



# City of Santa Cruz

## Wildfire Resiliency Plan

**AUGUST 2025**

*Prepared for:*

**City of Santa Cruz**



*With grant funding from:*

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# City of Santa Cruz - Wildfire Resiliency Plan

*Prepared for:*



## City of Santa Cruz

### **Contacts:**

Tim Shields – *Division Chief, Prevention/Fire Marshal* - [tshields@santacruzca.gov](mailto:tshields@santacruzca.gov)

*In Collaboration with:*

City of Santa Cruz Water Department

City of Santa Cruz Parks and Recreation Department

City of Santa Cruz Public Works Department

*Prepared by:*



## Auten Resource Consulting

### **Contacts:**

Lindsey Jasperse – *Assistant Forester III* – [lindseyjasperse@arcforestry.com](mailto:lindseyjasperse@arcforestry.com)

Shelby Kranich – *Registered Professional Forester #3249* – [shelbykranich@arcforestry.com](mailto:shelbykranich@arcforestry.com)

Steve Auten – *Registered Professional Forester #2734* – [steveauten@arcforestry.com](mailto:steveauten@arcforestry.com)

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# List of Acronyms & Abbreviations

<b>ADD</b>	– Average Daily Demand
<b>ARC</b>	– Auten Resource Consulting
<b>ASHCP</b>	– Anadromous Salmonid Habitat Conservation Plan
<b>Cal-IPC</b>	– California Invasive Plant Council
<b>CalVTP</b>	– California Vegetation Treatment Program
<b>CIP</b>	– Capital Improvement Program
<b>CCI</b>	– California Climate Investments
<b>CDFW</b>	– California Department of Fish and Wildlife
<b>CDP</b>	– Coastal Development Permit
<b>CEQA</b>	– California Environmental Quality Act
<b>CGT</b>	– Cutting the Green Tape
<b>COSC</b>	– City of Santa Cruz
<b>CPUC</b>	– California Public Utilities Commission
<b>CWPP</b>	– Community Wildfire Protection Plan
<b>CZU Fire</b>	– 2020 CZU Lightning Complex Fire
<b>DBH</b>	– Diameter at Breast Height
<b>DDW</b>	– Division of Drinking Water
<b>EIR</b>	– Environmental Impact Report
<b>EOC</b>	– Emergency Operations Center
<b>EPP</b>	– Environmental Protection Plan
<b>ESHA</b>	– Environmentally Sensitive Habitat Areas
<b>FHG</b>	– Forest Health Grant
<b>FPR</b>	– Forest Practice Rules
<b>FRA</b>	– Federal Responsibility Area
<b>FRAP</b>	– Fire and Resource Assessment Area
<b>FTP</b>	– Forest Trend Plot
<b>GIS</b>	– Geographic Information Systems
<b>HCP</b>	– Habitat Conservation Plan

**HDPE** – High Density Polyethylene

**IPM** – Integrated Pest Management

**LRA** – Local Responsibility Area

**Mgd** – Million Gallons per Day

**MM** – Mitigation Measure

**MND** – Mitigated Negative Declaration

**NOID** – Notice of Impending Development

**OMHCP** – Operations and Management Habitat Conservation Plan

**PEIR** – Programmatic Environmental Impact Report

**PG&E** – Pacific Gas & Electric Company

**PRC** – Public Resources Code

**PSA** – Project Specific Analysis

**PWP** – Public Works Plan

**RCDS** – Resource Conservation District Santa Cruz County

**ROE** – Right-of-Entry

**RPF** – Registered Professional Forester

**RPP** – Regional Prioritization Plan

**SERP** – Statutory Exemption for Restoration Projects

**SMRCD** – Resource Conservation District San Mateo County

**SRA** – State Responsibility Area

**SPR** – Standard Project Requirements

**TPA** – Trees per Acre

**TWG** – Technical Working Group

**UCSC** – University of California Santa Cruz

**VMP** – Vegetation Management Program

**VTS** – Vegetation Treatment Standards

**WPG** – Fire Prevention Grant

**WRP** – Wildfire Resiliency Plan

**WUI** – Wildland Urban Interface

# Executive Summary

Across the Santa Cruz Mountains, landscapes are experiencing increasing wildfire risk and significant vegetation type changes. These changes reflect the long-term impacts of intensive land use, wildfire suppression, and climatic shifts including rising temperatures, variable precipitation, intensified heat waves, reduced soil moisture, and prolonged and extensive drought. These combined impacts have resulted in higher density forests, significant fuel accumulation, and notable shifts in vegetation. Concurrently, the continued increases in development, housing density, communities within the wildland urban interface (WUI), and unhoused populations and associated ignitions further amplify the risk of wildfire in surrounding communities. The 2020 CZU Lightning Complex Fire (CZU Fire), which burned approximately 86,509 acres across the Santa Cruz Mountains with approximately 44,000 acres burning in 9-12 hours (stated by CAL FIRE Unit Chief Ian Larkin on the morning of August 22<sup>nd</sup>, 2020, four days after the start of the CZU Fire) demonstrated the reality of wildfire risk throughout the region and underscored the need for strategic, coordinated, forward-thinking actions to protect communities, infrastructure, and ecosystems from future wildfire impacts.

The City of Santa Cruz (COSC), like many regional landowners, faces growing threats from wildfire risk, driven by vegetation changes, climatic shifts, and continued development in the WUI. COSC lands span both urban and wildland areas across the City and County of Santa Cruz, support a diverse array of vegetation types, and contain critical infrastructure that serves residents city-wide. These lands also act as a key linkage for ecosystems, wildlife, recreation, and local water supply, making them an essential component in regional wildfire planning efforts.

## Purpose & Scope of the Wildfire Resiliency Plan (WRP)

Recognizing that time is of the essence, the COSC initiated the development and implementation of the Wildfire Resiliency Plan (WRP) – a strategic, department-led planning document intended to guide and support the implementation of prioritized vegetation management and wildfire risk reduction strategies on COSC lands. The WRP identifies and prioritizes strategic treatment recommendations, provides cost estimates and initial site assessments, and highlights actions already underway to reduce wildfire risk, protect critical infrastructure, and strengthen inter-departmental and regional collaboration. Even in this development stage, the plan has already served as a catalyst for several important actions, prompting permitting efforts, funding opportunities, and alignment with regional initiatives. Though not intended to serve as a legally binding regulatory plan, comprehensive California Environmental Quality Act (CEQA) analysis, or a final implementation schedule, the WRP serves as a living framework to guide and facilitate treatment planning, permitting, funding pursuit, and long-term resilience efforts across COSC properties.

Developed within the broader context of the City’s approach to public safety, emergency preparedness and response, and hazard mitigation, the WRP is designed to integrate with several COSC-led planning initiatives and documents. This plan supports key elements of COSC’s *General Plan*, the *Local Hazard Mitigation Plan*, and the *Emergency Operations Plan* – which together form a comprehensive framework for planning, implementation, and emergency management actions that advance wildfire resilience.

The WRP was developed through a collaborative effort involving COSC Fire, Parks and Recreation, Water, and Public Works Departments– collectively forming the WRP Technical Working Group (TWG). These entities participated in interdepartmental discussions and field tours, helping to ensure alignment of the WRP with COSC-wide and department-specific goals and objectives. In conjunction with this effort, vegetation treatment zones and strategies were developed and prioritized based on site-specific conditions evaluated through field investigations and Geographic Information Systems (GIS) analysis.

## Highest Priority COSC Sites for Treatment

Four critical areas ([Priority 1-4](#)) for vegetation management and fuel reduction treatments on COSC lands, which span approximately 108 acres, in addition to critical fire roads upgrades ([Priority 5](#)), are identified in the WRP. On-the-ground treatment implementation costs for [Priority 1-4](#) COSC sites are estimated to cost approximately \$565,000-\$1,260,000. These treatments and cost estimates are described below, and in subsequent sections of the WRP.

A total of [107.6 acres](#) of priority treatments across [Priority 1-4](#) COSC sites<sup>1</sup> should begin implementation within 1-2 years. These sites are considered top priority due to the number of people impacted or served and the current density of vegetative conditions. Additional details on Priority 1-5 COSC treatments are outlined in *Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate*. Table 1 below provides the location, treatment acreage and estimated cost for on-the-ground treatment implementation. These costs do not include estimated costs for mitigation implementation, project administration, or future maintenance costs that are expected to be significantly cheaper following initial treatments (actions are underway for permitting all treatments on COSC lands); the range of these additional costs would depend on the permitting and treatment implementation strategy utilized. The range of treatment costs listed in Table 1 are based on the treatment activities applied (reference *Priority Cost Estimate* for description of cost estimates based on treatment activity).

Table 1. The location, priority level, treatment acreage, and estimated costs for the highest priority COSC sites identified for treatment in the WRP.

Treatment Site	Priority Level	Treatment Area (acres)	Cost Estimate*
DeLaveaga Park Priority Treatment Zone 1 – Emergency Operations Center (EOC)/Netcom	1	32.6	\$262,300-\$506,000
Water Department Sites #1-6	2	7.6	\$22,800-\$76,000
Pogonip Open Space Preserve Priority Treatment Zone 1	3	66.4	\$271,700-\$664,000
Water Department Site #7	4	1.0	\$8,000-\$10,000
<b>Total Cost: \$564,800-\$1,256,000</b>			

\*Cost estimates do not include mitigation implementation, project administration and oversight, future maintenance costs, or Priority 5 critical roads maintenance and upgrades due to the variability of costs per treatment site; treatment sites may be grouped or treated independently, which may result in varying cost analyses.

Additional priority treatments include approximately [269.1 acres](#) of on-the-ground treatments at priority sites that should be initiated within 3-4 years or as funding is available. Further information on these sites is included in *Section II: Water Department Priorities* and *Section III: Parks and Recreation & Public Works Departments Priorities*, with priorities listed by department (Water and Parks and Recreation/Public Works). Total priority treatments considered for immediate planning and action in the WRP is approximately [376.7 acres](#).

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<sup>1</sup> Treatment acreage totals and cost estimates do not include Priority 5 COSC critical roads; further evaluation is needed to assess site-specific maintenance and upgrade needs, treatment type and extent, and estimated costs.



## Wildfire Resiliency and Response Dashboard

The development of a COSC Wildfire Resiliency and Response Dashboard is a key recommendation as part of the WRP. The dashboard could utilize ESRI ArcGIS Pro and Field Maps and serve as an interdepartmental platform that compiles information on critical COSC infrastructure, fire response access routes, and site prioritization to ultimately aid in wildfire response and planning. Having this information compiled in an online real-time platform could allow for the Fire Department to have access to identified key fire access points adjacent to and within COSC properties, including Water Department infrastructure sites, with associated fire apparatus access type and road condition information; or allow for the Parks and Recreation Department to plan, track, and implement treatments, with the ability to access online treatment areas and information while in the field, make notes and adjust treatments, and develop long-term treatment tracking and monitoring.

## COSC Wildfire Resiliency Actions Underway

Building on the outcomes of the WRP, COSC has advanced a series of strategic actions that reduce wildfire risk and contribute to broader collaborative initiatives across the region. Together, these initiatives highlight the WRP's role in advancing actions that increase the pace and scale of treatment implementation across COSC lands, while also demonstrating COSC's on-going commitment to long-term wildfire resiliency efforts that protect the communities and ecosystems it serves. Actions underway for [Priority 1-4 WRP treatments](#) are outlined below.

**Regional Prioritization Plan (RPP)** – As part of this work, COSC submitted the Priority 1-4 WRP treatments to the RPP. The RPP is a regional prioritization process led by the Resource Conservation Districts of San Mateo and Santa Cruz Counties (SMRCD, RCDSCC) generally focusing on forest health, wildland fuels reduction, ecosystem health, research, and community defensible space to enhance fire resilience and mitigate the risk of catastrophic wildfires. This regional effort develops a form of prioritization across multiple projects preparing for expected block funding from Prop 4.

### Actions for Priority 1 and Priority 3 Treatment Zones

- **DeLaveaga Park, Priority Treatment Zone 1 – Emergency Operations Center (EOC)/Netcom:** has received a permit under the 2025 Governor's Suspension under Governor Newsom's Executive Order N-25-25<sup>2</sup> as of June 4, 2025, with acquisition of funding currently under consideration.
- **Pogonip Open Space Preserve, Priority Treatment Zone 1:** has secured \$250,000 through the RCDSCC's 2024-2025 Forest Health Grant (FHG) awarded in May 2025 to conduct approximately 50 acres of vegetation treatments focused on forest health and fuels reduction. Consideration is being given to apply for a Governor's Suspension under Governor Newsom's Executive Order N-25-25 for this location since it is funded.

**California Vegetation Treatment Program (CalVTP) Project Specific Analysis (PSA)** – In parallel with the RPP, COSC Fire Department is actively pursuing the development of a CalVTP PSA with the Coastal Conservancy who appears intent on funding the development of this permit. The CalVTP is a statewide program designed to streamline CEQA review for large-scale forest health and fuel reduction projects. A COSC CalVTP would act as a long-term CEQA compliance strategy for initial and maintenance treatments, given that CEQA does not expire. The CalVTP would need to be amended overtime if there were significant changes to the project or circumstances, or when new information of substantial importance emerges that reveals new or more severe significant environmental effects not previously addressed. The CalVTP would

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<sup>2</sup> Reference *Fast Tracking Critical Fuels Reduction Projects: Requests to Suspend State Statutes and Regulations*: <https://wildfiretaskforce.org/requests-to-suspend-state-statutes-and-regulations/>.

provide CEQA compliance across all COSC lands and accelerate treatment actions including those prioritized in the WRP including long-term maintenance.

## **Conclusions**

This document provides professional recommendations and prioritized actions for consideration at the forefront, followed by a discussion of rationale in later sections. As mentioned, the recommended prioritized actions should be promptly considered for implementation and permitting. [Priority 1-4](#) treatments may cost approximately \$1,000,000 and do not consider estimated costs for mitigation implementation, project administration, future maintenance costs, or critical COSC road upgrades ([Priority 5](#)).

With a total of almost 6,000 acres of COSC land, and based on the current grant climate, it appears possible that permitting and initial treatments for COSC lands could be completed. However, the current grant climate may change and COSC should begin preparing for a wildfire resilience budget each year. Commonly considered for other public land blocks of this size are two dedicated positions that physically conduct wildfire resilience maintenance treatments on-the-ground and 1-2 pieces of heavy equipment to support treatment implementation. The implementation of restorative forest management treatments should consider that restoration and wildfire resilience is a long-term process that requires dedication to a focused and strategic effort – it took over 100 years for these systems to develop their existing impairments and it will likely take this amount of time, or more, to restore the ecosystem’s optimum function, health, and resilience to wildfire.

# Structure & Purpose of Document

## Structure

The COSC WRP is organized into several sections that range from establishing the document's context and significance, to providing essential information for the planning and implementation of restorative forest management projects. The WRP is designed to have a prioritized structure, in which key outcomes and information – including treatment recommendations, strategies, and priorities – are located at the front of the document, followed by supporting background information. The document is organized into the following sections:

**Section I – Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate**

describes the highest priority (Priority 1-4) COSC sites for treatments, including corresponding treatment recommendations and strategies; in addition to other COSC priority recommendations. This section also outlines key information for treatment implementation such as cost estimates.

**Section II – Water Department Priorities** provides an overview of Water Department priority sites, treatment prioritization justification, and priority sites and treatment recommendations and strategies.

**Section III – Parks and Recreation & Public Works Departments Priorities** provides an overview of Water Department priority sites, treatment prioritization justification, and priority sites and treatment recommendations and strategies.

**Section IV – Wildfire Resiliency & Response Dashboard** describes the WRP recommendation for a COSC interdepartmental mapping dashboard to support wildfire resiliency and response efforts.

**Section V – WRP Development Methods** provides necessary context for the prioritized treatment recommendations such as background analysis, treatment prioritization considerations, and introduces the proposed treatment activities and vegetation treatment prescriptions. Ultimately, the purpose of this section is to provide the necessary information and context for the contents of *Sections I-III*.

**Section VI – Treatment Strategies & Priority Treatment Zone Descriptions** describes the Priority Treatment Zones and treatment strategies (i.e., activities and prescriptions) recommended for implementing WRP treatments.

**Section VII – Permitting, Regulatory Compliance & Implementation** outlines permitting frameworks and pathways, analyzes estimated treatment costs for prioritized treatments, identifies opportunities for prescribed burning, and discusses potential funding and regional collaboration opportunities. The purpose of this section is to provide information necessary to take the next steps toward implementing the prioritized recommended actions.

**Section VIII – Background** provides background information on the WRP area and sets the stage for existing ecosystem conditions and climatic trends that drive vegetation treatment prescriptions.

## Purpose

The WRP functions as a guide to implement vegetation management actions that reduce wildfire risk and restore more resilient vegetated ecosystems within the WUI, open space properties, and around critical infrastructure and assets throughout the COSC. The WRP was developed in collaboration with the COSC Fire, Water, Parks and Recreation, and Public Works Departments to assess the existing conditions of vegetation within or immediately surrounding COSC sites; the result is a comprehensive roadmap for wildfire resilience that is established through the identification of prioritized recommendations for vegetation management and reducing wildfire risk around critical infrastructure and assets. The WRP is driven by COSC's responsibility to provide safe, high-quality water sources for nearly 100,000 people, reduce wildfire risk in the WUI, and in proximity to communities and ignition concentrations associated with unhoused populations<sup>3</sup>, provide adequate emergency response services through the use of strategic ingress and egress, and maintain the well-being and function of COSC's assets. The intent is that the COSC Fire, Water, Parks and Recreation, and/or Public Works Departments can use the WRP to identify projects for implementation as funding becomes available and to provide the site-specific justification to present to City Council, if approval is needed. Key considerations and strategies for implementation, such as, but not limited to estimated implementation costs, regulatory compliance pathways for vegetation treatments, and funding opportunities, follow the recommended priorities in *Section VII: Permitting, Regulatory Compliance & Implementation* of the WRP.

### **COSC Wildfire Resilience Goals:**

Wildfire resilience goals developed as part of the WRP establish standards for vegetation management strategies and outcomes across COSC lands. These goals also support COSC emergency management objectives by reducing wildfire risk to life, property, and critical infrastructure before an emergency occurs. Fuel reduction, defensible space, and emergency access improvements help to protect communities, vital assets, and environmental resources – key objectives of the City's emergency management and *Emergency Operations Plan*. Together, these proactive measures and shared goals strengthen the City's emergency preparedness and planning, and enable faster response and recovery.

WRP wildfire resilience goals include the following:

- Manage vegetation and forests to increase resilience in the anticipation of climatic trends in COSC lands, by implementing treatments that:
  - Reduce fuel loads, increase biodiversity, and promote forest health and the growth of larger, more resilient trees;
- Maintain and protect a safe, high-quality supply of water for nearly 100,000 people;
- Establish and maintain strategic roadside fuel breaks and road infrastructure that facilitate emergency ingress and egress; and
- Establish and maintain defensible space in proximity to communities and critical infrastructure and assets.

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<sup>3</sup> While the treatments prioritized in the WRP focus on managing fuels and vegetation, as well as improving fire response efforts near areas with high human-caused ignition risk, the WRP does not address the underlying causes of these ignitions. However, addressing the source of ignitions is a critical step in reducing wildfire risk and increasing resilience across COSC lands. COSC should continue exploring strategies to reduce ignitions alongside the implementation of WRP treatments.

## Integration with Existing COSC Planning

In addition to the goals stated above, the WRP is designed to integrate with existing COSC planning related to hazard mitigation, emergency operations and response, land use, and public safety. The WRP directly supports and aligns with the Safety Element of the COSC's *General Plan 2030*, the *Local Hazard Mitigation Plan*, and the *Emergency Operations Plan* by addressing wildfire as a shared threat across these documents and providing actionable strategies to reduce risk. The Safety Element identifies wildfire as a key hazard to public safety, property, and critical infrastructure, and promotes goals, objectives, and action plans to address wildfire hazard (City of Santa Cruz, 2018). The WRP operationalizes this policy intent by defining site-specific treatment zones and recommending vegetation treatment projects on city-owned lands, directly advancing actions that reduce exposure and increase community resilience.

The *Local Hazard Mitigation Plan* prioritizes wildfire risk reduction and establishes mitigation goals to protect life and property. The WRP implements these goals by detailing immediate and long-term treatment actions, pursuing permitting pathways, and securing funding to reduce vegetative fuel loads and mitigate wildfire impacts.

The *Emergency Operations Plan* focuses on response and coordination during incidents. The WRP complements this by enhancing wildfire preparedness while reducing the severity of potential incidents; thus improving emergency access, reducing response time, and protecting critical infrastructure such as communications and water systems that are essential to emergency operations.

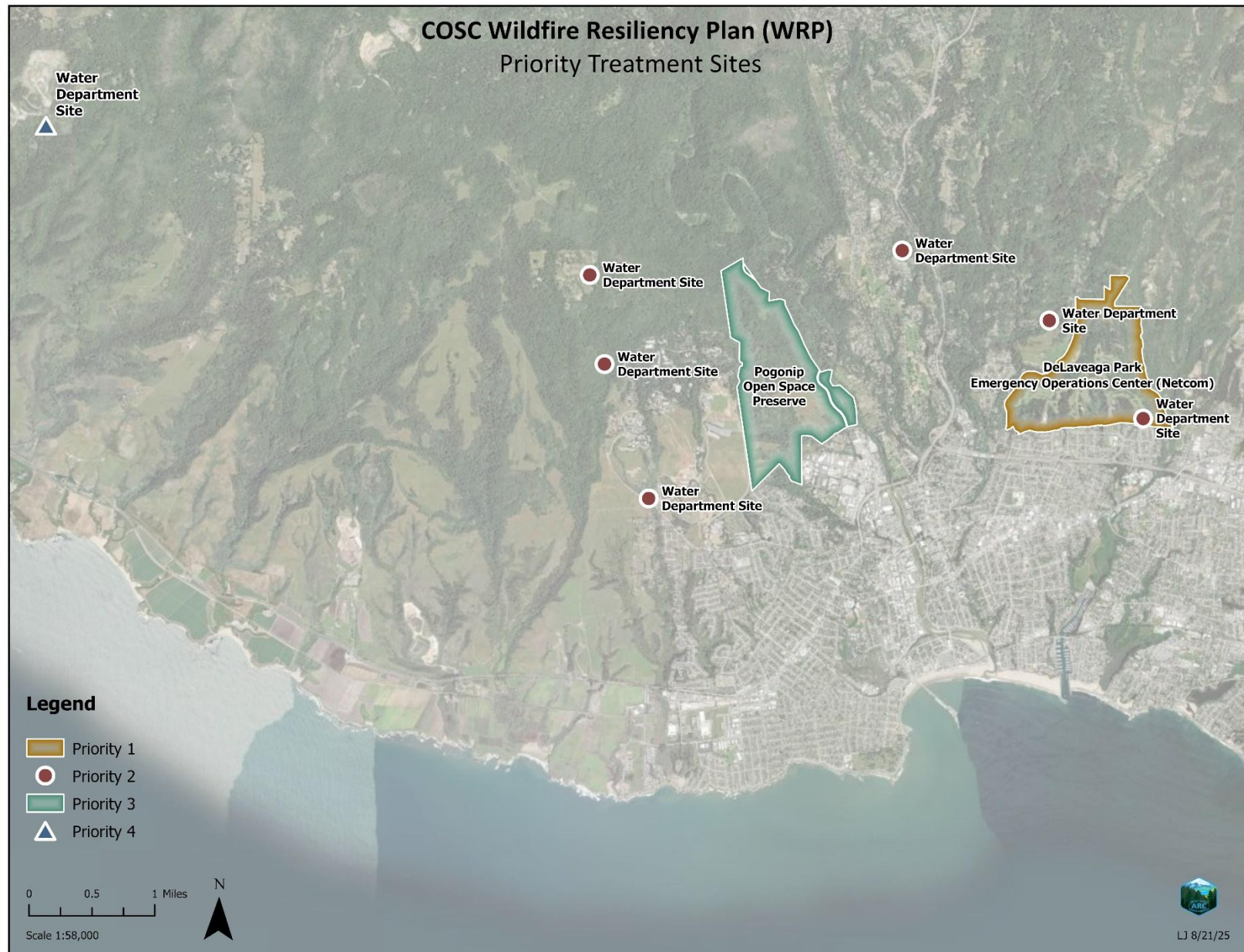
Together, these documents form a comprehensive framework: the *General Plan 2030* Safety Element sets policy direction, the *Local Hazard Mitigation Plan* identifies mitigation priorities, the WRP executes risk reduction on the ground, and the *Emergency Operations Plan* guides response. The WRP serves as a bridge between planning and implementation, ensuring consistent, proactive wildfire resilience across all phases of emergency management.



# Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate

## COSC Priority Treatments

This section provides an overview of the overall highest priority COSC sites identified for vegetation treatments as part of the WRP. These priority treatment sites (Map 1) represent areas where vegetation treatments or recommendations should be prioritized for implementation and considered immediately as funding becomes available due to the number of people impacted or served by each site, existing vegetative conditions, and/or history of ignitions associated predominantly with unhoused populations (reference *Section V: Wildfire Resiliency Plan (WRP) Development Methods* for further information on 2019-2024 ignitions data). Priority treatments and recommendations for each site are outlined below, including Priority Treatment Zones with corresponding treatment prescriptions (Table 3), documentation of vegetation and site conditions, and cost estimates for priority treatments (Table 4).



Map 1. Priority COSC Treatment Sites. *Map Not to 1:58,000 Scale.*

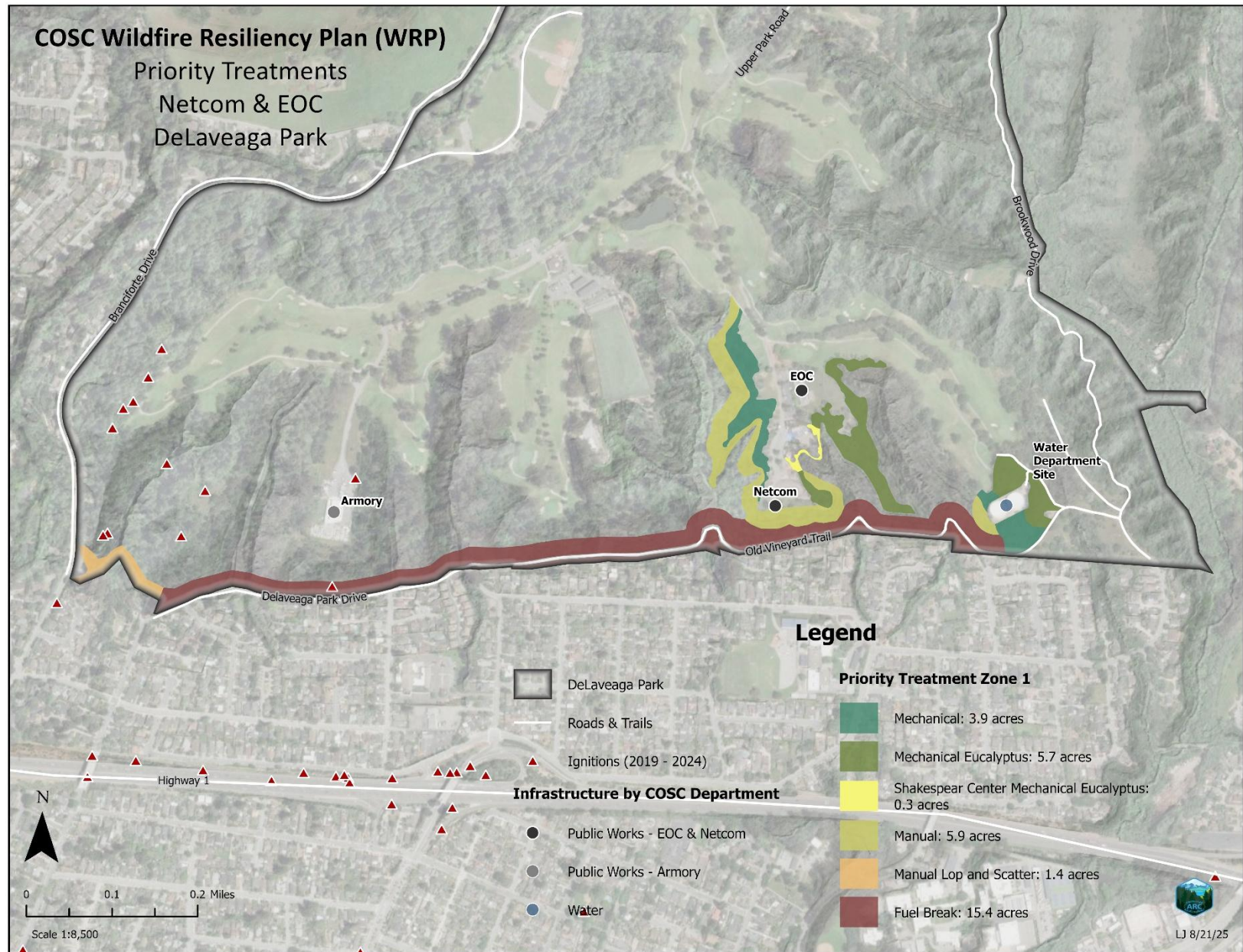
## Priority 1: DeLaveaga (Priority Treatment Zone 1)

A primary consideration in the prioritization of DeLaveaga Priority Treatment Zone 1 (Map 2) is the presence of critical infrastructure, including the EOC and Santa Cruz Regional 9-1-1 (Netcom), which provide essential public safety services to approximately 330,000 people across Santa Cruz and San Benito Counties.

DeLaveaga Priority Treatment Zone 1 also includes treatments adjacent to other COSC infrastructure sites, such as a Water Department site that provides substantial storage to the City's water supply, and the nearby Armory shelter, which serves the City's unhoused populations. Furthermore, vegetative conditions (Figure 1) within this area, and surrounding infrastructure, are conducive to increased fire risk and behavior. There is a history of concentrated fire ignitions within or in proximity to DeLaveaga between 2019-2024, predominantly related to warming or cooking fires associated with unhoused populations (reference *Section V: Wildfire Resiliency Plan (WRP) Development Methods*).

Treatments in this zone are strategically positioned to reduce the risk of ignition, minimize fire behavior, and increase protection around critical infrastructure. DeLaveaga Priority Treatment Zone 1 also represents a large, centrally located wildland area adjacent to communities, where treatments have the potential to help slow the spread of wildfire across the immediate region. Reference *Section III: Parks and Recreation & Public Works Departments Priorities* for additional Priority Treatment Zones and justification for prioritization for DeLaveaga Park (DeLaveaga).





Map 2. DeLaveaga Priority Treatments (Priority Treatment Zone 1). Map Not to 1:8,500 Scale.

## ***Treatment Recommendations & Strategies***

DeLaveaga Priority Treatment Zone 1 (Map 2) is proposed as the highest priority treatment area and recommendation within DeLaveaga, in addition to the highest priority site across all COSC sites (Map 1), based on the treatment prioritization criteria described in *Section V: Wildfire Resiliency Plan (WRP) Development Methods*. This Priority Treatment Zone 1 covers the lower portion of DeLaveaga bordered by DeLaveaga Park Drive and Old Vineyard Trail, DeLaveaga. Priority Treatment Zone 1 encompasses the area surrounding the EOC including Santa Cruz Regional 9-1-1 (Netcom), and a Water Department site. Fuel breaks mapped in DeLaveaga Priority Treatment Zone 1 correspond with critical COSC roads identified as priority 5 for overall COSC priority treatments.

This area consists of predominantly forested areas with eucalyptus (*Eucalyptus globulus*) and Monterey pine (*Pinus radiata*)/Monterey cypress (*Hesperocyparis macrocarpa* or *Cupressus macrocarpa*) forests, in addition to areas of riparian woodland, oak woodland, and non-native species (*Appendix A: Maps*, Map A1). Priority Treatment Zone 1 includes infrastructure sites managed by the Public Works Department (EOC/Netcom) and Water Department (Site #2), situated within the larger park area maintained by the Parks and Recreation Department. These treatments are intended to both create protection immediately surrounding critical infrastructure sites while also focusing on strategic landscape-scale fuel and vegetation reduction treatments.

### **DeLaveaga Priority Treatment Zone 1 - Recommendation 1**

*DeLaveaga Priority Treatment Zone 1 - Recommendation 1* includes the implementation of treatments within DeLaveaga Priority Treatment 1 (Map 2). DeLaveaga Priority Treatment Zone 1 is a total of approximately 32.6 acres. Fuel break treatments (15.4 acres) are designated along edges of selected existing roads on the park's southern boundary to maximize protection of the EOC and improve wildfire response access. Corresponding treatment activities and prescriptions for *DeLaveaga Priority Treatment Zone 1 - Recommendation 1* are described below.

#### *Treatment Activity*

Both manual and mechanical treatments are proposed within Priority Treatment Zone 1, with each treatment activity delineated into distinct areas based on varying treatment prescription specifications and methods (Table 2, Map 2). Manual treatments are proposed for a total of 7.3 acres. Manual treatments are delineated into areas of manual (i.e., understory treatments with option to chip or masticate piles; 5.9 acres) and manual log and scatter treatments (1.4 acres).

Mechanical treatments may occur on up to approximately 9.9 acres in Treatment Zone 1 on slopes generally less than 35 percent and no greater than 50 percent, 30-100 ft. away from all drainages<sup>4</sup>. Mechanical treatments are delineated into areas of mechanical (i.e., understory mastication; 3.9 acres) and mechanical eucalyptus treatments (6.0 acres) with follow-up herbicide application on 5.7 acres. Fuel breaks (15.4 acres), located primarily along the uphill side of DeLaveaga Park Drive and Old Vineyard Trail where portions extend approximately 100 ft. from the road edge, would be established using primarily mechanical treatment activities (i.e., mastication), but some level of manual treatments may be required on slopes inaccessible to

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<sup>4</sup> These distances pertain to Watercourse and Lake Protection Zones (WLPZ) and Equipment Limitation Zones (ELZ) avoidance buffers established on either side of watercourses for watercourse protection, based on 14 CCR Section 916.5 of the California Forest Practice Rules. A buffer of approximately 50 ft. was used for DeLaveaga Priority Treatment Zone 1; the Statewide Fuels Reduction Environmental Protection Plan (EPP) for the Governor's Executive Order defines the intermittent stream standard width as 50 ft and 100 ft. for perennial streams.



mechanized equipment (i.e., hand cut and drag to a chipper or lop and scatter). Fuel breaks correspond with critical COSC roads identified as priority 5 for overall COSC priority treatments.

Strategic maintenance mowing of grasslands for the purposes of fuel breaks should continue and be considered for expansion in Priority Treatment Zone 1 to reduce coyote brush (*Baccharis pilularis*) or future conifer encroachment.

#### *Treatment Prescription*

The treatment prescriptions listed below in order of priority apply to the *DeLaveaga - Recommendation 1* (Table 2). These specifications should be referenced alongside general treatment prescription categories and specifications to understand the full range and retention for vegetation treatments (Table 3).

Table 2. DeLaveaga Priority Treatment Zone 1-Specific Treatment Summary.

Treatment Activity	Acres	Site-Specific Specifications
Mechanized	3.9	<ul style="list-style-type: none"> <li>• <b>Treat</b> understory vegetation up to 12 in. Diameter at Breast Height (DBH), utilizing mastication</li> </ul>
Mechanized - Eucalyptus	6.0	<ul style="list-style-type: none"> <li>• <b>Remove</b> all eucalyptus up to 16 in. DBH, chip into site, and stump-application of herbicide<sup>5</sup>; or <b>remove</b> all eucalyptus of any size <ul style="list-style-type: none"> <li>- <b>Maintain</b> with follow-up treatments utilizing initial treatment activities and specifications</li> <li>- Conduct site evaluation one year following treatments to determine restoration to native communities</li> </ul> </li> </ul>
Manual	5.9	<ul style="list-style-type: none"> <li>• <b>Treat</b> understory vegetation up to 12 in. DBH, utilizing mastication or chipping of material piles</li> </ul>
Manual – Lop & Scatter	1.4	<ul style="list-style-type: none"> <li>• <b>Treat</b> understory vegetation up to 6 in. DBH utilizing lop and scatter, with a remaining slash height of 18 in.</li> </ul>
Fuel Break	15.4	<ul style="list-style-type: none"> <li>• <b>Treat</b> understory vegetation, utilizing mastication within reach of road and chipping of remaining material into the site up to 8 in. DBH</li> </ul>

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<sup>5</sup> Reference the COSC Integrated Pest Management (IPM) Guidance Manual, as well as Department IPM coordinators, for policies and procedures related the City's IPM approach, such as pesticide use practices.

## DeLaveaga Priority Treatment Zone 1 - Recommendation 2

Maintain and improve defensible space surrounding buildings and critical infrastructure located in Priority Treatment Zone 1, including the EOC and Water Department Site, by removing trees and vegetation within up to 100 ft. of all structures in accordance with CAL FIRE's LE-100, per the Defensible Space treatment prescription and additional treatment prescriptions below. While *DeLaveaga 1 - Recommendation 1* treatments aim to treat vegetation and fuels both across the landscape and surrounding infrastructure, additional defensible space treatments should be immediately implemented as part of *DeLaveaga Priority Treatment Zone 1 - Recommendation 2*.

### *Treatment Activity*

The treatment prescriptions below would utilize primarily a combination of manual and mechanical treatments, including the treatment activities discussed above for *DeLaveaga - Recommendation 1*, Priority Treatment Zone 1 treatments. Additionally, targeted herbicide and prescribed herbivory treatment activities could be utilized where appropriate on invasive and/or non-native species.

### *Treatment Prescription*

The treatment prescriptions listed below in order of priority apply to Priority Treatment Zone 1, *DeLaveaga - Recommendation 2* (Table 2; Table 3).

- Defensible Space
- Hazard Tree
- Invasive Species



Figure 1. DeLaveaga Treatment Zone 1 Vegetation Conditions. EOC and Netcom (top row and bottom left); proposed fuel break along Old Vineyard Trail below the EOC/Netcom (bottom right).

## Priority 2: Water Department Sites #1-6

Several Water Department Sites, including Sites #1-6<sup>6</sup>, are identified as high priority for vegetation treatments. These sites play an essential role in both storage and distribution for the City's water system, supporting several pressure zones, and notably the Gravity Zone. The Gravity Zone is a crucial component of the City's water system, with an Average Daily Demand (ADD) of over 6.0 million gallons per day (mgd) – the highest across all zones, representing 78% of total ADD (City of Santa Cruz Water Department, 2023). The University system is essential for supplying the University of California Santa Cruz (UCSC), the system's largest elevated pressure zone and consumer, with an additional ADD of approximately 1.0 mgd (City of Santa Cruz Water Department, 2023). These two zones are particularly significant due to their high ADDs, reflecting the large populations they serve across the region. These sites also house important infrastructure such as pump stations, tanks, valves, and communications systems. Essentially, these sites support thousands of people and businesses daily. During a wildfire-related emergency, these sites are key for maintaining water supply and ensuring the continued operation of the City's water system for the communities it serves.

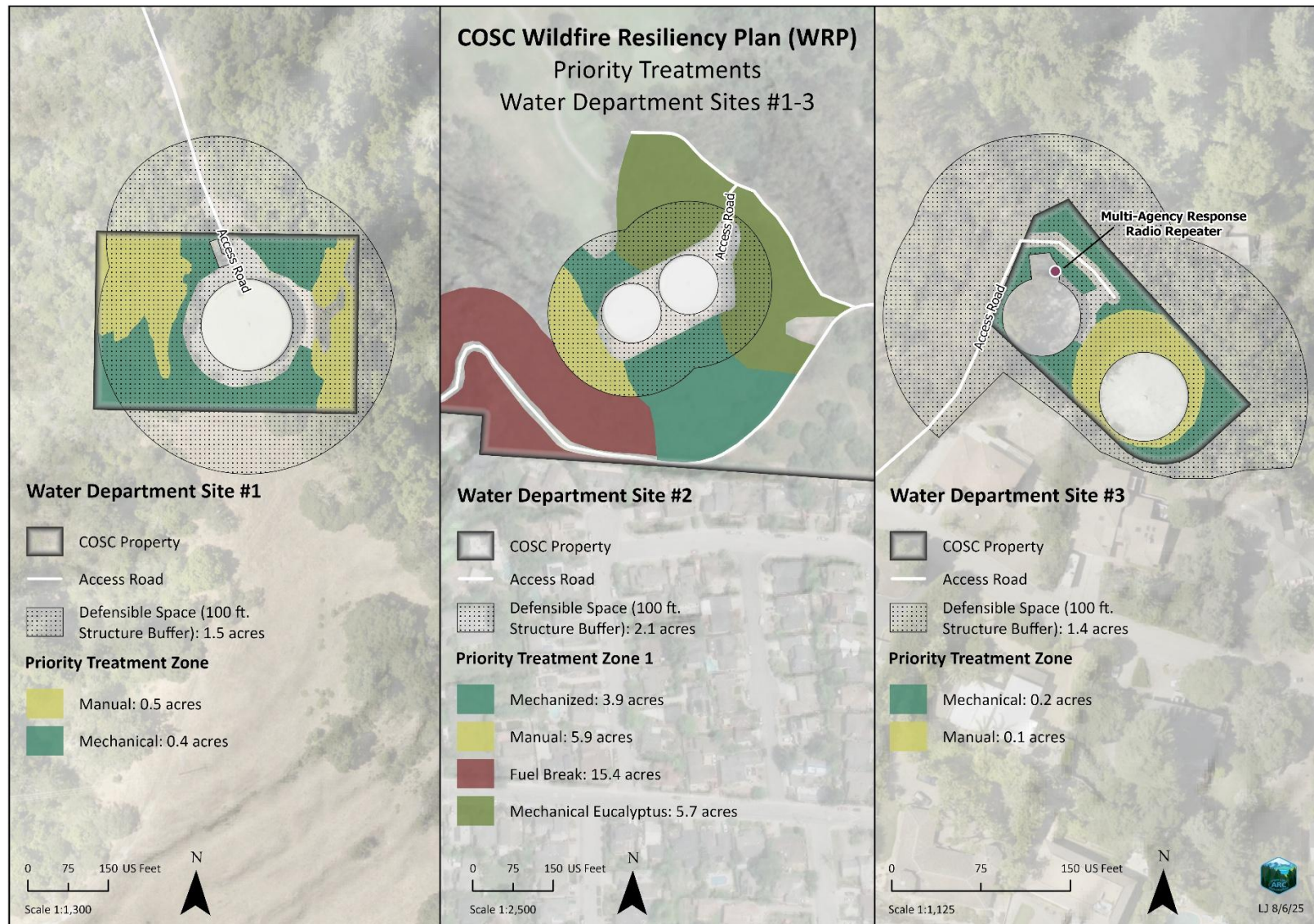
Priority Treatment Zones identified for Water Department Sites #1-6 indicate approximate areas where priority treatments may be implemented with the primary goal of establishing defensible space surrounding critical infrastructure, per *Water Department Sites #1-6 - Recommendation 1* below. For some sites, the 100 ft. structure buffer extends beyond COSC property; therefore, treatments that establish defensible space in accordance with the LE-100 requirements should be completed up to the fence or property line at minimum. For sites where COSC property boundaries do not extend beyond 100 ft. of infrastructure, COSC should consider pursuing a right-of-entry (ROE) agreement to maximize the protection of critical infrastructure sites. Treatments and defensible space buffers mapped beyond fence or property lines in the Priority 2 Treatment Zones are included for consideration of future treatment prioritization, contingent on pursual of ROEs. Again, the treatment prescriptions listed for *Water Department Sites #1-6 - Recommendations 1-2* represent the minimum recommended prescriptions. Additional manual or mechanical treatments under the Forest Health Fuels Reduction prescription (Table 3) that expand beyond defensible space and roadside treatments should be considered to increase treatment extents. Additional justification for prioritization is outlined in *Section II: Water Department Priorities*.

The following sections describe the conditions and treatments identified for each site.

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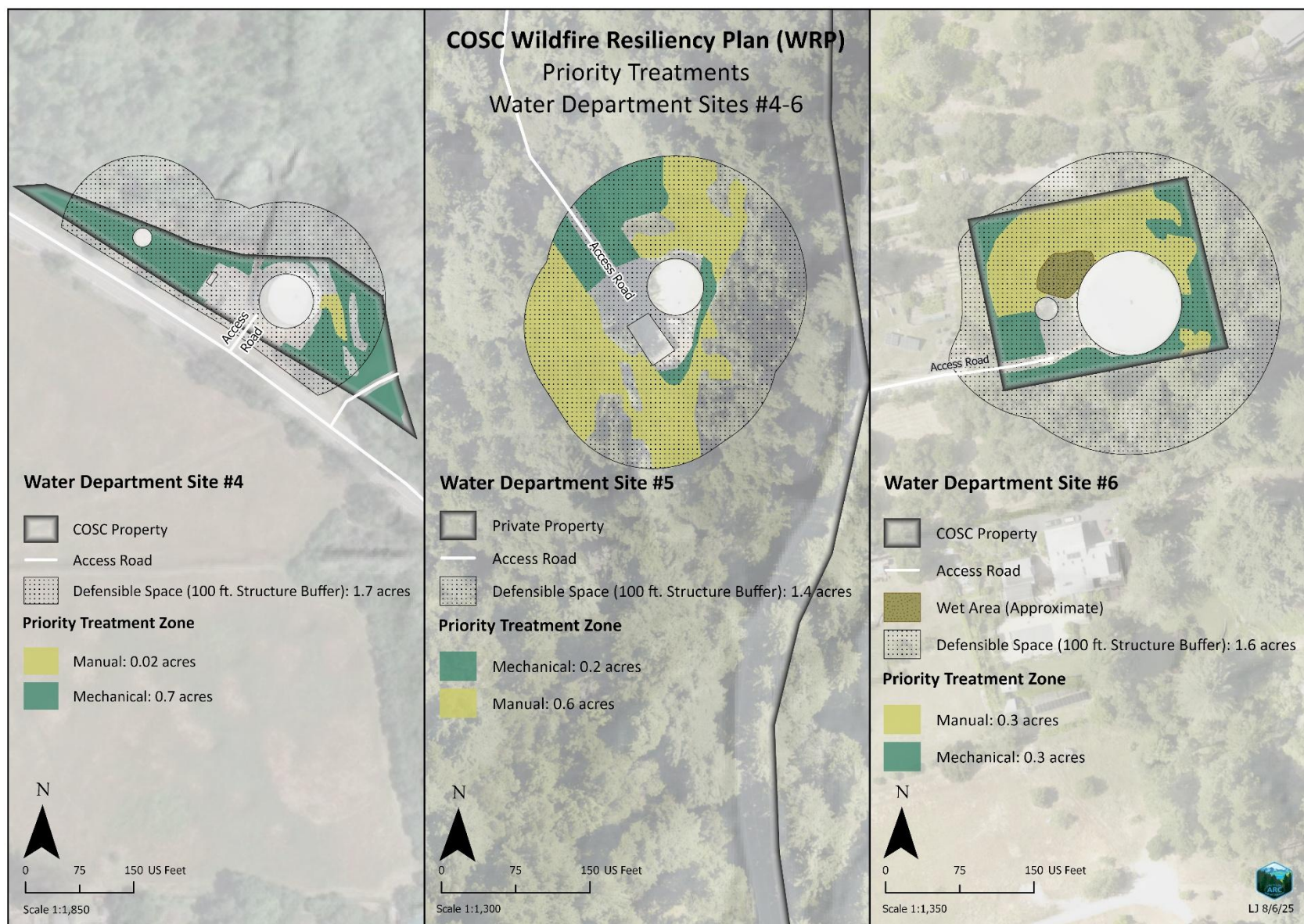
<sup>6</sup> All Water Department Sites are outlined with more detail in the *Internal Water Department WRP*.





Map 3. Water Department Sites #1-3, Priority Treatments (Example Priority Treatment Zones). Water Department Site #1 (Left), Site #2 (Middle), Site #3 (Right). *Maps Not to 1:1,300, 1:2,500, and 1:1,125 Scales.*





Map 4. Water Department Sites #4-6 Priority Treatments (Example Priority Treatment Zones). Site #4 (Left), Site #5 (Middle), Site #6 (Right). *Maps Not to 1:1,850, 1:1,300, and 1:350 Scales.*



### **Water Department Site #1:**

Water Department Site #1 (Map 3) serves a critical function in supplying the Gravity Zone, with a storage capacity of 1.0 mg. Vegetation within Site #1 and surrounding lands include predominately woodlands and Douglas-fir (*Pseudotsuga menziesii*) forest, with a large grassland area along the southern boundary of the property (*Appendix A: Maps*, Map A2). Difficult fire engine access and potentially limited capabilities for fire response and defense during a wildfire are key concerns at the site. Site-specific treatment considerations include the removal of up to all trees within the fenced area and to the property line due to having limited emergency access to the site and having dense fuel connectivity beyond the fenced property line. While not evaluated as part of the WRP, additional sites associated with Water Department Site #1 should also be considered for defensible space treatments given their role in supplying water to Site #1, in addition to highly vegetated conditions. The example Priority Treatment Zone includes approximately 1.5 acres of defensible space (100 ft. structure buffer), and approximately 0.5 acres of manual and 0.4 acres of mechanical treatments within the COSC property boundary.

### **Water Department Site #2:**

Water Department Site #2 (Map 3) functions as Gravity Zone storage and is also included as part of other Priority Treatment Zones described in the WRP due to proximity. Vegetation surrounding Water Department Site #2 is predominantly eucalyptus, Monterey cypress, Monterey pine, oak woodlands, and grasslands (*Appendix A: Maps*, Map A3). The site is situated within a large wildland area in proximity to high housing density. Combined with dense vegetation, high fuel accumulation, and proximity to ignitions, these factors create hazardous conditions conducive to increased fire risk and behavior. Treatments immediately surrounding the site include manual, mechanical, mechanical eucalyptus, and fuel break treatments, and are recommended to occur as part of other Priority Treatment Zones identified in the WRP.

### **Water Department Site #3:**

Water Department Site #3 (Map 3) supplies 1.0 mg of storage to the City's water supply. The site includes additional key infrastructure, including a multi-agency response radio repeater that connects to Netcom. Vegetation within and surrounding the site consists of predominantly eucalyptus and oak woodland (*Appendix A: Maps*, Map A4). The fence line immediately surrounding portions of the Water Department Site #3 currently limits treatment extent. The defensible space 100 ft. structure buffer in the example Priority Treatment Zone, which extends beyond both the fence line and COSC parcel boundary, is shown for reference and consideration of future treatment prioritization. Treatments mapped beyond the fence line in the example Priority Treatment Zones will likely require ROE agreements to allow for implementation beyond COSC ownership boundaries. The example Priority Treatment Zone includes approximately 1.4 acres of defensible space, and approximately 0.1 acres of manual and 0.2 acres of mechanical treatments within the COSC property boundary.

Dense eucalyptus is present along the main access road, with branches near and overhanging the multi-agency response radio repeater antenna, are conducive to increased wildfire risk and behavior, posing a threat to infrastructure on-site. Additionally, Water Department Site #1 is located adjacent to a large wildland area bordered by major roadways and highways, heightening the risk of potential ignitions. Site-specific treatment considerations include treating vegetation overhanging or adjacent to the multi-agency response radio repeater antenna and treating eucalyptus along the access road. In addition to hazardous vegetative conditions, one of the facilities on-site has a wood shingled roof that should be replaced with fire-resistant materials in accordance with structure-hardening recommendations.

