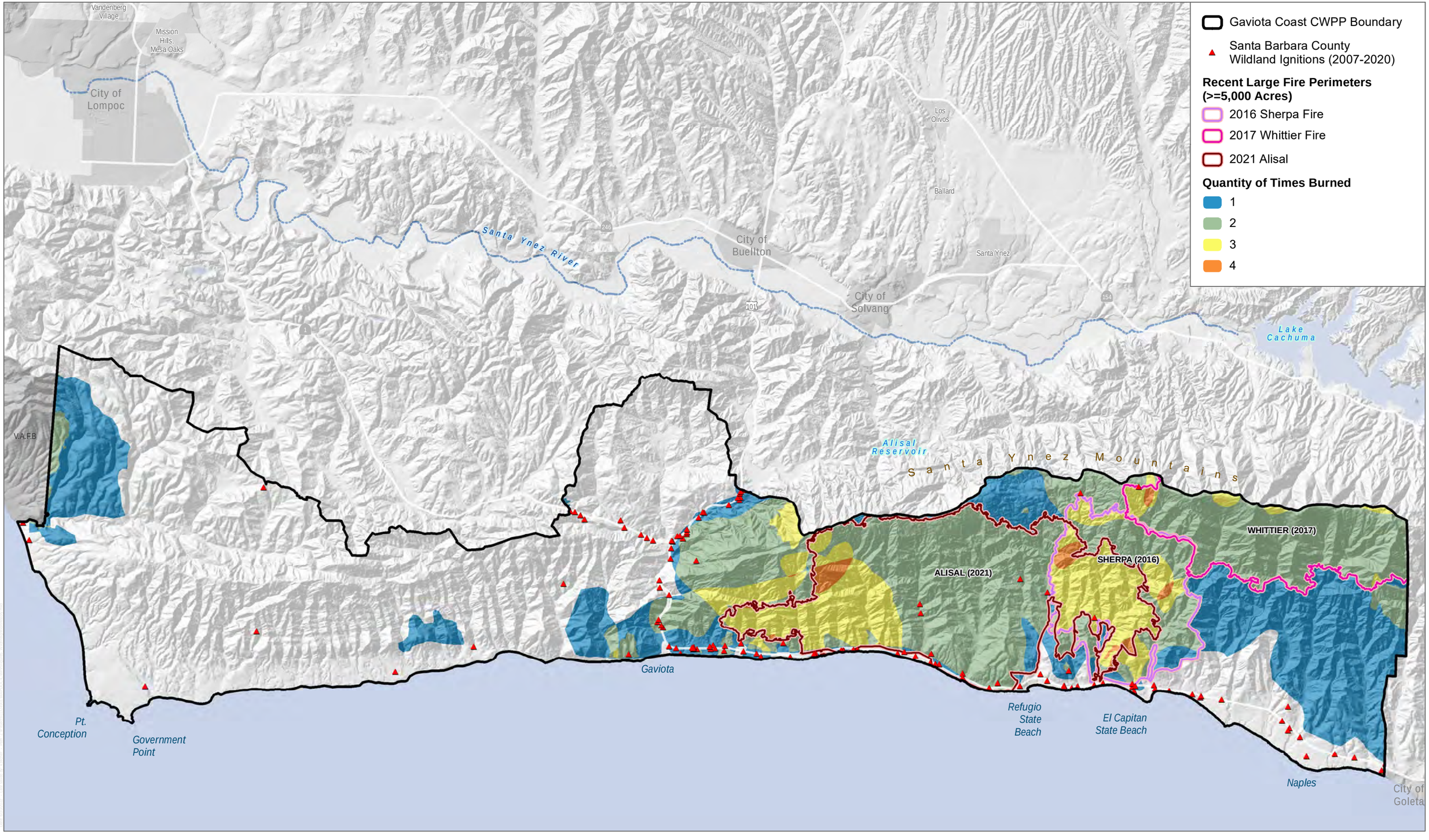
Other areas of concern for ignitions in the Plan Area identified during the CWPP development process include Farren Road, Jalama Road, and Refugio Road due to public access. The location of wildfire ignitions is presented in Figure 5.

2.8.1 2021 Alisal Fire

Alisal Fire, October 11, 2021 (Wildfire Today 2021).

The Alisal Fire started on October 11, 2021, northwest of Refugio Canyon. The fire actively burned for 39 days until it was contained on November 20, 2021. The cause of the fire remains under investigation. In total, the Alisal Fire burned 16,970 acres, stretching from east of the Gaviota Pass to El Capitan State Beach (CAL FIRE 2022b). Within 24 hours the fire burned to Highway 101, jumped all four lanes, and continued to burn to the coast (Gabbert 2021a). At the top of Refugio Road there was an entrapment issue due to the location of existing structures and limited access. Winds were reported to have sustained speeds from 20 to 30 miles per hour with over 50-mile-per-hour gusts (Gabbert 2021a). Winds during the event were from the northwest to north and not considered a true Sundowner wind as winds were calm in canyon bottoms. The rapid growth of the fire was caused by high wind conditions that made it difficult to contain. The fire burned into the 2016 Sherpa Fire perimeter, where vegetation was spotty, and did not result in a full burn in this area.

The fire resulted in structure loss and damage within the Plan Area, including to some orchards in the fire area, which only sustained minor damage where well-maintained. Due to the size of the burn scar and level of fire intensity, on October 23, 2021, Plan Area evacuation and shelter-in-place orders were issued for people living below the burn scar in response to the rainstorm potentially causing flash flooding, debris flows, and slope slippage. Due to additional rainstorms, the burn scar will be monitored for potential debris flow and other impacts (Sheahen 2021). Post-fire, Refugio Road has an increased risk of rock fall and debris-flow that will have a long-term impact.



SOURCE: USGS, County of Santa Barbara

DUDEK

0 1 2 Miles

FIGURE 5

Plan Area Wildfire and Ignition History

Gaviota Coast Community Wildfire Protection Plan

2.9 Land Ownership and Land Use

The dominant land use within the Plan Area is agriculture (including ranchland). Much of the Plan Area is considered a rural agricultural landscape that has been sustained by generations of farmers and ranchers. Public recreation, land conservancy, and, to a lesser extent, residential development are other main land uses within the Plan Area. In addition to private ownership, land within the Plan Area is also owned by federal, state, and County agencies and non-profit entities[5]. This combination of land ownership has a significant influence on the land use, resource protection, and services with the Plan Area. Table 9 describes the land ownership with the Plan Area. Land ownership distribution is presented in Figure 6.

Table 9. Land Ownership within the Plan Area

Land Ownership	Acres	Percentage of Total
Private	29,924	28.2%
Non-Profit	25,109	23.7%
California Department of Fish and Wildlife	35	<1%
California Department of Parks and Recreation	5,439	5.1%
California State Lands Commission	<1	<1%
California Wildlife Conservation Board	721	0.7%
Land Trust for Santa Barbara County	781	0.7%
County of Santa Barbara	1,617	1.5%
The Nature Conservancy (Dangermond Preserve)	24,278	22.9%
United States Coast Guard	29	<1%
United States Forest Service	18,070	17.0%

Source: CPAD 2020.

Private land (comprising 52% of the Plan Area) is primarily composed of agricultural land and private residential development. Private residential development is rural and broadly dispersed across the Plan Area. There are smaller pockets of more concentrated development in Arroyo Quemada, El Capitan Ranch, and the upper area of Refugio Road. In addition, Hollister Ranch, which owns approximately 14,600 acres between Gaviota State Park and Point Conception, is composed of 133 privately owned parcels. Hollister Ranch includes 84 homes that are moderately dispersed across the overall Hollister Ranch ownership.

The Dangermond Preserve/Cojo Ranch (The Nature Conservancy) is the largest individual land ownership in the Plan Area (24,278 acres). The preserve is dedicated primarily to ranchland and conservation type uses, and development is limited to two clusters of ranch operations and staff housing buildings. The USFS owns 18,070 acres of land, making it the second-largest individual landowner within the Plan Area. Los Padres National Forest is situated in the upper watershed portions of the Santa Ynez Mountains in the eastern half of the Plan Area. The Forest Plan for the region focuses on maintaining the rugged natural character of the landscape, protecting and enhancing wildlife species, managing vegetation (including hazardous fuels), protecting cultural resources, and providing recreational opportunities. The USFS also provides critical fire response to the Plan Area.

The third-largest individual landowner within the Plan Area is the State of California, primarily owned by the California Department of Parks and Recreation (DPR) (5,439 acres), although the California Wildlife Conservation

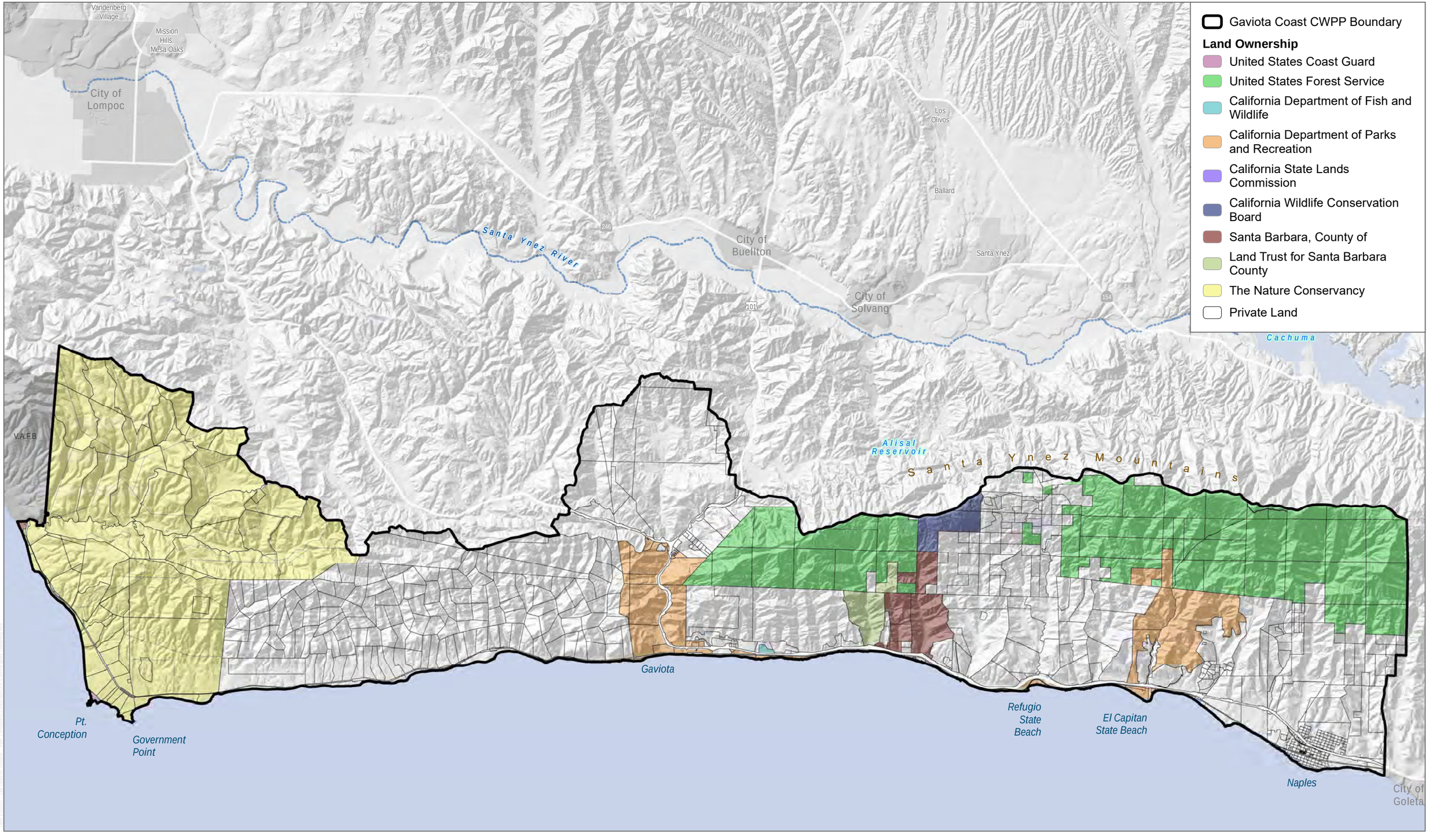
[5] Non-profit entities are private ownerships, represented by The Nature Conservancy and the Land Trust for Santa Barbara County.

Board, California State Lands Commission, and California Department of Fish and Wildlife (CDFW) collectively own another approximately 756 acres in the Plan Area. DPR owns and manages Gaviota State Park, Refugio State Beach, and El Capitan State Beach. CDFW owns the 35-acre Gaviota Tarplant Ecological Reserve.

County land ownership is divided into the Jalama Beach County Park, Tajiguas Landfill and Materials Recovery Facility (MRF), and Baron Ranch. The Tajiguas Landfill/MRF site encompasses approximately 400 acres and is the main waste facility for the County; it accepts waste from the City of Santa Barbara, unincorporated areas of southern Santa Barbara County, the Santa Ynez Valley, and the Cuyama Valley. It is located just north of Highway 101 between Gaviota State Park and Refugio State Beach. Jalama Beach County Park encompasses 23.5 acres and provides beach access and camping opportunities. Adjacent to the Tajiguas Landfill/MRF site, Baron Ranch encompasses 1,083 acres and was formerly an active agricultural property that included orchards and was regularly used for livestock grazing. Following the expansion of the neighboring Tajiguas Landfill/MRF site, portions of Baron Ranch were used for California red-legged frog (*Rama draytonii*) habitat restoration purposes. Grazing activities ceased when the County acquired the property in 1991.

The Land Trust for Santa Barbara County owns and manages the Arroyo Hondo Preserve, which consists of 781 acres in the Plan Area in Arroyo Hondo between Highway 101 and the Los Padres National Forest. Access is limited to reservations only. Temporary cattle grazing is occurring on the west side of the property and prescribed herbivory using sheep is occurring on east and west sides. Mowing in other areas is conducted routinely.

Exxon owns approximately 840 acres in Corral Canyon that has historically been dedicated to oil production and refinement activities. The property is well maintained in and around the facility and along roads where roadside weed abatement practices are in place. Little or no vegetation management is conducted outside of the areas adjacent to facilities and roads. This property was impacted by both the Sherpa and Alisal Fires.



SOURCE: USGS, County of Santa Barbara, CPAD 2020

DUDEK

0 1 2 Miles

FIGURE 6

Ownership

Gaviota Coast Community Wildfire Protection Plan

2.10 Fire Protection

SBC Fire provides a complete range of fire protection, prevention, and educational services in the Plan Area. SBC Fire is staffed and equipped for structural fire protection and wildland fire prevention and protection, including full-time staffing of wildland fire experts, developing codes and standards for vegetation management and structural protection, implementing vegetation management projects and a defensible space inspection program, and working with the community to increase resilience in the event of a wildland fire. SBC Fire recognizes that wildland fire in the Plan Area is inevitable.

SBC Fire also recognizes the need to maintain a long-range wildland fire plan to reduce the catastrophic effects of wildfire. Without this plan, the ability to prioritize, fund, and implement projects and programs to minimize the impact of wildfire in the community would be jeopardized.

In addition to fire protection from SBC Fire, the Plan Area is served by the USFS, California State Parks, Hollister Ranch Fire Company, and Mutual Aid Agreements with adjacent jurisdictions.

2.10.1 Santa Barbara County Fire Department

SBC Fire was established in 1926 and is a multi-disciplinary agency that responds to a variety of incidents, including vehicle, aircraft, and train accidents; hazardous materials incidents; urban search and rescue; structure fires; water rescue; medical emergencies; rope rescue; air support; confined space rescue; fire line construction; and vegetation fires. Within SBC Fire are 16 fire stations that consist of 16 engines and two truck companies. There are three battalions in the south, central, and northern parts of Santa Barbara County. SBC Fire employs approximately 277 full-time employees and responds to more than 15,000 incidents annually. Additionally, SBC Fire is one of six contract counties with CAL FIRE, meaning in the SRA, fire protection is provided by the County under contract with CAL FIRE. SBC Fire protects 670,677 acres of SRA within Santa Barbara County (SBC Fire 2022a). SBC Fire Station 38 is within the central portion of the Plan Area on Calle Mariposa Reina.

SBC Fire also serves as the County Operational Area Coordinator for all fire agencies within Santa Barbara County. Due to the combination of limited resources and frequent large incidents, there are regional response teams made up of personnel from all local fire agencies that respond to all large-scale incidents within Santa Barbara County. The XSB Incident Management Team #3 has been deployed to oversee and manage incidents such as the Whitter Fire, Cave Fire, Gibraltar Fire, and 1/9 Debris Flow.

2.10.1.1 SBC Fire Stations and Fire Equipment

There are 10 SBC Fire stations, one camp, and SBC Fire Headquarters within 10 miles of the Plan Area. Station 38 is in the Plan Area on Calle Mariposa Reina. Each fire station in SBC Fire is staffed 24 hours/7 days a week with a minimum of three firefighters. The stations within 10 miles of the Plan Area and fire equipment available are listed in Table 10.

Table 10. SBC Fire Stations within 10 Miles of the Plan Area

Station ID	Address	Equipment	Staffing
County Station 11	6901 Frey Way Goleta, CA 93117	Battalion 1 Ladder Truck 11 Engine 11 Rescue Watercraft	(2) Captain (2) Engineer (1) Firefighter (1) Firefighter/Paramedic Urban Search and Rescue Team
County Station12	5330 Calle Real Goleta, CA 93117	Engine 12 Engine 312	(1) Captain (1) Engineer (1) Firefighter/Paramedic
County Station 13	4570 Hollister Santa Barbara, CA 93110	Engine 13 Engine 313	(1) Captain (1) Engineer (1) Firefighter/Paramedic
County Station 14	320 Los Carneros Road Goleta, CA 93117	Engine 14 Engine 314	(1) Captain (1) Engineer (1) Firefighter/Paramedic
County Station 17	UCSB, Mesa Road Building 547 Santa Barbara, CA 93106	Engine 17 Rescue Ambulance 17	(1) Captain (1) Engineer (2) Firefighter/Paramedic (1) Firefighter
County Station 30	1644 Oak Street Solvang, CA 93464	Engine 30 Engine 330 Truck 30	(1) Captain (1) Engineer (1) Firefighter/Paramedic (1) Firefighter
County Station 31	168 West Highway 246 Buellton, CA 93427	Engine 31 Engine 331 Battalion 3 HazMat Unit	(1) Captain (1) Engineer (1) Firefighter/Paramedic (1) Firefighter Hazardous Materials Response Team
County Station 32	906 Airport Road Santa Ynez, CA 93460	Engine 32 Engine 332 WT 32	(1) Captain (1) Engineer (2) Firefighter/Paramedic
County Station 34	3510 Harris Grade Road Lompoc, CA 93436	Engine 34 Rescue Ambulance	(1) Captain (2) Engineers (2) Firefighter/Paramedics
County Station 38	17200 Calle Mariposa Reina Road Gaviota, CA 93117	Engine 38 Engine 338 WT 38 Air/Lighting Unit	(1) Captain (1) Engineer (1) Firefighter/Paramedic (1) Firefighter

Source: SBC Fire 2022b.

SBC Fire also has several special operation units, such as the Air and Wildland Unit, Construction, Hazardous Materials Response Team, Urban Search and Rescue, Search Dog Team, Water Rescue Team, and Wildland Fire Crew (SBC Fire 2022c). The Air and Wildland Fire Unit was formed in response to the fire hazard in Santa Barbara County and repeated extreme wildfire events such as the Gap Fire, Tea Fire, Jesusita Fire, Sherpa Fire, Whittier Fire, and Thomas Fire. Within the Air and Wildland Fire unit is the Construction Unit and the Wildland Fire Crew.

Resources include two firefighting helicopters, four fire bulldozers, two Type 1 20-person fire crews, and one Type 2 16-person fire crew. The Construction Unit has multiple roles, which include fire suppression, fire rehabilitation, overhaul support on structure incidents, and fire roads/break maintenance. Some of the important functions of the Construction Unit are to maintain fire access roads, prepare prescribed burns, hazards reduction, maintenance and repair of chainsaws, maintenance and repair of vehicles, and other projects. The Wildland Fire Crew is located at Camp One in Lake Cachuma. Each crew has 16 Fire Control Workers and two full-time Senior Fire Control Workers who are directly supervised by an Engineer/Crew Boss. There is also one Captain to oversee the program. During fire season, the crew is staffed 7 days a week. The Wildland Fire Crew is also responsible for completing annual projects that meet that Santa Barbara County Fire Department Unit Plan, as well as grant-funded, state-funded, and federal-funded projects throughout Santa Barbara County (SBC Fire 2022d, 2022e).

2.10.2 U.S. Forest Service

The USFS Santa Barbara Ranger District has jurisdiction in the Los Padres National Forest and can provide fire protection to the Plan Area. The USFS provides wildland fire suppression across Santa Barbara Country via engine crews, hand crews, helitack crews, hotshots, and smoke jumpers. Recently, the USFS aided in the response to the Alisal Fire and has a mutual aid agreement with the County. In addition to fire suppression, the USFS also facilitates fuels management projects such as prescribed burns and mechanical treatments, and aids in fire prevention via Community Mitigation Assistance Teams and Fire Adapted Communities. The USFS, Pacific Southwest Region Fire and Aviation Management is primarily responsible for fire suppression and management within the Los Padres National Forest lands and lands managed by USFS partners. The Pacific Southwest Region Fire and Aviation Management is responsible for wildland fire protection in the northeast portion of the Plan Area (USDA 2022).

2.10.3 California State Parks

The Channel Coast District (CCD) of DPR plays an active role in preparing for and responding to wildfires occurring on or threatening DPR-managed lands within the Plan Area. The three state parks within the Plan Area are Gaviota State Park, El Capitan State Beach, and Refugio State Beach. The primary responding agency for the CCD is SBC Fire.

CCD has fire-trained personnel in varying capacities who both respond to and prepare for wildfire incidents. These personnel include Resource Advisors who are trained to work with District Agency Representatives, Incident Management Teams, and wildland fire field staff to protect and repair cultural and natural resources on DPR lands during any fire events on or threatening DPR lands. DPR Resource Advisors also provide local specialist knowledge while planning for potential fire activity within the CCD.

The CCD follows statewide policies and guidelines. As well as local plans for interagency collaboration for wildfire preparedness, response, and recovery. Designated areas within the CCD parks often provide refuge for evacuees and serve as a base for emergency services during wildfire incidents.

2.10.4 Hollister Ranch Fire Company

The Hollister Ranch Fire Company was established in 2010 as a private fire company on Hollister Ranch. Many property owners within Hollister Ranch volunteer as firefighters. Firefighters in the Hollister Ranch Fire Company have basic wildland firefighter training, and all employees plus over half of the residents have CPR/AED training (Hollister Ranch 2022). Because the Hollister Ranch Company is within the Plan Area, they would be able to respond to or aid in response to wildfire incidents.

2.10.5 Fire Protection Partnerships

As previously described, SBC Fire acts as the Operational Area Coordinator for all fire agencies within Santa Barbara County. This also includes coordinating mutual and automatic aid plans within and outside of Santa Barbara County. Automatic aid is a contractual agreement between agencies and/or fire districts, and aid is dispatched to all first alarms. Mutual aid agreements differ from automatic aid in that outside assistance typically is provided when the agreement is activated, and aid is requested by the primary responding agency. Within the Operational Area, nine fire agencies provide mutual and automatic aid:

- Carpinteria/Summerland Fire Protection District
- Guadalupe City Fire Department
- Lompoc City Fire Department
- Montecito Fire Protection District
- Santa Barbara City Fire Department
- Santa Barbara County Fire Department
- Santa Maria City Fire Department
- Los Padres National Forest
- Vandenberg Air Force Base (VAFB) Fire Department

Additional aid from outside Santa Barbara County may come from San Luis Obispo County Fire, CAL FIRE, and Ventura County Fire. In the event of a large-scale wildfire, the state would also coordinate additional aid from across the state and country.

2.11 Existing Fire Risk Reduction Programs

2.11.1 Santa Barbara County Fire Safe Council

The Santa Barbara County Fire Safe Council (SBCFSC) was formed in 1997 with a goal of promoting wildfire safety throughout Santa Barbara County through education and action. Its stated mission is to unify public and private organizations in the County to educate, motivate, and coordinate to minimize losses associated with wildfires (SBCFSC 2022). The SBCFSC provides education, supports community emergency planning, and helps create fire adaptive communities through mitigation actions. Some of the education programs the SBCFSC offers are Ready! Set! Go! Developed by CAL FIRE, Firewise USA, and One Less Spark–One Less Wildfire. The SBCFSC also partners with SBC Fire, Santa Barbara City Fire Department, Carpinteria/Summerland Fire Protection District, and Montecito Fire Protection District.

The SBCFSC meets once a month at the Office of Emergency Management. Every other meeting includes an educational presentation from an expert on local issues. These presentations include topics such as fire ecology, fire behavior, vegetation management, habitat restoration, infrastructure improvement, weather services, and emergency planning. The meetings help provide relevant information to the community and offer a platform for community members to engage in wildfire challenges.

Supporting community emergency planning is also an action undertaken by the SBCFSC. The SBCFSC has had a successful record of securing funding through state and local grants. Grant funding has been used to support fire risk reduction efforts, including preparing CWPPs, implementing a "walk and talk" program (where local fire officials walk neighborhoods with residents to identify and recommend mitigation actions), supporting defensible space and community-level fuel break projects, organizing community chipping programs, guiding the Firewise USA process for local communities, and identifying, working with, and helping vulnerable communities in wildfire preparedness. The SBCFSC also conducts free home evaluations, hosts community education events about wildfire preparedness, creates educational videos, and is creating a home hardening and defensible space website portal.

2.11.2 Regional Wildfire Mitigation Program – Santa Barbara South Coast Region

The Regional Wildfire Mitigation Program (RWMP) is a multi-year initiative designed to assess hazard, exposure and vulnerability and equitably reduce wildfire hazard across the Santa Barbara front country. The RWMP area encompasses the entire Plan Area. The Program goals are to decrease the risk of wildfire impacts to structures and infrastructure, promote wildfire resilient green space, working lands, and habitats, and develop community capacity to adapt and recover from natural disasters. The Program is divided into three primary Resilience Domains:

- **Landscape Resilience Domain:** The Landscape Resilience Domain proposes a fire-resistant buffer or "greenbelt" area in strategic locations to create wildfire resilient green space, working lands, and habitats. Outcomes include co-benefits that support watershed and coastal ecological health using live oak shaded fuel breaks, habitat restoration, prescribed herbivory, hydrated and agricultural buffers, and land conservation.
- **Built Environment Resilience Domain:** The Built Environment Resilience Domain seeks to build local capacity to retrofit and increase wildfire resilience for homes, businesses, and critical infrastructure. This domain prioritizes retrofit and mitigation programs in areas that will provide the highest community benefit.
- **Community Resilient Domain:** Through collaboration with the SBCFSC, the Community Resilience Domain engages, educates, and trains local residents and communities to increase their resilience to wildfire by conducting home evaluations, encouraging communities to join the Firewise USA® Program, hosting wildfire education and preparedness events, and working directly with communities to reduce their wildfire risk.

The RWMP is a collaboration between many local, regional, and national partners, including SBCFSC and SBC Fire, and is funded by the National Fish and Wildlife Foundation.

2.11.3 Santa Barbara County Fire Programs

2.11.3.1 Defensible Space and Vegetation Management

As outlined in Chapter 15 of the Santa Barbara County Code of Ordinances (adopted by Ordinance #5901), all parcels in areas designated as High Fire Hazard by the Santa Barbra County Building Official are required to meet

the County's defensible space requirements year-round. Vegetation within defensible space zones, native or otherwise, must be maintained to create an effective fuel break by thinning dense vegetation and removing dry brush, flammable vegetation, and combustible growth from areas within 100 feet of all buildings or structures. With site-specific inspection and authorization from SBC Fire, up to 300 feet of defensible space vegetation treatments may be undertaken. Crossing property lines to achieve defensible space vegetation treatment is not required, although it is desirable when authorized by agreements with neighboring landowners.

Defensible space clearance also includes clearance of brush, vegetative growth, and combustible materials from all parcels deemed a fire hazard. SBC Fire also facilities a Hazard Reduction Program, which sends notices to abate fire hazards to property owners. The notices indicate defensible space requirements, and property owners have approximately 3 weeks to meet the requirements for defensible space.

2.11.3.2 Road Clearance

The County conducts roadside vegetation management to reduce the amount of vegetation along roadways, enhance evacuation during a wildfire, and allow greater access for fire engines and equipment to respond during a wildfire. Chapter 15 of the County Code of Ordinances requires property owners to maintain an area cleared of flammable vegetation and combustible growth on their properties on fire access roads and on driveways of 10 horizontal feet on each side; additionally, overhanging vegetation must be removed for a vertical clearance, not less than 13 feet 6 inches.

2.11.3.3 SBC Fire Roads Program

SBC Fire's Construction Section works with cooperating landowners to maintain existing ranch roads under this program. The Construction Section consists of five personnel—four fire equipment operators and one swamper—and provides support during fire suppression and fire rehabilitation efforts, and fire road/firebreak maintenance. The Roads Program is conducted by the Construction Section and is intended to facilitate SBC Fire access for incident response or other pre-fire activities, and not to maintain roads for ranching or other land management purposes (SBC Fire 2022f).

2.11.3.4 SBC Fire Vegetation Management Section

The County's approach to vegetation management uses a three-pronged start that focuses on reducing old-age class fuel loads, using broadcast burning in strategic locations and maintaining and enhancing defensible space around communities. The goal is to create protection for communities at risk and to conduct larger-scale mechanical treatments of identified hazardous fuel beds to help stop the spread of wildfire. Mechanical treatments consist of reducing continuity and the percentage of receptive fuel beds (SBC Fire 2022g).

The Vegetation Management section of SBC Fire is responsible for producing the County's Unit Fire Plan and for planning and oversight of range improvement burns and vegetation management projects. The Unit Fire Plan ensures compliance with state-mandated hazardous fuel reduction (SBC Fire 2022g).

2.11.3.5 Fuel Breaks and Fuel Management Projects

Several fuel breaks exist in the Plan Area, and SBC Fire is active in various fuel management projects to mitigate wildfire risk. The Plan Area also contains several contingency dozer lines that were used in fighting previous wildfires and could potentially be used again during another wildfire event. The following summarizes fuel breaks and fuel management projects in the Plan Area (SBC Fire 2021c):

- **Camino Cielo Fuel Break:** This established fuel break extends along the ridgeline of the Santa Ynez Mountains along the Plan Area's northern boundary from approximately Refugio Pass in the west to the

Plan Area's eastern boundary. Maintenance of this fuel break is conducted by the USFS. This fuel break is critical in stopping or slowing fires burning southward toward the Plan Area from the northern slope of the Santa Ynez Mountains.

- **Refugio Road Project:** An approximately 16,000-acre project along Refugio Canyon from Highway 101 in the south over the Santa Ynez Mountains to the Santa Ynez Valley in the north. Also includes roadside fuel treatment along Refugio Road between the lower Refugio Canyon community and the summit.
- **Western Front Country Fuel Break:** This fuel break extends in an east/west direction from approximately Las Llagas Canyon in the west to the Plan Area boundary near Farren Road in the east. It is at a lower, mid-slope elevation than the Camino Cielo fuel break above it.
- **Vista del Mar Project:** An approximately 137-acre project between Highway 1, Highway 101, and Gaviota State Park in Las Cruces. Also includes roadside fuel treatment along San Julian Road between Highway 1 and its termination at Gaviota State Park and defensible space treatment along the south side of Las Cruces School.
- **Contingency Dozer Lines:** Typically, north/south-oriented dozer lines along ridgelines between Arroyo Hondo in the west and Farren Road in the east. These lines occur on private and USFS lands. The dozer lines east of El Capitan Canyon typically connect into the Western Front Country Fuel Break and three dozer lines connect to the Camino Cielo Fuel Break.

2.11.3.6 Inspections

SBC Fire conducts defensible space inspections throughout Santa Barbara County each year. The inspections ensure that property owners have completed their annual defensible space maintenance and serve to educate citizens on ways to improve structure survivability to wildfire. The inspections evaluate natural and ornamental vegetation; document construction materials; and check for SBC Fire access, the visibility of the address, water supply, and any fire hazards. The inspections are done in conjunction with CAL FIRE. Per Assembly Bill 38, property sold on or after July 1, 2021, need documentation of a defensible space inspection.

2.11.3.7 Planning and Engineering

SBC Fire reviews documents for buildings, developments, and proposed projects to ensure all projects meet state and local fire safety requirements. SBC Fire reviews things such as fire protection water systems, fire sprinkler systems, fire alarm systems, cell sites, solar arrays, addressing, defensible space, tract and parcel maps, permits, land use, site development, and other fire-related items. The Planning and Engineering Section represents SBC Fire at County Special Development Review Committees, the County Special Problems Review Committee, and the County Planning Commission, and preforms field inspections as needed to ensure compliance with project conditions.

2.11.3.8 Wildfire Predictive Services

SBC Fire also maintains nine Remote Automated Weather Stations (RAWS) throughout Santa Barbara County. These stations are used to monitor and record fire weather conditions. The stations are at San Marcos Pass, Mission Canyon, Carpinteria Foothills, Refugio, Gaviota, Santa Ynez Mountains, Burton Mesa, Tepusquet, and Cuyama Valley. The RAWS at Refugio and Gaviota are within the Plan Area. SBC Fire also monitors live fuel moisture to aid in predicting wildfires. Live fuel moisture is gathered from field samples in five locations, including Refugio and western Gaviota (SBC Fire 2022h).

2.11.3.9 Public Education

SBC Fire also provides public education and information on a variety of topics, including wildfire. Some of these programs include station tours, training Community Emergency Response Teams, and the Fire Safety House. SBC Fire also runs the Wildfire Education Campaign. The campaign was launched in 2009 and is part of the statewide Ready! Set! Go! Approach to wildfire preparedness and evacuation. Additionally, SBC Fire offers free home fire safety inspections to residents. SBC Fire checks residents' homes and offers fire safety and prevention tips.

2.11.4 U.S. Forest Service

The USFS Los Padres Unit carries out fuels and vegetation management projects. Its mission is to provide safe, efficient, economical fire management while sustaining, protecting, and restoring ecosystems. Projects can include forest health projects, grazing management, and fuel treatment. Fuels treatments are typically conducted by mechanical methods or through prescribed fire (USDA 2022).

The USFS is helping to develop and implement the National Cohesive Wildland Fire Management Strategy, which focuses on creating resilient communities, fire-adapted communities, and safe and effective wildfire response (USDOI and USDA 2022a).

The USFS recognizes the value of cross-boundary collaboration and has the ability to enter into agreements with state, county, and tribal agencies to perform forest, rangeland, and watershed improvement projects (including hazardous fuels reduction projects) on and adjacent to USFS lands under the Good Neighbor Authority. The Good Neighbor Authority allows the USFS to enter into up to 10-year agreements with partner agencies that have the mandate to conduct forest, rangeland, and watershed projects. Adjacency of land is not required, and there are no restrictions on mutual interests or mutual benefits. Under the Good Neighbor Authority, there is no match requirement for partner contribution, although a match is recommended (USFS 2022d).

As noted, the USFS maintains the Camino Cielo Fuel Break along the ridgeline of the Santa Ynez Mountains along the Plan Area's northern boundary. This fuel break is critical to stopping or slowing fires burning southward toward the Plan Area from the northern slope of the Santa Ynez Mountains. Maintenance of this fuel break is a priority for mitigating fire hazard to the Gaviota Coast community.

2.11.5 California State Parks

The CCD takes a balanced approach to fire and fuels management to preserve biodiversity, natural resources, and cultural resources. This approach is based on statewide policy and on evaluation by local specialists (DPR 2022). The CCD implements fuels and vegetation management projects throughout DPR lands within the Plan Area.

2.11.6 Jack and Laura Dangermond Preserve

The Jack and Laura Dangermond Preserve is a 24,278-acre preserve at Point Conception. The preserve is undeveloped, with only two concentrations of structures built to support ranching operations: one at 8101 Jalama Road near Escondido Creek and the other near the coast at Point Conception. Both areas include housing and operations buildings (barns, utility and storage structures). Wildfire is of concern on the preserve and its Integrated Resource Management Plan identifies using cattle grazing to reduce fine fuel loads (Butterfield et. al. 2019). Cattle grazing is actively underway on the preserve. The Nature Conservancy manages the preserve and has expressed interest in working with SBC Fire to strategically implement prescribed burning activities on the preserve to reduce

surface fuel loads, reduce risk to preserve buildings and infrastructure, and enhance natural resources, and rangeland habitats. The Nature Conservancy is planning a Santa Barbara Prescribed Fire Training Exchange (TREX) event for Fall 2022.

2.11.7 Hollister Ranch

As previously described, Hollister Ranch has a fire company, and many owners participate as volunteer firefighters. All Hollister Ranch employees have National Wildfire Coordinating Group (NWCG) 310-01 basic wildland fire training (Hollister Ranch 2022), and there are four Emergency Medical Technicians (EMTs) on staff. Hollister Ranch has reverse-911 capabilities for residents, undertakes pre-inspections for defensible space, and has a developed evacuation plan. In testing, Hollister Ranch can be evacuated in 1.5 hours. An evacuation staging area has also been identified at Bulito Beach, which provides a good place to shelter, provides sufficient room for people and vehicles, has good cell phone reception, and is central to the Ranch.

Hollister Ranch also uses cattle leases to manage fuels and maintain grazing land. The grazing program is effective at maintaining fuel loads, and the availability of water can allow for expansion of this program. The cattle co-op also undertakes preservation projects to restore native grasses and remove noxious weeds. Hollister Ranch also routinely mows grasses along both sides of internal roads to minimize wildfire ignition potential.

Additionally, on March 8, 2022, Hollister Ranch was formally recognized as a Firewise Community by the National Fire Protection Association, the second community in Santa Barbara County to achieve this designation. This designation is valid for 3 years. A Firewise Community is one that has taken appropriate measures to become more resistant to wildfire structural damage. Firewise techniques include minimizing the risk of home ignition by carefully landscaping around residential structures, such as thinning trees and brush and choosing fire-resistant plants; selecting ignition-resistant building materials; and positioning structures away from slopes.

2.12 Evacuation

The Plan Area presents unique challenges for evacuation. Terrain limits radio and cellular communication capabilities in much of the Plan Area. Terrain also affects road types in the Plan Area, many of which are long and narrow with limited capabilities for accommodating numerous vehicles during an evacuation event. Factors associated with evacuation, such as human behavior, population density, overloaded transportation routes, visitors, vulnerable populations, and the evacuation of pets and large animals, make the task of any evacuation more complex. Any combination of these factors may significantly increase the amount of time it takes to execute an evacuation. In addition, the decision by property owners and agencies to evacuate is often made quickly.

Evacuation during a wildfire in the Plan Area is not necessarily directed by fire agencies, except in specific areas where fire personnel may enact evacuations on-scene. The Santa Barbara County Sheriff's Department and other cooperating law enforcement agencies have the primary responsibility for evacuations. These agencies work closely within the Unified Incident Command System with the County Office of Emergency Services and responding fire department personnel who assess fire behavior and spread, which should ultimately guide evacuation decisions.

3 Planning and Regulatory Environment

This section describes existing plans, codes, and standards relevant to wildfire protection and fuels management in the Plan Area.

3.1 Federal

3.1.1 Healthy Forests Restoration Act

The 2003 Healthy Forests Restoration Act (HFRA) is the legislative component of the Healthy Forest Initiative. The HFRA provides provisions for expediting the preparation and implementation of hazardous fuels reduction projects on federal land and assisting states, rural communities, and landowners with restoring healthy forest and watershed conditions. As a key component of the HFRA, a CWPP serves as a mechanism for community input and identification of areas presenting high wildfire risk, as well as identification of potential projects intended to mitigate such risk. The HFRA places a priority on fuel treatments identified by communities in their CWPPs.

3.1.2 National Fire Plan

The National Fire Plan was a presidential directive in 2000 in response to severe wildland fires that had burned throughout the United States. The National Fire Plan focuses on reducing fire impacts on rural communities and providing assurance for sufficient firefighting capacity in the future. The National Fire Plan addresses five key points: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability. The plan continues to provide technical, financial, and resource guidance and support for wildland fire management across the United States. The USFS and the Department of the Interior are working to implement the key points outlined in the National Fire Plan (U.S. Government 2000).