#### **Water Department Sites #4-6:**

Water Department Sites #4-6 are collectively part of the same pressure zone system. Dense, continuous vegetation and fuel accumulation extend along and beyond the fence lines into the adjacent properties, with areas of overhanging limbs adjacent to the infrastructure. Each of these sites are enclosed by a fence line surrounding the facilities, which currently restricts treatments to generally the immediate area around infrastructure. Treatments mapped beyond the fence lines in the example Priority Treatment Zones (Maps 3-4) will likely require ROE agreements for implementation.

Water Department Site #4 example Priority Treatment Zone includes approximately 1.7 acres of defensible space and approximately 0.02 acres of manual and 0.7 acres of mechanical treatments within the COSC property boundary. Water Department Site #5 example Priority Treatment Zone includes approximately 1.4 acres of defensible space and approximately 0.6 acres of manual and 0.2 acres of mechanical treatments within the approximate COSC easement area which spans approximately 100 ft. of structures. Water Department Site #6 example Priority Treatment Zone includes approximately 1.6 acres of defensible space and approximately 0.3 acres of manual and 0.3 acres of mechanical treatments within the COSC property boundary.

Water Department Site #4 has a storage capacity of 1.0 mg (City of Santa Cruz Water Department, 2023). Vegetation within this site primarily includes Monterey pine forest with a small portion of oak woodland and riparian shrub (*Appendix A: Maps*, Map A5). Water Department Site #5, located on a privately-owned parcel with a COSC easement covering approximately 100 ft. from structures, has a storage capacity of 0.4 mg. The site includes infrastructure that has been identified as a critical system component to Water Department operations (City of Santa Cruz Water Department, 2023). Vegetation within and surrounding this site is predominantly composed of redwood (*Sequoia sempervirens*) and Douglas-fir forest (*Appendix A: Maps*, Map A6). Water Department Site #6 has a storage capacity of 2.0 mg (City of Santa Cruz Water Department, 2023) that comprises approximately 75% of UCSC's supply. Vegetation within and surrounding this site primarily includes non-native forest, oak woodland, and forested areas of predominantly redwood and Douglas-fir (*Appendix A: Maps*, Map A7).

## ***Treatment Recommendations & Strategies***

The following recommendations are proposed for the priority Water Department Sites #1-6 identified above. Additional site-specific treatment recommendations and additional information on vegetation conditions are outlined in *Section II: Water Department Priorities*. These recommendations should be considered across all Water Department sites when feasible.

### **Water Department Sites #1-6 - Recommendation 1**

Maintain and improve defensible space surrounding buildings and critical infrastructure by treating trees and vegetation within up to 100 ft. of all structures in accordance with CAL FIRE's LE-100, per the treatment prescriptions below. The Priority Treatment Zones for Water Department Sites #1-6 (Maps 3-4) indicate approximate areas where priority treatments may be implemented to establish defensible space within 100 ft. of critical structures and infrastructure. Where implementation of defensible space treatments is limited by property boundaries, COSC should consider pursuing measures such as ROE agreements.

#### *Treatment Activities*

The treatment prescriptions below would utilize primarily a combination of manual (handwork) and mechanical (mastication) treatments. Targeted herbicide and prescribed herbivory treatment activities could also be utilized where appropriate.

#### *Treatment Prescriptions*

The following treatment prescriptions listed below in order of priority apply to *Water Department Sites #1-6 - Recommendation 1* (Table 3):

- Defensible Space
- Hazard Tree
- Invasive Species
- Forest Health Fuels Reduction

### **Water Department Sites #1-6 - Recommendation 2**

Maintain and improve access to Water Department Sites #1-6, ensuring adequate vertical and horizontal clearance to support appropriate fire apparatus access, by removing vegetation along and overhanging access roads and turnarounds, per the treatment prescriptions outlined below. Site-specific fire apparatus access type is included in *Section II: Water Department Priorities*.

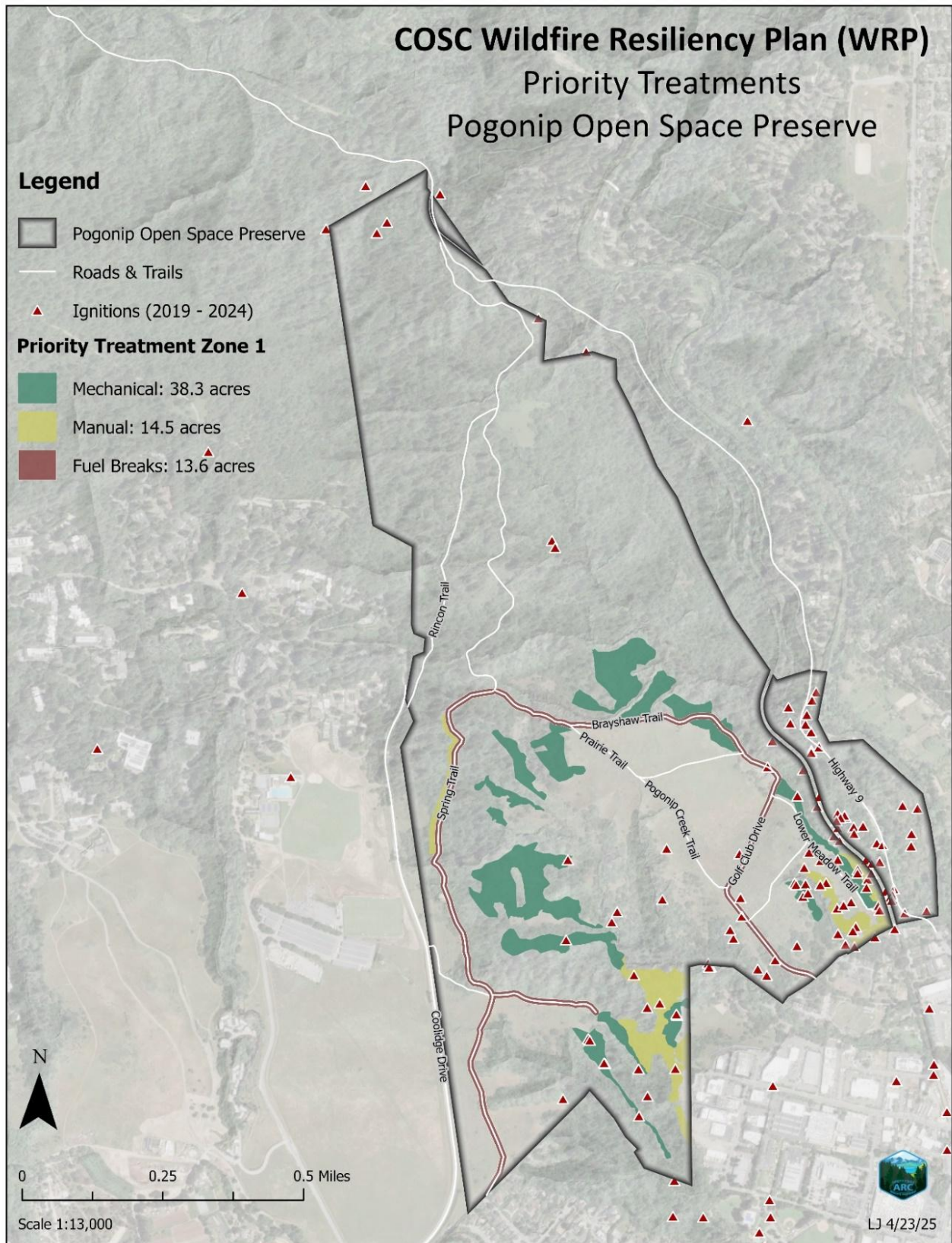
#### *Treatment Prescriptions*

The following treatment prescriptions listed below in order of priority apply to *Water Department Sites #1-6 - Recommendation 2* (Table 3):

- Roadside
- Hazard Tree
- Invasive Species
- Forest Health Fuels Reduction

### **Priority 3: Pogonip Open Space Preserve (Treatment Zone 1)**

Pogonip represents an area of high human influence with significant community impact, based on its proximity to communities, surrounding housing density, community use, presence of unhoused populations and encampments, and its location adjacent to the UCSC campus. Treatments in this zone are strategically located in proximity to communities, near ignition concentrations from warming or cooking fires predominantly associated with unhoused populations, while also aiming to create strategic linkages with UCSC's adjacent lands and on-going and planned vegetation management efforts (Map 5). Additionally, vegetative conditions (Figure 2) across Pogonip and within Priority Treatment Zone 1 are conducive to increased fire risk and behavior. Additional Priority Treatment Zones and justification for prioritization are outlined in *Section III: Parks and Recreation & Public Works Departments Priorities*.





## ***Treatment Recommendations & Strategies***

Pogonip Priority Treatment Zone 1 (Map 5) consists of predominantly Douglas-fir and redwood forests, woodlands, and small portions of non-native forest, shrubland and grassland (*Appendix A: Maps*, Map A8). This Treatment Zone encompasses the lower portion of the property, bordered by Golf Club Drive, Lower Meadow Trail, Brayshaw Trail, and Spring Trail. This Priority Treatment Zone is designed to create strategic landscape-scale fuel and vegetation reduction treatments.

### **Pogonip - Recommendation 1**

*Pogonip - Recommendation 1* includes the implementation of treatments across Pogonip Priority Treatment Zone 1 (Map 5). This zone is a total of approximately 66.4 acres and includes areas of mechanical (38.3 acres) and manual (14.5 acres) treatment activities, with additional fuel break treatments designated along edges of selected existing roads throughout the lower property (approximately 13.6 acres).

#### *Treatment Activity*

Both manual and mechanical treatments are proposed within Pogonip's Priority Treatment Zone 1 (Map 5). Manual treatments are proposed for 14.5 acres but may occur across the entire 66.4 acres. Mechanical treatments may occur on up to approximately 38.3 acres on slopes generally less than 35 percent and no greater than 50 percent, and with appropriate watercourse avoidance buffers. Fuel breaks are proposed for approximately 13.6 acres, extending approximately 25 ft. from the road edge along portions of Golf Club Drive, Brayshaw Trail, and Spring Trail. Fuel breaks correspond with critical COSC roads identified as priority 5 for overall COSC priority treatments. The treatment prescriptions below would utilize primarily a combination of manual and mechanical treatments and could also include targeted herbicide and prescribed herbivory treatments if/where appropriate. Strategic maintenance mowing of grasslands for the purposes of fuel breaks should continue and/or be considered for expansion to reduce coyote brush encroachment.

#### *Treatment Prescription*

The following treatment prescriptions apply to *Pogonip – Recommendation 1*, listed in order of priority (Table 3):

- Forest Health Fuels Reduction
- Roadside
- Hazard Tree
- Hardwood Restoration
- Invasive Species
- Grassland Restoration
- Shrubland Restoration



Figure 2. Pogonip Treatment Zone 1 Vegetation Conditions. Proposed fuel break along Brayshaw Trail (left) and conditions in Priority Treatment Zone 1 mapped treatments (center, right).

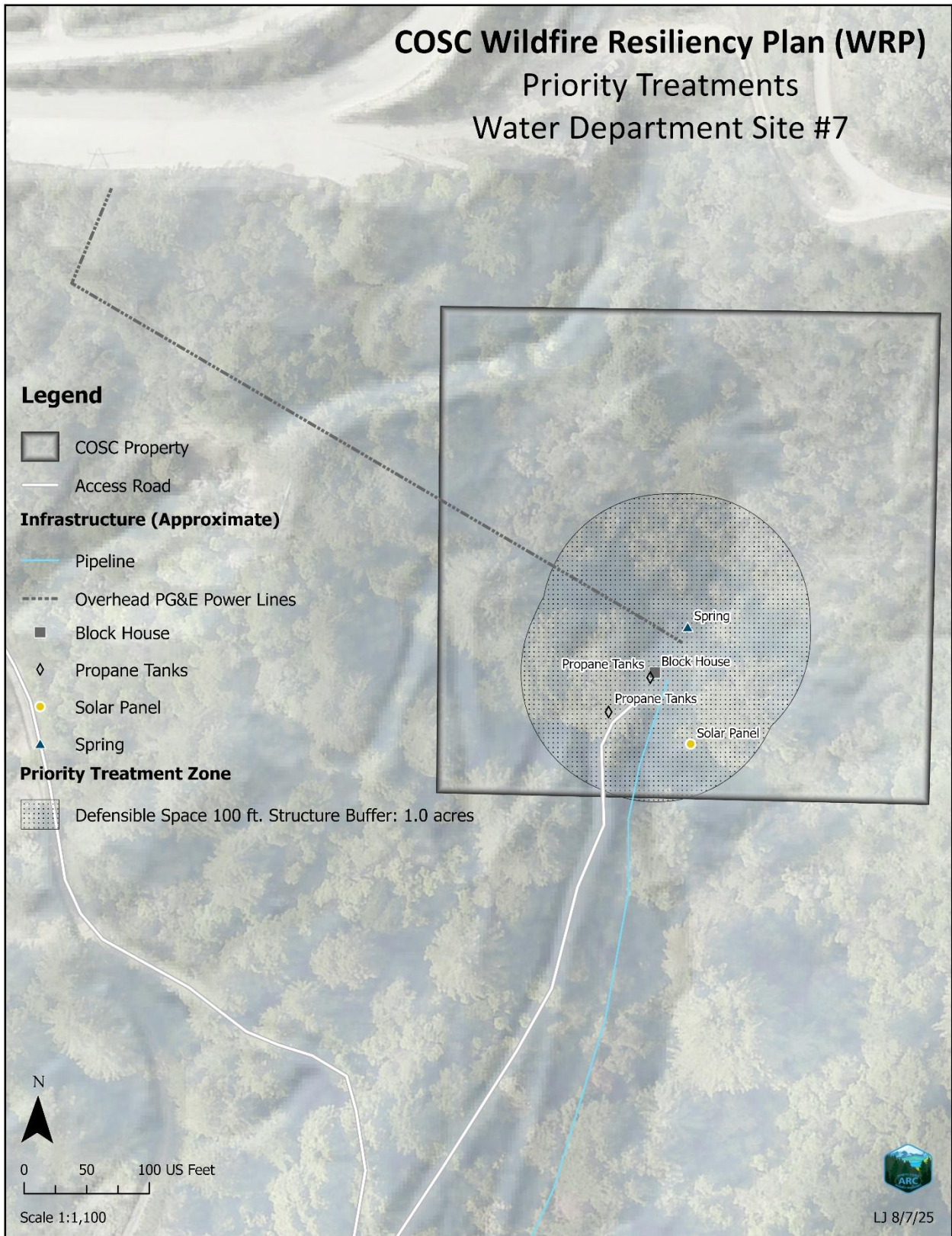
## Priority 4: Water Department Site #7

Water Department Site #7 is a critical infrastructure site for its contributions as a key source for the City's overall water supply, producing approximately 1.2 to 1.7 mgd (Ebbin Moser + Skaggs LLP; Science, Hagar Environmental; Dana Bland & Associates; Entomological Consulting Services, Ltd.; Services, Kittleson Environmental Consulting; Group, Biotic Resources Group, 2021). This spring source is less vulnerable to contamination and able to recover quickly following storm events, in addition to having high alkalinity due to its flow through the Karst formation. As such, it is one of the only sources expected to remain operational under large-scale disturbances, which is a key consideration in its prioritization for vegetation treatments. Although relatively resilient due to the nature of the site, there are still dense vegetative conditions (Figures 3-6) immediately surrounding infrastructure that should be treated to reduce exposure to wildfire.

Priority treatment recommendations for Water Department Site #7 are focused on establishing defensible space surrounding critical infrastructure, improving access to the site, and promoting resiliency in the case of a wildfire-related emergency in both the short-and long-term. Specific treatment recommendations at Site #7 may require long-term planning and strategizing, which is reflected in its prioritization relative to other COSC priority treatment sites including the EOC/Netcom, Water Department Sites #1-6, and Pogonip, where treatments may be implemented more immediately.

While near-term actions can improve protection in the immediate future, the long-term strategies identified for Water Department Site #7 will ultimately provide the highest level of protection and resilience from wildfire for future years. As these long-term actions require additional time for planning, initial treatments should be conducted as soon as possible. Priority treatment recommendations – organized into short-term and long-term recommendations – strategies, and prioritization are described below. The treatment prescriptions listed for *Water Department Site #7 - Recommendations 1-3* represent the minimum recommended prescriptions. Additional manual treatments under the Forest Health Fuels Reduction prescription that expand beyond defensible space, electrical transmission line, and roadside treatments should be considered to increase treatment extent where feasible. Further justification of prioritization is outlined in *Section II: Water Department Priorities*.





Map 6. Water Department Site #7, Priority Treatments (Example Priority Treatment Zone). *Map Not to 1:1,100 Scale.*

## Near-Term (Immediate) Treatment Recommendations & Strategies

### Water Department Site #7 - Recommendation 1

Maintain and improve defensible space surrounding buildings and critical infrastructure (Figure 3) by treating trees and vegetation up to 100 ft. of all structures in accordance with CAL FIRE's LE-100, per the treatment prescriptions below. The Priority Treatment Zone identified for Water Department Site #7 (Map 6) indicates approximate areas where priority treatments may be implemented; this zone does not encompass all treatment recommendations for the site that are located on the adjacent property.

#### *Treatment Activity*

Manual treatments would be the primary treatment activity used to implement treatments across the 100 ft. defensible space buffer (1.0 acres) in the example Priority Treatment Zone due to steep slopes and access. Mechanical treatments may occur in areas where slopes are generally less than 35 percent and no greater than 50 percent with appropriate watercourse avoidance buffers.

#### *Treatment Prescription*

The following treatment prescriptions listed below in order of priority apply to the *Water Department Site #7 – Recommendation 1* (Table 3):

- Defensible Space
- Hazard Tree
- Invasive Species
- Forest Health Fuels Reduction

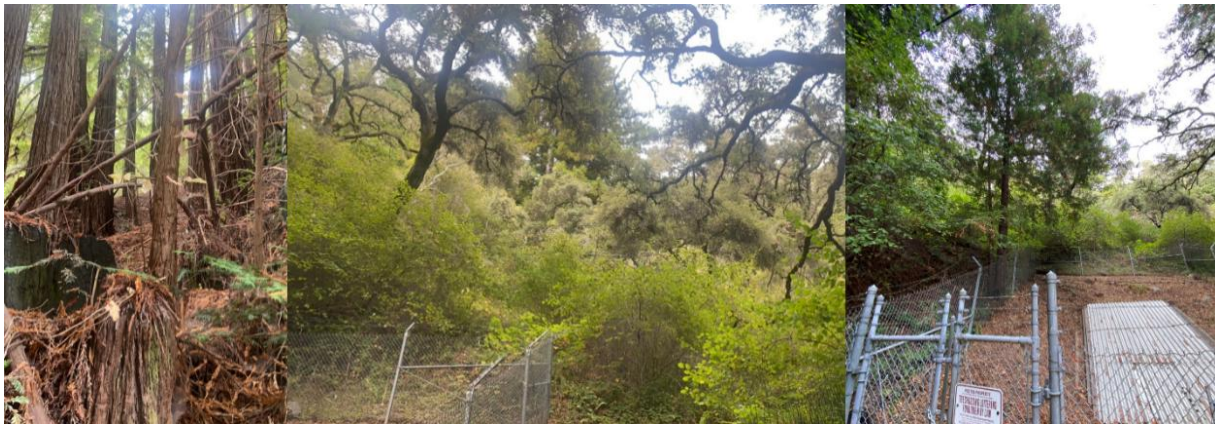


Figure 3. Water Department Site #7, Vegetation Conditions.

### Water Department Site #7 - Recommendation 2

Remove vegetation surrounding city-owned overhead electrical transmission and/or telecommunication lines, from the point of Pacific Gas & Electric Company (PG&E) distribution to facilities (Figure 4; Map 6), per the treatment prescriptions listed below, and consider undergrounding electrical and gas lines to facilities (reference *Water Department Site #7 - Recommendation 5*). California Public Utilities Code (CPUC) regulations, Public Resources Code (PRC) statutes, and other applicable fuel clearance requirements should be followed including specific clearances for power lines, line fuses, and transformers.

#### *Treatment Activity*

The treatment prescriptions below would utilize a combination of manual and mechanical treatments. Manual treatments could occur across the entirety of the treatment area, while mechanical treatments may



occur in areas where slopes are generally less than 35 percent and no greater than 50 percent with appropriate watercourse avoidance buffers.

#### *Treatment Prescription*

The following treatment prescriptions listed below in order of priority apply to *Water Department Site #7 – Recommendation 2* (Table 3):

- Defensible Space
- Hazard Tree
- Invasive Species
- Forest Health Fuels Reduction

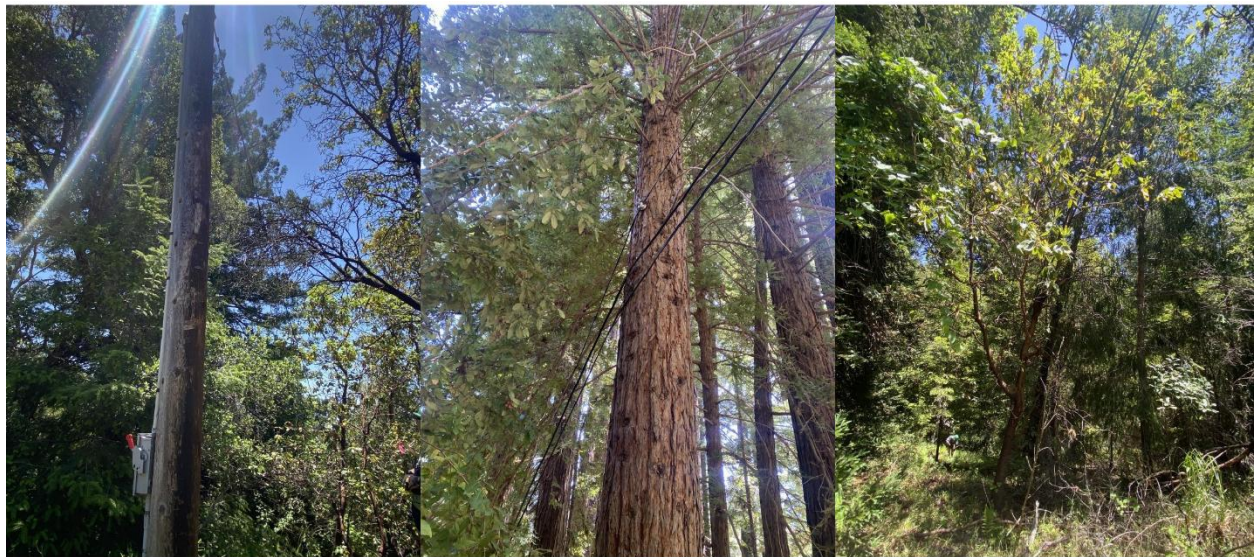


Figure 4. Water Department Site #7, Vegetation Conditions – Overhead Power Lines.

#### **Water Department Site #7 - Recommendation 3**

Maintain and improve access to Water Department Site #7, ensuring adequate vertical and horizontal clearance to support Type 3 Fire Engine access, by removing vegetation along and overhanging access roads and turnarounds, per the treatment prescriptions listed below. Additional road maintenance recommendations include improving road drainage through maintenance and additional installation of rolling dips or waterbars and improving road surface conditions by rocking and compacting the road bed; consultation with a certified engineering geologist is recommended to determine appropriate measures.

#### *Treatment Activity*

The treatment prescriptions below would utilize primarily a combination of manual and mechanical treatment activities but could also include targeted herbicide where appropriate.

#### *Treatment Prescription*

The following treatment prescriptions listed below in order of priority apply to *Water Department Site #7 – Recommendation 3* (Table 3):

- Roadside
- Hazard Tree

- Invasive Species
- Forest Health Fuels Reduction

#### Water Department Site #7 - Recommendation 4

Improve vegetation clearance surrounding propane tanks currently anchored to structures and on hillside (Map 6; Figure 5), including a minimum clearance of 10 ft. to bare minimum soil with no flammable vegetation within an additional 10 ft. around the exterior, per CAL FIRE's LE-100 and the treatment prescriptions outlined below.

##### *Treatment Prescription*

The following treatment prescriptions apply to *Water Department Site #7 – Recommendation 4* (Table 3):

- Defensible Space

#### **Long-Term Treatment Recommendations & Strategies**

As these long-term actions require additional time for planning, initial steps should be initiated as soon as possible, in tandem with the planning and implementation of immediate near-term actions.

#### Water Department Site #7 - Recommendation 5<sup>7</sup>

Relocate critical infrastructure, including generators, propane tanks, and data control and communications systems currently housed in the block house, to the adjacent neighboring parcel, and underground existing overhead electrical lines serving the main facilities. Initial recommendations indicate direction drilling as a feasible method for undergrounding utility lines; consultation with a qualified engineer should occur in coordination with the Water Department operations staff to assess appropriate measures for undergrounding lines and data communications system requirements. Relocation to open areas on the adjacent parcel would reduce hazardous vegetation and fuels in proximity to infrastructure, facilitate defensible space compliance, and improve access to the site during a wildfire or emergency.

##### *Treatment Prescription*

The following treatment prescriptions apply to relocated infrastructure in *Water Department Site #7 – Recommendation 5* (Table 3):

- Defensible Space

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<sup>7</sup> In addition to *Water Department Site #7 – Recommendation 5*, Capital Improvement Program (CIP) project prioritization should continue to evaluate improvements for Water Department Site #7 and possible re-alignment alternatives for the pipeline on-site as well as other key Water Department pipelines.



Figure 5. Water Department Site #7, Vegetation Conditions – Propane Tanks.

### Water Department Site #7 - Recommendation 6<sup>8</sup>

Install additional protective cover over the Water Department Site #7 box enclosure (Figure 6) to reduce vulnerability and protect from wildfire-and sediment-related impacts, considering alignment with structure-hardening guidelines and recommendations. Initial recommendations include removing the existing wood-paneled corrugated locking door cover and replacing it with a raised, fire-resistant structure. Consultation with a qualified engineer should occur in coordination with the Water Department operations staff to assess appropriate options.



Figure 6. Water Department Site #7, Spring Box Enclosure.

<sup>8</sup> Although not assessed in the WRP, the pipeline that transports water from Water Department Site #7 to the Water Department's system should be evaluated for potential wildfire vulnerabilities, considering its High Density Polyethylene (HDPE) material and location above-ground. Evaluations and upgrades could be considered as part of CIP improvements mentioned under *Water Department Site #7 – Recommendation 5* above.

## Priority 5: Critical Fire Roads

There are several critical roads on COSC properties that should be prioritized for maintenance and upgrades. The most critical roads for maintenance and upgrades (Map 7), as identified by the Fire Department, are located in DeLaveaga and Pogonip, which are two of the highest priority COSC sites in the WRP. These roads act as essential ingress and egress routes for emergency response access, aiding in fire response efforts to protect infrastructure, adjacent homes, as well as wildland areas of COSC open space properties. As both DeLaveaga and Pogonip are mutual threat zones, maintenance and upgrades of these roads will facilitate improved emergency response access not only for the COSC Fire Department, but other emergency personnel as well. Recommendations for critical COSC roads are outlined below, including the highest priority recommendation (*Critical Roads – Recommendation 1*) for roads in DeLaveaga and Pogonip, along with overall recommendations for all high priority COSC properties (*Critical Roads – Recommendation 2*).



### Critical Roads - Recommendation 1 (DeLaveaga and Pogonip)

Critical roads within DeLaveaga and Pogonip generally correspond with those designated for fuel breaks in DeLaveaga and Pogonip Priority Treatment Zones 1 and 2 (Map 7), including Golf Club Drive, Brayshaw, Rincon, and Spring Trails in Pogonip, and Old Vineyard Trail, DeLaveaga Park Drive, and Brookwood Drive in DeLaveaga. Access should also be established for select roads and trails with currently limited access identified as high priority by the COSC Fire Department, including portions of Fern Trail in Pogonip and Park Way Trail in DeLaveaga (Map 7). Maintenance and upgrades for the highest priority critical roads in DeLaveaga and Pogonip should aim to improve access by:

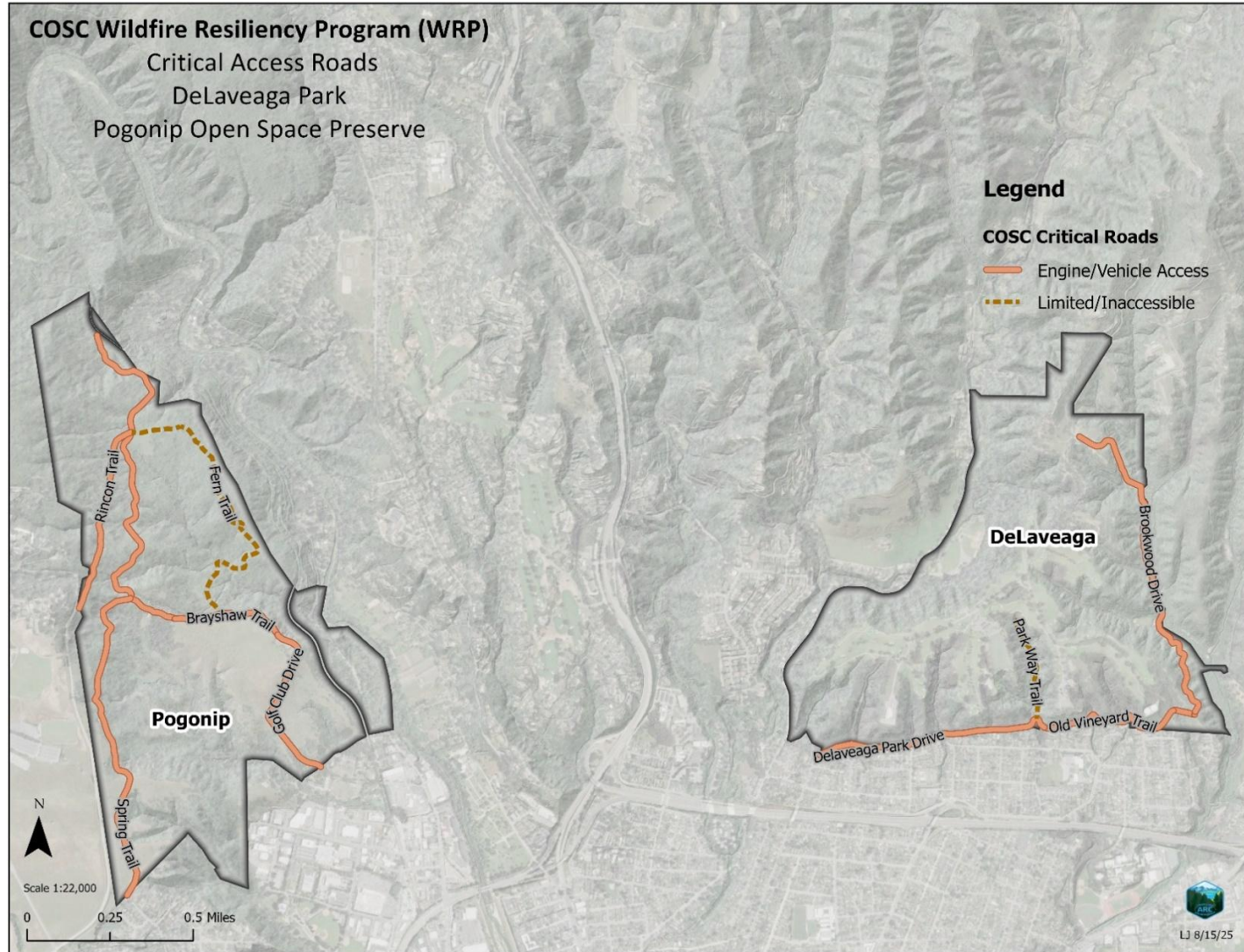
- Increasing vertical and horizontal clearance (per the Roadside treatment prescription; Table 3)
- Improving road conditions
- Achieving minimum access requirements appropriate fire apparatus, including upgrades to allow for larger engines<sup>9</sup> (per the Roadside treatment prescription; Table 3)
- Establishing necessary turnaround areas for appropriate fire apparatus access

### Critical Roads – Recommendation 2 (All COSC Sites)

In addition to recommendations for maintenance and upgrades for the most critical roads in DeLaveaga and Pogonip, the COSC Fire Department should also assess current access type and evaluate future maintenance and upgrade needs for all high priority COSC open space and infrastructure sites. Access information for all sites, including DeLaveaga and Pogonip, should be incorporated into the COSC Wildfire Resiliency & Response Dashboard online mapping platform (*Section IV: Wildfire Resiliency & Response Dashboard*). This will ensure that critical access routes, locations, and details are readily available to the Fire Department and other COSC departments during emergencies.

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<sup>9</sup> For most critical roads identified in both DeLaveaga and Pogonip, maintenance and upgrades should aim to achieve Type 3 access or below. The COSC Fire Department should identify the current access type and appropriate minimum access requirements, along with maintenance and upgrade needs, for specific roads throughout DeLaveaga and Pogonip.



Map 7. COSC Critical Fire Roads. *Map Not to 1:22,000 Scale.*

## COSC Wildfire Resilience Budget

A key recommendation as part of the WRP is the development of a COSC wildfire resilience budget. Although several grant opportunities and funding pathways are currently available to support the permitting and implementation of WRP Priority 1-5 treatments, the current grant climate may change in the future. To support the implementation and maintenance of priority WRP treatments over the long-term, COSC should begin developing an annual wildfire resilience budget to help cover treatment implementation costs. A wildfire resilience budget will enable COSC to build capacity for conducting wildfire resilience projects by hiring and training staff, as well as purchasing new equipment to conduct vegetation treatments and on-going maintenance in-house. Commonly considered for other public land blocks of this size are two dedicated positions that physically conduct wildfire resilience maintenance treatments on-the-ground and 1-2 pieces of heavy equipment to support them (reference *Section II: Water Department Priorities* and *Section III: Parks and Recreation & Public Works Departments Priorities* for equipment recommendations).

## General Vegetation Treatment Prescriptions

The treatment prescription categories below provide an overview of the specifications for vegetation treatment prescriptions that may be implemented to achieve treatments identified throughout the WRP and may be applied to other prioritized treatment locations on any COSC lands. Treatment prescription categories provide a foundation of generalized prescription details that may be applied or altered to develop site- and vegetation-specific prescriptions. Example treatment prescription specifications are shown in Table 3 below (reference *Section V: Wildfire Resiliency Plan (WRP) Development Methods* for description of categories). While these treatment prescription specifications are recommended as part of the WRP, existing COSC resource management plans that include site-specific treatment or management guidelines should also be considered in conjunction with WRP recommendations to help achieve broader management goals and maintain compliance with any existing regulatory documents such as a Local Coastal Plan or other approved Environmental Impact Report (EIR).

Table 3. Treatment Prescriptions.

Treatment Prescription Category	Specifications
Defensible Space <sup>10</sup>	<ul style="list-style-type: none"> <li>• <b>Treat</b> trees and vegetation of any size within up to 100 ft. of infrastructure or to property line, with the first 0-30 ft. as the most intensive removals, to maintain compliance with CAL FIRE LE-100 defensible space standards.</li> <li>• <b>Remove</b> trees and vegetation adjacent to electrical transmission, distribution, or telecommunication lines to maintain compliance with applicable California Public Utilities Commission (CPUC) regulations, Public Resources Code (PRC) statutes, or other applicable requirements.</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication), and/or prescribed herbivory. <i>Applies across all vegetation types.</i></p>
Hazard Tree	<ul style="list-style-type: none"> <li>• <b>Remove</b> hazard trees of any size that pose a threat to life or infrastructure. Hazard tree as defined as (1) appears dead, dangerous, or likely to fall, even after proper maintenance activities are performed to eliminate dead or dangerous parts; (2) obstructs or damages a street, trail, sidewalk, or other existing structure; (3) harbors a serious disease or infestation threatening the health of other trees; (4) interferes with vehicular or pedestrian traffic; or (5) poses any other significant hazard or potential hazard, as determined by COSC.</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork) and/or mechanical. <i>Applies across all vegetation types.</i></p>
Forest Health Fuels Reduction	<ul style="list-style-type: none"> <li>• <b>Remove</b> dead, dying and diseased trees of any size</li> <li>• <b>Selectively remove</b> live trees and understory shrubs less than or equal to 16 in. Diameter at Breast Height (DBH) that increase crown spacing, reduce competition for available resources, and reduce horizontal and vertical fuel connectivity <ul style="list-style-type: none"> <li>- <b>Retain</b> healthy hardwoods and conifers greater than 16 in. DBH</li> </ul> </li> </ul>

<sup>10</sup> California PRC section 4291 and CAL FIRE's guidelines for implementing defensible space delineate a zone system based on 3 concentric buffers between 0-5 feet, 5-30 feet, and 30-100 feet from structures. Visit CAL FIRE Defensible Space Resources for additional guidance: <http://fire.ca.gov/dspace>, <https://readyforwildfire.org/prepare-for-wildfire/defensible-space/>.

Treatment Prescription Category	Specifications
	<ul style="list-style-type: none"> <li>- <b>Retain</b> a mosaic of understory trees and shrubs less than or equal to 16 in. DBH at 10-20 ft. spacing by vegetation alliance</li> <li>- <b>Retain</b> 1-4 snags per acre and downed woody debris for habitat complexity</li> <li>- <b>Maintain</b> approximately four pieces of downed woody debris greater than 16 in. in diameter and 15 ft. long per acre where feasible</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication), prescribed herbivory, and/or prescribed burning. <i>Applies in all forested vegetation types.</i></p>
Hardwood Restoration	<ul style="list-style-type: none"> <li>• <b>Remove</b> dead, dying and diseased trees of any size</li> <li>• <b>Selectively remove</b> live trees and understory shrubs less than or equal to 16 in. DBH that increase crown spacing, reduce encroachment on hardwoods and competition for available resources, and reduce horizontal and vertical fuel connectivity <ul style="list-style-type: none"> <li>- <b>Retain</b> healthy hardwoods greater than 16 in. DBH</li> <li>- <b>Retain</b> a mosaic of understory trees and shrubs less than or equal to 16 in. DBH at 10-20 ft. spacing by vegetation alliance</li> <li>- <b>Retain</b> 1-4 snags per acre and downed woody debris for habitat complexity</li> <li>- <b>Maintain</b> approximately four pieces of downed woody debris greater than 16 in. in diameter and 15 ft. long per acre where feasible</li> </ul> </li> <li>• <b>Selectively remove</b> Douglas-fir (<i>Pseudotsuga menziesii</i>) trees up to 36 in. DBH which have become established in woodlands due to lack of disturbance</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication), prescribed herbivory, and/or prescribed burning. <i>Applies in hardwood forests.</i></p>
Shrubland Restoration	<ul style="list-style-type: none"> <li>• <b>Remove</b> up to 65 percent of shrubs and chaparral outside the dripline of trees, on a site-specific basis</li> <li>• <b>Retain</b> a mosaic of shrubs by vegetation alliance</li> <li>• <b>Retain</b> at least 35 percent of the total chaparral-covered area outside the dripline of trees <ul style="list-style-type: none"> <li>- Consider additional protections for sensitive natural communities where feasible</li> </ul> </li> <li>• Consider shrubland restoration treatments within the natural fire return interval unless proximal to critical infrastructure</li> <li>• Selectively remove Douglas-fir (<i>Pseudotsuga menziesii</i>) trees up to 36 in. DBH which have become established in shrublands due to lack of disturbance</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication), prescribed herbivory, and/or prescribed burning. <i>Applies in shrublands.</i></p>
Grassland Restoration	<ul style="list-style-type: none"> <li>• <b>Remove</b> up to 100 percent woody shrubs such as coyote brush (<i>Baccharis pilularis</i>) to prevent encroachment, while maintaining rare grassland species and native grasses and forbs, where present</li> <li>• <b>Selectively remove</b> Douglas-fir (<i>Pseudotsuga menziesii</i>) trees up to 36 in. DBH which have become established in grasslands due to lack of disturbance</li> </ul>

Treatment Prescription Category	Specifications
	<p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication or mowing), prescribed herbivory, and/or prescribed burning. <i>Applies in grasslands.</i></p> <p><b>Note:</b> Time treatments appropriately during the year to maintain native annual seed beds, as feasible.</p>
Invasive Species	<p><b>Remove</b> invasive species by utilizing the California Invasive Plant Council Inventory, COSC Integrated Pest Management (IPM) Guidance Manual or COSC resource management plans for invasive species removals for prioritization of removals and management methods<sup>11</sup></p> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication), herbicide, prescribed herbivory, and/or prescribed burning. <i>Applies across all vegetation types.</i></p>
Roadside	<p><b>Within 25 ft.</b> of the edge of roads and trails, including fuel breaks along existing roads:</p> <ul style="list-style-type: none"> <li>• <b>Maintain</b> appropriate vertical and horizontal clearance requirements for applicable fire apparatus access*</li> <li>• <b>Prune</b> lower branches of trees 6-15 ft. but not more than 33% of the tree crown where feasible</li> <li>• <b>Selectively remove</b> live trees and shrubs less than or equal to 16 in. in DBH that encroach on vertical and horizontal clearance</li> </ul> <p><b>Within 25-100 ft.</b> of the edge of roads and trails, including fuel breaks along existing roads:</p> <ul style="list-style-type: none"> <li>• <b>Remove</b> hazard trees and dead, dying, diseased trees of any size</li> <li>• <b>Retain</b> healthy hardwoods and conifers greater than 16 in. DBH</li> <li>• <b>Retain</b> a mosaic of understory trees and shrubs less than or equal to 16 in. DBH at 10-20 ft. spacing by vegetation alliance</li> <li>• <b>Maintain</b> select down woody debris and snags for appropriate habitat retention</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication or mowing), prescribed herbivory, targeted herbicide treatment, and/or prescribed burning. <i>Applies across all vegetation types.</i></p> <p>*Reference Sections I-III of the WRP for recommended site-specific fire apparatus access</p>

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<sup>11</sup> Reference the COSC Integrated Pest Management IPM Guidance Manual, as well as Department IPM coordinators, for policies and procedures related the City's IPM approach, such as pesticide use practices.



## Priority Cost Estimate

Across forested vegetation types, 2025 handwork rates range from approximately \$8,000/acre-\$10,000/acre and 2025 mechanized work ranges from approximately \$3,000/acre-\$4,000/acre in the Santa Cruz Mountain region. These costs are applied to the highest priority sites and treatments identified in the WRP (Table 3)<sup>12</sup>, including DeLaveaga Priority Treatment Zone 1, Water Department Sites #1-6 Priority Treatment Zones, Pogonip Priority Treatment Zone 1, and Water Department Site #7 Priority Treatment Zone as an example; two options are outlined for each Priority Treatment Zone to provide variations in treatment costs based on the treatment activities applied. A description of general treatment cost estimates is provided in *Section VII: Permitting, Regulatory Compliance & Implementation*.

These estimates only consider costs for on-the-ground implementation and do not consider costs for additional required survey work, permitting documentation, field layout, contractor compliance supervision, or any COSC requirements for developing and implementing projects on COSC lands. Generally, cost savings on the unconsidered costs would be realized if Priority 1-4 sites were completed as one project.

Acreages and costs for some sites in Table 4 do not include additional treatment recommendations proposed. For instance, Priority Treatment Zones for Water Department Sites #1-7 are estimated to represent approximate defensible space treatments within 100 ft. of infrastructure; costs and acreages for these sites do not include additional treatment recommendations such as electrical line clearance or other site-specific recommendations. Additionally, the treatment acreages and cost estimates for Water Department Sites #1-6 include portions of the 100 ft. buffer that are outside of COSC property boundaries.

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<sup>12</sup> Treatment acreage totals and cost estimates do not include Priority 5 COSC critical roads; further evaluation is needed to assess site-specific maintenance and upgrade needs, treatment type and extent, and estimated costs.

Table 4. Highest Priority COSC Treatments, Treatment Cost Estimates.

Treatment Site & Activity	Area (Acres)	Cost per Acre	Initial Treatment Cost
<b>OPTION 1 – Mechanical<sup>13</sup> &amp; Manual</b>			
<b>DeLaveaga – Priority Treatment Zone 1</b>			
Mechanical	3.9	\$3,000/ac.-\$4,000/ac.	\$11,700-\$15,600
Mechanical: Eucalyptus	6.0	\$15,000/ac.-\$40,000/ac.	\$90,000-\$240,000
Manual	5.9	\$8,000/ac.-\$10,000/ac.	\$47,200-\$59,000
Manual: Lop and Scatter	1.4	\$4,000/ac.-\$5,000/ac.	\$5,600-\$7,000
Fuel Break	15.4	\$7,000/ac.-\$9,000/ac.	\$107,800-\$138,600
			<b>Total: \$262,300-\$460,200</b>
<b>Water Department Sites #1-6<sup>14</sup></b>			
Total ~100 ft. Defensible Space Buffers			
Mechanical or Manual	~7.6	\$3,000/ac.-\$10,000/ac.	<b>Total: \$22,800-\$76,000</b>
<b>Pogonip – Priority Treatment Zone 1</b>			
Mechanical + Fuel Breaks (25 ft.)	51.9	\$3,000/ac.-\$4,000/ac.	\$155,700-\$207,600
Manual	14.5	\$8,000/ac.-\$10,000/ac.	\$116,000-\$145,000
			<b>Total: \$271,700-\$352,600</b>
<b>Water Department Site #7 – Priority Treatment Zone</b>			
Manual (~100 ft. Defensible Space Buffer)	~1.0	\$8,000/ac.-\$10,000/ac.	<b>Total: \$8,000-\$10,000</b>
			<b>Total Priority Treatments: \$564,800-\$898,800</b>
<b>OPTION 2 – All Manual</b>			
<b>DeLaveaga – Priority Treatment Zone 1</b>			
Manual	26.6	\$8,000/ac.-\$10,000/ac.	\$212,800-\$266,000
Mechanical: Eucalyptus <sup>15</sup>	6.0	\$15,000/ac.-\$40,000/ac.	\$90,000-\$240,000
			<b>Total: \$302,800-\$506,000</b>
<b>Water Department Sites #1-6</b>			
Total ~100 ft. Defensible Space Buffers			
Manual	~7.6	\$8,000/ac.-\$10,000/ac.	<b>Total: \$60,800-\$76,000</b>
<b>Pogonip – Priority Treatment Zone 1</b>			
Manual + Fuel Breaks (25 ft.)	66.4	\$8,000/ac.-\$10,000/ac.	<b>Total: \$531,200-\$664,000</b>
<b>Water Department Site #7 – Priority Treatment Zone</b>			
Manual (~100 ft. Defensible Space Buffer)	~1.0	\$8,000/ac.-\$10,000/ac.	<b>Total: \$8,000-\$10,000</b>
			<b>Total Priority Treatments: \$902,800-\$1,256,000</b>

<sup>13</sup> Manual treatments and other treatment activities may occur within areas mapped as mechanical treatments, as these mapped footprints indicate areas of less than approximately 35 percent slope that are generally accessible by mechanized equipment.

<sup>14</sup> Total acreages and cost estimates for Water Department Sites #1-6 do not include the Water Department Site #2 defensible space buffer; treatments for this site are accounted for in other Priority Treatment Zones in the WRP.

<sup>15</sup> Treatments designated as mechanical eucalyptus in DeLaveaga Priority Treatment Zone 1 are not suitable for manual activities; all other treatments may be implemented with manual activities.

## Section II: Water Department Priorities

While the following treatments and prescription specifications for priority Water Department sites are recommended as part of the WRP, existing resource management documents developed by COSC and the Water Department – containing site-or department-specific guidelines – should be referenced alongside WRP recommendations. Integrating WRP recommendations with existing guidelines will support alignment with broader goals, regulatory frameworks, and policies while advancing treatment implementation across sites.

Priority Treatment Zones and recommendations, with corresponding treatment strategies and prioritization, are described below. Of note, Water Department Sites #1-7 recommendations were first introduced *Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate*, emphasizing their importance and criticality; this section provides an overview of these sites and outlines additional priority Water Department sites and treatments.<sup>16</sup>

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<sup>16</sup> Detailed site-specific information and prioritization justification can be found in the *Internal Water Department WRP*.

## Overview of Water Department Priority Sites

This section provides an overview of site concerns and existing management strategies across priority Water Department sites (Table 5). Management approaches are primarily informed by the Water Department's guiding documents (reference *Section V: Wildfire Resiliency Plan (WRP) Development Methods*). Existing management at Water Department sites includes on-going facility and infrastructure maintenance and operations, vegetation and habitat management, and road maintenance. Vegetation management activities conducted at Water Department properties for vegetation removal include cutting, flaming, pulling, mowing or targeted herbicide, following the COSC IPM Guidelines Manual and IPM Program (Ebbin Moser + Skaggs LLP; Science, Hagar Environmental; Dana Bland & Associates; Entomological Consulting Services, Ltd.; Services, Kittleson Environmental Consulting; Group, Biotic Resources Group, 2021).

The presence of sensitive species and habitats may necessitate avoidance and mitigation measures (MMs), along with adherence to specific regulatory compliance requirements outlined in the Water Department's guiding documents, including the *Environmental Regulatory Compliance Guidelines*, *Vegetation Management Procedures*, *Anadromous Salmonid Habitat Conservation Plan* (ASHCP), and *Operations and Management Habitat Conservation Plan* (OMHCP). Specifically, the City's HCPs outline several sensitive plant and wildlife species covered by the City's incidental take permit (ITP), provides for coverage of a range of COSC activities, identifies potential impacts from covered activities, describes measures to minimize and mitigate effects for the covered species (Ebbin Moser + Skaggs LLP; Science, Hagar Environmental; Dana Bland & Associates; Entomological Consulting Services, Ltd.; Services, Kittleson Environmental Consulting; Group, Biotic Resources Group, 2021) (City of Santa Cruz Water Department; Ebbin Moser + Skaggs LLP; Hagar Environmental; Gary Fiske and Associates; Balance Hydrologics, Inc.; Alnus Ecological, 2023). Covered species in the OMHCP and ASHCP include Ben Lomand spineflower (*Chorizanthe pungens* var. *hartegiana*), Robust spineflower (*Chorizanthe robusta* var. *robusta*), Santa Cruz tarplant (*Holocarpha macradenia*), San Francisco popcorn flower (*Plagiobothrys diffusus*), Ohlone tiger beetle (*Cicindela Ohlone*), Mount Hermon June beetle (*Polyphylla barbata*), Tidewater goby (*Eucyclogobius newberryi*), Pacific lamprey (*Lampetra tridentata*), California red-legged frog (*Rana draytonii*), Central California Coast steelhead (*Oncorhynchus mykiss*), and Central California Coast coho (*Oncorhynchus kisutch*). Covered activities include those involved in the operation, maintenance, management, and rehabilitation of City facilities and lands.

The OMHCP and ASHCP should be referenced for specific avoidance and minimization measures for impacts to covered species during covered Water Department activities. Additionally, across the Water Department priority sites there may be subsets of the properties which are subject to additional protections that preclude the vegetation management strategies mentioned below (i.e., compensatory mitigation sites required by permitting agencies and/or CEQA). These mitigation sites may or may not be mapped within the Priority Treatment Zones. Specific treatment areas must be coordinated with Water Department Planners to specify any protected areas to be omitted from treatment. Additionally, mitigation strategies and considerations for sensitive resources will be evaluated on a project-specific basis and must be put into effect at the time of permitting. Consideration of these concerns, in addition to potential impacts and guidelines outlined in the Water Department's guiding documents, should be considered prior to treatment implementation.

Table 5. Overview of Priority Sites, Water Department.

Priority Site	Site Concerns	Existing Management
Water Department Site #1	<ul style="list-style-type: none"> <li>• Difficult road access limits fire response efforts</li> <li>• Dense vegetation and steep slopes adjacent to the site</li> <li>• Sensitive habitat for nesting birds</li> <li>• Non-native species, including eupatory (<i>Ageratina adenophora</i>), French broom (<i>Genista monspessulana</i>), and Italian thistle (<i>Carduus pycnocephalus</i>) along the access road</li> </ul> <p>(City of Santa Cruz, 2014) (City of Santa Cruz Water Department, 2020)</p>	<ul style="list-style-type: none"> <li>• Repairs to paved areas and buildings</li> <li>• Maintenance, removal, and installation of equipment (i.e., pumps, tanks, meters, etc.)</li> <li>• Vegetation management along perimeter and access road</li> </ul> <p>(City of Santa Cruz Water Department, 2020)</p>
Water Department Site #2	<ul style="list-style-type: none"> <li>• History of unhoused individuals accessing the area and associated break-ins</li> <li>• Dense eucalyptus along the fence line</li> <li>• Potential erosion on the uphill side behind the facilities along the site perimeter</li> <li>• Sensitive species and habitats, including: <ul style="list-style-type: none"> <li>- San Francisco dusky-footed wood rat (<i>Neotoma fuscipes</i> subsp. <i>annectens</i>) and nesting bird habitat</li> </ul> </li> <li>• Non-native species such as eupatory and French broom behind the fence line</li> </ul> <p>(City of Santa Cruz, 2014) (City of Santa Cruz Water Department, 2020)</p>	<ul style="list-style-type: none"> <li>• Vegetation management along site perimeter</li> <li>• Implementation of pest management</li> <li>• Repairs to paved areas and buildings</li> <li>• Maintenance, removal, and installation of equipment and infrastructure (i.e., pumps, tanks, meters, etc.)</li> </ul> <p>(City of Santa Cruz Water Department, 2020)</p>
Water Department Site #3	<ul style="list-style-type: none"> <li>• Located within a densely vegetated wildland area adjacent to major roadways and highway</li> <li>• Eucalyptus surrounding the site and access road presents a significant concern due to</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of vegetation management along site perimeter</li> <li>• Implementation of pest management</li> <li>• Repairs to paved areas and buildings</li> </ul>



Priority Site	Site Concerns	Existing Management
	<p>potential ignitions and fire risk, particularly near key infrastructure such as the multi-agency response radio repeater that connects to Netcom and supports essential public services</p> <ul style="list-style-type: none"> <li>History of opposition to vegetation management activities from adjacent landowners</li> <li>Sensitive habitats for nesting birds</li> <li>Non-native species such as acacia (<i>Acacia spp.</i>, blue gum eucalyptus, and English ivy (<i>Hedera helix</i>))</li> </ul> <p>(City of Santa Cruz, 2014) (City of Santa Cruz Water Department, 2020)</p>	<ul style="list-style-type: none"> <li>Maintenance, removal, and installation of equipment and infrastructure (pumps, tanks, valves, etc.)</li> </ul> <p>(City of Santa Cruz Water Department, 2020)</p>
Water Department Site #4	<ul style="list-style-type: none"> <li>Dense vegetation along the fence line of the property on adjacent property, in which the Water Department currently has limited ability to treat</li> <li>Sensitive species and habitats, including: <ul style="list-style-type: none"> <li>San Francisco dusky-footed wood rat, California red-legged frog (located in pond), western pond turtle (<i>Actinemys marmorata</i>), Ohlone tiger beetle located across the street from site, karst features, bats, and nesting bird habitat</li> </ul> </li> <li>Non-native species such as French broom, Spanish broom (<i>Spartium junceum</i>), and <i>Vicia</i> sp.</li> </ul> <p>(City of Santa Cruz, 2014) (City of Santa Cruz Water Department, 2020)</p>	<ul style="list-style-type: none"> <li>Repairs to paved areas and buildings</li> <li>Maintenance, removal, and installation of equipment and infrastructure (i.e., pumps, tanks, valves, etc.)</li> <li>Implementation of vegetation management along site perimeter</li> <li>Implementation of pest management</li> </ul> <p>(City of Santa Cruz Water Department, 2020)</p>
Water Department Site #5	<ul style="list-style-type: none"> <li>Dense vegetation on adjacent land that surrounds the site, where the Water Department</li> </ul>	<ul style="list-style-type: none"> <li>Repairs to paved areas and buildings</li> <li>Maintenance, removal, and installation of equipment and</li> </ul>

Priority Site	Site Concerns	Existing Management
	<p>has limited ability to conduct treatments</p> <ul style="list-style-type: none"> <li>• Sensitive species and habitats, including: <ul style="list-style-type: none"> <li>– San Francisco dusky-footed wood rat, California red-legged frog, karst features, bats, and nesting bird habitat</li> </ul> </li> <li>• Non-native species such as pampass grass (<i>Cortaderia selloana</i>), blackwood acacia (<i>Acacia melanoxylon</i>), and Saint John's wort (<i>Hypericum perforatum</i>)</li> <li>• Located within Coastal Zone</li> </ul> <p>(City of Santa Cruz, 2014)</p> <p>(City of Santa Cruz Water Department, 2020)</p>	<p>infrastructure (i.e., pumps, tanks, valves, etc.)</p> <ul style="list-style-type: none"> <li>• Implementation of vegetation management along site perimeter</li> <li>• Implementation of pest management</li> </ul> <p>(City of Santa Cruz Water Department, 2020)</p>
Water Department Site #6	<ul style="list-style-type: none"> <li>• Dense vegetation on adjacent private property, where the Water Department has limited ability to conduct treatments</li> <li>• History of neighboring property owners expressing sensitivity to on-site activities</li> <li>• Sensitive species and habitats, including: <ul style="list-style-type: none"> <li>– San Francisco dusky-footed wood rat, California red-legged frog, karst features, bats, nesting bird and riparian habitat, and a natural spring with wetland habitat</li> </ul> </li> <li>• Non-native species such as periwinkle (<i>Vinca major</i>) outside of the fence line</li> </ul> <p>(City of Santa Cruz, 2014)</p> <p>(City of Santa Cruz Water Department, 2020)</p>	<ul style="list-style-type: none"> <li>• Repairs to paved areas and buildings</li> <li>• Maintenance, removal, and installation of equipment and infrastructure (i.e., pumps, tanks, valves, etc.)</li> <li>• Implementation of vegetation management along site perimeter</li> <li>• Implementation of pest management</li> </ul> <p>(City of Santa Cruz Water Department, 2020)</p>

Priority Site	Site Concerns	Existing Management
Water Department Site #7	<ul style="list-style-type: none"> <li>Operational- and emergency-related concerns; including: <ul style="list-style-type: none"> <li>Difficult access to the site with a steep and narrow entry road</li> <li>The current location of infrastructure and data communications systems requires access to the site for operations, representing a significant concern during a wildfire or emergency when access may be limited or dangerous</li> <li>The current location of propane tanks necessitates propane deliveries via the main access road, posing a significant concern for regular deliveries, particularly during certain times of the year when road conditions can limit access</li> <li>Overhead power lines, serving a critical function for the site, are situated amid dense vegetation and fuel conditions, contributing to hazardous conditions that threaten both the site and its operation</li> <li>Vulnerability of the HDPE pipeline that brings water from the site into the water system</li> </ul> </li> <li>Sensitive habitat and species; including: <ul style="list-style-type: none"> <li>California red-legged frog, San Francisco dusky-footed wood rat, steelhead trout and rainbow trout (<i>Oncorhynchus mykiss</i>) located downstream, nesting birds, bats, and riparian habitat</li> </ul> </li> <li>Non-native species such as pampas grass</li> <li>Located within Coastal Zone</li> </ul> <p>(City of Santa Cruz, 2014)</p>	<ul style="list-style-type: none"> <li>Implementation of sediment management within the spring box</li> <li>Rocking of the parking area</li> <li>Maintenance of roads</li> <li>Implementation of vegetation management, removal, and pruning</li> <li>Implementation of pest management</li> </ul> <p>(City of Santa Cruz Water Department, 2020)</p>

Priority Site	Site Concerns	Existing Management
	(City of Santa Cruz Water Department, 2020)	
Water Department Site #8	<ul style="list-style-type: none"> <li>Operational- and emergency-related concerns include: <ul style="list-style-type: none"> <li>The site being a surface water source and thus is subject to contamination. In the event of a wildfire, storm, or other emergency, the Water Department may be unable to rely on supply from this site</li> <li>While the site is generally more accessible compared to other water sources, the site's location within a densely forested wildland area is a concern for accessing the site if the surrounding region were to be impacted by a wildfire</li> </ul> </li> <li>Sensitive habitat and species, including: <ul style="list-style-type: none"> <li>Steelhead trout (<i>Oncorhynchus mykiss</i>), tidewater goby and Central California Coast coho located downstream, California red-legged frog, San Francisco dusky-footed wood rat, nesting birds, riparian habitat, and karst features</li> </ul> </li> <li>Non-native species such as English ivy, French broom, and Himalayan blackberry (<i>Rubus armeniacus</i>)</li> <li>Located within Coastal Zone</li> </ul> <p>(City of Santa Cruz Water Department, 2020)</p> <p>(City of Santa Cruz, 2014)</p>	<ul style="list-style-type: none"> <li>Implementation of preserve surveys and management</li> <li>Implementation of vegetation management</li> <li>Implementation of pest management</li> </ul> <p>(City of Santa Cruz Water Department, 2020)</p>

## Water Department Treatment Prioritization

The top three priority Water Department sites (Sites #1-6, Site #7, and Site #8) were prioritized based on criteria described in *Section V: Wildfire Resiliency Plan (WRP) Development Methods*; this same methodology was considered for the prioritization of all COSC lands, of which Water Department Sites #1-6 ranked Priority 2 and Water Department Site #7 as Priority 4. The primary criteria considered in the prioritization of these three sites and corresponding treatment recommendations are detailed below.

### **Community Impact & Critical Infrastructure**

The presence of critical infrastructure, including infrastructure critical for site operation and function, and the essential services provided to communities across Santa Cruz, are key factors in the prioritization of the Water Department Sites #1-6, Site #7, and Site #8. Each site contains infrastructure essential for the site's function and operation (e.g., valves, pump stations, sensors, controls, generators, communications, intake infrastructure, etc.), which need to be protected to maintain function during an emergency event.

[Water Department Sites #1-6](#) play an essential role in both storage and distribution for the City's water system, supporting several pressure zones, and notably the Gravity Zone. The Gravity Zone is a crucial component of the City's water system, with an ADD of over 6.0 mgd – the highest across all zones, representing 78% of total ADD (City of Santa Cruz Water Department, 2023). Water Department Sites #4-6 are essential for supplying the UCSC, the system's largest elevated pressure zone and consumer, with an additional ADD of approximately 1.0 mgd (City of Santa Cruz Water Department, 2023). These two zones are particularly significant due to their high ADDs, reflecting the large populations they serve across the region. Water Department Sites #1-6 house important infrastructure such as pump stations, tanks, valves, and communications systems. During a wildfire-related emergency, these sites are key for maintaining essential water supply and ensuring the continued operation of the City's water system for the communities it serves. In addition to providing communities with essential water supply, many of these sites are located within and adjacent to residential areas within the WUI and/or surrounded by relatively high housing density, serving as an indication of potential ignition risk from human influence. The 2019 CAL FIRE Fire and Resource Protection Area (FRAP) WUI dataset<sup>17</sup> indicates that housing density surrounding Water Department Sites #1-6 is highly variable, ranging from low to high. The highest housing density class (class 4) is to the south of Site #2, immediately surrounding Site #3, and around Site #5. Moderate housing densities (class 3) are present to the west of Site #1, adjacent to Site #3, to the south of Site #4, and surrounding Site #6.

[Water Department Site #7](#) has several on-site equipment and infrastructure; critical to this site, includes the block house with data communications systems, sensors, and controls, valves, and generator, the pipeline, propane tanks, the spring box, power distribution lines, solar panel system, and other operational equipment that are essential components of the site and its operation. The site also includes city-owned electrical lines that run overhead across the property. The property of Site #7 is located within a Tier 2 Elevated High Fire Threat District, as designated by the CPUC, indicating an increased risk of utility-related wildfires with potential impacts on people and property (California Public Utilities Commission, n.d.). The overhead lines lack adequate clearance, with high connectivity of surrounding fuels and vegetation, further contributing to elevated fire risk. The combination of critical infrastructure, overhead utility lines and associated vegetation conditions, and the site's location within a High Fire Threat District, underscores its prioritization for short- and long-term actions and vegetation treatments.

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<sup>17</sup> Reference the [2019 CAL FIRE WUI dataset information](#).



[Water Department Site #8](#) contains critical infrastructure essential to its operation, allowing the site to feed water into the Water Department's system. Infrastructure includes sediment bypass valves, propane tanks, generator, block house, data communications systems, sensors, and controls, and other operational equipment.

[Water Department Sites #7 and #8](#) have important contributions as water sources for the City's overall water operations and supply. Depending on seasonal influences and required bypass flows, the combination of Sites #7 and #8, as well as an additional Water Department source site, can contribute up to 4.4 mgd to the Graham Hill Water Treatment Plant, with Site #7 producing approximately 1.2 to 1.7 mgd (Ebbin Moser + Skaggs LLP; Science, Hagar Environmental; Dana Bland & Associates; Entomological Consulting Services, Ltd.; Services, Kittleson Environmental Consulting; Group, Biotic Resources Group, 2021). Together, the system encompassing Sites #7 and #8, as well as other sites, supplies approximately 15-35% of the City's overall water supply (Dudek, 2021). Among the surface sources, [Site #7](#) is considered the most critical water source and is less vulnerable to contamination during a wildfire or storm event. For this reason, it is one of the few sources expected to remain operational during a wildfire-related emergency. Thus, Site #7 represents an essential site for maintaining water supply during a wildfire, making it a critical resource for the COSC community. Notably, [Site #8](#) has a relatively high volume capacity in an emergency situation, along with automated communication systems – which enable remote operation and may reduce the need for on-site access during emergencies. However, monitoring and control capabilities are dependent on the site's telecommunications line. Loss of the telecommunications line during a wildfire or disaster would result in the inability to control and monitor the site. Additionally, unlike Site #7 – which is spring-fed and less susceptible to contamination during a wildfire – Site #8, as a surface water source, is more vulnerable to contamination. This limitation is reflected in its lower prioritization relative to Site #7.

### **Fire Response Access**

Access to [Water Department Sites #1-6](#) is highly variable. All sites are accessible by Type 3 fire engines and only Site #2, Site #4 and Site #6 all currently have suitable Type 1 engine access that should be maintained. Where Type 3 engines are the primary emergency vehicle with suitable access at the sites, it indicates that current road conditions may generally lack vertical and horizontal clearance, lack space for Type 1 engines to turn around, have steeper grades, and/or have unpaved road surfaces.

Unlike Site #7 and other Water Department sites, [Site #8](#) is relatively accessible, as it is located directly off of a major road with only a short access road leading to the facility. If emergency conditions permit, the major road could be accessible by a Type 1 or Type 3 engine. In contrast, Site #7, and other Water Department sites, have more challenging access, requiring access along long, narrow roads with areas of hazardous road conditions. While these sites may be inaccessible or dangerous during a wildfire, access to Site #8 may be the most reliable among Water Department Sites in the area, representing an important factor in the site's treatment prioritization.

Limited access to [Water Department Site #7](#) suggests the importance of ensuring critical infrastructure can be accessed during emergencies. Currently, the main road to reach the facilities is steep, unpaved, and narrow, making it only accessible by a Type 3 engine or smaller apparatus; a Type 1 engine has suitable access through the adjacent parcel to the large open flat near the powerline drop, where the long-term *Water Department Site #7 – Recommendation 5* suggests that critical infrastructure should be moved to.

### **Topography & Local Climate**

The [Water Department Site #7](#) and [Water Department Site #8](#) are located in similar forested watershed settings that share climatic influences and topographical conditions. Both sites are naturally located in drainage canyons that are surrounded by rugged terrain and steep slopes. Site #7's watershed has an

elevation spanning from sea level to approximately 1,300 ft (City of Santa Cruz Water Department; Ebbin Moser + Skaggs LLP; Hagar Environmental; Gary Fiske and Associates; Balance Hydrologics, Inc.; Alnus Ecological, 2023). [Water Department Site #2](#), [Site #4](#), and [Site #6](#) are relatively flat, but are generally in proximity to steep topography, while [Site #1](#), [Site #3](#), and [Site #5](#) are located on and/or surrounded by drainage features and very steep slopes. The region's prevailing northwest wind further elevates wildfire risk and the potential for fire spread adjacent to these sites; this threat is particularly high during certain times of the year in Santa Cruz, when hazardous fuel moisture, vegetation, and weather conditions align.

### ***Vegetation Conditions***

Although vegetation conditions vary by site, each site generally exhibits characteristics such as dense vegetation and high fuel accumulations surrounding infrastructure – factors that contribute to increased wildfire risk and behavior. These conditions, along with the critical role each site plays in the overall water system and surrounding communities, are key factors in their prioritization for treatment.

[Water Department Sites #1-6](#), as mentioned above, have great variations in conditions surrounding each site. However, similar vegetation conditions and trends (e.g., vegetation overhanging infrastructure) were noted. Site #1 (Figure 7) conditions include several trees located near the facilities within the property, and steep wooded, forested, and grassland areas surrounding the site.



Figure 7. Water Department Site #1, Vegetation Conditions.

Vegetation conditions surrounding Site #2 (Figure 8) consist of dense eucalyptus forest, with broom and other non-native vegetation present surrounding the site. The site is also situated within a larger wildland park that has been identified as having high potential for a significant wildland fire and recognized as one of the most vulnerable areas to wildfire in the City (City of Santa Cruz, 2018).





Figure 8. Water Department Site #2, Vegetation Conditions.

At Site #3 (Figure 9), dense eucalyptus is present along the main access road and surrounding infrastructure, including the multi-agency response radio repeater antenna. The site is also located directly adjacent to a large wildland area bordered by major roadways and highways, heightening the risk of potential ignitions.



Figure 9. Water Department Site #3, Vegetation Conditions.

Water Department Sites #4-6 (Figures 10-12) are surrounded by dense, continuous vegetation and fuel accumulation that extend along and beyond the site fence lines into the adjacent properties, with overhanging limbs adjacent to infrastructure.





Figure 10. Water Department Site #4, Vegetation Conditions.



Figure 11. Water Department Site #5, Vegetation Conditions.

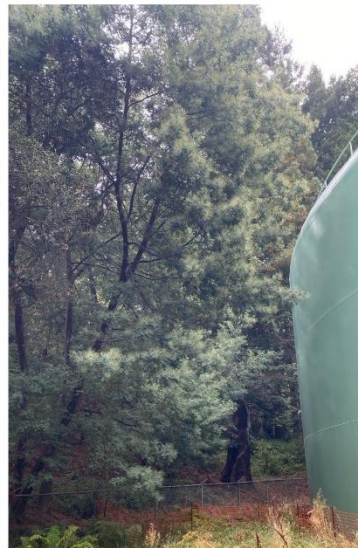


Figure 12. Water Department Site #6, Vegetation Conditions.

Vegetation types within the [Water Department Site #7](#) property predominantly consist of redwood forest, oak woodland, and a small shrubland area (*Appendix A: Maps*, Map A9). Surrounding infrastructure and across the Site #7 property, vegetation conditions (Figures 3-6) are conducive to increased fire risk and behavior, including high tree densities and fuel accumulations. These conditions are present directly surrounding infrastructure, in addition to along overhead powerlines that run adjacent to the site (Figure 4). These conditions, along with the critical role the site plays in the overall water system, are key factors in the prioritization for treatment. While short-term recommendations aim to reduce hazardous vegetation and fuel conditions immediately surrounding the site, overhead power lines, and roads, long-term recommendations aim to relocate critical components of the site to an area with maximum vegetation clearance.

Redwood forest is the dominant vegetation type within the [Water Department Site #8](#), with small patches of evergreen hardwood, shrubland, and Monterey pine/cypress and Douglas-fir forest beyond the COSC easement area (*Appendix A: Maps*, Map A10). Site #8 is located on larger parcel zoned for Timber Production. Vegetation conditions (Figure 13) surrounding infrastructure and across the property are conducive to

increased fire risk and behavior, including high tree densities and fuel accumulations. These conditions are present directly surrounding infrastructure within the COSC easement area and particularly beyond the easement area into the adjacent wildland property.



Figure 13. Water Department Site #8, Vegetation Conditions.



## **Additional Water Department Sites**

Several Water Department sites were not included in field visits, evaluations, or prioritization as part of the WRP. Initial assessments of sites to include for field visits and evaluation in the WRP were made in coordination with the Water Department, which identified sites that were generally high priority for operations and/or posed significant vegetation hazards and wildfire threat-related concerns. The most notable Water Department sites were not included due to dangerous and unreliable access during a wildfire or emergency, on-going facilities improvement projects, and certain sites being outside the scope of the WRP.

Although these sites were not identified as top priorities within the current WRP, they remain critical to Water Department operations. They should be considered for treatment evaluation and implementation following completion of the WRP's highest priority recommendations. The intent of the WRP is to establish a framework that can be adapted for future treatments at other COSC sites. The treatments, recommendations, and defensible space guidelines developed for priority Water Department facilities in the WRP may be applied to additional sites, when feasible. The development of a CalVTP PSA could also help facilitate future treatments across Water Department sites.

## Additional Water Department Recommendations

In addition to the proposed site-specific priority treatment recommendations and strategies outlined above, there are additional recommendations to improve wildfire resiliency across Water Department sites. Additional Department-specific recommendations are outlined below.

### Water Department Forester

The Water Department should consider hiring a staff forester to manage its properties and facilities following the recent retirement of the previous staff forester. This position could support the planning, permitting, preparation, and implementation of natural resources, wildfire resiliency, and vegetation management projects on Water Department lands.

### Equipment

Purchasing equipment could support the Water Department's ability to implement and maintain vegetation treatments across Water Department sites. Owning key equipment would enable the Water Department to implement treatments and conduct maintenance in-house, particularly for re-treatments that may be needed on a regular basis, potentially lowering overall treatment costs long-term. Owning, staffing, and maintaining equipment in the long-term would need to be evaluated in comparison to contracting out vegetation management services. The following equipment, or reasonable alternatives, are recommended:

- CAT 299 equipped with a Fecon masticating head for conducting vegetation treatments, or equivalent.
- CAT 309 Excavator with boom-mounted masticating head for conducting vegetation treatments, or equivalent.
- Construction-grade backhoe for conducting general road maintenance and other maintenance activities.

### Road Access & Maintenance

Results from the LE-100 Infrastructure Assessment highlight several road access and maintenance recommendations for Water Department sites aimed at maintaining reliable access routes. These include:

- Clearly marking primary entrances and access roads with high-visibility signage and address numbers to support fire response access in the case of an emergency.
- Conducting regular road maintenance to maintain and improve all-weather driving capabilities and road access, including installation of water bars and rolling dips, clearing of culverts, erosion control, and road repairs.
- Removing overgrown vegetation that obstructs horizontal and/or vertical clearance and limit or impair access to sites; this should consider clearance specifications for appropriate site-specific fire response apparatus type.

### Structure Hardening

Structure hardening is a critical component of improving a structure's ability to resist embers, flames, heat, and other impacts associated with wildfire. While not directly evaluated in the LE-100 Infrastructure Assessment, observations and site notes indicated that some infrastructure components included non-fire-resistant materials, which may increase their vulnerability to wildfire impacts.

On-going and future facility maintenance should prioritize the replacement of building materials and infrastructure components to achieve compliance with applicable CAL FIRE structure hardening guidelines<sup>18</sup>. Although these guidelines are often designed for residential home hardening, they offer useful direction on fire-resistant materials, ember sealing and venting methods, in addition to vegetation clearance, that is often applicable to infrastructure sites.

COSC and the Water Department should establish a phased implementation plan for facility maintenance and upgrades that includes evaluating infrastructure sites for compliance with structure hardening standards and implementing necessary improvements. These improvements can be phased alongside recommendations and treatments in the WRP or integrated into routine facility maintenance schedules.

### Remote Communication & Control Systems

Install communication and control systems at sites to enable remote monitoring and operation, ensuring continuity of operations during an emergency when physical access to the site may be limited. This should be prioritized at sites critical to Water Department operations and/or those with difficult access that is more likely to be compromised during or following an emergency.

### Raw Water Distribution

Prioritizing the ability to pump raw water through the system to Water Department Site #16 could help maintain water supply during a wildfire or emergency. This would involve running Water Department Site #16 when the water is unable to be adequately treated, such as during an extended power outage that prevents refueling of the generator. In such cases, the Water Department could continue pumping water through Water Department Site #16 from Water Department Site #14 and Water Department Site #12 and into the distribution system, or alternatively, pump water from the Water Department's coastal sources directly into the distribution system through the installation of a spool at Water Department Site #9. Also of note, existing improved water rights present raw water alternatives that may be considered for use in the event that there are impacts to infrastructure.

This measure is considered a worst-case scenario option and would only be implemented if life and property were at risk from wildfire. Because the water would not meet drinking water standards, Division of Drinking Water (DDW) and public notification would be required.

### Additional Sites & Treatment Recommendations

While treatment implementation at the highest priority sites identified in the WRP should be prioritized, defensible space and road maintenance treatments at all Water Department sites should be considered in the long-term. General recommendations that can be applied to all Water Department sites include defensible space treatments within 100 ft. of critical infrastructure, in addition to home hardening and road maintenance and access treatments, per the Defensible Space and Roadside treatment prescriptions (Table 3), and as discussed above in the *Road Access & Maintenance* and *Structure Hardening* sections above).

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<sup>18</sup> [CAL FIRE structure hardening guidelines](#) for reference.

## Water Department Sites #1-6

Water Department Sites #1-6 are prioritized overall as Priority 2 for vegetation treatments across COSC sites (Map 1) and Priority 1 for the Water Department (Maps 3-4). Treatment recommendations and strategies aim to establish defensible space surrounding critical infrastructure, improve access to sites, and improve landscape resiliency surrounding sites where feasible. The example Priority Treatment Zones identified for Sites #1-6 indicate approximate areas where priority treatments may be implemented with the primary goal of establishing defensible space surrounding critical infrastructure.

Table 6 summarizes key findings from the LE-100 Infrastructure Assessment regarding defensible space, including observations of vegetation conditions and corresponding treatment recommendations. These findings are intended to guide defensible space treatments outlined in *Water Department Sites #1-6 - Recommendation 1* and should be considered in conjunction with treatment prescription categories and specifications (Table 3). Recommendations listed in Table 6 are based on LE-100 guidelines and general assessments of vegetation conditions. For a complete list of LE-100 Infrastructure Assessment scores, reference *Appendix B: LE-100/Infrastructure Assessment Scores*.

Table 6. Water Department Sites #1-6, LE-100 Infrastructure Assessment Key Findings.

Water Department Sites #1-6 - Recommendation 1 – LE-100 Defensible Space Guidance	
Site	Water Department Sites #1-6 LE-100 Infrastructure Assessment - Key Observations & Findings
Water Department Site #1	<p><b>Within 30 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>Oak and madrone trees overhanging infrastructure including facilities and communications antenna. Remove all trees within property boundary and/or limb overhanging branches to improve spacing from infrastructure</li> <li>Accumulation of dead leaves and needles surrounding facilities. Remove and maintain accumulations, pursuant to Public Resources Code (PRC) §4291(a)(1)</li> </ul> <p><b>Within 100 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>Although the 100 ft. defensible space zone extends beyond the fence line, vegetation in this area is dense and poses an elevated wildfire risk. Treatments that cover the full extent of the 100 ft. defensible space zone should be considered. Key observations and recommendations include: <ul style="list-style-type: none"> <li>Dense, continuous understory with fuel accumulation beyond fence line. Increase vertical and horizontal spacing between shrubs and trees, and remove fuels and lower tree limbs, pursuant to PRC §4291(a)(1)</li> <li>Accumulation of dead leaves and needles surrounding facilities. Remove and maintain accumulations, pursuant to PRC §4291(a)(1)</li> <li>Some areas of obstructed vertical and horizontal clearance along the road and turnaround area. Conduct limbing to improve clearance and access for Type 3 Fire Engine</li> </ul> </li> </ul>
Water Department Site #2	<p><b>Within 30 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>Vegetation generally well maintained immediately surrounding facilities within fence line. However, the backside of facilities along fence line (approximately 30 ft. from infrastructure) could be maintained to improve defensible space and vegetation conditions. Key observations and recommendations include: <ul style="list-style-type: none"> <li>Tall dead grass and herbaceous material present along and behind fence line, intermixed and adjacent to shrubs, needles, and other vegetation. Remove all dead and dying grass, plants,</li> </ul> </li> </ul>

Water Department Sites #1-6 - Recommendation 1 – LE-100 Defensible Space Guidance	
Site	Water Department Sites #1-6 LE-100 Infrastructure Assessment - Key Observations & Findings
	<p>shrubs, trees, branches, leaves, weeds and needles, and mow areas of tall dead grass, pursuant to PRC §4291(a)(1)</p> <ul style="list-style-type: none"> <li>- Areas of overhanging tree limbs present near facilities. Limb overhanging branches to improve spacing from infrastructure</li> <li>- Live flammable ground cover and shrubs present behind fence line. Remove or separate, pursuant to PRC §4291(a)(1)</li> </ul> <p><b>Within 100 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>• Dense continuous understory present surrounding site fence line, including areas of live flammable vegetation, shrubs, and eucalyptus forest. These areas are prioritized for treatment in DeLaveaga Treatment Zone 1, with both mechanical and manual treatments. Treatments should focus on: <ul style="list-style-type: none"> <li>- Improving vertical and horizontal spacing by removing or separating fuels, live flammable ground cover and shrubs, and removing lower tree limbs, pursuant to PRC §4291(a)(1) and the Continuous Tree Canopy and Horizontal Spacing Standards</li> <li>- Mowing or cutting tall dead grasses surrounding site, pursuant to PRC §4291(a)(1)</li> </ul> </li> </ul>
Water Department Site #3	<p><b>Within 30 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>• Multiple trees overhanging and adjacent to facilities and pump house. Remove and/or limb overhanging branches to improve clearance from infrastructure</li> <li>• Additional pruning should be completed for trees surrounding facilities and infrastructure. Complete pruning of trees within 30 ft. of infrastructure, pursuant to PRC §4291(a)(1)</li> <li>• Accumulation of dead leaves and needles surrounding facilities. Remove and maintain accumulations, pursuant to PRC §4291(a)(1)</li> </ul> <p><b>Within 100 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>• Although the 100 ft. defensible space zone extends beyond the fence line, vegetation in this area is dense and poses an elevated wildfire risk. Treatments that cover the full extent of the 100 ft. defensible space zone should be considered when feasible. Key observations and recommendations include: <ul style="list-style-type: none"> <li>- Dense, continuous understory with fuel accumulation beyond fence line. Increase vertical and horizontal spacing between shrubs and trees, and remove fuels and lower tree limbs, pursuant to PRC §4291(a)(1) and the Continuous Tree Canopy and Horizontal Spacing Standards</li> <li>- Accumulation of dead leaves and needles surrounding facilities. Remove and maintain accumulations, pursuant to PRC §4291(a)(1)</li> <li>- Propane tank located directly under oak trees and surrounded by leaf accumulation. Improve clearance around propane tank, pursuant to 14 CCR § 1299.03(c)(1)</li> <li>- Oak tree limbs overhanging turnaround area. Limb or remove branches to improve clearance and access for Type 3 Fire Engine</li> </ul> </li> </ul>
Water Department Site #4	<p><b>Within 30 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>• Overhanging branches adjacent to generator/motor control center structure. Remove branches, pursuant to PRC §4291(a)(4)</li> </ul>



Water Department Sites #1-6 - Recommendation 1 – LE-100 Defensible Space Guidance	
Site	Water Department Sites #1-6 LE-100 Infrastructure Assessment - Key Observations & Findings
	<ul style="list-style-type: none"> <li>Dead Monterey pine overhanging facilities within fence line. Remove all dead or dying trees and branches, pursuant to PRC §4291(a)(5)</li> <li>Trees overhanging and adjacent to facilities along fence line on adjacent property. Remove and/or limb overhanging branches to improve clearance from infrastructure</li> </ul> <p><b>Within 100 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>Although the 100 ft. defensible space zone extends beyond the fence line, vegetation in this area along the back fence line on adjacent property is dense and poses an elevated wildfire risk. Treatments within the full extent of the 100 ft. defensible space zone should be considered. Key observations and recommendations include: <ul style="list-style-type: none"> <li>Dense, continuous understory with fuel accumulation beyond fence line. Increase vertical and horizontal spacing between shrubs and trees, and remove fuels and lower tree limbs, pursuant to PRC §4291(a)(1) and the Continuous Tree Canopy and Horizontal Spacing Standards</li> </ul> </li> </ul>
Water Department Site #5	<p><b>Within 30 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>Vegetation generally well maintained immediately surrounding facilities within fence line. Key observations and recommendations include: <ul style="list-style-type: none"> <li>Limbs overhanging remote access antenna. Remove and/or limb overhanging branches to improve spacing from infrastructure</li> </ul> </li> </ul> <p><b>Within 100 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>Although the 100 ft. defensible space zone extends beyond the fence line, vegetation in this area along back fence line on adjacent property is dense and poses an elevated wildfire risk. Treatments that cover the full extent of the 100 ft. defensible space zone should be considered. Key observations and recommendations include: <ul style="list-style-type: none"> <li>Dense, continuous understory with fuel accumulation beyond fence line. Increase vertical and horizontal spacing between shrubs and trees, and remove fuels and lower tree limbs, pursuant to PRC §4291(a)(1) and the Continuous Tree Canopy and Horizontal Spacing Standards</li> <li>Leaning hazard tree present along main access road. Remove to improve clearance and safe access conditions</li> </ul> </li> </ul>
Water Department Site #6	<p><b>Within 30 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>Vegetation generally well maintained immediately surrounding facilities within fence line. Key observations and recommendations include: <ul style="list-style-type: none"> <li>Douglas-fir limbs overhanging propane tank and antenna structure by site entrance. Remove and/or limb overhanging branches to improve spacing from infrastructure</li> <li>Tree overhanging facilities from beyond fence line. Remove and/or limb overhanging branches to improve spacing from infrastructure</li> <li>Propane tank located directly under Douglas-fir tree and surrounded by surface litter accumulation. Improve clearance around propane tank, pursuant to 14 CCR § 1299.03(c)(1)</li> </ul> </li> </ul>

Water Department Sites #1-6 - Recommendation 1 – LE-100 Defensible Space Guidance	
Site	Water Department Sites #1-6 LE-100 Infrastructure Assessment - Key Observations & Findings
	<p><b>Within 100 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>Although the 100 ft. defensible space zone extends beyond the fence line, vegetation in this area along back fence line on private property is dense and poses an elevated wildfire risk. Treatments that cover the full extent of the 100 ft. defensible space zone should be considered. Key observations and recommendations include: <ul style="list-style-type: none"> <li>Dense, continuous understory with fuel accumulation beyond fence line. Increase vertical and horizontal spacing between shrubs and trees, and remove fuels and lower tree limbs, pursuant to PRC §4291(a)(1) and the Continuous Tree Canopy and Horizontal Spacing Standards</li> </ul> </li> </ul>

## Water Department Site #7

Water Department Site #7 is prioritized overall as Priority 4 for vegetation treatments across COSC sites (Map 1), and Priority 2 for Water Department sites (Map 6). Priority treatment recommendations for Water Department Site #7 are focused on establishing defensible space surrounding critical infrastructure, improving access to the site, and promoting resiliency to wildfire in both the short-and long-term. Specific treatment recommendations at Water Department Site #1 may require long-term planning and strategizing, which is reflected in its prioritization relative to other COSC Priority Treatment Sites including the EOC, Water Department Sites #1-6, and Pogonip, where treatments may be implemented more immediately (reference *Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate*).

Findings from the LE-100 Infrastructure Assessment regarding defensible space indicate dense vegetation conditions within 100 ft. of infrastructure. Table 7 summarizes key findings from the LE-100 Infrastructure Assessment, including observations of vegetation conditions and corresponding treatment recommendations. These findings are intended to guide defensible space treatments outlined in *Water Department Site #7 - Recommendation 1* and should be considered in conjunction with treatment prescription categories and specifications. Recommendations listed in Table 7 are based on LE-100 guidelines and general assessments of vegetation conditions. For a complete list of LE-100 Infrastructure Assessment scores, reference *Appendix B: LE-100/Infrastructure Assessment Scores*. Although utility lines were not directly evaluated for vegetation clearance compliance, initial observations suggest inadequate clearance. Assessment of conditions and appropriate treatments should be evaluated following relevant regulations and standards, per *Water Department Site #7 - Recommendation 2*.

Table 7. Water Department Site #7, LE-100 Infrastructure Assessment Key Findings.

Site	Water Department Site #7 LE-100 Infrastructure Assessment - Key Observations & Findings
Water Department Site #7	<p><b>Within 30 ft. of Structures:</b></p> <ul style="list-style-type: none"><li>• Extensive needle accumulation present on the backside and on the roof the block house building, creating continuity from ground-level needles to needles on the roof and siding of the structure. Remove needles and vegetation from roofs and within 30 ft. of structures, pursuant to Public Resources Code (PRC) §4291(a)(6) and PRC §4291(a)(1)</li><li>• Redwood limbs overhanging the blockhouse building on backside of facility and within 30 ft. of facilities; with some limbs nearing ground contact. Limb overhanging branches to increase clearance from infrastructure and prune lower branches of trees within 30 ft. of structures, pursuant to PRC §4291(a)(1)</li><li>• Propane tanks anchored to structures and on hillside surrounded by vegetation, fuels, and thick duff, with no clearance. Relocate tanks away from structures and/or establish adequate vegetation clearance, pursuant to 14 CCR § 1299.03(c)(1)</li></ul> <p><b>Within 100 ft. of Structures:</b></p> <ul style="list-style-type: none"><li>• Dense, continuous understory with fuel accumulation surrounding infrastructure. Increase vertical and horizontal spacing between shrubs and trees, and remove fuels and lower tree limbs, pursuant to PRC §4291(a)(1) and the Continuous Tree Canopy and Horizontal Spacing Standards</li><li>• Areas of extensive surface fuel accumulation. Remove surface fuels, such as needles, twigs, leaves, bark, and cones greater than 3 in. in depth, pursuant to 14 CCR § 1299.03(b)(2)(A)</li><li>• Complete limbing to increase clearance in turnaround area to improve Type 3 Fire Engine access</li></ul>

## Water Department Site #8

### ***Treatment Recommendations & Strategies***

Water Department Site #8 is designated as Priority 3 for vegetation treatments for Water Department sites, with treatment recommendations primarily focused on establishing defensible space surrounding critical infrastructure and improving access to the site. The Priority Treatment Zone identified for Site #8 (1.1 acres; Map 8) indicates approximate areas where priority treatments may be implemented with the primary goal of improving and maintaining defensible space surrounding critical infrastructure, per *Water Department Site #8 - Recommendation 1* below.

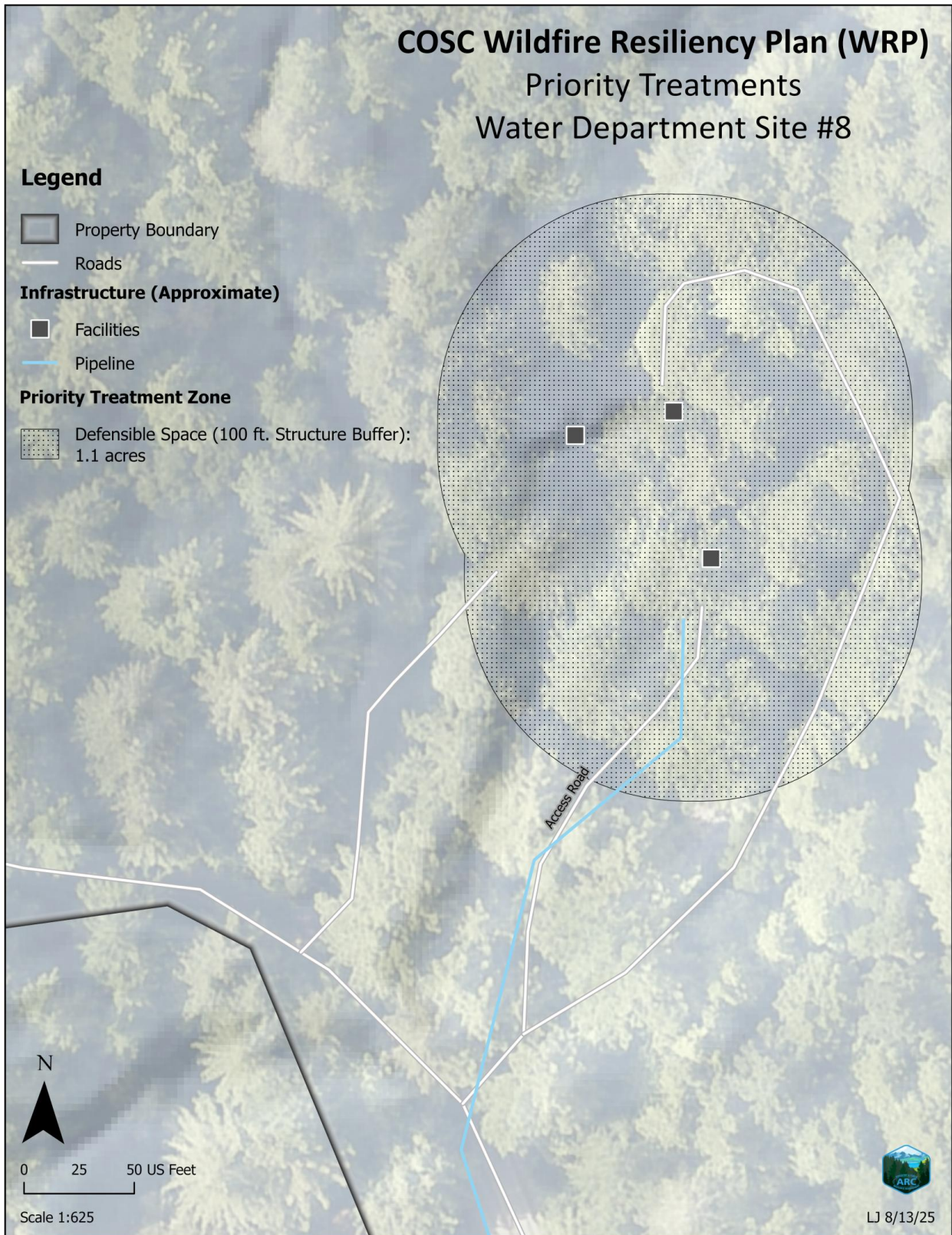
Water Department Site #8 is located on privately owned land, where the Water Department holds an easement for the area directly surrounding infrastructure. The defensible space 100 ft. structure buffer in the example Priority Treatment Zone may extend beyond the COSC easement area; therefore, treatments under *Water Department Site #8 - Recommendation 1* that establish defensible space in accordance with the LE-100 requirements should be completed up to the fence line or easement area boundary at minimum. Where defensible space treatments within 100 ft. of structures are limited by property boundaries, COSC should consider pursuing measures such as ROE agreements or obtaining neighbor consent to maximize the protection of critical infrastructure sites. Defensible space buffers mapped beyond fence lines or easement areas in the example Priority Treatment Zone are included for consideration of future treatment prioritization, contingent on pursuit of such agreements. The treatment prescriptions listed for *Water Department Site #8 - Recommendations 1-2* represent the minimum recommended prescriptions. Additional manual or mechanical treatments under the Forest Health Fuels Reduction prescription that expand beyond defensible space and roadside treatments should be considered to increase treatment extents where feasible. Portions of the mapped treatment areas may be subject to additional protections and MMs that limit implementation of proposed treatment strategies for Site #8; specific treatments within the Priority Treatment Zone must be coordinated with Water Department planners to specify any protected areas to be omitted from treatment.

Priority treatment recommendations, strategies, and prioritization, are described below.<sup>19</sup>

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<sup>19</sup> In addition to *Water Department Site #8 - Recommendations 1-2*, CIP project prioritization should continue to evaluate the Site #8, along with other Water Department Sites, and possible re-alignment alternatives for the site's pipeline.





Map 8. Water Department Site #8, Priority Treatments (Example Priority Treatment Zone). *Map Not to 1:625 Scale.*



## Water Department Site #8 - Recommendation 1

Maintain and improve defensible space surrounding buildings and critical infrastructure by treating trees and vegetation (Figure 13) within up to 100 ft. of all structures in accordance with CAL FIRE's LE-100, per the treatment prescriptions (Table 3) listed below. The Priority Treatment Zone identified for Water Department Site #8 (Map 8) indicates approximate areas where priority treatments may be implemented with the primary goal of establishing defensible space surrounding critical infrastructure; this zone does not encompass all treatment recommendations for the site.

### *Treatment Activity*

The treatment prescriptions below would primarily utilize manual treatments within the 100 ft. defensible space buffer surrounding infrastructure. Additional treatments beyond the 100 ft. defensible space buffer and/or easement area in the future could utilize mechanical treatments in areas where slopes are generally less than 35 percent and no greater than 50 percent with appropriate watercourse avoidance buffers.

### *Treatment Prescription*

The following treatment prescriptions listed below in order of priority apply to *Water Department Site #8 - Recommendation 1* (Table 3):

- Defensible Space
- Hazard Tree
- Invasive Species
- Forest Health Fuels Reduction

Findings from the LE-100 Infrastructure Assessment regarding defensible space indicate dense vegetation conditions within 100 ft. of infrastructure. Table 8 summarizes key findings from the LE-100 Infrastructure Assessment, including observations of vegetation conditions and corresponding treatment recommendations. These findings are intended to guide defensible space treatments outlined in *Water Department Site #8 - Recommendation 1* and should be considered in conjunction with treatment prescription categories and specifications. Recommendations listed in Table 8 are based on LE-100 guidelines and general assessments of vegetation conditions. For a complete list of LE-100 Infrastructure Assessment scores, reference *Appendix B: LE-100/Infrastructure Assessment Scores*.

Table 8. Water Department Site #8, LE-100 Infrastructure Assessment Key Findings.

Site	LE-100 Infrastructure Assessment - Key Observations & Findings
Water Department Site #8	<p><b>Within 30 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>• Dense, continuous understory with fuel accumulation and live flammable ground cover within 30 ft. of infrastructure (Figure 13). Increase vertical and horizontal spacing between shrubs and trees, and remove fuels and lower tree limbs, pursuant to Public Resources Code (PRC) §4291(a)(1)</li> <li>• Propane tank located on hillside is rusting and surrounded by vegetation, fuels, and thick duff layer, with minimal clearance (Figure 13). Relocate tanks away from vegetation and/or establish adequate vegetation clearance, pursuant to 14 CCR § 1299.03(c)(1)</li> </ul> <p><b>Within 100 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>• Although the 100 ft. defensible space zone extends beyond the COSC, vegetation in this area is dense and poses an elevated fire risk. Treatments within the full extent of the 100 ft. defensible space zone beyond the COSC easement area should be considered when feasible. Key observations and recommendations include: <ul style="list-style-type: none"> <li>• Dense, continuous understory with ladder fuels and surface fuel accumulation within 100 ft. of infrastructure (Figure 13). Increase vertical and horizontal spacing between shrubs and trees, and remove fuels and lower tree limbs, pursuant to PRC §4291(a)(1) and the Continuous Tree Canopy and Horizontal Spacing Standards</li> <li>• Areas of extensive surface fuel accumulation. Remove surface fuels, such as needles, twigs, leaves, bark, and cones greater than 3 in. in depth, pursuant to 14 CCR § 1299.03(b)(2)(A).</li> <li>• Complete limbing to increase clearance in turnaround area to improve fire response access for Type 3 Fire Engine</li> </ul> </li> </ul>

### Water Department Site #8 - Recommendation 2

Maintain and improve access to Water Department Site #8, ensuring adequate vertical and horizontal clearance to support Type 3 Fire Engine access, by removing vegetation along and overhanging access roads and turnarounds, per the treatment prescriptions listed below.

#### *Treatment Activity*

The treatment prescriptions below would utilize primarily a combination of manual and mechanical treatment activities but could also include targeted herbicide where appropriate.

#### *Treatment Prescription*

The following treatment prescriptions listed below in order of priority apply to *Water Department Site #8 - Recommendation 2* (Table 3):

- Roadside
- Hazard Tree
- Invasive Species
- Forest Health Fuels Reduction

## Treatment Implementation: Timing & Maintenance

### *Treatment Timing*

The Water Department should initiate implementation of treatments identified as highest priority overall across COSC sites in 1-2 years, including Water Department Sites #1-6 and Site #7. Additional treatments, including Priority Treatment Zones or additional recommendations across priority Water Department sites, should be initiated within 3-4 years or as funding is available. Initial planning actions necessary for certain treatments, such as long-term recommendations for Site #7 and those extending beyond COSC property boundary, which likely require ROE agreements, should be initiated within 1-2 years.

Existing treatments that occur annually through the Water Department, including facility and road maintenance and defensible space treatments should also be prioritized as part of on-going vegetation management concurrent with implementation of WRP treatment recommendations.

### *Treatment Maintenance*

Most treatments require maintenance treatments, or re-treatments; however, the interval of maintenance varies widely depending on vegetation type, history of land management, and other factors such as storm events. Maintenance intervals may vary greatly and are generally related to the vegetation life form, landscape location (e.g., climate and soil types of influence plant regrowth), and activity type. Maintenance treatments would be based on monitoring of the site conditions but are estimated to occur immediately following initial treatments or approximately every 2-10 years, or if the qualified professional/landowner determines that the initial treatment did not obtain the appropriate results to meet treatment objectives. Maintenance treatments would generally occur at lower intensity, scale, and cost than initial treatments depending on vegetative regrowth and treatment method and objectives. Monitoring the progression of understory regeneration can aid in the development of a timeline for maintenance treatment cycles. Designating time to monitor and maintain the treatment areas could significantly reduce costs of re-treating these areas if vegetative conditions are to become too dense to be re-treated in-house by COSC.

Maintenance treatment methods may employ the same treatment activities used in the initial treatment or introduce a new treatment activity. Often the maintenance treatment is different than the initial treatment, such as manual or mechanical treatments in tree-dominated vegetation types that reduce surface and ladder fuels followed by prescribed fire treatment(s) to maintain reduced fuel loads, in consideration of the natural fire return interval of the vegetation community and other environmental factors as well as treatment objectives are important factors in determining appropriate intervals.

## Section III: Parks and Recreation & Public Works Departments Priorities

The Parks and Recreation and Public Works Departments work collaboratively on a variety of COSC efforts and initiatives, including vegetation management across COSC lands and sites. In many cases, Public Works Department facilities are located adjacent to or within larger Parks and Recreation-maintenance areas and open space properties. Therefore, site and treatment prioritization, recommendations, and strategies were developed collectively across both Departments, as outlined below.

While the following treatments and prescription specifications are recommended as part of the WRP, existing resource management documents developed by COSC, Parks and Recreation, or Public Works Department – containing site-or department-specific guidelines – should be referenced alongside WRP recommendations (reference *Section VIII: Background*). Integrating WRP recommendations with existing guidelines will support alignment with broader goals and policies while advancing treatment implementation across site. Of note, DeLaveaga and Pogonip recommendations were first introduced in the *Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate* for all COSC lands, emphasizing their importance and criticality; this section further distinguishes priority actions, including additional Priority Treatment Zones, within these sites.