3.1.3 National Incident Management System

The National Incident Management System (NIMS) is a system that guides all levels of government, nongovernmental organizations, and the private sector to work together to prevent, protect against, mitigate, respond to, and recover from incidents. The National Incident Management System provides guidance regardless of the cause, size, location, or complexity of the incident, and provides shared vocabulary, systems, and processes as well as defines operational systems used during incidents.

3.1.4 Disaster Mitigation Act

The Disaster Mitigation Act of 2000 created incentives for state and local entities to coordinate hazard mitigation planning and implementation. The act is an important source of funding for fuels reduction and fire hazard reduction efforts through federal hazard mitigation grants.

3.1.5 National Forest Management Act

The National Forest Management Act governs the administration of national forests and was an amendment to the Forest and Rangeland Renewable Resources Planning Act of 1974. The act called for the management of renewable resources on national forest lands.

3.1.6 National Historic Preservation Act

The National Historic Preservation Act protects and preserves historic and cultural sites. The act also created the National Register of Historic Places, the list of National Historic Landmarks, and the State Historic Preservation Offices.

3.1.7 Endangered Species Act

The Endangered Species Act of 1973 protects species that are listed as endangered or threatened throughout all or a significant portion of their range. The act also provides protection for critical habitats on which the listed species depend.

3.1.8 Los Padres National Forest Land Management Plan

In accordance with the National Forest Management Act, each national forest has a land and resource management plan. The Land Management Plan for the Los Padres National Forest describes the strategic direction for managing the forest's land and resources over the next 10 to 15 years (USFS 2005).

3.1.9 Quadrennial Fire Review

The Quadrennial Fire Review is a strategic risk assessment that is conducted every 4 years, with the most recent assessment carried out in 2014. The purpose of the review is to forecast the conditions that may present the greatest challenge for wildland fire management over the next 10 to 20 years.

3.1.10 National Cohesive Wildland Fire Management Strategy

The National Cohesive Wildland Fire Management Strategy is a push to work collaboratively among stakeholders across landscapes to create resilient landscapes, fire-adapted communities, and safe and effective wildfire response.

3.1.11 Federal Wildland Fire Management Policy

The Federal Wildland Fire Management Policy was developed in 1995, updated in 2001, and again in 2009 by the National Wildfire Coordinating Group, a federal multi-agency group that establishes consistent and coordinated fire management policy across multiple federal jurisdictions. An important component of the Federal Wildland Fire Management Policy is the acknowledgement of the essential role of fire in maintaining natural ecosystems. The Federal Wildland Fire Management Policy and its implementation are founded on the following guiding principles, found in the Guidance for Implementation of Federal Wildland Fire Management Policy (NWCG 2009):

- Firefighter and public safety is the first priority in every fire management activity.
- The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process.

- Fire management plans, programs, and activities support land and resource management plans and their implementation.
- Sound risk management is a foundation for all fire management activities.
- Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives.
- Fire management plans and activities are based upon the best available science.
- Fire management plans and activities incorporate public health and environmental quality considerations.
- Federal, state, tribal, local, interagency, and international coordination and cooperation are essential.
- Standardization of policies and procedures among federal agencies is an ongoing objective.

3.1.12 International Fire Code

Created by the International Code Council, the International Fire Code addresses a wide array of conditions hazardous to life and property, including fire, explosions, and hazardous materials handling or usage (although not a federal regulation, but rather the product of the International Code Council). The International Fire Code places an emphasis on prescriptive and performance-based approaches to fire prevention and fire protection systems. Updated every 3 years, the International Fire Code uses a hazards classification system to determine the appropriate measures to be incorporated to protect life and property (often these measures include construction standards and specialized equipment). The International Fire Code uses a permit system (based on hazard classification) to ensure that required measures are instituted.

3.1.13 International Wildland-Urban Interface Code

The International Wildland-Urban Interface Code is published by the International Code Council and addresses wildfire issues in the WUI. It is a model code that is intended to be adopted and used supplemental to the adopted building and fire codes of a jurisdiction. The International Wildland-Urban Interface Code establishes minimum special regulations for development in the WUI to safeguard life and property from wildfire hazards.

3.1.14 National Fire Protection Association Codes, Standards, Practices, and Guides

National Fire Protection Association (NFPA) codes, standards, recommended practices, and guides are developed through a consensus development process approved by the American National Standards Institute. This process brings together professionals representing varied viewpoints and interests to achieve consensus on fire and other safety issues. NFPA standards are recommended guidelines and nationally accepted good practices in fire protection but are not laws or codes unless adopted or referenced as such by a state, county, city, or other fire code or local fire agency.

- **NFPA 1140, Standard for Wildland Fire Protection (2022):** This standard provides the minimum requirements for wildland fire management and the associated professional qualifications for wildland fire positions. It is intended to specify the minimum requirements for fire protection and emergency services infrastructure in wildland, rural, and suburban areas; wildland fire management practices and policies; methods of assessing wildland fire ignition hazards; and job performance requirements for wildland fire positions.

- **NFPA 1141, Standard for Fire Protection Infrastructure for Land Development in Wildland, Rural, and Suburban Areas (2017):** This standard addresses the requirements for fire protection infrastructure in wildland, rural, and suburban areas where there is an intended change of land use or intended land development. It is intended to develop fire protection and emergency services infrastructure to reduce the impact of land use changes in wildland, rural, and suburban areas.
- **NFPA 1142, Standard on Water Supplies for Suburban and Rural Firefighting (2022):** This standard addresses a method for determining the minimum requirements for alternative water supplies for structural firefighting purposes in areas where the authority having jurisdiction (AHJ) determines that adequate and reliable water supply systems for firefighting purposes do not otherwise exits. It is intended to assist the AHJ in establishing the minimum water supply necessary for structural firefighting purposes in areas where it has been determined that there is no water or inadequate water for firefighting.
- **NFPA 1143, Standard for Wildland Fire Management (2018):** This standard provides minimum requirements to fire protection organizations on the management of wildland fire, including prevention, mitigation, preparation, and suppression. It is intended to specify management practices and policies necessary for a fire protection organization to develop a wildland fire management program.
- **NFPA 1144, Standard for Reducing Structure Ignition Hazards from Wildland Fire (2018):** This standard provides a methodology for assessing wildland fire ignition hazards around existing structures, residential developments, and subdivisions, and improved property or planned property improvement that will be located in a WUI area, and provides minimum requirements for new construction to reduce the potential of structure ignition from wildfires. It is intended to assess fuel sources in the structure ignition zone for their potential to ignite structures, and to identify possible mitigation measures to reduce the possibility of structure ignition.

3.2 State

3.2.1 California Strategic Fire Plan

The 2018 Strategic Fire Plan for California reflects CAL FIRE's focus on (1) fire prevention and suppression activities to protect lives, property, and ecosystem services, and (2) natural resource management to maintain the state's forests as a resilient carbon sink to meet California's climate change goals and to serve as important habitat for adaptation and mitigation. Strategic Fire Plan goals include the following (State Board of Forestry and Fire Protection and CAL FIRE 2018):

1. Identify and evaluate wildland fire hazards and recognize life, property, and natural resource assets at risk, including watershed, habitat, social and other values of functioning ecosystems. Facilitate the collaborative development and sharing of all analyses and data collection across all ownerships for consistency in type and kind.
2. Promote and support local land use planning processes as they relate to: (a) protection of life, property, and natural resources from risks associated with wildland fire, and (b) individual landowner objectives and responsibilities.
3. Support and participate in the collaborative development and implementation of local, county, and regional plans that address fire protection and landowner objectives.
4. Increase fire prevention awareness, knowledge, and actions implemented by individuals and communities to reduce human loss, property damage, and impacts to natural resources from wildland fires.

5. Integrate fire and fuels management practices with landowner/land manager priorities across jurisdictions.
6. Determine the level of resources necessary to effectively identify, plan and implement fire prevention using adaptive management strategies.
7. Determine the level of fire suppression resources necessary to protect the values and assets at risk identified during planning processes.
8. Implement post-fire assessments and programs for the protection of life, property, and natural resource recovery.

3.2.2 CAL FIRE Strategic Fire Plan

In 2019 CAL FIRE released its Strategic Plan. The plan is updated from the 2012 CAL FIRE Strategic Plan and focuses on the department's mission, vision, and values. Four goals were identified in the plan: (1) improve the core capabilities, (2) enhance internal operations, (3) ensure health and safety, (4) and build an engaged, motivated, and innovative workforce (CAL FIRE 2019a).

3.2.3 California Fire Service and Rescue Emergency Mutual Aid Plan

The California Fire Service and Rescue Emergency Mutual Aid Plan is an extension of the California Emergency Plan. The plan supports the Incident Command System, the Integrated Emergency Management System, and multi-hazard response planning. The plan provides more detailed operational plans that support fire and rescue resources at the state, regional, and local levels.

3.2.4 California State Multi-Hazard Mitigation Plan

Approved by the Federal Emergency Management Agency (FEMA) in September 2018 as an Enhanced State Mitigation Plan, the 2018 State Multi-Hazard Mitigation Plan update continues to build upon California's commitment to reduce or eliminate the impacts of disasters caused by natural, technological, accidental, and adversarial/human-caused hazards, and further identifies and documents progress made in hazard mitigation efforts, new or revised state and federal statutes and regulations, and emerging hazard conditions and risks that affect the State of California.

3.2.5 California Government Code

California Government Code Sections 51175 through 51189 provide guidance for classifying lands in California as fire hazard areas and provide requirements for management of property within those lands. CAL FIRE is responsible for classifying FHSZs based on statewide criteria and makes the information available for public review. Further, local agencies must designate, by ordinance, Very High FHSZs within their jurisdiction based on the recommendations of CAL FIRE.

Section 51182 sets forth requirements for maintaining property within fire hazard areas, such as defensible space, vegetative fuels management, and building materials and standards. Defensible space around structures in fire hazard areas must consist of 100 feet of fuel modification on each side of a structure, but not beyond the property line unless findings conclude that the clearing is necessary to significantly reduce the risk of structure ignition in

the event of a wildfire. Clearance on adjacent property is only conducted following written consent by the adjacent owner. Further, trees must be trimmed from within 10 feet of the outlet of a chimney or stovepipe, vegetation near buildings must be maintained, and roofs of structures must be cleared of vegetative materials. Exemptions may apply for buildings with an exterior constructed entirely of nonflammable materials.

3.2.6 California Public Resources Code

PRC Section 4290 requires minimum fire safety standards related to defensible space that are applicable to residential, commercial, and industrial building construction in SRA lands and lands classified and designated as Very High FHSZs. These regulations include road standards for fire apparatus access, standards for signs identifying roads and buildings, fuel breaks and green belts, and minimum water supply requirements. These regulations do not supersede local regulations that equal or exceed minimum regulations required by the state.

PRC Section 4291 requires a reduction of fire hazards around buildings adjacent to a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered in flammable material. It is required to maintain 100 feet of defensible space around all sides of a structure, but not beyond the property line unless required by state law, local ordinance, rule, or regulations. Further, PRC Section 4291 requires the removal of dead or dying vegetative materials from the roof of a structure, and trees and shrubs must be trimmed from within 10 feet of the outlet of a chimney or stovepipe. Exemptions may apply for buildings with an exterior constructed entirely of nonflammable materials.

PRC Section 4741 states that CAL FIRE shall assist local governments in preventing future wildland fire and with vegetation management problems by making its wildland fire prevention and vegetation management expertise available to local governments.

PRC Sections 4292-4296 and 14 CCR 1246 address vegetation clearance standards for electrical utilities. They include standards for clearing around energy lines and conductors.

3.2.7 California Code of Regulations

Title 14, Natural Resources

California Code of Regulations (CCR) Title 14, Division 1.5, Chapter 7, Subchapter 3, Fire Hazard, sets forth requirements for defensible space and provides alternate options if the required distances cannot be achieved. For example, options that have similar practical effects include noncombustible block walls or fences; 5 feet of noncombustible material horizontally around a structure; installing hardscape landscaping or reducing exposed windows on the side of structures with less than 30-foot setbacks; or additional structure hardening, such as those required in the California Building Code, CCR Title 24, Part 2, Chapter 7A.

Title 19, Public Safety

CCR Title 19 addresses public safety and includes State Fire Marshal requirements (CCR, Title 19, Division 1), which incorporate general fire and safety standards regarding fire department access and egress, fire alarms, emergency planning, and evacuation procedures.

Title 19, Division 2, Chapter 1, Standardized Emergency Management System Regulations

The Standardized Emergency Management System (Emergency System) regulations are described in CCR Title 19, Division 2, Chapter 1. The Emergency System is required by the California Emergency Services Act to manage multi-agency and multi-jurisdictional responses to emergencies in California, and to coordinate among all levels of government and affected agencies. The Emergency System unifies all elements of California's emergency management community into a single, integrated system, and standardizes key elements.

Title 24, California Building Standards Code

The California Building Standards Code (CCR Title 24) contains provisions for building and safety standards, including fire safety standards for new buildings that are provided in the California Building Code (CCR Title 24, Part 2) and the California Fire Code (CFC) (CCR Title 24, Part 9). These standards apply to all occupancies in California, except where state agencies and local governing bodies adopt more stringent standards.

Title 24, Part 2, California Building Code

The California Building Code includes several chapters relevant to fire safety and protection that address types of construction, fire and smoke protection features, construction materials and methods, and rooftop construction. Typical CFC safety requirements include fire sprinklers in all high-rise buildings; fire-resistance standards for fire doors, building materials, and particular types of construction; debris and vegetation clearance within a prescribed distance from occupied structures within wildfire hazard areas; and fire-flow requirements, fire hydrant spacing, and access road specifications.

Chapter 7A of the California Building Code regulates building materials, systems, and/or assemblies used in the exterior design and construction of new buildings within a fire hazard area. Fire hazard areas as defined by the California Building Code include areas identified as an FHSZ within an SRA or a WUI fire area. The purpose of Chapter 7A is to establish minimum standards for the protection of life and property by increasing the ability of structures in a fire hazard area to resist the intrusion of flames or embers projected by a wildfire, and to contribute to a systematic reduction in structural losses from a wildfire. New buildings in such areas must comply with the ignition-resistant construction standards outlined in Chapter 7A.

Title 24, Part 9, California Fire Code

Part 9 of Title 24 contains the California Fire Code (CFC), which incorporates by adoption the International Fire Code with necessary California amendments. The purpose of the CFC is to establish the minimum requirements to safeguard the public health, safety, and general welfare from the hazards of fire, explosion, and dangerous conditions in new and existing buildings, structures, and premises, and to provide safety and assistance to firefighters and emergency responders during emergency operations. CFC Chapter 49 contains minimum standards for development in the WUI and fire hazard areas.

The CFC and Office of the State Fire Marshal provide regulations and guidance for local agencies in the development and enforcement of fire safety standards. The CFC is updated and published every 3 years by the California Building Standards Commission.

3.2.8 2019 California Fire Code with July 2021 Supplement

The 2019 CFC (CCR Title 24, Part 9) establishes regulations to safeguard against the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises. The CFC also establishes requirements intended to provide safety for and assistance to firefighters and emergency responders during emergency operations. The provisions of the CFC apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of every building and structure throughout California. The CFC includes regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems, fire services features such as fire apparatus access roads, means of egress, fire safety during construction and demolition, and WUI areas.

3.2.9 Assembly Bill 3074

Assembly Bill 3074 was passed into law in 2020 and requires a third zone of defensible space. The law requires the Board of Forestry and Fire Protection to develop regulations for the ember-resistant zone (Zone 0) within 0 to 5 feet of a structure by January 1, 2023. Within this zone, fuels reduction would be more intense and be designed to keep fire and embers from ignition material that could spread fire to a structure.

3.2.10 Assembly Bill 38

Assembly Bill 38 established that, as of July 1, 2021, sellers of property located in a High or Very High FHSZ are required to provide the buyer with documentation that the property is in compliance with defensible space requirements.

3.2.11 1968 California FAIR Plan Act

The California FAIR Plan Act is composed of all insurer's licenses to write property insurance in California. The insurance pool was established to ensure the availability of property insurance to people who, beyond their control, have been unable to obtain insurance in the voluntary insurance market.

3.3 County

3.3.1 Santa Barbara Comprehensive Plan

The Santa Barbara Comprehensive Plan is a long-term planning document for the development of the County. The plan includes various elements, such as land use, circulation, open space, conservation, housing, safety, and noise. The goal of the plan is to analyze regional resources and environmental constraints to identify opportunities for urban development, agriculture expansion, and recreational activities. The plan also evaluates environmental hazards, ecological communities, and scenic values. Additional elements in the plan are groundwater resources, oak tree protection, air quality, and coastal land use (County of Santa Barbara 2022).

3.3.2 Santa Barbara County Code of Ordinances

3.3.2.1 Chapter 35 – Zoning

The Santa Barbara County Land Use and Development Code is Chapter 35, Zoning, of the Santa Barbara County Code. The Development Code carries out the policies of the Santa Barbara Comprehensive Plan by classifying and regulating land use and structures within the County. The Development Code is adopted to protect and promote the public health, safety, comfort, convenience, prosperity, and regional welfare of residents and businesses in Santa Barbara County. Within the Seismic and Safety Element of the Comprehensive Plan are the goals and policies for protecting the community from fire-related hazards.

3.3.2.2 Chapter 15 – Fire Prevention

The Santa Barbara County Board of Supervisors adopted the 2019 edition of the California Fire Code and the following provisions of the 2018 edition of the International Fire Code, including Chapters 1—80 and Appendix Chapters 4, A, B, BB, C, CC, D, E, F, G, H, I, J, K, L, M, N, and O as published by the International Code Council, that are added and/or amended by Section 15-3.

Section 4908, Santa Barbara County Fire Hazard Abatement, is applicable to all areas within the Santa Barbara County Fire Protection District and all other unincorporated areas of the County. Section 4908 includes the requirements for the clearance of brush, vegetative growth, and combustible materials from parcels and roadways, and clearance for fire protection equipment.

Chapter 49 of Chapter 15 outlines requirements for WUI areas. Per Section 4907, Defensible Space:

> Defensible space will be maintained around all buildings and structures in State Responsibility Area (SRA) as required in Public Resource Code 4290 and "SRA Fire Safe Regulations" California Code of Regulations, Title 14, Division 1.5, Chapter 7, Subchapter 2, Section 1270. Buildings and structures within the Very-high Fire Hazard Severity Zones of a Local Responsibility Areas (LRA) shall maintain defensible space as outlined in Government Code 51175–51189 and any local ordinance of the authority having jurisdiction. Buildings and structures in the High Fire Hazard Area shall maintain defensible space as outlined in Government Code 51175–51189 and the Santa Barbara County Defensible Space Standard.

3.3.2.3 Chapter 10 – Building Regulations

County building regulations are defined in Chapter 10 of the Santa Barbara County Code of Ordinances. The County Code adopts Chapter 1, Divisions 1 and 2 of the California Building Code (2019 Edition) in its entirety, except as amended in Chapter 10. Chapter 10 amends standards related to structural hardening and the definition of "Local Agency Very High Fire Hazard Severity Zone," and it defines the County's High Fire Hazard Area. Structural fire protection standards are addressed in the building codes and address structural hardening requirements for buildings within a High Fire Hazard Area and are consistent with Chapter 7A of the California Building Code. Structural hardening requirements address roofing, exterior coverings, decking materials, windows and doors, eaves, and vents, among others. The intent of these requirements is to minimize the potential for structural ignition through radiant or convective heat exposure or ember intrusion.

3.3.3 Gaviota Coast Plan

The Gaviota Coast Plan (GCP) (County of Santa Barbara 2016a) designates and regulates land use in the GCP area. The GCP area contains 1,006 parcels and is dominated by agriculture, mountains, and open space. The land issue facing the GCP area is balancing future development with agriculture, and the protection of environmental areas. Within the GCP, wildfire is identified as a hazard to the area. Action LU-10, Community Wildfire Protection Plan, identifies the need for a CWPP, and states that the County shall encourage and support the development of a CWPP for the at-risk communities within the Gaviota Coast. In addition, the GCP identifies the following goals, policies, and development standards related to fire protection (County of Santa Barbara 2016a):

Goal AG-3: Recognizing that agriculture can enhance and protect natural resources, agricultural operations should be encouraged to incorporate such techniques as soil conservation and sound fire risk reduction practices.

Policy AG-3.A: Fire Hazard Reduction Programs. (INLAND) Major wildfires cause severe erosion, property damage, and safety hazards. Within the Inland Area of the Gaviota Coast Plan Area, the County shall encourage range improvement and fire hazard reduction programs, including prescribed burning of brush and alternative non-burning techniques. Such programs shall be designed and conducted to avoid excessive erosion and other significant adverse effects on the environment for the purpose of increasing water yields, improving wildlife habitat, wildlife protection, and increasing agricultural productivity.

Dev Std LU-3: Fire Protection. Development shall be sited to minimize exposure to fire hazards and reduce the need for grading, fuel modification (including thinning of vegetation and limbing of trees), and clearance of native vegetation to the maximum extent feasible. Building sites should be located in areas of a parcel's lowest fire hazard and should minimize the need for long and/or steep access roads and/or driveways.

Policy TEI-15: Fire Protection Service. The community should work to maintain a productive relationship with the County Fire Department and the US Forest Service to assure effective emergency service.

3.3.4 County of Santa Barbara Coastal Land Use Plan

The County's Coastal Land Use Plan lays out the patterns of development in the coastal areas of the County. The purpose of the plan is to protect coastal resources while also accommodating land use development within the coastal zone. Other elements are applicable within the coastal zone, but when there is a conflict, the Coastal Land Use Plan takes precedent (County of Santa Barbara 2019).

3.3.5 Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan

The Santa Barbara County Multi-Jurisdictional Hazard Mitigation Plan serves as a complete hazard mitigation planning tool for the County. The emphasis of this plan is on assessing and avoiding identified risks, implementing loss reduction measures for existing exposures, and ensuring critical services and facilities survive a disaster. Further, the plan contains updated capability assessment information, vulnerability assessment, and mitigation strategies for each of the identified hazards, including wildfire (County of Santa Barbara 2017). By having a completed and approved plan, the County is eligible for mitigation grant funding made available by FEMA, which may involve funds for identified fire hazard reduction projects.

Under the Multi-Jurisdictional Hazard Mitigation Plan, wildfires are classified as either wildland fires or WUI fires. WUI fires are further subdivided into three categories: (1) classic WUI exists where well-defined urban and suburban development presses up against open expanses of wildland areas; (2) the mixed WUI is characterized by isolated homes, subdivisions, and small communities situated predominantly in wildland settings; and (3) the occluded WUI exists where islands of wildland vegetation occur inside a largely urbanized area. The plan identified the community of Gaviota as at-risk (County of Santa Barbara 2017).

The Multi-Jurisdictional Hazard Mitigation Plan is currently in the process of being updated. The Santa Barbara County Office of Emergency Management submitted the completed draft of the Multi-Jurisdictional Hazard Mitigation Plan in June 2022 to the California Governor's Office of Emergency Services and the Federal Emergency Management Agency for each agency's review and approval. Review is underway as of the date of this Plan.

3.3.6 Santa Barbara County Unit Strategic Fire Plan

The 2021 Santa Barbara County Unit Strategic Fire Plan is intended to serve as a local planning document. The Plan is tiered under the 2018 California Strategic Fire Plan and the 2019 CAL FIRE Strategic Plan. The plan identifies goals and objectives to minimize wildland fire risk to County watersheds, communities, firefighters, the public, and various local assets (SBC Fire 2021c). The Unit Strategic Plan incorporates the State CalMAPPER database and spatial mapping tool developed to map and record all data derived from local and state government funded fuel reduction projects. SBC Fire, as part of its contract with CAL FIRE, is required to develop, maintain, and annually update the Unit Strategic Fire Plan.

3.3.7 Santa Barbara Operational Area Emergency Management Plan

The Santa Barbara Operational Area Emergency Management Plan addresses planned response within the Santa Barbara Operational Area to natural disasters, technological incidents, and national security emergencies. The plan does not address normal day-to-day operations. The focus of the plan is on large-scale disasters. Within the plan, wildland fire is identified as a trigger point in which the plan would be activated (County of Santa Barbara 2013).

3.4 Environmental Review

3.4.1 National Environmental Policy Act

Any proposed fuel treatment project on federal land, funded by a federal agency, or requiring a discretionary action by a federal agency requires compliance with the National Environmental Policy Act (NEPA). NEPA requires federal agencies to evaluate the potential environmental effects of proposed actions prior to making decisions on permit applications, adopting federal land management actions, and constructing highways and other publicly owned facilities. Projects implementing a CWPP recommendation on federal land within the WUI defined in a CWPP are afforded expedited NEPA review. NEPA review is typically conducted by, and the appropriate level of NEPA analysis to be conducted is decided by, the federal agency carrying out the proposed action or related to land ownership (e.g., USFS). Lead agencies typically prepare a Record of Decision, Finding of No Significant Impact, Categorical Exclusion, Environmental Assessment, and/or Environmental Impact Statement to assess the likelihood of impacts from a proposed action and alternative courses of action.

3.4.2 California Environmental Quality Act

Proposed fuel treatment projects on non-federal lands may require compliance with the California Environmental Quality Act (CEQA). Private landowners conducting defensible space projects under PRC 4291 guidelines are not subject to CEQA review requirements. Non-defensible space fuel treatment projects on non-federal lands that are discretionary and are to be carried out or approved by public agencies are subject to CEQA review and documentation (CEQA Guidelines 21080[a]). CEQA review for non-defensible space fuel reduction projects should be instituted during the project planning process. Typically, the lead agency under CEQA is the public agency with discretionary authority over a project; that is, the public agency that has principal responsibility for carrying out or approving the project. The appropriate level of CEQA analysis is decided by the lead agency, which could be a Categorical Exemption, Initial Study/Mitigated Negative Declaration, Environmental Impact Report (EIR), or a document tiered from an EIR.

3.4.2.1 California Vegetation Treatment Program

The California Vegetation Treatment Program (CalVTP) was developed by the California Board of Forestry and Fire Protection in an effort to address California's ongoing wildfire issues. The CalVTP includes the use of prescribed burning, mechanical treatments, manual treatments, herbicides, and prescribed herbivory activities to reduce hazardous vegetation, construct fuel breaks, and restore healthy ecological fire regimes (California Board of Forestry and Fire Protection 2022). The CalVTP Program EIR was prepared in accordance with CEQA and was approved by the Board of Forestry and Fire Protection in December 2019. The Program EIR provides a programmatic analysis of potential impacts related to vegetation treatment activities within the "Treatable Landscape," which is defined by the CalVTP. Project proponents may tier from the CalVTP Program EIR to analyze project-related impacts for future projects within the Treatable Landscape. Fuel management projects occurring in the Treatable Landscape can complete a streamlined CEQA review via the project-specific analysis process outlined in the CalVTP Program EIR (California Board of Forestry and Fire Protection 2019).

Nearly 60,000 acres of the Plan Area is in the CalVTP Treatable Landscape. Initial planning efforts for fuel management projects conducted under this CWPP should examine the project's location relative to the CalVTP Treatable Landscape to determine suitability for analysis under the CalVTP Program EIR. Figure 7 presents the CalVTP treatable landscape for the Plan Area.

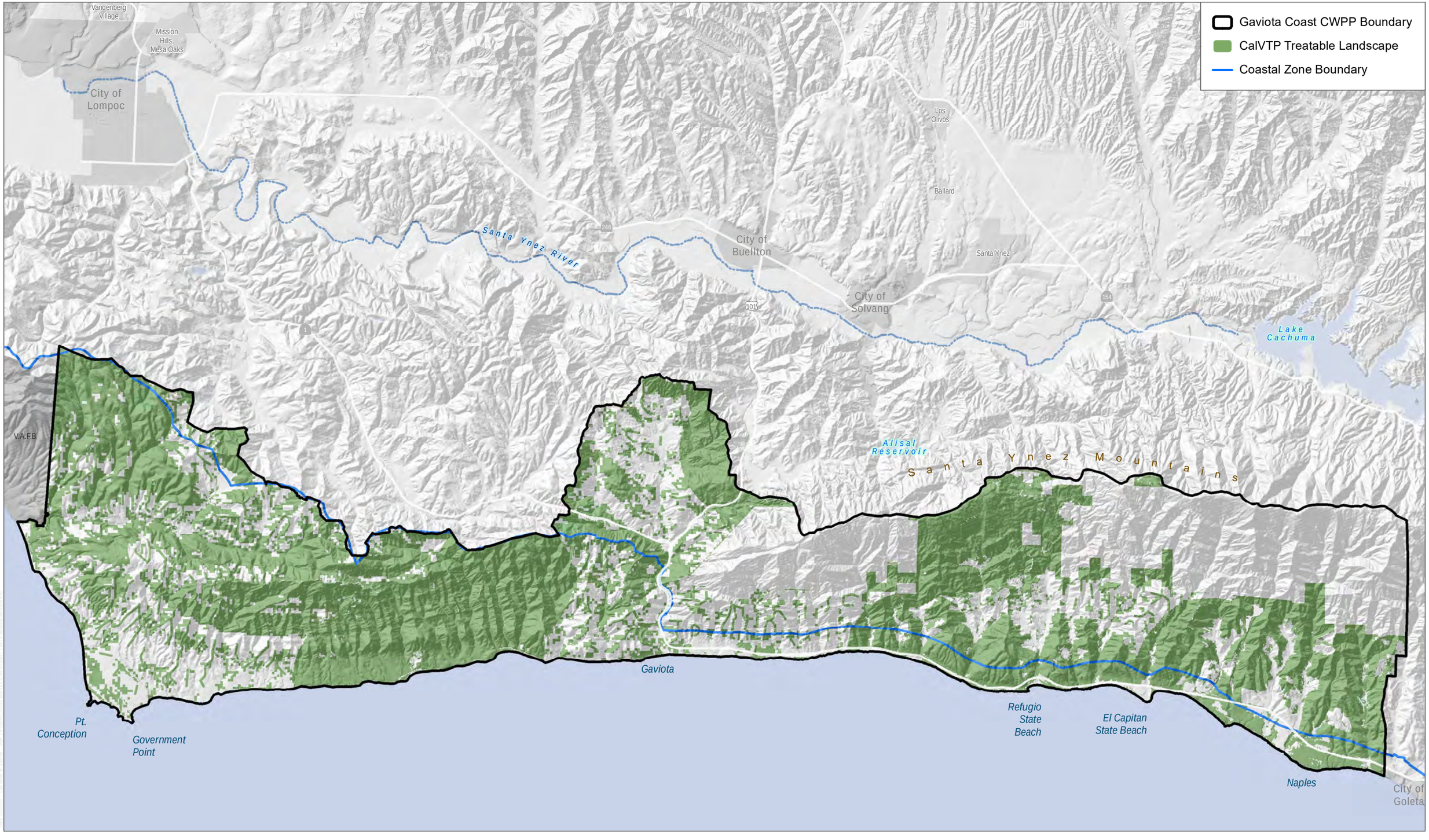
3.4.3 California Coastal Act

The California Coastal Act defines the Coastal Zone, which is under the jurisdiction of the California Coastal Commission. The Coastal Zone covers both land and water, and the California Coastal Commission has the authority to regulate construction, buildings, housing, roads, fire, and erosion abatement, and to issue fines within the Coastal Zone. Local governments are required to prepare Local Coastal Programs under the California Coastal Act, which guide development within the Coastal Zone. Projects proposed within the Coastal Zone generally must obtain a Coastal Development Permit.

More than 49,000 acres of the Plan Area is in the Coastal Zone. Figure 7 presents the Coastal Zone for the Plan Area.

3.4.4 Agency Consultation/Permitting

Regulatory permits may also be required for fuel treatment actions that would adversely impact riparian areas under the jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and CDFW. It is anticipated that the U.S. Army Corps of Engineers may require a fill permit under Section 404 of the Clean Water Act. CDFW may require a Streambed Alteration Agreement under Section 1602 of the California Fish and Game Code. The Regional Water Quality Control Board may require a Water Quality Certification under Section 401 of the Clean Water Act. Additionally, it is anticipated that the U.S. Army Corps of Engineers would consult with the U.S. Fish and Wildlife Service pursuant to Section 7 of the federal Endangered Species Act during the 404 permitting process for potential impacts to special-status plants/wildlife and their habitats. Applications for each of these regulatory permits can be processed concurrently; however, some may take longer than others to process and obtain. Consultation with a qualified biologist, initiating any necessary seasonal surveys, and early coordination with the regulatory agencies are recommended.



SOURCE: USGS, County of Santa Barbara, CalFIRE

DUDEK

0 1 2 Miles

FIGURE 7

Plan Area CalVTP Treatable Landscape and Coastal Zone

Gaviota Coast Community Wildfire Protection Plan

4 Wildfire Hazard Assessment

The wildfire hazard assessment conducted in support of this CWPP involved an evaluation of field conditions, processing and analyzing spatial datasets in GIS, conducting GIS-based modeling of wildfire behavior and wildfire hazard, and analyzing existing plans and data sets related to wildfire hazard. This assessment effort is presented in the following sections.

4.1 Wildfire Hazard Assessment Methods

4.1.1 Field Evaluations

Field assessments were conducted by Dudek staff, SBCFSC representatives, landowners/stakeholders, and SBC Fire staff on March 9, 16, and 17; May 28; and November 15, 2021, to evaluate existing fuel load conditions, current land management practices, access capabilities, infrastructure type and locations, development patterns, and distribution, and to gain an understanding of general fire hazard conditions throughout the Plan Area. The November 15 field assessment was also focused on evaluating conditions in the Plan Area following the Alisal Fire. During field assessments, site conditions were noted and documented via photographs and, in some cases, noted on digital or hard-copy field maps.

4.1.2 GIS Analysis

Development of this CWPP included analysis, processing, and development of various GIS datasets (in ArcGIS, version 10.8.1) for variables influencing wildfire hazard. The following summarizes the datasets analyzed or developed for CWPP development:

- Fire history
- Fire frequency
- Wildfire ignition history
- Vegetation/fuels
- Vegetation age
- Suppression difficulty
- Terrain
- Land ownership
- Land use
- Jurisdictional boundaries
- Grazing areas
- Parcel boundaries
- Roads
- Structure locations
- Defensible space areas
- WUI areas
- Fire station locations

4.1.3 Fire Behavior and Hazard Modeling

Following field evaluations and concurrent with GIS data analysis, fire hazard and fire behavior modeling was conducted to evaluate wildfire burn probability, potential flame lengths, and the potential for spot fires. Burn probability and flame length were further analyzed to evaluate integrated fire hazard for the Plan Area. Further, suppression difficulty data was analyzed for the Plan Area. Modeling efforts are described below and considered the terrain, vegetation, and weather unique to the Gaviota Coast.

4.1.3.1 Interagency Fuels Treatment Decision Support System

The Interagency Fuel Treatment Decision Support System (IFTDSS) (USDOI and USDA 2022b) fire behavior modeling program was used to evaluate wildfire hazard for the Plan Area. A Landscape Burn Probability (LBP) analysis was performed in the IFTDSS software to evaluate Integrated Hazard. Integrated Hazard is an analysis process that combines two important measures—burn probability and conditional flame length—into a single model output layer in a GIS/mapping format. In IFTDSS, the LBP model is identical to the Minimum Travel Time (MTT) Burn Probability model in FlamMap, with some fixed modeling inputs (see below), and simulates head, backing, and flanking fire. Conditional flame length is an estimate of the mean flame length for all the fires that burn a given point on the landscape during a model run. Integrated Hazard modeling in IFTDSS generates seven relative hazard classes that can be used to prioritize vegetation management projects to mitigate fire hazard and risk.

The initial step in this analysis involved selecting and analyzing the Landscape Base file, which formed the basis for the modeling run. The Landscape Base file consists of eight distinct data layers representing terrain (elevation, slope, and aspect) and vegetation/fuels (fuel model, canopy cover, stand height, canopy base height, and canopy bulk density) conditions. This file was sourced from the 2016 LANDFIRE data set embedded in the IFTDSS application. The LANDFIRE base data is provided in raster format, with a ground resolution of 30 meters (where each pixel of the base data file represents a 30-meter by 30-meter area on the ground). The 2016 Landscape Base file was evaluated to confirm fuel model accuracy based on field observations. The fuel model layer was edited to account for the impacts associated with the 2016 Sherpa Fire, with the intent of modeling fire conditions associated with more mature (pre-fire) fuel beds. To accomplish this, the IFTDSS Landscape Edit tool was used to reclassify fuel model types in the Sherpa Fire perimeter only. Table 11 summarizes the fuel model reclassifications for the Sherpa Fire area. The revised Landscape Base file was then used for the remaining IFTDSS model run.

Table 11. Landscape Base File Edits for the 2016 Sherpa Fire

Original Fuel Model	Reclassified Fuel Model
Grass 1 (GR1/101)	Grass-Shrub 2 (GS2/122)
Grass-Shrub 1 (GS1/121)	Grass-Shrub 2 (GS2/122)
Shrub 2 (SH2/142)	Shrub 7 (SH7/147)
Timber Litter 1 (TL1/181)	Timber Litter 4 (TL4/184)
Timber Litter 2 (TL2/182)	Shrub 7 (SH7/147)
Timber Litter 3 (TL3/183)	Timber Litter 4 (TL4/184)

To run the LBP model in IFTDSS, model inputs are required for wind, weather, ignition, and model duration variables. Wind and weather inputs were derived from an analysis of data from two Remote Automated Weather Stations (RAWS) located in the Plan Area (Gaviota RAWS and Refugio RAWS). Use of RAWS data is necessary for fire behavior modeling. RAWS measure and catalogue fuel moisture, wind speed, and wind direction data. The following summarizes the location and available data ranges for each RAWS:

Station: Gaviota
Latitude: 34.48833
Longitude: -120.2356
Elevation: 878 feet
Data years: 2017–2020

Station: Refugio
Latitude: 34.51639
Longitude: -120.0753
Elevation: 1,465 feet
Data years: 2016–2020

This data was retrieved and processed using the FireFamily Plus software package (v. 5.0) to determine 97th percentile weather conditions, representing worst-case fire weather associated with a Sundowner wind event. Data from the two RAWS were combined into a Special Interest Group (SIG) in the FireFamily Plus software (FireFamily Plus 2019), with data from each station being weighted equally. The project SIG was evaluated from May 1 through December 31 for each year from 2016 through 2020 (extent of available data record). Data derived from this analysis included 97th percentile values for 1-hour, 10-hour, and 100-hour fuel moistures; live herbaceous moisture; live woody moisture; 20-foot sustained wind speed; and wind direction.

Random ignitions were selected for the model. The LBP analysis in IFTDSS generates fires from random ignitions until 98% of burnable pixels (cells) on the Landscape Base burn or there is no significant change to the percentage burned even if the 98% target is not hit. For this analysis, 1,573 random fires were run in IFTDSS for the LBP analysis. Finally, model run duration was set at the maximum value of 12 hours. Table 12 summarizes the model input variables used for the LBP analysis. The LBP report generated by IFTDSS is provided in Appendix B.

Table 12. Landscape Burn Probability Model Input Values

Variable	Model Input Value
Wind Type	Gridded
Wind Speed	36 miles per hour
Wind Direction	343 degrees
Crown Fire Method	Finney
Foliar Moisture	100%
Ignitions	Random
Fuel Moisture Conditioning	On, Extreme – South Central California Foothills and Coastal Mountains
1-Hour Fuel Moisture	2%
10-Hour Fuel Moisture	3%
100-Hour Fuel Moisture	5%
Herbaceous Fuel Moisture*	30%
Woody Fuel Moisture	60%
Spotting Probability	20%

Note:
* Live herbaceous moisture values were lower than 30%, so the herbaceous fuels are considered fully cured (Scott and Burgan 2005).

IFTDSS LBP model is identical to Minimum Travel Time (MTT) Burn Probability in FlamMap, with some fixed modeling inputs (see below for details). LBP simulates head, backing, and flanking fire.

4.1.3.1.1 Burn Probability

LBP represents the likelihood that a given location on the Landscape Base file would burn, considering the model inputs used. Burn probability is related to the size of fires that occur on a given landscape, where larger fires produce higher burn probabilities than smaller fires. Because fire size is a function of wildfire spread rate and wildfire duration, weather conditions that reduce spread rates lower burn probability (USDOI and USDA 2022b). In this analysis, weather conditions were set to 97th percentile conditions to mimic extreme fire weather conditions that would be experienced during a Sundowner wind event.