## Overview of Priority Parks and Recreation & Public Works Department Sites

This section provides an overview of site concerns and existing management strategies across priority Parks and Recreation and Public Works Department sites (Table 9). Many Parks and Recreation and Public Works Department sites include areas of concentrated ignitions, primarily due to human-caused fires linked to unhoused populations. These ignitions, and associated encampment areas, represent a key management and wildfire-related concern for the Parks and Recreation and Public Works Departments. As a result, many of the proposed treatments at these sites are focused on reducing vegetation and fuels in ignition-prone areas.

Existing management at Parks and Recreation and Public Works Department sites range from on-going facilities management, road maintenance, invasive species removal, biotic surveys, and vegetation management actions. Management approaches at DeLaveaga, Pogonip, Moore Creek, and Arroyo Seco are generally guided by COSC-wide and site-specific management plans. Prior to implementation, treatment strategies and recommendations outlined in the WRP should be referenced with these existing plans to ensure alignment with COSC- and site-specific management goals, objectives, and policies.

In [Pogonip](#), the *Pogonip Master Plan* and corresponding *Pogonip Master Plan EIR* provide the foundation for on-going management actions. The *Pogonip Master Plan* outlines key objectives and vision for long-term use and resource management in Pogonip, providing guidance on the park's mixed-use concept, protection of historical resources, sensitive habitat, and biotic resources, in addition to public use policies (City of Santa Cruz Parks and Recreation Department, *Pogonip Final Master Plan*, 1998). The EIR, prepared in 1998, documents the potential impacts of the approaches outlined in the *Pogonip Master Plan*.

Similarly, management actions in [Moore Creek](#) are primarily guided by the *Moore Creek Preserve Interim Management Plan*. The plan outlines management actions aimed at protecting natural resources, native species, sensitive habitats, while also maintaining trails, infrastructure, and reducing fire hazard. Conservation easements held by the State of California within the Canyon along Moore Creek also inform and direct management strategies and responsibilities throughout the property, with the main goal of protecting the natural condition of Moore Creek and preventing significant impacts to resources (City of Santa Cruz Parks and Recreation Department, 2002). While the Parks and Recreation Department holds primary responsibility for the entire Moore Creek property and is tasked with implementing the management actions outlined in the *Moore Creek Interim Management Plan*, the Land Trust of Santa Cruz has been designated by the State of California to carry out conservation easement-specific management actions within the easement area (City of Santa Cruz Parks and Recreation Department, 2002). Together, these entities design and implement management approaches within the shared management area. The Moore Creek property is also included in the COSC OMHCP plan area, which provides coverage for a range of Parks and Recreation Department management activities and outlines potential impacts and MMs for covered species that occur on the property. Notably, Moore Creek is also located within the Coastal Zone, which involves additional environmental compliance considerations for permitting, treatment planning, and implementation. Considerations for permitting within the Coastal Zone are described in [Section VII: Permitting, Regulatory Compliance & Implementation](#). Prior to implementation, treatment strategies and recommendations outlined in the WRP should be reviewed in conjunction with the *Moore Creek Interim Management Plan* and assessed for Coastal Act compliance.

Site concerns across these properties include vegetation conditions, access limitations, human-related impacts, non-native species, and the presence of or potential impacts to sensitive habitats and species. The presence of sensitive species and habitats may necessitate avoidance and MMs, along with adherence to specific regulatory compliance requirements outlined by COSC and the Parks and Recreation Department



guidelines. Where concentrations of unhoused populations are located, concerns pertain to human health, safety, ignition-related risks, additional coordination, site preparation, and clean-up prior to treatment implementation. Consideration of these concerns, in addition to potential impacts and guidelines outlined in the Parks and Recreation and Public Works Department’s guiding documents, and/or site-specific management plans, should be evaluated prior to treatment planning and implementation.

Table 9. Overview of Priority Sites, Parks and Recreation and Public Works Departments.

Site	Site Concerns	Existing Management
DeLaveaga	<ul style="list-style-type: none"> <li>• Critical multi-department infrastructure that provides essential public services, located within a large wildland area</li> <li>• Unhoused populations and encampments throughout the property, with concentration of ignitions in the southwestern corner of the property</li> <li>• Known or potential sensitive habitat and species including: <ul style="list-style-type: none"> <li>- Brackish or freshwater marsh, grassland coastal prairie, oak woodland, and eucalyptus groves that provide overwintering habitat for monarch butterfly monarch butterfly (<i>Danaus Plexippus</i>)</li> <li>- Dusky-footed woodrat, monarch butterfly, and Santa Cruz tarplant</li> </ul> </li> <li>• Non-native species, including eucalyptus, acacia, and broom</li> </ul> <p>(City of Santa Cruz Parks and Recreation, 2020)</p>	<ul style="list-style-type: none"> <li>• Firebreak mowing in grasslands and along key roads, trails, and fire access routes occurs across approximately five acres per year</li> <li>• Trail brushing across approximately 12 acres per year, along 17 miles of trail with 3 ft. of brushing on each side of the trail.</li> <li>• General maintenance of the DeLaveaga Golf Course</li> <li>• Landscaping around the EOC building</li> <li>• Maintenance activities at Netcom communications tower, such as weed whacking along the fence line</li> <li>• Maintenance activities on the state-owned Armory parcel, including: <ul style="list-style-type: none"> <li>- Vegetation management along the building’s fence line conducted by COSC</li> <li>- Invasive species treatments conducted by the state throughout the year in the wildland areas near the entrance of the property</li> </ul> </li> </ul>
Pogonip	<ul style="list-style-type: none"> <li>• Unhoused populations and encampments throughout the property, with particular concern in the lower property adjacent to Sycamore Grove</li> <li>• Known or potential sensitive habitat and species including: <ul style="list-style-type: none"> <li>- Robust spineflower, San Francisco popcorn flower (<i>Plagiobothrys diffuses</i>), Santa Cruz clover (<i>Trifolium buckwestiorum</i>), Gairdner’s Yampah (<i>Perideridia gairdneri</i> ssp. <i>gairdneri</i>), California red-legged frog and Ohlone tiger beetle; and Coastal prairie, wet meadow, springs, and oak woodlands</li> </ul> </li> <li>• Non-native species, including: <ul style="list-style-type: none"> <li>- Eucalyptus, acacia, and broom</li> </ul> </li> </ul> <p>(Baron, 2007) (City of Santa Cruz Parks and Recreation, 2020) (City of Santa Cruz Parks and</p>	<ul style="list-style-type: none"> <li>• Firebreak mowing in primarily grasslands and along key roads, trails, and fire access routes occurs across approximately 78 acres per year</li> <li>• Trail brushing across approximately 8 acres per year, along 11.5 miles of trail with 3 ft. of brushing on each side of the trail</li> <li>• Invasive species control in coastal prairies</li> <li>• Rare plant and Ohlone tiger beetle surveys</li> <li>• Habitat management</li> </ul> <p>(City of Santa Cruz Parks and Recreation, 2020)</p>

Site	Site Concerns	Existing Management
	Recreation Department, Pogonip Final Master Plan, 1998) (Biotic Resources Group, 2023)	
Moore Creek	<ul style="list-style-type: none"> <li>Unhoused populations and encampments throughout the property, with particular concern in the lower property adjacent to the west branch of Moore Creek</li> <li>Known or potential sensitive habitat and species including: <ul style="list-style-type: none"> <li>Ohlone tiger beetle, San Francisco popcornflower, southwestern pond turtle (<i>Actinemys pallida</i>), California red-legged frog, and monarch butterfly with overwintering habitat</li> <li>Coastal prairie, wet meadow, and riparian woodland habitat</li> </ul> </li> <li>Non-native species, including: <ul style="list-style-type: none"> <li>Eucalyptus and French broom</li> </ul> </li> <li>Increased fire hazard within the property's eucalyptus stand, which has been recommended for thinning treatments to minimize hazard</li> <li>Located within Coastal Zone</li> </ul> <p>(City of Santa Cruz Parks and Recreation Department, 2002) (Biosearch Environmental Consulting, 2024) (City of Santa Cruz Parks and Recreation, 2020) (Biotic Resources Group, 2023)</p>	<ul style="list-style-type: none"> <li>Treatments cover a total of approximately 110 acres annually, including: <ul style="list-style-type: none"> <li>Grazing (year-round, in coastal prairie)</li> <li>Firebreak mowing (primarily in grasslands and along key roads, trails, and along the property boundary)</li> <li>Grant-funded invasive species removal (manual removal and targeted herbicide application)</li> </ul> </li> <li>Additional management activities include: <ul style="list-style-type: none"> <li>Rare plant and Ohlone tiger beetle surveys</li> <li>Habitat management</li> </ul> </li> </ul> <p>(City of Santa Cruz Parks and Recreation, 2020)</p>
Arroyo Seco	<ul style="list-style-type: none"> <li>Neighbor concerns regarding vegetation conditions and wildfire risk</li> <li>Key fire response access routes, including a primary access road and several access points along the property boundary</li> <li>Non-native species, including: <ul style="list-style-type: none"> <li>Pampas grass</li> <li>Eucalyptus</li> <li>French broom</li> </ul> </li> </ul> <p>(John Gilchrist &amp; Associates, 1999)</p>	<ul style="list-style-type: none"> <li>On-going maintenance maintenance activities include: <ul style="list-style-type: none"> <li>Maintenance of the primary access road from Meder St. through the property (Parks and Recreation Department)</li> <li>Maintenance of the wastewater line located underground along the primary access road in the upper portion of the property (Public Works Department)</li> <li>Removal of downed trees and vegetation blocking the road</li> <li>Clearing of vegetation and debris within 4 to 5 ft. of either side of the road to maintain emergency vehicle access</li> <li>Removal of obstructions, clearing and repairing of culverts and sewer blockages</li> <li>Areas of weed whacking and mowing</li> </ul> </li> </ul>

Site	Site Concerns	Existing Management
		<ul style="list-style-type: none"> <li>- Removal of non-native species, such as Pampas grass, French broom, and eucalyptus saplings</li> </ul> <p>(John Gilchrist &amp; Associates, 1999)</p>

## Parks and Recreation & Public Works Departments Treatment

### Prioritization

The top four priority Parks and Recreation and Public Works Department sites (DeLaveaga, Pogonip, Moore Creek, and Arroyo Seco) were prioritized based on criteria described in *Section V: Wildfire Resiliency Plan (WRP) Development Methods*; this same methodology was considered for the prioritization of all COSC lands, of which DeLaveaga Priority Treatment Zone 1 ranked Priority 1 (Maps 1-2) and the Pogonip Priority Treatment Zone 1 ranked Priority 3 (Map 5). DeLaveaga, Pogonip, and lands immediately adjacent to Moore Creek and Arroyo Seco are considered among the most wildfire-vulnerable areas in the City (City of Santa Cruz, 2018). In addition to their overall vulnerability, several factors contribute to elevated fire risk at these sites, and thus prioritization in the WRP. The key criteria used to prioritize these sites, and their corresponding treatment recommendations, are outlined below.

### Community Impact

These four priority Parks and Recreation and Public Works Department sites play a vital role for communities throughout Santa Cruz, given the services they provide, their location within the WUI, and their overall value to the community. Of the four sites, DeLaveaga, Pogonip, and Arroyo Seco have relatively high community significance, while Moore Creek has relatively moderate level of community significance, based on factors such as proximity to communities, surrounding housing density, and community use. The COSC *Local Hazard Mitigation Plan* identifies all four properties as WUI and wildfire hazard zones, in part because of surrounding housing density and limited access (City of Santa Cruz, 2018). DeLaveaga, Pogonip, and Arroyo Seco area are designated as mutual threat zones (reference *Section VIII: Background*) due to the combination of urban development and dense vegetation within their canyons (City of Santa Cruz, 2018). While not designated as a mutual threat zone, Moore Creek has been identified as an additional area of wildfire-related concern for its location within the WUI and adjacent to residential homes (City of Santa Cruz, 2018). The 2019 CAL FIRE FRAP WUI dataset indicates that DeLaveaga, Pogonip, Moore Creek, and Arroyo Seco are located adjacent to large areas of high housing density, highlighting their proximity to the greater urban areas of Santa Cruz – which include mixed residential, industrial, and commercial development. However, Moore Creek is generally less intermixed within these high density areas given significant wildlands to the west/northwest of the property.

A key factor in the prioritization of [DeLaveaga](#) and corresponding Priority Treatment Zones is the presence of critical Public Works and Water Department infrastructure (Map 9). These infrastructure sites represent high priority sites for their respective Departments, for COSC, and the communities they serve, providing essential public services for COSC residents. These include a Water Department Site, which provides substantial storage to the Water Department’s water supply and supports the Gravity Zone that has the highest ADD (6.0 mgd) among pressure zones (City of Santa Cruz Water Department, 2023), the Public Works Department’s EOC and Netcom facilities, which provides public safety services for approximately 330,000 people across Santa Cruz and San Benito Counties, and the Public Works Department’s Armory, which

provides housing and public health services to the City's unhoused populations. Treatments within Priority Treatment Zones 1 and 3 are positioned directly surrounding critical infrastructure sites to improve the resilience of facilities to wildfire, helping to ensure their continued operation and capacity to provide essential community services. DeLaveaga represents a large area for mixed-use recreation as one of COSC's Greenbelt properties. The park is also located within and adjacent to extensive forested wildland areas that connect to communities and residential areas, including the greater urban areas of Santa Cruz. Corresponding to these adjacent communities, housing and structure density is relatively high surrounding areas of DeLaveaga. Treatments within the Priority Treatment Zones and additional treatment areas are strategically placed in proximity to surrounding residential communities and areas of high housing density.

**Pogonip** is directly adjacent to large community populations, including the UCSC campus that directly borders Pogonip along the western boundary of the property, which hosts a student population of approximately 19,457 (UC Santa Cruz, n.d.). Additionally, Pogonip also represents a large area for mixed-use recreation as one of COSC's Greenbelt properties (City of Santa Cruz Parks and Recreation Department, Pogonip Final Master Plan, 1998). Corresponding to these adjacent communities, housing and structure density is relatively high surrounding areas of Pogonip. Notably, UCSC represents a large building footprint area immediately adjacent to Pogonip, encompassing a network of infrastructure including facilities, student housing, academic buildings, utility systems, transportation systems, and telecommunication networks. Additional areas of relatively high structure density to the southwest and east of Pogonip include residential housing, and to the south, commercial and industrial development, which connect to the greater urban areas of Santa Cruz. Treatments in Pogonip Priority Treatment Zone 1 are positioned to treat vegetation and fuels adjacent to high structure density areas to the south and east of Pogonip, while treatments in Priority Treatment Zone 2 are located along the western ridgeline connecting Pogonip and the UCSC campus. Notably, Priority Treatment Zone 1 and prescribed fire treatment units in the southeastern portion of Pogonip are in proximity to the Public Works Department Corporation Yard. The Corporation Yard, situated below Pogonip, is a critical property for COSC and the Public Works Department that has limited opportunity for vegetation treatments on-site. Treatments in Pogonip are designed to also improve wildfire resiliency for the facility by implementing landscape-level treatments that help slow the spread of fire through the immediate region.

**Moore Creek** is used by many COSC residents for mixed-use recreation, as one of COSC's Greenbelt properties since 1998 (City of Santa Cruz Parks and Recreation Department, 2002). The property is uniquely situated between the denser urban and residential areas of Santa Cruz to the east and extensive wildlands to the north and west. The property directly borders residential communities along its eastern edge and is in proximity to the greater urban areas of Santa Cruz. Treatments within Moore Creek Priority Treatment Zones 1-2 are strategically located in proximity to these residential communities, extending along the property's eastern boundary where it directly borders adjacent homes.

**Arroyo Seco** is located within the developed urban areas of the City, surrounded by residential neighborhoods that directly border the property, in addition to the UCSC campus to the north. This property is situated within the riparian corridor, where the creek is met by steep slopes that lead upslope to adjacent parcels. Given its location within a residential area, the surrounding structure density is relatively high. The main fire access road at Arroyo Seco also serves a publicly accessible pedestrian trail, frequently used by nearby residents and communities for recreation. The property also contains key Public Works Department sewer infrastructure that serves residents throughout the City by transporting wastewater from pipelines to the City of Santa Cruz Wastewater Treatment Facility at Neary Lagoon. Infrastructure located within the Arroyo Seco property includes sewer pipes and structures along the primary access road, as well as trails and roads that connect to adjacent neighborhoods. Notably, Arroyo Seco is also an area of concern within the community, as nearby residents and neighbors have raised issues regarding current vegetation

conditions and wildfire risk. The fuel break treatments along the main access road in Arroyo Seco Priority Treatment Zone are intended to improve emergency access to protect nearby homes and communities.

### **Ignition Risk**

Use of DeLaveaga, Pogonip, Moore Creek, and Arroyo Seco has steadily increased for recreation by COSC residents and as a location for encampments for those who are unhoused, and for nearby residential development. Consequently, potential for human-caused wildfire ignitions increases in likelihood, leading to higher wildfire risk within and surrounding these properties (City of Santa Cruz, 2018). COSC human-caused ignition data from 2019-2024, predominantly associated with unhoused populations, indicates concentrations of ignitions within and adjacent to each of these sites.

**DeLaveaga** has approximately 15 ignition points within the property concentrated in the southwestern portion of the park, primarily occurring in 2024, and an additional concentration adjacent to the park along Highway 1 (Map 8). Priority Treatment Zones 1 and 3 are positioned to reduce vegetation and fuel conditions near ignition-prone areas, specifically where adjacent to infrastructure.

**Pogonip** has a very high concentration of ignitions relative to other COSC sites, with approximately 103 ignitions occurring directly within Pogonip (Map 10). The southeastern portion of the property, where Highway 9 coincides with Sycamore Grove, is of particular concern with a large concentration of ignitions in addition to unhoused populations. Priority Treatment Zone 1 fuel breaks and treatments, in combination with grassland prescribed burn treatment areas, are positioned to reduce vegetation and fuel conditions between Sycamore Grove/Highway 9 and central portions of Pogonip where fire risk is high.

**Moore Creek** has approximately eight ignitions occurring directly within Moore Creek concentrated in the southeastern portion of the park and additional ignitions to the south and east along Highway 1 (Map 11). Priority Treatment Zone 1 has been strategically prioritized and positioned to reduce vegetation, fuels, and flammable grasses in proximity to these ignition-prone areas to help slow fire spread in high-risk areas and across the property.

While **Arroyo Seco** only contains approximately two recorded human-caused ignitions from 2019-2024, the property borders Moore Creek and associated ignitions located in the southeastern portion of the park. Additionally, the lower portion of Arroyo Seco is located in proximity to several ignitions along Highway 1 as well as Natural Bridges Drive and State Beach.

### **Fire Response Access**

The COSC *Local Hazard Mitigation Plan* outlines several non-State Responsibility Area (SRA) areas within the city – including DeLaveaga, Pogonip, and Arroyo Seco – as mutual threat zones (reference *Section VIII: Background*), due to their proximity to SRA lands and the presence of both urban development and dense vegetation within their canyon areas (City of Santa Cruz, 2018). As designated mutual threat zones, access roads within these properties have the potential to support multi-agency fire response efforts. Notably, select roads and trails in DeLaveaga and Pogonip are identified as critical fire roads in the WRP, prioritized for future upgrades and maintenance to improve emergency response access (*Priority 5: Critical Fire Roads*). Key roads through Moore Creek provide access to wildland areas within and adjacent to the property, in addition to nearby residential communities. Arroyo Seco also contains essential fire access roads, with a primary access road that connects to several residential Fire Department access points along the property border. The prioritization and placement of treatments are designed to improve fire response capabilities within these high priority sites and surrounding areas.

Access roads located in the southern and eastern portions of **DeLaveaga** within Priority Treatment Zones 1 and 2 provide critical fire access for Type 3 engines throughout the property, with limited access for Type 1



engines. These access routes, ranked Priority 5 for overall COSC treatments, are high priority for maintaining and improving as they fire response capabilities by both the Fire Department and other fire agencies throughout the property and specifically to critical infrastructure (EOC/Netcom and Water Department Site). Priority Treatment Zones 1 and 2 include fuel breaks that establish a buffer of treated vegetation and fuels along these key access routes, aiding in fire response within the property.

**Pogonip** has several key fire response access roads, connecting access from the southern to the northern portions of the property. These fire access routes, predominantly accessible by Type 3 engines or smaller apparatus, are critical to fire response and suppression and are prioritized for treatment in Priority Treatment Zones 1 and 2, as well as Priority 5 for overall COSC priority treatments. Treatments are designed to create a buffer of treated vegetation and fuels near fire access routes and ignition-prone areas, helping to moderate fire behavior and limit its spread within Pogonip and to neighboring properties. Furthermore, fuel break treatments along access roads further support fire response efforts in the event of an ignition.

Central access roads through **Moore Creek** connect Highway 1 to the top of the property, serving as a key access route for fire response within the property and to and/or from adjacent properties. The Moore Creek property is most suitable for Type 3 engines or smaller apparatus due to having predominantly unpaved road surfaces tracked by livestock and narrow gates; however, the main Highway 1 entrance gate may provide Type 1 access to the lower portions of the property. Priority Treatment Zones 1 and 2 include mowing along key roads and trails within the property to further aid in fire response.

**Arroyo Seco** has a main fire access road that runs through the center of the property along the canyon bottom from University Terrace Park to near Grandview Street. Additionally, the property includes several Fire Department access locations along the property boundary within surrounding residential neighborhoods. Many of these residential access points connect to the primary fire access road, providing access from various locations of the property. The main fire access road provides critical fire access for Type 3 engines, with fire access points providing varying types of fire engine, equipment, and vehicle access. Priority Treatment Zone 1 treatments are designed to improve fire response access along the main access road.

### ***Topography & Local Climate***

Unique topography and localized climate conditions present at DeLaveaga, Pogonip, Moore Creek, and Arroyo Seco have the potential to influence fire behavior across the landscape and are important factors in the prioritization and placement of treatments. Topographic features, such as canyons with steep slopes, in proximity to dense vegetation and urban development, are contributing factors to elevated fire risk and overall vulnerability for various areas in the City (City of Santa Cruz, 2018). Fire behavior in several areas of Santa Cruz with steep canyons is expected to result in rapid, uphill fire spread with potential for ember cast, posing a threat for nearby homes and structures (City of Santa Cruz, 2018). In addition to steep topography present at each site, the region's prevailing northwest wind poses a risk for increased fire activity and spread into and across each property. This threat is particularly high during certain times of the year in Santa Cruz, when hazardous fuel moisture, vegetation, and weather conditions align. In general, treatments within the Priority Treatment Zones are positioned perpendicular to the prevailing wind pattern.

In **DeLaveaga**, steep canyons and drainage features characterized by slopes of greater than 35 percent are present across many areas of the property. It has been noted DeLaveaga's steep topography and canyons, combined with vegetative conditions and certain weather conditions, pose significant threats to adjacent homes and the EOC/Netcom along the southern border of the property (MHA Environmental Consulting, Inc., 1997).

The ridgeline connecting **Pogonip**, UCSC campus, and the Spring Street neighborhood is a noted area of concern, where the combination of topography and westerly winds during fire season coincide to create

heightened wind patterns and turbulence along the ridgeline (City of Santa Cruz Parks and Recreation Department, 1998). This wind pattern can contribute to the drying and spread of fine-fuels and has the potential to increase fire behavior and spread (City of Santa Cruz Parks and Recreation Department, 1998). Given these local features, treatment areas within Priority Treatment Zones 1 and 2 are positioned along the western ridgeline and generally perpendicular to the prevailing northwest wind to help minimize fire spread into both Pogonip and adjacent properties.

Topography within **Moore Creek** is generally steep, featuring uplifted marine terraces with coastal prairie and grasslands, transitioning into steep canyons along Moore Creek (City of Santa Cruz Parks and Recreation Department, 2002). The area's elevated fire risk reflects a combination of steep topographic features in proximity to dense vegetation and urban development. Steep canyons along the property's eastern boundary are of particular concern as they directly border residential homes and communities, support dense vegetation, and are adjacent to ignition concentrations. The region's prevailing northwest wind further elevates wildfire risk and the potential for fire spread across Moore Creek, due to the presence of extensive wildland area to the north and west, as well as the property's easily ignitable grasslands that converge with densely vegetated, steep canyons. Both Priority Treatment Zones are strategically positioned with consideration of these factors, targeting the treatment of grassland, vegetation and fuels located along the steep slopes of Moore Creek adjacent to residential areas, and perpendicular to the prevailing northwest wind.

**Arroyo Seco** features several steep canyons and drainages throughout the property that contribute to elevated fire risk within the property and for adjacent communities. The main drainage follows the access road, with secondary canyons joining the primary canyon on the eastern side and several drainages and springs feeding into the creek from the western side (John Gilchrist & Associates, 1999). These canyons and drainages are directly bordered by residential housing and neighboring communities. Fire behavior across these topographic features is noted to be expected to have increased fire spread, with fire generally moving uphill towards homes located at the top of the canyons. Given significant vegetation and housing density, there is potential for ember cast and involvement of nearby structures. The region's prevailing northwest wind, coupled with extensive and steep wildland area to the west, including Moore Creek, increases the likelihood of heightened fire risk and behavior across Arroyo Seco's steep canyon features and dense vegetation.

### ***Vegetation Conditions***

Although vegetation conditions vary by site, each site generally exhibits characteristics such as dense vegetation, high fuel accumulations in the WUI, and invasive and non-native plant populations – factors that contribute to increased wildfire risk and behavior. These vegetation conditions, coupled with climatic trends, have created conditions that elevate fire risk and potential fire behavior. Of note, the majority of the DeLaveaga, Pogonip, Moore Creek, and Arroyo Seco properties have been identified as areas of wildfire hazard within the City (City of Santa Cruz, 2018). Additionally, the expansion of non-native species across these properties represents a significant management concern for the Parks and Recreation Department and a contributing factor to hazardous vegetation conditions and wildfire risk. As such, management of non-native species for the purpose of



Figure 14. Armory, Vegetation Conditions.

persevering sensitive habitats, reducing fire risk, and improving ecosystem health, is a key focus of management for the Parks and Recreation Department. For instance, the *Moore Creek Interim Management Plan*, *Pogonip Master Plan*, and *Moore Creek Preserve and Pogonip Open Space French Broom and Acacia Management Plan* identifies priority action for the removal of invasives and non-natives within these properties (Biotic Resources Group, 2023). Site-specific vegetation conditions are described below.

**DeLaveaga** features a diverse range of vegetation types (*Appendix A: Maps*, Map A1) including oak-and hardwood-dominated woodlands, shrublands, grasslands, and eucalyptus, Monterey pine/Monterey cypress, redwood/Douglas-fir, and mixed-evergreen forests. Notably, concerns in DeLaveaga include the presence of eucalyptus forests, other non-native vegetation, and substantial fuel loads (MHA Environmental Consulting, Inc., 1997). Additionally, the area south of the Golf Course near Priority Treatment Zone 1 has been identified in previous assessments as posing a significant threat to nearby homes and structures, including the EOC/Netcom, under certain fire weather conditions, given high vegetation density and fuel loads (MHA Environmental Consulting, Inc., 1997). Figures 1, 8, and 14 depict vegetative conditions within the DeLaveaga Priority Treatment Zones, highlighting dense forest conditions with continuous ladder fuels along the proposed Old Vineyard Trail fuel break, and adjacent to EOC and Armory facilities. Non-native species that are common in DeLaveaga include including eucalyptus, acacia, and broom, which pose management concerns. Treatments in DeLaveaga Priority Treatment Zones are specifically designed to address these conditions, with a focus on treating vegetation and fuels particularly where it is adjacent to critical infrastructure and fire response access routes.

A diverse range of vegetation types occur across **Pogonip** (*Appendix A: Maps*, Map A8), including grasslands, coastal prairie, shrublands, oak-and hardwood-dominated woodlands, and redwood and mixed-evergreen forests. Like many landscapes in California including those within the WRP area (reference *Section VIII: Background*) these vegetation communities at Pogonip have undergone and continue to face significant vegetation type transitions. Specifically, coastal prairies and grasslands in Pogonip, including those along Spring Trail and in the Main Meadow, are increasingly threatened by encroachment from native woody shrubs such as coyote brush and expanding Douglas-fir dominated forests (Figure 23). Similarly, hardwood-dominated woodlands across Pogonip are being replaced by more shade tolerant species because of encroaching Douglas-fir. These changes are coupled with higher forest densities and increased fuel accumulations, creating conditions conducive to increased fire risk and behavior (Figure 2). Figure 2 depicts dense forest conditions with continuous ladder fuels present across many areas of Pogonip, including eucalyptus stands along Brayshaw Trail and oak woodlands within Priority Treatment Zone 1. Non-native species that occur in Pogonip include eucalyptus, acacia, and broom. Notably, silver wattle (*Acacia dealbata*), blackwood wattle (*Acacia melanoxylon*), and French broom, all listed by the California Invasive Plant Council (Cal-IPC) as invasive non-native species, occur at varying densities throughout Pogonip (Biotic Resources Group, 2023).

Many of the treatments recommended in Map 11 for Pogonip, particularly those within Priority Treatment Zone 1, target coastal prairie and grasslands already impacted by or vulnerable to encroachment from shrubs, Douglas-fir, invasive species, and other woody vegetation (Figure 23). These treatments are located in predominantly woodland and forested areas adjacent to coastal prairies and grasslands, where high tree density and encroachment threatens these vegetation communities. Additionally, prescribed fire treatments (Map 11) are designed to help reintroduce the natural, frequent fire disturbance regimes that historically maintained coastal prairie and grassland habitat, while also reducing non-native species in these areas. Treatments within woodland and forested vegetation types also aim to limit conifer encroachment into woodlands, reduce forest density and fuel loads, and thereby promote resiliency to future wildfire.

Vegetation communities within **Moore Creek** include oak woodlands, riparian forest and shrub, coastal prairie and grasslands, shrublands, and eucalyptus, pine/cypress, and redwood/Douglas-fir forests



(Appendix A: Maps, Map A11). Vegetation conditions present at Moore Creek (Figure 15), including overgrown vegetation and grasses, high forest density, and fuel accumulations, are an important factor in the prioritization of Moore Creek and corresponding treatments. These vegetation conditions interact with other factors discussed above, including steep topography, wind patterns, and human-caused ignitions, that increase the likelihood of a significant wildfire within and adjacent to Moore Creek. Figure 15 depicts the dense stands of eucalyptus and oak woodland directly adjacent to homes along the west branch of Moore Creek in proximity to Priority Treatment Zone 1 treatments. Treatments in both Priority Treatment Zones focus on understory treatments in woodland and forested areas, while mowing treatments within these zones target the maintenance of tall dead grasses that act as flammable, easily ignitable, fine-fuels, increasing the risk of heightened fire behavior and spread across the property. Across many open space areas in Santa Cruz, including the Moore Creek property, coastal prairie habitat is increasingly threatened by the spread of non-native species and encroachment from native woody shrubs such as coyote brush. Notably, 22 dense stands of French broom, listed by the Cal-IPC as an invasive species, occur primarily along the woodland edges of the Moore Creek drainage (Biotic Resources Group, 2023). The presence and expansion of non-native species, such as eucalyptus, French broom, and grassland species, as well as native woody vegetation including coyote brush, not only threaten native and existing plant communities, but also contribute to increased fire risk and behavior.



Figure 15. Moore Creek, Vegetation Conditions.

Arroyo Seco contains a range of vegetation communities, including grasslands, pine/cypress, eucalyptus, and non-native forest, riparian and non-native shrubland, and oak woodlands (Appendix A: Maps, Map A12). The canyons and canyon slopes of Arroyo Seco generally include dense vegetation, while the west-facing slopes on the canyon's eastern side contain grasslands consisting of predominantly non-native grasses (John Gilchrist & Associates, 1999). Figure 16 highlights vegetation conditions across portions of the property, including eucalyptus stands along the primary access road and proposed fuel break, grasslands adjacent to neighboring homes, and densely vegetated canyons and drainages. Fuel break treatments proposed in Priority Treatment Zone 1 aim to treat dense vegetation encroaching on the primary fire access route to improve emergency response access.



Figure 16. Arroyo Seco, Vegetation Conditions.

## Additional Department Recommendations

In addition to the proposed site-specific treatment recommendations and strategies outlined above, there are additional recommendations to improve wildfire resiliency across Parks and Recreation and Public Works Department sites. Additional Department-specific recommendations are outlined below.

### Equipment

Purchasing equipment could support the City's ability to implement and maintain vegetation treatments across Parks and Recreation Department open space properties and Public Works Department sites. Owning key equipment would enable the implementation and maintenance of treatments in-house; particularly for re-treatments that may be needed on a regular basis, lowering overall treatment costs long-term. The following equipment, or reasonable alternatives, are recommended:

- CAT 299 equipped with a Fecon masticating head for conducting vegetation treatments, or equivalent.
- CAT 309 Excavator with boom-mounted masticating head for conducting vegetation treatments, or equivalent.
- Construction-grade backhoe for conducting general road maintenance and other maintenance activities.

### Road Access & Maintenance

Maintaining access along key roads and trails within Parks and Recreation and Public Works Department sites is essential for ensuring reliable routes for fire response and facilitating the implementation of vegetation treatments. In addition to roads identified for fuel breaks in Priority Treatment Zones, other key roads and trails should be prioritized for on-going maintenance and management. Recommendations include:

- Clearly marking primary entrances and access roads with high-visibility signage and address numbers to support fire response access in the case of an emergency.
- Conducting regular road maintenance to maintain and improve all-weather driving capabilities and road access on select roads, including installation of water bars and rolling dips, clearing of culverts, erosion control, and road repairs.
- Removing overgrown vegetation that obstructs horizontal or vertical clearance and limit or impair access.



## Additional Sites & Treatment Recommendations

Several Parks and Recreation and Public Works Department sites were ranked overall as lower priority for vegetation treatments relative to sites identified in *Section III: Parks and Recreation & Public Works Departments Priorities*. However, treatments at these sites should be considered for future implementation as funding and resources become available. Table 10 provides an overview of these additional sites and recommended treatments to support future treatment planning and implementation.

Table 10. Additional Treatment Recommendations, Parks and Recreation and Public Works Departments.

Site	Department	Overview of Treatment Recommendations
Arana Gulch	Parks and Recreation	<ul style="list-style-type: none"> <li>Continue on-going strategic mowing of grasslands throughout property</li> <li>Maintain existing fuel breaks established along the western/northwestern boundary of the property, increasing limbing in select areas where vertical and/or horizontal clearance is limited</li> <li>Conduct handwork and/or mechanical treatments from the Harbor Vista Lane property access point, expanding upon existing COSC mowing by extending understory treatments into adjacent oak woodland areas</li> <li>Consider implementing prescribed fire treatments in the grassland units as a demonstration project and as part of phased treatments for Santa Cruz tarplant</li> </ul>
Resource Recovery Facility (City Landfill)	Public Works	<ul style="list-style-type: none"> <li>Maintain and improve the fire access route and fuel break along the south/southeastern boundary of the property, by: <ul style="list-style-type: none"> <li>Further treating overhanging vegetation along the access route</li> <li>Widening the turnaround (consider for Type I Fire Engine access)</li> </ul> </li> </ul>
Wastewater Treatment Facility & Neary Lagoon	Public Works & Parks and Recreation	<ul style="list-style-type: none"> <li>Re-treat area within Neary Lagoon adjacent to the Wastewater Treatment Facility digester; conduct regular maintenance treatments in this area due to high ignition risk</li> <li>Conduct understory shrub treatments along the fence line adjacent to RTC facility, clearing 3 to 5 ft. from the concrete edge while retaining existing trees to maintain visual screening</li> </ul>

## DeLaveaga Park

### ***Treatment Recommendations & Strategies***

DeLaveaga is ranked as Priority 1 for both overall COSC sites (Map 1) and for Parks and Recreation and Public Works Department sites. DeLaveaga also includes critical COSC roads identified as Priority 5 for overall COSC priority treatments. Three Priority Treatment Zones are proposed for DeLaveaga, spanning a total of 67.7 treatment acres (Map 9). Proposed Priority Treatment Zones are intended to occur in conjunction with existing treatments that occur annually across DeLaveaga, with on-going treatments remaining a priority for continued implementation. Priority Treatment Zones in DeLaveaga build off these existing treatment areas and establish linkages between zones to increase treatment connectivity and enhance resilience at both the infrastructure and landscape-scales. DeLaveaga Priority Treatment Zone 1 is described in detail in *Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate*. Additional treatments within DeLaveaga, including Priority Treatment Zones 2-3 and corresponding treatment recommendations and strategies are described below. In addition, information from the LE-100 Infrastructure Assessment regarding defensible space is provided below for applicable structures located in DeLaveaga Priority Treatment Zones 1 and 3.

Findings from the LE-100 Infrastructure Assessment regarding defensible space indicate dense vegetation conditions within 100 ft. of infrastructure within DeLaveaga Priority Treatment Zone 1, including the EOC and Netcom facilities. Table 11 summarizes key findings from the LE-100 Infrastructure Assessment, including observations of vegetation conditions and corresponding treatment recommendations. These findings are intended to guide defensible space treatments outlined in *Recommendation 1* for Priority Treatment Zone 1. Recommendations listed in Table 11 are based on LE-100 guidelines and general assessments of vegetation conditions. For a complete list of LE-100 Infrastructure Assessment scores, reference *Appendix B: LE-100/Infrastructure Assessment Scores*.

Table 11. DeLaveaga Priority Treatment Zone 1 Infrastructure Sites, LE-100 Infrastructure Assessment Key Findings.

Priority Treatment Zone 1 – Recommendation 2 – LE- 100 Defensible Space Guidance	
Site	LE- 100 Infrastructure Assessment - Key Observations & Findings
EOC & Netcom	<p><b>Within 30 ft. of Structures:</b></p> <ul style="list-style-type: none"><li>• Vegetation well maintained immediately surrounding the EOC building.</li><li>• Areas immediately surrounding Netcom/the communications tower include vegetation conditions conducive to elevated wildfire risk and behavior. Key observations and recommendations include:<ul style="list-style-type: none"><li>- Areas of tall dead grass and herbaceous material, intermixed or adjacent to shrubs, needles, and other vegetation present, including within immediate structure fence line. Remove all dead and dying grass, plants, shrubs, trees, branches, leaves, weeds and needles, and mow areas of tall dead grass, pursuant to Public Resources Code (PRC) §4291(a)(1)</li></ul></li></ul>

Priority Treatment Zone 1 – Recommendation 2 – LE- 100 Defensible Space Guidance	
Site	LE-100 Infrastructure Assessment - Key Observations & Findings
	<p><b>Within 100 ft. of Structures:</b></p> <ul style="list-style-type: none"> <li>• Vegetation generally well maintained within fence line of EOC building. However, dense eucalyptus forest surrounds the EOC building beyond fence line/100 ft. of infrastructure and is prioritized for treatment in Priority Treatment Zone 1</li> <li>• Vegetation conditions within 100 ft. of Netcom/the communications tower, and beyond, are conducive to elevated wildfire risk and behavior. Key observations and recommendations include: <ul style="list-style-type: none"> <li>- Dense continuous understory present immediately adjacent to Netcom and communications tower fence line, including areas of live flammable vegetation and shrubs. Improve vertical and horizontal spacing by removing or separating fuels, live flammable ground cover and shrubs, and removing lower tree limbs, pursuant to PRC §4291(a)(1) and the Continuous Tree Canopy and Horizontal Spacing Standards</li> <li>- Large dead debris pile and surface fuel accumulation present adjacent to fence line. Remove dead and dying woody fuels and material piles, and remove surface litter &gt; 3 in. in depth, pursuant to 14 CCR § 1299.03(b)(2)(A)</li> <li>- Generator building outside EOC surrounded by vegetation including eucalyptus, redwood saplings, and a Monterey cypress tree. Remove vegetation surrounding building and conduct limbing to improve vertical clearance</li> </ul> </li> </ul>

## DeLaveaga Priority Treatment Zone 2

DeLaveaga Priority Treatment Zone 2 (Map 9) is proposed as the second highest priority treatment area within DeLaveaga, covering the upper portion of DeLaveaga above the DeLaveaga Disc Golf Course, in addition to the eastern boundary of the park. This area primarily consists of Monterey pine/Monterey cypress, redwood/Douglas-fir, and non-native forests, with areas of oak woodland (*Appendix A: Maps*, Map A1). Recommendations proposed for Priority Treatment Zone 2 are described below.

### *DeLaveaga Priority Treatment Zone 2 - Recommendation 1*

*DeLaveaga Priority Treatment Zone 2 - Recommendation 1* includes the implementation of treatments across Priority Treatment Zone 2 (Map 9). These treatments focus on strategic landscape-scale fuel and vegetation reduction treatments across the upper portion and eastern boundary of DeLaveaga. Treatments span a total of 19.5 acres and include areas of mechanical and manual treatment activities. Fuel break treatments are designated along edges of selected existing roads along Brookwood Drive and portions of Upper Park Drive. Corresponding treatment activities and prescriptions for *DeLaveaga Priority Treatment Zone 2 - Recommendation 1* are described below.

### *Treatment Activity*

Both manual and mechanical treatments are proposed within DeLaveaga Priority Treatment Zone 2 (Map 9). Manual treatments are proposed for 8.0 acres but may occur across the entire 19.5 acres of Treatment Zone 2. Mechanical treatments may occur on up to approximately 1.4 acres in Treatment Zone 2 on slopes

generally less than 35 percent and no greater than 50 percent with appropriate watercourse avoidance buffers. Fuel breaks (10.1 acres), located along Brookwood Drive and portions of Upper Park Road, extend approximately 25 ft. from the road edge and would be established using primarily mechanical and manual treatment activities. Fuel breaks correspond with critical COSC roads identified as Priority 5 for overall COSC priority treatments. Targeted herbicide and prescribed herbivory treatments could also be utilized where appropriate. Strategic maintenance mowing along roads and trails for the purposes of fuel breaks should continue and/or be considered for expansion in Priority Treatment Zone 2.

#### *Treatment Prescription*

The treatment prescriptions listed below in order of priority apply to *DeLaveaga Priority Treatment Zone 2 - Recommendation 1* (Table 3).

- Forest Health Fuels Reduction
- Roadside<sup>20</sup>
- Hardwood Restoration
- Invasive Species
- Hazard Tree

### DeLaveaga Priority Treatment Zone 3

DeLaveaga Priority Treatment Zone 3 (Map 9) is proposed as the third highest priority treatment area within DeLaveaga, surrounding the Public Works Department Armory site in the southwestern portion of the park. This area primarily consists of Monterey pine/Monterey cypress forest and oak woodland, with areas of eucalyptus forest and shrubland (*Appendix A: Maps*, Map A1). The Armory, and treatments in Priority Treatment Zone 3, are located on a state-owned California Air National Guard Armory parcel within DeLaveaga. Coordination with the state, including ROE or similar agreements, may be necessary prior to treatment planning and implementation. Recommendations proposed for Priority Treatment Zone 3 are described below.

#### *DeLaveaga Priority Treatment Zone 3 - Recommendation 1*

*DeLaveaga Priority Treatment Zone 3 - Recommendation 1* includes the implementation of treatments across DeLaveaga Priority Treatment Zone 3 (Map 9). These treatments focus on reducing fuels and vegetation within the defensible space zone and surrounding infrastructure, while also increasing connectivity with on-going mowing and Priority Treatment Zone 1 treatments. Treatments span a total of 15.6 acres and include areas of mechanical and manual treatment activities.

#### *Treatment Activity*

Both manual and mechanical treatments are proposed within DeLaveaga Priority Treatment Zone 3 (Map 9). Manual treatments are proposed for 5.2 acres but may occur across the entire 15.6 acres of Treatment Zone 3. Mechanical treatments may occur on up to approximately 10.4 acres in Treatment Zone 3 on slopes generally less than 35 percent and no greater than 50 percent, and with appropriate watercourse avoidance buffers. Targeted herbicide and prescribed herbivory treatments could occur where appropriate. Strategic maintenance mowing of grasslands and along key roads for the purposes of fuel breaks should continue and/or be considered for expansion in Priority Treatment Zone 3. Corresponding treatment activities and prescriptions for *Recommendation 1* are described below.

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<sup>20</sup> The mapped fuel break along Brookwood Drive should achieve vertical and horizontal clearance for Type 3 Fire Engine access, per the Roadside treatment prescription.

### *Treatment Prescription*

The treatment prescriptions listed below in order of priority apply to Priority Treatment Zone 3  
*Recommendation 1* (Table 3).

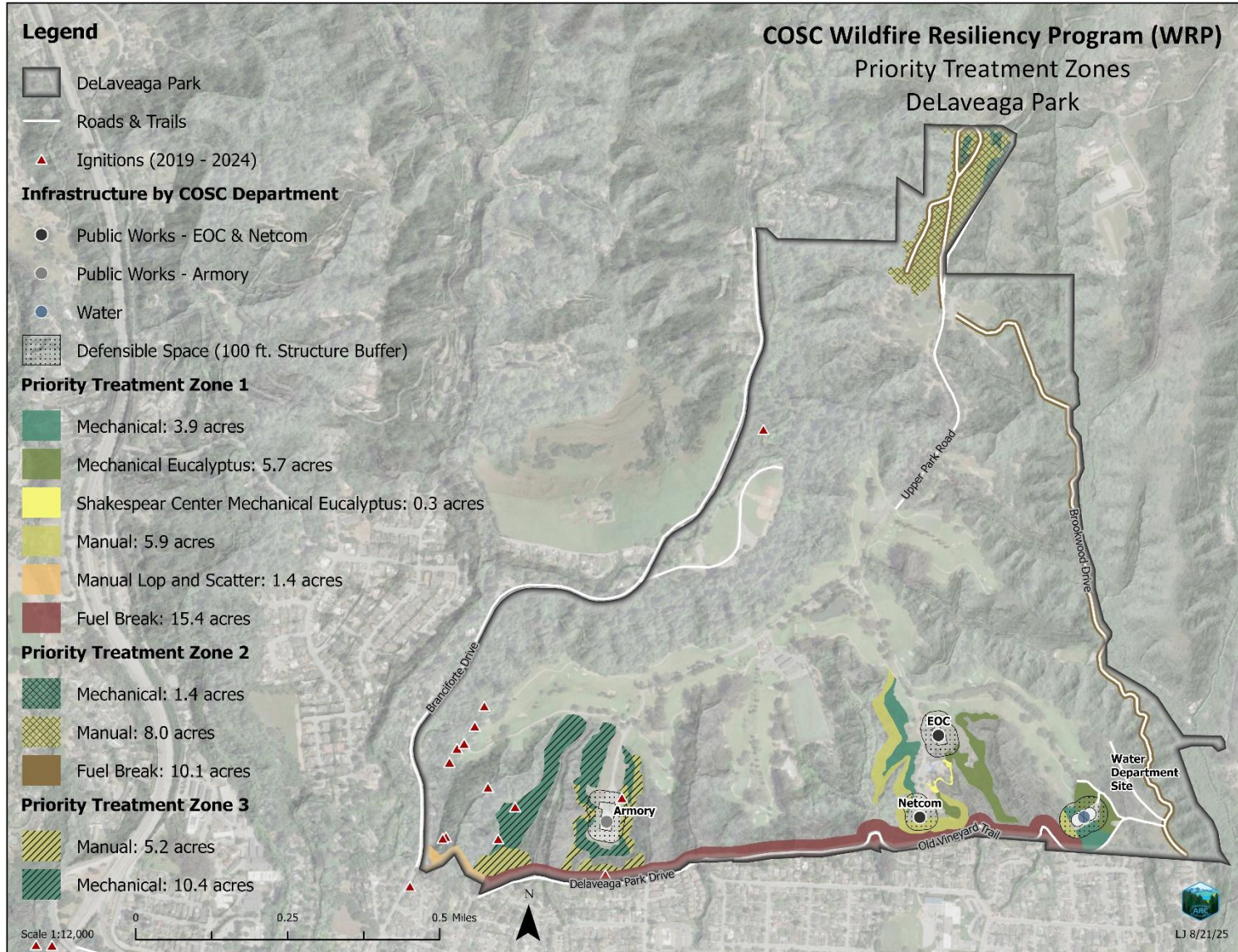
- Forest Health Fuels Reduction
- Roadside
- Hardwood Restoration
- Invasive Species
- Hazard Tree

Findings from the LE-100 Infrastructure Assessment regarding defensible space indicate dense vegetation conditions within 100 ft. of infrastructure within DeLaveaga Priority Treatment Zone 3, including Armory facilities. Table 12 summarizes key findings from the LE-100 Infrastructure Assessment, including observations of vegetation conditions and corresponding treatment recommendations. These findings are intended to guide defensible space treatments outlined in *DeLaveaga Priority Treatment Zone 3 - Recommendation 1*. Recommendations listed in Table 12 are based on LE-100 guidelines and general assessments of vegetation conditions. For a complete list of LE-100 Infrastructure Assessment scores, reference *Appendix B: LE-100/Infrastructure Assessment Scores*.

Table 12. DeLaveaga Priority Treatment Zone 3 Infrastructure Sites, LE-100 Infrastructure Assessment Key Findings.

Priority Treatment Zone 3 – Recommendation 1 – LE- 100 Defensible Space Guidance	
Site	LE-100 Infrastructure Assessment - Key Observations & Findings
Armory	<p><b>Within 30 ft. of Structures:</b></p> <ul style="list-style-type: none"><li>• Vegetation well maintained immediately surrounding structures.</li></ul> <p><b>Within 100 ft. of Structures:</b></p> <ul style="list-style-type: none"><li>• Although the 100 ft. defensible space zone extends beyond the fence line, vegetation in this area is dense and poses an elevated wildfire risk. Key observations and recommendations include:<ul style="list-style-type: none"><li>- Tall dead grass intermixed with fuels and other vegetation present beyond fence line. Mow areas of tall dead grass, pursuant to Public Resources Code (PRC) §4291(a)(1)</li><li>- Dense, continuous understory with fuel accumulation beyond fence line. Increase vertical and horizontal spacing between shrubs and trees, and remove fuels and lower tree limbs, pursuant to PRC §4291(a)(1) and the Continuous Tree Canopy and Horizontal Spacing Standards</li><li>- Areas of dead or dying vegetation present beyond fence line. Remove all dead or dying trees, branches, shrubs, or other plants, and surface debris, pursuant to 14 CCR § 1299.03(b)(2)(A)</li><li>- Propane tank located adjacent to vegetation. Consider relocating to area clear of vegetation, pursuant to CFC §3807.3</li></ul></li></ul>





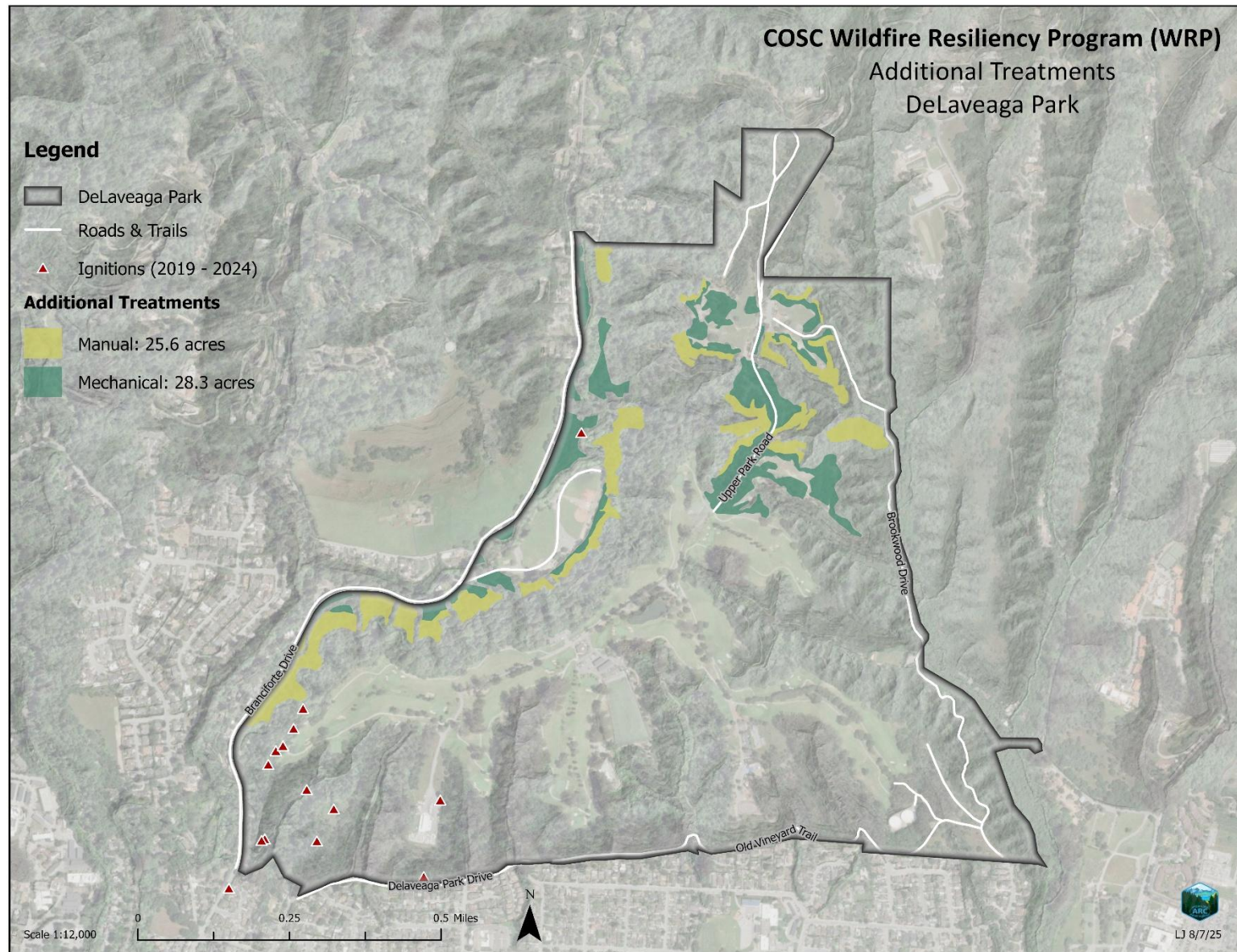
Map 9. DeLaveaga, Priority Treatments (Priority Treatment Zones). *Map Not to 1:12,000 Scale.*

### DeLaveaga Additional Treatment Recommendations

Additional treatments proposed for DeLaveaga (Map 10) include manual (25.6 acres) and mechanical (28.3) treatments along the western boundary of the park and adjacent to Priority Treatment Zone 2, and are recommended for implementation in the long-term following implementation of Priority Treatment Zone treatments. These treatments would require field verification prior to treatment planning and implementation, and thus estimated acreage will likely vary.

Additional treatments would aim to strategically treat vegetation and fuels with consideration of local wind patterns, ignitions located in the southwestern portion of the property, adjacent communities along Branciforte Drive, in addition to expanding off treatments in Priority Treatment Zones 1-3. Treatments located adjacent to the DeLaveaga Disc Golf Course and Priority Treatment Zone 2 would aim to expand off existing golf course grassland areas and treatments in Priority Treatment Zone 2, while treatments along the western boundary would focus on creating protection surrounding residential communities along Branciforte Drive. Mechanical treatment areas with generally accessible terrain, direct road access, and proximity to existing treatments should be prioritized for initial implementation.





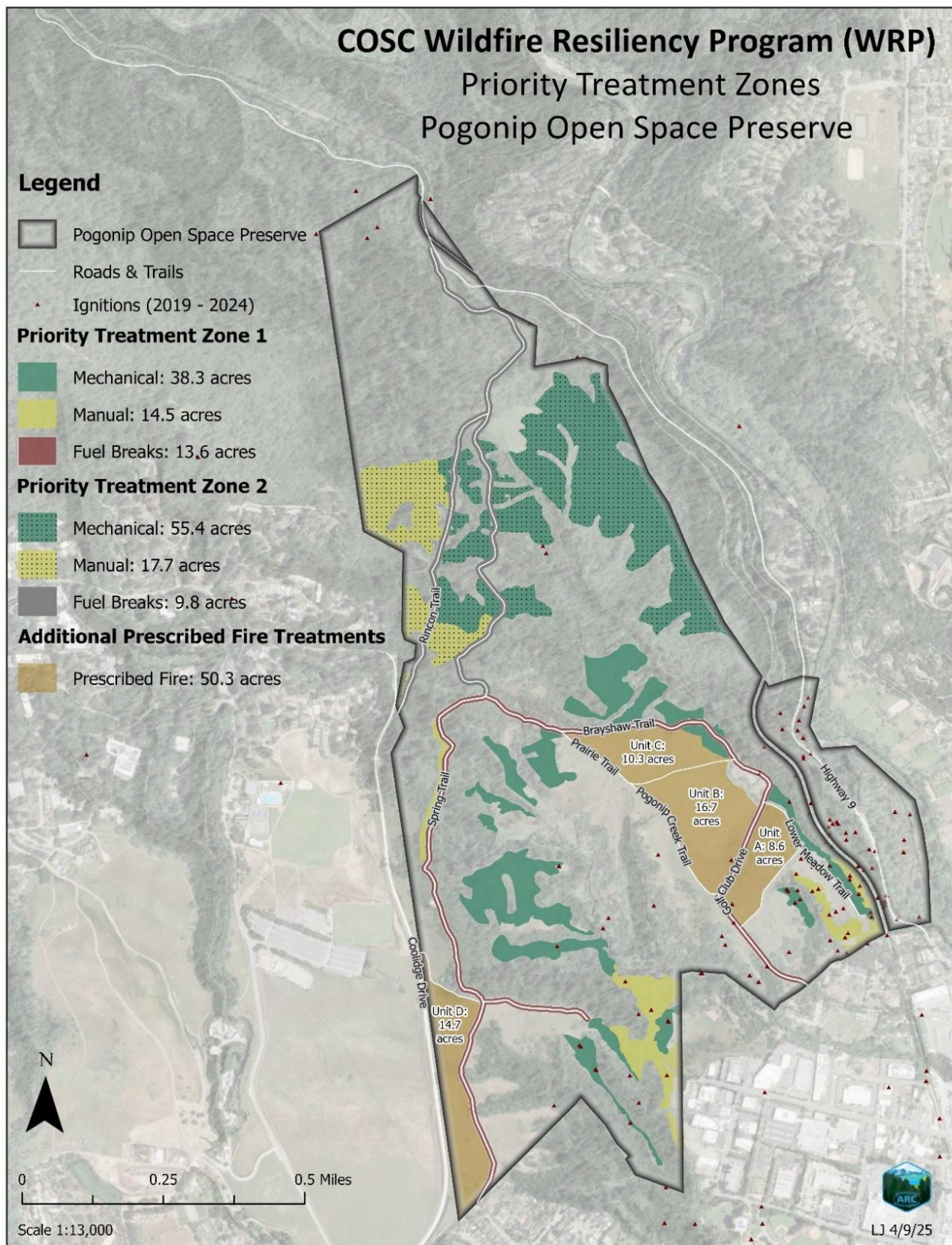
Map 10. DeLaveaga, Additional Treatments. *Map Not to 1:12,000 Scale.*

## Pogonip Open Space Preserve

### ***Treatment Recommendations & Strategies***

Pogonip is ranked as Priority 2 for Parks and Recreation and Public Works Department sites (Map 11), with Priority Treatment Zone 1 ranked as Priority 3 for overall COSC priority treatments (Map 1). Two Priority Treatment Zones are proposed for Pogonip, spanning a total of 149.3 treatment acres, with up to an additional 50.3 acres of recommended prescribed fire treatments (Map 11). Roads and trails within both Priority Treatment Zone 1 and 2 are designated as critical COSC roads and are identified as Priority 5 for overall COSC priority treatments. Roads and trails within both Priority Treatment Zone 1 and 2 are identified as critical COSC roads and listed as Priority 5 for overall COSC priority treatments (*Priority 5: Critical Fire Roads*). Proposed Priority Treatment Zones and prescribed fire treatments are intended to occur in conjunction with on-going treatments that occur annually across Pogonip. Priority Treatment Zones in Pogonip build off these existing treatment areas and establish linkages between zones to increase treatment connectivity and enhance resilience at landscape-scale across Pogonip. Priority Treatment Zone 2, and corresponding treatment recommendations, strategies, and prioritization, are described below; Pogonip Priority Treatment Zone 1 is described in *Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate*.





Map 11. Pogonip, Priority Treatments (Priority Treatment Zones). Map Not to 1:13,000 Scale.



## Pogonip Priority Treatment Zone 2

### *Pogonip Priority Treatment Zone 2 - Recommendation 1*

*Pogonip Priority Treatment Zone 2 - Recommendation 1* includes the implementation of treatments across Priority Treatment Zone 2 (Map 11). Priority Treatment Zone 2 is a total of approximately 82.9 acres of predominantly forested area consisting of primarily Douglas-fir and redwood forests, with areas of woodland and small portions of shrubland and grassland (*Appendix A: Maps*, Map A8). Priority Treatment Zone 2 encompasses the upper portion of the property above Brayshaw Trail along Rincon and Spring Trails, extending to the eastern and western boundaries of the property. Priority Treatment Zone 2 includes areas of mechanical (55.4 acres) and manual (17.7 acres) treatment activities, with additional fuel break treatments designated along edges of selected existing roads (9.8 acres).

#### *Treatment Activity*

Manual treatments are proposed for 17.7 acres in Priority Treatment Zone 2 but may occur across the entire 82.9 acres of Priority Treatment Zone 2 (Map 11). Mechanical treatments may occur on up to approximately 55.4 acres in Priority Treatment Zone 2 on slopes generally less than 35 percent and no greater than 50 percent, and with appropriate watercourse avoidance buffers. Fuel breaks are proposed for 9.8 acres in Priority Treatment Zone 2, extending approximately 25 ft. from road edge along portions of Rincon and Spring Trails. These fuel breaks correspond with critical COSC roads identified as Priority 5 for overall COSC priority treatments. Fuel breaks would be established utilizing primarily mechanical and manual treatment activities. The treatment prescriptions below would utilize primarily a combination of manual and mechanical treatments, and could also include targeted herbicide, prescribed fire, and prescribed herbivory treatments where appropriate. Strategic maintenance mowing of grasslands for the purposes of fuel breaks should continue and/or be considered for expansion in Priority Treatment Zone 2.

#### *Treatment Prescription*

The following treatment prescriptions apply to *Pogonip Priority Treatment Zone 2 – Recommendation 2*, listed in order of priority (Table 3):

- Forest Health Fuels Reduction
- Roadside
- Hardwood Restoration
- Invasive Species
- Hazard Tree
- Grassland Restoration
- Shrubland Restoration

## Pogonip Additional Prescribed Fire Treatments

Prescribed fire treatments are recommended to occur across the lower portion of Pogonip with a primary focus on restoring grassland and coastal prairie habitat. Treatments include four example prescribed fire units (Map 11) covering up to approximately 50.3 acres. These units are bounded by existing roads, trails, and mowing lines such as Golf Club Drive, Prairie Trail, Lower Meadow Trail, Spring Trail, and Pogonip Creek Trail, and are also adjacent to proposed fuel breaks and treatments in Priority Treatment Zone 1 aimed at reinforcing control lines for prescribed fire operations.

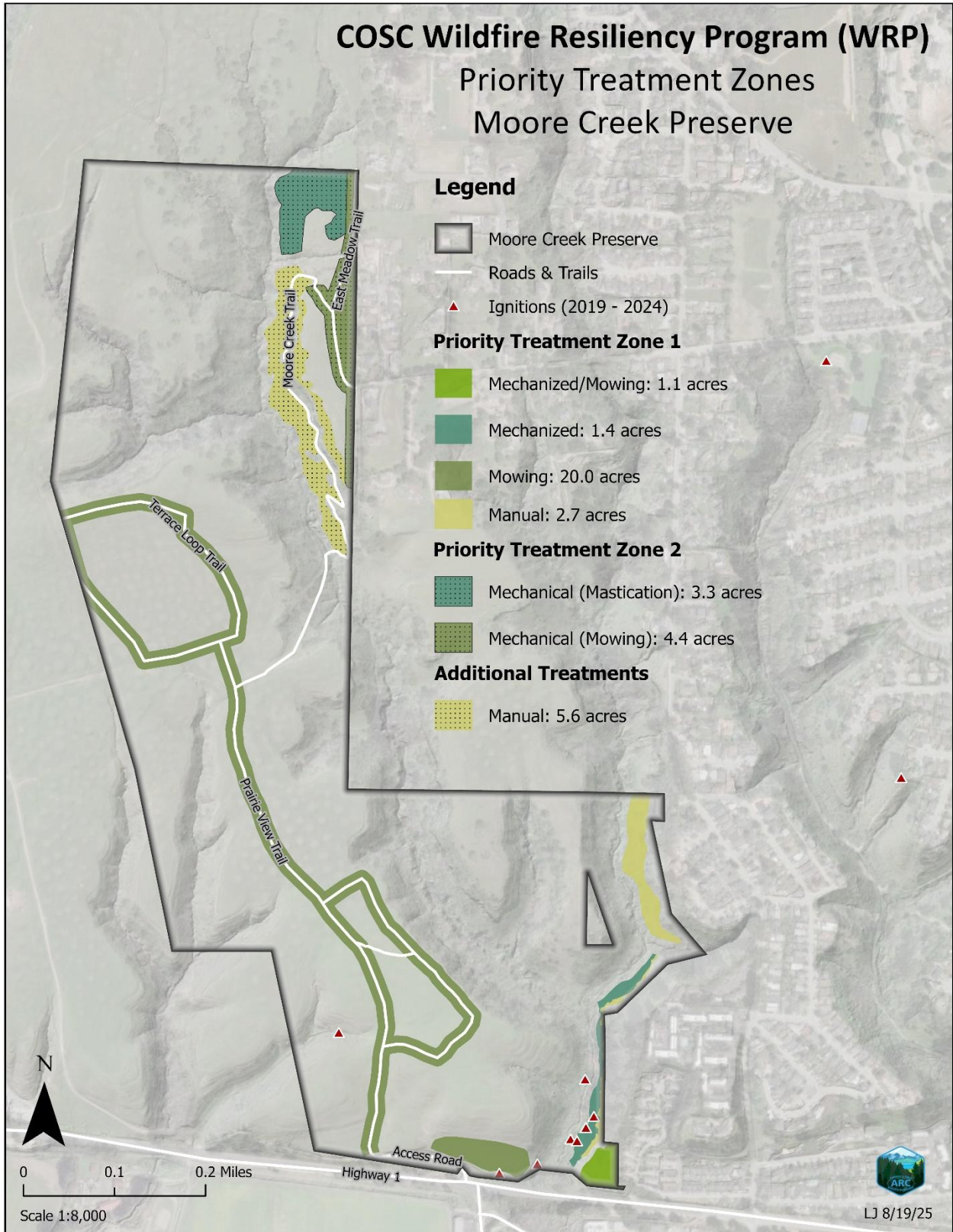
The example prescribed fire units are strategically located in areas facing significant vegetation change, as shown in Figure 22. These prescribed fire treatments within Pogonip also provide an opportunity to implement COSC-led demonstration projects in collaboration with the Fire and Parks and Recreation Departments and other local entities. The example units may be further delineated into smaller units to increase feasibility of implementation and to achieve demonstration project goals. Strategic maintenance

mowing of grasslands for the purposes of fuel breaks should continue and/or be considered for expansion in and adjacent to prescribed fire units to further reduce coyote brush encroachment and aid in prescribed fire implementation. Implementation of these treatments are recommended to occur alongside or following treatments in Priority Treatment Zones 1 and 2.

## Moore Creek Preserve

### ***Site Treatment Recommendations & Strategies***

Moore Creek is ranked as Priority 3 for Parks and Recreation and Public Works Department sites, based on criteria described in *Section V: Wildfire Resiliency Plan (WRP) Development Methods*. Two Priority Treatment Zones are proposed for Moore Creek, spanning a total of 32.9 treatment acres (Map 12), with 2.7 acres of additional lower priority manual treatments. Proposed Priority Treatment Zones are intended to occur in conjunction with existing treatments that occur annually across Moore Creek, with on-going treatments remaining a priority for continued implementation. Priority Treatment Zones build off these existing treatment areas and establish linkages between zones to increase treatment connectivity and enhance resilience at the landscape-scale. Priority Treatment Zones, and corresponding treatment recommendations, strategies, and prioritization, are described below.



Map 12. Moore Creek, Priority Treatments (Priority Treatment Zones). *Map Not to 1:8,000 Scale.*

## Moore Creek Priority Treatment Zone 1

Moore Creek Priority Treatment Zone 1 (Map 12) is proposed as the highest priority treatment area and recommendation within Moore Creek. Priority Treatment Zone 1 encompasses the southeastern portion of Moore Creek, bordered by residential neighborhoods along the eastern boundary of the property and Highway 1 to the south. Priority Treatment Zone 1 consists of predominantly riparian and oak woodland, eucalyptus forest, and areas of shrubland and Monterey pine/cypress (*Appendix A: Maps*, Map A11). This area is surrounded by extensive coastal prairie and grassland that characterizes the majority of the Moore Creek property.

### *Moore Creek Priority Treatment Zone 1 - Recommendation 1*

*Moore Creek Priority Treatment Zone 1 - Recommendation 1* includes the implementation of treatments across Priority Treatment Zone 1 (Map 12). Treatments span a total of 25.4 acres and include areas of mechanical and manual treatment activities. Treatments in Priority Treatment Zone 1 are intended to build upon existing Parks and Recreation Department fire break mowing, by extending mowing along key roads, trails, and property lines, and connecting with additional treatments in adjacent woodland and forested areas. Corresponding treatment activities and prescriptions for *Moore Creek Priority Treatment Zone 1 - Recommendation 1* are described below.

#### *Treatment Activity*

Both manual and mechanical treatments are proposed within Priority Treatment Zone 1 (Map 12). Manual treatments are proposed for 2.7 acres but may occur across the entire 25.2 acres of Treatment Zone 1. Mechanical treatments may occur on up to approximately 22.5 acres in Treatment Zone 1 on slopes generally less than 35 percent, and no greater than 50 percent, and with appropriate watercourse avoidance buffers. Mechanical treatments are delineated into areas of mowing and/or mastication (1.1 acres), mastication (1.4 acres), and mowing (20.0 acres). Mowing treatments are designated along key roads and trails spanning from the lower to upper portions of the property, extending approximately 50 ft. from either side of the road edge, and in targeted grassland areas adjacent to the property entrance and ignition concentrations. Mastication/mowing treatments are designated for areas of grassland and forested vegetation, with mechanical (mastication) and manual treatments extending off from mowing/mastication areas and continuing along the property. The treatment prescriptions below would utilize primarily a combination of manual and mechanical treatments and could also utilize targeted herbicide, prescribed fire, and prescribed herbivory treatments where appropriate. Strategic maintenance mowing and prescribed herbivory of coastal prairie and grasslands should continue to occur for the purpose of creating fuel breaks, reducing coyote brush encroachment, and enhancing Ohlone tiger beetle (*Cicindela Ohlone*) habitat.

#### *Treatment Prescription*

The following treatment prescriptions apply to *Moore Creek Priority Treatment Zone 1 – Recommendation 1*, listed in order of priority (Table 3):

- Roadside
- Forest Health Fuels Reduction
- Grassland Restoration
- Hardwood Restoration
- Invasive Species
- Hazard Tree
- Shrubland Restoration



## Moore Creek Priority Treatment Zone 2

Moore Creek Priority Treatment Zone 2 (Map 12) is proposed as the second highest priority treatment area and recommendation within Moore Creek. Priority Treatment Zone 2 encompasses the northeastern portion of Moore Creek, bordered by residential neighborhoods along the eastern boundary of the property. Priority Treatment Zone 2 consists of predominantly grassland and riparian and oak woodland, with areas of shrubland (*Appendix A: Maps*, Map A11).

### *Moore Creek Priority Treatment Zone 2 - Recommendation 1*

*Moore Creek Priority Treatment Zone 2 - Recommendation 1* includes the implementation of treatments across Priority Treatment Zone 2 (Map 12). Priority treatments span a total of 7.7 acres of mechanical (mowing and mastication) treatments, focused in coastal prairie, grasslands, and oak woodlands. Treatments in Priority Treatment Zone 2 are intended to build upon existing Parks and Recreation Department fire break mowing, by extending mowing along key roads, trails, and property lines, and connecting with additional treatments in adjacent woodland areas. An additional 5.6 acres of handwork are also proposed along Moore Creek Trail. While these treatments are lower priority than the mechanical treatments in this zone, they should be considered for future implementation to expand the overall treatment footprint. Corresponding treatment activities and prescriptions for *Moore Creek Priority Treatment Zone 2 - Recommendation 1* are described below.

#### *Treatment Activity*

Primarily mechanical treatments are proposed within Priority Treatment Zone 2 (Map 12) and may occur on up to approximately 7.7 acres on slopes generally less than 35 percent and no greater than 50 percent, and with appropriate watercourse avoidance buffers. Mechanical treatments are delineated into areas of mowing (4.4 acres) and mastication (3.3 acres). Mowing treatments are designated along key roads and trails spanning from the lower to upper portions of the property, extending approximately 50 ft. from either side of the road edge. Mastication treatments are focused in primarily woodland and shrubland areas adjacent to mowing treatments. Additional manual treatments are proposed for future implementation across 2.7 acres. The treatment prescriptions below would utilize primarily a combination of manual and mechanical treatments and could also utilize targeted herbicide, prescribed fire, and prescribed herbivory treatments where appropriate. Strategic maintenance mowing and prescribed herbivory of coastal prairie and grasslands should continue to occur for the purpose of creating fuel breaks, reducing coyote brush encroachment, and enhancing Ohlone tiger beetle habitat.

#### *Treatment Prescription*

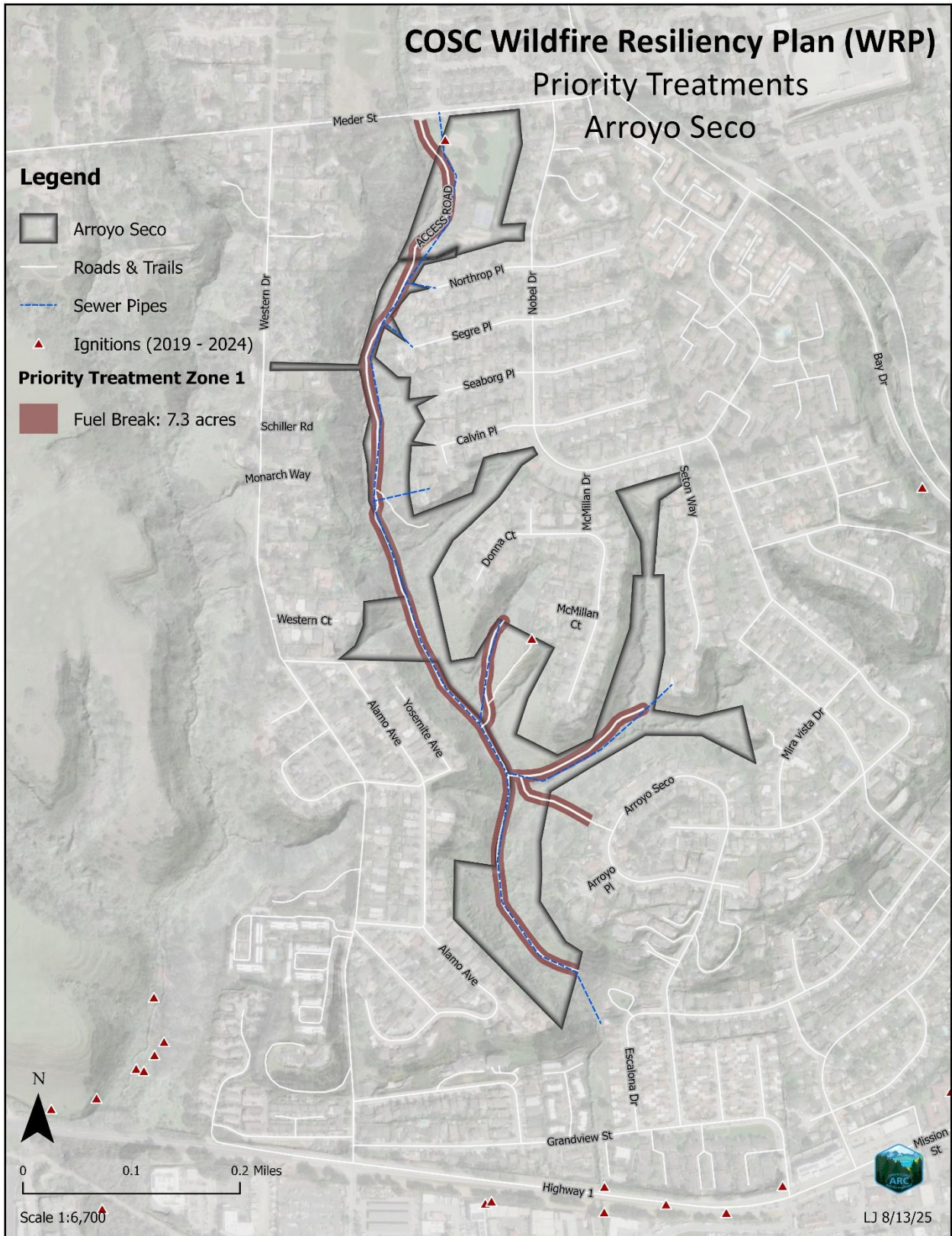
The following treatment prescriptions apply to *Moore Creek Treatment Zone 2 – Recommendation 1*, listed in order of priority (Table 3):

- Roadside
- Forest Health Fuels Reduction
- Hardwood Restoration
- Grassland Restoration
- Invasive Species
- Hazard Tree
- Shrubland Restoration

## Arroyo Seco

### ***Site Treatment Recommendations & Strategies***

Arroyo Seco is ranked as Priority 4 for Parks and Recreation and Public Works Department sites, based on criteria described in *Section V: Wildfire Resiliency Plan (WRP) Development Methods*. One Priority Treatment Zone is proposed for Arroyo Seco, spanning a total of 7.3 treatment acres (Map 13). The Priority Treatment Zone is intended to occur in conjunction with existing treatments that occur annually across Arroyo Seco, with on-going treatments remaining a priority for continued implementation. Additional recommendations for Arroyo Seco aim to reduce wildfire risk for adjacent residents and communities while also improving emergency response access through the property. Priority Treatment Zone 1, and corresponding treatment recommendations, strategies, and prioritization, are described below.



## Arroyo Seco Priority Treatment Zone 1

Arroyo Seco Priority Treatment Zone 1 (Map 13) encompasses the area along the main access road that runs through the property. Priority Treatment Zone 1 consists of predominantly riparian shrub, eucalyptus forest, grassland, and oak woodland.

### *Arroyo Seco Priority Treatment Zone 1 - Recommendation 1*

*Arroyo Seco Priority Treatment Zone 1 - Recommendation 1* includes the implementation of treatments across Priority Treatment Zone 1 (Map 13). Treatments span a total of 7.3 acres consisting of fuel break treatments designated along edges of the existing access road.<sup>21</sup> Treatments in Priority Treatment Zone 1 are intended to build upon previous and/or on-going Parks and Recreation Department activities, including mowing, weed whipping, and other treatments that primarily occur along the main access road and along sewer lines.

#### *Treatment Activity*

Both manual and mechanical treatments may occur within Priority Treatment Zone 1 (Map 13). Manual treatments may occur across the entire 7.3 acres of Treatment Zone 1. Mechanical treatments may occur on slopes generally less than 35 percent, and no greater than 50 percent, and with appropriate watercourse avoidance buffers. The treatment prescriptions below would utilize primarily a combination of manual and mechanical treatments and could also utilize targeted herbicide, prescribed fire, and prescribed herbivory treatments where appropriate.

#### *Treatment Prescription*

The following treatment prescriptions apply to *Arroyo Seco - Recommendation 1*, listed in order of priority (Table 3):

- Roadside<sup>22</sup>
- Forest Health Fuels Reduction
- Hazard Tree
- Invasive Species
- Hardwood Restoration
- Grassland Restoration
- Shrubland Restoration

### *Arroyo Seco Priority Treatment Zone 1 - Recommendation 2*

Pursue Release of Liability and/or Landowner Agreements to permit neighboring residents adjacent to the Arroyo Seco property to conduct additional defensible space treatments that increase home and community protection.

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<sup>21</sup> Portions of the mapped access road and corresponding fuel break treatment extend beyond the COSC property boundary and Parks and Recreation Department maintenance area. COSC should consider pursuing ROE agreements to implement the full extent of fuel break treatments in these areas, where feasible, to improve critical fire response access through Arroyo Seco. If ROE are acquired, additional treatments that expand the fuel break should be evaluated. Fuel break treatments mapped beyond the COSC property boundary and/or maintenance area are included for consideration for treatment implementation.

<sup>22</sup> The mapped fuel break along the primary access road through Arroyo Seco should achieve vertical and horizontal clearance for Type 3 Fire Engine access, at minimum, per the Roadside treatment prescription.

### *Arroyo Seco Priority Treatment Zone 1 - Recommendation 3*

Evaluate road upgrades to connect the main access road from the top of the property at Meder St., extending beyond the bottom of the property to Grandview St., to enable improved fire response access. Evaluations would need to consider the presence of sensitive resources and community infrastructure located between the lower portion of the property boundary and Grandview St. Consultation with a certified engineer is recommended to determine appropriate measures for road upgrades.



## Treatment Implementation: Timing & Maintenance

### *Treatment Timing*

The Parks and Recreation and Public Works Departments should initiate implementation of treatments identified as highest priority overall across COSC sites in 1-2 years, including DeLaveaga's Priority Treatment Zone 1 (EOC/Netcom) and Pogonip's Priority Treatment Zone 1. Additional treatments, including Priority Treatment Zone or additional recommendations across priority Parks and Recreation and Public Works Department sites, should be initiated within 3-4 years or as funding is available. Initial planning actions necessary for certain treatments, such as those extending beyond COSC property boundary adjacent to the Armory which likely require ROE agreements, should be initiated within 1-2 years.

Existing treatments that occur annually through the Parks and Recreation and Public Works Departments, including strategic firebreak mowing along key fire roads, trails, and grasslands, should also be prioritized as part of on-going vegetation management concurrent with Priority Treatment Zone implementation.

### *Treatment Maintenance*

Most treatments require maintenance treatments, or re-treatments; however, the interval of maintenance varies widely depending on vegetation type, history of land management, and other factors such as storm events. Maintenance intervals may vary greatly and are generally related to the vegetation life form, landscape location (e.g., climate and soil types of influence plant regrowth), and activity type. Maintenance treatments would be based on monitoring of the site conditions but is estimated to occur immediately following initial treatments or approximately every 2-10 years, or if the qualified professional/landowner determines that the initial treatment did not obtain the appropriate results to meet treatment objectives. Maintenance treatments would generally occur at lower intensity, scale, and cost than initial treatments depending on vegetative regrowth and treatment method and objectives. Monitoring the progression of understory regeneration can aid in the development of a timeline for maintenance treatment cycles. Designating time to monitor and maintain the treatment areas could significantly reduce costs of re-treating these areas if vegetative conditions are to become too dense to be re-treated in-house by COSC.

Maintenance treatment methods may employ the same treatment activities used in the initial treatment or introduce a new treatment activity. Often the maintenance treatment is different than the initial treatment, such as manual or mechanical treatments in tree-dominated vegetation types that reduce surface and ladder fuels followed by prescribed fire treatment(s) to maintain reduced fuel loads, in consideration of the natural fire return interval of the vegetation community and other environmental factors as well as treatment objectives are important factors in determining appropriate intervals.

## Section IV: Wildfire Resiliency & Response Dashboard

The development of a COSC Wildfire Resiliency and Response Dashboard is a key recommendation as part of the WRP. Given that wildfire resiliency spans multiple departments across COSC, cross-departmental tools, resources, and planning initiatives are needed to advance the long-term resiliency of COSC lands, infrastructure, and the human and natural communities they support. The goal of the dashboard is to serve as an interdepartmental platform that compiles information on critical COSC infrastructure, fire response access routes, and site prioritization to ultimately aid in wildfire response and planning. The dashboard could utilize ESRI ArcGIS Pro and Field Maps, allowing for real-time mapping, location identification, and data collection.

Having this information compiled in an online real-time platform could allow for the Fire Department to have access to identified key fire access points adjacent to and within COSC properties, including Water Department infrastructure sites, with associated fire apparatus access type and road condition information; or allow for the Parks and Recreation Department to plan, track, and implement treatments, with the ability to make treatment areas and information visible while in the field, make notes and adjust treatments, and develop long-term treatment tracking and monitoring. It would also support the Parks and Recreation and Public Works Departments in planning, tracking, and implementing vegetation treatments by enabling users to view and delineate treatment areas, document notes, generate GIS data related to treatment implementation and operations, and establish a system for long-term tracking and monitoring of treatments.

The example dashboard interface shown in Figure 17, created as part of the Los Gatos Creek Watershed Collaborative, highlights these various tools used for project implementation and treatment tracking. The following information and features are recommended for inclusion in the dashboard:

- Locations of COSC assets, including Parks and Recreation, Public Works, and Water Department infrastructure and open space sites.
- Locations and key information of high priority COSC sites, as determined by the WRP.
- Locations and information on key fire response access points for high priority COSC sites, including information on fire apparatus access type and road condition.
- Additional GIS layers that aid in fire response and resiliency planning efforts, such as assessor parcels and fine-scale topography and vegetation.
- Treatment areas and activities recommended as part of the WRP, with ability to measure and monitor treatment tracking as treatments are planned and implemented.

As part of the WRP, many of these GIS files will be provided in an ArcGIS Geodatabase, which can be hosted and integrated into the online ArcGIS Field Maps platform. This online hub could be maintained by COSC to support emergency response efforts as well as on-going and future wildfire resiliency planning and vegetation treatment implementation.

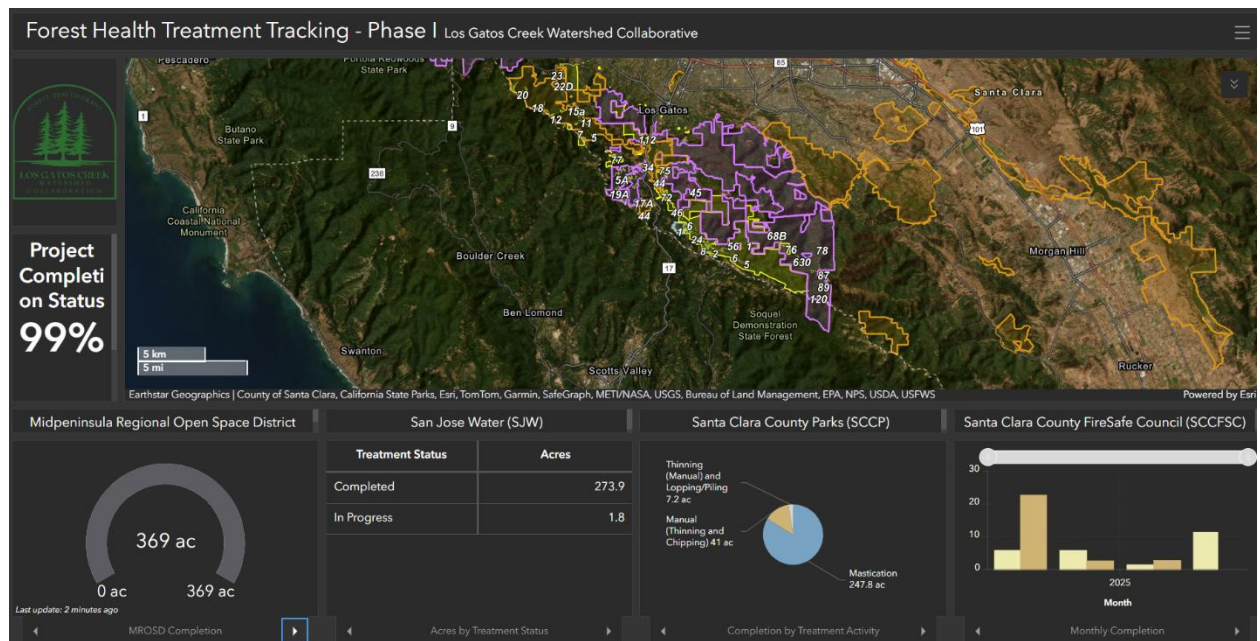


Figure 17. Los Gatos Creek Watershed Collaborative Example Forest Health Treatment Tracking Dashboard.

## Section V: Wildfire Resiliency Plan (WRP)

### Development Methods

This section provides context and necessary information for prioritized treatment recommendations outlined in *Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate*, *Section II: Water Department Priorities*, and *Section III: Parks and Recreation & Public Works Departments Priorities*. This includes information on background analysis, treatment prioritization considerations, and introduces the proposed treatment activities and vegetation treatment prescriptions.

## Background Analysis

The development of the WRP represents a culmination of multiple collaborative steps, including input from the TWG, information gathered from COSC guiding documents, completion of GIS analysis to develop treatments, and field investigations. These factors are summarized below.

### Technical Working Group (TWG)

The WRP TWG consists of representatives from various COSC departments, including the Fire, Water, Parks and Recreation Department, and Public Works Departments. The TWG was developed to identify wildfire risk and strategize management approaches through collaborative discussions and field meetings. The TWG functions as a coordination structure for facilitating discussions to ensure individual goals of each participating department are addressed in the WRP and to provide direction regarding proposed treatments and site prioritization across COSC lands based on their technical knowledge and expertise of COSC infrastructure and assets, stewardship practices, and wildfire history and risk.

Field meetings consisted of preliminary assessments of COSC sites described in the *Field Investigations* section below and tours of project sites located in the Santa Cruz Mountain region that employed various vegetation treatment management actions and prescriptions that were considered as part of this WRP; project site tours occurred at the Los Gatos Creek Watershed Collaborative Forest Health Project on San Jose Water lands and at the Butano State Park Forest Health Project's Olmo Ranch House Demonstration Area, where vegetation management was in implementation or completion phases..

### Guiding Documents

COSC, including the Parks and Recreation and Water Departments, maintains several key documents – including resource management plans, emergency response plans, and environmental compliance guidelines – that provide overarching and site-specific management guidance. As part of the WRP development, these documents were evaluated to gather background information on resource and infrastructure management approaches and site-specific treatment considerations. Other documents informing WRP recommendations include relevant biological survey reports and habitat plans. While recommendations in the WRP are intended to align with COSC-and department-specific goals and objectives, policies and guidelines set forth in these guiding documents and other relevant plans should be followed to ensure consistency with COSC's broader management goals and regulatory frameworks. These key guiding documents used to inform treatment recommendations and outcomes of the WRP are listed below.

- *Pogonip Master Plan (1998)* – Parks and Recreation Department
- *DeLaveaga Vegetation Management Plan (1997)* – Parks and Recreation Department
- *Moore Creek Interim Management Plan (2002)* – Parks and Recreation Department
- *Environmental Regulatory Compliance Guidelines (2020)* – Water Department
- *Vegetation Management Procedures (2014)* – Water Department
- *Emergency Response Plan (2023)* – Water Department
- *Operations and Maintenance Habitat Conservation Plan (2021)* – COSC



- *Anadromous Salmonid Habitat Conservation Plan (2023)* – COSC
- *Local Hazard Mitigation Plan Five Year Update 2018-2023 (2018)* – COSC
- *General Plan 2030 (2012)* – COSC
- *Emergency Operations Plan (2011)* – COSC
- *Parks Master Plan 2030 (2020)* – Parks and Recreation Department

## Geographic Information System (GIS) Analysis

ESRI ArcGIS Pro was used to conduct pre-field GIS analysis and develop maps to support field investigations and to be included in the WRP. During pre-field GIS analysis, spatial data (i.e., slope analysis, vegetation types<sup>23</sup>, infrastructure, known sensitive resources, etc.) was referenced to develop potential vegetation treatment footprints and fuel breaks to be verified on the ground during field investigations. As part of this initial GIS analysis, approximate 30 ft. buffers were added on either side of watercourses in the development of treatment areas and appropriate watercourse protections. Importantly, existing firebreak mowing locations were provided by the Parks and Recreation Department to be digitized and to aid the assessment of where prioritized recommended treatments should occur in relationship to ongoing maintenance. COSC provided additional data, such as Water Department infrastructure (i.e., intake sites, pump stations, water tank sites, critical pipelines, etc.) and proposed fuel break locations, to support the WRP assessments. Spatial data that supported field investigations was compiled into an ESRI Field Maps project, which is further described in the *Field Investigations* section below. Following field investigations and assessments, verified spatial data was uploaded to ArcGIS Pro to support the development of final WRP maps and to provide a compiled geodatabase for COSC’s use.

## Field Investigations

The purpose of conducting field investigations is to assess and evaluate site conditions to support the development of site-specific prioritized treatments and recommended actions. Field investigations occurred over a series of days with Auten Resource Consulting (ARC) Forestry and COSC Fire Department, as well as respective department representatives from the Water, Parks and Recreation, and Public Works Departments depending on the sites visited. In total, 34 COSC sites were visited as part of the field investigations under the WRP (Table 13). Initial identification of sites for field visits and evaluation was made in coordination with the WRP TWG, including input from the Water, Public Works, and Parks and Recreation Departments. Each Department generally identified sites that were important to their operations and/or presented significant concerns related to wildfire, vegetation conditions, ignition potential, and/or adjacent communities. Sites that were visited but not fully evaluated (Table 14) were generally those considered by the TWG and/or ARC to be lower priority for vegetation treatments, or were undergoing facility renovation projects (e.g., Graham Hill Water Treatment Plant).

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<sup>23</sup> Online GIS datasets are accessible for the [Santa Cruz County Fine Scale Vegetation Mapping Data](#) and [Santa Cruz County Enhanced Lifeform Mapping Data](#).

Field Maps and Survey123® software were used to collect data points from in-field observations, ultimately providing the basis for proposing applicable vegetation treatment prescriptions and the prioritization of treatment zones.

Table 13. WRP Field Investigation Sites. Asterisk (\*) indicates sites not fully evaluated as part of the WRP.

Visited Facilities and Sites		
Water Department	Parks and Recreation Department	Public Works Department
Water Department Site #1	Arana Gulch	Armory
Water Department Site #2	DeLaveaga	City Landfill
Water Department Site #3	Jesse Street Marsh	Corporation Yard
Water Department Site #4	Moore Creek	Emergency Operations Center, Netcom
Water Department Site #5	Neary Lagoon	Wastewater Treatment Facility
Water Department Site #6	Pogonip	
Water Department Site #7	Arroyo Seco	
Water Department Site #8	Harvey West & Wagner Grove*	
Water Department Site #9		
Water Department Site #10*		
Water Department Site #11*		
Water Department Site #12		
Water Department Site #13		
Water Department Site #14		
Water Department Site #15		
Water Department Site #16*		
Water Department Site #17		
Water Department Site #18		
Water Department Site #19		
Water Department Site #20		
Water Department Site #21		

Site-specific notes and key considerations for treatment viability, such as sensitive resources (i.e., hydrologic features, sensitive species, cultural and archaeological resources, etc.), treatment area slope and access for equipment, ingress and egress access for fire apparatus, treatment prescriptions, or site-specific conditions, were noted using Field Maps. Survey123<sup>®</sup> was used to conduct LE-100 and Infrastructure assessments for Water and Public Works Department sites; this process is further described below in the *Infrastructure Assessments* section below.

## Treatment Prioritization Criteria

This section provides an overview of the criteria evaluated in site and treatment prioritization, including TWG goals and input, vegetation conditions and LE-100 scores, fire response and access, community impact, ignition risk, and topography and local climate.

### Vegetation Conditions

Vegetation conditions – including vegetation and fuel density, type, continuity, and location – play a critical role in influencing wildfire risk, spread, and behavior across a landscape. These conditions were assessed through field investigations and GIS analysis for both infrastructure and open space sites. Infrastructure sites also included infrastructure assessments (outlined in the *Infrastructure Assessments* section below) evaluating vegetation and fuel conditions surrounding critical infrastructure within the defensible space zone utilizing CAL FIRE’s LE-100 defensible space requirements. Findings, observations, and assessments from these efforts were evaluated on a site-specific basis to inform site and treatment prioritization, in addition to informing the development of treatment strategies and recommendations, such as treatment locations, activities, and prescriptions for implementation.

### Infrastructure Assessments

Through the use of Survey123<sup>®</sup>, an LE-100 Infrastructure Assessment<sup>24</sup> was completed at Water and Public Works Department infrastructure sites. The infrastructure assessment evaluated various categories related to wildfire resilience, including CAL FIRE LE-100’s described below, Fire Department engine and apparatus accessibility, existing vegetation conditions surrounding the facility, planning and preparedness, structure hardening, and wildfire behavior influences. Each of these categories included a ranking system or compliance questionnaire to support the determination of site prioritization. Scores were averaged for each criteria grouping where applicable to show an overall score for each criteria. Additionally, the form included options to add general site photos and prioritization notes. The following sections briefly describe each category that was evaluated as part of the Infrastructure Assessment.

#### **LE-100 Infrastructure Assessment**

The LE-100 Infrastructure Assessment is based on the CAL FIRE LE-100 Defensible Space Inspection<sup>25</sup>, which evaluates vegetation conditions within two zones surrounding structures and additional criteria for structure preparedness for compliance with PRC 4291(a)(1); Zone 1 is considered within 30 ft. of all structures or to the property line and Zone 2 is considered within 30-100 ft. of all structures or to the property line. Local CAL FIRE Notice of Fire Hazard Inspections<sup>5</sup> were also referenced to develop the WRP LE-100 Infrastructure Assessment, which includes a third zone encompassing both Zone 1 and Zone 2 (within 100 ft. of all structures or to property line), in addition to other requirements and recommendations pertaining to defensible space, wildfire preparedness, and fire hazard. The LE-100 assessment was adapted to pertain more specifically to COSC facilities and structures, rather than homes; for example, original LE-100 questions that mentioned chimneys or stovepipes did not necessarily apply, therefore, the question was adapted to evaluate any heat exhaust system in alignment with the original intent.

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<sup>24</sup> Although the CAL FIRE LE-100 is primarily used for inhabited structures, its requirements provide reasonable guidance for critical infrastructure evaluated in the WRP.

<sup>25</sup> A sample [CAL FIRE Notice of Defensible Space Inspection](#) and [local CAL FIRE Notice of Fire Hazard Inspection](#) forms are available online for reference.

Each LE-100 question was ranked on a scale from 1-5, where 1 represented a low level of preparedness (high priority for treatment or action) and 5 represented a high level of preparedness (low priority for treatment or action). In some cases, the question may not apply or be relevant to the facility, in which case the site would rank a 0 to represent a null score. Following the score for each question, observers had an opportunity to add justification in notes or to capture photos that supported the score. It is important to note that, due to property lines immediately surrounding infrastructure at some sites, portions of the 100 ft. LE-100 defensible space zones were not fully evaluated where property boundaries currently restrict COSC's ability to implement treatments. For instance, for some sites, most or all of the reduced fuel zone (30-100 ft.) was beyond the COSC property line. As a result, some sites received an NA score for this zone. However, general observations, notes, and photos documenting existing conditions were recorded for these sites to help guide future treatments should access to adjacent properties be pursued. For sites where 30-100 ft. is partially within COSC's property boundary, evaluations were completed up to the approximate property boundary.

## Access

The access section of the Infrastructure Assessment evaluated the potential access for Fire Department engine or apparatus. This assessment included the option to check any fire-related emergency response vehicles (i.e., side-by-side, standard vehicle, Type 6 engine, Type 3 engine, Type 1 engine, or other) that could have access in two circumstances: (1) based on the existing vegetation conditions and obstructions that would interfere with access and (2) following vegetation treatments to improve accessibility and clearance. Additional access observations included noting the unobstructed width and vertical clearance of the road (current and following vegetation treatments), the primary surface of the road to inform winter-weather access or maintenance, the visibility of addresses or facility signage from main roads, and gate and lock access for key personnel, including fire response personnel.

## Vegetation Treatment Information

The purpose of the vegetation treatment information section was to identify whether or not vegetation treatments would be applicable in the areas surrounding the assessed facilities. Observations were noted for vegetation conditions that surrounded the facility including the surrounding vegetation type, the average height of understory vegetation, and slope accessibility for mechanical vegetation treatment equipment. This assessment section was not mandatory to complete due to it not applying to all sites.

## Planning and Preparedness

The intent of the planning and preparedness section of the Infrastructure Assessment is to formulate an understanding of the protocol and procedures for each facility in the event of emergency. Information gathered for this section was generally provided by COSC personnel on and off-site. Questions in the planning and preparedness section evaluated the power required to maintain system function at each site, back up generator capabilities, and contingency plans in the event that the facility could not maintain function during an emergency event or wildfire. This section was optional to fill out for each site.

## Structure Hardening

The structure hardening section of the Infrastructure Assessment evaluated the existing structure characteristics, including materials and conditions. Observations for this section included the exterior material type (i.e., stucco, concrete, wood, metal, brick, etc.), roof material type (i.e., composite shingles, concrete, metal, wood, etc.), presence of windows and vents, presence of metal screening on heat exhaust openings, and the condition and material of the structure's foundation stem walls. This section was optional to fill out for each site, however, topics were noted if certain aspects were in poor condition.



## Fire Behavior

The fire behavior section assessed surrounding topographic conditions to determine the presence of features that are more conducive to exacerbated fire behavior. In this case, a site would score a Yes, No, or NA (not applicable); a yes would indicate a site that has steep slopes immediately adjacent to facility or structure or a site that is located in a box canyon, whereas a no would align best with slopes that have a gradual grade, generally less than 30 percent, and is located outside of a canyon feature. This section was optional to fill out for each site.

## Fire Response & Access

The Fire Department provided a series of roadside fuel breaks and access routes that were of importance to maintain in the event of an emergency. Many of the provided fuel break and access route locations tied into other priority sites evaluated in this WRP. During field investigations, the provided fuel breaks and access routes were verified for treatment feasibility and current access conditions. The fuel breaks and access routes provided by the Fire Department included those within Parks and Recreation Department open space properties along key roads and trails, in addition to residential access points into the properties. Several fire response access routes and fuel breaks were identified as priority locations, as discussed in *Section II: Water Department Priorities* and *Section III: Parks and Recreation & Public Works Departments Priorities*.

## Community Impact

When prioritizing COSC sites for wildfire resilience, it was important to consider what factors have the most impacts on communities in general and during emergency events, such as during a wildfire; for the purpose of this WRP, water supply, communications, shelter, and community use were carefully considered for site prioritization.