Random ignitions were used for the model run, and 1,573 modeled fires were run for the LBP analysis for the Plan Area. Burn probability is calculated as follows:

- Burn Probability = No. times burned / total number of ignitions

For example, if a pixel burned 850 times over the model run period (with 1,573 fire simulations), it would have a burn probability of 0.54 (850/1,573=0.54). If a pixel burned 1,573 times in 1,573 fire simulations, it would have a burn probability of 1.0 (1,573/1,573=1.0). If a pixel never burned during the 1,573 fire simulations, it would have a burn probability of 0 (0/1,573=0).

The modeling results for burn probability are displayed with seven distinct classes. The first two classes represent pixels that did not burn:

- Non-burnable – Pixels have a non-burnable fuel model and cannot burn.
- Burnable but did not burn – Pixels have burnable fuels but did not burn (e.g., a fire never reached the pixel, or a fire started within the pixel, but it was unable to burn out of the pixel because the fire spread rate was too slow).

The other five classes are dynamic and based on the maximum value of burn probability for the model run:

- Lowest (0–20% of maximum)
- Lower (20–40% of maximum)
- Middle (40–60% of maximum)
- Higher (60–80% of maximum)
- Highest (80–100% of maximum)

4.1.3.1.2 Conditional Flame Length

Conditional flame length is an estimate of the mean flame length for all the fires that burn a given point on the landscape during a model run. This value is typically lower than flame length values generated from a Landscape Fire Behavior analysis in IFTDSS because it accounts for heading, flanking, and backing fires. Head fire typically has higher flame lengths than flanking or backing fire; thus, the conditional flame length value is lower because it is the mean of these three fire types. Conditional flame length is the mean of all fires encountered by a pixel over the model period as compared with a singular condition. Conditional flame length values have a maximum of 25 feet (USDOI and USDA 2022b).

Conditional flame length is calculated as follows (where FLPi is the probability of fire at a given intensity and FLi is the mid-point of the given intensity level) (USDOI and USDA 2022b):

- Conditional Flame Length = $\sum_{i=1}^{n} FLP_i * FL_i$

The modeling results for conditional flame length are displayed with eight distinct classes. The first two classes represent pixels that did not burn:

- Non-burnable – Pixels have a non-burnable fuel model and cannot burn.
- Burnable but did not burn – Pixels have burnable fuels but did not burn (e.g., a fire never reached the pixel, or a fire started within the pixel, but it was unable to burn out of the pixel because the fire spread rate was too slow).

The remaining six classes match those of the fire intensity levels:

- 0–2 feet
- >2–4 feet
- >4–6 feet
- >6–8 feet
- >8–12 feet
- >12 feet

4.1.3.1.2.1 Flame Length

As noted, conditional flame length is an estimate of the mean flame length for all the fires that burn a given point on the landscape during a model run and is typically lower than flame length values generated from a Landscape Fire Behavior analysis in IFTDSS because it accounts for heading, flanking, and backing fires. To evaluate worst-case flame lengths for the Plan Area, a Landscape Fire Behavior Analysis was also run in IFTDSS. Flame length values output from the IFTDSS analysis are in units of feet. Flame length, the length of the flame of a spreading surface fire within the flaming front, is measured from midway in the active flaming combustion zone to the average tip of the flames (Andrews et. al. 2008). It is a somewhat subjective and non-scientific measure of fire behavior but is important to fireline personnel in evaluating fireline intensity and is worth considering as an important fire variable (Rothermel 1993).

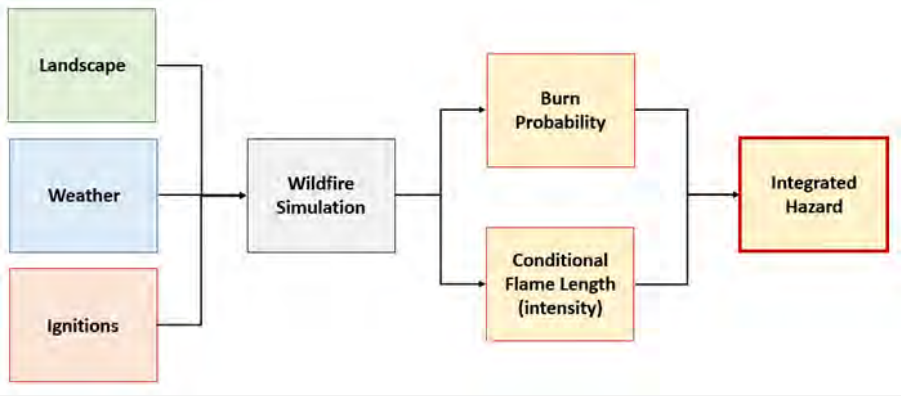
4.1.3.1.3 Integrated Hazard

Integrated Hazard is quantified and categorized in IFTDSS using the LBP model. This model evaluates the results from the burn probability (probability of a fire occurring at a specific point under a specified set of conditions) and conditional flame length (intensity at a specific point given a fire occurs) analyses described above. A diagram of the Integrated Hazard analysis process is provided in Figure 8.

IFTDSS Integrated Hazard is categorized into seven distinct classes. The first two are for pixels that did not burn, and the remaining five classes are dynamic based on the integrated hazard matrix presented in Figure 9. The seven classes are as follows:

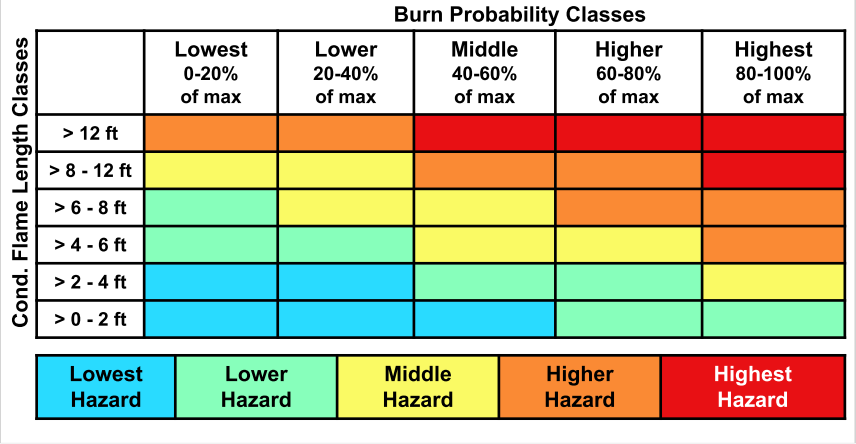
- Non-Burnable
- Burnable but Not Burned
- Lowest Hazard
- Lower Hazard
- Middle Hazard
- Higher Hazard
- Highest Hazard

Figure 8. IFTDSS Integrated Hazard Model Diagram



Source: USDOI and USDA 2022b.

Figure 9. IFTDSS Integrated Categorization



Source: USDOI and USDA 2022b.

4.1.3.2 FlamMap

4.1.3.2.1 Spotting Potential

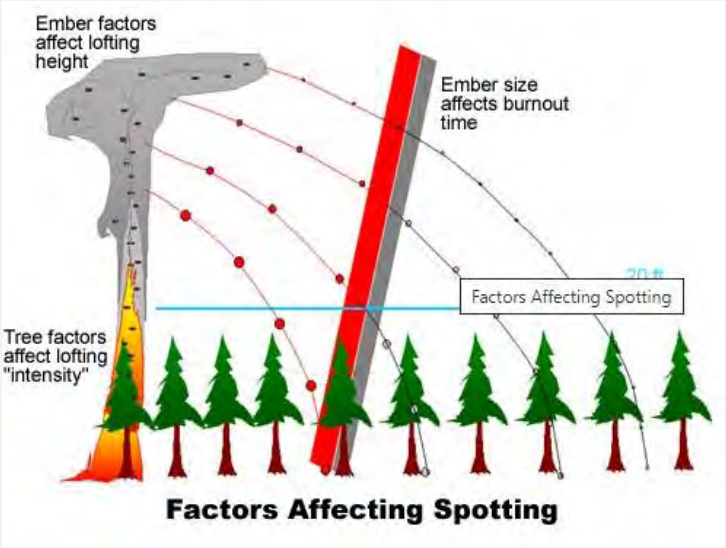
In addition to the fire hazard analysis conducted using IFTDSS, the FlamMap software package was used to model spot fire potential for the Plan Area. FlamMap (version 6.1) is a GIS-driven computer program that incorporates fuels, weather, and terrain data in generating static fire behavior outputs, including values associated with flame length and crown fire activity, among others (Finney et. al. 2019). It is a flexible system that can be adapted to a variety of specific wildland fire planning and management needs. The calculations that come from FlamMap are based on the BehavePlus fire modeling system algorithms but result in geographically distinct datasets based on

GIS inputs. FlamMap model outputs allow wildland resource managers to evaluate anticipated fire behavior, which provides important insight into the characteristics of wildfire spread within management areas. Each of the input variables used in FlamMap remains constant at each location, meaning that the input variables are applied consistently to each grid cell, and the fire behavior at one grid cell does not impact that at a neighboring grid cell. Essentially, the model presents a "snapshot" in time and does not account for temporal changes in fire behavior or the movement of fire across the landscape. As such, the results of FlamMap models contained in this CWPP are best used as information sources and tools to identify wildfire spotting potential, rather than used as a forecasting tool of an exact representation of wildfire behavior.

The following are the basic assumptions and limitations of FlamMap:

- The model output files describe fire behavior only in the flaming front. The primary driving forces in the predictive calculations are the dead fuels less than 0.25 inches in diameter. These are the fine fuels that carry fire. Fuels greater than 1 inch in diameter have little effect in carrying fire, and fuels greater than 3 inches in diameter have no effect. Although not contributing to the fire behavior calculation, larger fuels (1 inch and greater) are consumed by the fire and are components of the fuels being consumed. For example, the smaller portions (e.g., leaves, twigs, peeling bark) of a chaparral shrub will combust readily and affect fire behavior, while larger portions (e.g., trunk, main branches) do not affect fire behavior but are part of the overall fuel load and will combust after the flaming front has passed.
- The model bases calculations and descriptions on a wildfire spreading through surface fuels that are within 6 feet of the ground and contiguous to the ground. Surface fuels are classified as grass, brush, litter, or slash, which are general categories that are assigned to different vegetation types.
- The software assumes that fuel moisture conditions are uniform. However, because wildfires almost always burn under non-uniform conditions, the length of the projection period and choice of fuel must be carefully considered to obtain useful predictions.
- WindNinja software, which is incorporated into FlamMap, allows for the generation and incorporation of gridded wind data in the FlamMap simulation. This approach is preferable because it allows the model to account for the effect of terrain on wind speed and direction at different locations throughout the modeling area, rather than relying on one single input value applied to the entire modeling area.

Spotting diagram



Source: (Finney et. al. 2019).

FlamMap was used to model spot fire potential for an area encompassing the Plan Area plus a buffer of approximately 4 miles. "Spotting" is the launching of embers that result in spot fires increasing the spread of a fire. In FlamMap, spotting is only simulated from torching trees when a passive or active crown fire is modeled. Spotting only occurs in trees where an active or passive crown fire is initiated. FlamMap does not model independent crown fires. The spotting component of FlamMap is intended to compute the maximum spotting distance from a given point on a fire front if torching occurs. The maximum spotting distance is determined by particle size, burnout rate, time, or distance traveled. Smaller particles are lofted higher and transported farther but will burnout sooner than larger particles. FlamMap does not simulate the number of embers, exact location of embers, or location of resulting spot fires. The results of the spotting potential analysis are presented in Section 4.2, Hazard Assessment Results.

4.1.3.3 Suppression Difficulty

Developed by the USFS Rocky Mountain Research Station (USFS 2022e), the wildfire Suppression Difficulty Index (SDI) is a spatial data layer that considers the effect of terrain, fuels, anticipated fire behavior during extreme fire weather conditions, firefighter line production rates, and proximity to roads and trails (access) in rating the relative difficulty in performing fire suppression activities. The data is categorized into six classes, ranked from lowest to highest difficulty.

The SDI data set provides another layer of insight into where fire suppression capabilities may be limited in the Plan Area, and thus where strategic fuel management projects may create a greater benefit to the community. Currently, the data set is viewable only, so no calculations or further spatial analysis with Plan Area data is possible. A summary of the evaluation of the SDI data set for the Plan Area is presented in Section 4.2.

4.2 Hazard Assessment Results

The following sections summarize the results of the hazard assessment conducted in support of this CWPP. Maps depicting the model results and SDI data are presented in Figures 10 through 14.

4.2.1 Burn Probability

Table 13 summarizes the burn probability classifications for the Plan Area. As shown, middle, higher, and highest burn probabilities (40%+ of maximum) represents 60.3% of the Plan Area. Middle burn probabilities are distributed across the Plan Area. Higher and highest burn probabilities are concentrated at lower elevations in the eastern portion of the Plan Area along the Highway 101 and Highway 1 corridors, near Las Cruces, and between Eagle

Canyon and Las Flores Canyon. Higher and highest burn probabilities are also concentrated near Point Conception on the Dangermond Preserve, between Damsite Canyon and Jalama Creek County Park. The Burn Probability model output layer is presented in Figure 10.

Table 13. Burn Probability Classifications for the Plan Area

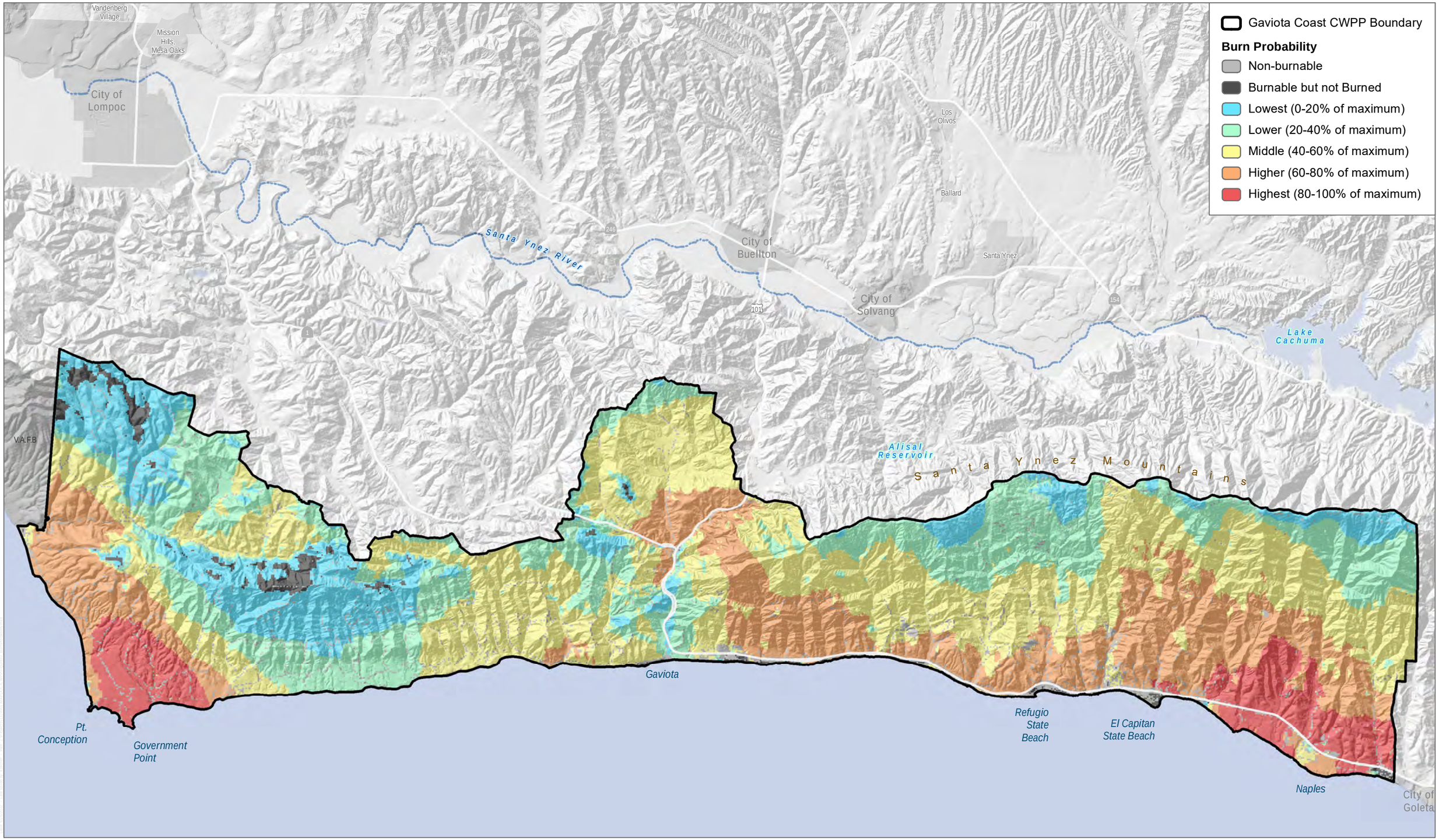
Burn Probability	Acreage	Percentage of Plan Area
Non-Burnable	4,852	4.6%
Burnable but Not Burned	1,611	1.5%
Lowest (0–20% of maximum)	12,810	12.1%
Lower (20–40% of maximum)	22,831	21.5%
Middle (40–60% of maximum)	35,857	33.8%
Higher (60–80% of maximum)	21,104	19.9%
Highest (80–100% of maximum)	6,956	6.6%

4.2.2 Conditional Flame Length

Table 14 summarizes the conditional flame length classifications for the Plan Area. As shown, conditional flame lengths in the 2- to 6-foot range represents the largest land area (collectively 67.7%). Conditional flame lengths greater than 8 feet are concentrated primarily in the eastern portion of the Plan Area (between Eagle Canyon and Las Flores Canyon), the central portion of the Plan Area (between Cañada San Onofre and Arroyo Hondo), and in the western portion of the Plan Area (near Point Conception). Portions of Hollister Ranch also exhibit conditional flame lengths greater than 8 feet. The conditional flame length model output layer is presented in Figure 11.

Table 14. Conditional Flame Length Classification for the Plan Area

Conditional Flame Length	Acreage	Percentage of Plan Area
Non-Burnable	4,852	4.6%
Burnable but Not Burned	1,611	1.5%
0–2 feet	3,764	3.6%
>2–4 feet	18,393	17.3%
>4–6 feet	39,586	37.3%
>6–8 feet	23,872	22.5%
>8–12 feet	9,153	8.6%
>12 ft	4,790	4.5%



SOURCE: USGS, County of Santa Barbara, CalFIRE

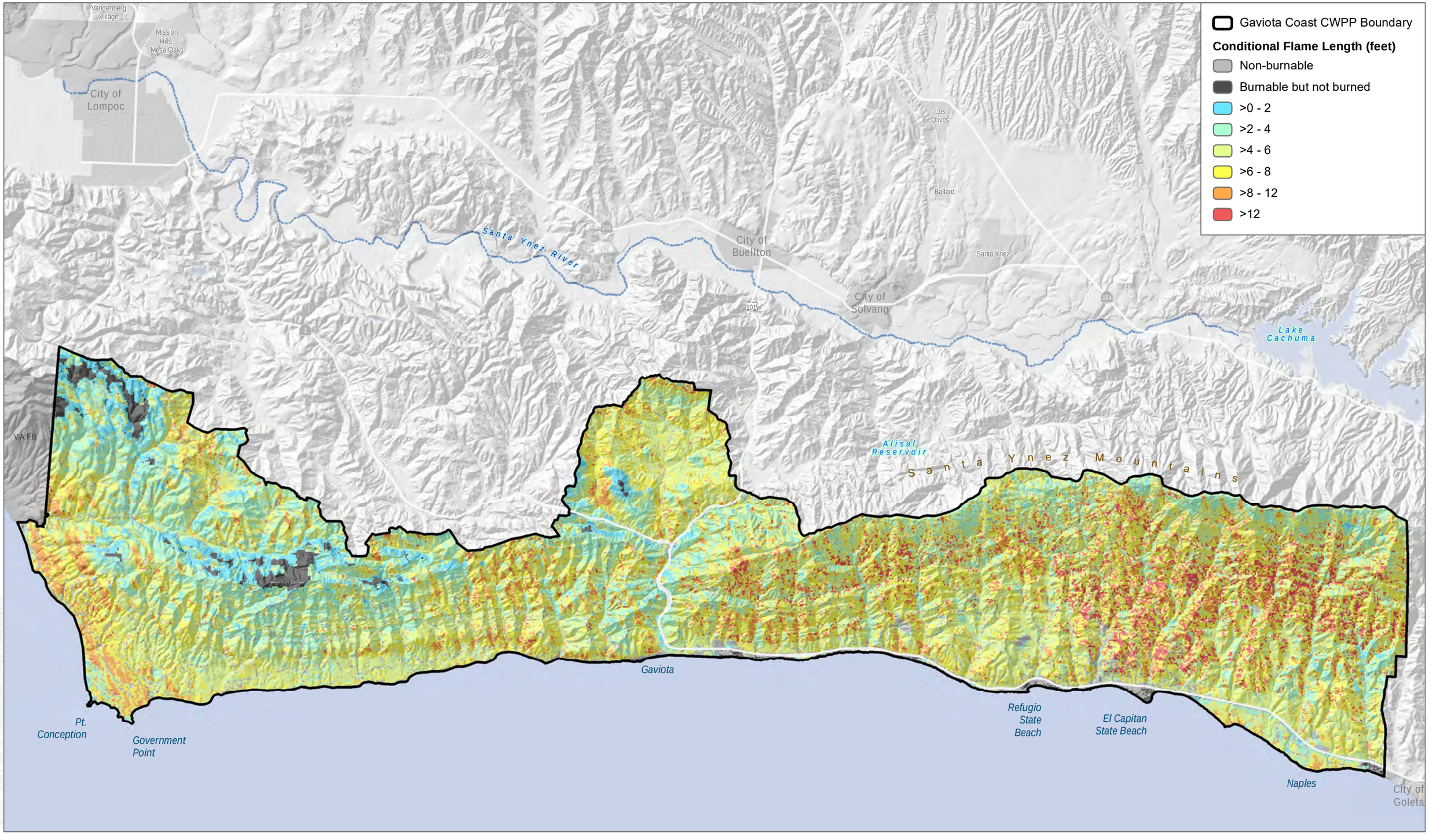
DUDEK

0 1 2 Miles

FIGURE 10

Plan Area Burn Probability

Gaviota Coast Community Wildfire Protection Plan



SOURCE: USGS, County of Santa Barbara, CalFIRE

DUDEK

0 1 2 Miles

FIGURE 11

Plan Area Conditional Flame Length

Gaviota Coast Community Wildfire Protection Plan

4.2.2.1 Flame Length

Table 15 summarizes the flame length classifications for the Plan Area. As shown, flame lengths in the 8- to 25-foot range represents the largest land area (collectively 62.2%). Flame lengths greater than 11 feet are present throughout the Plan Area, concentrated primarily in chaparral and sage scrub fuel beds. The flame length model output layer is presented in Figure 12.

Table 15. Flame Length Values for the Plan Area

Flame Length	Acreage	Percentage of Plan Area
Non-Burnable	4,984	4.7%
0–1 feet	2,841	2.7%
>1–4 feet	14,512	13.7%
>4–8 feet	11,751	11.1%
>8–11 feet	33,200	31.3%
>11–25 feet	32,707	30.9%
>25 feet	6,015	5.7%

Table 16 presents an interpretation of flame length and its relationship to fireline intensity. Fireline intensity is a measure of heat output from the flaming front and affects the potential for a surface fire to transition to a crown fire.

Table 16. Fire Suppression Interpretation

Flame Length	Fireline Intensity	Interpretation
Under 4 feet	Under 100 BTU/ft/s	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 feet to 8 feet	100–500 BTU/ft/s	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers, and retardant aircraft can be effective.
8 feet to 11 feet	500–1,000 BTU/ft/s	Fires may present serious control problems—torching out, crowning, and spotting. Control efforts at the fire head will probably be ineffective.
Over 11 feet	Over 1,000 BTU/ft/s	Crowning, spotting, and major fire runs are probable. Control efforts at head of fire are ineffective.

Source: Roussopoulos and Johnson 1975.
BTU/ft/s = British thermal units per foot per second.

4.2.3 Integrated Hazard

Table 17 summarizes the Integrated Hazard classifications for the Plan Area. As shown, the middle hazard classification represents the largest land area (38.2%). Higher and Highest hazard classifications are concentrated primarily in the eastern portion of the Plan Area (between Eagle Canyon and Las Flores Canyon), the central portion of the Plan Area (between Cañada San Onofre and Arroyo Hondo), and the western portion of the Plan Area (near Point Conception). The Integrated Hazard model output layer is presented in Figure 13.

Table 17. Integrated Hazard Classification for the Plan Area

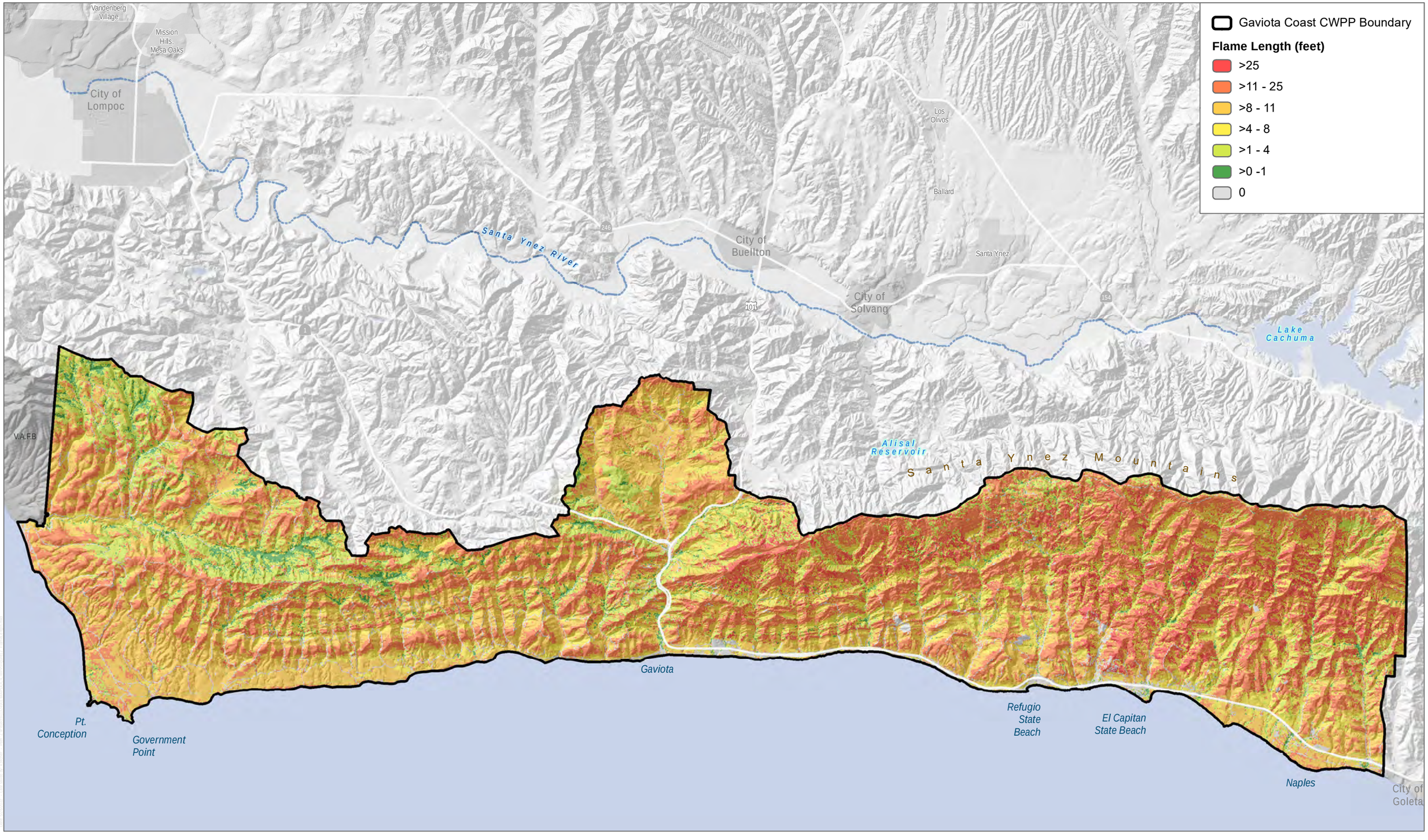
Integrated Hazard Classification	Acreage	Percentage of Plan Area
Non-Burnable	4,852	4.6%
Burnable but Not Burned	1,611	1.5%
Lowest Hazard	15,033	14.2%
Lower Hazard	20,630	19.5%
Middle Hazard	39,746	37.5%
Higher Hazard	19,339	18.2%
Highest Hazard	4,809	4.5%

4.2.4 Spotting Potential

Model outputs for spotting are the maximum spotting distance (in meters) from a crown fire. FlamMap only generates spotting potential where crown fires occur (e.g., in oak woodlands), so this analysis does not account for spotting generated in a fire burning in chaparral vegetation. FlamMap outputs generate a point data set coded with the maximum spotting distance. This data set was then buffered to create a spotting potential layer, where the buffer radius equaled the maximum spotting distance. The buffering exercise represented a circular area around each spotting point, which is not an accurate representation of upwind spotting distances (the modeling scenario used a Sundowner wind event). However, this analysis does give an estimate of potential fire hazard associated with spotting (embers) in the downwind portion of the Plan Area. The results of the spotting analysis indicate high spotting density occurring along the north side of the Santa Ynez Mountains, just outside of the Plan Area (near Broadcast and Santa Ynez Peaks). Lower spotting densities occur elsewhere, and nearly the entire Plan Area would be subject to receiving embers cast from crown fires. It should be noted that for ignition to occur, embers from torching trees must land in a receptive fuel bed. This is an important consideration when evaluating structural vulnerabilities and identifying projects to reduce structural ignitability. The Spotting Potential model output layer is presented in Figure 14.

4.2.5 Suppression Difficulty

A visual analysis of the SDI data set indicates that greater suppression difficulty would occur in the eastern portion of the Plan Area, largely consistent with the perimeters of the 2016 Sherpa Fire, the 2017 Whittier Fire, and the 2021 Alisal Fire. Areas of greater suppression difficulty are also found south of the 2017 Whittier Fire perimeter into and including portions of Eagle Canyon, Dos Pueblos Canyon, Las Varas Canyon, Gato Canyon, and Las Llagas Canyon, as well as west of the 2021 Alisal Fire perimeter and east of Highway 101/Cañada de la Gaviota. The results of this analysis are consistent with field observations and GIS data analysis, as these areas include heavier fuel loads (primarily chaparral), steeper slopes, and more limited road access. The SDI data is presented in Figure 15.



SOURCE: USGS, County of Santa Barbara, CalFIRE

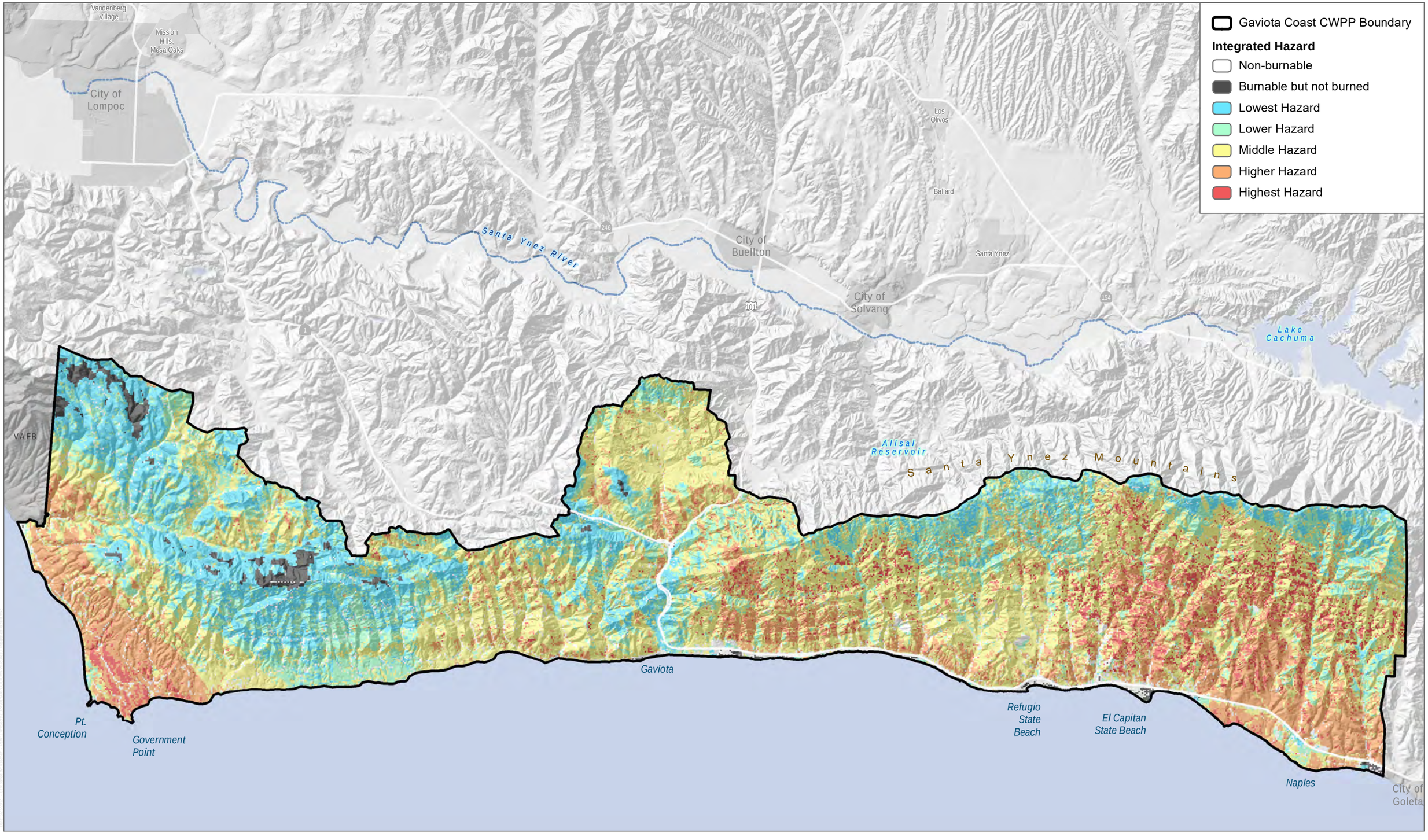
DUDEK

0 1 2 Miles

FIGURE 12

Plan Area Flame Length

Gaviota Coast Community Wildfire Protection Plan



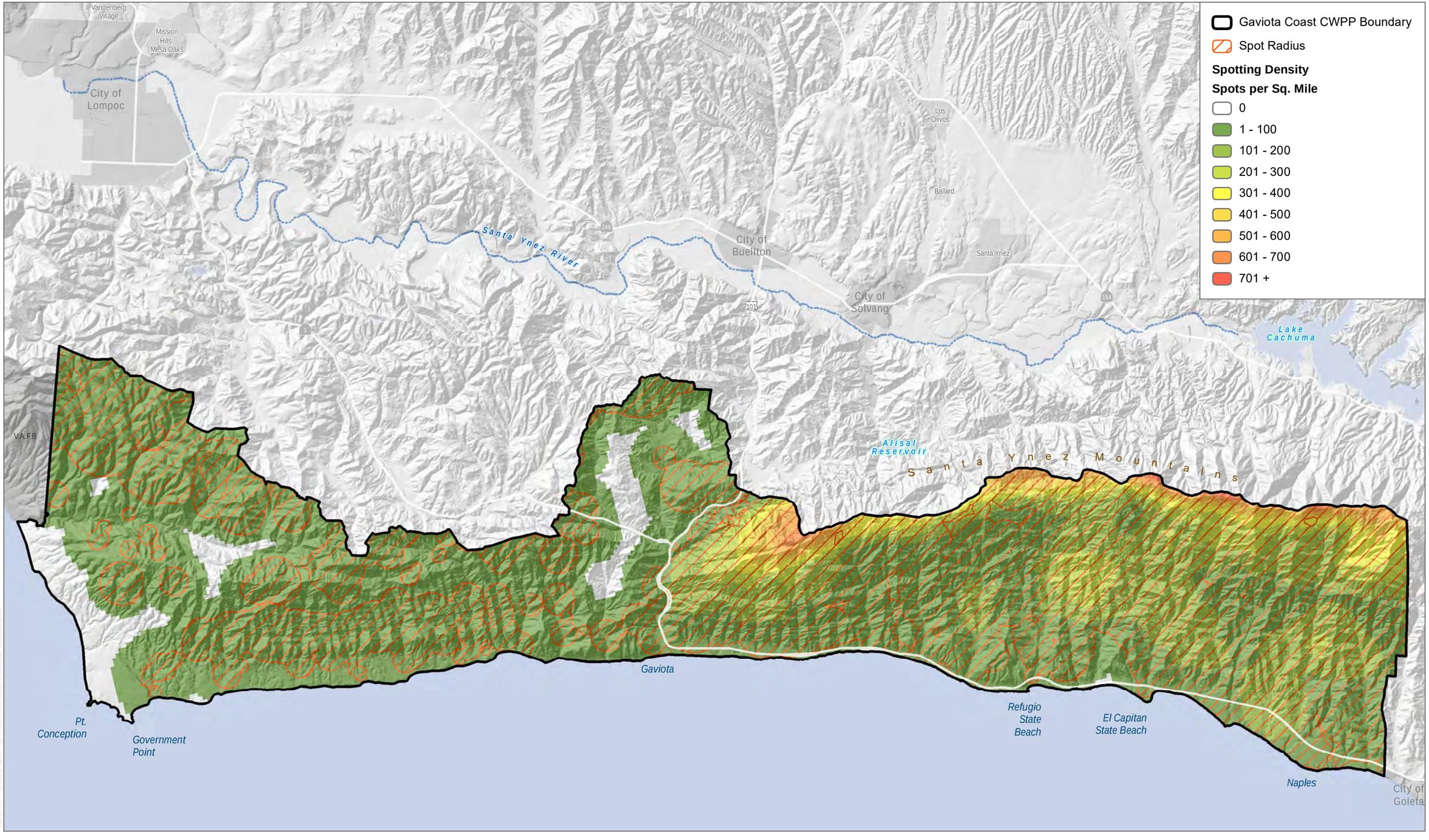
SOURCE: USGS, County of Santa Barbara, CalFIRE

DUDEK 0 1 2 Miles

FIGURE 13

Plan Area Integrated Hazard

Gaviota Coast Community Wildfire Protection Plan



SOURCE: USGS, County of Santa Barbara, CalFIRE

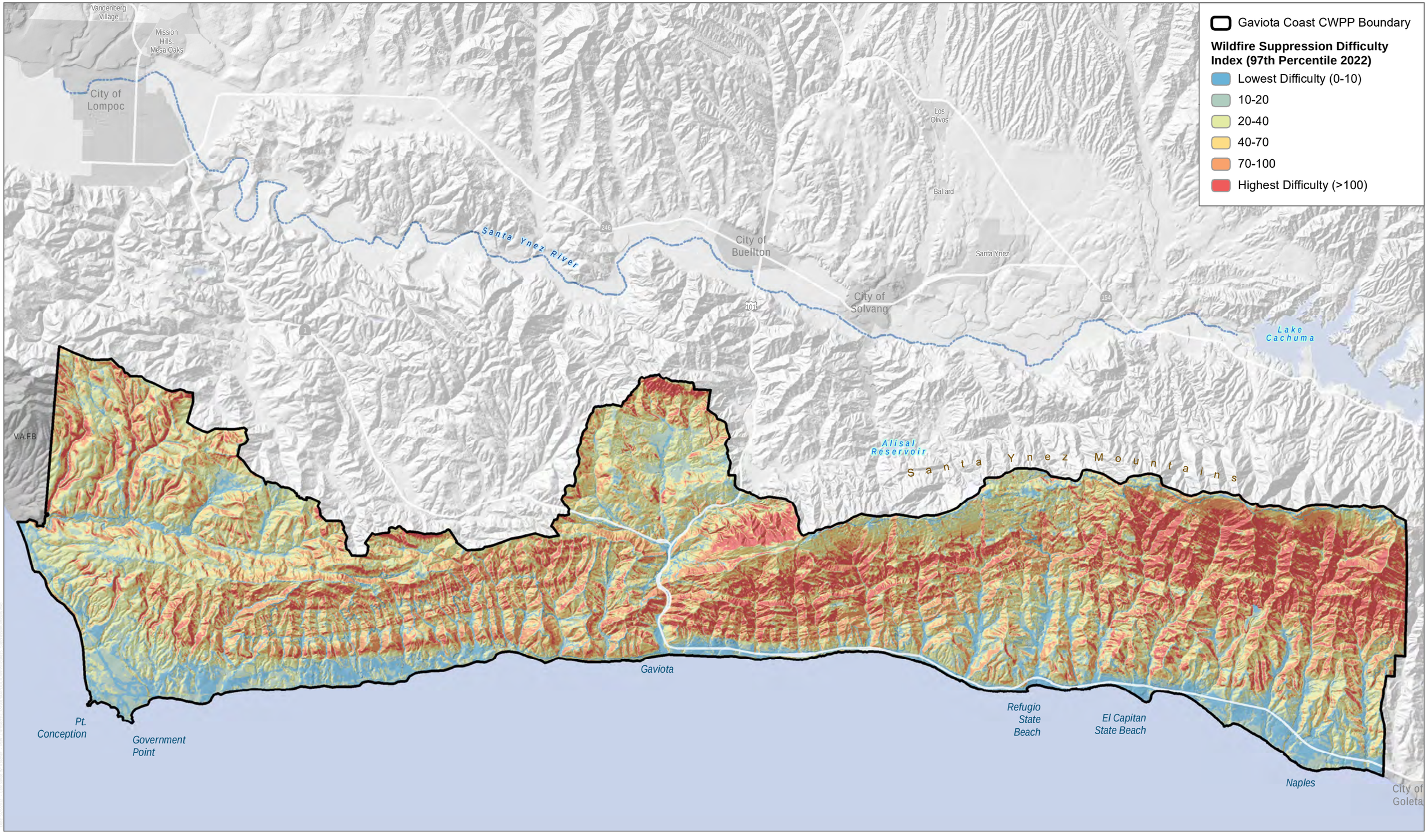
DUDEK

0 1 2 Miles

FIGURE 14

Plan Area Spotting Potential

Gaviota Coast Community Wildfire Protection Plan



SOURCE: USGS, County of Santa Barbara, CalFIRE

DUDEK

0 1 2 Miles

FIGURE 15

Plan Area Suppression Difficulty

Gaviota Coast Community Wildfire Protection Plan

5 Values at Risk

5.1 At-Risk Communities

The Healthy Forest Restoration Act of 2003 (HFRA) identifies at-risk communities as an area:

(A) that is comprised of—

  (i) an interface community as defined in the notice entitled "Wildland Urban Interface Communities Within the Vicinity of Federal Lands That Are at High Risk From Wildfire" issued by the Secretary of Agriculture and the Secretary of the Interior in accordance with title IV of the Department of the Interior and Related Agencies Appropriations Act, 2001 (114 Stat. 1009) (66 Fed. Reg. 753, January 4, 2001); or

  (ii) a group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) within or adjacent to Federal land;

(B) in which conditions are conducive to a large-scale wildland fire disturbance event; and

(C) for which a significant threat to human life or property exists as a result of a wildland fire disturbance event.