When considering vegetation management for fuels reduction and structure protection, publicly available GIS data was analyzed to evaluate site proximity to communities to determine potential wildfire spread into or from communities through the connectivity of fuels. For instance, dense housing areas that are in close proximity to highly vegetated areas were evaluated closely to identify opportunities for vegetation management and fuel reduction. Additionally, radio repeaters and supporting infrastructure that facilitate emergency communications were evaluated for vegetation management based on populations and regions served. In the event of a wildfire, impacts to communities are not limited to the spread of wildfire and can affect greater numbers of people than the fire footprint alone; for this reason, Water Department data was assessed, such as storage capacities, number of people served, and the amount of water produced per day, for critical sites. The Water Department's *Emergency Response Plan* was referenced for analysis to support the prioritization of Water Department sites.

## Ignition Risk

COSC provided GIS data documenting ignitions primarily associated with unhoused encampment warming or cooking fires for 2019-2024, to be evaluated as part of the WRP analysis. The ignition data includes information on the incident date, location, cause, and category of camp. The ignition data provided insight into ignition frequency and concentration to support the analysis of wildfire risk; generally, areas of higher frequency or with higher concentration of ignitions were located in parks and open space areas. Regardless of the ignition source, any ignition on the landscape poses a threat to community safety and wellbeing if the ignition were to spread. Therefore, the development and prioritization of vegetation treatments, including treatment recommendations and strategies (i.e., locations and methods of treatment), considered opportunities to treat vegetation and fuels in proximity to ignition-prone and high-risk areas. The ignition data

used to inform treatment development and prioritization is depicted on various site maps located in *Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate, Section II: Water Department Priorities* and *Section III: Parks and Recreation & Public Works Departments Priorities*.

## Topography & Local Climate

Topography and climate are important considerations for wildfire risk. Although all COSC sites fall predominantly into the same local climate as described in *Section VIII: Background*, microclimates influence vegetation conditions and, therefore, can influence wildfire risk. Microclimates can be defined as the climatic condition of a small area where temperature, humidity, wind, and other factors differ from nearby locations and can be influenced by topography (Britannica, 2025); for example, on a given day the microclimate of a valley that is shaded by a canopy of trees would likely have a cooler temperature and higher humidity than an a grassland ridge that receives more direct sunlight.

Topography influences fire behavior and the rate of spread as well as access for vegetation management. Steep slopes are more conducive to extreme fire behavior due to radiation, which pre-heats and reduces the fuel moisture of vegetation upslope from the head of the fire making it more ready to combust. Similarly, valleys or canyons can act as shoot or chimney that funnels fire driven by the movement of hot air up the canyon at more rapid rates of spread than flat, open areas. Although steep slopes may have the most potential for extreme fire behavior, they pose more limitations to vegetation management due to the lack of accessibility for ground-based equipment. Therefore, topography was assessed to identify gradual sloped areas for vegetation management that are strategically configured with consideration to proximity to steep slopes, proximity to and the potential spread of fire. Notably, much of the WRP area has a prevailing northwest wind that contributes to wildfire risk. This wind pattern can interact with vegetation conditions, topography, and fuel moisture, as evidenced in the CZU Fire, thus representing an important consideration for prioritization and placement of treatments at each WRP site.

## Technical Working Group (TWG) Input & Goals

Input gathered from the TWG represents an important factor in the prioritization of sites and treatments, as the WRP aims to achieve alignment with department goals, priorities, and objectives, while also incorporating the prioritization factors discussed above. Each department has distinct goals, objectives, and desired outcomes related to resource management, vegetation treatments, and wildfire risk within their respective areas of responsibility, while collectively working toward the shared goal of wildfire resiliency and the protection of communities and ecosystems. These include:

**Parks and Recreation Department** – Managing open spaces for natural resource protection, outdoor recreation, and public health and safety, while advancing both ecosystem health and wildfire protection;

**Public Works Department** – Protecting critical infrastructure related to stormwater, wastewater, and flood control systems, as well as other essential public health and community services;

**Water Department** – Safeguarding infrastructure critical to the operation and supply of the water system, and providing resource and source-water protection and recreation opportunities for communities across Santa Cruz;

**Fire Department** – Improving wildfire and emergency response capabilities, including maintaining access to critical COSC assets and critical ingress and egress routes, implementation of vegetation treatments, and establishment of fuel breaks to support fire response and suppression.

In addition to these broader goals, TWG input also included site-specific concerns – such as identified high priority treatment locations, emergency access priorities, and site criticality to department operations – which were also considered in the prioritization process.

## Section VI: Treatment Strategies & Priority Treatment Zone Descriptions

The purpose of this section is to identify the treatment strategies and treatment zones developed across sites evaluated in the WRP. Treatment strategies and zones in the following sections were derived from GIS analysis, field investigations, in collaboration with the WRP TWG, and with consideration of key prioritization factors as described above in *Treatment Prioritization Criteria*. Additional guidance was derived from regional projects in the Santa Cruz Mountains and local defensible space ordinances, when in proximity to buildings and critical infrastructure.

## Priority Treatment Zones

Priority Treatment Zones delineate unique footprint locations within priority COSC sites where treatments are recommended for implementation in priority phases. The Priority Treatment Zones identified for each site indicate priority level, in addition to treatment areas and the broad treatment activities (i.e., mechanical and manual) that may be employed for implementation. Priority Treatment Zones by COSC department site, including corresponding treatment strategies within each zone, are detailed in order of priority in *Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate, Section II: Water Department Priorities, and Section III: Parks and Recreation & Public Works Departments Priorities*.

## Treatment Strategies

Treatment strategies outline treatment prescription categories and treatment activities. Treatment activities identify the various methods in which treatments would be implemented to achieve treatment prescriptions (reference the *Treatment Activities* section below). Treatment prescription categories describe general project specifications that apply across WRP sites, with categories including Defensible Space, Hazard Tree, Forest Health Fuels Reduction, Hardwood Restoration, Shrubland Restoration, Grassland Restoration, Invasive Species, and Roadside. Site-specific treatment recommendations, including Priority Treatment Zones, identify the applicable treatment activities and prescription categories that are recommended for implementation.

### ***Treatment Activities***

Treatment activities identify the methods through which treatments would be implemented, and are delineated within each Priority Treatment Zone. The proposed vegetation treatment activities are manual treatments, mechanical treatments, prescribed burning (broadcast and pile burning), targeted herbicide application, and prescribed herbivory. Each of these treatment activities are described in more detail below. While primarily manual and mechanical treatment activities are delineated for each Priority Treatment Zone, other treatment activities should be considered to aid in achieving treatment goals and objectives when feasible.

Treatment activities could occur during any time of year, although limited operating periods would be implemented for special-status species and winter period operations when required. In addition, treatment activities would be limited when soils are saturated, and prescribed burning would be confined to appropriate burn windows when weather conditions are appropriate. Although there is the potential for prescribed burning to occur during nighttime and weekend hours, all treatment activities using equipment would be limited to daytime hours.

### **Mechanical**

Mechanical treatments use mechanized equipment and would be implemented on slopes less than approximately 35 percent and no greater than 50 percent and with appropriate watercourse avoidance buffers. Mechanical treatment activities would primarily include mastication but may also include “mowing” of shrubs (leaving root systems intact) and small trees, and in some cases skidding of felled larger dead trees. Also, mechanical equipment may reach with a boom-mounted excavator from an existing road on slopes greater than 35 percent. Equipment types used would include a boom-mounted tracked excavator, tracked grinder, skidder, slope mower, chipper, or masticator (Figure 18). Mechanical treatment is effective for removing dense stands of vegetation and is typically used in shrub and tree fuel types. Some mechanical equipment can masticate (mulch) or lop and scatter vegetative debris concurrently with vegetation removal.



Mastication involves the use of a large, mechanized device for chopping and is used in areas with shrubs and trees to break up the fuel pattern and decrease combustibility by placing fuels on the ground. Chipped or masticated biomass from mechanical and manual treatments will be distributed throughout the project area in a mosaic pattern, at variable depths. In general, residual material depths should average 3 in. and not exceed a depth of approximately 6 in.. In addition, resulting biomass may be piled using equipment (e.g., skid steer, tractor, bulldozer, or excavator) or hand crews and pile burned. Material may be masticated or chipped and left on site. Chipping should not occur if a prescribed broadcast burn is planned to occur within 2 years of treatment. If prescribed burning will not occur within 2 years of treatment, chipping may occur along treatment edges. Consideration of curtain burners and other means of biomass utilization is encouraged.

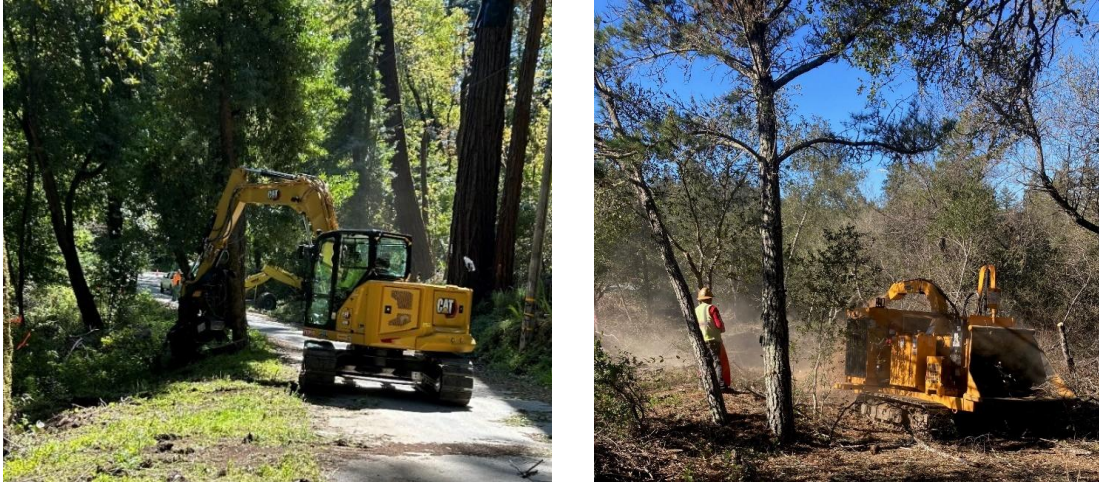


Figure 18. Mechanized equipment. CAT 309 Excavator (Left) and Bandit tracked chipper (Right).

## Manual

Manual treatment would be implemented using hand tools and hand-operated power tools to cut, clear, or prune herbaceous and woody species (Figure 19). Activities could include thinning trees with chainsaws, loppers, or pruners; pulling, grubbing, or digging out root systems of undesired plants to prevent sprouting and regrowth; and placing mulch around desired vegetation to limit competitive growth. Manual treatments would be implemented using hand crews and could occur on all slopes, generally up to 75 percent. Manual treatments may occur within areas mapped as mechanical treatment, as these areas generally represent accessible ground with slopes less than approximately 35 percent.



Figure 19. UC Santa Barbara, Kenneth S. Norris Rancho Marino Reserve, Cambria, CA. Handwork in shaded fuel break.

### Prescribed Burning

Prescribed burning consists of two general types: pile burning and broadcast burning (underburning<sup>26</sup>). Both types of prescribed burning would be used to implement the project. All burning would be implemented in fall, winter, or spring and in accordance with regulations regarding the use of prescribed burning. This would include the preparation and implementation of a burn plan that includes a smoke management plan.

For pile burning activities, biomass from manual and mechanical treatment will likely be piled by hand crews but could also be piled using equipment (e.g., skid steer, tractor, bulldozer, or excavator) and burned appropriately. Pile burning would occur in forested understory or in areas with little to no live overstory, including areas that have experienced previous wildfire (Figure 20).



Figure 20. Pile burning in Redwood (Left) and broadcast burning in oak woodland (Right).

<sup>26</sup> Underburning means low-intensity prescribed burning to maintain forest health through reduction of fuels in the understory of a forest stand while maintaining the overstory stand characteristics.



Broadcast burning would be used to promote forest health and native flora and reduce biomass and fuel loading in grassland, woodland, and forest vegetation. Pretreatment of vegetation using mechanical and manual activities or herbicide application would occur in areas proposed for prescribed burning. Prescribed burning would promote the re-establishment of more natural ecological processes and a wildfire-resilient native landscape.

COSC could implement both pile burning and broadcast burning to partially remove understory and groundcover vegetation during periods when weather and vegetation conditions allow the desired fire intensity to meet treatment objectives and do not create fire behavior jeopardizing maintaining control of the prescribed burn (e.g., relatively high humidity and high fuel moisture content). Prescribed burning may require the construction of new control lines or enhancement of existing control lines using manual or mechanical treatments activities. Prescribed burning is identified as a treatment activity within Pogonip Open Space Preserve as a COSC demonstration project; additional prescribed burning treatments should be considered in conjunction with or following initial treatments across COSC and WRP sites.

### Prescribed Herbivory

Prescribed herbivory for vegetation treatment is the intentional use of domestic livestock (predominantly goats or sheep) to remove, rearrange, or convert vegetation in wildlands to reduce the costs and losses associated with wildfires and to enhance the condition of forests, rangelands, and watersheds (Figure 21). In addition to fire prevention benefits, carefully managed prescribed herbivory can help increase soil organic matter, control invasive species, and improve plant and wildlife habitat. Treatments would use goats or sheep and could be implemented in various vegetation types. A herder, fencing, mineral block, and/or a watering site may be required to keep the animals within the desired area. Herds may be moved as often as every 1 to 3 days and one to two workers would be required on average to implement this treatment activity.

Prescribed herbivory, such as cattle grazing, is an existing treatment activity utilized on some COSC properties. WRP treatment recommendations, such as Priority Treatment Zones utilizing mechanical or manual treatment activities, should occur in conjunction with existing COSC prescribed herbivory activities.



Figure 21. Santa Barabara County, CA. Prescribed herbivory utilizing sheep.

### Targeted Herbicide Application

Herbicide use would be limited, targeted, and utilized strategically to treat invasive plant species as defined by Cal-IPC and the City's Integrated Pest Management (IPM) Guidance Manual. Targeted herbicide treatment would be used on French broom outbreaks along roadsides and eucalyptus species (Figure 22) or other invasive tree, shrub, forb or grass species. All targeted herbicide applications would be performed by certified and licensed pesticide applicators in accordance with all local, state, and federal regulations. Only ground-level application would occur; no aerial spraying of herbicides would occur. Several targeted herbicide application methods are available for use by on-the-ground personnel, including painting herbicide on stems and using a backpack sprayer and hand application. The method that is least likely to affect nontargeted vegetation would be used at any given site. On eucalyptus trees, cut stump treatment methods could be used. Herbicides would also be avoided to the maximum extent feasible and may be used only if such treatment activities are the least environmentally damaging feasible alternative.



Figure 22. Mount Madonna County Park, Watsonville, CA. Herbicide treatment applied directly to blue gum eucalyptus stump to prevent re-sprouting.

## **Treatment Prescriptions**

This section describes various vegetation treatment prescription categories that may be implemented to achieve treatments identified in the WRP. Treatment prescriptions provide a foundation of generalized prescription details that may be applied or altered to develop site- and vegetation-specific prescriptions. These prescriptions aim to enhance resiliency to future wildfire by reducing forest density, understory vegetation, and fuel loads, promoting grassland and woodland ecosystems, while protecting critical infrastructure and improving road access. Treatment prescriptions and their intended outcomes are described below, with example specifications for each treatment prescription category outlined in Table 3 and in *Appendix C: Treatment Prescriptions*. Table 3 is also provided at the beginning of the document in *Section I: Priority Treatment Recommendations, Vegetation Prescriptions & Priority Cost Estimate* to provide context for priority treatment recommendations. While these treatment prescription specifications are recommended as part of the WRP, existing COSC resource management plans that include site-specific treatment or management guidelines should also be considered in conjunction with WRP recommendations to help achieve broader management goals.

### **Defensible Space**

Defensible Space treatments would help to decrease ignition potential and fire severity in proximity to infrastructure and increase the likelihood of structure protection in the event of a wildfire. Treatments would maintain defensible space standards per CAL FIRE LE-100 by removing trees and vegetation of any size up to 100 ft. of all buildings and critical infrastructure on a site-specific basis across COSC infrastructure sites. Defensible Space treatments would primarily apply to COSC infrastructure sites, or structures and facilities located in open space sites.

### **Hazard Tree**

Hazard Tree treatments would focus on the removal of hazardous trees of any size from high use areas in open space sites, along key roads, trails, and fire access routes, and adjacent to critical infrastructure sites. Hazard trees may include weakened trees from root damage, decay, pests and disease, poor structure, and negative human and infrastructure impacts. Hazard Tree treatments apply across all COSC sites, including infrastructure and open space sites. Trees that qualify as hazard trees under the Hazard Tree prescription would be determined on a permitting basis and may involve a qualified arborist, Registered Professional Forester (RPF), landowner, and/or vegetation management crew; a chain of commands for obtaining permissions should be established.

### **Forest Health Fuels Reduction**

Forest Health Fuels Reduction treatments would reduce density and connectivity in the understory while retaining a mosaic of understory vegetation by considering specific retentions for shrubland, snags, herbaceous vegetation, and hydrophytic species. Understory treatments can decrease competition for available resources, like sunlight, water, and nutrients, resulting in a greater allocation of resources for the residual stand, ultimately promoting the growth of larger diameter trees over time while also reducing future wildfire severity. Forest Health Fuels Reduction may also include shaded fuel breaks that are not located along existing roads, such as those established along ridgetops. Forest Health Fuels Reduction treatments would primarily apply to COSC open space sites but may also be applicable to infrastructure sites, particularly where treatments extend beyond the Defensible Space or Roadside treatment prescriptions for infrastructure and roads.



## Hardwood Restoration

Hardwood Restoration treatments would aim to prevent and limit conifer encroachment by removing Douglas-fir trees up to 36 in. in Diameter at Breast Height (DBH). Similar to Forest Health Fuels Reduction, treatment would remove understory trees less than 16 in. in DBH to create patchy, mosaic habitat structure for ecosystem resilience to wildfire, insects, and disease. Wildlife habitat would be enhanced by retention of snags, legacy trees, openings, downed woody debris, and mosaics of understory species. The Hardwood Restoration prescription category may apply in all hardwood-dominated woodland forests across COSC sites but would primarily apply to open space sites. Over time, prescribed fire should be considered for implementation for re-establishing alignment with the more frequent fire return intervals that historically characterized woodland areas throughout the region.

## Shrubland Restoration

Shrubland Restoration treatments would prevent and limit conifer encroachment by removing Douglas-fir trees up to 36 in. DBH. Additionally, no more than 65 percent of shrubs would be removed to create a patchy, mosaic structure as the first step of re-establishing disturbance regimes; shrub removals would be determined on a site-specific basis and recognize any sensitive natural communities requiring greater protections. Retention components would include downed woody debris for wildlife cover and a mosaic of at least 35 percent of understory, alliance-level species. Over time, prescribed fire should be considered for implementation for re-establishing alignment with more frequent fire return intervals. Shrubland Restoration treatments would primarily apply to COSC open space sites.

## Grassland Restoration

Grassland Restoration treatments would support grassland ecosystem health by mowing, grazing, removing woody plants, and reintroducing prescribed fire to promote native grassland diversity and productivity and limit encroachment of woody shrubs and conifers. Grassland Restoration treatments would primarily apply to COSC open space sites.

## Invasive Species

Invasive Species treatments would target the control and removal of invasive species by utilizing the COSC IPM Guidance Manual, Cal-IPC Inventory and/or COSC resource management plans for invasive species removals for prioritization of removals and management methods. Invasive Species treatments apply across all COSC sites, including infrastructure sites and open space sites.

## Roadside

Roadside treatments would include treatments that remove or treat vegetation along major roads, including seasonal and permanent roads, trails, and shaded fuel breaks along existing roads or trails. Roadside treatments would improve safety and visibility, reduce fuels and potential ignition sources along road corridors, create opportunities to connect treatment units, and help maintain or establish access for fire response. The Roadside treatment prescription may be applied to any road at COSC's discretion but is recommended in the WRP for mapped fuel breaks within Priority Treatment Zones, and roads or trails that provide access for fire response or to infrastructure sites. While primarily recommended in the context of fuel breaks and roadside treatments for fire response, the Roadside prescription may overlap with any of the other prescription categories listed above.

## **Section VII: Permitting, Regulatory Compliance & Implementation**

This section outlines permitting framework and pathways, analyzes estimated treatment costs for prioritized treatments, identifies pathways for prescribed burning, and discusses potential funding and regional collaboration opportunities. The purpose of this section is to provide information necessary to take the next steps toward implementing the prioritized recommended actions.

## Environmental Regulatory Compliance

Prior to vegetation management implementation, environmental compliance will be considered. Environmental regulatory compliance can be achieved through conformance with applicable environmental laws, regulations, and standards, including but not limited to state and federal Endangered Species Acts (ESA), typically demonstrated through documentation of compliance with such standards. CEQA was signed into law in 1970 to establish a policy of environmental sustainability and requires the disclosure and evaluation of significant environmental impacts, including proposed MMs to minimize impacts (State of California Department of Justice, n.d.). CEQA applies to discretionary activities that require approval by California public agencies or that require discretionary government approvals; CEQA does not apply to ministerial projects, or projects that conform to a public agency's own laws and ordinances, which is a determination that can be appropriately made by the particular public agency involved, per CEQA Guidelines § 15268. There is a range of potential pathways for environmental compliance; for the purpose of this WRP, two pathways are discussed in detail in the sections to follow.

### California Environmental Quality Act (CEQA) Compliance Pathways

The proposed wildfire resilience treatment prescriptions and vegetation management actions described in the beginning of this document may be implemented by completing appropriate and applicable CEQA documents, permits, or exemptions. For the purpose of this WRP, various permitting pathways are described below that may be used to implement the proposed treatments dependent on independent project goals, prescriptions, and vegetation management actions. COSC should consider whether proposed treatments can be implemented under existing management or maintenance plans, or if they may be considered ministerial projects that are exempt from the requirements of CEQA.

This section outlines two common CEQA compliant permitting mechanisms that can facilitate the implementation of the proposed wildfire resilience treatments, including the CalVTP PSA – a Programmatic EIR (PEIR), or exemptions, including CAL FIRE exemptions, Statutory Exemptions written into law, or Categorical Exemptions from CEQA. The WRP highlights these two compliance pathways due to their applicability to the site conditions and management goals and their streamlined nature; the proposed prioritized treatments are designed in alignment with the CalVTP and may be applied to the exemptions outlined above. However, various other pathways exist for environmental compliance, such as an EIR or a Mitigated Negative Declaration (MND) that could be developed with the WRP as a basis that would require additional preparation, or the Vegetation Management Program (VMP) that may be used to develop a plan for projects that focus on prescribed fire; these alternative pathways should be considered if proposed projects are expected to result in impacts that are outside the scope of the CalVTP PEIR or exemptions. Additionally, portions of COSC lands are located within the Coastal Zone, which involves additional environmental compliance considerations for permitting. The Local Coastal Program through the COSC or County of Santa Cruz could be applied to obtain a Coastal Development Permit (CDP) or utility exemption for vegetation management; importantly, if project impacts are in alignment with the CalVTP PEIR, then CalVTP projects may apply a newer process under a Public Works Program to achieve environmental compliance in the coastal zone (see the *Coastal Zone Considerations for the CalVTP* section below). *Appendix D: Permit Decision Matrix* outlines the forest management actions, prescription categories, and details of the two permitting mechanisms described in this section of the WRP. Information from the WRP may be used to provide supporting information for consideration of cumulative impacts and may also be used as needed for other permitting efforts. In addition to these recommended permitting mechanisms, existing COSC HCP's, such as the Water Department's OMHCP and ASHCP, can serve as compliance pathways for permitting, providing coverage for specific COSC activities and outlining avoidance and minimization measures to mitigate impacts to covered species.

The Federal ESA of 1973 and California ESA (CESA) of 1970 are important regulatory considerations for projects proposed for implementation in the WRP. Compliance with both ESA and CESA are evaluated as part of CEQA compliance, including the two compliance pathways described below. For the CalVTP PSA that will be developed for COSC lands, an evaluation is conducted to identify special-status plant and wildlife species with potential to occur within the project area, and a set of CalVTP standard project requirements (SPRs) and MMs are applied as standards for avoidance measures; a similar process would be conducted for alternative CEQA compliance pathways.

The two permitting pathways identified must also comply with applicable local ordinances, policies, and plans. Local ordinances, plans, and policies will be evaluated at the time of permitting, including, but not limited to, Heritage Tree Ordinance, Street Tree Ordinance, Santa Cruz County Riparian Ordinance, Community Wildfire Protection Plans (CWPPs), CAL Fire Unit Fire Plans, and the City's *2030 General Plan*, *City-Wide Creeks and Wetland Management Plan*, and *IPM Guidance Manual*.

### ***California Vegetation Treatment Program Project Specific Analysis (CalVTP PSA)***

The CalVTP is a statewide vegetation treatment program proposed by the California Board of Forestry and Fire Protection (Board of Forestry) in 2019 that was designed to streamline CEQA review of landscape-level forest health fuels reduction treatments in California and was developed in response to California's wildfire crisis. The CalVTP<sup>27</sup> functions under a PEIR that analyzes the potential for impacts related to the implementation of the treatment activities and treatment types defined in the PEIR for 20.3 million acres within California that are designated as "treatable landscape".

To implement the CalVTP, a lead agency must complete a PSA that is certified by the Board of Forestry. To qualify for certification, a PSA should implement all applicable Standard Project Requirements and MMs and analyze the site-specific treatments and resources to ensure that all potential impacts are within the scope of the PEIR, meaning that the findings within the PSA are consistent with the findings of the PEIR. In a case where a project would result in at least one new impact that is either less than significant, less than significant with mitigation incorporated, or potentially significant and/or substantially more severe significant impact, the PSA would be subject to adopting additional CEQA compliance such as a negative declaration, mitigated negative declaration, or EIR respectively.

According to CEQA Section 21166 and CEQA Guidelines Sections 15162, 15163, 15164, and 15168, an Addendum to an EIR, including PEIRs, should be prepared when changes or revisions to the project are proposed, or when the circumstances surrounding the project have changed and would not result in any new or substantially more severe significant environmental impacts that were covered in the certified PEIR. For instance, various recent CalVTPs propose the inclusion of areas outside of the CalVTP treatable landscape in vegetative and landscape conditions that are essentially the same or substantially similar to those within the treatable landscape to increase connectivity of ecologically restorative treatments.

Like CEQA, the PSA does not expire unless conditions significantly change in the project area. A PSA may be amended to include evaluation of the new conditions or in some cases, depending on the significance of the changed conditions, a memorandum, an amendment, or minor clarification may also be prepared. An additional advantage of the CalVTP is that COSC may be the lead agency for their PSA, or they may designate a lead agency by agreement.

As depicted in *Appendix D: Permit Decision Matrix*, a CalVTP PSA can be used to implement initial and maintenance treatment projects with prescription categories proposed in the WRP including Forest Health Fuels Reduction, Hardwood Restoration, Shrubland Restoration, Grassland Restoration, Defensible Space,

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<sup>27</sup> For additional information regarding the CalVTP, reference the [CalVTP Homepage and StoryMap](#).

Roadside, and Hazard Tree, that can be achieved through the following proposed management actions: broadcast burning, pile burning, herbicide, manual treatments, ground-based mechanical treatments, chipping, masticating, and air curtain burning. The CalVTP does not allow for the sale of wood products to offset project costs. A PSA should disclose any plans for COSC to donate wood products, such as chips, mulch, or firewood and analyze the potential impacts of biomass leaving the project site.

### Coastal Zone Considerations for the CalVTP

The Coastal Act of 1976 shares similar goals to COSC in its coastal areas. The CalVTP PSA process has become a newer more streamlined process under the Coastal Act than obtaining a CDP through the adoption of a Public Works Plan (PWP) and Coastal Vegetation Treatment Standards (Coastal VTS) through the Resource Conservation Districts acting as a special district.

Essentially, the CalVTP Standard Project Requirements coupled with additional and specific treatment information, called the Coastal VTS must identify, among other key coastal act impact questions, how a project will not impact, but restore, Environmentally Sensitive Habitat Areas (ESHA). This permit process takes close coordination with Coastal Commission Staff to prepare a Notice of Impending Development (NOID) under the PWP through the Resource Conservation District for the proposed project area to be heard before the Board. These approvals are effective for 10 years and may be extended as opposed to a one-year approval for a CDP. Most notably, if appropriate environmental documents are prepared ahead of time, from the start of coastal staff contact, NOIDs have been approved on average within six months, a notable accomplishment.

### **California Environmental Quality Act (CEQA) Exemptions**

Depending on the scope of a project, it may qualify for an exemption that dismisses some of the obligations of CEQA, through a Statutory or Categorical Exemption, or of the California Forest Practice Rules (FPR), through a CAL FIRE Exemption. Notice of Exemptions are often filed alongside Statutory, Categorical, and CAL FIRE Exemptions to enact a 35-day statute of limitations, or a law that defines a period of time that allows the possibility of legal challenge. Without filing a Notice of Exemption, a 180-day statute of limitations is applied to projects, creating a larger window for legal challenge to occur.

The types of treatment prescription categories, forest management actions, and initial or maintenance treatment projects that may be implemented vary by exemption. This section outlines and defines the three exemption types and highlights applicable pathways; please note that alternative exemptions exist within these exemption types and may be considered for use to implement the proposed projects.

#### Statutory Exemption:

Statutory Exemptions are written into statute to be excluded from CEQA consideration and are delineated in PRC 21080 et seq. Essentially, Statutory Exemptions are written into statute, or law, then further defined by PRCs that outline the bounds of projects and activities that apply under different types of Statutory Exemptions. A project may use a Statutory Exemption as long as it applies to its definition, regardless of potential environmental impacts. The exemption only applies to CEQA and all other applicable state, local, or federal laws must be considered (California Office of Historic Preservation, n.d.).

For example, COSC may consider a Statutory Exemption for Restoration Projects (SERP), among others, to facilitate restoration projects that promote wildfire resilience through California Department of Fish and Wildlife (CDFW) review in support of the Cutting the Green Tape (CGT) Program. As the lead agency, COSC would determine that project qualifies for the criteria and definition of the SERP as written in PRC 21080.56 to begin the process (Wildlife & California Department of Fish and Wildlife, n.d.). The SERP process involves a formal consultation with CDFW, optional site visits or site visits upon request, document development, and a



60-day concurrence review period by CDFW. A SERP provides the opportunity to offset costs to fund other restoration projects.

### Categorical Exemption

Categorical Exemptions consist of categories of projects that are considered to not have potential environmental impacts or substantial adverse impacts to historical resources. Categorical Exemptions are defined in the CEQA Guidelines 14 CCR Section 15300-15331, meaning they are defined in a set of regulations adopted by state agencies that complies and further defines the California Environmental Quality Act. To determine use of a Categorical Exemption, the lead agency is required to determine that the project will not have substantial adverse change to the significance of a historic resource (Office of Historic Preservation, n.d.).

For example, a Class 4 Categorical Exemption for minor alteration to the land is an applicable and common exemption for vegetation management that could facilitate some of the proposed initial treatment projects or could be applied to cover maintenance treatment projects. 14 CCR 15304 defines a Class 4 Categorical Exemption as minor alterations to the condition of the land, water, and/or vegetation, excluding the removal of healthy, mature, scenic trees except for forestry or agricultural purposes.

### CAL FIRE Exemptions

CAL FIRE Exemptions are defined in the California FPRs 14 CCR 1038, meaning that they are defined in the regulations adopted by the Board of Forestry to comply with and further define the Forest Practice Act written in statute.

There are several CAL FIRE exemptions that may be appropriate for COSC to consider for the implementation of forest management actions, including but not limited to the Forest Resilience Exemption, formerly a Forest Fire Prevention Exemption (14 CCR 1038.3), the Harvesting of Dead, Dying, Diseased Trees (14 CCR 1038(b)), and the Drought Mortality/ Substantially Damaged Timberland (14 CCR 1038(d)) exemptions. CAL FIRE exemptions provide the opportunity to offset costs to fund other restoration projects. CAL FIRE may also facilitate emergency notices, such as a Fuel Hazard Reduction emergency, as defined in 14 CCR 1052.

### ***Governor Newsom's Executive Order N-25-25***

In response to on-going statewide threat of catastrophic wildfires, Governor Newsom issued a State of Emergency in March 2025 to expedite critical wildfire prevention and fuels reduction projects aimed at advancing wildfire resiliency efforts across California. This emergency proclamation authorized the temporary suspension of specific regulatory requirements, notably CEQA and the Coastal Act, for qualifying wildfire mitigation and forest management projects. The Governor's Suspension does not suspend appropriate environmental measures from being carried out for treatment implementation operations; projects conducted under the Governor's Suspension must follow the Statewide Fuel Reduction EPP requirements<sup>28</sup>.

Capitalizing on this opportunity, COSC submitted its highest priority project identified in the WRP – [Priority 1](#), encompassing DeLaveaga Priority Treatment Zone 1 surrounding EOC/Netcom – for coverage under Governor Newsom's Executive Order N-25-25. The project received permitting approval on June 4, 2025, providing coverage for the entirety of the 32.6 acres included in the [Priority 1](#) submission. As part of the permitting approval, project implementation must begin prior to October 15, 2026, with expected completion within two years. Acquisition of funding for the project is currently under consideration.

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<sup>28</sup> [Statewide Fuels Reduction EPP](#) requirements provided for reference.

## Treatment Cost Estimates

Across forested vegetation types, handwork rates range from approximately \$8,000/acre-\$10,000/acre and mechanized work ranges from approximately \$3,000/acre-\$4,000/acre. These cost estimates only represent recent project implementation costs for contractor equipment and people on the ground conducting treatments on a per acre basis and are subject to change if prevailing wage applies. These estimates do not consider costs for additional required survey work, permitting documentation, field layout, contractor compliance supervision, or any COSC requirements for developing and implementing projects on COSC lands. Treatment maintenance should occur every 2 to 10 years, at significantly lower costs following initial treatments, depending on vegetative regrowth conditions and treatment methods and goals. Example treatment costs are provided in Table 3 (and *Appendix E: Treatment Cost Estimates*) for priority COSC sites and treatment costs.

## Prescribed Burning Pathways & Opportunities

Prescribed burning may include prescribe pile burning or prescribed broadcast burning – both are tools available to COSC to utilize for vegetation treatments that achieve wildfire risk reduction and resilience goals. There are opportunities to implement prescribed burning across COSC lands, and particularly within Parks and Recreation Department open space properties. While many of the treatment recommendations in the WRP involve mechanical and manual activities, these initial treatments are designed to create opportunities for prescribed fire by initially treating hazardous vegetation conditions and preparing landscapes for future fire. In doing so, these initial treatments can improve prescribed fire operations, implementation, and ecological outcomes. Prescribed fire can then be used following these initial treatments, as an effective tool for on-going maintenance and re-treatments.

There is also an opportunity to implement COSC-demonstration projects utilizing prescribed burning, highlighting treatment outcomes, ecological benefits, and wildfire risk reduction and resiliency for the public. These projects may involve small-scale units led by the COSC Fire Department, with opportunities for collaboration with regional partners such as CAL FIRE and the Central Coast Prescribed Burn Association.

*Appendix F: Prescribed Burning Opportunities* outlines potential prescribed fire implementation and collaboration pathways, highlighting the benefits and limitations of integrating COSC Fire Department-led prescribed fire efforts with these regional entities. Pogonip has been identified by the Fire Department and as part of the WRP for opportunities to conduct initial prescribed fire demonstration projects (Map 11) focused in grassland areas experiencing encroachment, where prescribed fire could enhance and restore coastal prairie habitat.

## Regional Collaboration

COSC lands and infrastructure span throughout the county creating linkages to other cities, towns, counties, entities, and landowners and posing opportunities for collaboration for wildfire resilience planning, permitting, and implementation.

In 2022, a CWPP was developed for Santa Cruz and San Mateo Counties to expedite the preparation and implementation of hazardous fuels reduction projects within the WUI. The CWPP identifies risks and hazards, including, but not limited to roadside fuel reduction and fuel breaks and shaded fuel breaks adjacent to roads and structures. The WRP was developed with alignment to the fuel reduction treatments described in the CWPP and identifies specific locations for COSC to implement resilience projects.

UCSC is an adjacent landowner that is in the process of developing a Wildfire Vegetation Management Plan and subsequent CEQA documentation to support implementation. The UCSC project was considered during the development of this WRP to design treatments on COSC lands, in this case within Pogonip, that increase the connectivity of wildfire resilience treatments on the landscape. Similar strategies can be applied on other COSC lands where adjacent or proximal landowners have opportunities for vegetation management to expand and connect efforts.

Entities such as the RCDSCC or FireSafe Councils can provide resources for project planning, permitting, funding opportunities, and implementation. RCDSCC, COSC, UCSC, and various regional stakeholders collaboratively submitted a 2024-2025 CAL FIRE Forest Health Grant to support environmental documentation and implementation for several projects that are at varying phases of development. The application was successfully awarded \$7,000,000 to fund these efforts. As part of this grant, \$250,000 in funding will support the implementation of 50 acres of forest health and fuels reduction treatments within Pogonip, including portions of Priority Treatment Zone 1 identified in the WRP.

COSC is involved in other regional wildfire resiliency planning and prioritization efforts, such as the RPP. COSC submitted [Priority 1-4](#) treatments to the RPP. The RPP is a regional prioritization process led by the SMRCD and RCDSCC, generally focused on forest health, wildland fuels reduction, ecosystem health, research, and community defensible space to enhance fire resilience and mitigate the risk of catastrophic wildfires. This regional effort develops a form of prioritization across multiple projects preparing for expected block funding from Proposition 4. Key aspects of the RPP prioritization process include:

- **Goals:** Identify and implement projects to reduce the risk of severe wildfires and create climate and fire resilient ecosystems within the Coastal Zone.
- **Methodology:** Utilizes tools such as the CAL FIRE Fire Hazard Severity Zone maps and high-resolution vegetation maps, along with expert knowledge.
- **Partnerships:** Collaboration with various entities including public and private landowners, technical advisors, and government agencies.
- **Focus:** Projects related to forest health and fuel load reduction within the Coastal Zone.
- **Project Identification:** Creates a continuous list of high priority projects.
- **Funding:** Secured funding from sources including CAL FIRE and the Coastal Conservancy, with expectations of future grants.
- **Long-Term Vision:** A ten-year plan for sustained impact on forest health and fire resilience.

## Funding Opportunities

This section provides information on relevant funding opportunities to support the implementation of priority treatment strategies identified in the WRP, including California Climate Investments (CCI) CAL FIRE Wildfire Prevention and Forest Health grant programs, Coastal Conservancy, and Proposition 4.

### CAL FIRE Grants

CAL FIRE presents opportunities to provide CCI grant funding for vegetation management projects, including FHGs and Wildfire Prevention Grants (WPG). Collaboration with adjacent landowners and entities is recommended to support grant management and increase grant application scoring. Of note, several grant guidelines include the opportunity to purchase equipment capable of vegetation modification up to specified dollar amounts.

#### Forest Health Grant (FHG)

The FHG program<sup>29</sup> funds projects that focus on implementing resilient and sustainable forest treatments. The primary goal of the FHG program is to implement projects that seek to restore forest health, promote carbon storage, reduce greenhouse gas emissions, minimize the loss of forest carbon to wildfire, and reintroduce prescribed fire into forests and woodlands to promote wildfire resilience. However, the program identifies the dual benefit of implementing forest health projects that also work to manage and reduce fuels.

A grant application must consist of a minimum of 800 acres of landscape-scale forestland treatments that do not need to be contiguous. Although a FHG can fund portions of environmental compliance documentation, grant applications are stronger for projects that are shovel-ready, or have all documentation completed.

#### Wildfire Prevention Grant (WPG)

The WPG program<sup>30</sup> funds projects that are located in or near fire threatened communities to implement hazardous fuels reduction projects and conduct wildfire prevention planning and education, while reducing greenhouse gas emissions. The primary goal of this program is to support projects that reduce the risk of wildfire and reduce wildfire potential in areas within or adjacent to forests.

Grant applications are reviewed with significant consideration of wildfire risk reduction to the greatest number of habitable structures, State Responsibility Area, and peoples. However, there is not a minimum acreage needed to submit a WPG grant application.

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<sup>29</sup> Information about the [Forest Health Grant Program](#) is available online.

<sup>30</sup> Information about the [Wildfire Prevention Grant Program](#) is available online.



## Coastal Conservancy Grants

Climate Ready or Wildfire Resilience grants<sup>31</sup> may be issued by the California State Coastal Conservancy for projects that restore and protect the California coast and enhance resilience to climate change. The primary goal of Coastal Conservancy grants is to increase public access to coastal lands and beaches, protect and restore natural lands and habitats, preserve working lands, and increase community resilience to climate change. Coastal Conservancy grants can fund various stages of a project, including planning and design, environmental documentation, implementation, and monitoring. The State Coastal Conservancy Strategic Plan outlines various goals and objectives that are considered during application review; some of the applicable objectives include, prioritizing equity, protecting and restoring the coast, and promoting climate readiness. Coastal Conservancy funds are currently in the works with COSC and consulting partners to support the preparation of CEQA documentation (i.e., Cal VTP PSA) for all of COSC lands.

## Proposition 4

Proposition 4 was approved in November 2024, allocating \$10 billion in state bond funding for climate adaptation, and \$1.5 billion specifically for wildfire prevention and forest resilience. These investments aim to advance programs that prevent catastrophic wildfire, improve forest health, and protect communities, ultimately contributing to the state's goals of accelerating the pace and scale of wildfire resiliency treatments. The funding will support agencies in implementing projects focused on forest management, fuel reduction, capacity-building, workforce development, and community resilience. Funds are distributed across multiple state agencies and programs, such as the Office of Emergency Services, Department of Conservation, CAL FIRE, and the Coastal Conservancy.

## Cost Offset Projects

Cost offset projects are not identified in the priority treatments, however, other COSC projects or additional phases of treatments that build off the WRP treatments, could present opportunities to produce funds for additional wildfire resilience and ecological treatments on COSC lands. Most wildfire resilience treatments within this plan will generate a level of vegetation biomass and woody debris that will require management, processing, or removal. In some cases, it may be feasible to offset the costs of a project by trading some materials for additional ecologically restorative treatments, while other options include chipping and spreading material on site, disposal at a green waste facility, and limited log dispersal on the landscape.

Opportunities considered in this WRP recognize the value for material such as chips, second growth redwood, and Douglas-fir, etc. in conjunction with the costs associated in performing the proposed restorative treatments. For certain restorative practices proposed in this WRP, an opportunity may be present for COSC to offset a portion of project costs from utilization of this material, while accomplishing the goals and objectives outlined within the WRP. Any potential for value in biomass that is removed from the site as a byproduct of projects that restore ecological function will be reinvested into restoration treatments, such as by expanding treatment footprints or supporting additional restoration efforts within the COSC lands. Such a practice could be supported by a working forest model, which is managed for sustainable production in perpetuity while achieving site-specific ecological and wildfire resilience goals. More information on the targeted approach for forest management practices for these projects is detailed within this WRP; however, COSC would only be considering cost offset for the purpose of achieving the wildfire resilience benefits.

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<sup>31</sup> Information about the [Coastal Conservancy Grant Programs](#) is available online.

## Section VIII: Background

Modern anthropogenic influences, disturbance events, and shifting climatic trends appear to be accelerating vegetation type transitions and the loss of valuable vegetated habitat for sensitive species; these landscape-level effects of altered historic fire regimes, subsequent intensive land uses, and trajectory of climatic trends have demonstrated the need for strategic vegetation management and infrastructure protection on COSC lands.

The CZU Fire swept through over 86,000 acres of forest and vegetated lands in the Santa Cruz Mountains, claiming nearly 1,500 homes and structures in its path (CAL FIRE San Mateo-Santa Cruz Unit, n.d.). According to GIS analysis, the CZU Fire footprint appears nearly a quarter-mile from a Water Department Site with additional recommendations and appears to have burned at lower severity on COSC lands near Ice Cream Grade; the CZU Fire was also in close proximity, less than 1 mile, to other extensive Water Department resources and water supply infrastructure such as the Felton Diversion and Newell Creek watershed. This wildfire event, among various others in recent California history, shed light on the importance of preparing vegetated ecosystems, especially those in the WUI, and critical infrastructure and assets to have increased resilience to unprecedented wildfire. For the COSC, such a wildfire event would impact the approximately 100,000 people that inhabit COSC, or that rely on COSC's water supply.

Preparation and implementation of a WRP is necessary to establish a roadmap of prioritized actions to minimize wildfire risk and to achieve greater wildfire resilience in COSC parks and around critical infrastructure and assets. Thus, a long-term, amendable WRP was developed to outline vegetation management actions that address restoring wildfire resilience in the WUI and protecting critical infrastructure and assets, and to house applicable information to support permitting is essential to stewarding this landscape now and in the future.

## Setting

The following sections provide an overview of the environmental and management context that led to the development of the WRP. These sections highlight key characteristics of COSC-managed lands and infrastructure, including vegetation communities, wildlife habitats, climate influences, fire history—such as the CZU Fire—and regional strategies for wildfire response and resilience. These site-specific conditions underscore the need for proactive, landscape-scale management to reduce wildfire risk, protect critical assets, and support long-term ecological and community resilience.

### Plan Area

The COSC manages a variety of open space lands, parks, and infrastructure essential to city operations, distributed across different parts of Santa Cruz County. Much of the open space maintained by COSC and the Parks and Recreation Department within City limits is located within the WUI, directly adjacent to residential and commercial development. Larger open space properties such as DeLaveaga (517 acres), Harvey West Park (44 acres), Moore Creek (250 acres), Pogonip (616 acres), and the City Resource Recovery Facility (City Landfill; 95 acres) are located on the outskirts of the urban core of Santa Cruz. These areas are generally situated where the coastal marine terraces transition into the more rugged terrain of the Santa Cruz Mountains, creating diverse and complex topographic landscapes. Other open spaces — such as Neary Lagoon (37 acres), Arana Gulch (67 acres), Jesse Street Marsh (3 acres), and Arroyo Seco (34 acres) — are embedded within or surrounded by residential development, offering important ecological and recreational functions within the urban matrix.

In addition to open space lands, COSC maintains critical water infrastructure located in the nearby Santa Cruz Mountains, in unincorporated Santa Cruz County, and within the urban areas of the City. These facilities are often positioned along watercourses to allow for efficient water collection, storage, and conveyance. Watersheds that these facilities are located on include Majors Creek, Laguna Creek, Liddell Creek, Cave Gulch, the San Lorenzo River, Arana Gulch, and Branciforte Creek. Additionally, many of the Water Department sites, including pump stations, tank sites, and the City's Graham Hill Water Treatment Plant, are located within urban and/or WUI areas of Santa Cruz, often directly adjacent to residential or commercial development. Infrastructure across the Water Department service area is divided into distinct pressure zones, with the Gravity Zone as the largest and most critical zone (City of Santa Cruz Water Department, 2023). In addition to these facilities, the City also maintains nearly 4,000 acres of drinking source watershed lands, encompassing Loch Lomond and the Newell Creek, Zayante Creek, and Laguna Creek watershed lands. The Loch Lomond Recreation Area and watershed lands provide recreational opportunities to the public in addition to providing drinking water source, while the Newell Creek, Zayante Creek, and Laguna Creek watershed lands are solely for drinking water source (City of Santa Cruz Water Department; Ebbin Moser + Skaggs LLP; Hagar Environmental; Gary Fiske and Associates; Balance Hydrologics, Inc.; Alnus Ecological, 2023).

## Vegetation Communities

Vegetation is identified across the COSC landscape at the alliance level using the 2020 Fine-Scale Map data for Santa Cruz and Santa Clara counties. This data is defined by the Vegetation Classification and Mapping Program, which provides a statewide standard for vegetation classification as described in the Manual of California Vegetation<sup>32</sup>. Fine-scale vegetation data was developed by Tukman Geospatial through a process that involved remote sensing, survey data collection, vegetation classification scheme development, lifeform mapping, calibration field work, machine learning, field validation and manual editing, expert review, accuracy assessment, and data dissemination as described in the Santa Cruz and Santa Clara Fine Scale Vegetation Map – Final Report (Tukman Geospatial & Aerial Information Systems, 2023).

The regional classification defines vegetation at the two finest levels, alliance and association. The alliance is defined by plant species composition, habitat conditions, physiognomy, and diagnostic species. Typically, at least one of the diagnostic species is found in the uppermost vegetation stratum (i.e., vegetation of varying stature). The association is the most detailed classification level and displays finer-level differences in species composition, topography, soils, substrate, climate, hydrology, and disturbance regime. Associations often recognize two or more diagnostic species found in different vegetation strata (Sikes et al., 2023). Map A13 in *Appendix A: Maps* displays fine-scale vegetation across the COSC open space properties.

### Conifer

Forested areas across COSC are composed of the redwood (*Sequoia Sempervirens*) alliance with remaining areas of Douglas-fir-tanoak (*Pseudotsuga menziesii*-*Notholithocarpus densiflorus*/*Vaccinium ovatum*) association, Monterey Cypress alliance (*Hesperocyparis macrocarpa*), Monterey Pine alliance (*Pinus radiata*), Ponderosa Pine alliance (*Pinus ponderosa*). Redwood forests in the area were clear-cut during the late 19th to early 20th centuries and therefore entirely consist of second-growth trees. Seedling stands of redwood have become established in more-mesic sites of historic woodlands and shrublands over the last 100 years due to lack of disturbance. The understories of redwood and Douglas-fir forests are typically sparse with only shade-tolerant shrubs or herbs below the canopies such as hazelnut (*Corylus cornuta*), tanoak (*Notholithocarpus densiflorus*), redwood sorrel (*Oxalis oregana*), and various types of ferns (*Polypodiopsida spp.*). Properties that these conifer alliances can be found on are Moore Creek, Pogonip, DeLaveaga, and a small portion of the City Landfill.

### Hardwood

Woodlands are common across COSC properties and are dominated by hardwoods that vary in composition including coast live oak alliance (*Quercus agrifolia*), interior live oak and Santa Cruz Island oak alliance (*Quercus Wislizeni* – *Quercus Parvula*), and California bay-laurel. Hardwoods with dense canopies have lower amounts of understory species, while more open hardwood stands promote shrubs including honeysuckle (*Lonicera hispidula*), California coffee berry (*Frangula californica*), and toyon (*Heteromeles arbutifolia*). Hardwood ecosystems are present at Arana Gulch, Arroyo Seco, the City Landfill, Jesse Street Marsh, Moore Creek, Neary Lagoon, DeLaveaga, and Pogonip.

### Herbaceous

Herbaceous areas are widespread across COSC properties and are predominantly coastal prairie ecosystems, heavily influenced by the maritime fog. The mesic herbaceous locations are classified as the

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<sup>32</sup> The California Native Plant Society's Manual of California Vegetation can be referenced online at the following link: <https://vegetation.cnps.org/>.

Californian Annual & Perennial Grassland Macro group. These herbaceous ecosystems are present at Arana Gulch, Arroyo Seco, the Landfill, Jesse Street, Moore Creek, Neary Lagoon, DeLaveaga, and Pogonip.

### **Herbaceous Wetland**

Herbaceous wetlands across COSC properties are classified as Arid West Interior Freshwater Marsh Group and the Vancouverian Lowland Marsh, Wet Meadow & Shrubland Group. Properties that encompass hydraulic features such as watercourses, lagoons, springs or seeps allow for these communities to exist. These plant communities are found at Moore Creek, Neary Lagoon, Arana Gulch, and Jesse Street properties.

### **Riparian Forest**

Riparian Forests across COSC properties include big leaf maple – red alder alliance (*Acer macrophyllum* – *Alnus rubra*), box elder - pacific blackberry (*Acer negundo* - *Rubus ursinus*) Association, black cottonwood Alliance (*Populus Trichocarpa*), and Gooddings black willow – red willow (*Salix Gooddingii* – *Salix Laevigata*) Alliance. These ecosystems are found adjacent to watercourses, springs, seeps, lagoons, or other hydraulic features that provide water to these communities for a longer time into the dry season are found in Arana Gulch, Neary Lagoon, Pogonip, and DeLaveaga.