In addition to this definition, the Office of the State Fire Marshal maintains a list of communities at risk. The National Fire Plan directs funding to be provided for projects designed to reduce the fire risks to these communities. These high-risk communities identified within the WUI were published in the Federal Register in 2001 and include those communities neighboring federal lands. The communities of Tajiguas and Gaviota are identified as communities at risk by the California Office of the State Fire Marshal and are listed in the Federal Register as at-risk communities. There are other communities in the Plan Area that are also at risk of wildfire and not captured on state or federal lists. Such communities have been identified by SBC Fire and include El Capitan, Refugio Canyon, and Farren Road.

Many of the communities at risk contain relatively old homes that reflect the building materials and/or codes in effect at the time of construction. As such, large numbers of homes are at increased risk of ignition due to structure vulnerabilities (e.g., wood shake roofs and siding, open eaves, unscreened crawlspace, and attic vents), which research has shown to be important in most home losses during wildfires. In addition to hazard reduction through fuel reduction, education of homeowners and mitigation of structure ignition vulnerabilities is recognized as an important priority in these communities at risk. Programs that support retrofits to existing structures, combined with building codes that make future structures more fire-resistant, are needed in many fire-prone areas.

5.2 Wildland-Urban Interface

The wildland-urban interface (WUI) is a potential treatment zone in which fuel-reduction projects may be conducted to reduce wildland fire threats to communities at risk. The HFRA defines the WUI as follows:

(A) an area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a community wildfire protection plan; or

(B) in the case of any area for which a community wildfire protection plan is not in effect-

  (i) an area extending ½ mile from the boundary of an at-risk community;

  (ii) an area within 1½ miles of the boundary of an at-risk community, including any land that-

(iii) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community;

(iv) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or

(v) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; and

(C) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuel reduction to provide safer evacuation from the at-risk community.

The importance of the HFRA definition of the WUI is emphasized in the expedited environmental review process for federal fuel treatment projects conducted within 1.5 miles of a community at risk of wildfire. Specifically, if an authorized hazardous fuel reduction project proposed to be conducted in the WUI is no farther than 1.5 miles from the boundary of an at-risk community, "the Secretary is not required to study, develop, or describe any alternative to the proposed agency action in the environmental assessment or environmental impact statement prepared pursuant to Section 102(2) of the National Environmental Policy Act of 1969."

In developing this CWPP, individual structure locations were evaluated and mapped and compared with the WUI mapping data developed by CAL FIRE (CAL FIRE 2015). Based on this comparison, CAL FIRE's WUI mapping data was determined to be inadequate for the Plan Area, as a significant number of Plan Area structures were outside of mapped WUI areas and thus considered non-WUI. To address this issue, individual structure location data provided by Microsoft (Microsoft 2022) was downloaded for the Plan Area and reviewed in GIS. This data set was then edited to remove mapped structures that no longer exist (e.g., structures at Baron Ranch) and add structures that were omitted. New structures were digitized based on field observations and comparison with digital aerial imagery. In all, the Plan Area contains approximately 1,277 structures, which include houses, ranch buildings, barns, sheds, outbuildings, industrial buildings, recreational buildings, and other structure types with footprints readily visible from aerial imagery.

These structures were then used to calculate and map the following in GIS:

- Area within 100 feet of buildings: This area represents the minimum defensible space area around a building, as defined in PRC 4291. For the Plan Area, this area covers 1,008 acres.
- Area within 300 feet of buildings: This area represents the maximum defensible space around a building for Santa Barbara County. Extension beyond 100 feet for defensible space requires site-specific inspection and authorization from SBC Fire. Extension beyond 300 feet requires a Land Use Permit. For the Plan Area, this area covers 3,551 acres (excluding the area within 100 feet of buildings).
- Area within 1.5 miles of buildings: This area represents the HFRA-defined WUI and the CAL FIRE Wildfire Influence Zone (CAL FIRE 2015). For the Plan Area, this area covers 94,087 acres (excluding the area within 300 feet of buildings).

Due to the development pattern characterizing the Plan Area (rural in nature, low building density, buildings scattered throughout), the Plan Area may better be described as a wildland-urban intermix. Such areas are characterized by low house/structure density where the space between structures consists of vegetative fuels capable of propagating fire. In the intermix, wildland vegetation is continuous, and more than half of the land area is vegetated with combustible fuels. The wildland fire risk associated with intermix areas primarily includes vegetation-to-house fire spread or ember intrusion, although structure to structure fires may occur where buildings are close together (e.g., shed or outbuilding is proximate to a house). Advantages associated with

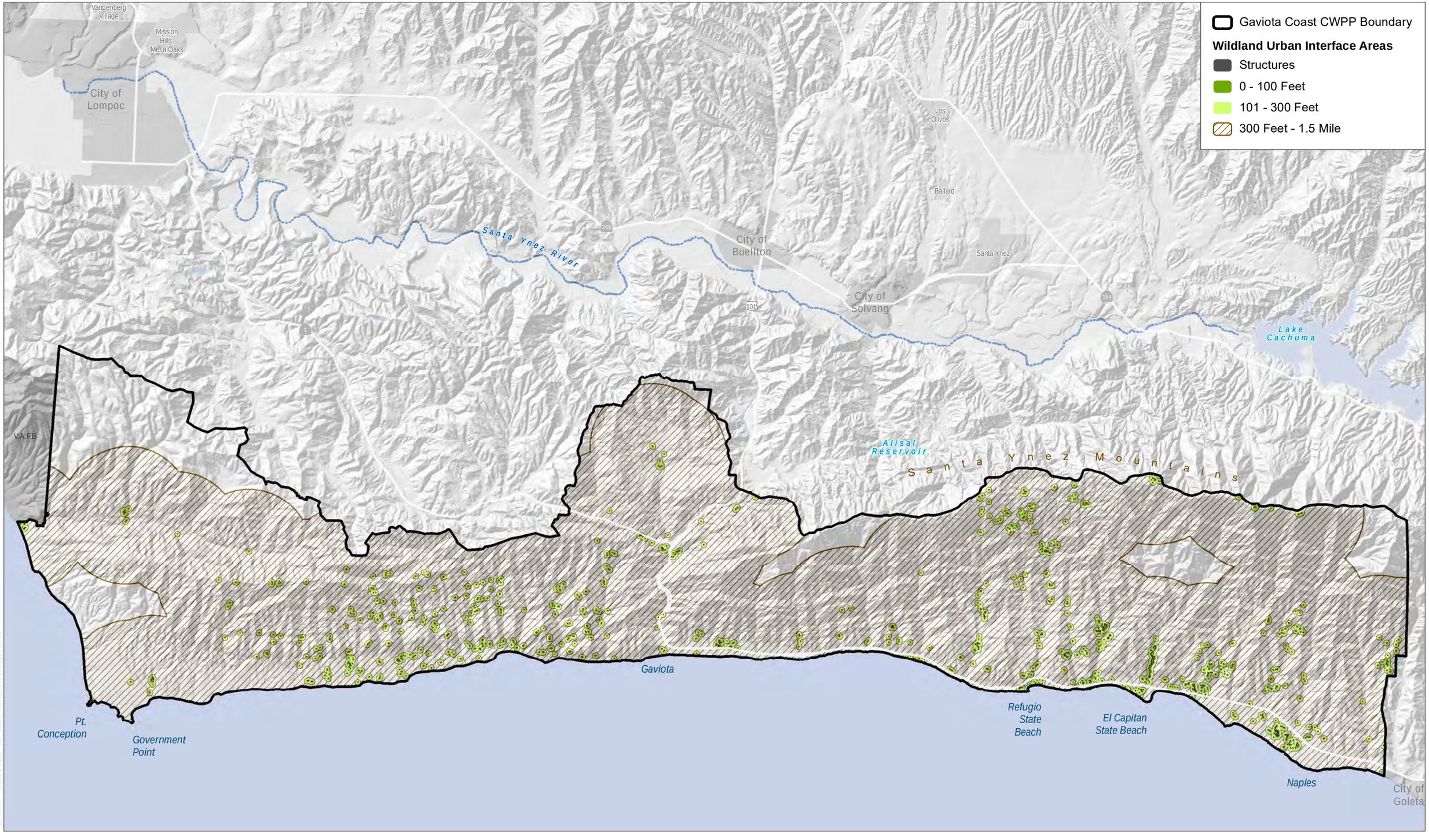
intermix areas include low housing density and a diversity of water supply systems. Disadvantages associated with intermix areas include an increased risk to firefighters, emergency equipment being only able to protect single assets, delayed emergency equipment response times due to rural roads (single lane, windy, heavy fuel loading) and long driveways, congested roads during emergencies, inconsistencies with water supply systems, and structures surrounded by vegetation.

The three mapped areas discussed above (area within 100 feet of structures, area within 300 feet of structures, and area within 1.5 miles of structures) were also analyzed in relation to the Integrated Hazard modeling output. Based on this analysis, nearly half of the areas within 100 and 300 feet of structures rank as middle or higher Integrated Hazard. These results emphasize the importance of defensible space creation and maintenance in the Plan Area. The results of this analysis are presented in Table 18.

Table 18. Integrated Hazard Classification for the Plan Area by Wildland-Urban Interface Classification

Integrated Hazard Classification	100 Feet		300 Feet		1.5 Miles	
	Acres	Percent	Acres	Percent	Acres	Percent
Non-Burnable	197.2	19.6%	481.6	13.6%	3,862.1	4.3%
Burnable but Not Burned	15.8	1.6%	41.3	1.2%	910.8	1.0%
Lowest Hazard	99.9	9.9%	413.3	11.6%	12,236.4	13.7%
Lower Hazard	204.9	20.3%	781.9	22.0%	18,338.9	20.5%
Middle Hazard	339.3	33.7%	1,309.3	36.9%	35,435.7	39.6%
Higher Hazard	137.3	13.6%	448.3	12.6%	14,566.6	16.3%
Highest Hazard	13.6	1.4%	75.3	2.1%	4,177.5	4.7%

Based on the analysis of building locations and the land area within 1.5 miles of buildings and considering the nature of the development patterns in the Plan Area that increase wildfire risk due to the proximity of vegetation to structures, the Plan Area's WUI would more accurately encompass the entire Plan Area. Therefore, this CWPP defines the WUI for the Gaviota Coast as including all 106,002 acres of the Plan Area. Figure 16 presents the Plan Area structures and WUI area and the identified communities at risk.



SOURCE: USGS, County of Santa Barbara, CalFIRE

DUDEK

0 1 2 Miles

FIGURE 16

Plan Area Wildland-Urban Interface

Gaviota Coast Community Wildfire Protection Plan

5.3 Values at Risk

Values threatened by wildfire in the Plan Area include life, property, critical infrastructure, agriculture, and natural resources. The primary focus of this CWPP is to protect these values at risk. The lives and property threatened by wildfire are of paramount importance. However, infrastructure, agriculture, and natural resources threatened by wildfire are also significant. Wildfires in the Plan Area, and even the threat of wildfires during extreme fire weather periods, also have the capability to generate secondary impacts to the community, including the loss of access (closed/damaged roads), communication capabilities (damaged/inoperable phone lines or cell towers), power supply (damaged distribution lines, public safety power shutoffs), water availability (damaged infrastructure, no power to well pumps), recreation/tourism opportunities (limited access to area closures), and economic activity (inability of employees/workers to access job sites, reduced capacities for production and distribution of agricultural goods). Post-fire effects are also a concern in the Plan Area, notably debris flows that have had devastating impacts in the Plan Area in the past. This section summarizes the values threatened by wildfire in the Plan Area.

5.3.1 Life Safety

The potential for loss of life due to a wildfire is difficult to calculate. Locally, in Santa Barbara County, the 1990 Painted Cave Fire resulted in one fatality, the 1977 Romero Fire resulted in four fatalities, and the 1964 Coyote Fire resulted in one fatality. Most recently, the 2017 Thomas Fire in Santa Barbara County resulted in two fatalities, although the fire occurred outside the Plan Area. However, the potential for greater loss of life is possible during extreme wildfire events, as seen in the 1991 Oakland Hills Fire, where 25 people, both emergency responders and residents, perished while trying to evacuate. Additionally, 22 people perished in the 2017 Tubbs Fire and 85 perished in the 2018 Camp Fire as a result of these extreme wildfire events (CAL FIRE 2022a). The potential for loss of life due to wildfires exists in the Plan Area.

The potential for loss of life also exists post-fire, as seen in the debris flow following the 2017 Thomas Fire where 23 people perished. The Thomas Fire occurred approximately 15 miles east of the Plan Area, but burned more than 280,000 acres in similar terrain and vegetation as exists in the Plan Area. Heavy rains following the Thomas Fire, and the lack of vegetation and trees to stabilize hillsides, resulted in a catastrophic debris flow on January 9, 2018, which affected Montecito and the Coast Village Road area of the City of Santa Barbara. Similar conditions existed in the Plan Area following the 2016 Sherpa Fire, where a debris flow in El Capitan Canyon occurred on January 20, 2017. Fortunately, there were no fatalities caused by this event, although 22 people were trapped in cabins and required immediate rescue from first responders. Nine cabins were destroyed and as many as 21 vehicles were carried away in the flow. Boulders and woody debris clogged culverts and underpasses, contributing to the flooding and various impacts observed beyond the damage to cabins and vehicles, including impacts to infrastructure such as roads, bridges, and pipelines (Schwartz et. al. 2021). The Plan Area is considered highly susceptible to post-fire debris flows that could significantly impact life and safety again.

5.3.2 Structures and Population

5.3.2.1 Structures

There are an estimated 1,277 structures in the Plan Area, as calculated from available structure mapping data (Microsoft 2022) augmented with additional building footprints digitized using GIS. Additional buildings were added to the baseline structure mapping data set based on field observations and comparison with digital aerial imagery.

The 1,277 structures mapped in support of this CWPP include houses, ranch buildings, barns, sheds, outbuildings, industrial buildings, recreational buildings, and other structure types whose footprints were readily visible from aerial imagery. The total residential structure count per SCB Fire's defensible space inspection database is 423. Because much of the landscape in Plan Area is considered a working landscape, most non-residential structures are associated with agricultural usage.

Residential structures are generally isolated from each other, and homes are broadly dispersed. This results in a wildland-urban intermix condition where native vegetation is found between structures and often creates an access issue for firefighting and evacuation. Homes are scattered throughout the Plan Area, with concentrated pockets of structures in the communities of Arroyo Quemada, Tajiguas, Refugio, Dos Pueblos, El Capitan, Las Varas Canyon, Farren Road, and Hollister Ranch. Hollister Ranch is the largest concentration of homes and covers approximately 14,500 acres between Gaviota State Park and Point Conception. It was subdivided in 1971 into 133 one-hundred-acre parcels; currently, 84 homes have been built. While Hollister Ranch has the largest concentration of houses in the Plan Area, Arroyo Quemada has the densest.

Within the Plan Area, there are also residential structures dedicated to vacation rentals/tourism only, notably El Capitan Canyon, which offers cedar cabins, yurts, and pre-constructed tents. Additionally, with the rise of short-term rentals such as Airbnb and VRBO, there are several residences within the Plan Area that are short-term rental properties.

Because homes within the Plan Area are not part of a planned community, there is a lot of variability in structure type, age, and, setting. Some homes are part of a working landscape and are more ranch-style, with accessory structures on site. Other homes are set into mountains, hills, and canyons, such as those in the upper portion of Refugio Canyon. Structure age varies greatly within the Plan Area, and homes range from being built in the early 1800s to much more recently.

Because the structures within the Plan Area vary greatly in age, their ignition resistance varies as well. As a result, many homes are vulnerable to impacts from wildfire. For example, the 2021 Alisal Fire resulted in 13 structures being lost. These homes were predominantly next to Refugio Creek and built many years before current structural hardening building codes had been adopted. The 2017 Whittier Fire destroyed 16 residences and burned over 18,000 acres. Rebuilding after a fire is challenging due to factors such as post-fire contamination, code requirements, and cost.

Wildland-urban intermix development in upper Refugio Canyon.

5.3.2.2 Population

The Plan Area is sparsely populated when compared to neighboring cities of Santa Barbara and Lompoc. Permanent residents are concentrated where homes and structures are present, as described above. However, because the Plan Area is a popular recreation destination, populations fluctuate daily and throughout the year. As such, there may be considerably more people

within the Plan Area who are visiting overnight (e.g., camping) or during the day (e.g., visiting Plan Area beaches) than the number of permanent residents suggests. Annual visitation typically peaks within the summer months, which coincides with the fire season. Having an increased population with people who are unfamiliar with the area can create additional challenges regarding wildfires and evacuation. This phenomenon was evident during the 2020 Creek Fire near Shaver Lake (Freedman 2020). The fire broke out near popular camping sites over Labor Day weekend and created significant evacuation challenges because there were many people unfamiliar with the area, access was limited, and dispersed camping was occurring over one of the busiest holiday weekends. Approximately 1,000 people were stranded near the Mammoth Lake Reservoir, and helicopters were required to evacuate people from Mammoth Pool Campground (Freedman 2020).

Plan Area populations can also fluctuate daily with the influx of agricultural workers and employees of different facilities (e.g., Exxon facility, County MRF), parks, and commercial venues. Additionally, motorists on Highway 1 and Highway 101 are temporarily in the Plan Area and may stop briefly at beaches, scenic overlooks, and rest areas. As with fluctuation in population due to recreation, having an increased population with people who are unfamiliar with the area can create additional challenges regarding wildfires and evacuation.

In addition to temporal variations in populations, the Plan Area also includes frontline populations and communities, as evaluated in the County's Climate Change Vulnerability Assessment (County of Santa Barbara 2021). Frontline populations and communities include people or households that live in isolated areas, have high outdoor exposure, are "income constrained", have limited mobility or chronic health conditions, live in non-resilient housing, or have limited resources and live in high pollution areas (County of Santa Barbara 2021). Such populations experience the impacts of climate change earlier and/or to a disproportionately severe degree than others and are less able to access resources. Residents of frontline communities are often immigrants and refugees, indigenous, and persons of color, and face increased hardship due to socio-economic or environmental pressures, which may include low-income levels, housing cost burdens, high levels of unemployment, disabilities or chronic medical issues, and high levels of exposure to pollutants and climate hazards, among other factors (County of Santa Barbara 2021).

Based on mapping efforts conducting for the Assessment, the western portion of the Plan Area is ranked as moderate in respect to the quantity of people in a frontline community relative to the other unincorporated areas of the County. Frontline populations in the Plan Area may include isolated and rural communities, persons with limited English proficiency, and persons without access to transportation and telecommunications. Such population characteristics can limit the ability to access information about wildfire hazards, understand the wildfire environment in which they live or work, and may create additional challenges during wildfire events in the Plan Area, especially when evacuation is necessary. In a study conducted in Ventura County (Baker et. al. 2022), marginalized and vulnerable communities faced disproportionally more barriers to wildfire preparedness and understanding when it came to communications, available resources, and inclusion in the planning process. Potential solutions to breaking the link between marginalization and vulnerability to wildfire risks were identified. Section 6.2.3 of this CWPP includes recommendations related to community outreach and education, including specific recommendations for engaging such communities.

5.3.3 Critical Infrastructure

Highway 101 near Vista Point (Santa Maria Times 2017a).

Critical infrastructure encompasses physical assets that are vital to maintaining essential services, such as water service, roads, and communications (Figure 17, Plan Area Critical Infrastructure). Wildfire-related damage to critical infrastructure can sometimes require weeks or months of repair until they are fully restored or replaced. Impacts to critical infrastructure can also impact surrounding communities. For example, during the 2004 Gaviota Fire, damage to the Union Pacific Railroad Coast Route resulted in major disruption to freight and passenger rail traffic that had impacts well outside the Plan Area. Table 19 identifies critical infrastructure within the Plan Area. Damage to or destruction of these assets during a wildland fire can result in the temporary delay or loss of critical services to the Gaviota Coast community and, in some cases, the central coast region.

Table 19. Critical Facilities in the Plan Area

Critical Facility	Infrastructure Type
Highway 101	Transportation Network
Highway 1	Transportation Network
Calle Real	Transportation Network
Refugio Road	Transportation Network
West Camino Cielo	Transportation Network
Jalama Road	Transportation Network
Coast Route	Union Pacific Railroad
Transmission and Distribution Lines	Energy
Gaviota Pump Station and Consolidation Site	Energy
Las Flores Pump Station and Consolidation Site	Energy
All American Pipeline	Energy
Santa Barbara County Fire Department Station 38	Public Service
Santa Ynez Peak Facilities	Communications
Broadcast Peak Facilities	Communications
Tajiguas Landfill/Materials Recovery Facility	Public Service
Goleta Water District	Public Service
Naples Municipal Water Company	Private Service
El Captain Municipal Water Company	Private Service
San Augustine Municipal Water Company	Private Service
Santa Anita Municipal Water Company	Private Service
Alegra Municipal Water Company	Private Service
El Rancho Tajiguas Water Services	Private Service
Exxon La Flores Canyon Water Service	Private Service

Table 19. Critical Facilities in the Plan Area

Critical Facility	Infrastructure Type
Gaviota Gas Plant Water Service	Private Service
Refugio, El Capitan, and Gaviota State Beach Water Systems	Private Service
Vista De Las Cruces Elementary School	Education

Source: County of Santa Barbara 2016a.

5.3.3.1 Roads

Within the Plan Area, six critical transportation routes occur. Highway 101 is a four-lane highway that serves as the critical access route to the Plan Area and also serves as the main coastal route between Los Angeles and San Francisco. It connects the Plan Area with the communities of Buellton, Santa Maria, Goleta, and Santa Barbara. At Las Cruces, Highway 1 splits from Highway 101, providing access to the community of Lompoc. Both highways are managed by Caltrans and have been impacted by wildfire events in the Plan Area. For example, during the 2021 Alisal Fire, both highways were closed and sustained damage from the fire.

Most of the roads in the Plan Area are private paved and unpaved ranch roads. The ranch roads provide access for responding agencies to the residential areas of the Plan Area. The ranch roads are the primary access point for residents. Additionally, there is a road connecting Dangermond Preserve into the west end of Hollister Ranch. There are also four main County roads. Calle Real is a two-lane frontage road that is parallel to the north side of Highway 101. It provides the only other access route to the Gaviota Coast, but sections are privately owned. Refugio Road is a two-lane road that connects Highway 101 to Highway 246 in Santa Ynez. The road is primarily used by residents of Refugio Canyon. Although the County does not maintain Refugio Road from the summit down the north side of the Santa Ynez Mountains to the Santa Ynez Valley, this road section is used by residents. West Camino Cielo is a paved and unpaved single-lane road. The road is owned by both the County and Los Padres National Forest. Seasonally, the road is closed, and it was impacted by USFS road closures due to high fire risk in the last 2 years. Jalama Road is a two-lane road that connects with Highway 1 and travels toward the coast to Jalama Beach County Park. It is used by residents and recreational users accessing the park.

Roads are essential for evacuation and bringing in critical resources during a wildfire and can function as fuel breaks. However, they can be severely impacted by fire, causing challenges with evacuation and firefighting. Wildfires can also result in significant and costly damage to transportation systems. Road systems can also result in wildfires due to vehicle fires, accidents, sparks from dragging chains/equipment, and cars parked on dried-out fuels.

5.3.3.2 Other Transportation

Other critical transportation facilities also occur within the Plan Area. Although the Plan Area does not have accessible public transit or extensive sidewalks, there is the Pacific Coast Bike Route. The Pacific Coast Bike Route is a Class III bike route that is on the shoulder of Highway 101 and continues on Highway 1. The Pacific Coast Bike Route runs from Vancouver, Canada, to the Mexico border.

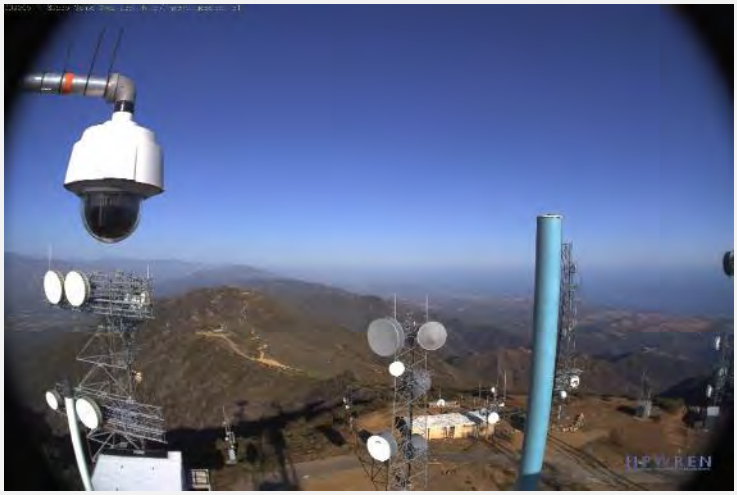
Union Pacific Railroad operates a single-line railroad that passes along the entire Plan Area. The Coast Route is adjacent to the beach and serves as a secondary access route for the railroad. This means that when Union Pacific experiences a line outage on its Fresno subdivision through the Central Valley, or other routes are operating at capacity, the Coast Route provides surge capacity. The rail line is also used by the Amtrak Pacific Surfliner and Coast Starlight for passenger trains that go between San Diego and San Luis Obispo. However, there are no stops within the Plan Area.

Rail lines are a potential wildfire ignition source in the Plan Area. Train trestles, as seen in several locations in the Plan Area where the rail line crosses drainages, can ignite and burn for several days, thereby exacerbating wildfire risk.

5.3.3.3 Communication Facilities

Three communication hubs are within the Plan Area: Santa Ynez Peak, Broadcast Peak, and Bald Mountain. Santa Ynez Peak is the highest point of the Santa Ynez Mountains and houses critical communication towers. This site is part of a system of communication towers throughout the Central Coast and covers Santa Barbara, including Point Conception, Buellton, Solvang, and Santa Maria, and down the coast to Ventura through the Alert Central Coast system. There is also a wildfire camera stationed at the site. The USFS has established a large fuel break around Santa Ynez Peak. Broadcast Peak houses the tower location for KEYT-TV (Channel 3) plus several FM Radio broadcasters for Santa Barbara County. Bald Mountain houses a Federal Aviation Administration OMNI Beacon and includes a flat helicopter landing area to facilitate access.

Santa Ynez Peak communications infrastructure (HPWREN 2022).



Communication facilities are critical resources during wildfires because they relay emergency information and evacuation orders and facilitate emergency response. If a communication facility is damaged by a wildfire, it can make it very difficult for an emergency response to be coordinated; in addition, repair costs can be significant. The communication facility at Santa Ynez Peak has been threatened by wildfires in the past, including the 2017 Whittier Fire and the 2021 Alisal Fire.

5.3.3.4 Resource Recovery and Waste Management

MRF biofilter burning during the 2021 Alisal Fire (Noozhawk 2021).

The Tajiguas Landfill and Materials Recovery Facility (MRF) is a County-owned and operated waste facility within the Plan Area since 1967. The landfill is just north of Highway 101 between Gaviota State Park and Refugio State Beach in a coastal canyon (Cañada de la Pila, just west of Arroyo Quemado). The community of Arroyo Quemada is just southeast of the landfill. The landfill serves the South Coast, Santa Ynez, and New Cuyama and has the capacity to process up to 1,500 tons of waste a day. However, traditionally, trash was buried on site, and the facility is considered nearly full. In addition to processing waste material, the Tajiguas landfill now also operates a recycling and methane energy plant (Yamamura 2021). The site is now able to convert 200,000 tons of trash into recyclables, compost, methane, and energy that has the capacity to generate power for the electrical grid. It is estimated that the methane created on site can produce 2 megawatts of power (Yamamura 2021).

The Tajiguas Landfill is both vulnerable to wildfire and an ignition risk. The 2021 Alisal Fire caused the closure of the facility and an estimated $20 million in damages (Magnoli 2021) when the MRF biofilter ignited from embers. The MRF was heavily damaged during the fire due to exposed woodchips catching fire from embers and smoldering for days. The fire also damaged the methane gas collection system, resulting in explosion risk because the methane could not be safely extracted (Magnoli 2021). A fire also occurred at the Tajiguas Landfill on May 12, 2022. This fire burned approximately 0.5 acres of compost and 1.5 acres of nearby vegetation and was believed to be started by a piece of heavy equipment (Magnoli 2022). Given the nature of the site, the risk for dust explosions is also a reality. If any type of explosion (dust, methane) were to occur on site, it could result in a wildfire and put people at risk due to it being staffed 24/7 and the proximity of the Arroyo Quemada community.

5.3.3.5 Remote Automated Weather Stations

Remote Automated Weather Stations (RAWS) are a system of automated weather stations that are managed by SBC Fire under protocols established by USFS and the Bureau of Land Management. They are monitored by the National Interagency Fire Center to observe potential wildfire conditions. RAWS stations collect weather data such as relative humidity, wind speed, wind direction, air temperature, fuel moisture, temperature, rain, and solar radiation. Within the Plan Area, there are two RAWS: the Gaviota RAWS station within Gaviota State Park and the Refugio RAWS in Refugio Canyon. The RAWS are used by SBC Fire to predict and monitor for fire weather and high-risk days.

5.3.3.6 Transmission Lines

A 66-kilovolt transmission line exists in the Plan Area, running roughly parallel to Highway 101, entering the Plan Area at its eastern boundary (coming from Goleta) and running westward to its terminus at Mariposa Reina. Spur lines run from the main alignment up to the Tajiguas Landfill/MRF and to the Exxon facility at Corral Canyon.

Numerous other lower-voltage distribution lines are present throughout the Plan Area serving infrastructure and buildings. Powerlines are not only a critical resource but also a significant ignitions risk. Powerlines and electrical sources have caused eight of the most destructive fires in California, such as the 2018 Camp Fire, the 2018 Woolsey Fire, the 2017 Thomas Fire, and the 2007 Witch Creek Fire (CAL FIRE 2022). Within 2 miles of the Plan Area, 23 ignitions have been caused by electrical system infrastructure between 2007 and 2020. Due to the high ignition risk, power service providers can and have turned off power during public safety power shutoff events to prevent ignitions from overhead lines.

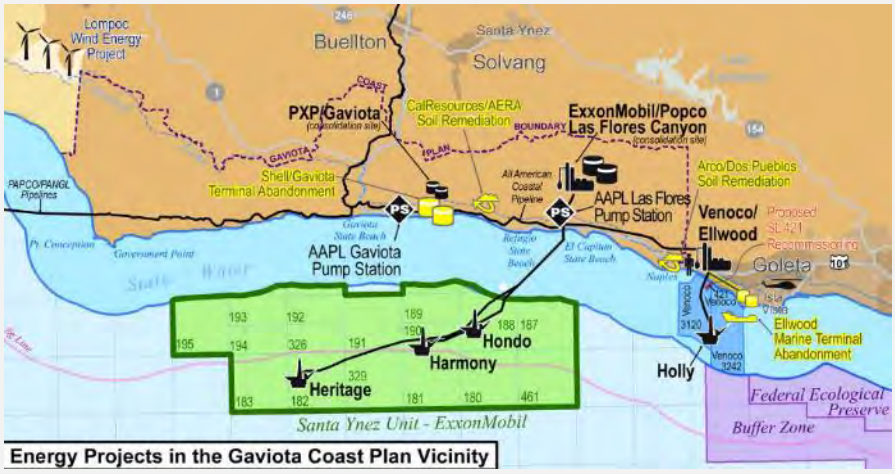
In 2018, the California Public Utilities Commission approved a statewide Fire-Threat Map (CPUC 2022) that delineates a High Fire-Threat District and is intended to assist with implementation of new fire prevention rules. The map delineates areas in the state where there is an elevated risk (Tier 2) and an extreme risk (Tier 3) from utility-associated wildfires, including likelihood and potential impacts on people and property. The Fire-Threat Map helped prioritize fire hazard areas to allow for implementation of new fire-safety regulations adopted by the California Public Utilities Commission in December 2017. Electric investor-owned utilities must file an annual report that contains a fire-prevention plan containing specified information for its overhead electric facilities in the High Fire-Threat District. Increased vegetation management and new fire regulations also apply to High Fire-Threat Districts.

The Plan Area includes 72,413 acres (68% of Plan Area) mapped as Tier 2 (Elevated Risk) and 31,347 acres (30% of Plan Area) mapped as Tier 3 (Extreme Risk) under the California Public Utilities Commission's Fire Threat Map (CPUC 2022).

5.3.3.7 Oil and Gas

The Plan Area has a long history of oil and gas production. There are four onshore oil and gas production fields that have been or soon will be abandoned and surface areas restored. Although there are no other recoverable oil and gas reserves within the Plan Area, new technology could render the abandoned facilities commercially viable for recovery. There are also three existing production units—Point Pedernales, Point Arguello, and Santa Ynez—located offshore of the Gaviota Coast. These offshore drilling sites are connected to onshore facilities via underwater pipelines. Oil from Point Arguello and the Santa Ynez Unit is sent to Gaviota and Las Flores Canyon onshore facilities. These facilities are used for handling, storage, and shipment of oil via the All American Pipeline. There are two pump stations for the pipeline within the Plan Area: the Gaviota Pump Station and the Las Flores Pump Station. The Gaviota facility heats and temporarily stores oil, and generates electricity and heat. Las Flores Canyon, which is operated by ExxonMobil, is the only oil and gas processing facility within the Plan Area. These facilities are at risk of fire and are an ignition risk. A wildfire

Oil and gas infrastructure in the Plan Area (County of Santa Barbara 2016).



could threaten or damage these facilities and result in significant environmental damage due to the oil and gas present. These facilities are also an ignition risk and have the potential to result in fires that could spread off site and impact the Plan Area.

5.3.3.8 Public Services

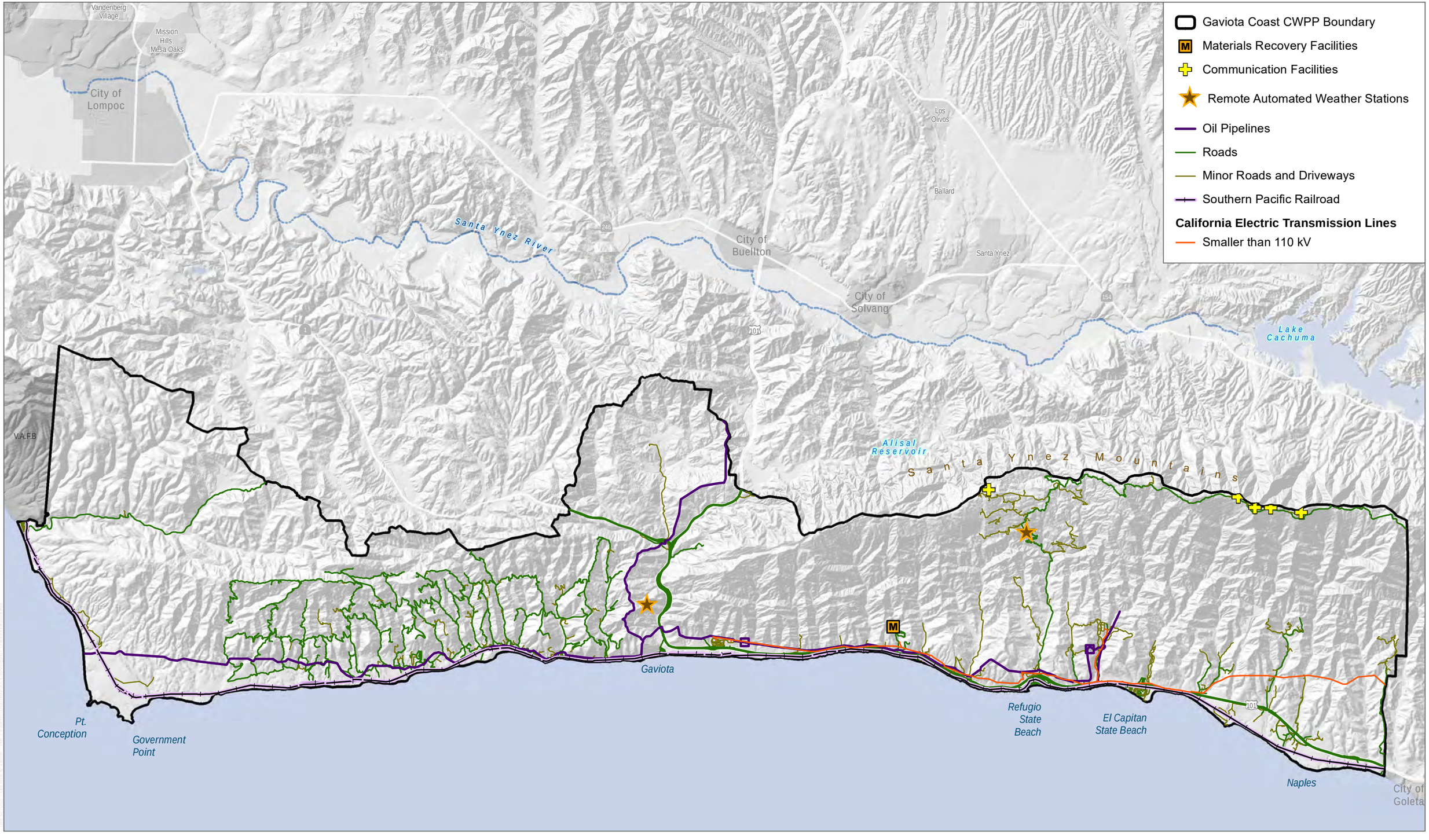
Public services within the Plan Area are provided by different entities. As described in Section 2, Plan Area Description, fire services are predominantly provided by SBC Fire with support from the USFS, DPR, Hollister Ranch, and surrounding cities and counties. Station 38 is within the Plan Area near Cañada de la Gaviota. The USFS is primarily responsible for fire suppression and management within USFS lands, as well as providing wildland fire protection in the northern portion of the Plan Area. The County Sheriff and California Highway Patrol provide law enforcement in the Plan Area; however, there are no stations within the Plan Area. Public services are critical in wildfire response.

5.3.3.9 Water Services

A critical value within the Plan Area is water. As described in Section 2, there are several watersheds and sub-watersheds within the Plan Area. Water sources in the Plan Area provide potable water and irrigation for agricultural uses via surface water diversions and groundwater extraction. Because the Plan Area lacks a true aquifer, groundwater extraction is a limiting factor for additional development.

Water service is provided by the Goleta Water District and small private water companies. Private water supplies serve limited areas. El Rancho Tajiguas, Gaviota Gas Plant, ExxonMobil Las Flores Canyon, Pacific Offshore Pipeline Company, Gaviota State Beach, Refugio State Beach, and El Capitan State Beach also have private water systems. Additionally, there are many private on-site water wells for residential and agricultural needs.

Water resources are crucial for fighting wildfires and can also be significantly impacted by wildfire events. Wildfires can cause contamination and sedimentation of water resources that last years. Additionally, as climate change occurs, water resources are expected to be significantly impacted and at risk.



SOURCE: USGS, County of Santa Barbara, CalFIRE

DUDEK

0 1 2 Miles

FIGURE 17

Plan Area Critical Infrastructure

Gaviota Coast Community Wildfire Protection Plan

5.3.4 Economics

Grazing operations at Hollister Ranch.

The potential impact of wildfire on economic loss is significant. Each year the suppression cost related to wildfire significantly increases. Suppression costs alone in 2020 and 2021 were over $1 billion in California (CAL FIRE 2021c). The total dollars lost by SBC Fire in 2021 was $6 million due to fire impacts to properties, structures, vehicles, and more (SBC Fire 2021d). In 2018, the worst fire season prior to 2020, the loss to the California economy was nearly $150 billion, with 59% of the calculated loss being from indirect impacts due to the distribution of economic supply chains (Wang et. al. 2018). The 1990 Painted Cave Fire resulted in 524 homes being destroyed and a dollar loss of more than $290 million. With the buildup of fuels and new homes built in High and Very High FHSZs, a wildfire of that proportion today would have similar results and a much greater dollar loss. Additionally, repair and rebuilding of infrastructure following a wildfire can be a significantly costly effort for municipalities and utilities. Following the 2008 Tea Fire in Santa Barbara County, for example, an underground water main was irreparably damaged by heat from the fire above, and area roads were degraded to the point where they needed to be resurfaced. Fires also affect industries and local economies far from the burned area due to impacts in agriculture, tourism, smoke impacts, restrictions on recreation, and damage to infrastructure (Gedye 2021).

The local economy is heavily dependent on the beauty of its natural and cultural resources, with a significant amount of revenue generated by the tourism industry. There is a high potential for a wildland conflagration to disrupt both the quality of life and the economic stability of the Plan Area. Wildfire and post-wildfire-related closures to local roads and highways, notably Highway 101, can impact travel into and out of the Plan Area. Temporary closures of businesses and/or reduced volumes of tourist traffic affect local business and tax revenues. The potential for economic losses due to litigation resulting from wildfire damage is also a reality. Damage claims against the property owners where the fire originated and/or spread from or through their property, due to untreated wildland areas, represent a potential economic loss to the County and private property owners. Utility companies have also been found responsible for wildfire ignitions and resulting damages, with significant settlements being paid to fire victims and local municipalities. For example, Pacific Gas & Electric settled with Sonoma County and the City of Santa Rosa for more than $300 million (combined)—their share of the $1 billion deal the utility made with local governments to settle claims for damages caused by wildfires in 2017 and 2018 (Press Democrat 2020). Other potential economic impacts associated with wildfires include increased insurance costs for property owners, the potential for dropped policies, and public safety power shutoffs implemented by utility companies to reduce ignition potential.

5.3.5 Ranching and Agriculture

Citrus orchard within an agricultural greenbelt along lower Refugio Road.

The Plan Area is one of the last remaining working agricultural landscapes in Southern California. The hills in the Plan Area provide for grazing cattle, orchards, and crops. Agriculture and rangeland management are extremely important to the local culture and history of the Plan Area and contribute significantly to the County's largest industry. The climate and soil in the Plan Area provide optimal conditions for cattle grazing and cultivation of various crops. Of the agricultural operations in the Plan Area, cattle grazing is the primary use in the western portion of the Plan Area. In the eastern portion of the Plan Area, cattle operations occur, along with increased land area dedicated to the cultivation of a wide variety of crops such as avocado, citrus, and flowers. The State Department of Conservation's Farmland Mapping and Monitoring Program (CDOC 2018) data was analyzed for the Plan Area. The Farmland Mapping and Monitoring Program agricultural designations are summarized in Table 20. However, not all of the land zoned for agriculture within the Plan Area is able to be farmed or grazed due to the rugged topography, restrictions on public lands, or other factors.

Table 20. Farmland Mapping and Monitoring Program Designations

Classification	Acreage	Percentage of Plan Area
Urban and Built-Up Land	476	0.4%
Grazing Land	61,561	58.1%
Farmland of Local Importance	234	0.2%
Prime Farmland	649	0.6%
Farmland of Statewide Importance	44	0.0%
Unique Farmland	2,103	2.0%
Other Land	40,803	38.5%

Source: CDOC 2018.

As presented in Table 20, over half of the Plan Area (58.1%) is classified as grazing land, with other land use classifications making up most of the remaining Plan Area lands. Farmland of Local Importance, Prime Farmland, Farmland of Statewide Importance, and Unique Farmland make up smaller percentages of the Plan Area. In addition to the Farmland Mapping and Monitoring Program data, the following agricultural resources were analyzed in development of this CWPP:

- **Agricultural Greenbelts:** Agricultural areas actively managed as orchards (avocado and citrus, primarily) were mapped by the County and encompass 2,105 acres of the Plan Area. These areas are situated in canyons between Eagle Canyon and Tajiguas Creek. Agricultural greenbelts (or buffers) are an important

component to the Plan Area's working landscape and can also serve as fire breaks due to their lower dead fuel loads and the presence of access roads and irrigation. They also serve as spatial buffers between embers generated by wildfires and down-wind communities and other at-risk values. These areas are also valuable resources that can be threatened by wildfires burning in the Plan Area.

- **Grazing Land:** Existing grazing land was identified by the Project Team based on their knowledge of existing land use practices on private lands in the Plan Area. Existing grazing land is concentrated in the eastern portion of the Plan Area between Eagle Canyons and Cañada San Onofre and totals 5,923 acres. In this area, grazing lands connect with agricultural greenbelts, which can further benefit adjacent and nearby communities and at-risk values through reduces fuels loads and a wider ember buffer from wildland fuels. Grazing is also occurring on Hollister Ranch and the Dangermond Preserve. There is the possibility to expand grazing activities in the Plan Area to manage and maintain fuel loads. There are some locations (e.g., Arroyo Quemado) where grazing historically occurred but has ceased. Cessation of grazing in these areas has resulted in the conversion of grasslands to non-native cover (e.g., mustard) or shrub cover. This conversion results in increased surface fuel loads that can contribute to higher-intensity, faster-moving fires.

Wildfire has the potential to negatively impact ranching and agricultural land uses in the Plan Area. Potential impacts to these valuable Plan Area resources include the following:

- Damage or destruction of agricultural infrastructure, including roads, fences, buildings, irrigation systems, pumps, and other supplies and materials.
- Damage or destruction of crops, vines, and orchard trees.
- Loss of rangeland area and productivity.
- Economic loss due to inability to harvest and export crops.
- Post-fire erosion and sedimentation and alterations to soil compositions.

5.3.6 Recreation

The Plan Area includes approximately 24,250 acres of publicly owned land (USFS, DPR, and the County) that is primarily dedicated to public recreational uses. Wildfires have and continue to impact recreational areas and their resources. During wildfire events or when there is an anticipated high fire risk, closures of recreation areas are becoming more common. For instance, over the Labor Day weekend in 2021, all National Forest lands in California were closed due to the potential fire danger. Some of the wildfire-related impacts to recreation resources can include damaged trails systems, restricted access, and damaged recreational facilities. These impacts can affect an area for several years (USFS 2007). Smoke and ash, even from fires miles away, can reduce recreation use due to poor air quality and health hazards. Wildfires can also damage environmental resources in recreational and open space areas. After a fire burns through an area there can be a significant increase in soil erosion, landslides/debris flows, sedimentation, algae blooms from ash deposits, and impacts to water quality due to ash and fire retardant (Chavez and McCollum 2004; USFS 2007; USGS 2020). Catastrophic wildfires can result in significant impacts to wildlife, impacts to aesthetic resources, loss of critical habitats, environmental degradation, and type conversion. These impacts can also affect recreational and open space areas that are downstream from the burned area.

5.3.6.1 Parks and Recreation

The Plan Area experiences a high demand for coastal recreational activity. Three State Parks occur within the Plan Area: Gaviota State Park, El Captain State Beach, and Refugio State Beach. More than 5,400 acres of the

Plan Area is within State Park ownership. Recreation amenities include camping, picnicking, swimming, surfing, diving, fishing, hiking, horseback riding, and biking. DPR also manages six other properties within the Plan Area: Cañada del Leon, Cañada San Onofre, Cañada del Molino, Cañada de Guillermo, Corral Beach, and Philips Tajiguas West. These are undeveloped sites, having been historically used as vertical access points to the beach from informal turnouts along Highway 101.

Jalama Beach County Park is the first park and vertical public access and is at the western edge of the Plan Area. The park includes 116 campsites and cabins. It is approximately 15 miles southwest of Highway 1 and is relatively isolated at the end of Jalama Road. The park is considered well developed and includes hot water, electrical hookups, and the Jalama Beach Grill and Store.

The Los Padres National Forest is within the north-eastern portion of the Plan Area and encompasses approximately 18,000 acres. It is also open to recreational activities. There are also private recreational areas, such as the Arroyo Hondo Preserve and El Capitan Canyon Campground, in the Plan Area. Additionally, the Hollister Ranch Owner's Association provides access for schools and researchers to the shoreline and tidelands adjacent to the beach.

Jalama Beach County Park.

Recreational demand in the Plan Area is a value at risk and an ignition risk. There is a high demand for recreation that could be severely impacted. This could be from direct impacts, such as physical damage from a fire, or indirect impacts such as loss of economic revenue or loss in tourism. Recreation can also put other values in the Plan Area at risk due to potential ignitions. Recreational activities such as campfires, fireworks, and vehicles have caused fires. Table 21 summarizes the recreational lands in the Plan Area.

Table 21. Recreation Lands in the Plan Area

Recreation Resource	Operating Agency	Acres
El Capitan State Beach	DPR	2,258
Refugio State Beach	DPR	67
Gaviota State Park	DPR	2,261
Jalama Beach County Park	Santa Barbara County Community Services Department	23*
Baron Ranch	Santa Barbara County Community Services Department	723
El Capitan Canyon Resort	El Capitan Canyon (Private)	447
Arroyo Hondo Preserve	Land Trust of Santa Barbara	782
Los Padres National Forest	U.S. Forest Service	15,634

Source: CPAD 2020
Note: DPR = California Department of Parks and Recreation
* Jalama Beach County Park to expand by ~36 acres (to total ~59 acres) through a donation of land from The Nature Conservancy

5.3.6.2 Coastal Access and Trails

There are four dedicated public beach access locations along the coastline of the Plan Area. The formal access sites are limited to El Captain State Beach, Refugio State Beach, Gaviota State Park, and Jalama Beach County Park. East of El Capitan State Beach is private landholdings and public access is not allowed. However, there are multiple informal access points along the coastline via informal turnouts along Highway 101.

Plan Area beach along Highway 101.

The Plan Area also hosts numerous trails. Public trails in the inland portion of the Plan Area are within Gaviota State Park, El Capitan State Beach, and Los Padres National Forest. Baron Ranch north of Highway 101 near Arroyo Quemada Creek is owned by the County. There is a 6-mile trail on this property that is open to the public. Some trails within the Plan Area include Gaviota Wind Caves Trail, Gaviota Hot Springs, Trespass Trail, Gaviota Peak Trail, and Tunnel View Loop. Wildfires could result in limited access to these resources or cause significant environmental damage.

5.3.7 Cultural and Natural Resources

5.3.7.1 Natural Resources

Natural resources include biological resources, visual resources, streams and water resources, slopes and soil stability, and air quality. The Plan Area includes the largest continuous stretch of rural coastline in Southern California. As such, the area features a high concentration of diverse species and habitats. This is in part due to its topographic diversity, which includes rolling hills, valleys, canyons, coastal terraces, streams, coastal bluffs, estuaries, sandy beaches, and rocky shorelines. Point Conception is the convergence point for the northern and southern ecosystems of the west coast. The rural and relatively undisturbed landscape provides migration corridors for wildlife between inland, mountain, and coastal habitats areas, and offers a refuge for plants and wildlife.

5.3.7.2 Biological Resources

Biotic Communities

Coastal scrub at Dangermond Preserve.

The Plan Area's vegetation (biotic) communities provide important biological habitats for plant and animal species. The distribution of vegetation types in the Plan Area is presented in Section 2.6, Vegetation and Fuels, and Figure 18, Plan Area Biological Resources. The vegetation that exists in these communities also becomes fuel available to burn during a wildfire. The impact of a wildfire in many of these communities can be devastating, especially under extreme wind and weather conditions. The Plan Area is in the Southern California Coast Section of the California Coastal Chaparral Forest and Shrub U.S. Department of Agriculture Ecoregion Province. Within the Plan Area, the Central Western Ecoregion transitions into the Southwestern Ecoregion at the Santa Ynez Mountain, creating a high level of species endemism. The Jalama Creek and upper Gaviota Creek watersheds are within the Central Western Region. The Southwestern region is characterized by the Santa Ynez Mountains, Cojo-Jalama plains, Hollister Ranch, and Eastern plains of Gaviota Creek. Vegetation in the Plan Area varies. Some notable vegetative communities are bishop pine forest, tanbark oak forest valley oak woodlands, coastal sage scrub, central maritime chaparral, native grassland, wetlands, riparian woodlands, and coastal dunes.

The Gaviota Coast Plan (County of Santa Barbara 2016a) identifies environmentally sensitive biotic communities, which are defined as communities that cannot adapt to new environmental stresses. Environmentally sensitive habitats were identified based on direct field observation and/or assessments by contract biologists and the County's Planning and Development staff biologist. The following sensitive biotic communities are present in the Plan Area and may be adversely affected by wildfire:

- Coastal Oak Woodland
- Montane Hardwood
- Valley Foothill and Montane Riparian
- Valley Oak Woodland
- Coastal Sage Scrub
- Chaparral
- Fresh Emergent Wetland
- Perennial Grasslands
- Saline Emergency Wetlands
- Coastal Bluff Scrub

Rare, Endangered, or Threatened Plants and Wildlife

Because of the diversity of biotic communities in the Plan Area, many different rare, endangered, and threatened animal species exist. The protection of these plants and animals is required by law and is essential to biological diversity. Like biotic communities, these plants and animals are threatened by wildfire. The following rare, endangered, or threatened wildlife species are present in the Plan Area and may be adversely affected by wildfire (CDFW 2022):

- White-tailed kite (*Elanus leucurus*)
- Western snowy plover (*Charadrius alexandrinnus nivosus*)
- Tidewater goby (*Eucyclogobius newberryi*)
- California red-legged frog (*Rama draytonii*)
- Southwestern willow flycatcher (*Empidonax trailii extimus*)
- Southern California steelhead trout (*Onocorhynchus mykiss*)

The following rare and endangered plant species are present in the Plan Area and may be adversely affected by wildfire (CDFW 2022):

- Gaviota tarplant (*Dienandra increscens* ssp.)
- Lompoc yerba santa (*Eriodictyon capitatum*)
- Santa Ynez false lupine (*Thermopsis macrophylla*)

Dangermond Preserve

The western boundary of the Plan Area includes the Jack and Laura Dangermond Preserve. The preserve is owned and managed by The Nature Conservancy and consists of 24,364 acres at Point Conception. The preserve stretches from the coast to the Santa Ynez Mountains and includes chaparral, grassland, oak woodlands, coastal scrub, and closed-cone pine. It is also on a major ecological boundary and consists of extremely biologically diverse ecosystems. Within the preserve is 9,000 acres of native and annual grassland, 6,000 acres of oak woodland and forest, over 200 wildlife species, and nearly 600 plant species. The preserve also hosts a large-scale restoration project aimed at replanting over 150 acres of oak woodland (TNC 2020).

Point Conception at Dangermond Preserve.

Gaviota Tarplant Ecological Reserve

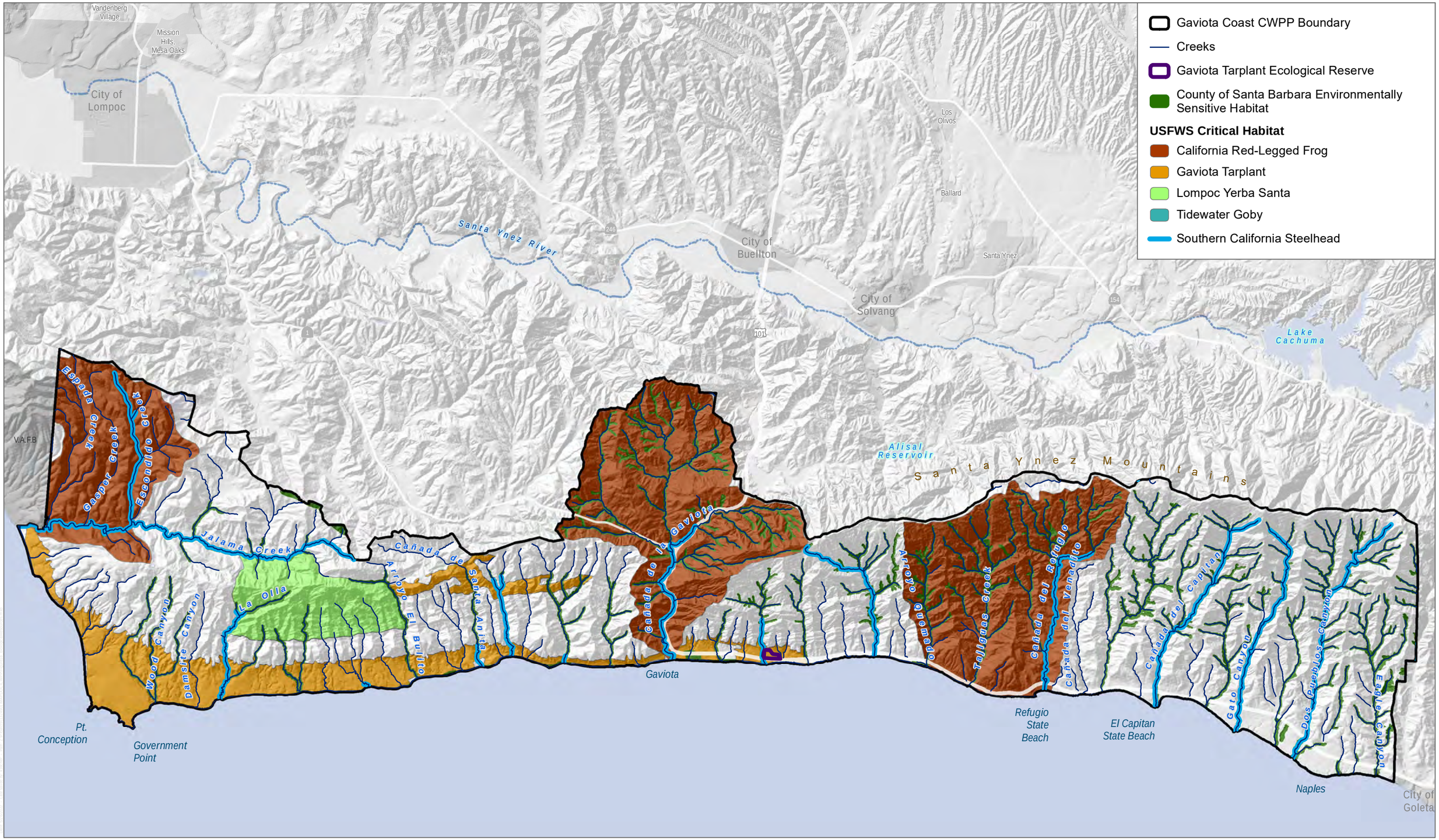
The 35-acre Gaviota Tarplant Ecological Reserve area is within the Plan Area along the north edge of Highway 101 at the base of Cañada San Onofre. Gaviota tarplant is an annual species and its numbers may vary from year to year due to a number of conditions. The reserve was established by CDFW in 1995. The reserve was conveyed to CDFW by Chevron and the All American Pipeline Company as a preserve and mitigation bank (DPR 2007).

Critical Habitat

Critical habitat constitutes areas considered essential for the conservation of a listed species. These areas provide notice to the public and land managers of the importance of an area to the conservation of a species. Special protections and/or restrictions are possible in areas where federal funding, permits, licenses, authorizations, or actions occur or are required. Critical Habitat for Lompoc yerba santa (4,159 acres), Gaviota tarplant (8,910 acres), California red-legged frog (32,245 acres), and tidewater goby (17 acres) exist in the Plan Area (CDFW 2022).

Environmentally Sensitive Habitat

Santa Barbara County's Comprehensive Plan, including the Conservation Element, Open Space Element, Environmental Resource Management Element, Land Use Element, and specifically the Coastal Land Use Plan, contain policies identifying the protection, preservation, and enhancement of biological and natural resources, in particular Environmentally Sensitive Habitat (ESH) areas (County of Santa Barbara 2022). ESH includes areas such as wetlands, intertidal areas, monarch butterfly habitat, streams, riparian corridors, native grasslands, and other native plant communities. Inland Riparian Corridors are included in the ESH areas and mapped in the ESH Overlay. Limitations to fuel modification and agricultural uses exist in the ESH Overlay areas. The Plan Area includes 5,546 acres of ESH Overlay (5,400 acres of ESH and 146 acres of Riparian Corridor) (County of Santa Barbara 2016a).



SOURCE: USGS, County of Santa Barbara, CalFIRE

DUDEK

0 1 2 Miles

FIGURE 18

Plan Area Biological Resources

Gaviota Coast Community Wildfire Protection Plan

5.3.7.3 Visual Resources

The Plan Area includes provides numerous open vistas with views of the Pacific Ocean, chaparral-covered mountains, wooded canyons, grasslands, coastal bluffs, and beaches. The Plan Area is only lightly inhabited and there are few visible structures. The publicly accessible portions of the Plan Area (the eastern part of the Plan Area) are bisected by Highways 1 and 101 and the railroad, but visual resources are largely undisturbed by developed elements. The segment of Highway 101 that passes through the Plan Area is a California Scenic Highway and the area adjacent to the highway is considered by the County as a critical viewshed. The scenic highway stretches from Highway 1 at Las Cruces to the eastern boundary of the Plan Area, approximately 21 miles. The Land Use Element and Open Space Element of the County's Comprehensive Plan include policies to protect and enhance visual resources (County of Santa Barbara 2009, 2016b). Additionally, the Coastal Act mandates that scenic and visual resources of the coast be considered and protected as a resource of public importance. Wildfires damage visual resources and have damaged Highway 101 in the past, most recently during the 2021 Alisal Fire.

5.3.7.4 Streams and Water Resources

Vegetation in Plan Area watersheds and along streams and watercourses provides many important functions in protecting water resources, water quality, and habitat. Vegetated riparian corridors may provide water quality buffering benefits to adjacent streams. Vegetation removal or treatment in riparian corridor areas must be conducted in consideration of potential effects on water quality and ecological function. Riparian vegetation provides habitat for terrestrial and aquatic wildlife species; provides streambank stability; reduces erosion; shades the water surface, thereby affecting water temperature (which affects aquatic habitat); and is a source for large woody debris, which falls into streams and watercourses providing habitat and affecting flow patterns and pool development (Kocher and Harris 2007). When a watershed is catastrophically burned in a wildfire, many of these functions and roles are lost or severely reduced until the vegetation recovers. Following a catastrophic watershed-scale fire, hillslope erosion and sediment yields typically increase by an order of magnitude (or greater) over non-fire average conditions (Neary et. al. 2008).

Sound vegetation management that reduces the extent and frequency of watershed-wide extreme fires also helps avoid and minimize potential sediment and water quality impacts in the watershed. Vegetation management activities can maintain water quality benefits while reducing the hazard and risk of fires. Past large fires within the Plan Area have been wind-driven fires. Because of the east/west alignment of the Santa Ynez Mountains, winds are funneled down through major drainages. Some creek sections have heavy concentrations of flammable vegetation. A wildfire burning through these areas has the potential for significant loss of riparian habitat and water quality. In addition, erosion occurring on steeper slopes above

Soil deposited in Refugio Creek following the 2021 Alisal Fire.

drainages where soil conditions are more susceptible to erosion exacerbated by wildfire effects can result in deposits of soil into creeks where flow velocities are sufficiently reduced.

5.3.7.5 Slopes and Soil Stability

Watersheds severely burned by wildfire are vulnerable to accelerated rates of soil erosion and can experience large amounts of post-fire sediment deposits. Increases in post-fire suspended sediments in streams can result from erosion and overland flow, channel scouring, and creep accumulations in stream channels after an event (USDA 2005). Although less is known regarding the effect of fire on turbidity, it has been observed that post-fire turbidity levels in stream water are affected by the steepness of the burned watershed (USDA 2005). The little data available regarding post-fire turbidity levels have indicated that the U.S. Environmental Protection Agency water quality standard for turbidity can be exceeded after a fire event (USDA 2005). In some cases, during severe, slow-moving fires, the combustion of vegetation during wildfires creates a gas that can penetrate the soil. As the soil cools, this gas condenses and forms a waxy coating that causes the soil to repel water. This phenomenon, called hydrophobicity, increases the rate of surface water runoff as water percolation into the soil is reduced (Moench and Fusaro 2012). This accelerated slope runoff can move dry soil material that has accumulated at the base of slopes, creating flooding and debris flows.

These conditions occurred after the 2016 Sherpa Fire and resulted in additional property and soil loss in El Capitan Canyon. The debris flow washed away cabins and cars in the El Capitan area. Most recently, after the 2021 Alisal Fire, mandatory evacuation orders were issued over possible debris flows on the fire scar (Yamamura 2021). Further, the U.S. Geological Survey has mapped numerous landslides within the Plan Area (USGS 2022). The topography of the Plan Area, combined with the east/west orientation of canyons within the Santa Ynez Mountains, makes the Plan Area vulnerable to post-fire debris flows.

El Capitan Canyon flooding post-Sherpa Fire (Santa Maria Times 2017b).

Vegetation helps stabilize slopes and minimize soil erosion by providing root strength and by absorbing soil moisture. Plant roots can anchor into bedrock or more stable soils and can bind weaker soils through fibrous root development. Excessive, haphazard, or indiscriminate vegetation removal can result in the loss of root strength in the soil, and their decay can increase soil moisture levels, increasing the potential for erosion and slope failure (Ziemer 1981). Vegetation also reduces stormwater runoff by capturing and storing rainfall in the canopy and releasing it through evapotranspiration. Vegetation also promotes infiltration of rainfall into the soil (Center for Watershed Protection and USFS 2008).

5.3.7.6 Air Quality

The California Air Resources Board regulates the air quality within California. The Santa Barbara County Air Pollution Control District is mandated to develop plans to meet federal and state air quality standards, monitor air quality, and regulate activities that may result in air pollution within Santa Barbara County.

Wildland fire affects air quality by producing smoke emissions that may exceed California Air Resources Board's standards for carbon monoxide, carbon dioxide, methane and non-methane hydrocarbons, and particulate matter less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$). The amount of chemicals and particulate matter produced in a wildland fire is directly related to the amount of fuel consumed.

Carbon dioxide, water vapor, carbon monoxide, particulate matter, hydrocarbons, and other constituent materials are all present in wildfire smoke. The specific composition of smoke depends largely on the fuel type (vegetation types contain different amounts of cellulose, oils, waxes, and starches that, when ignited, produce different compounds). In addition, hazardous air pollutants and toxic air contaminants, such as benzene and formaldehyde, are present in smoke. However, the principal pollutant of concern from wildfire smoke is particulate matter. In general, particulate matter from smoke is very small in size and can be inhaled into the deepest recesses of the lungs, presenting a serious health concern (Stone et. al. 2019).

Factors including weather, stage of fire, and terrain can all dictate fire behavior and the impact of wildfire smoke. Wind, for instance, generally results in lower smoke concentrations because wind causes smoke to mix with a larger volume of air. Large quantities of pollutants can also be released by wildland fires over a relatively short period of time. Air quality during large fires can become severely hazardous and can remain impaired for several days after the fire is ignited (Stone et. al. 2019). Wildfire smoke can also impact areas far from the fire and result in smoke inundation. During the 2021 Alisal Fire, smoke triggered air quality advisories for Southern California (Gabbert 2021b).

Wildland fire mitigation involves many fuels management practices, such as prescribed burning, cutting, chipping, and mechanical methods. Prescribed burning, like wildfire, produces chemical and particulate matter that has the potential to exceed California Air Resources Board standards. But unlike wildfire, prescribed burning can be mitigated through smoke management practices outlined by the California Air Resources Board and Santa Barbara County Air Pollution Control District to avoid exceeding air quality standards. Other fuel management practices where vegetation is not burned, but cut, chipped, or mechanically removed, do not exceed air quality standards and are considered a nonsignificant, short-term activity.

5.3.7.7 Cultural and Historic Resources

The Plan Area has been historically used and inhabited by Native Americans, Spanish, Mexican, and American people. There are significant cultural resources in the Plan Area, many of which are intact and preserved. It is estimated that the Gaviota Coast has been occupied for 10,000 years. The Millingstone Peoples occupied the area about 8,500 years ago, and archeological sites have been found containing items from that population. Between 5,000 and 6,000 years ago it is believed that the Native American population in the Plan Area increased. By 3,000 years ago, the Plan Area was occupied by the Chumash who lived along the Central Coast. The Chumash had a complex culture, well-organized technology, craft specialization, complex trade network, and a thriving economy (County of Santa Barbara 2016a).

In the mid-1700s, the Plan Area was occupied by early Spanish settlements. In 1822 the Plan Area was occupied by Mexicans who were operating historical ranchos. The historical rancho names are still used in the Plan Area, including Punta de la Conceptions, San Julian, Las Cruces, and more. Some of the adobe and stone homes are still standing, including the Las Cruces Adobe north of the Gaviota Pass, Orella Adobes at Cañada del Corral, the Pedro Baron Adobe at Arroyo Quemada, the Squat Adobe on USFS land near Gaviota, and the Pico Adobe off of Refugio Road (County of Santa Barbara 2016a).

The history of the Plan Area has resulted in a number of important cultural resources, archeological and historic sites, traditional cultural properties, tribal cultural resources, and rural historic landscapes. The Santa Barbara County Coastal Land Use Plan identified the 1850 Vincent Ortega Adobe between Goleta and Gaviota as the most important site within the Coastal Zone. The Coastal Plan also identified nine other resources within the Plan Area (County of Santa Barbara 2019):

- Point Conception Lighthouse
- Gaviota Landing
- Gaviota Pass
- Baron Adobe
- La Vigia
- Refugio Beach Park
- Erro Pepper Tree
- Ygnacio Ortega Adobe
- Bruno Orella Adobe
- El Capitan Beach Park
- Dos Pueblos

Reagan Ranch (Rancho del Cielo).

Within the Plan Area is one California State Historical Landmark, Gaviota Pass. The County also has designated two Plan Area Resources as County Landmarks—Orella Adobe and Las Cruces Adobe—and two Structures of Historic Merit—the Point Conception Lighthouse and Vista del Mar School. Other historic structures in the Plan Area include the prisoner of war branch camp, the Victorian House on former Edwards Ranch, Casa Grande, the Western White House on the former Reagan Ranch (Rancho del Cielo), the Cojo Ranch Headquarters building on the Dangermond Preserve (built in 1840), the main house at the Arroyo Hondo Preserve (built in 1842), and the Hollister House on the Hollister Ranch. There are also prehistorical archeological sites recorded in the Plan Area. These range from small limited active areas to large villages that were inhabited by hundreds of people (County of Santa Barbara 2016a). Wildfires could damage or result in the permanent loss of these cultural and historic resources.

6 Action Plan

This section identifies recommended actions and projects to be implemented in the Plan Area that would minimize wildfire impacts to the community. Projects and actions identified in this section would need to be funded and approved by the appropriate regulatory authority prior to implementation. In some cases, completion of environmental review would be necessary prior to project implementation.

The SBCFSC and SBC Fire, along with Plan Area stakeholders and community members, intend to assess project progress annually and invite agencies, landowners, and involved community members to submit projects that would minimize wildfire risk and promote community wildfire protection. Project identification and implementation is an ongoing process, and additional projects will be evaluated by SBCFSC and SBC Fire. Where applicable, the projects or recommended actions presented in this section will be updated to reflect additions or changes.

This CWPP is a living document and has been created to allow for ongoing management, updates, and community input intended to reduce the impact of wildfires in the Plan Area.

6.1 Plan Monitoring and Management

Long-term monitoring of projects and project areas (e.g., vegetation management areas) is important for identifying areas that need follow-up maintenance or identifying new or additional projects necessary for reducing overall community wildfire risk. The following actions by the SBCFSC are intended to reduce community wildfire risk:

- Conduct annual monitoring of vegetation management project areas. Management of vegetation is recommended in this CWPP, and maintenance of treated areas can typically be completed at a cost less than that for the initial effort. Monitoring efforts can identify areas in need of additional vegetation management treatments. Monitoring efforts will be managed by the SBCFSC, and performance standards identified on a project-level basis.
- Maintain this CWPP. Long-term maintenance of this CWPP is essential. Maintaining the CWPP document is critical to track completed projects and ongoing vegetation management efforts, and, most importantly, to address and define new priority projects. The SBCFSC should direct management of the CWPP and should conduct a review of the CWPP at least annually with an edit cycle every 3 to 5 years. The SBCFSC should set up a standing committee to address the long-term management and maintenance of this CWPP.
- Review vegetation management projects. The prioritized list of vegetation management projects included in Appendix C of this CWPP should be reviewed at least annually by the SBCFSC and updated accordingly. Requests from project proponents to update this table should be considered in a timely manner.

6.2 Action Plan

The goal of this CWPP is to identify action items that can be implemented to serve and protect lives, property, critical infrastructure, and Plan Area resources threatened by wildland fire. The SBCFSC and SBC Fire recognize the catastrophic impacts of wildfire on the Gaviota Coast community. This CWPP is intended to reduce wildfire hazards and risk through implementation of the action items outlined in this section.

6.2.1 Vegetation Management

Vegetation management is a critical component to wildfire risk reduction in the Plan Area. All vegetation will burn, given the right conditions (Reinhardt et. al. 2008). Therefore, the goal of vegetation management is not to remove all vegetation, but to moderate potential fire behavior by reducing fuel loads and altering the structure, composition, and spacing (horizontal and vertical) of retained vegetation. Vegetation management treatment types (e.g., fuel breaks) and techniques (e.g., grazing) are used to meet overall vegetation management goals, which are dependent on vegetation type, structure, and condition. It is anticipated that vegetation management projects identified in this CWPP would be further clarified at advanced stages of project planning, with detailed management prescriptions and management area boundaries defined. The following sections identify vegetation management types, recommended treatment standards, and treatment techniques that can be used for the vegetation management projects identified in this CWPP. A prioritized list of vegetation management projects is provided in Appendix C.

This CWPP recommends implementation of the prioritized vegetation management projects identified in Appendix C.

6.2.1.1 Vegetation Treatment Types

6.2.1.1.1 Wildland-Urban Interface

The wildland-urban interface (WUI) is the geographic area where wildlands and development intersect or intermix, presenting significant fire hazard risks and a complex fire environment. When wildfires occur in WUI areas, firefighting and emergency response efforts are primarily focused on protecting human life and property. WUI fuel reduction generally consists of strategic reduction and removal of vegetation to reduce fuel loads and prevent or slow the spread of wildfire between structures and wildlands, and vice versa. WUI fuel reduction treatments also provide emergency access points and staging areas for firefighters and equipment and reduce flammable vegetation near emergency evacuation routes. Additionally, WUI fuel reduction treatments may serve to enhance habitat quality in areas where existing habitat is degraded, such as by removal of invasive plant species (additional treatments that improve habitat quality are discussed in Section 6.2.1.1.3, Ecological Restoration).

WUI fuel reduction treatments serve as one component of wildfire risk reduction efforts occurring in the WUI. Fuel reduction is also part of the requirements of WUI building codes (e.g., California Building Code Chapter 7A), defensible space (e.g., PRC Section 4291, Santa Barbara County Code Chapter 15), and other structure hardening and fire safe development requirements. Defensible space is an effective means of reducing the risk of loss of life and property due to wildfire in the WUI. Defensible space works to achieve four objectives: reduce the risk of direct flame contact with a structure, reduce the overall fire intensity and rate of spread near a structure, remove ember sources and provide a space for embers to fall to the ground before reaching the structure, and provide an area for firefighters to safely engage with the fire and provide access to structures. A defensible space zone that is around the entire structure has been proven to be effective for achieving these objectives (Syphard et. al. 2014). Conversely the lack of defensible space within 30 feet of a structure has been shown to be a key factor in structure ignition during wildfires (Troy 2020).

WUI fuel reduction treatments for the Plan Area are anticipated to occur within the space between structures and wildlands or other areas of non-maintained vegetation. The size of the treatment area (distance from structure) would be dictated by the most currently applicable codes and standards in place for the adjacent structures (PRC 4291, County Code Chapter 15, or other more restrictive standard). WUI fuel reduction treatments may occur on private property or where insufficient room for required treatments exists on private

property and the treatment area extends out into other undeveloped land (e.g., neighboring undeveloped parcel). Vegetation management occurring outside of WUI areas, as defined, would be categorized as fuel breaks or ecological restoration (discussed below).

6.2.1.1.2 Fuel Breaks

Fuel breaks are typically wide strips of land where vegetation management has taken place so that wildfires burning into them can be more easily controlled. Fuel breaks are not intended to stop fire spread, especially where embers can be transported via strong winds over the fuel break, but rather to modify fire behavior and enhance firefighting capabilities. Treatments conducted in fuel breaks are intended to reduce fire intensity, slow fire progression rates, reduce flame lengths, minimize the likelihood of crown fire transition, increase fireline construction rates, and provide for points of access fire crews (CAL FIRE 2019b). Vegetation treatments in fuel breaks 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. Fuel breaks can vary in total width depending on terrain, vegetation, and proximity to developed uses, and may reach up to 300 feet (CAL FIRE 2019b). Fuel breaks in shrub-dominated vegetation types typically consist of thinning brush stands to remove dead vegetation, decrease surface fuels loading, and provide horizontal spacing between retained shrubs or shrub groupings. Fuel breaks in tree-dominated vegetation types (shaded fuel breaks) typically consist of ladder fuel removal (removal or treatment of live and dead understory trees and shrubs) to provide vertical spacing between trees and tree groupings and understory vegetation and, in some cases, selective removal of overstory trees to provide horizontal separation between retained tree canopies.

Fuel breaks can be combined with other treatment types to increase effectiveness, and should be designed considering terrain, fuel characteristics, anticipated fire behavior, and local weather conditions. 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 to 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.

6.2.1.1.3 Ecological Restoration

Ecological restoration treatments focus on restoring ecosystem processes, conditions, habitat value, and wildfire resiliency by modifying uncharacteristic fuel conditions (Fuller 2020). Such fuel conditions could exist for various reason, including a history of fire exclusion; occurrence of severe wildfire events; conversion of vegetation community types; displacement of native plant communities by invasive species; increased plant mortality due to pest or disease infestations; or other influences that contribute to deviation from historical landscape conditions, such as climate change, land use conversions, and other indirect effects (Lenihan et. al. 2008). Ecological restoration treatments would involve management actions intended to return the treatment area to more natural conditions. Wildfire is a natural occurrence in many California ecosystems and has played an important role in shaping the landscape and maintaining ecosystem processes (Pausas et. al. 2004). Ecological Restoration treatments can contribute to improving overall ecosystem health by increasing plant vigor, reducing susceptibility to pests and disease, increasing tolerance to drought and climate change effects, and reducing the threat of high-severity wildfire. Healthy ecosystems have a mosaic of successional stages, providing a diversity of wildlife habitats, and are composed of vegetation that is more resistant to pest and disease outbreaks.