### **Shrubland**

Various shrub communities are present on COSC properties such as California sagebrush – coastal sage (*Artemisia californica* – *Salvia leucophylla*) Alliance, coyote brush (*Baccharis pilularis* Alliance), salal – Pacific blackberry alliance (*Gaultheria shallon* – *Rubus (ursinus)*), salmonberry – California wax myrtle Alliance (*Rubus spectabilis* – *Morella californica*), black sage and California sagebrush Alliance (*Salvia mellifera* - *Artemisia californica*), poison oak – coyote brush Association (*Toxicodendron diversilobum* – *Baccharis pilularis*). Shrub communities thrive in areas that transition from forest to grasslands. Shrub communities are present in Arana Gulch, Arroyo Seco, the City Landfill, Moore Creek, Neary Lagoon, DeLaveaga, and Pogonip.

### **Riparian Shrub**

Across COSC properties, riparian shrub communities are found on the edges of water courses and wetland marshes. The primary plant community identified is the Arroyo willow alliance (*Salix Lasiolepis*). This plant community is found at Arana Gulch, Arroyo Seco, the City Landfill, Moore Creek, Neary Lagoon, DeLaveaga, and Pogonip.

### **Non-Native Forest, Shrub, and Herbaceous**

Across COSC properties non-native forest, shrub, and herbaceous species are commonly found along disturbed areas or slopes. These areas contain Australian blackwood, also known as acacia, Association Semi-Natural (*Acacia melanoxylon*), Scotch broom – French Broom Semi-Natural Alliance (*Cytisus scoparius* – *Genista monspessulana* – *Cotoneaster spp.*), Himalayan blackberry Association (*Rubus armeniacus* Semi-Natural). Non-native forest and shrub communities are located within Arana Gulch, Arroyo Seco, the City landfill, Jesse Street, Moore Creek, Neary Lagoon, DeLaveaga, and Pogonip. Additionally, there is one small area identified as non-native herbaceous within the property boundary at the Moore Creek Property.



## Threats to Ecosystems

Like other regions across California, significant vegetation type transitions have occurred over the past 100 years due to altered disturbance regimes and climatic changes. Invasive species have spread across the landscape, and in forested areas, tree decline and mortality is prevalent due to forest pathogens. Additionally, woody encroachment on grasslands, shrublands, and hardwoods has greatly contributed to vegetation type change in the Santa Cruz Mountains. Shrubs including coyote and Douglas-fir have encroached into grasslands, shrublands, and hardwood ecosystems due to lack of disturbance, decreasing species richness and increasing fuel connectivity, thereby increasing wildfire risk. The increased shade and cooler temperatures underneath Douglas-fir in encroached grasslands, shrublands, and hardwood stands restricts native species with a narrow range of shade tolerance, which significantly diminishes native flora (Livingston et al., 2016). These vegetation type changes have led to heightened wildfire risk in forested areas and decreased biodiversity and species richness in woodlands and grasslands.

### **Woodlands & Shrublands**

Across the COSC properties, characteristic species of hardwood forests and shrublands are being replaced by more shade tolerant species because of encroaching Douglas-fir. For thousands of years these ecosystems developed with the indigenous use of fire, which contributed to a much more open environment. After subsequent intensive logging and land clearing during the industrial period, the land has been left to ecological succession without disturbance for the last 100 years.

In earlier successional stages of conifer encroachment, woodlands have large, legacy hardwoods such as live oak (*Quercus* spp.) and Pacific madrone growing above small conifers and declining manzanita in the understory. In areas of later succession, mid-diameter conifers grow up through the canopies of legacy hardwoods and completely shade out understory shrubs. In many areas with mid-diameter<sup>33</sup> Douglas-fir, ecosystems show evidence of later stages of succession, where dead manzanita burls and skeletons are present in the understory. With competition from co-dominant Douglas-fir trees, oak and madrone trees in woodlands throughout the region are more prone to various fungal diseases such as Sudden Oak. Tree mortality from Sudden Oak Death leads to higher amounts of dead and downed woody debris in the understory, creating higher fuel connectivity. These disturbance-excluded ecosystems were once adapted to a more frequent, low-intensity fire regime but are now associated with greater susceptibility to stand replacing fire due to higher fuel connectivity. Overall lack of disturbance has contributed to vegetation type changes in shrublands and woodlands across the region, leading to lower species richness and heightened wildfire risk.

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<sup>33</sup> Mid-diameters generally include trees between 12-24 in. DBH.

## Grasslands

COSC's coastal prairies are threatened through the encroachment of shrublands and Douglas-fir forests resulting in type conversion. Figure 23 below displays aerial imagery of Pogonip, illustrating how conifers have encroached into historic grassland and coastal prairie areas across the property over an 81-year period between 1941 and 2022. This encroachment is of particular concern in the Main Meadow and along Spring Trail, as indicated by portions of the lower property delineated in blue (Figure 23). Figure 24 illustrates the difference in size of the grasslands at the former Cowell Ranch currently UCSC, with a Water Department site, between 1940 and 2022. Historically, these grasslands were much larger developing as a result of regular disturbance from large ungulate grazers in combination with indigenous burning practices. In the 1940's photo, grasslands were a spotted mosaic throughout the forested landscape. Fast forward to recent years, the small pockets of grassland have been encroached upon changing the entire plant community resulting in forests. The results of this type conversion not only have an effect on the loss of biodiversity through the expression of grassland species, it also reduces the habitat that grassland fauna rely on.

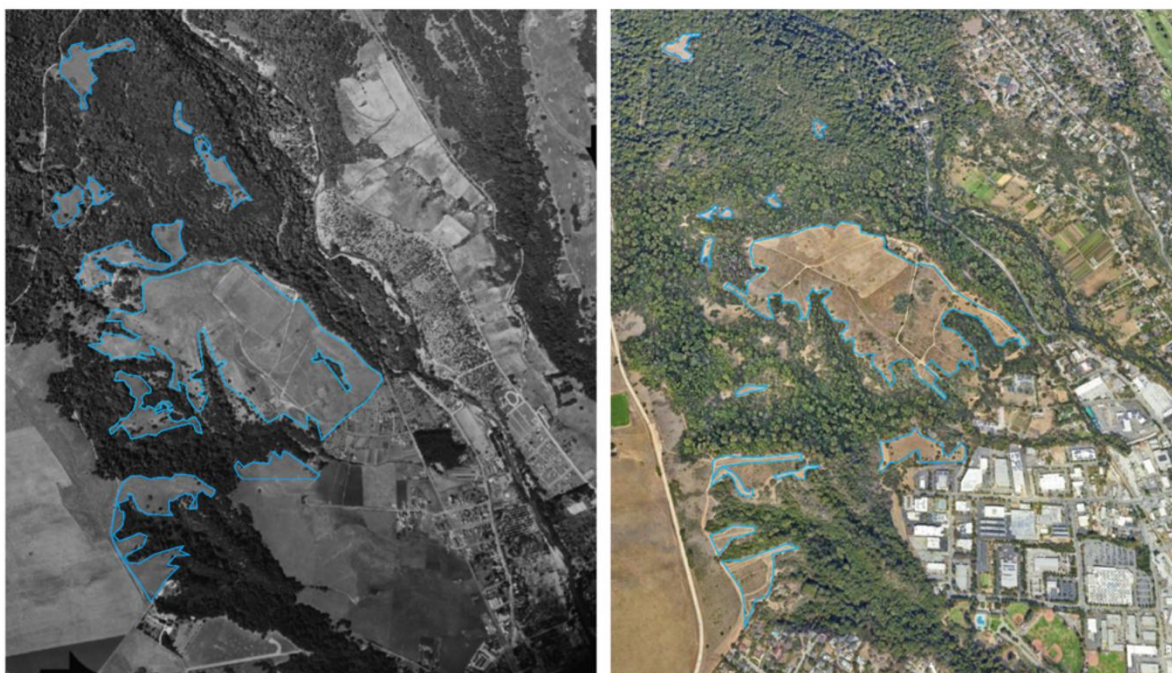


Figure 23. Pogonip, Grassland Complex in 1940 (Left) and 2022 (right) delineated in blue.

Notably, the COSC's Moore Creek and Pogonip properties have multiple areas of sensitive coastal prairie habitat that have been identified as sensitive to these stressors and are considered priorities for management and protection. To overcome the persistence of invasive species and woody encroachment, disturbance regimes that replicate the disturbance regime these grassland systems evolved with must be reestablished, and native seed planting must continue in grassland ecosystems. This may be accomplished with mowing, prescribed burning, and grazing to enhance wildlife habitat and biodiversity (Livingston et al., 2016). Overall, lack of disturbance has led to a decrease in native plant species diversity, wood and conifer encroachment, habitat loss for special-status species, and widespread establishment of invasive species, which have degraded grassland ecosystems across the COSC landscape. Strategic management can mitigate these effects while enhancing overall ecosystem function.



Figure 24. UCSC's Cowell Ranch Reservoir and Water Department site in 1930s (Left) and 2024 (Right).

## Wildlife

The COSC lands, and particularly Parks and Recreation Department open space properties, host a wide array of wildlife from mammals, reptiles, amphibians, birds and invertebrates. Larger open space forested properties support various wildlife including mammals, reptiles, amphibians, and birds. Open shrublands and grasslands support rodents, rabbits, and insects, which in turn are preyed upon by raptors, bats, and mesopredators such as foxes, bobcats, and coyotes. Many of the larger open space properties that contain grassland communities also supports populations of black-tailed deer (*Odocoileus hemionus*), which are preyed upon by mountain lions (*Puma concolor*), the apex predators of the ecosystem.

Other special-status species that have been identified on or near by these properties, or contain suitable habitat include the Mount Hermon June beetle, federally endangered Zayante band-winged grasshopper (*Trimerotropis infantilis*), Ohlone Tiger Beetle, federally threatened Steelhead (*Oncorhynchus mykiss irideus* pop.8), federally endangered tidewater goby, federally endangered and a CDFW species of special concern California red-legged frog, and CDFW species of special concern western pond turtle (Ecological Concerns Inc., 2014). Impact analyses, avoidance measures, and/or mitigation measures will be evaluated for special-status species at the time of CEQA compliance.

## Climate

Climatic trends influence ecosystem conditions, subsequently impacting ecosystem resilience to climate-related events such as extended drought, severe wildfire, pests and disease, and heavy rain and high winds. Climate is directly influenced by the amount of carbon dioxide in the atmosphere. In the carbon cycle, carbon is removed from the atmosphere when it is utilized by plants and living organisms or stored in soils, the ocean, and fossil fuels. In return, carbon is released back into the atmosphere as part of various processes, such as plant respiration, decomposition of living organisms, and wildfire or burning fossil fuels, ultimately fostering a cyclical loop (Riebeek, 2011). Understanding current and future climate trends creates opportunities to apply adaptive management and promote changes in ecosystem structure that are more

resilient to anticipated climate-related events. Changing climatic patterns, as driven by greenhouse gas emissions among various other drivers, are expected to impact and exacerbate wildfire severity.

### ***Temperature***

The Santa Cruz region can be broadly characterized by the cool to warm, dry summers and cool, wet winters that define the Mediterranean climate (Britannica, 2024). The moderating effect of the Pacific Ocean generally promotes mild temperatures year-round in the Santa Cruz area. The City has a mean annual temperature of approximately 68.9°F (California Energy Commission, 2020). Summer conditions in Santa Cruz generally occur throughout the months of June, July, August, and September, whereas the winter season is most generally characterized by the months of November, December, January, February, and March. Summer high temperatures reach approximately 74.9°F on average and winter high temperatures are approximately 62.2°F, with an average low temperature of 40.2°F (Western Regional Climate Center, 2016). Daily highs and lows vary greatly throughout the year, where summer high temperatures reach 90°F or greater and winter low temperatures may reach close to freezing in the evenings and early mornings (Weather Underground, n.d.).

### ***Precipitation***

Rainfall in the Santa Cruz region is most common between November and March, generally with the most rainfall occurring in January and February. The average annual rainfall for Santa Cruz is approximately 29.33 in., with a high degree of variability between seasons (Western Regional Climate Center, 2016).

The Santa Cruz region has experienced reoccurring drought conditions, often followed by periods of high precipitation that trace back to the early 19<sup>th</sup> century (NOAA, 2024). The highest average annual rainfall in Santa Cruz occurred in 1983, with precipitation amounts reaching approximately 59.76 inches and accounting for a notable storm year that resulted in significant damage to developments and coastline (Griggs & Johnson, 1983). In more recent years, portions of the Santa Cruz Mountains experienced heavy winter conditions during the 2022-2023 and 2023-2024 winter seasons, including high precipitation and flooding, high surf, strong winds, and in February 2023 some locations above 1,000 feet elevation experienced heavy snowfall (NOAA, 2024).

During the dry season, the Pacific Ocean provides a marine fog layer that accompanies the warm summer days as it settles in the topographical depressions and drainages. The marine layer moisture collects on coastal redwoods and is released to the ground as fog drip, producing a unique characteristic of the redwood forest ecosystems on the Central California Coast (Ewing et al., 2009).

### ***Climatic Shifts***

Climatic shifts directly influence the suitability of ecosystems to support certain habitat types and influence biotic migration to more suitable habitats and climates, a process that has occurred consistently over geologic time. Paleoclimate records suggest evidence of such patterns, including a cooling episode, termed the Little Ice Age, that occurred between 1300-1850 CE due to decreases in solar radiation, increased volcanism, and varying atmospheric circulation (Smith College, n.d.). Modern climate change patterns of the 21<sup>st</sup> century generally trend towards hotter, drier conditions and altered precipitation patterns. Temperatures in California have risen almost 3°F since the beginning of the 20th century (Figure 25), and the six warmest years on record have all occurred since 2014 (2014, 2015, 2016, 2017, 2018, and 2020). Considering greenhouse gas emission trends under a higher emissions pathway, historically unprecedented warming of over 12°F is projected during this century. Even under a lower emissions pathway, annual average temperatures are projected to most likely exceed historical record levels by the middle of the century (Figure 25) (Frankson et al., 2022).



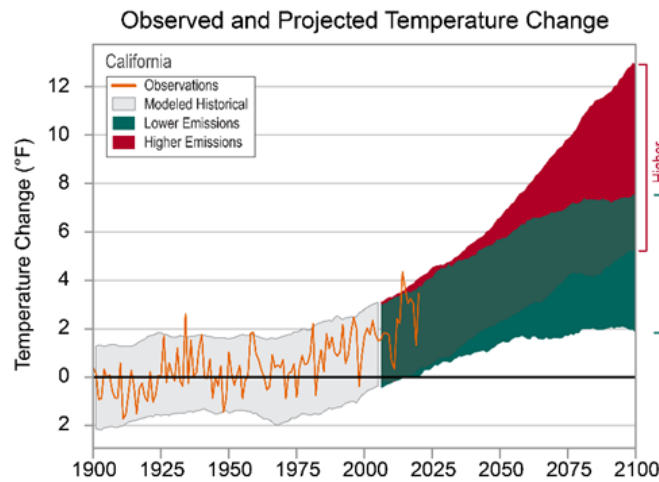


Figure 25. Observed and project temperature changes in California.

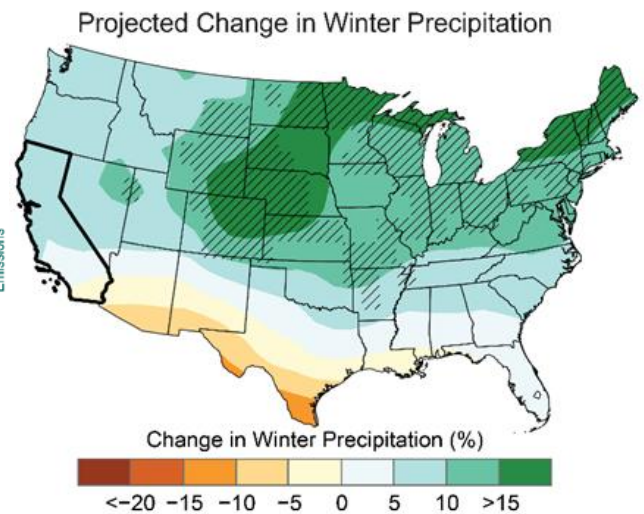


Figure 26. Projected changes in winter precipitation across the U.S.

Precipitation patterns are also expected to be altered by current warming trends; increased precipitation is projected in the Central Coast region of California (Figure 26). Even if precipitation increases in the future, rising temperatures will likely increase the rate of soil moisture loss during dry spells, further reducing streamflow and water supplies (Frankson et al., 2022). The observed and projected trend toward warmer and drier seasons suggests that climate change will contribute to increased fire severity in future decades where fuels remain abundant.

The coastal redwoods of the Santa Cruz region are reliant on cool, wet environments with coastal fog. Increases in surface temperatures may also reduce relative humidity and coastal fog development and foster drought-like conditions that influence the footprint of coastal redwoods to recede and retract to cooler, moister locations such as drainages and north and northwest facing slopes (Johnstone & Dawson, 2010). Consequently, vegetation communities are left more prone to vegetation type changes amidst drought conditions and threat of higher severity wildfires (Parks & Abatzoglou, 2020).



## Fire History & CZU Fire Insights

### *Regional Fire History*

Regional fire history has been limited but has resulted in significant loss to the community in residents and natural resources. In 2020, there were two fires in the area, the Coast Fire and the CZU Fire (CAL FIRE, n.d.). While the Coast Fire was a small arson start, held at 20.21 acres, burned just north of Highway One. This fire was isolated west of Moore Creek property and east of Wilder Ranch State Park. The CZU fire was a much different fire which was started by lightening activity but driven by high winds, low humidity and low fuel moistures. The fire burned across 86,553 acres, of which 7,783 had burned in 2009 in the Lockheed Fire, destroying 1,430 structures throughout Santa Cruz and San Mateo Counties in the Santa Cruz Mountains (The County of Santa Cruz, 2022). Forested ecosystems experienced a range of fire severities, resulting in beneficial disturbance in some areas, such as reduced understory and ladder fuels, reduced competition for resources, increased biodiversity, consumption of dead, dying, and diseased trees and vegetation, or increased nutrient cycling; whereas other areas resulted in impaired post-fire conditions that will take decades to recover from, such as loss of valuable wildlife habitat or stand replacing mortality.

### *Post-CZU Fire Insights*

These recent wildfire events in the region have highlighted the vulnerability of forested landscapes and critical infrastructure to high-severity fire, especially in areas with dense, homogenous vegetation. In response to the CZU fire, ARC conducted regional post-fire monitoring efforts, which included establishing and analyzing data from 264 forest trend plots (FTP) across Big Basin State Park, Ano Nuevo State Park and Butano State Park. The key findings are as follows:

- Fewer trees per acre (TPA) and larger diameter trees suggest increased tree resilience to wildfire.
- High TPA in smaller diameter trees (less than or equal to 12 in.) suggest increased susceptibility to tree mortality, including tree mortality in a component of larger diameter trees.
- Higher severity burns experience increased tree mortality across all forest types and all diameters. These areas, among other burn severities, include a significant regenerative basal sprouting response from coastal coppice sprouting species.

### *Implications for COSC Wildfire Resiliency*

Resiliency in this refers to the ability of forest systems and adjacent communities to absorb and adapt to wildfire disturbances while maintaining essential functions. These regional monitoring efforts shed light on the characteristics that contribute to post-fire resilience – such as lower tree densities, greater structural diversity, and dominance of larger-diameter trees. These traits not only improve a stand’s ability to survive fire, but also enhance its recovery afterward. Although data informing these insights were collected outside COSC lands, the forest types and stand conditions are ecologically similar. As such, these findings highlight a meaningful opportunity: through proactive, thoughtful vegetation management, COSC can foster healthier, more resilient landscapes that are better prepared to withstand wildfire and continue providing ecosystem and community benefits well into the future. Vegetation management practices —such as those proposed in the WRP including strategic thinning, removal of ladder fuels, and promotion of fire-adapted species—can improve stand structure, reduce the risk of high-intensity fire, and support more robust regeneration. These treatments are also critical in protecting critical infrastructure, emergency access routes, and other assets from future wildfire impacts.

## Regional Fire Response

### ***Regional Interagency Coordination & Responsibilities***

All of the Parks and Recreation Department open space properties occur within the Local Responsibility Area (LRA) of Santa Cruz County, while some of the Water Department infrastructure sites farther from town lie within a patchwork of LRA, SRA, and the edges of Federal Responsibility Area (FRA). Wildfire response efforts in these zones involve coordination among Santa Cruz County Fire, CAL FIRE, and federal agencies, depending on the jurisdiction. Across COSC, five areas are designated as WUI zones, with three areas designated as mutual threat or mutual response zones. These zones represent areas where wildfire threatens property in multiple jurisdictions, and as such, multiple jurisdictions or entities share responsibility for wildfire response and protections. In the context of Santa Cruz and the WRP, this includes areas where fire poses a threat to property within both the Santa Cruz fire protection district, in addition to property protected by another fire protection agency (City of Santa Cruz, 2018). The *COSC Local Hazard Mitigation Plan* outlines non-SRA areas – such as DeLaveaga, Pogonip, and Arroyo Seco – as mutual threat zones, due to their proximity to SRA lands and the presence of both urban development and dense vegetation within their canyon areas (City of Santa Cruz, 2018).

COSC, Santa Cruz County, UCSC, and the State of California are collectively part of a mutual aid and emergency coordination system, representing a key component of interagency coordination across the region. This system enables coordination across multiple agencies, departments, and districts to share and consolidate resources to better respond to emergencies (City of Santa Cruz, 2018). The Santa Cruz County CWPP and regional Fire Safe Councils also play a key role in cross-agency planning, fuel reduction, and public safety preparedness. These collaborative frameworks form the backbone of an integrated approach to wildfire response and landscape resiliency.

## Conclusion

Landscapes across the Santa Cruz Mountains have been shaped by a complex legacy of historic fire, land use, and on-going climate change – factors that have led to increased forest density, shifts in vegetation, and heightened wildfire risk. These conditions, further underscored by the impacts of the 2020 CZU Fire, emphasize the urgent need for coordinated actions that reduce wildfire risk and safeguard ecosystems, communities, and infrastructure. COSC plays a key role in this effort through the management of open space lands and critical infrastructure assets throughout Santa Cruz that serve communities in the region.

The WRP serves as a roadmap to support and guide the implementation of prioritized and strategic vegetation management and wildfire risk reduction strategies on COSC lands. Key outcomes of the WRP include the identification of **107.6 acres** of treatments across **Priority 1-4** COSC sites, and several additional priority recommendations for COSC lands. The WRP also outlines essential information to support COSC in implementing WRP treatments, such as cost estimates, funding opportunities, environmental compliance, and regional collaborations.

To date, the outcomes of the WRP have facilitated several key actions, such as involvement in regional collaborations, and pursuit of permitting coverage and funding to support implementation. Notably, **Priority 1-4** treatments have been submitted to the RPP, a regional prioritization process, while \$250,000 has been awarded for forest health and fuel reduction treatments within **Priority 3** (Pogonip Priority Treatment Zone 1) through the RCDSCC's 2024-2025 FHG. The COSC has also taken action on permitting coverage for priority treatments, including a permit under Governor Newsom's Executive Order N-25-25 for **Priority 1** (DeLaveaga Priority Treatment Zone 1, EOC/Netcom). Additionally, COSC is actively pursuing the development of a CalVTP PSA for all of COSC lands, with potential funding from the Coastal Conservancy.

Immediate action should focus on the implementation of **Priority 1-5** treatments within 1-2 years, which include landscape-scale, defensible space, and access treatments at DeLaveaga (EOC/Netcom), Water Department Sites #1-6, Pogonip, Water Department Site #7, and critical COSC roads. Additional WRP recommendations and Priority Treatment Zone treatments should be initiated within 3-4 years or as funding is available.

Current estimated costs per acre solely for on-the-ground treatment implementation for initial treatments are anywhere from \$3,000 to \$10,000 per acre depending on initial treatment activities. **Priority 1-4** COSC treatments identified in the WRP may cost approximately **\$1,000,000** and do not consider estimated costs for mitigation implementation, project administration, future maintenance costs, or COSC critical road treatments (**Priority 5**). Budgeting for future treatment implementation and maintenance through a COSC wildfire resilience budget is imperative. Maintenance treatments are expected to be significantly cheaper following initial treatments and should occur between generally 2-10 years depending on conditions.

It is long term endeavor to foster resiliency across COSC lands, requiring dedication, budget, and a focused and strategic effort to conduct both initial treatments and maintenance. The WRP sets the stage for both near-term actions and the continued development of innovative approaches necessary to ensure wildfire resilient communities, ecosystems, and infrastructure across Santa Cruz now and in the years to come.

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# Appendix A: Maps

## List of Maps

**Map 1** – Priority COSC Treatment Sites

**Map 2** – DeLaveaga, Priority Treatments (Priority Treatment Zone 1)

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**Map A6** – Water Department Site #5, 2020 Fine-Scale Vegetation Alliances

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**Map A11** – Moore Creek, 2020 Fine-Scale Vegetation Alliances

**Map A12** – Arroyo Seco, 2020 Fine-Scale Vegetation Alliances

**Map A13** – COSC Open Space Properties, 2020 Fine-Scale Vegetation Alliances

# COSC Wildfire Resiliency Plan (WRP)

## Priority Treatment Sites

Water  
Department  
Site



Water  
Department  
Site

Water  
Department  
Site

Water  
Department  
Site

Pogonip  
Open Space  
Preserve

Water  
Department  
Site

Water Department  
Site

DeLaveaga Park  
Emergency Operations Center (Netcom)

Water  
Department  
Site

### Legend



Priority 1



Priority 2



Priority 3



Priority 4

0 0.5 1 Miles

Scale 1:58,000



Map 1



LJ 8/21/25

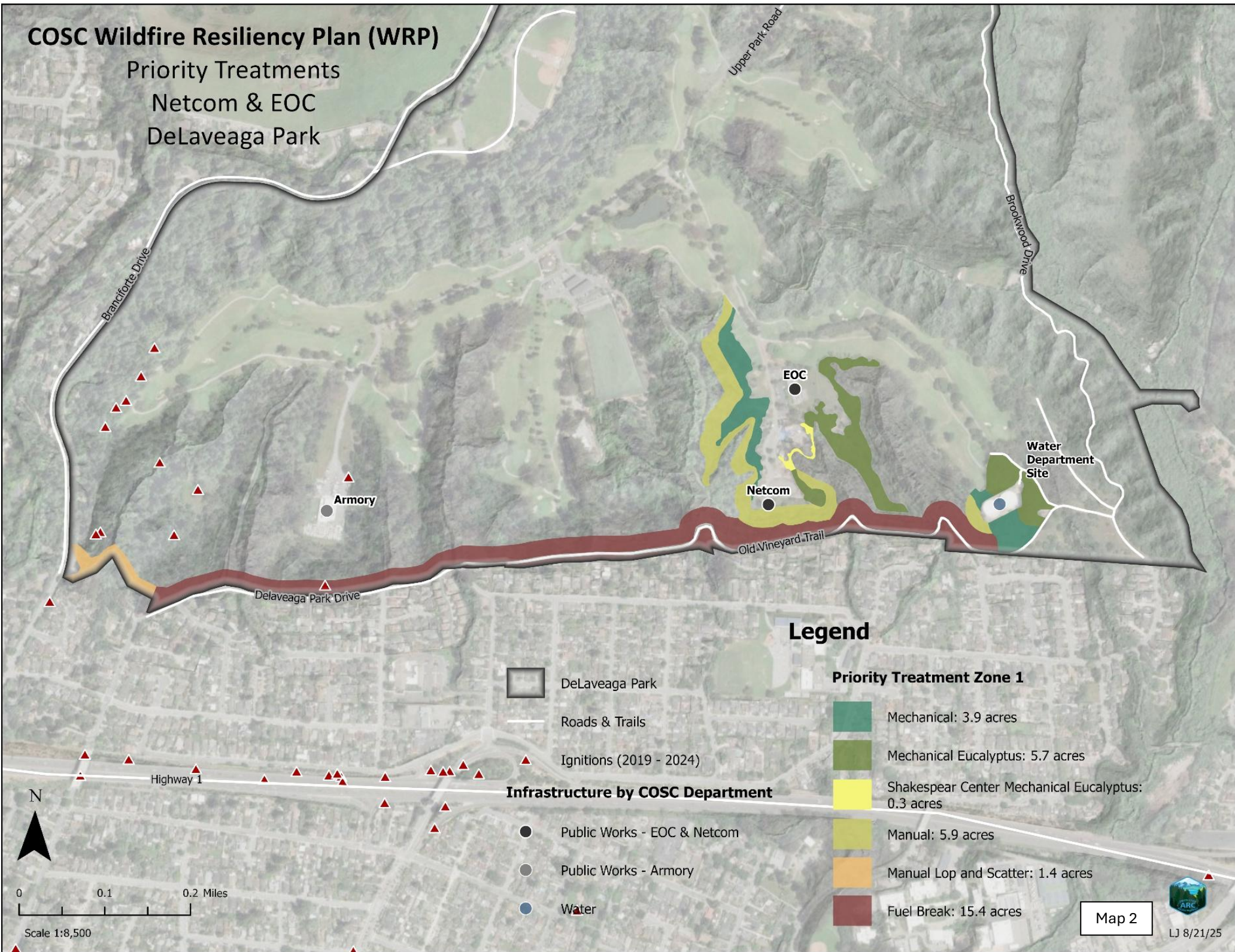


# COSC Wildfire Resiliency Plan (WRP)

## Priority Treatments

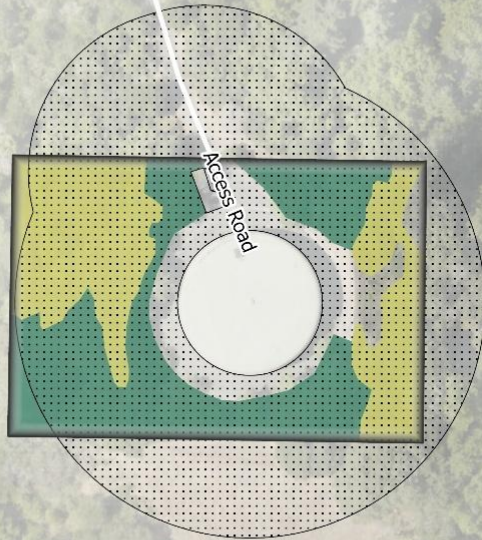
Netcom & EOC

DeLaveaga Park





# **COSC Wildfire Resiliency Plan (WRP)** **Priority Treatments** **Water Department Sites #1-3**



**Water Department Site #1**

- COSC Property
- Access Road
- Defensible Space (100 ft. Structure Buffer): 1.5 acres

## **Priority Treatment Zone**

- Manual: 0.5 acres
- Mechanical: 0.4 acres

0 75 150 US Feet  
 Scale 1:1,300



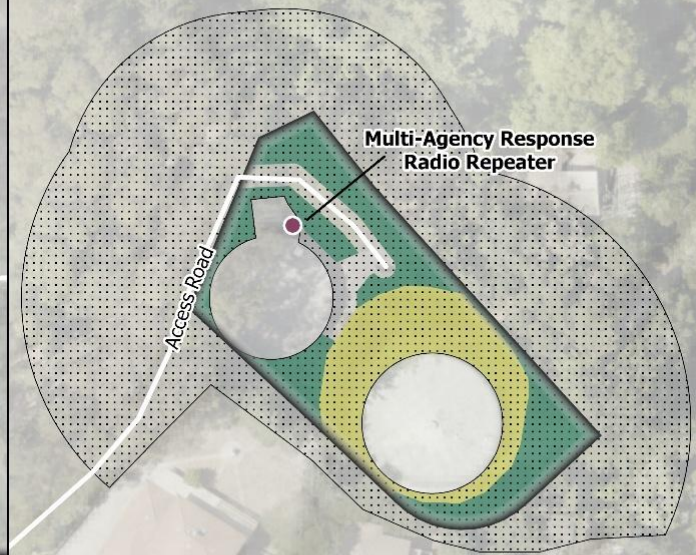
**Water Department Site #2**

- COSC Property
- Access Road
- Defensible Space (100 ft. Structure Buffer): 2.1 acres

## **Priority Treatment Zone 1**

- Mechanized: 3.9 acres
- Manual: 5.9 acres
- Fuel Break: 15.4 acres
- Mechanical Eucalyptus: 5.7 acres

0 75 150 US Feet  
 Scale 1:2,500



**Water Department Site #3**

- COSC Property
- Access Road
- Defensible Space (100 ft. Structure Buffer): 1.4 acres

## **Priority Treatment Zone**

- Mechanical: 0.2 acres
- Manual: 0.1 acres

0 75 150 US Feet  
 Scale 1:1,125



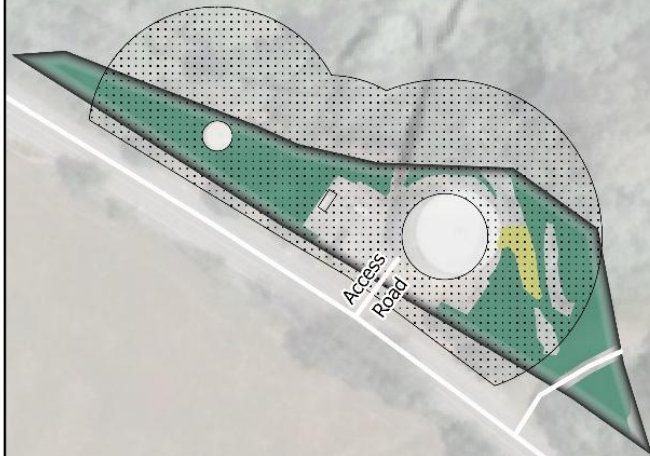
Map 3



LJ 8/6/25



# **COSC Wildfire Resiliency Plan (WRP)** **Priority Treatments** **Water Department Sites #4-6**

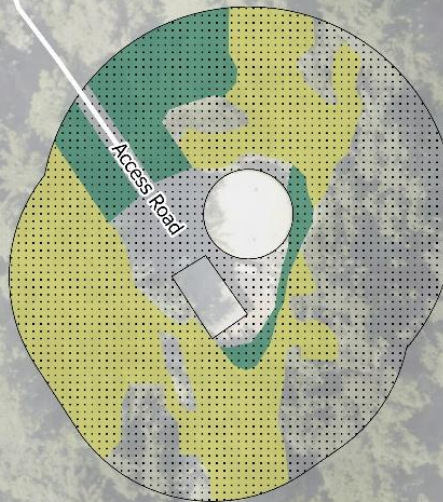
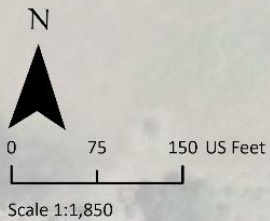


## **Water Department Site #4**

- COSC Property
- Access Road
- Defensible Space (100 ft. Structure Buffer): 1.7 acres

## **Priority Treatment Zone**

- Manual: 0.02 acres
- Mechanical: 0.7 acres

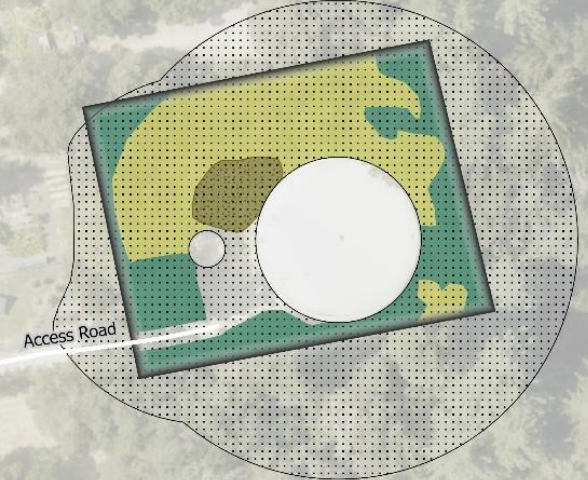
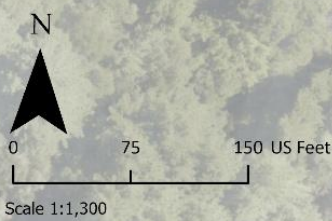


## **Water Department Site #5**

- Private Property
- Access Road
- Defensible Space (100 ft. Structure Buffer): 1.4 acres

## **Priority Treatment Zone**

- Mechanical: 0.2 acres
- Manual: 0.6 acres

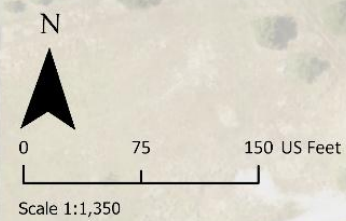


## **Water Department Site #6**

- COSC Property
- Access Road
- Wet Area (Approximate)
- Defensible Space (100 ft. Structure Buffer): 1.6 acres

## **Priority Treatment Zone**

- Manual: 0.3 acres
- Mechanical: 0.3 acres



Map 4








# COSC Wildfire Resiliency Plan (WRP)




## Priority Treatments

### Pogonip Open Space Preserve

#### Legend

-  Pogonip Open Space Preserve
-  Roads & Trails
-  Ignitions (2019 - 2024)

#### Priority Treatment Zone 1

-  Mechanical: 38.3 acres
-  Manual: 14.5 acres
-  Fuel Breaks: 13.6 acres



0 0.25 0.5 Miles

Scale 1:13,000

Rincon Trail

Coolidge Drive

Spring Trail

Brayshaw Trail

Prairie Trail

Pogonip Creek Trail

Golf Club Drive

Lower Meadow Trail

Highway 9



Map 5

LJ 4/23/25





# COSC Wildfire Resiliency Plan (WRP)

## Priority Treatments


### Water Department Site #7


#### Legend


 COSC Property


 Access Road


#### Infrastructure (Approximate)


 Pipeline

 Overhead PG&E Power Lines


 Block House

 Propane Tanks

 Solar Panel

 Spring

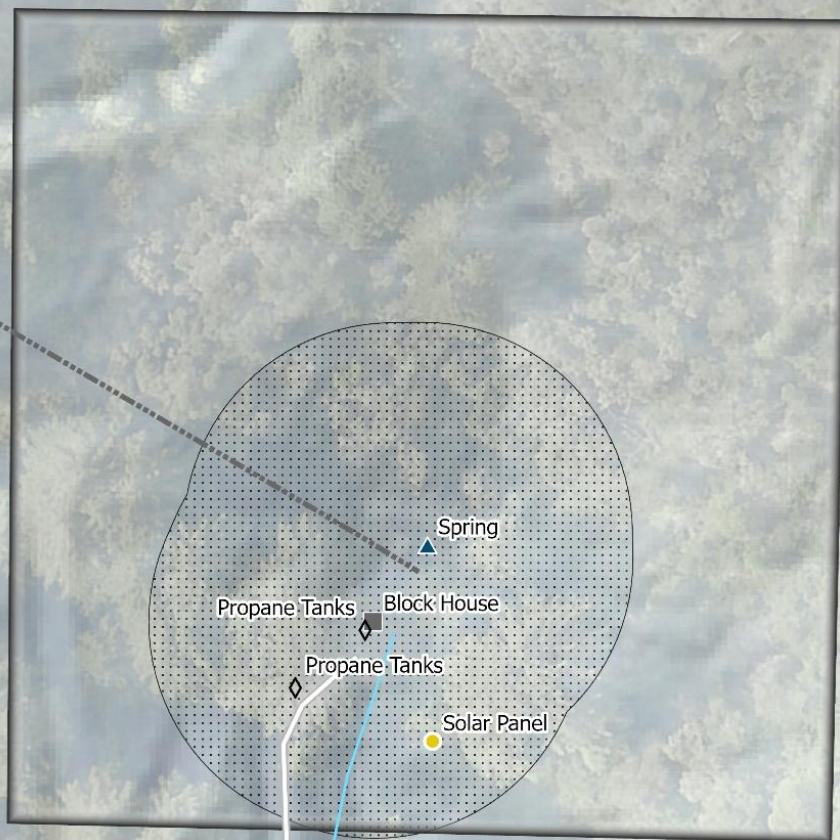
#### Priority Treatment Zone

 Defensible Space 100 ft. Structure Buffer: 1.0 acres



0 50 100 US Feet

Scale 1:1,100





COSC Wildfire Resiliency Program (WRP)

Critical Fire Roads

DeLaveaga Park

Pogonip Open Space Preserve

Legend

COSC Critical Roads

- Engine/Vehicle Access
- Limited/Inaccessible







# COSC Wildfire Resiliency Plan (WRP)



## Priority Treatments

### Water Department Site #8


#### Legend

-  Property Boundary
-  Roads

#### Infrastructure (Approximate)

-  Facilities
-  Pipeline

#### Priority Treatment Zone

-  Defensible Space (100 ft. Structure Buffer):  
1.1 acres



Scale 1:625

Map 8



LJ 8/13/25



## Legend

- DeLaveaga Park
- Roads & Trails
- Ignitions (2019 - 2024)

## Infrastructure by COSC Department

- Public Works - EOC & Netcom
- Public Works - Armory
- Water
- Defensible Space (100 ft. Structure Buffer)

## Priority Treatment Zone 1

- Mechanical: 3.9 acres
- Mechanical Eucalyptus: 5.7 acres
- Shakespear Center Mechanical Eucalyptus: 0.3 acres
- Manual: 5.9 acres
- Manual Lop and Scatter: 1.4 acres
- Fuel Break: 15.4 acres

## Priority Treatment Zone 2

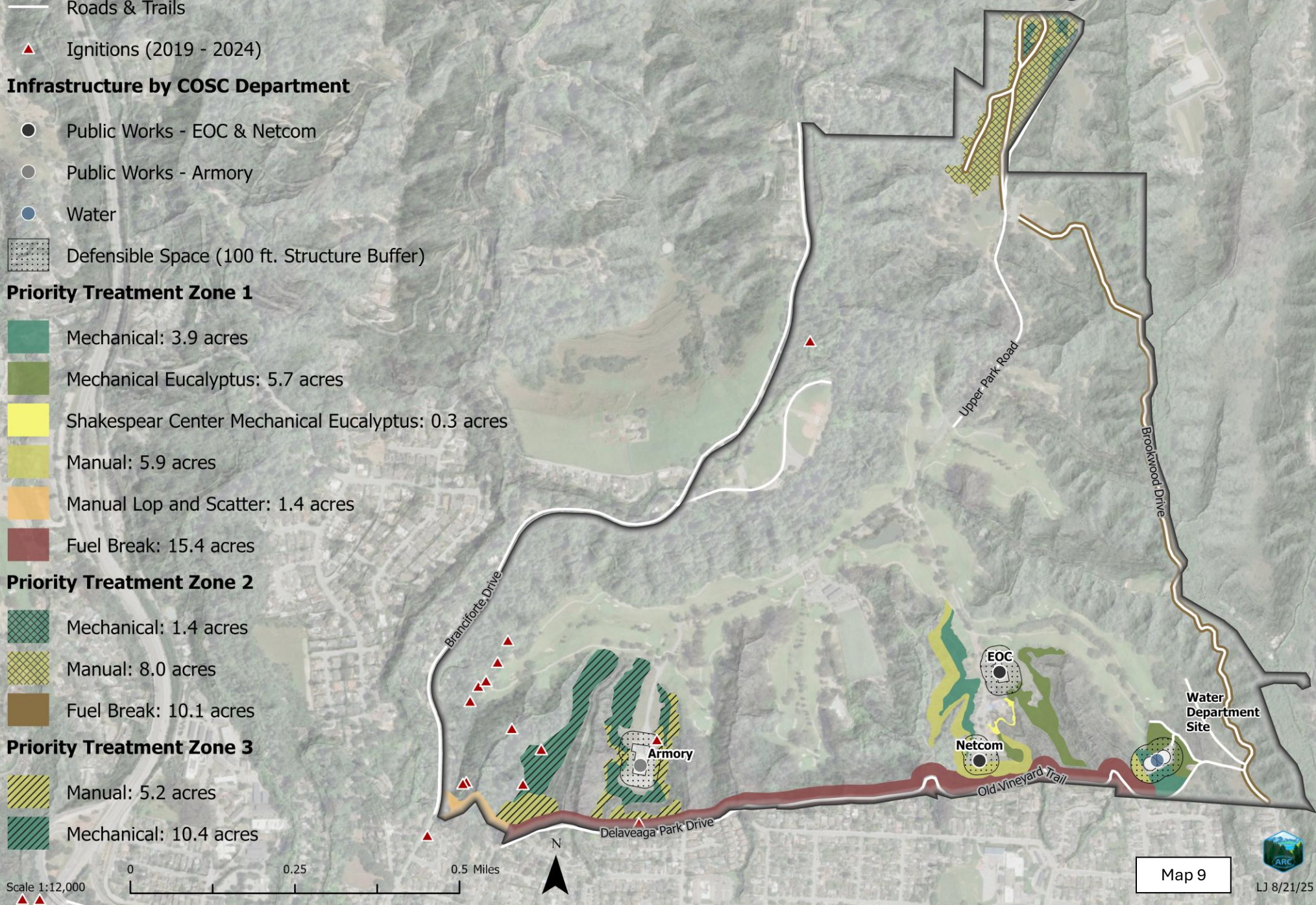
- Mechanical: 1.4 acres
- Manual: 8.0 acres
- Fuel Break: 10.1 acres

## Priority Treatment Zone 3

- Manual: 5.2 acres
- Mechanical: 10.4 acres

## COSC Wildfire Resiliency Program (WRP)

### Priority Treatment Zones DeLaveaga Park





# COSC Wildfire Resiliency Program (WRP)

## Additional Treatments

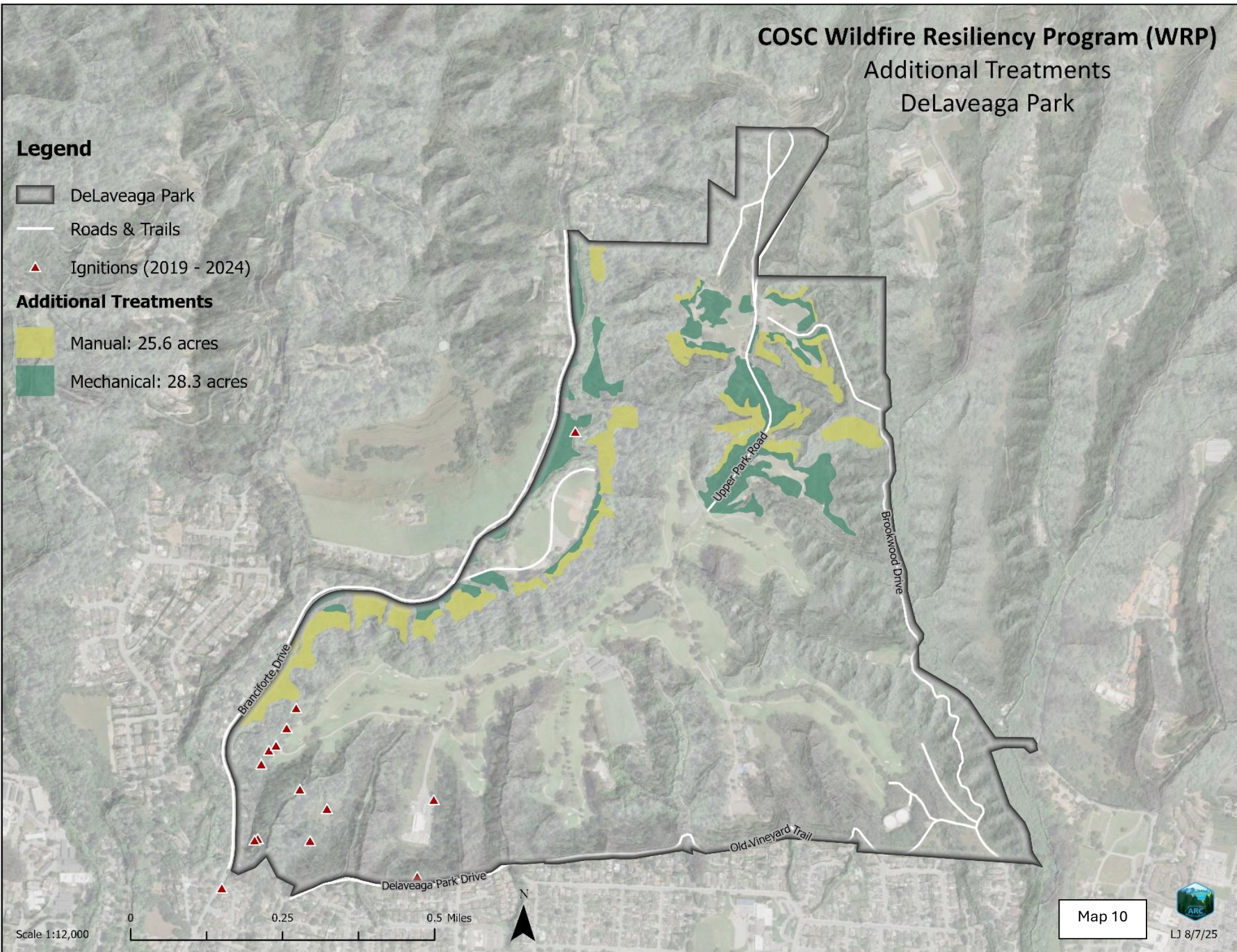
### DeLaveaga Park

#### Legend

- DeLaveaga Park
- Roads & Trails
- Ignitions (2019 - 2024)

#### Additional Treatments

- Manual: 25.6 acres
- Mechanical: 28.3 acres





# COSC Wildfire Resiliency Program (WRP)

## Priority Treatment Zones

### Pogonip Open Space Preserve

#### Legend

- Pogonip Open Space Preserve
- Roads & Trails
- Ignitions (2019 - 2024)