Potential ecological restoration treatments in the Plan Area may include invasive species control or removal, treatments focused on managing type conversion of vegetation communities, treatments to mimic natural disturbances to control species encroachment and alter vegetation community successional stages, prescribed burning to mimic natural fire recurrence, prescribed burning to treat thatch buildup in grasslands, post-fire hazard tree removal, treatment of pest- or disease-infected vegetation, and treating ladder fuels or thinning forest stands to reduce fuel loads and return woodlands/forests to historical compositions.

6.2.1.1.4 Grazing Programs and Rangeland Management

Grazing is a vegetation treatment technique and has also been identified as an important wildfire mitigation strategy for the Plan Area. Grazing can be an effective method for reducing fine fuel loads, treating live herbaceous growth on shrubs and trees, and preventing the expansion of brush into grasslands. The Plan Area has a significant history of grazing. Current existing grazing land is concentrated primarily in the eastern portion of the Plan Area between Eagle Canyons and Cañada San Onofre, although grazing is also occurring on Hollister Ranch and the Dangermond Preserve. In some areas, previous grazing practices have ceased, resulting in the conversion of grasslands to non-native cover (e.g., mustard) or shrub cover, thereby increasing surface fuel loads.

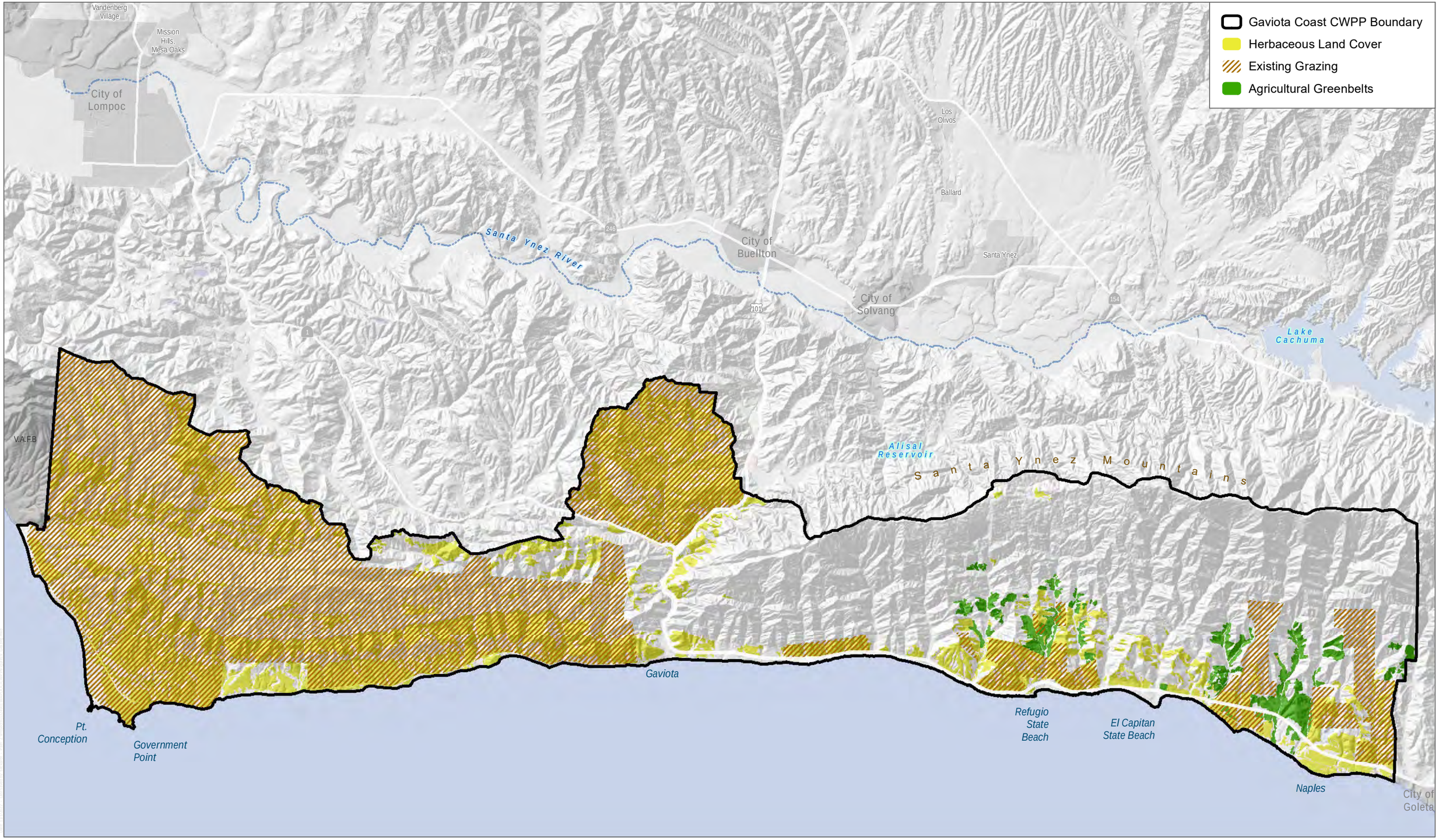
Grazing may be used as a treatment technique to reach vegetation management goals for other treatment types (WUI, fuel breaks, and ecological restoration). However, grazing programs have been identified as an overall treatment type to be applied at a broader landscape scale in the Plan Area. Grazing programs may include re-introduction of grazing practices on lands where it historically occurred but has ceased, introduction into new areas with suitable vegetative cover (e.g., grasslands), use of different livestock (goats, sheep, cattle) in existing grazing areas, and/or alterations to grazing locations or timing to meet management goals. It is important to appropriately plan and implement grazing activities to minimize potential negative effects on the landscape and enhance the benefits that grazing provides beyond surface fuel load reductions. Implementing restorative grazing practices and avoiding over grazing can benefit overall soil health (increased water holding capacity, soil organic matter, and soil fertility) and sustain longer-term grazing activities. An added benefit to this type of practice is an increase in carbon sequestration. Identification of grazing lands and planning for grazing programs would be addressed on a case-by-case basis and would also benefit from cross-boundary coordination.

An evaluation of existing grazing lands and potential opportunity areas for expansion of grazing in the Plan Area was conducted, as shown in Figure 19. Potential opportunity areas are those mapped with herbaceous (grass) vegetative cover, and existing grazing areas are those identified during CWPP development. The mapped opportunity areas are not intended to be inclusive of all potential grazing areas, and grazing may not be suitable in all mapped areas due to other land use priorities or conflicts. However, identified opportunity areas serve as a starting point for grazing program project development.

Connection to other grazing lands (existing or proposed), agricultural buffers, fuel breaks, or other developed or non-combustible land cover types (e.g., roads) can further increase the effectiveness of grazing lands in fuel load reduction and wildfire risk mitigation in the Plan Area. In many cases, connectivity of grazing activities will necessitate coordination between private and public landowners. Grazing on private lands where zoning regulations permit would not require environmental review and regulatory permits. Grazing projects conducted on public lands, or where public grant money funds grazing activities, would be subject to environmental review under CEQA and/or NEPA. The environmental review process would include mitigation measures to minimize or avoid impacts resulting from grazing activities.

SBCFSC was also recently awarded a CAL FIRE grant for the Santa Barbara South Coast Herbivory project, which proposes 3,000 acres of fuel reduction through the use of prescribed herbivory (sheep, goats) to reduce fuel loads across the south coast of Santa Barbara County. A portion of treatment falls within the Plan Area. This project is intended to reduce fuel loading to mitigate the potential for high-intensity wildfire and reduce the potential for wildfire ignitions.

Rangeland management focused on improving soil health and shifting herbaceous cover from annual grass species to perennial grass species can also provide benefits related to wildfire hazard reduction. Perennial grasses establish root systems that can alter overall soil health by improving soil physical properties such as organic matter content, aggregate stability, water infiltration, and subsoil macro-porosity (Shawver et. al. 2021). These alterations can result in increased water holding capacity of soils, allowing perennial grasses to retain moisture longer. Perennial grasses are characterized as being highly tolerant to fire and they grow in bunches, where the space between each bunch helps reduce fire spread rates (Stavi 2019). Conversely, annual grasses have a greater fine fuel load, dry out earlier than perennial-dominated communities, amount and continuity and have a more uniform and continuous growth pattern facilitating more rapid fire spread rates (Davies et. al. 2022, Ozeran 2019). Utilization of grazing can be effective in creating compositional changes in herbaceous vegetation by decreasing highly flammable invasive annual grasses and increasing perennial bunchgrasses (Davies et. al. 2022).



SOURCE: USGS, County of Santa Barbara

DUDEK

0 1 2 Miles

FIGURE 19

Plan Area Potential Grazing Opportunity Areas

Gaviota Coast Community Wildfire Protection Plan

6.2.1.2 Vegetation Treatment Standards

The vegetation management and maintenance standards presented in this CWPP are intended to reduce fire hazards by rearranging and maintaining the spatial distribution of fuels. Vegetation management for fire hazard reduction is an ongoing, cyclical process. Given the dynamic nature of vegetation, a single management prescription cannot be assigned to any location and be effective in perpetuity. Additionally, management prescriptions intended for initial treatments may differ from those intended for maintenance of the same area. Therefore, the management and maintenance standards presented herein are derived from the principles of vegetation management for fire hazard reduction and have been broken down by dominant vegetation community/land cover type (grassland/herbaceous, brush/scrub, and tree/woodland/forest). Certain vegetation community/land cover types found in the Plan Area (e.g., aquatic, developed) do not present a wildfire hazard due to high moisture levels or noncombustible conditions. Therefore, management standards have not been developed for these types of vegetation communities.

This “dynamic approach” allows the vegetation management techniques outlined herein to be selected based on the needs of each management area as conditions change over time. The management and maintenance standards outlined here are intended to modify fuel arrangements to moderate potential fire behavior. These standards have been developed to reduce fuel loads, eliminate fire ladders, disrupt the horizontal continuity of vegetation, minimize ignition potential, and prioritize the retention of fire-resistant plants.

In grass-dominated vegetation types, management is intended to reduce vegetation height (e.g., mowing, grazing), resulting in a shorter and more compact surface fuel layer that is less ignitable and less likely to sustain fire spread. Implemented beneath shrub or tree canopies, such treatments also minimize the potential for a surface to crown fire transition. Management is also intended to maintain low fuel volumes in the areas between shrub- and tree-dominated vegetation types.

In shrub-dominated vegetation types, management is intended to reduce surface fuel loading and flame lengths, and slow fire spread by increasing the horizontal spacing between retained shrubs. In areas beneath trees, management is also intended to increase the vertical spacing between shrub and tree canopies to reduce the potential for a surface to crown fire transition. Removal or treatment (e.g., chipping) of dead material from shrub-dominated types also reduces dead fuels loads, can assist in reaching spacing standards, and helps minimize the growth of highly ignitable grass/herbaceous vegetation.

In tree-dominated vegetation types, specifically oak woodlands, management is intended to remove fuel ladders by increasing the vertical spacing between surface fuels (shrubs, grasses) and tree canopies to reduce the potential for surface to crown fire transition. Creating more fire-resilient woodlands involves reducing surface fuels and ladder fuels (i.e., fuel that can facilitate fire spread from ground fuels into tree crowns). As noted by Nunamaker et. al. (2007), surface and ladder fuels should have the highest priority for management to reduce fire intensity, rate of spread, and crown fire potential. Active crown fires are initiated with torching but are ultimately sustained by the density of the overstory crowns. Reduction in potential surface fire behavior plus an increase in canopy base height minimizes torching potential (Agee and Skinner 2005). Table 22 summarizes the effects and advantages associated with fuel management in tree-dominated vegetation types.

Table 22. Principles of Fire Resistance to Tree-Dominated Vegetation Types

Principle	Effect	Advantage	Concerns
Reduce surface fuels	Reduces potential flame length	Control easier; less torching	Surface disturbance less with fire than other techniques
Increase height to live crown	Requires longer flame length to begin torching	Less torching	Opens understory; may allow surface wind to increase
Decrease crown density	Makes tree-to-tree crown fire less probable	Reduces crown fire potential	Surface wind may increase and surface fuels may be drier
Keep big trees of resistant species	Results in less mortality for same fire intensity	Generally restores historical structure	Less economical; may keep trees at risk of insect attack

Source: Agee and Skinner 2005.

6.2.1.2.1 Grassland/Herbaceous

This section outlines management and maintenance standards for grasses; other light, flashy fuels; and surface fuels capable of igniting and carrying fire. Grassland/herbaceous fuels in the Plan Area are composed primarily of annual grasslands and pasture land, but may also include other disturbed areas (e.g., along roadsides) where grasses have been established. The following management standards have been identified for grass/herbaceous fuels in treatment areas:

- Grasses and other light, flashy fuels should be treated such that heights do not exceed 3 inches. Avoid removal of the mineral soil to minimize erosion.
- Cut grass may be left on the ground surface to protect the soil as long as it does not exceed 6 inches in height.
- All dead or dying ground cover, vines, and other surface vegetation should be removed or chipped and spread on site.
- All dead twigs, branches, and limbs from overstory shrubs and/or trees should be removed or treated (e.g., chipped, piled, and burned) and spread as a ground cover (mulch) on site.
- All mulch or chipped material should be spread to a depth not to exceed 4 inches.
- All material removed from the treatment area should be properly disposed of per County standards.

6.2.1.2.2 Brush/Scrub

This section outlines management and maintenance standards for brush/scrub vegetation. Brush/scrub fuels in the Plan Area are composed primarily of chaparral and coastal scrub types. Brush/scrub vegetation is typically characterized by relatively open to dense woody shrub cover and may include some scattered trees or clusters of trees. Brush/scrub fuels may be found within other dominant vegetation types (e.g., woodlands) and should be treated to the standards outlined in this section. The following management standards have been identified for brush/scrub fuels in treatment areas:

- All dead brush/scrub should be treated.
- Removal of dead and dying growth from retained shrubs should be prioritized.
- Individual 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 8 feet in diameter. Shrub groupings should be horizontally separated from adjacent shrubs, shrub groupings, and trees by at least two times the height of the shrub crown.

- Where brush/scrub is located within the dripline of an individual tree, isolated tree, or small tree grouping, the vertical separation between the top of the shrub and the lowest tree branch should be at least three times the height of the shrub crown or 8 feet, whichever is greater.
- Individual, isolated, undesirable trees located within brush/scrub stands should be prioritized for removal (SBC Fire 2022i).
- Where treatment occurs in chaparral, chamise (*Adenostoma fasciculatum*) and big pod ceanothus (*Ceanothus megacarpus*) should be prioritized for treatment.
- Manzanita shrubs (*Manzanita* spp.) occurring in treatment areas should be retained, where feasible.
- To minimize soil erosion potential, removed shrubs should be cut at or near the ground surface and root systems left intact.
- All vegetative material from brush/scrub removal or trimming should be removed or treated (e.g., masticated, chipped) and spread on site (or piled and burned).
- All chipped material should be spread to a depth no greater than 4 inches.
- All material removed from the treatment area should be properly disposed of per County standards.
- When brush/scrub removal is necessary to achieve the spacing standards outlined above, removal of undesirable plants should be prioritized over desirable plants.

6.2.1.2.3 Tree/Woodland/Forest

This section outlines management and maintenance standards for tree-dominated vegetation types. Tree/woodland/forest fuels in the Plan Area are primarily composed of oak woodlands, although smaller occurrences of other hardwood and conifer types are present. Tree-dominated vegetation in the Plan Area varies from relatively open tree stands to dense stands with relatively closed canopy cover. Tree/woodland types may also include scattered shrubs or shrub groupings, small patches of grass/herbaceous vegetation, or shrub and grass herbaceous vegetation occurring beneath tree canopies, although trees are the dominant cover type. The general management standards outlined below apply to oak woodlands and other hardwood stands where canopy retention is an overall goal. The shade of the retained canopy helps reduce the potential for rapid re-growth of surface vegetation and can reduce erosion. The following management standards have been identified for tree/woodland/forest fuels in treatment areas:

- Dead, dying, and undesirable trees should be removed or treated.
- Coast live oak trees measuring 8 inches and greater in trunk diameter (as measured at 4 feet, 6 inches above grade) should not be removed.
- Portions of tree crowns above roads should be pruned to maintain 13.5 feet of vertical clearance above the road surface.
- Retention of other healthy native understory components (e.g., toyon) should be prioritized, as long as they do not create fire ladders.
- Trees should be pruned to remove limbs located closer than 6 feet above the ground surface.
- Where a brush/scrub is located within the dripline of a tree, the vertical separation between the top of the retained shrubs and the lowest tree branch should be at least three times the height of the retained shrub crown or 8 feet, whichever is greater.

- Pruned oak limbs should be clean cut using the best industry standard practices.
- All chipped material should be spread to a depth no greater than 4 inches. Chip piles should be kept at least 5 feet from oak tree trunks.
- Cut (lop and scatter) vegetation should be treated such that it does not exceed 12 inches in depth.
- To minimize soil erosion potential, stumps from removed trees should be left intact, with stump heights not exceeding 6 inches (as measured from the uphill side).
- Native vegetative material from tree removal or trimming should be removed or treated (e.g., chipped) and spread on site. Where necessary for erosion control, logs no smaller than 8 inches in diameter (small end) may be retained on the soil surface.
- All material removed from the site should be properly disposed of per County standards.

6.2.1.3 Vegetation Management Techniques

Vegetation management for fire hazard mitigation is the practice of thinning, pruning, removing, or otherwise altering vegetation to reduce the potential for ignitions and modify fire behavior. Different vegetation management techniques can be used, depending on vegetation type, location, condition, and configuration. Given the dynamic nature of vegetation, a single treatment technique or management prescription may not be appropriate for one site over time. Therefore, an adaptive approach that allows for the selection of appropriate management techniques is needed to achieve management goals. Selection of vegetation management techniques, or combinations thereof, will be determined by site-specific conditions during the project planning process. In general, vegetation management techniques can be classified into five categories:

- Biological (Grazing)
- Hand Labor
- Mechanical
- Prescribed Fire
- Chemical

Appendix D describes these vegetation management techniques in more detail and identifies best management practices to minimize or avoid resource impacts. It is anticipated that environmental review will be necessary prior to implementation of vegetation management projects. Additionally, selection of qualified and trained contractors, training of personnel, scheduling, and supervision to carry out vegetation management treatments and any associated best management practices are also key components of an effective vegetation management project.

6.2.1.4 Vegetation Management Project Prioritization

Potential vegetation management projects were identified during development of the wildfire hazard assessment, as well as by community members and stakeholders during Development Team meetings, agency meetings, public workshops, and field meetings. Vegetation management projects were prioritized by evaluating their locations relative to the fire hazard layers developed and evaluated for this CWPP (integrated hazard, SDI, ignition history, fire history, vegetation age) and through direct feedback on community priorities. A prioritized list of vegetation management projects is provided in Appendix C. It is intended that this prioritized list will be reviewed and updated routinely by SBCFSC. A geodatabase including GIS mapping data for prioritized projects is kept on file with SBC Fire, GIS Section.

6.2.2 Structural Ignitability

Terrain, vegetation, and climatic conditions in the Plan Area combine to create a unique situation capable of supporting large-scale, high-intensity, and sometimes damaging wildfires. There are two main components to reducing structural ignitability: vegetation management and structural hardening. The main way in which structures ignite is via direct fire exposure (flame impingement, convection, radiation) or via ember exposure (Maranghides et. al. 2022). To reduce structural ignitability, efforts need to address direct fire and ember exposure (Maranghides et. al. 2022). Addressing structural ignition potential is an effective mitigation strategy for preventing wildfires and increasing WUI ignition resistance (Zhou 2013). Research has found that structural characteristics, especially roofing, play a significant role in reducing structural vulnerability to fire and the likelihood of burning (Gorte and Bracmort 2012; Kolden and Henson 2019; Manzello et. al. 2011; Syphard et. al. 2017; Zhou 2013). Further, reducing a structure's likelihood of ignitions reduces the risk for individual homeowners and the risk associated with fire spreading to other homes and wildland areas (Mockrin et. al. 2020). Reducing fire exposure is achieved via vegetation management in defensible space areas. The following five zones are identified for defensible space areas. Recommendations for management actions that can be taken by homeowners in each of these zones can be found on SBCFSC's website at https://sbfiresafecouncil.org/get-ready/. In addition, SBCFSC conducts free home evaluations to help the community understand the contribution of embers and direct flame impingement to structure ignition risk.

- **Zone 0 (0–5 feet):** Zone Zero, sometimes referred to as the "Immediate Zone," is the area nearest the house and includes the surfaces of the structure itself, plants, decks, and outdoor furniture. Ideally, there should be zero combustibles in this zone. This area is the most vulnerable and should be more aggressively maintained to be fire resistant.
- **Zone 1 (5–30 feet):** Zone 1, sometimes referred to as the "Intermediate Zone," extends from the house's exterior walls to a distance of 30 feet. Management actions include a combination of landscaping and hardscaping, with the goal of moderating fire behavior.
- **Zone 2 (30–100 feet):** Zone 2, sometimes referred to as the "Extended Zone," extends from 30 feet to at least 100 feet. More defensible space may be required depending on site-specific characteristics such as topography, building construction, and vegetation types, or within certain areas of Santa Barbara County.
- **Zone 3 (0–10 feet along access routes):** Zone 3, the "access zone," extends from 0 feet to at least 10 feet horizontally from the edge of roads and driveways and includes 13 feet, 6 inches of overhead clearance. Property owners are responsible for vegetation adjacent to roads and driveways. Properly maintained access routes are critical for emergency evacuations and first responder access.
- **Zone 4 (100+ feet):** If defensible space treatments are necessary beyond 100 feet (following site-specific inspection and authorization from SBC Fire), coordination with neighboring landowners may be necessary. Management actions in Zone 4 would be similar to Zone 2.

Vegetation management and defensible space are key components to an overall fire protection strategy; however, structural hardening also plays an important role in minimizing the potential for structure ignitions. Structural hardening refers to steps a property owner may take to enhance the survivability of an existing structure that may not be up to the current building or residential code standards for wildland areas. Homes survive wildfires through a combination of vegetation management and maintenance, management of combustible materials on the property, and installation and maintenance of fire- and ember-resistant construction materials. Hardening of the homes and other structures to enhance survivability during a wildfire would include retrofitting the most vulnerable home features, including the following:

- Roofs
- Vents
- Eaves and soffits
- Windows

- Walls
- Decks
- Rain gutters
- Patio covers
- Chimneys
- Garages
- Fences
- Driveway and access roads
- Address signage
- Water supply

Although fire-resistant construction standards are mandatory for new buildings in the Plan Area, hardening of existing structures is voluntary. Adopting mandatory home hardening provisions of building and fire codes is problematic because existing, nonconforming structures were typically approved and built to the codes in effect at the time of construction. The problem persists, however, that a burning structure in a wildfire contributes to the fire and presents a danger to nearby structures through radiant heat exposure and other structures downwind by way of embers. Retrofits to existing structures can reduce fire risk, and some cost-sharing and grant programs are available to offset costs. Resources for hardening structures can be found on the following websites:

- Wildfire Home Retrofit Guide
- Protect Your Property from Wildfire
- Prepare for Wildfire
- Low Cost Retrofit List
- Preparing Your Home

In addition to the resources above, the following actions are recommended to address structural ignitability in the Plan Area:

- Evaluate opportunities for engaging Plan Area residents and landowners in structural retrofit programs.
- Encourage structural retrofits for Plan Area structures through evaluations, community education, and grant funding opportunities.

6.2.3 Community Outreach and Education

Community outreach and education is an important component in community wildfire hazard reduction efforts. Such efforts increase the community's knowledge and awareness of wildland fire, can assist in prevention and preparedness efforts, and are an important component in planning and implementing vegetation management projects. The SBCFSC sponsors ongoing fire prevention and public education and outreach programs countywide and supports and promotes Firewise activities by educating the community in ways to reduce structural ignitibility. The SBCFSC is currently engaged in active public outreach through a variety of programs and provides valuable resources through its website at https://sbfiresafecouncil.org/.

The following programs are currently active in Santa Barbara County to address wildfire risk and community engagement:

- **"Ready! Set! Go!"** – SBC Fire has adopted the "Ready! Set! Go!" Wildfire Action Plan through the Santa Barbara County Ready Program (https://readysbc.org/). "Ready! Set! Go!" was designed to provide the community with information about creating defensible space around homes, retrofitting homes with fire-resistive materials, and preparing the community to safely evacuate well ahead of a wildfire. The "Ready! Set! Go!" Action Plan provides a three-step process that teaches homeowners to create their own action plan of preparedness, have situational awareness, and leave early in the event of a fire. A copy of the "Ready! Set! Go!" Action Plan can be found at https://www.sbcfire.com/ready-set-go/.

- **Defensible Space Program** – SBC Fire administers the County's Defensible Space Program, as outlined in PRC Section 4291. The Defensible Space Program addresses defensible space zones, general guidelines for creating and maintaining defensible space, the County's Hazard Reduction Program, structural hardening, defensible space inspections, and fire-resistive landscaping. The Defensible Space Program also allows residents to request a defensible space inspection. More information about SBC Fire's Defensible Space Program can be found at https://www.sbcfire.com/defensible-space-program.
- **SBCFSC Wildfire Preparedness Evaluations** – Wildfire Preparedness Evaluations are a free and voluntary review of the vulnerability of a house and landscape to wildfire and ember-ignition conducted by SBCFSC staff. The assessment includes a review of defensible space and home hardening principles and makes specific recommendations based on the property evaluated. The evaluation also addresses evacuation preparedness. This is not a regulatory program, rather a community outreach and education program offered by the SBCFSC. More information can be found at: https://sbfiresafecouncil.org/evaluation/.
- **Community Emergency Response Team** – The Community Emergency Response Team (CERT) educates people about disaster preparedness for hazards that may impact their area, and trains people in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. Using the training learned in the classroom and during exercises, CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help. CERT members also are encouraged to support emergency response agencies by taking a more active role in emergency preparedness projects in their community. More information on the CERT program managed by SBC Fire can be found at https://www.sbcfire.com/community-emergency-response-team-cert.
- **Red Flag Warnings** – A Red Flag Warning means that critical fire weather conditions are either occurring now or will shortly. A combination of strong winds, low relative humidity, and warm temperatures can create extreme fire behavior. The National Weather Service provides daily fire weather forecasts in close coordination with local fire agencies. The Red Flag Warning Program enables firefighting agencies to manage critical resources and prepare appropriate suppression responses for protecting life and property. Red Flag Warnings are typically issued within 24 hours of an impending critical fire weather event. Residents can sign up for Red Flag Warning text alerts by texting the word "redflag" to 888777. More information about Red Flag Warnings and fire weather in Santa Barbara County can be found at https://www.sbcfire.com/red-flag-warnings.
- **Aware and Prepare Notification System** – The Aware and Prepare Notification System is an emergency notification system that allows the County to alert individuals of existing or potential emergencies. Through Aware and Prepare, the County can alert individuals by landline, cell phone, and email. Individuals can register for emergency alerts at https://readysbc.org/.
- **Santa Barbara Equine Assistance and Evacuation Team –** This team serves members of the community who own or stable large animals and are adversely affected or displaced by fire and other emergency disaster incidents. Upon notification of disaster and need for large animal evacuation, the team establishes a mobile command center at a designated site and prepares for the intake and sheltering of large animals. More information about this team can be found at https://www.sbequineevac.org/.
- **Santa Barbara County Animal Services** – This department, in cooperation with the Santa Barbara Humane Society and other local non-profits, functions as part of the SBC Fire's emergency response system in case of wildfires. More information about the department and its services can be found at https://countyofsb.org/phd/animal/aboutus.sbc. Information related to disaster planning for pets can be found at https://countyofsb.org/uploadedFiles/phd/PROGRAMS/Animal/DisasterPlanningForPets.pdf.

- **Community Alert Radio Program** – The Community Alert radio program broadcasts on Tuesdays (11 am and 9 pm), Wednesdays (5 am), and Saturday (1 pm) on KZSB-AM 1290. More information can be found at: https://sbfiresafecouncil.org/community-alert/.

In addition to the above listed programs, the following specific actions are recommended to address community outreach and education in the Plan Area:

- Continue to coordinate with and seek resources through the Regional Wildfire Mitigation Program to engage Gaviota Coast communities in the NFPA Firewise USA program.
- Support the goal of the Regional Wildfire Mitigation Program to engage Gaviota Coast communities in the NFPA Firewise USA program.
- Work to increase the number of properties inspected in the Plan Area annually under SBC Fire's Defensible Space Program.
- Install signage along the lower portion of Farren Road and Refugio Road and along Jalama Road to notify the public that the area is a High Fire Hazard area. Include information about parking restrictions, maintaining access for residents, and best practices for reducing ignition potential.
- Identify key locations and coordinate with appropriate agencies (Caltrans, Santa Barbara County, DPR, USFS) to install signage to notify the public of the area's high fire hazard.
- Develop wildfire awareness materials (e.g., handouts, signage, QR codes) for display and/or distribution at recreation areas (e.g., State Parks, County Parks, trailheads, USFS recreation areas) to increase non-resident awareness of wildfire hazard in the Plan Area.
- Work with camps, recreational facilities, and other guest-oriented businesses to develop evacuation preplans and preparedness for wildfire.
- Work with communities, landowners, and individuals to get the message across that reducing wildland fire threat requires personal responsibility for preparedness, evacuation, defensible space, driveway and roadway maintenance, and community cooperation.
- Conduct outreach specific to marginalized and vulnerable communities (frontline populations and communities) to provide education regarding wildfire hazards, emergency communications, and evacuation procedures in the Plan Area. Outreach should address emergency notifications, materials, training and communications for non-English speakers, social networks, and community advisory councils and should engage local leaders where possible.
- Conduct outreach with the agricultural community to encourage enrollment in the County's Ag Pass program.
- Conduct outreach with the real estate community to address Assembly Bill 38 requirements associated with wildfire-related real estate disclosures and to coordinate delivery of the Fire Resistive Landscaping and Defensible Space Guidelines and home hardening documents to home buyers in the Plan Area.
- Support collaborative vegetation management projects across ownership boundaries that reduce fire hazard and protect natural and agricultural resources.
- Coordinate with stakeholders (SBC Fire, USFS, DPR, County of Santa Barbara, The Nature Conservancy, Santa Barbara Land Trust, Hollister Ranch, and others) to facilitate information and data sharing, resource sharing, coordination of management activities, property access, grant funding, and cost-sharing opportunities.
- Post the CWPP, updates, and specific project descriptions on the SBCFSC website.
- Conduct public outreach/education in communities where vegetation management projects are proposed prior to initiation of work.

6.2.4 Access and Evacuation

The Plan Area presents unique challenges for evacuation due to terrain, limited radio and cellular communication capabilities, narrow/winding road networks, locked gates, non-maintained roads, the distribution of residences, the non-resident population (e.g., hikers, campers), and the presence of livestock and other animals. Agricultural and ranch roads and infrastructure can be an asset during fire suppression efforts because landowners and managers are familiar with resource availability and access constraints. Given the size of the Plan Area and its large expanses of undeveloped land, fire agency access is also a critical component of fire risk reduction. Providing and maintaining road access across ownerships can help facilitate fire suppression efforts during wildfire events and support pre-fire mitigation activities. Finally, controlling public access in strategic areas, and at strategic times (e.g., during Red Flag Warnings), can minimize wildfire ignition potential.

The following summarizes different components of wildfire evacuation in the Plan Area:

- The Santa Barbara County Sheriff's Department (SBC Sheriff) is responsible for alerting and warning the public, coordinating evacuations, enforcing laws and emergency orders, establishing safe traffic routes, ensuring that security is provided at incident facilities, ensuring access control to damaged areas, ordering and coordinating appropriate mutual aid resources, and assuming responsibility for the coroner function. SBC Sheriff has the sole jurisdictional authority to order and lift evacuation notices within the Plan Area.
- The County's Reverse 911 system is also managed by SBC Sheriff. In the event of an emergency, an operator can identify the affected community or region of Santa Barbara County and record a message that describes the emergency situation. The Reverse 911 system automatically calls listed and unlisted telephone numbers within the affected area and delivers the recorded message. Additionally, through Aware and Prepare, the County can alert individuals by landline, cell phone, and email. Individuals can register for emergency alerts at https://readysbc.org/.
- SBC Sheriff communicates the need for evacuation to the public using various communication methods, including Reverse 911, Aware and Prepare Alerts, the Emergency Alert System (EAS) supported by the National Weather Service broadcast, radio and television announcements, public address systems and announcements from emergency responders, door-to-door notifications, and social media.
- SBC Sheriff and SBC Fire have an Incident Evacuation Plan and Incident Re-Entry Plan that assist law enforcement and fire department personnel in the implementation of evacuation plans. These plans guide agencies in the decision-making process for evacuation and re-entry of residents, and small and large animals. Evacuation levels defined in the existing plan are as follows:
  - Evacuation Order – Movement of community members out of a defined area due to an immediate threat to life and property from an emergency incident. An Evacuation Order should be used when there is a potential or actual threat to civilian life within 1 to 2 hours.
  - Evacuation Warning – Alerting residents in a defined area of a potential threat to life and property from an emergency incident. An Evacuation Warning may be issued when the potential or actual threat to civilian life is more than 2 hours away.
  - Shelter in Place – Directs residents to stay secured inside their current location. This direction is only used if the safety of the citizens can be assured if they remain or if an evacuation will cause a higher potential for loss of life.
  - Safe Refuge Area – A temporary safe location to hold evacuees until evacuation routes are open.

- Levels of closure to areas when evacuation occurs are as follows:
  - Level 1 Closure – Closed to all traffic except local residents; this level may require escorts.
  - Level 2 Closure – Closed to all traffic except fire suppression resources, law enforcement, and critical incident resources (e.g., utility companies, Caltrans, Santa Barbara County Public Works, Transportation Division).
  - Level 3 Closure – Closed to all traffic except fire suppression resources and law enforcement.
  - Level 4 Closure – Closed to all traffic, including fire suppression resources and law enforcement.
- The County's Ag Pass program provides a uniform way to identify vetted commercial farm and ranch owner operators and their employees to firefighting personnel, California Highway Patrol officers, Sheriff's deputies and other law enforcement officers, and other emergency personnel. An Ag Pass allows for limited emergency access during a wildfire event to protect or care for agricultural assets and/or provide support information to emergency personnel. Ag Pass cards are applied for by and distributed to eligible agriculturalists before a disaster. More information on the program can be found at https://sbfiresafecouncil.org/ag-pass-program/ and https://www.countyofsb.org/293/Ag-Pass.
- Evacuation preparedness and planning should follow the process of developing an Action Plan under the County's Ready! Set! Go! Program. A copy of the Ready! Set! Go! Action Plan can be found at https://www.sbcfire.com/ready-set-go/. Information regarding large animal evacuation can be found at https://www.sbequineevac.org/.
- Re-entering an evacuated area requires as much forethought and planning as an evacuation order. The safety of residents and emergency responders is of the utmost concern and must drive the decision of when to repopulate. SBC Fire and SBC Sheriff determine when it is safe for residents, pets, and large animals to move back into an area.

The following actions are recommended to address access and evacuation in the Plan Area:

- Conduct outreach to landowners in the Plan Area to encourage enrollment in the County's Ag Pass program.
- Facilitate emergency vehicle access and evaluate the need for road maintenance on private and public lands that can be conducted though SBC Fire's Fire Access Road program. Coordinate with SBC Fire to establish road maintenance agreements with willing landowners and land managers.
- Coordinate with County Public Works regarding the timing and treatment width for vegetation treatment along Jalama Road through the Plan Area.
- Facilitate information sharing to responding fire agency personnel who may be from out of the area.
- Evaluate opportunities for installing and maintaining fire boxes at entry gates to communities. Fire boxes could include hard copy maps, other pertinent community data or information, and scannable QR codes for access to digital maps and community information. Boxes should be secured with a Knox Key.
- Coordinate and establish an evacuation route from Hollister Ranch to the west through adjacent land (Surfing Cowboy Ranch and Dangermond Preserve). Practice evacuation through this area and develop a simple plan for communications with neighboring landowners to facilitate egress during an emergency.
- Manage access to Camino Cielo during Red Flag Warnings, or other high fire hazard periods, to minimize ignition potential.
- Work with SBC Fire to evaluate opportunities for creating designated fallback zones where the potential exists for road blockage due to wildfire, flood, downed trees, and other emergencies. These fallback zones could be used as temporary staging areas until obstructions are cleared and it is safe to evacuate.
- Work with SBC Fire to evaluate the need for additional helispots (identified in pre-attack plans).

- Evaluate opportunities for upgrading Refugio Road to the minimum standards outlined in Title 14 of the California Code of Regulations (14 CCR) or reaching similar practical effect through the installation of turnouts, guard rails, wider radius switchbacks, and bridges to replace the Arizona and culvert creek crossings. Also include road improvements sufficient to facilitate emergency resident access/egress from the upper portion of Refugio Road down the north side of the Santa Ynez Mountains to Santa Ynez.
- Work with the County to maintain and improve the road system on the Baron Ranch property. Make roads passable by a Type 3 engine from the entrance to the existing upper road intersection and provide an adequate turnaround at the intersection.
- Establish an agreement between Hollister Ranch and the Dangermond Preserve to repair and maintain the ridgeline road that connects the two properties to facilitate fire agency access. Gates at the property line should have a KnoxBox for emergency access purposes.
- Collaborate with SBC Sheriff and California Highway Patrol on evacuation planning for the Plan Area.
- Develop a coordinated evacuation plan for the Plan Area.
- Encourage community members to practice evacuation at least annually.
- Sign existing Wildfire Management Plans to establish Local Operating Agreements (DPR).

6.2.5 Funding

Funding is critical to implementing projects identified in this CWPP. SBCFSC, in coordination with SBC Fire and Plan Area landowners, has been successful in securing numerous grant funds in the past. Development of funding sources and incentive programs for landowners, land managers, and residents of the Plan Area can encourage reduction of wildfire hazards and risks. The following provides information on potential project funding opportunities:

- **California Department of Forestry and Fire Protection (CAL FIRE):** CAL FIRE provides grant funding for various project types, including Forest Health, Wildfire Prevention, and Wildfire Resilience projects. Eligible project types under these grant programs include fuels management, fire reintroduction, treatment of degraded areas, conservation of forests, hazardous fuels reduction, wildfire prevention planning, and wildfire prevention education. More information regarding CAL FIRE grants can be found at https://www.fire.ca.gov/grants/.
- **Environmental Quality Incentives Program (EQIP):** A cost-share program for working landscapes that can address wildfire preparation or damage, including fuel reduction, reforestation, soil erosion control, and water quality protection, often on parcels 1 acre or more or smaller parcels with natural resource concerns. Neighbors can collaborate to meet acreage requirements. Information regarding EQIP can be found at https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/.
- **Catastrophic Fire Recovery EQIP Fund Pool:** A cost-share program for working landscapes that can addresses fire recovery. Fire recovery may be cost-shared up to 90%, often on parcels 1 acre or more or smaller parcels with natural resource concerns. Neighbors can collaborate to meet acreage requirements. More information can be found at https://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/programs/financial/eqip/?cid=stelprdb1247015.
- **California Healthy Soils Program:** The Healthy Soils Program stems from the California Healthy Soils Initiative, a collaboration of state agencies and departments to promote the development of healthy soils on California's farmlands and ranchlands. Covered management practices include but are not limited to cover cropping, no-till, reduced-till, mulching, compost application, and conservation plantings. More information can be found at: https://www.cdfa.ca.gov/oefi/healthysoils/

- **State Fire Assistance Grants:** Program to support fire risk reduction activities by landowners and residents in at-risk communities to restore and maintain resilient landscapes and create fire-adapted communities. Projects may include fuel hazard mitigation (chipping, thinning, burning, or grazing), community hazard mitigation planning (CWPPs, Firewise assessments, hazard assessments, and similar types of planning activities), prevention, mitigation, and education (outreach, mailings, workshops, events, project-specific analysis, and other educational programs). More information regarding State Fire Assistance Grants can be found at https://cafiresafecouncil.org/grants-and-funding/2022-sfa-grant-opportunity/.
- **California Wildfire Mitigation Program:** This program, developed by the California Governor's Office of Emergency Services and CAL FIRE, institutes a home hardening initiative to retrofit, harden, and create defensible space for homes at high risk to wildfires, focusing on high socially vulnerability communities and providing financial assistance for low- and moderate-income households. This project is in its pilot phase and currently operating only in San Diego, Shasta, and Lake Counties. More information can be found at https://www.caloes.ca.gov/cal-oes-divisions/recovery/disaster-mitigation-technical-support/california-wildfire-mitigation-program.
- **Coastal Conservancy Wildfire Resilience Program:** This program funds on-the-ground activities to restore the health and increase resilience of California forests, grasslands, and natural lands to wildfire, and for planning and capacity building to increase wildfire resilience. More information regarding Coastal Conservancy grants can be found at https://scc.ca.gov/2021/12/03/rfp-for-wildfire-resilience-projects-announced/.
- **County Coordinators Grant:** The objective of the County Coordinators Grant is to educate, encourage, and develop countywide collaboration and coordination among various wildfire mitigation groups operating within counties containing State Responsibility Area (SRA) lands. Grants to be used to cover administrative costs relevant to countywide coordination efforts (salary, support, and administrative costs) for a designated County Coordinator. More information regarding County Coordinator Grants can be found at https://cafiresafecouncil.org/grants-and-funding/2021-county-coordinators-grant-opportunity/.
- **County Evacuation Route Grant:** For completing wildfire evacuation route projects, including evacuation route planning, implementation, public education, construction, signage, maintenance, and related activities. More information regarding County Evacuation Route Grants can be found at https://cafiresafecouncil.org/2021-county-evacuation-route-grant-opportunity/.
- **United States Department of Agriculture (USDA) Community Wildfire Defense Grants:** Community Wildfire Defense Grants are intended to help at-risk local communities and Tribes plan and reduce the risk against wildfire. The program prioritizes at-risk communities in an area identified as having high or very high wildfire hazard potential, are low-income, and/or have been impacted by a severe disaster. Grants assist WUI communities restore and maintain landscapes, create fire adapted communities, and improve wildfire response. More information regarding Community Wildfire Defense Grants can be found at: https://www.fs.usda.gov/managing-land/fire/grants.
- **Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grants:** FEMA's hazard mitigation assistance provides funding for eligible mitigation measures that reduce disaster losses. The following programs are applicable to wildfire:
  - **Hazard Mitigation Grant Program (HMGP):** Provides funding to state, local, tribal, and territorial governments to implement hazard mitigation projects. Eligible projects include creation of defensible space, application of ignition-resistant and/or non-combustible materials on new and existing homes, and treatment of hazardous fuels proximate to at-risk structures. More information regarding FEMA's Hazard Mitigation Grant Program can be found at https://www.fema.gov/grants/mitigation/hazard-mitigation.

- **Hazard Mitigation Grant Program Post-Fire Grant:** Post-fire assistance to help communities implement hazard mitigation measures after wildfire disasters. Eligible projects include wildfire mitigation (e.g., removal of burned trees), infrastructure retrofits (e.g., water system repairs), soil/slope stabilization, and post-fire flood prevention/sediment reduction. More information regarding FEMA's Hazard Mitigation Grant Program Post-Fire Grants can be found at https://www.fema.gov/grants/mitigation/post-fire.
- **Building Resilient Infrastructure and Communities (BRIC) Grants:** Support states, local communities, tribes, and territories in hazard mitigation projects to reduce the risks faced from disasters and natural hazards. A wide variety of projects are eligible for Building Resilient Infrastructure and Communities Grant funding. More information regarding these grants can be found at https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities.

The following actions are recommended to address funding in the Plan Area:

- Research grant funding opportunities for wildfire projects and apply for appropriate grants or cost-share programs. Wildfire projects may include those associated with vegetation management, structural retrofits (structural hardening), planning, and community education or engagement.
- Research grant funding opportunities for land management and/or agricultural programs or projects that encourage land stewardship and maintenance/management of Plan Area vegetation (fuel loads) and agricultural infrastructure (roads, water supply).
- Pursue efforts to get Plan Area communities on California's Fire Risk Reduction Communities List to be prioritized for CAL FIRE Fire Prevention Grant Funding.
- Coordinate with and support grant funding efforts for structural hardening projects in the Plan Area.
- Coordinate with and support landowners in applying for grant funding for vegetation management and other wildfire risk reduction projects in the Plan Area.
- Partner with universities and research institutions to support or conduct wildfire-related projects or research that would benefit the Plan Area.
- Evaluate opportunities for subsidies for property owners to complete and maintain defensible space vegetation management work.

6.2.6 Infrastructure and Communications

Infrastructure in the Plan Area is a critical component supporting communications, planning, and evacuation needs. The Plan Area presents unique challenges for communications during evacuations due to terrain and limited radio and cellular communication capabilities. Many Plan Area residents rely on landline phones, which can be compromised during a fire, as seen during the 2021 Alisal Fire when phone lines burned. Increasing Plan Area communication capabilities between fire/emergency response agencies and community members, and among fire agencies during wildfire events can benefit the community. Other communications infrastructure in the Plan Area serves the greater Santa Barbara County and South Coast region (wildfire cameras, TV and radio towers, Federal Aviation Administration beacon) and is threatened by wildfire. RAWS provide critical fire weather data to SBC Fire, support SBC Fire's Fire Danger Rating program, and support other planning and environmental analysis efforts. Additional valuable weather and fuel moisture data could be obtained by installation and maintenance of more RAWS in the Plan Area, situated where gaps exist in their current placement.

The following actions are recommended to address infrastructure and communications in the Plan Area:

- Install a RAWS on the Hollister Ranch and one or two RAWS on the Dangermond Preserve. Coordinate RAWS placements with SBC Fire and consider the location of existing RAWS in the Plan Area. Partner with SBC Fire for RAWS maintenance.
- Evaluate opportunities for installing a fire camera along Cojo Ridge on Hollister Ranch.
- Identify and establish one to two safety zones along Cojo Ridge on Hollister Ranch. Safety Zones should be cleared areas measuring 200 feet by 200 feet. Safety Zones could be used by residents or responding fire agencies.
- Evaluate the need for firefighting infrastructure on the Baron Ranch property, to include water supply (tanks, hydrants), grading, clearance, maintenance of access roads, and Knox Boxes on access gates.
- Evaluate the need for firefighting and grazing infrastructure on the Arroyo Hondo Preserve, to include water supply (tanks, water lines, troughs), fencing for grazing operations, gates, and maintenance of access roads.
- Work with County staff to develop pre-fire plans to address defensible space, ember ignition, dust explosion risk, and evacuation at the Tajiguas Landfill/MRF.
- Due to limited radio and cellular reception in many portions of the Plan Area, explore opportunities for enhancing communications to residents prior to, during, and following wildfire events.
- Evaluate opportunities for installing water supplies/hydrants at key locations (e.g., along Highway 101) where gaps exist to facilitate supplying water to responding fire agencies during fire suppression efforts.
- Evaluate opportunities to build infrastructure to support helicopter firefighting operations, such as permanent helispots, ground fill water sources, and dip sites.

6.2.7 Post-Fire Recovery

The Plan Area has been subject to numerous large wildfires that have necessitated evacuations, impacted Plan Area road systems, reduced soil stability, and damaged infrastructure and agricultural and natural resources. Post-fire debris flows have also occurred, causing further damage and impacts downstream of the burn area. Issues associated with post-fire recovery include repair and re-opening of access roads, repairs to utilities and other infrastructure, instability of slopes, proliferation of invasive species, and the need to rebuild damaged or destroyed structures, amongst others. Additionally, given the rural nature of much of the Plan Area, establishing communications with residents and landowners can be delayed for significant periods of time after a fire. Post-fire recovery actions are difficult to complete in advance because the location and extent of a burn area is unknown, and the level of burn severity drives much of the required actions. However, some preliminary actions can be taken to minimize community impacts.

The Cachuma Resource Conservation District has compiled a valuable list of resources related to post-fire recovery, including erosion control, restoration, and post-fire flood and mudslide prevention and response. They are partnered with the Natural Resources Conservation Service who also provide post-fire disaster assistance.

The following actions are recommended to address post-fire recovery in the Plan Area:

- Develop appropriate post-fire rehabilitation guidelines for property owners and landowners that address post-fire effects of flooding and soil erosion.
- Ensure that post-fire rehabilitation guidelines are developed in cooperation with appropriate federal, state, and local agencies, including Incident Command, if applicable, and Santa Barbara County Flood Control.

- Ensure that post-fire rehabilitation guidelines focus on reducing the importation or spread of invasive species and focus on restoring native habitats where applicable.
- Work with appropriate agencies to ensure that dozer lines constructed during wildfire events are properly repaired to minimize the potential for erosion.
- Coordinate with Santa Barbara County Public Works to evaluate and identify alternative access routes for communities, or portions thereof, that may become isolated following wildfires and post-fire debris flows.

7 CWPP Authorization

The Gaviota Coast CWPP was collaboratively developed. Interested parties and local, state, and federal agencies managing land within or adjacent to the Gaviota Coast community were consulted. This document identifies and prioritizes areas for hazardous fuel reduction treatments, provides recommendations for the types and methods of treatment that will protect the at-risk communities in the Plan Area, and recommends measures to reduce the ignitability of structures within the Plan Area. This CWPP is intended to better protect the community from the threat of wildfires by promoting community-level fuel reduction projects.

The following entities mutually agree with the contents of the Gaviota Coast Community Wildfire Protection Plan:

_____

Das Williams, Chair
Santa Barbara County Board of Supervisors

DocuSigned by:
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Mark Hartwig, Fire Chief
Santa Barbara County Fire Department

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John Owens, San Luis Obispo Unit Chief
California Department of Forestry and Fire Protection

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Appendix A

Community Survey Responses

Survey Question	Total Answers	Respondent																											Written Comments
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
1. Are you a resident of the Gaviota Coast?																														
Yes	18	1			1	1	1				1	1		1	1		1	1	1			1	1	1	1	1	1		1	
No	10		1	1				1	1	1			1			1				1	1						1		
2. How long have you or your family lived on the Gaviota Coast?																														
0-1 years	0																													
1-5 years	0																													
5-10 years	4																					1	1	1	1					
10+ years	14	1			1	1	1				1	1		1	1		1	1	1							1	1		1	
Non-resident	10		1	1				1	1	1			1			1				1	1						1		
3. Which best describes your type of residency?																														
Full-time resident	12	1			1	1					1	1		1	1				1			1	1		1		1			
Seasonal resident	4			1													1	1						1						
Temporary resident	2		1										1																	
Owner of undeveloped land/lot	1															1														
Owner of agricultural or ranch land	6						1	1	1	1																1			1	
4. Which community do you identify with?																														
Farren Road	0																													
Dos Pueblos	0																													
El Capitan	0																													
Refugio	0																													
Tajiguas	0																													
Arroyo Quemada	1							1																						
Las Cruces	1																									1				
Hollister Ranch	23	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1				1	
Cojo-Jalama Ranch	1																											1		
Other	2																				1						1			
5. How concerned are you about wildfire on the Gaviota Coast?																														
Extremely concerned	18		1	1	1		1	1	1		1	1			1		1	1	1		1	1	1			1	1		1	
Very concerned	7	1				1							1	1										1	1			1		
Somewhat concerned	3									1						1				1										
Slightly concerned	0																													
Not concerned	0																													
6. How would you rate your home/property's wildfire risk?																														
High	18		1	1	1		1	1	1		1	1	1	1	1	1			1	1				1		1	1		1	
Moderate	10	1			1	1				1							1	1			1	1	1		1				
Low	1																											1		
7. How would you rate your own wildfire preparedness?																														
High	8			1		1					1	1									1		1		1		1			
Moderate	15	1	1		1				1				1	1		1	1	1	1	1		1		1		1			1	
Low	5						1	1		1					1													1		
8. My home/property is vulnerable to wildfire because (check all that apply):																														
Fuels/vegetation on my property	21		1	1	1		1			1	1	1	1		1	1	1	1	1	1		1	1	1	1	1	1		1	
Fuels/vegetation on neighboring property	15	1				1	1	1	1		1	1	1						1	1			1	1	1	1	1			
Building materials used on my home	3																			1							1	1		
My home is not properly hardened	3								1											1							1			
Poor road access	15	1				1	1	1	1		1	1	1	1	1				1			1	1	1	1					
Lack of available water	8	1					1	1			1	1	1	1														1		
Far from nearest fire station	16	1	1	1	1		1				1	1	1	1	1		1	1	1			1	1	1						
Other	3					1										1													1	downwind of hwy 1, wind
9. Have you made any upgrades to your home for fire resistance?																														
Yes	15			1	1	1					1	1		1	1		1	1				1	1	1	1	1			1	
No	11	1	1				1	1	1	1									1	1	1						1	1		
10. Have you made efforts to create/maintain defensible space around your home?																														
Yes	23	1	1	1	1	1		1	1		1	1		1	1		1	1	1	1		1	1	1	1	1	1	1	1	
No	3						1			1											1									

Survey Question	Total Answers	Respondent																											Written Comments
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
11. The biggest obstacle to making my home and property more fire safe is (best choice):																														
Time	3			1	1																								1	
Money	6									1					1				1	1		1				1				
Information/knowledge	2		1																					1						
Conditions on neighboring properties	13	1				1	1	1	1		1	1					1	1					1		1		1	1		
My home/property is currently safe	1													1																
Other	0																													
12. What are your concerns related to wildfire?																														
Structure losses	16		1	1	1	1			1		1	1		1	1	1	1	1					1	1	1			1		
Evacuation	19	1	1		1		1	1			1	1	1	1	1		1	1	1	1	1	1	1	1					1	
Smoke	7				1	1			1		1	1											1	1						
Agricultural resource damage	9	1					1	1			1	1											1	1		1	1			
Environmental damage	11			1	1		1	1		1	1	1									1		1	1		1			
Other	3																						1	1					1	
13. Which best describes your property type/land use?																														
Agricultural	7						1						1		1				1					1		1	1			
Ranching	17	1	1		1	1	1				1	1		1	1		1	1	1				1	1	1		1		1	
Open space management	9			1		1		1		1	1	1		1		1					1									
Recreation	6						1	1									1	1			1							1		
Residential	13								1	1	1	1		1	1		1	1	1	1	1	1		1						
Industry	0																													
Commercial	0																													
14. Which activities are the most important in reducing wildfire risk on the Gaviota Coast?																														
Defensible space creation/maintenance	20	1	1	1	1	1	1	1	1		1	1		1	1		1	1			1	1		1	1		1		1	
Fuel management projects on public lands	19	1	1	1			1	1	1	1	1	1					1	1	1	1	1		1			1	1	1	1	
Fuel management projects on private lands	19	1	1		1		1	1			1	1		1	1		1	1	1	1	1		1			1	1	1	1	
Road clearance and surface maintenance	14						1		1		1	1	1	1	1		1	1	1		1		1	1					1	
Community education	14	1	1				1				1	1		1		1	1	1		1	1		1	1					1	
Improved water supply	10				1		1				1	1	1	1	1		1	1											1	
Improved fire access	12						1	1			1	1		1	1		1	1	1				1	1					1	
Other	2																								1	1				
15. What types of fuel management activities do you support?																														
Defensible space	26	1	1	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	
Roadside vegetation clearance	24	1	1		1	1	1	1			1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	
Fuel breaks	20	1	1		1		1	1		1	1	1	1	1	1		1	1	1	1	1			1		1	1		1	
Invasive plant removal	19			1		1	1	1		1	1	1		1	1		1	1	1	1	1		1	1	1	1			1	
None	0																													
Other	1																										1			remove eucalyptus, not qualified to answer
16. What types of fuel management techniques do you support?																														
Prescribed fire	14	1	1	1		1	1							1			1	1	1					1		1	1	1	1	
Grazing	25	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1		1	1	1		1	1	1	1	
Mechanical/equipment treatments	19			1	1		1	1			1	1		1	1		1	1	1	1	1	1		1		1	1	1	1	
Hand treatments	21	1		1		1		1	1		1	1		1	1		1	1	1	1	1	1	1	1		1	1	1	1	
None	1																								1					
17. What are your concerns related to fuel/vegetation management?																														
Smoke	5	1			1				1														1					1		
Dust	1																						1							
Visual/aesthetic changes	7										1	1					1	1		1	1		1							
Erosion/water quality	13	1			1	1	1				1	1				1	1	1		1	1		1						1	
Biological resource impacts	16	1	1		1	1			1	1	1	1	1		1		1	1			1		1	1	1					
None	7			1				1						1					1			1				1	1			
Other	1																								1					
18. Is the current level of vegetation management on the Gaviota Coast sufficient?																														
Yes	4					1				1															1			1		
No	19	1		1	1		1	1	1		1	1	1		1		1	1	1	1		1	1			1	1		1	
Unknown/undecided	5		1											1		1					1			1						

Survey Question	Total Answers	Respondent																												Written Comments
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
19. What is the best way to distribute information regarding wildfire hazard on the Gaviota Coast?																														
Social media	21		1			1	1	1	1		1	1	1	1	1	1	1	1		1	1	1	1	1		1		1	1	
Brochures/direct mail	13	1	1	1	1	1					1	1							1	1	1	1					1		1	
Community events	16	1	1	1							1	1		1	1		1	1	1		1		1	1		1	1		1	
Newspaper	12		1		1			1			1	1	1						1		1	1		1		1			1	
Fire Department or Fire Safe Council website	18	1	1		1		1			1	1	1		1	1		1	1	1	1	1		1			1	1		1	
Radio	12		1				1		1		1	1	1				1	1	1		1					1			1	
Television	12		1		1						1	1	1			1	1	1	1		1					1			1	
Other	3					1																	1		1					Email newsletter to residents

Appendix B

IFTDSS Landscape Burn Probability Report

Report: Landscape Burn Probability
Landfire Version: LANDFIRE 2016
Landscape Name: Gaviota_LF16_Edit3 60m
Landscape Acres: 242,855
Area of Interest: gaviota_coast_cwpp_boundary

Prepared for: Scott Eckardt
5/5/2022, 11:56:28 AM

Model Parameters

Run Name: Gaviota_LF16_3_Prob

Model Type: Landscape Burn Probability

Run Date: Aug 9, 2021 1:51:44 PM

Wind Type: Gridded Winds

Wind Speed: 36 mph

Wind Direction: 343 deg

Crown Fire Method: Finney

Foliar Moisture: 100

Conditioning: On - Extreme - South Central California Foothills and Coastal Mountains

Conditioning start: , NaN/NaN/NaN

Days conditioned:

Conditioning start: 1300, 7/9/2012

Conditioning end:1600, 7/12/2012

Run resolution: 60 m

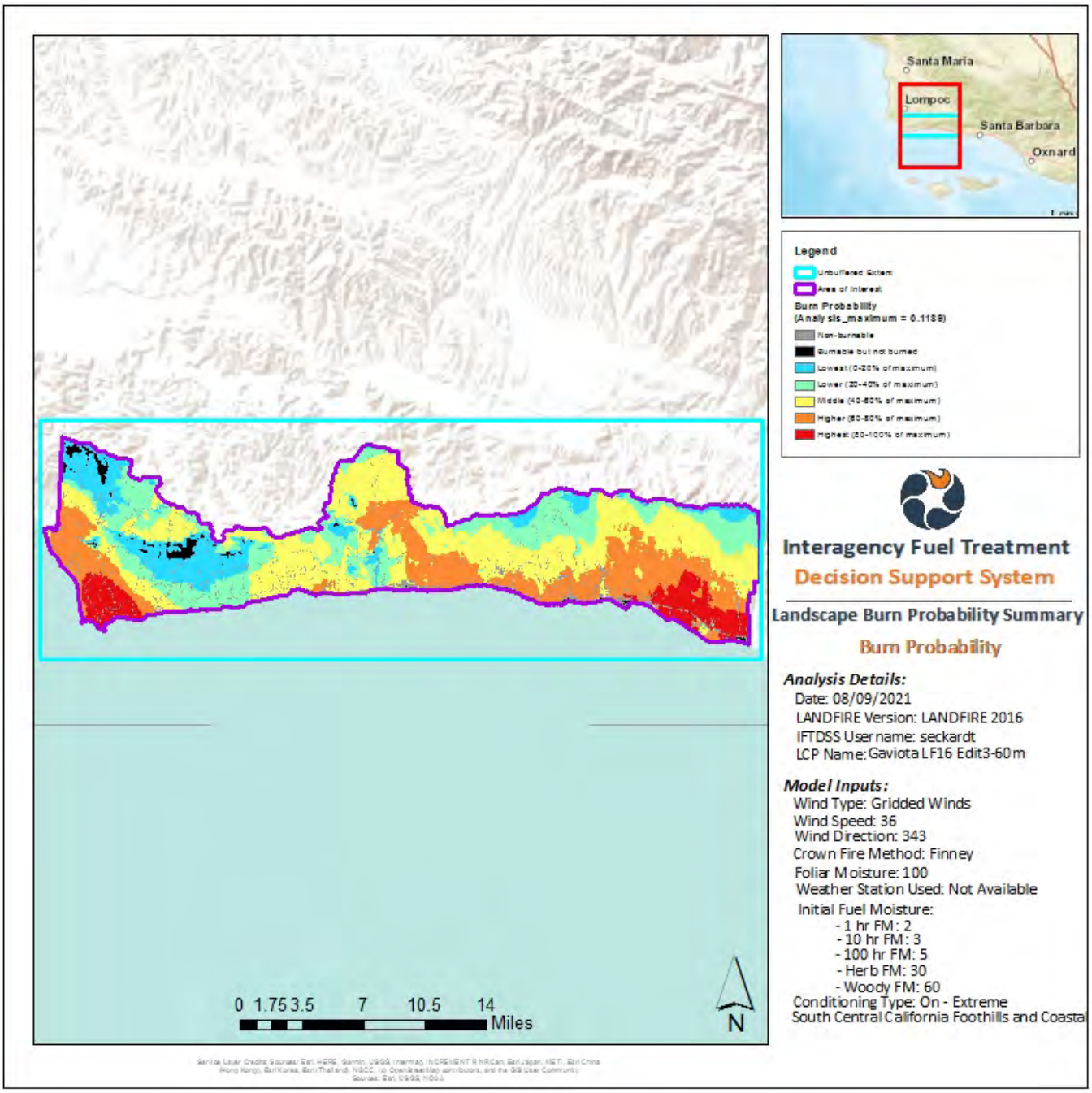
Number of fires: 1573

Burn Period: 12 hours

Spotting probability: 20%

Fuel Model	1 Hr Fuel Moisture	10 Hr Fuel Moisture	100 Hr Fuel Moisture	Live Herbaceous Fuel Moisture	Live Woody Fuel Moisture
All	2	3	5	30	60

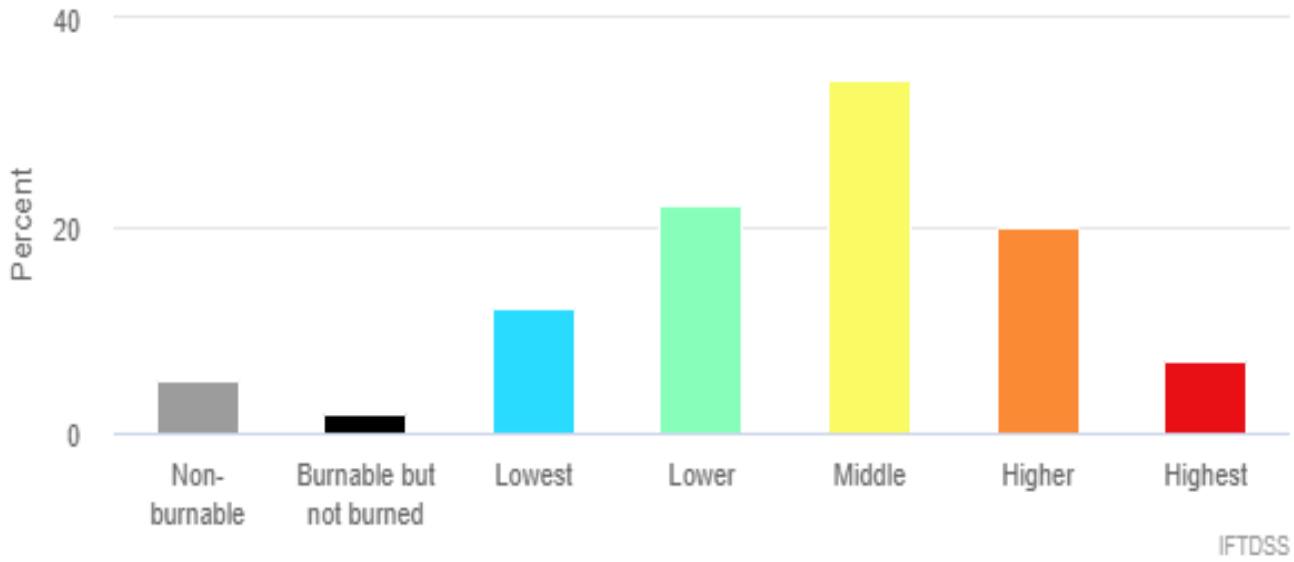
Burn Probability



Burn Probability

Burn Probability Data Summary for Area of Interest "gaviota_coast_cwpp_boundary" within "Gaviota_LF16_Edit3-60m" Landscape

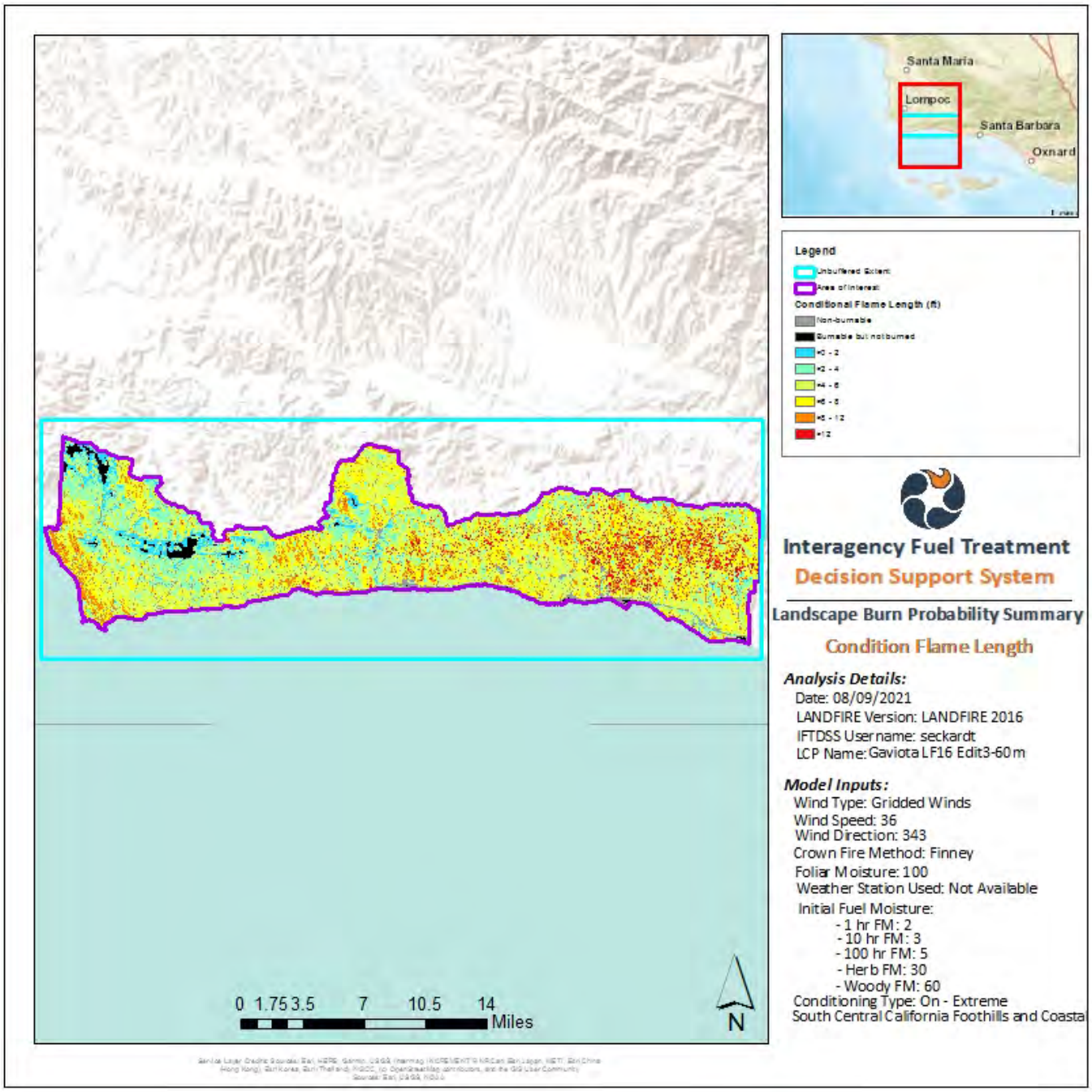
Source Landscape Name: Gaviota_LF16_Edit3-60m
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 242,855
Area of Interest Name: gaviota_coast_cwpp_boundary
Area of Interest Acres: 106,021
Model Name: Gaviota_LF16_3_Prob
Analysis Maximum Burn Probability: 0.1189



Burn Probability

Burn Probability	Pixel Count (freq)	Acres In AOI	Percent In AOI
Non-burnable	5454	4852	5
Burnable but not burned	1811	1611	2
Lowest (0-20% maximum)	14400	12810	12
Lower (20-40% maximum)	25665	22831	22
Middle (40-60% maximum)	40308	35857	34
Higher (60-80% maximum)	23724	21104	20
Highest (80-100% maximum)	7819	6956	7

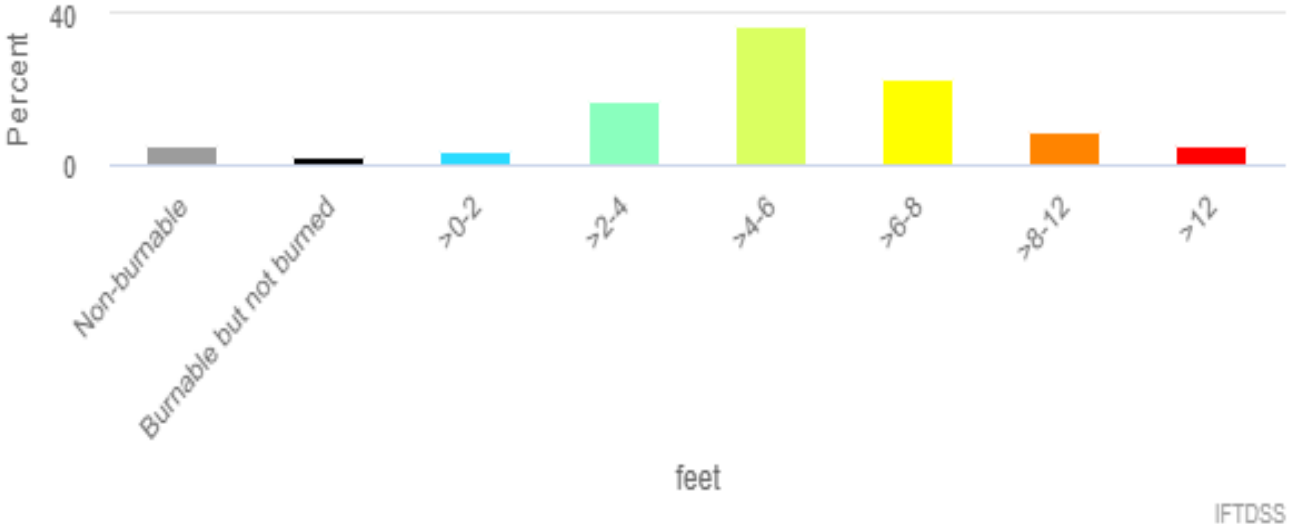
Conditional Flame Length



Conditional Flame Length

Conditional Flame Length (feet) Data Summary for Area of Interest "gaviota_coast_cwpp_boundary" within "Gaviota_LF16_Edit3-60m" Landscape

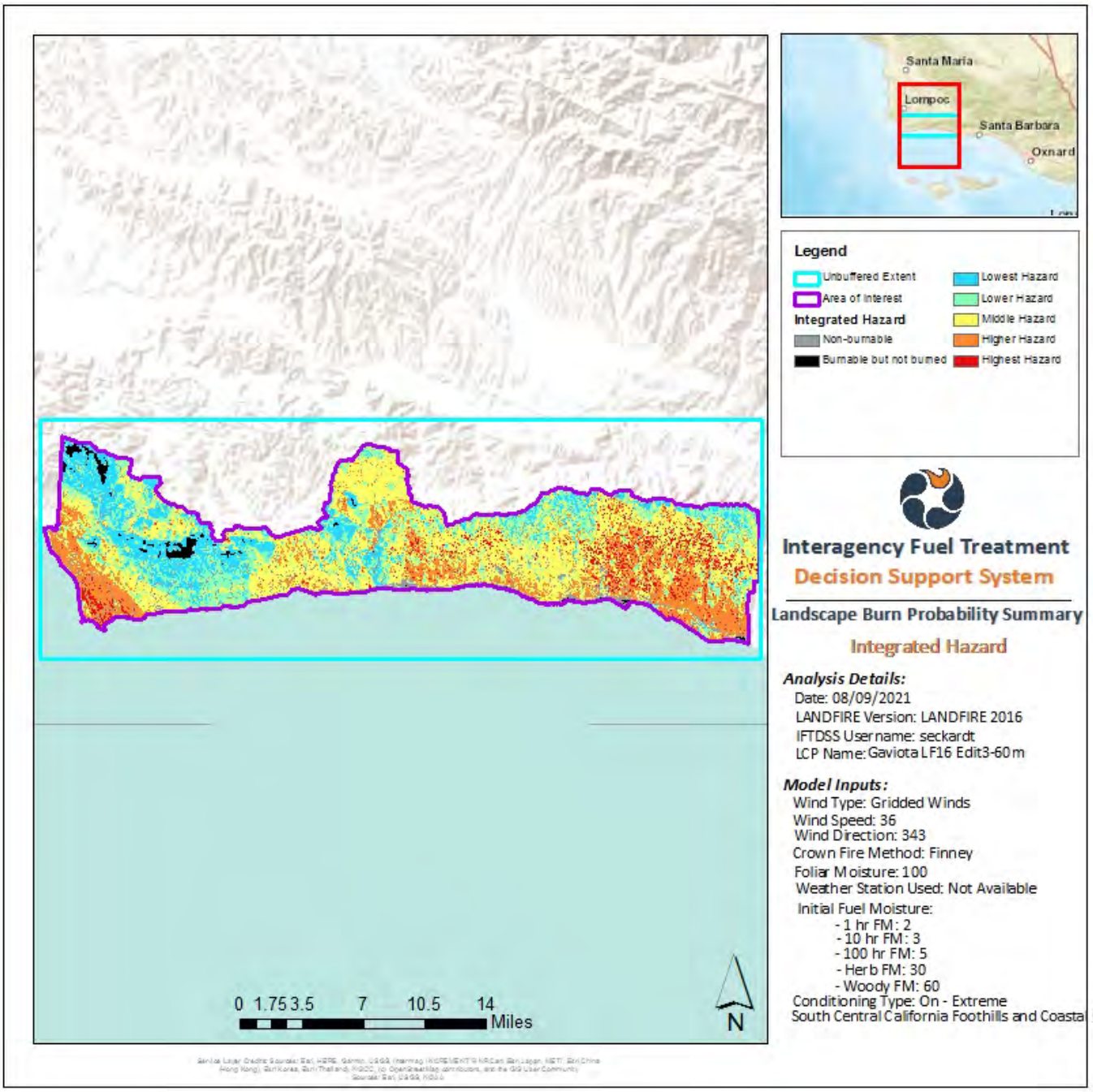
Source Landscape Name: Gaviota_LF16_Edit3-60m
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 242,855
Area of Interest Name: gaviota_coast_cwpp_boundary
Area of Interest Acres: 106,021
Model Name: Gaviota_LF16_3_Prob



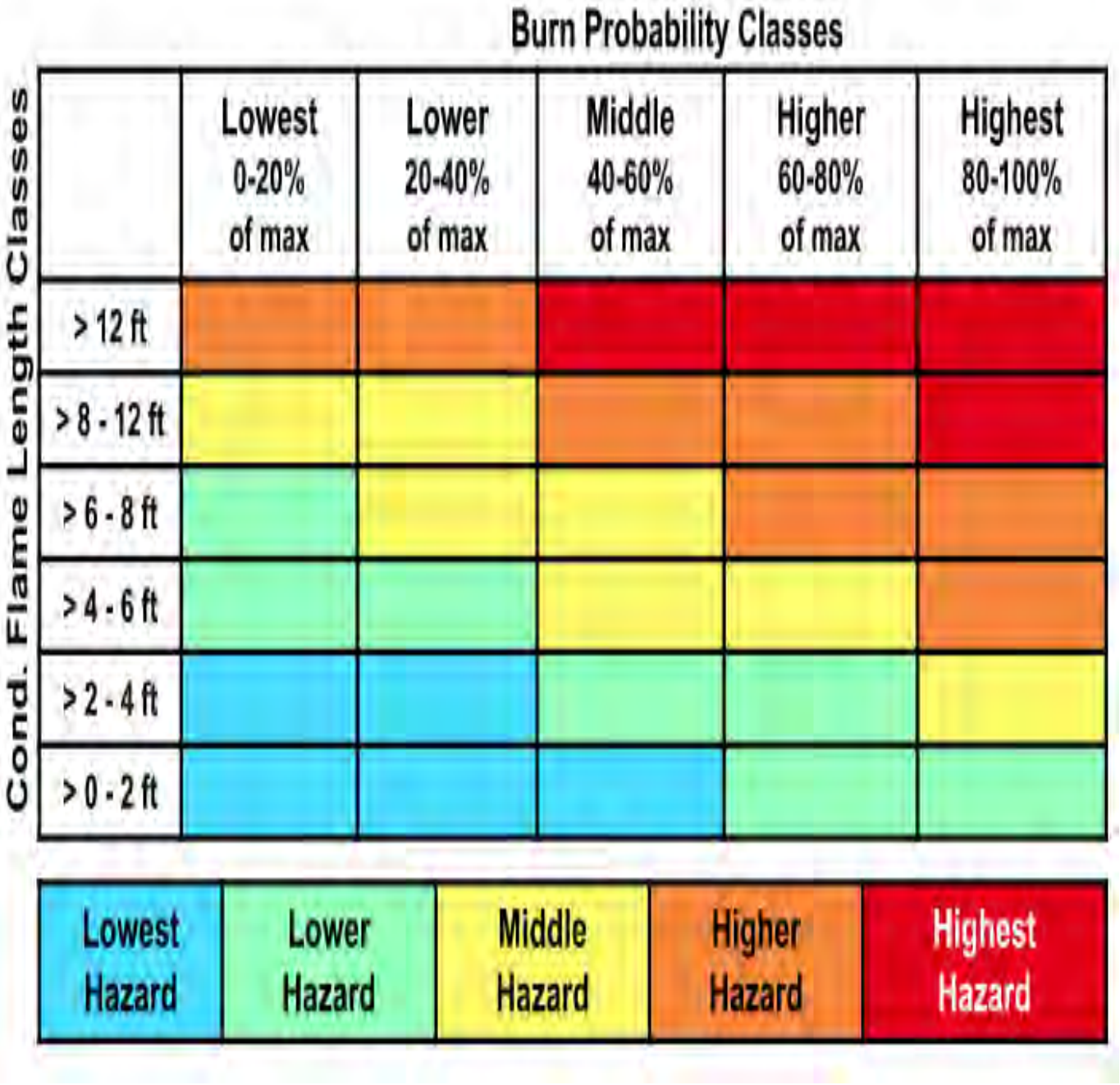
Conditional Flame Length

Conditional Flame Length (feet)	Pixel Count (freq)	Acres In AOI	Percent In AOI
Non-burnable	5454	4852	5
Burnable but not burned	1811	1611	2
>0 - 2	4231	3764	4
>2 - 4	20676	18393	17
>4 - 6	44500	39586	37
>6 - 8	26835	23872	23
>8 - 12	10289	9153	9
>12	5385	4790	5

Integrated Hazard



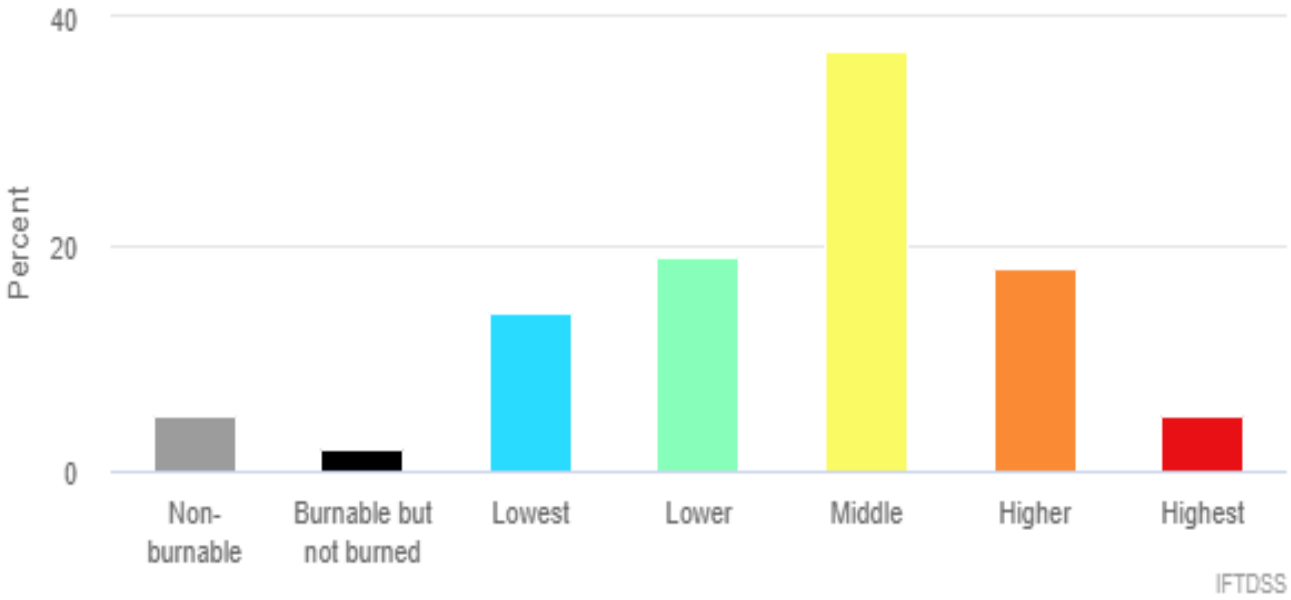
Integrated Hazard



Integrated Hazard

Integrated Hazard Data Summary for Area of Interest "gaviota_coast_cwpp_boundary" within "Gaviota_LF16_Edit3-60m" Landscape

Source Landscape Name: Gaviota_LF16_Edit3-60m
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 242,855
Area of Interest Name: gaviota_coast_cwpp_boundary
Area of Interest Acres: 106,021
Model Name: Gaviota_LF16_3_Prob



Integrated Hazard

Integrated Hazard	Pixel Count (freq)	Acres In AOI	Percent In AOI
Non-burnable	5454	4852	5
Burnable but not burned	1811	1611	2
Lowest	16899	15033	14
Lower	23191	20630	19
Middle	44680	39746	37
Higher	21740	19339	18
Highest	5406	4809	5

Appendix C

Prioritized Vegetation Management Projects

A list of prioritized vegetation management projects is presented in Table C-1. The locations of existing fuel breaks and fuel treatment projects, and the locations of some recommended projects are provided in Figure C-1.

Table C-1. Prioritized Vegetation Management Projects

Priority	Project Description	Coordinating Agencies/Entities
Agriculture and Grazing		
1	Implement the Santa Barbara South Coast Herbivory project where it occurs in the Plan Area.	SBCFSC, SBC Fire, Private Landowners
2	Identify and implement grazing programs in the Plan Area to maintain or reduce fuel loads. Use the Potential Grazing Opportunities map (Figure 18) to identify areas where grazing may be introduced. Consider vegetation type, terrain, access, and fire history to identify potential grazing expansion areas. Connect grazing areas to other grazing lands (existing or proposed), agricultural buffers, fuel breaks, or other developed or non-combustible land cover types (e.g., roads), where feasible.	SBCFSC, SBC Fire, Private Landowners
3	Encourage continuation and expansion (or re-introduction) of grazing activities across the Plan Area to reduce or maintain fuel loads.	SBCFSC, SBC Fire, Private Landowners
4	Identify Plan Area orchards that are vulnerable to wildfire (proximate to heavy fuels) and work with landowners to implement orchard edge treatments to minimize wildfire impacts to orchard trees and to allow orchards to function as fuel breaks.	SBC Fire, Private Landowners
5	Work with Santa Barbara County to develop and implement a prescribed grazing program on the Baron Ranch property.	Santa Barbara County, SBC Fire
6	Identify opportunities for expanding agricultural buffers in the Plan Area, where feasible.	SBCFSC, SBC Fire, Private Landowners
Defensible Space		
1	Work to increase defensible space compliance in the Plan Area through engagement with property owners and through SBC Fire inspection and enforcement efforts and through evaluations conducted by SBCFSC through the Wildfire Preparedness Evaluations program.	SBCFSC, SBC Fire
2	Support Firewise Community creation and participation to encourage implementation and maintenance of defensible space on private properties.	SBCFSC, SBC Fire, Private Landowners, Homeowner's Associations
3	Create and maintain defensible space around historic and community structures in the Plan Area (Cojo-Jalama Ranch Headquarters, Hollister House, main house at Arroyo Hondo Preserve, Las Cruces School).	SBC Fire, TNC, Hollister Ranch, Santa Barbara Land Trust
Vegetation Management		
1	Routinely manage roadside vegetation on all public and private roads in the Plan Area to reduce ignition potential and create fire-safe evacuation and fire access corridors.	County Public Works, SBC Fire, USFS, State Parks, Private Landowners
2	Remove the stand of eucalyptus trees along Farren Road near the entrance gate to the Farren Road community to facilitate access/egress and remove hazardous fuels.	SBC Fire

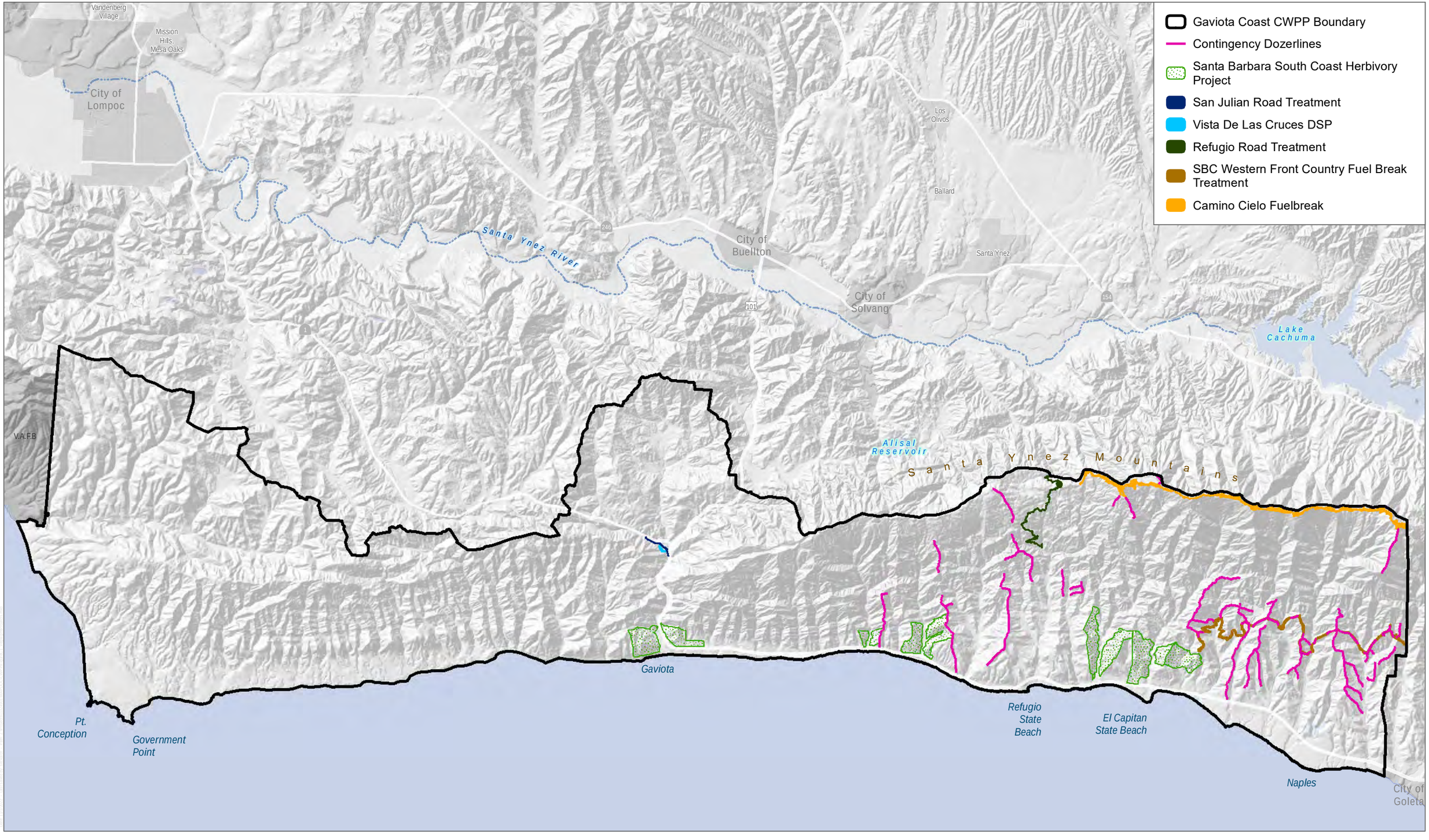
Table C-1. Prioritized Vegetation Management Projects

Priority	Project Description	Coordinating Agencies/Entities
3	Routinely manage vegetation within and adjacent to the Temporary Refuge Area (TRA) located at the top of Refugio Road. Expand the area of the TRA as necessary based on field assessments.	SBC Fire
4	Maintain vegetation in the treatment area for the Vista Del Mar Project (approximately 137 acres between Highway 1, Highway 101, and Gaviota State Park in Las Cruces) to reduce the potential for ignitions, extreme fire behavior, and structure loss.	SBC Fire, State Parks
5	Plan and implement roadside vegetation management along Jalama Road in the Plan Area to reduce fuel loads and reduce ignition potential. Implement vegetation management at vehicle pullouts at the high point of Jalama Road to minimize ignitions from overheating vehicles.	County Public Works, TNC, SBC Fire
6	Collaborate with Caltrans to identify and implement ignition prevention/shoulder hardening projects to minimize wildfire ignitions along Highway 101 and Highway 1 through the Plan Area.	Caltrans, SBC Fire, State Parks
7	Evaluate opportunities for implementing vegetation management and prescribed burns on the Dangermond Preserve adjacent to the Vandenberg Air Force Base (VAFB) property to minimize potential for invasive species spread and fire spread into the Plan Area from VAFB.	VAFB Fire Dept., TNC, SBC Fire
8	Plan and implement vegetation management in Long Canyon on Hollister Ranch to reduce fuel loads by creating a mosaic of grass and shrubs through targeted grazing.	Hollister Ranch
9	Continue cattle grazing for fire management and evaluate opportunities for prescribed burns on the Dangermond Preserve to manage invasive species, maintain grassland habitat, and improve oak woodland health and resiliency.	TNC, SBC Fire
Fuel Breaks		
1	Regularly manage and maintain the Camino Cielo fuel break and Camino Cielo Road to facilitate fire agency access.	SBC Fire, USFS
2	Establish a shaded fuel break along Farren Road from its intersection with Calle Real to its northern terminus.	SBC Fire, Private Landowners
3	Evaluate opportunities for connecting existing dozer lines/fuel breaks in the eastern portion of the Plan Area (from El Capitan to Tecolote Canyons [eastern Plan Area boundary]), focusing on east-to-west connections, to keep fires out of foothill areas. Use masticators, where feasible, to widen dozer lines/fuel breaks or to establish connections to other fuel breaks/dozer lines or tie-in points (e.g., roads, agricultural buffers) to slow fire spread and limit soil disturbance. Identify dozer lines/fuel breaks in this area needing maintenance or rehabilitation.	SBC Fire, Private Landowners
4	Regularly manage and maintain the fuel breaks surrounding critical communications infrastructure on Santa Ynez Peak, Broadcast Peak, and Bald Mountain.	SBC Fire, USFS
5	Coordinate with landowners to complete, restore, and/or connect existing fuel breaks with each other or other logical tie-in points (e.g., roads, agricultural buffers), where feasible.	SBC Fire, Private Landowners

Table C-1. Prioritized Vegetation Management Projects

Priority	Project Description	Coordinating Agencies/Entities
6	Evaluate opportunities to establish a north/south fuel break in the eastern portion of the Hollister Ranch to minimize potential impacts to the Hollister Ranch community resulting from a fire burning westward from the Highway 101 corridor.	SBC Fire, Hollister Ranch
7	Evaluate opportunities for establishing a ridgeline shaded fuel break along the road between Hollister Ranch and the Dangermond Preserve (approximately 30–50 feet on either side of the road) to facilitate fire agency access.	SBC Fire, TNC, Hollister Ranch
8	Evaluate opportunities for connecting and managing existing contingency dozer lines from Bald Mountain downhill to Highway 101. Connection and management may include vegetation management (e.g., mastication) in lieu of grading.	SBC Fire, USFS, Private Landowners
9	Establish a fuel break around the Tajiguas Landfill/Materials Recovery Facility by masticating the edges of existing dozer lines, or via a combination of mechanical and manual techniques. Connect fuel break to roads or other existing fuel breaks.	SBC Fire, Santa Barbara County
Prescribed Fire		
1	Evaluate the potential use of prescribed fire in the Plan Area to restore appropriate fire return intervals in fire-adapted vegetation communities.	SBC Fire, USFS
2	Evaluate the use of prescribed fire for range improvement on grazing lands.	SBC Fire, Range Improvement Association
3	Evaluate the potential use of prescribed fire for cultural purposes.	SBC Fire, Native American Tribal Groups

Notes: Caltrans = California Department of Transportation; County = County of Santa Barbara; SBC Fire = Santa Barbara County Fire Department; SBCFSC = Santa Barbara County Fire Safe Council; State Parks = California Department of Parks and Recreation; TNC = The Nature Conservancy; USFS = United States Forest Service



SOURCE: USGS, County of Santa Barbara

DUDEK

0 1 2 Miles

FIGURE C-1

Existing and Recommended Vegetation Management Projects

Gaviota Coast Community Wildfire Protection Plan

Appendix D

Vegetation Management Techniques and Best Management Practices

1 Vegetation Management Techniques

As identified in this CWPP, vegetation management techniques can be classified into five categories:

- Biological
- Hand Labor
- Mechanical
- Prescribed Fire
- Chemical

The following sections present a discussion of each of the vegetation management techniques that may be implemented, including information regarding equipment, application, timing, limiting factors, special considerations, and BMPs.

1.1 Biological Techniques

1.1.1 Grazing

Grazing is a method of using livestock to reduce the fine fuel loading of live herbaceous growth, shrubs, and new growth of trees. Livestock, such as cattle, goats, or sheep, browse on grasses, forbs, shrubs, and fresh growth of young trees, thereby removing vegetation from the overall fine fuel load of the site. Grazing is effective in managing fine fuels and preventing the expansion of brush into grasslands. Livestock each have different grazing habits and not all livestock are ideally suited for grazing treatments in all areas. Most livestock, with the exception of goats, do not consume live or dead, tough, woody plant material in any significant quantity as this material is generally unpalatable. Additionally, livestock does not effectively create fuel breaks but is well-suited to maintain new annual growth within them.

To achieve management goals, grazing typically begins in the late spring, when the growth of annual grasses has slowed and continues through the summer in order 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 and should include goals and implementation actions to ensure that the timing of grazing treatment meets identified goals but minimizes potential negative effects. Grazing management plans should also identify the optimal stocking rate and grazing duration, typically measured in pounds per acre of residual dry matter. Optimal residual dry matter levels should be determined by overall management objectives, such as suppression of weeds, fuel load reduction, or minimizing erosion potential. As a fuel reduction technique, grazing does not need to be conducted each year if the intent is to control shrubs or maintain understory fuels; however, if the intent is to reduce grass or other flashy fuels, grazing should be conducted at least annually.

Grazing can be a relatively inexpensive and effective treatment method and can even generate revenue when cattle grazing is contracted for large areas. Control of livestock movements and prevention of overgrazing is critical for successful implementation. Using professional herders or portable fences may be an alternative to fixed fencing where the treatment is ephemeral. Additional controls may also be needed for the protection of retained plants, riparian zones, and sensitive resources areas, and to minimize erosion potential.

1.1.1.1 Grazing Management

Although the concept of grazing is the same regardless of which type of animal is used, how each animal type conducts its grazing varies significantly. As a result, not all animals will be ideally suited for grazing treatments in all areas. Animal selection should be determined by the fuel management goal. As noted, the development of site-specific grazing management plans should be completed considering site-specific conditions and identified management goals. The plan should specify management objectives and standards, animal stocking rates and use levels, grazing season (turn-out and turn-in dates), and monitoring requirements and performance criteria. Stocking rates are determined by a range analysis, which calculates the number of animals required for a given period to attain the desired use level, which generally ranges from 600 to 1,000 pounds per acre of residual dry matter, depending on site-specific conditions.

Timely movement of livestock to the next treatment area or other available pastures once identified goals have been met is important to minimize potential adverse effects, including soil compaction, overgrazing, and resource damage. Fencing is an important component of grazing management efforts to prohibit livestock from leaving the identified treatment area or gaining access to riparian zones, wetlands, or other sensitive resource areas. Finally, water sources are necessary for livestock and need to be provided if insufficient water is available at the treatment site. The following summarizes specific considerations for different grazing animals:

- **Goats:** Goats also have the ability to access steeper slopes in an efficient manner. Unlike other livestock, goats prefer to browse on woody vegetation (e.g., tree leaves, twigs, vines, and shrubs) and will consume materials up to 6 feet above the ground. This grazing pattern makes goats a desirable choice for fuel reduction treatments as they can effectively create and maintain vertical separation between surface vegetation and the lower limbs of overstory trees (NRCS 2005). Additionally, substantial amounts of invasive plant seed can effectively be removed from the landscape by the use of time-controlled, short-duration, high-intensity grazing in early spring (Menke 1992). However, since goats will indiscriminately damage most plants, their use in areas with desired shrub and tree retention should be minimized as goats can girdle shrubs and trees by browsing on bark. Alternatively, portable electric fences can be effectively used to control goat herds and more effectively guide the outcome of grazing efforts.
- **Sheep:** With proper management, sheep dramatically reduce the density of grasses and can be used to suppress annual grasses (Lerner 2007). Similar to goats, sheep have the ability to access steeper slopes in an efficient manner. Sheep have an intermediate diet, as they have no preference for grasses, forbs, or shrubs and commonly consume large amounts of green grass during rapid growth stages but avoid dry mature grass (Bush 2006). In addition to their diet making them versatile for grazing, sheep can also be utilized with other species such as cattle or goats for diversity fuel treatment (Bush 2006). Substantial amounts of invasive plant seed, such as yellow starthistle, can effectively be removed from the landscape by the use of time-controlled, short-duration, high-intensity grazing in early spring (Bush 2006). However, since predation of sheep by animals such as coyotes is common, consideration needs to be given to anti-predation techniques. Portable electric fences can be effectively used to control sheep flocks and help prevent predation of the animals.
- **Cattle:** Management of cattle herd population density is necessary to limit impacts especially as they relate to soil compaction and erosion, plant cover retention, water quality, and animal waste concentrations. However, the steepness of the terrain significantly influences the distribution of cattle which tend to prefer level to gently rolling hills (Bush 2006). Cattle may be better suited to larger expanses for fuels treatment rather than small confined areas to avoid unnecessary impacts. Cattle are considered grazers and have a

diet dominated by grasses and grass-like plants such as forbs (Bush 2006). Invasive plant species, such as yellow starthistle and medusahead can effectively be removed from the landscape by the use of time-controlled, short-duration, high-intensity grazing in early spring for yellow star thistle and in late spring for medusahead (Bush 2006). Water availability and water supply also need to be considered with cattle to ensure they do not cause environmental damage to watercourses or impact water quality. Utilizing grazing for invasive species management needs to be carefully monitored to ensure the timing is correct to prevent regrowth. Fencing or cattle guards should be used to ensure cattle don't escape and unintentionally graze not prescriptive areas or interfere with adjacent land uses.

1.1.1.2 Best Management Practices for Grazing

The following BMPs should be implemented, where feasible, when utilizing grazing as a vegetation management technique. Measures addressing the BMPs below should be incorporated into grazing plans. Additional BMPs are provided in Section 7.

- Identify and assess streams, watercourses, and sensitive biological and cultural resources 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 Environmentally Sensitive Habitat (ESH) areas or 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 vegetation type, terrain, access fire history, and management goals when selecting grazing animals.
- 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.

1.1.2 Hand Labor Techniques

Hand labor involves pruning, cutting or removal of trees or other vegetation by hand or using hand-held equipment. Other hand labor treatments involve removing dead wood, piling material, and spreading chips/mulch. 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. Manual treatment may also include lop and scatter. Lop and scatter involves cutting vegetation (using hand tools, chainsaws, weed whips, and mowers) and cut vegetation is then reduced in size by cutting into lengths no longer than 6 inches long. The cut vegetation is then left on the ground within the project area no greater than 12 inches in depth. Minimal ground disturbance results using this method since the root structure of vegetation is left intact and biomass generated from vegetation treatment is left on site.

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.

1.1.2.1 Best Management Practices for Hand Labor

The following BMPs should be implemented, where feasible, when utilizing hand labor vegetation management techniques. In all circumstances, tools and equipment should be utilized only for their intended use. Additional BMPs are provided in Section 7.

- 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;
- 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; and
- When lopping and scattering, the goal is for each piece to lay flat and as close as feasibly possible to the ground surface. Pieces that are left elevated have a much slower rate of decomposition and will contribute to the fuel loading.

1.1.3 Mechanical Techniques

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, and chippers. Chippers are moved around as work occurs and placement is dependent on the ability to minimize the distance vegetation must be hauled to the chipper.

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, vegetation 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.)

1.1.3.1 Best Management Practices for Mechanical Techniques

The following BMPs should be implemented, where feasible, when utilizing mechanical vegetation management techniques. In all circumstances, equipment should be utilized only for its intended use.

- Utilize 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;
- 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;
- To minimize impacts on soil stability, 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.

1.1.4 Prescribed Fire

Prescribed fires reduce the volume of fuel through combustion and are conducted under specific regulations when conditions permit both adequate combustion and proper control. Prescribed fire is the use of fire in a planned setting with low to moderate intensity fire and defined goals. Application of prescribed fire occurs in conjunction with specific land management objectives such as reducing fuel loads, increasing overall forest or habitat health, and/or protecting communities from wildfire (USDA 2018). Other land management objectives prescribed fire can accomplish are controlling undesirable vegetation, preparing sites for harvesting/seeding, controlling plant pathogens and pests, improving wildlife habitat, improving plant production or quality, removing debris, restoring ecological sites, and maintaining native plants diversity and composition. Prescribed fire can occur in small designated areas or over larger expanses. There are two types of prescribed fire – pile burning, and broadcast burning. Both pile and broadcast burning are often implemented in conjunction with hand labor and mechanical treatment methods as a means of treating vegetative debris, or in advance of an herbicide treatment to enhance the effectiveness of the application.

Prescribed burning can be a cost-effective way to quickly reduce a large volume of woody material remaining after other fuel treatment operations. A broadcast burn produces a more uniform treatment and minimizes areas of great burn intensity. 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.

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 fuel reduction requirements, local weather conditions, and available resources for fire management. Burning activities should consider and be managed in accordance with wildlife and habitat needs. Consideration also needs to be given to existing barriers, cultural resources, threatened or endangered species, smoke, and weather conditions. The following sections summarize the planning needs for implementing prescribed burns.

1.1.4.1 Pile Burning

Pile burning is fairly common and often applied in forest settings. Small pile burning is typically conducted at or near the treatment area. Pile burning involves stacking hand or machine-cut vegetation into piles and allowing the material time to dry out. Piles should be free of dirt, debris, and stumps. The 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 the 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. Piles burns should be lit when weather conditions allow such as in winter and spring and are confined to the footprint of the pile. Burns should be divided over multiple days to allow for a halt of burning activities if conditions fall out of prescription (USDA 2018).

An alternative to pile burning is the utilization of an air curtain burner. 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. Where feasible, the use of an air curtain burner is recommended to dispose of wood waste. Air curtain burners may be available as a shared resource between County and other nearby municipal or land management agencies and can be temporarily sited at work locations to facilitate wood waste treatment.

1.1.4.2 Broadcast Burning

Broadcast burns are usually done in larger areas where a maximum amount of fuel treatment can take place and can be used to control noxious weeds and treat cut material (slash) on the ground surface in areas treated by other techniques, or reduce surface and/or ladder fuels beneath tree canopies (understory burning). Broadcast burning can create a mosaic pattern of vegetation and allow for the regeneration of different plant species (USDA 2018). Broadcast burning can also be used to break up the continuity of vegetation in order to promote diversity in ecosystems or reduce fuel loading. 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. Prescribed burns can be used in all vegetation types, where conditions allow for effective control (USDA 2018).

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. Spring burns are sometimes preferred to ensure a greater measure of public safety; however, there may be impacts on animal and plant reproduction. 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. "Cool" burn prescriptions, using techniques such as backfiring, chevron burning, and flank firing, as well as timing the fires during periods of high humidity and high fuel moisture content, typically results in incomplete combustion; therefore, existing vegetation is partially retained.

Prescribed burns must be conducted by trained fire protection personnel. Utilizing personnel and equipment from neighboring fire districts 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.

1.1.4.3 Prescribed Fire Planning

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 vegetation 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 California Air Resource Board (CARB) and the South Coast Air Quality Management District (South Coast AQMD) require 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. Current air quality regulations within the jurisdiction of the South Coast AQMD limit open burning for range management projects less than 10 acres and controlled burns less than 10 acres, or that produce less than one ton of particulate emission to require Burn Authorization on a Burn Day. Open burning for range management projects or controlled burns that exceed 10 acres or produce more than one ton of emissions are required to obtain approval prior to any burn activities and submit a Smoke Management Plan. Additionally, approval must be obtained from a local Fire Protection Agency. In addition to the preparation and approval of a smoke management plan, the South Coast AQMD requires notification of the burn and that burning is conducted on a permissive burn day. The South Coast AQMD selects burn days based on air quality, weather conditions, and wind patterns; provides the burn's acreage allocation the morning of the burn and provides the "all clear" designation prior to initiation of the burn. Regulations regarding burning can be found in the South Coast AQMD Rule 444.
- **Pre-Broadcast Burn Site Preparation:** Hand labor or mechanical treatment techniques are often conducted 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. These fire lines are typically constructed using bulldozers or by hand using scraping tools. Occasionally they are "burned in" with a strip of fire under conditions that limit fire spread.

- **Burn Notification:** Notifying the local or surrounding communities, local fire departments, media, and South Coast AQMD is an essential component to avoid potential misinterpretation of the prescribed burn as a wildfire. Notification to interested and affected parties and the media is also repeated on the day of the prescribed burn. Printed materials or interpretive signs are made available at the site and distributed to neighboring communities explaining the reason for the prescribed burn, the type of burn being conducted, and the intended result of the prescribed burn. Prescribed fires generate high levels of public safety concerns over the chance of fire escape from control lines, and the rapid distribution rate of smoke, ash, and particulate matter may raise additional concerns from the public many miles downwind from the actual burn site.
- **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.

1.1.4.4 Best Management Practices for Prescribed Fire

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 7.

- Ensure equipment operators and project personnel are properly trained in equipment use;
- Ensure that appropriate fire safety measures are implemented;
- For safety purposes, provide necessary signage and patrol alerting the public to active operations and area closures;
- Burn piles size should be no larger than necessary to avoid soil sterilization;
- Minimize excess dragging of cut materials to piles to minimize soil disturbance;
- Piles that cannot be burned before the commencement of fire season should be compacted to the extent possible; and
- Protect retained trees and vegetation from potential damage by pre-treating adjacent fuels.

1.1.5 Chemical Techniques

Chemical techniques involve the use of herbicides to kill vegetation or prevent growth and are typically used in combination with other types of fuel reduction treatments. Herbicides do not remove any vegetation from a treatment area; therefore, dead plant material remains unless otherwise treated. Application of herbicides and other chemicals is typically performed by hand and can include sponging, spraying, or dusting chemicals onto undesirable vegetation. Hand application provides flexibility in application and is ideally suited for small treatment areas. Roadside application of herbicides may employ a boom affixed to or towed behind a vehicle.

Herbicide application requires specific storage, training, and licensing to ensure proper and safe use, handling, and storage. 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. Personal protection equipment is essential 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.

1.1.5.1 Herbicides

The application of herbicides may be used on its own or as a secondary vegetation treatment technique following manual (hand labor) or mechanical removal for controlling sprout growth and regeneration. The advantage of herbicide treatments is that they typically result in high kill rates and can prevent treated plants from setting seed. Thus, in the long run, targeted plants are eliminated as their "seed bank" is eventually eliminated. Some disadvantages include the necessity of applicators to be trained and then licensed by the State of California, the cost of application and safety equipment, the cost of the herbicide itself, the potential to affect non-target vegetation and/or wildlife, and public concern regarding potential health impacts from herbicide use. In spite of these disadvantages, herbicides, or herbicides in combination with hand/mechanical removal, are the most widely used and effective techniques for controlling certain types of vegetation.

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 seeds of desired species remaining in the soil, and often have longer persistence times in the environment. Post-emergent herbicides are applied directly onto the plants, often during the early phases of their growth, killing them before they have the chance to mature and set seed. With proper equipment and training, herbicides can be applied selectively, minimizing impacts on seeds of desired species residing in the soil. However, should the target vegetation be intermixed with growing desired vegetation, the chance of affecting desired vegetation would be increased.

Different plants vary in their response to any particular herbicide and can also vary in their response depending upon which stage of their life cycle the herbicide is applied. Herbicides applied during the "bolting" phase (when flowing stalks are being produced) may have greater kill rates than the same chemical applied during the rosette stage or the flowering stage. Some herbicides are specific to particular groups of plants (e.g., Fusillade affects only grasses), while others can kill nearly all kinds of plants. Still, others are permitted for use in California, while others are not. Systemic herbicides (as opposed to contact herbicides) are likely the most effective for control of highly flammable/rapidly spreading species due to their ability to spread via translocation into root tissue.

Herbicide application should be used following removal of all trees and other perennial species that have the ability to regenerate from root fragments when removal of all plant material is not feasible. 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 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.

1.1.5.2 Cut and Daub

Cut and daub treatment is recommended for larger highly flammable/rapidly spreading plants, such as large trees and shrubs, to control regrowth and kill the portion of the plant remaining belowground. Cut and daub involves the cutting of plant stalks or trunks and then the direct application of an appropriate systemic herbicide directly to the cambium layer of the freshly cut stump or stem. Other related methods include drill and fill, where holes are drilled into the trunk of a tree and herbicide is injected, or the glove method, where an herbicide-soaked glove is used to apply directly to plant foliage or freshly cut stumps. It is critical that the herbicide treatment occur immediately after the plants are severed so that the herbicide is carried into the plant tissue. If enough time elapses to allow the cut surface of the severed plant to dry out, a fresh cut should be made prior to herbicide application.

1.1.5.3 Best Management Practices for Chemical Techniques

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 7.

- Herbicide use should be considered only when other treatment techniques are determined to be infeasible or ineffective in achieving desired management and maintenance standards;
- A state-licensed pest control advisor and/or the Los Angeles County Agricultural Commissioner should be consulted 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.

2 Best Management Practices for Vegetation Management

The following Best Management Practices are recommended to minimize potential adverse impacts from vegetation management activities. Additional requirements, standards, or conditions may be necessary based on project specific analyses conducted during the environmental review process or as required by County, State, or Federal regulatory agencies. In general, projects should consider the following BMPs during design, layout, and prescription development.

2.1 Fire Protection

All operations conducted in the Plan Area associated with project implementation should 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). Per State code, projects are required to take precautions to reduce the chance of 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 vegetation management project operations that require a vehicle, machine, tool, or equipment powered by an internal combustion engine operated on hydrocarbon fuels, suitable and serviceable tools for firefighting purposes shall be provided and maintained. 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 person at the operation can be equipped to fight fire.
- All equipment with an internal combustion engine using hydrocarbon fuels shall be equipped with a spark arrestor, as defined in California Public Resources Code Section 4442.
- Establish internal project communication procedures for reporting fires or call 911 in emergencies.
- Comply with applicable standards restricting spark-generating equipment usage and spark arrestor requirements. Additionally on Red Flag Warnings, High to Extreme Fire Danger days, and in High Wildfire Risk Areas, the timing and type of activities should be limited to activities that would not exacerbate fire risk or cause unintentional ignitions.
- Identify staging areas before 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.

2.2 Pests/Pathogens

Pest and pathogen BMPs should be incorporated into project planning and implementation efforts. These practices encompass protection of the residual vegetation from mechanical damage and quarantine and sanitation practices. Outbreaks of known invasive pathogens such as the Invasive Shothole Borer (ISHB), and unknown pests and pathogens pose a threat to Plan Area forests. Sanitation of tools and equipment on project sites should be conducted to reduce the spread of pests and diseases following treatments in areas of a known infestation. If soil

is collected on 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. Additionally, certain pathogen-specific measures have been developed to deal with regional pathogens, ISHB. These measures should be implemented in the Plan Area, where applicable. Specific measures can be found at: https://ucanr.edu/sites/pshb/management/.

2.3 Slope Stability, Erosion Control, and Water Quality

Vegetation management activities have the potential to affect soil stability. Soil stability may be indirectly affected by the removal of overstory vegetative cover, which reduces rainfall interception and thereby increases 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 the use of heavy equipment, tools, hand crews, or livestock, 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.

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 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. This rating should be determined and considered on a site-specific basis when determining the needs for erosion control BMPs in the Plan Area. In addition, areas, where erosion has occurred in the past due to vegetation management activities, should be avoided, or alternative methods implemented to minimize potential impacts to soil stability.

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, and jute rolls are more predictable for reducing soil erosion and post-fire hydrological problems than seeding or other treatments (Robichaud et. al. 2010). Mulching may introduce exotic/weed seeds (Kruse et. al. 2004) if brought in from off-site (as opposed to chipped on-site material), so erosion potential should be high before the decision to use this material is finalized.

Erosion and Sediment Control BMPs include:

- 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 RoughheningFiber Rolls
- Temp 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 Plan Area, stabilization of soils in the burn area is a primary concern, especially in areas with steep slope gradients. Erosion control BMPs should be installed as soon as possible and prior to the onset of the winter period.

2.3.1 Access Roads

In areas where existing dirt access roads will be retained, waterbreaks[1] 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 (October 15 to April 1). Outside the winter period, waterbreaks and drainage structures should be installed before 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 the use of access roads that do not have permanent and adequate drainage structures. Distances between waterbreaks should adhere to the standards outlined in Table D-1. Access roads should be closed to public vehicle travel following the completion of vegetation treatment operations.

Table D-1: Maximum Distance between Waterbreaks

	Road Slope Gradient (percent)			
Estimated Erosion Hazard Rating	≤10	11–25	26–50	>50
Extreme	100	75	50	50
High	150	100	75	50
Moderate	200	150	100	75
Low	300	200	150	100

Source: 2022 California Forest Practice Rules (14 CCR, Chapters 4, 4.5, and 10).

2.4 Watercourses

Considerations need to be taken when vegetation management projects take place in or near watercourses. Vegetation management activities within a riparian zone may require additional permitting. The intent is to assure that work done will avoid or limit, to the extent feasible, negative impacts on creeks and watercourses. The primary measure to minimize impacts on creeks and watercourses in the Plan Area is avoidance, meaning all work should be conducted outside of riparian areas where feasible. Should it be necessary to conduct vegetation management activities within riparian areas, all necessary agency permits would need to be obtained. Additionally, the following BMPs should be implemented:

- Preserve creeks and riparian corridors in a natural state.
- Preserve and enhance creek-side vegetation and wildlife.
- Prevent activities that would contribute significantly to flooding, erosion, or sedimentation, or that would destroy riparian areas or would inhibit their restoration.
- Control erosion and sedimentation.
- Protect drainage facilities.

[1] A waterbreak (or waterbar) is a shallow trench with a parallel berm or ridge on the downslope side, angled downward across a road and installed to control surface runoff.

2.5 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.
- Develop and implement a burn plan and associated smoke management plan for prescribed burning activities.

2.6 Reforestation/Revegetation

Revegetation of areas subject to vegetation management can minimize the potential for erosion by stabilizing soils. Revegetation is recommended only in areas where disturbed and/or bare soil exists following vegetation treatment operations as a measure to stabilize soils. The need for revegetation should be determined during project planning and design or subsequent monitoring efforts and should consider slope, soil type, access, irrigation and maintenance needs, and other BMPs being implemented on-site. Qualified professionals (e.g., landscape architects, revegetation specialists) should be consulted to develop site-specific revegetation plans, as appropriate. Revegetation may include hydroseeding, direct seeding, or container plant installation. Plant species selection should be consistent with revegetation goals and should consider erosion protection value (e.g., deep-rooted species). Undesirable species should not be used for revegetation purposes.

2.7 Special-Status Plant and Wildlife Species

Vegetation treatment activities have the potential to impact special-status plant or wildlife species via ground disturbance, vegetation removal or management, or the use of vegetation management tools and equipment. To minimize the potential for impacts on special-status species, measures should be implemented, depending on the species present in the identified treatment area. In general, these measures include conducting pre-operations biological surveys, identifying and marking avoidance or buffer areas, conducting biological monitoring during vegetation management operations, and establishing work windows to avoid and minimize adverse effects on nesting birds and special-status plants and animals. Additionally, where feasible, projects should avoid impacts to riparian areas, Environmentally Sensitive Habitat (ESH) areas, Critical Habitat areas, and the Gaviota Tarplant Ecological Reserve. Project proponents should engage qualified biologists during project design and implementation.

Special-status Plants

- All vehicles and equipment should be inspected and cleaned of weed seed prior to entering a project site to reduce the spread of noxious weed seeds.
- Conduct pre-operations surveys for rare plants prior to vegetation management 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 would be necessary. If rare plant populations are observed during the survey, all populations should 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. Crews should be educated on the purpose and need of avoidance of habitat areas within exclusion zones.

Special-status Wildlife

- For the protection of nesting birds, including raptors, limit vegetation treatment to the non-nesting season for birds. If vegetation clearing must occur during the bird breeding season, a qualified biologist should conduct pre-operations surveys for nesting birds no more than one week prior to vegetation treatment activities. If no nests are observed during the survey, no further measures would be necessary. If active nests are observed, avoidance buffers appropriate for the species of bird should be implemented.
- Buffers should 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 other special-status species, pre-operations surveys should be conducted by a qualified biologist. Buffers or treatment exclusion areas identified by the biologist should be avoided during vegetation treatment activities. Other measures identified by the biologist (e.g., movement of nests, modifications to treat types or timeframes) should be implemented as necessary.

2.8 Cultural Resources

It is anticipated that cultural resources surveys will be conducted prior to implementation of vegetation management projects. 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.

2.9 Recreation Resources

Temporary impacts to recreation resources in the Plan Area may result from vegetation treatment project implementation. 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 vegetation treatment projects 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 infrastructure (e.g., signs, 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 monitors to ensure access control measures are maintained and effective.
- Disseminate information regarding planned project activities via websites, social media, in-park signage, and/or via outreach to regular known user groups.

2.10 Tree Protection

The general management standards outlined in this CWPP are associated with oak woodlands and other hardwood stands where canopy retention is an overall goal. However, retained trees near vegetation management activities may be subject to impacts. The following protection measures are provided to minimize impacts to retained trees:

- 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. Use existing access roads or trails where available to reduce soil compaction.
- 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 crowns during operations. If limb removal is necessary for equipment operation, limbs should be pruned according to ANSI A300 standards.
- Avoid piling chips, soil, or other materials against the trunk/bole of retained trees.
- 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.
- For 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.