#### Priority Treatment Zone 1

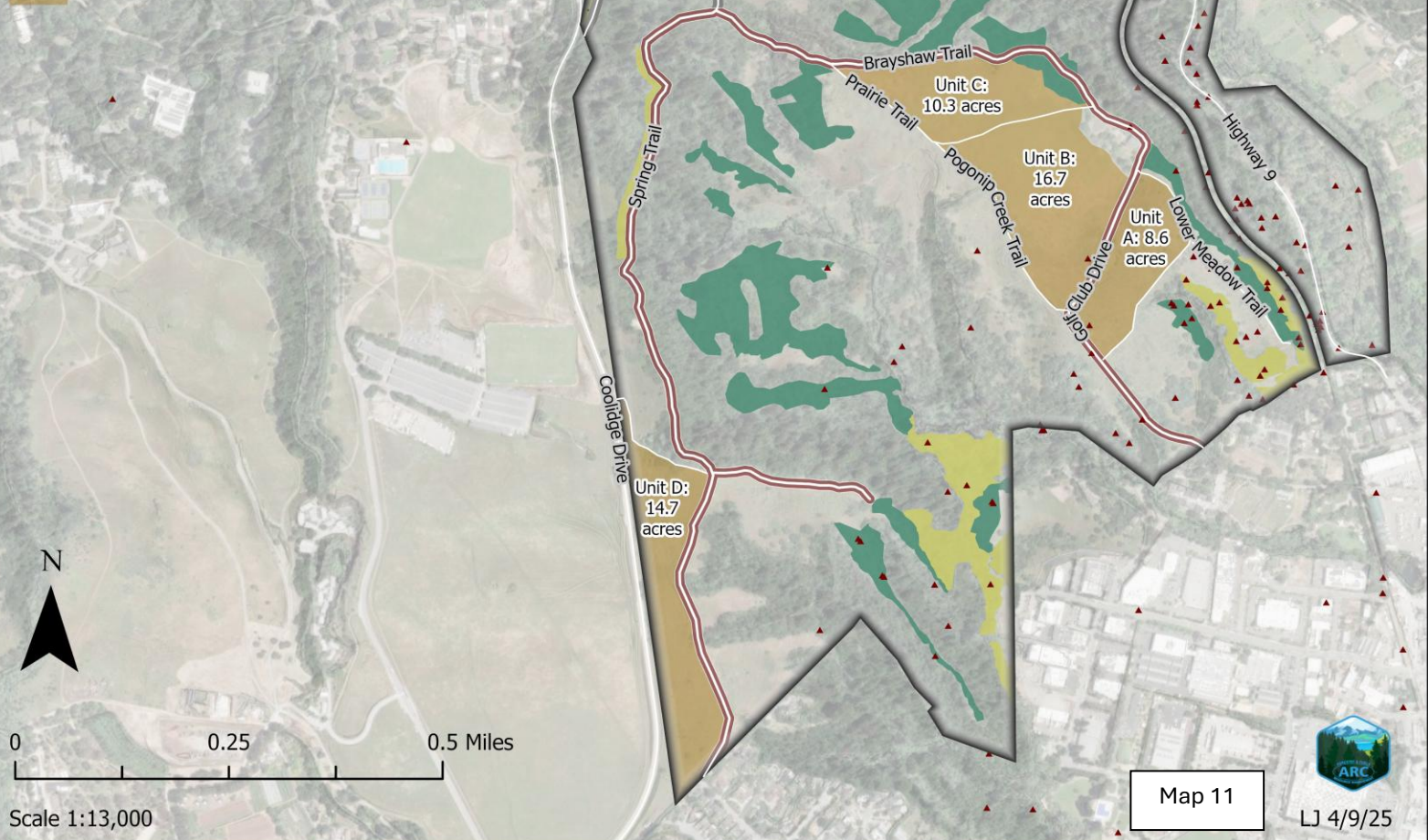
- Mechanical: 38.3 acres
- Manual: 14.5 acres
- Fuel Breaks: 13.6 acres

#### Priority Treatment Zone 2

- Mechanical: 55.4 acres
- Manual: 17.7 acres
- Fuel Breaks: 9.8 acres

#### Additional Prescribed Fire Treatments

- Prescribed Fire: 50.3 acres







# COSC Wildfire Resiliency Program (WRP)


## Priority Treatment Zones

### Moore Creek Preserve


#### Legend


 Moore Creek Preserve


 Roads & Trails


 Ignitions (2019 - 2024)

#### Priority Treatment Zone 1


 Mechanized/Mowing: 1.1 acres


 Mechanized: 1.4 acres

 Mowing: 20.0 acres


 Manual: 2.7 acres

#### Priority Treatment Zone 2

 Mechanical (Mastication): 3.3 acres

 Mechanical (Mowing): 4.4 acres

#### Additional Treatments

 Manual: 5.6 acres



0 0.1 0.2 Miles

Scale 1:8,000

Highway 1

Access Road

Map 12



LJ 8/19/25



# COSC Wildfire Resiliency Plan (WRP)

## Priority Treatments

### Arroyo Seco

#### Legend

- Arroyo Seco
- Roads & Trails
- Sewer Pipes
- Ignitions (2019 - 2024)

#### Priority Treatment Zone 1

- Fuel Break: 7.3 acres



0 0.1 0.2 Miles

Scale 1:6,700



## Legend



### Infrastructure by COSC Department

- Public Works - EOC & Netcom
- Public Works - Armory
- Water

### 2020 Fine-Scale Vegetation Alliances

#### Conifer

- Pseudotsuga menziesii – Notholithocarpus densiflorus / Vaccinium ovatum Association
- Sequoia sempervirens Alliance

#### Developed and Built Up

- Developed

#### Hardwood

- Quercus agrifolia Alliance

- Quercus wislizeni – Quercus parvula (tree) Alliance
- Umbellularia californica Mapping Unit

#### Herbaceous

- Californian Annual & Perennial Grassland Macrogroup

#### Non-native Forest, Shrub, and Herbaceous

- Acacia melanoxylon Provisional Semi-Natural Association
- Eucalyptus (globulus, camaldulensis) Provisional Semi-Natural Association
- Hesperocyparis macrocarpa Ruderal Semi-Natural Association
- Non-native Forest
- Non-native Shrub

- Pinus radiata Plantation Provisional Semi-Natural Association
- Rubus armeniacus Semi-Natural Association

#### Other Map Classes

- Forest Fragment
- Water

#### Riparian Forest

- Acer negundo / (Rubus ursinus) Association
- Populus trichocarpa Alliance

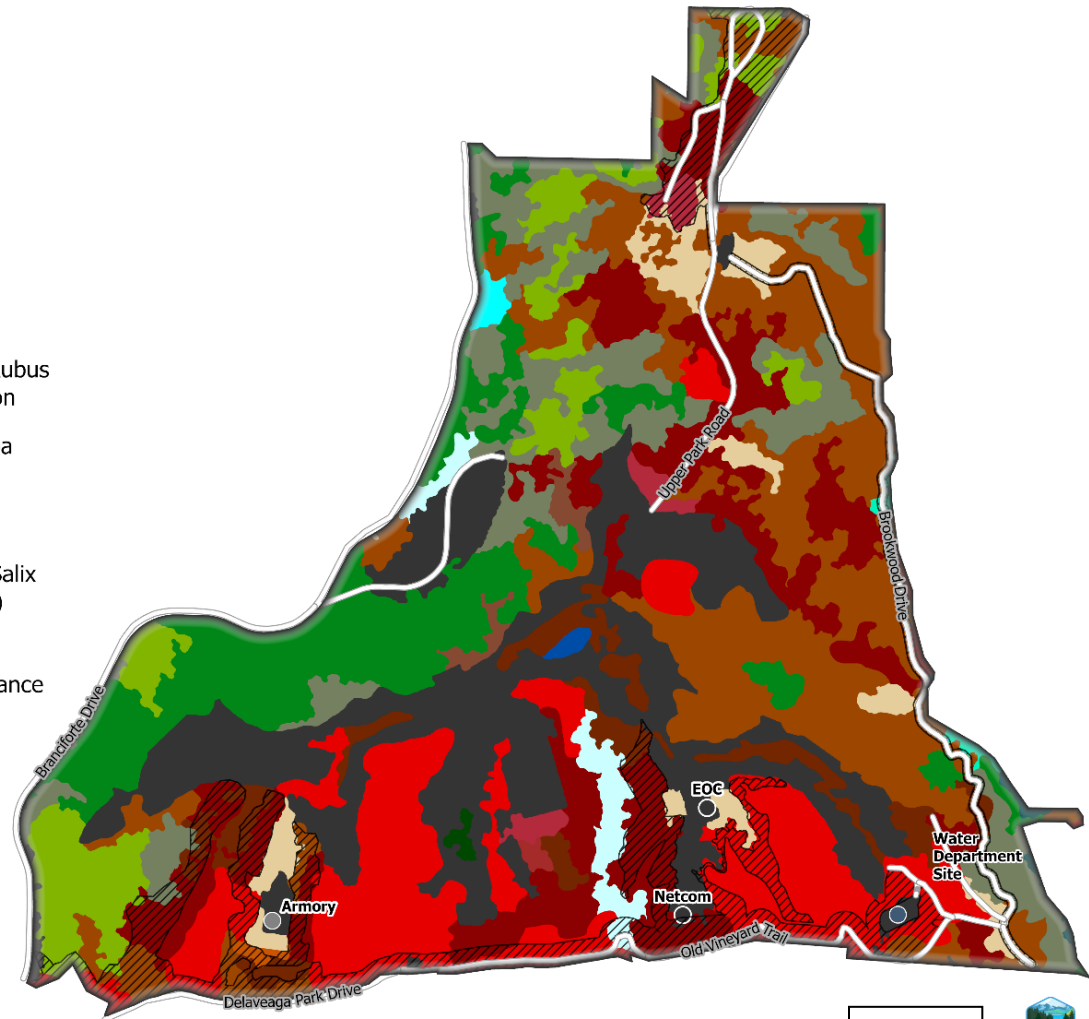
#### Riparian Shrub

- Cornus sericea – Salix (lasiolepis, exigua) Association
- Salix lasiolepis Alliance

#### Shrub

- Baccharis pilularis Alliance

## COSC Wildfire Resiliency Program (WRP) 2020 Fine-Scale Vegetation Alliances DeLaveaga Park



Map A1



Map Not to 1:12,000 Scale.





# COSC Wildfire Resiliency Plan (WRP)

## Fine-Scale Vegetation Alliances


### Water Department Site #1

#### Legend

-  COSC Property
-  Defensible Space  
(100 ft. Structure  
Buffer): 1.5 acres

#### 2020 Fine-Scale Vegetation Alliances



##### Conifer

-  Pseudotsuga  
menziesii –  
Notholithocarpus  
densiflorus /  
Vaccinium ovatum  
Association

##### Developed and Built Up

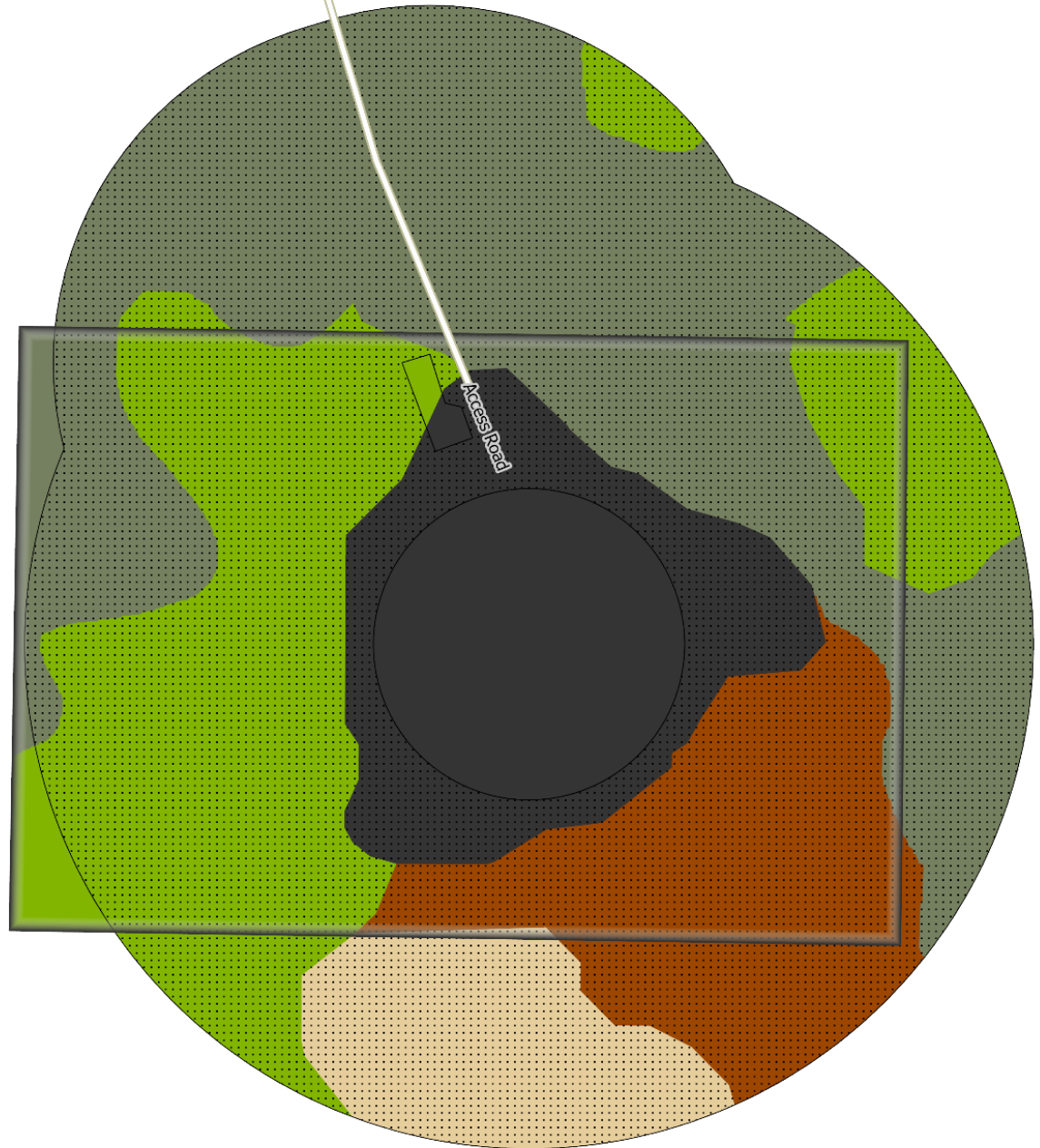
-  Developed

##### Hardwood

-  Quercus agrifolia  
Alliance
-  Umbellularia  
californica Mapping  
Unit

##### Herbaceous

-  Californian Annual &  
Perennial Grassland  
Macrogroup



0 25 50 US Feet

Scale 1:600

Map A2







LJ 8/7/25

# COSC Wildfire Resiliency Plan (WRP)

## 2020 Fine-Scale Vegetation Alliances

### Water Department Site #2

#### Legend


-  COSC Property
-  Access Road
-  Defensible Space (100 ft. Structure Buffer): 2.1 acres
-  Priority Treatment Zone 1

#### 2020 Fine-Scale Vegetation Alliances


##### Developed and Built Up

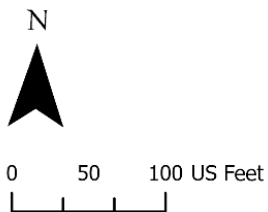
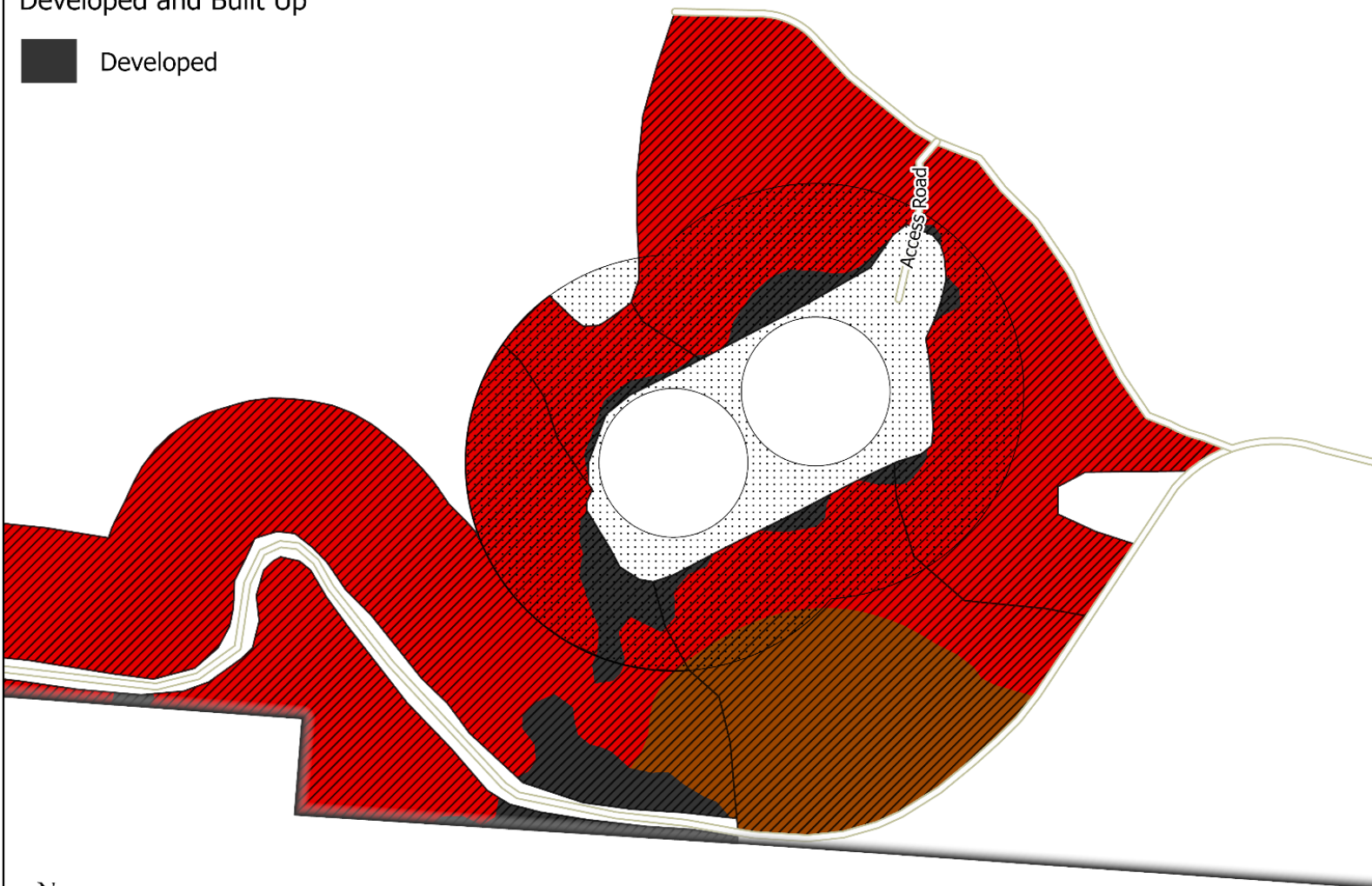
-  Developed

##### Hardwood

-  Quercus agrifolia Alliance

##### Non-native Forest, Shrub, and Herbaceous

-  Eucalyptus (globulus, camaldulensis) Provisional Semi-Natural Association



Scale 1:1,500

Map A3



LJ 8/7/25















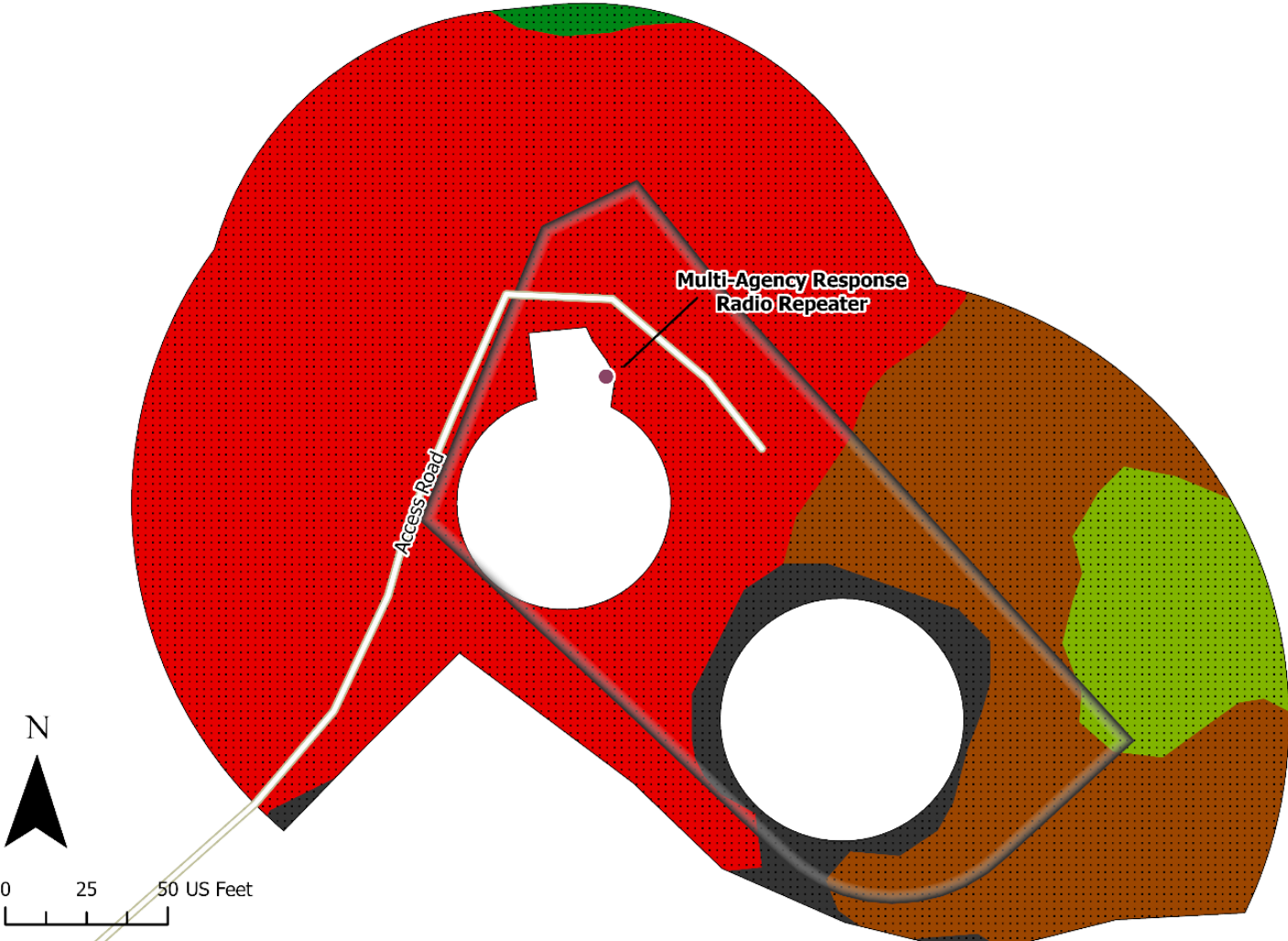
# COSC Wildfire Resiliency Plan (WRP)

## 2020 Fine-Scale Vegetation Alliances

### Water Department Site #3

#### Legend

-  COSC Property
-  Access Road
-  Defensible Space (100 ft. Structure Buffer): 1.4 acres
-  Developed and Built Up
-  Developed
-  Hardwood
-  *Quercus agrifolia* Alliance
-  Conifer
-  *Pseudotsuga menziesii* –  
*Notholithocarpus densiflorus* /  
*Vaccinium ovatum* Association
-  *Sequoia sempervirens* Alliance
-  Non-native Forest, Shrub, and  
Herbaceous
-  *Eucalyptus* (*globulus*,  
*camaldulensis*) Provisional Semi-  
Natural Association



Map A4


















LJ 8/7/25

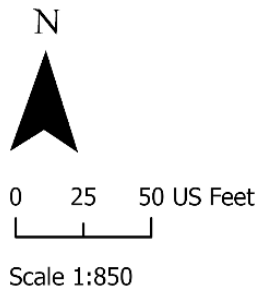
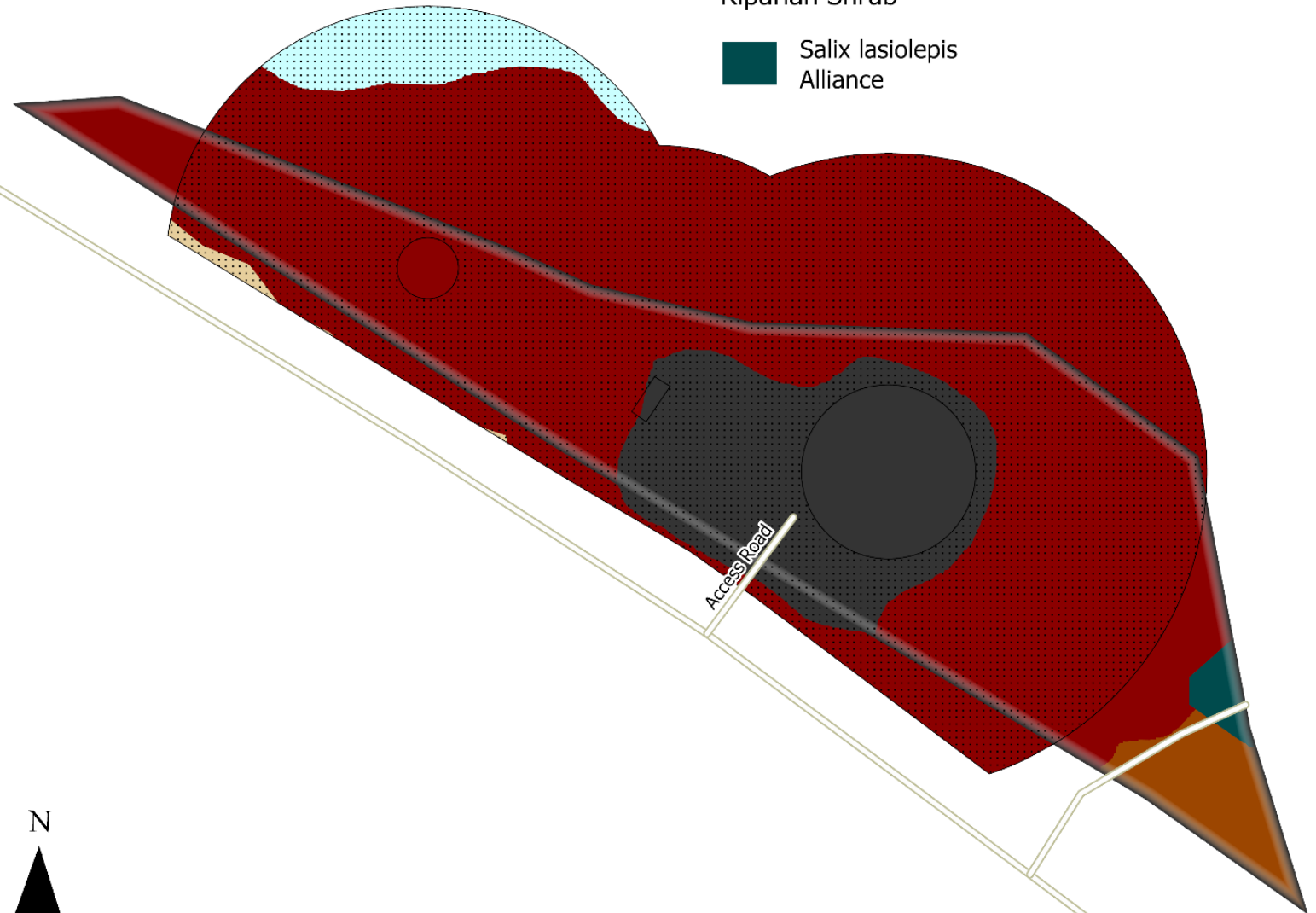
# COSC Wildfire Resiliency Plan (WRP)

## 2020 Fine-Scale Vegetation Alliances

### Water Department Site #4

#### Legend

-  COSC Property
-  Access Road
-  Defensible Space (100 ft. Structure Buffer): 1.7 acres
-  Hardwood
  -  Quercus agrifolia Alliance
-  Herbaceous
  -  Californian Annual & Perennial Grassland Macrogroup
-  Non-native Forest, Shrub, and Herbaceous
  -  Pinus radiata Plantation Provisional Semi-Natural Association
-  Riparian Forest
  -  Populus trichocarpa Alliance
-  Riparian Shrub
  -  Salix lasiolepis Alliance
-  Developed and Built Up
  -  Developed






# COSC Wildfire Resiliency Plan (WRP)

## 2020 Fine-Scale Vegetation Alliances


### Water Department Site #5

#### Legend

-  Private Property
-  Access Road
-  Defensible Space (100 ft. Structure Buffer): 1.4 acres

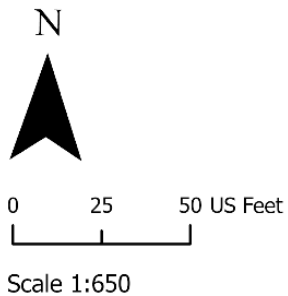
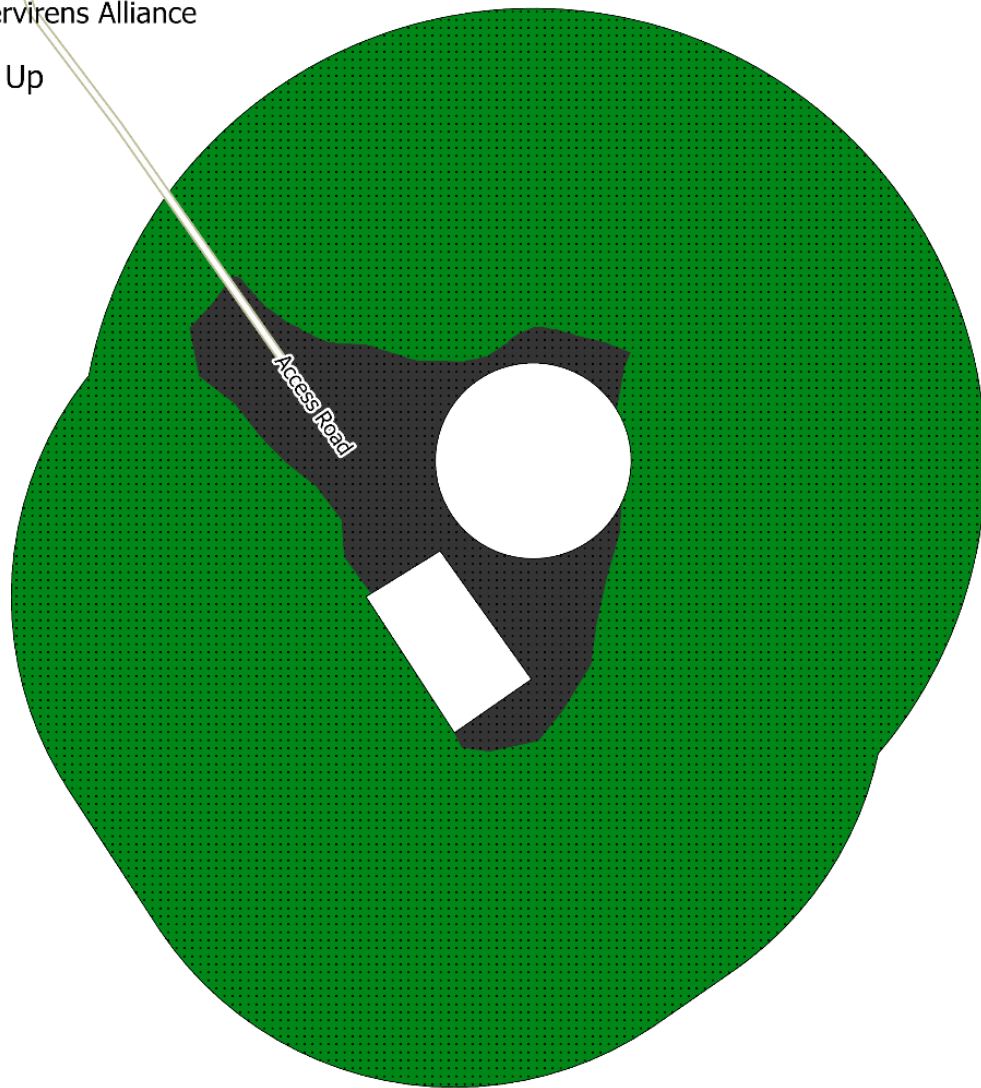
#### 2020 Fine-Scale Vegetation Alliances

##### Conifer

-  Sequoia sempervirens Alliance

##### Developed and Built Up

-  Developed






# COSC Wildfire Resiliency Plan (WRP)

## 2020 Fine-Scale Vegetation Alliances

### Water Department Site #6

#### Legend

-  COSC Property
-  Access Road
-  Defensible Space (100 ft. Structure Buffer): 1.6 acres

#### 2020 Fine-Scale Vegetation Alliances


##### Conifer

-  Sequoia sempervirens Alliance


##### Developed and Built Up

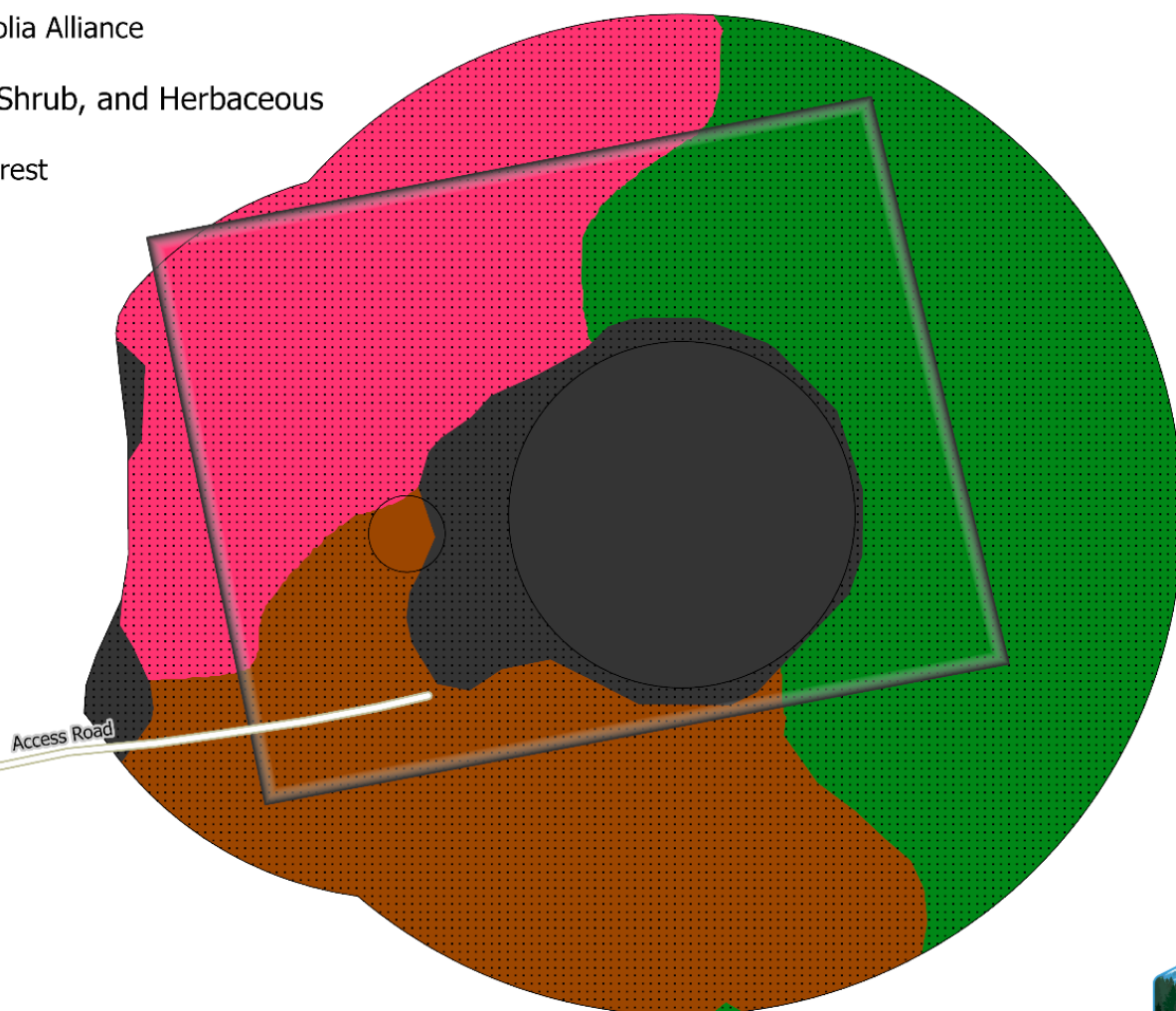
-  Developed

##### Hardwood

-  Quercus agrifolia Alliance

##### Non-native Forest, Shrub, and Herbaceous

-  Non-native Forest



N  
0 25 50 US Feet  
Scale 1:700

Map A7



LJ 8/7/25




# COSC Wildfire Resiliency Program (WRP)

## Fine-Scale Vegetation Alliances

### Pogonip Open Space Preserve

#### Legend

 Pogonip Open Space Preserve


 Roads & Trails


 Priority Treatment Zones

 Prescribed Fire Treatments

#### 2020 Fine-Scale Vegetation Alliances

##### Conifer

 *Pinus ponderosa* – (*Quercus agrifolia* – *Arbutus menziesii*) Provisional Association

 *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* / *Vaccinium ovatum* Association


 *Sequoia sempervirens* Alliance


##### Developed and Built Up


 Developed


 Major Road

##### Hardwood


 *Arbutus menziesii* Alliance

 *Quercus agrifolia* Alliance


 *Quercus wislizeni* – *Quercus parvula* (tree) Alliance


 *Umbellularia californica* Mapping Unit


##### Herbaceous


 Californian Annual & Perennial Grassland Macrogroup

Non-native Forest, Shrub, and Herbaceous


 *Acacia melanoxylon* Provisional Semi-Natural Association

 *Eucalyptus* (*globulus*, *camaldulensis*) Provisional Semi-Natural Association

 Non-native Forest

 *Pinus radiata* Plantation Provisional Semi-Natural Association


##### Other Map Classes

 Barren and Sparsely Vegetated

 Water

##### Riparian Forest

 *Acer macrophyllum* – *Alnus rubra* Alliance

 *Platanus racemosa* – *Quercus agrifolia* Alliance


 *Populus trichocarpa* Alliance

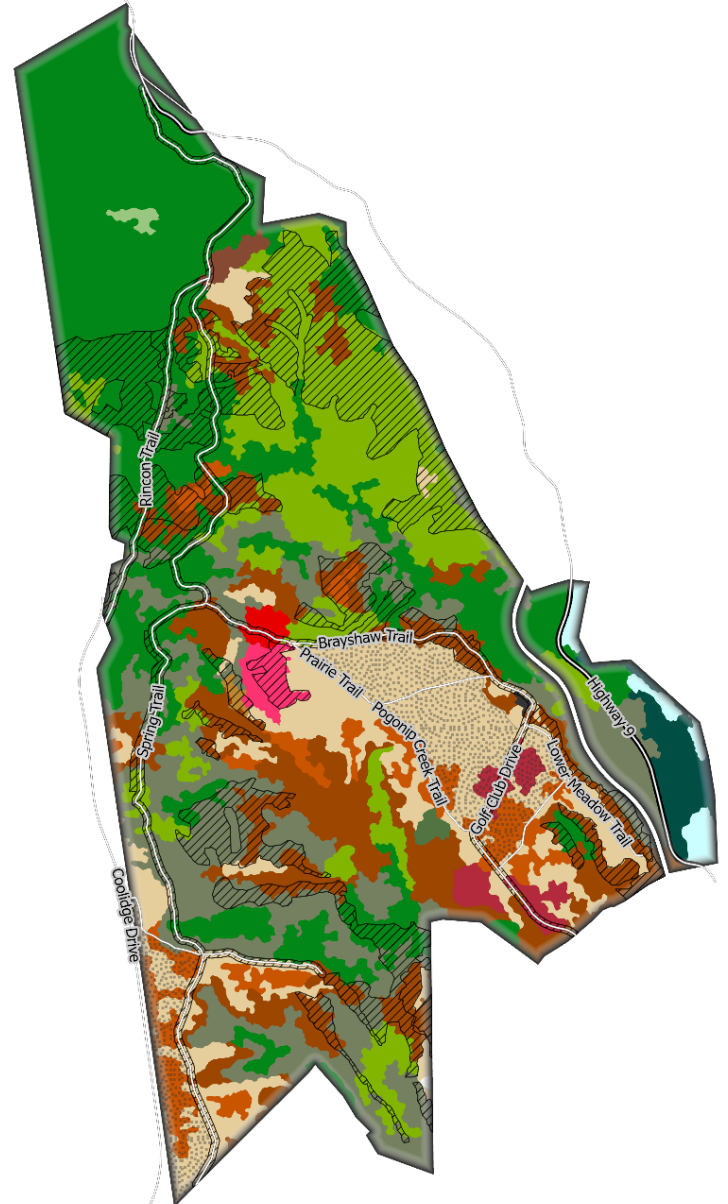
##### Riparian Shrub

 *Salix lasiolepis* Alliance

##### Shrub

 *Baccharis pilularis* Alliance

 *Toxicodendron diversilobum* – (*Baccharis pilularis*) Association



Scale 1:15,000

0 0.25 0.5 Miles



Map A8



LJ 4/9/25

Map Not to 1:15,000 Scale.

# COSC Wildfire Resiliency Plan (WRP)

## Fine-Scale Vegetation Alliances

### Water Department Site #7

#### Legend

 COSC Property

 Access Road


#### Infrastructure (Approximate)

 Pipeline


 Overhead PG&E Power Lines

 Block House

 Propane Tanks

 Solar Panel

 Spring


 Defensible Space 100 ft.  
Structure Buffer: 1.0 acres

#### 2020 Fine-Scale Vegetation Alliances


Conifer

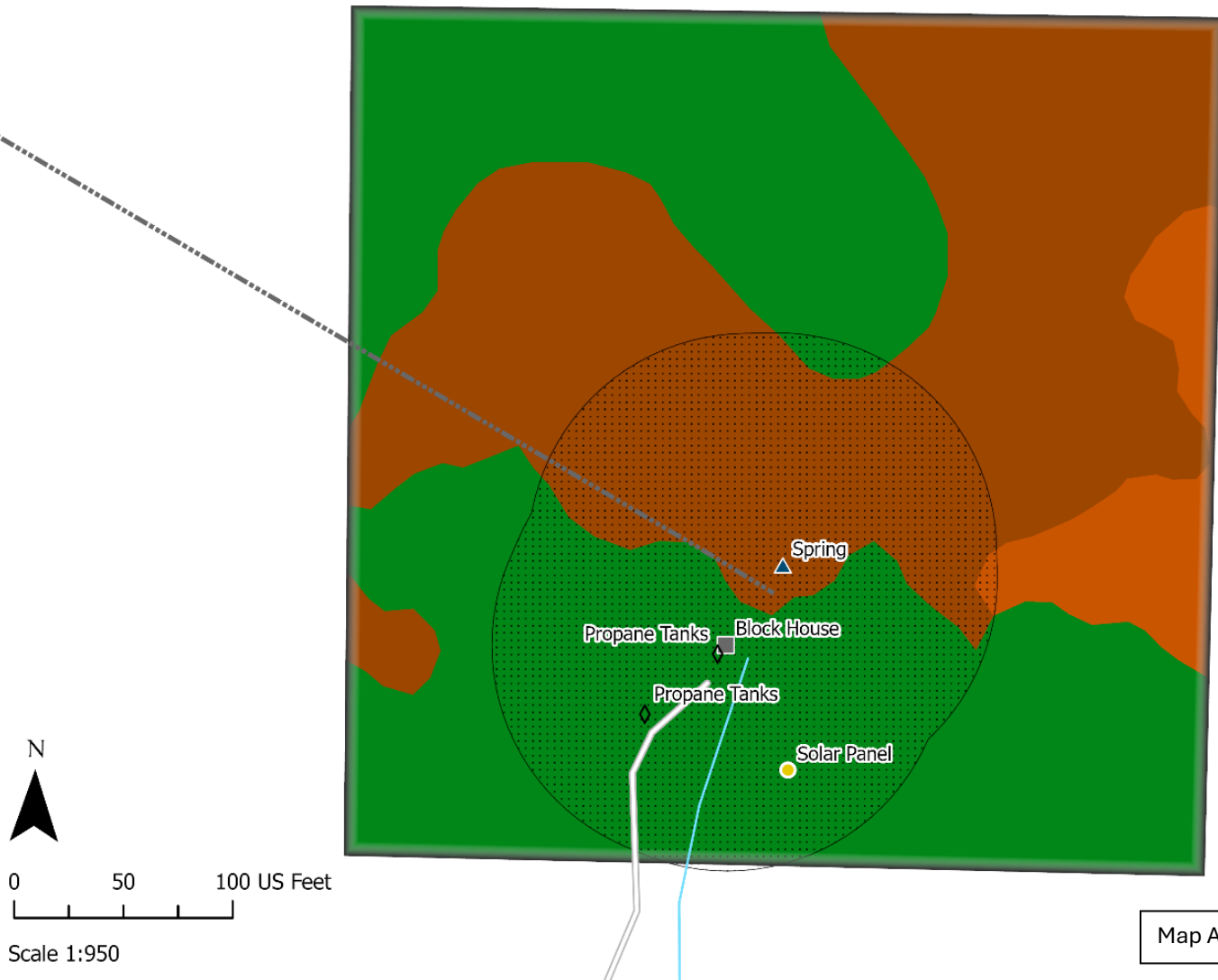
 Sequoia sempervirens Alliance

Hardwood

 Quercus agrifolia Alliance

Shrub

 Baccharis pilularis Alliance





# COSC Wildfire Resiliency Plan (WRP)



## 2020 Fine-Scale Vegetation Alliances

### Water Department Site #8

#### Legend




-  Property Boundary
-  Roads

#### Infrastructure (Approximate)

-  Pipeline
-  Facilities

#### 2020 Fine-Scale Vegetation Alliances

##### Conifer

-  *Pinus attenuata* Alliance
-  *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* / *Vaccinium ovatum* Association
-  *Sequoia sempervirens* Alliance


##### Developed and Built Up

-  Developed


##### Hardwood

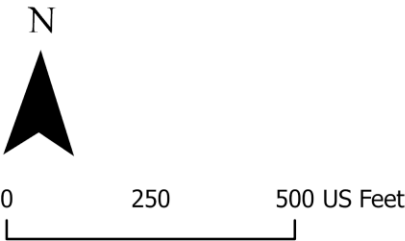
-  *Notholithocarpus densiflorus* Alliance

##### Shrub

-  *Adenostoma fasciculatum* Alliance

#### Priority Treatment Zone

-  Defensible Space (100 ft. Structure Buffer): 1.1 acres



Scale 1:4,000



Map A10




LJ 8/13/25

# COSC Wildfire Resiliency Program (WRP)

## 2020 Fine-Scale Vegetation Alliances



### Moore Creek Preserve

#### Legend

-  Moore Creek Preserve
-  Roads & Trails
-  Priority Treatments

#### 2020 Fine-Scale Vegetation Alliances


##### Conifer

-  *Pseudotsuga menziesii* –
-  *Notholithocarpus densiflorus* / *Vaccinium ovatum* Association


##### Developed and Built Up

-  Developed


##### Hardwood

-  *Quercus agrifolia* Alliance


##### Herbaceous


-  Californian Annual & Perennial Grassland Macrogroup


##### Herbaceous Wetland


-  Vancouverian Lowland Marsh, Wet Meadow & Shrubland Group


##### Non-native Forest, Shrub, and Herbaceous


-  *Cytisus scoparius* – *Genista monspessulana* – *Cotoneaster* spp. Semi-Natural Alliance

-  *Eucalyptus (globulus, camaldulensis)* Provisional Semi-Natural Association


-  *Hesperocyparis macrocarpa* Ruderal Semi-Natural Association

-  Non-native Herbaceous

-  Non-native Shrub

-  *Pinus radiata* Plantation Provisional Semi-Natural Association



##### Other Map Classes

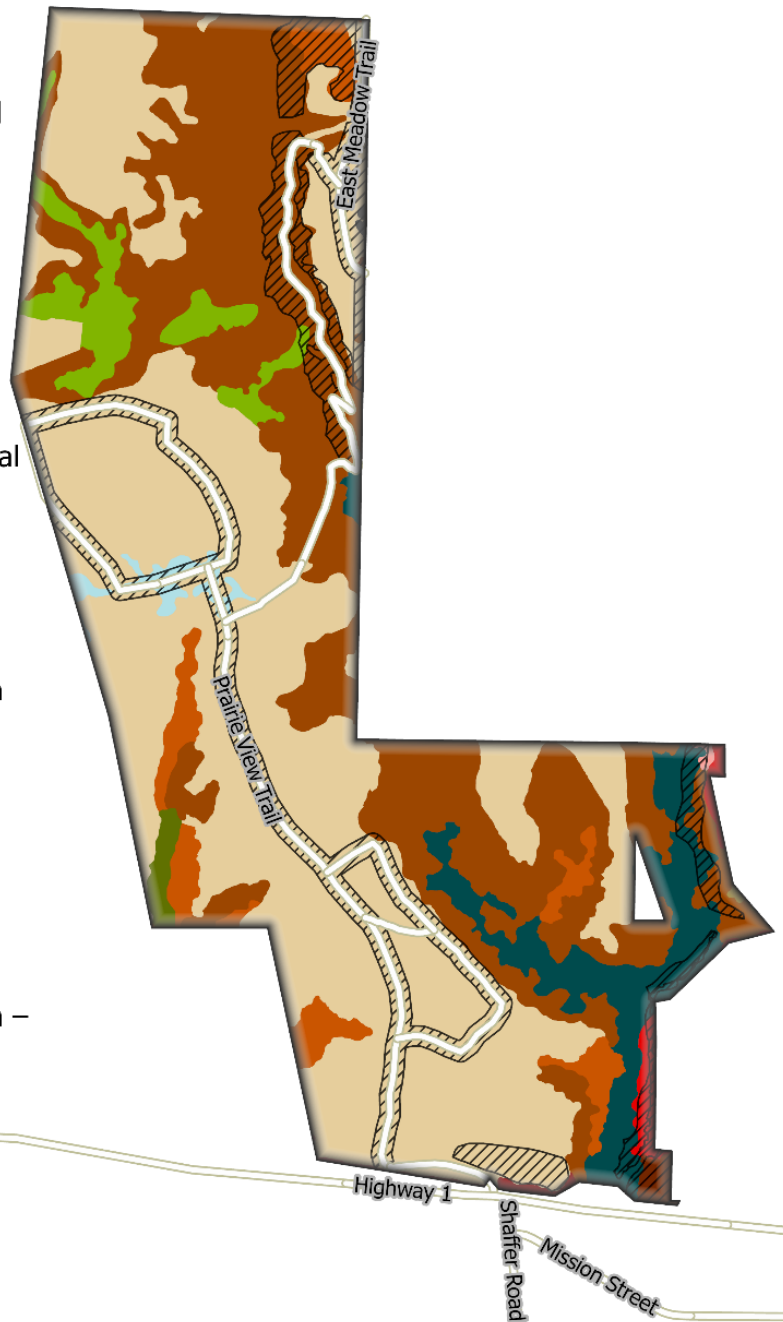
-  *Salvia mellifera* - *Artemisia californica* Alliance

##### Riparian Shrub

-  *Salix lasiolepis* Alliance

##### Shrub

-  *Artemisia californica* – (*Salvia leucophylla*) Alliance
-  *Baccharis pilularis* Alliance





# COSC Wildfire Resiliency Plan (WRP)

## 2020 Fine-Scale Vegetation Alliances

### Arroyo Seco

#### Legend


-  Arroyo Seco
-  Roads & Trails
-  Priority Treatment Zone 1 Fuel Break

#### 2020 Fine-Scale Vegetation Alliances


##### Developed and Built Up

-  Developed


##### Hardwood

-  Quercus agrifolia Alliance


##### Herbaceous

-  Californian Annual & Perennial Grassland Macrogroup


##### Non-native Forest, Shrub, and Herbaceous

-  Eucalyptus (globulus, camaldulensis) Provisional Semi-Natural Association

-  Hesperocyparis macrocarpa Ruderal Semi-Natural Association

-  Non-native Forest

-  Non-native Shrub

-  Pinus radiata Plantation Provisional Semi-Natural Association

##### Other Map Classes


-  Forest Fragment

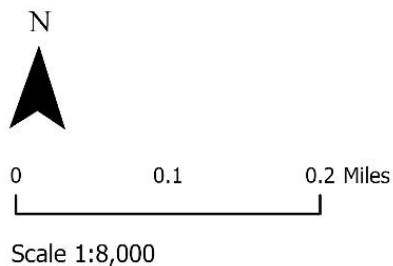
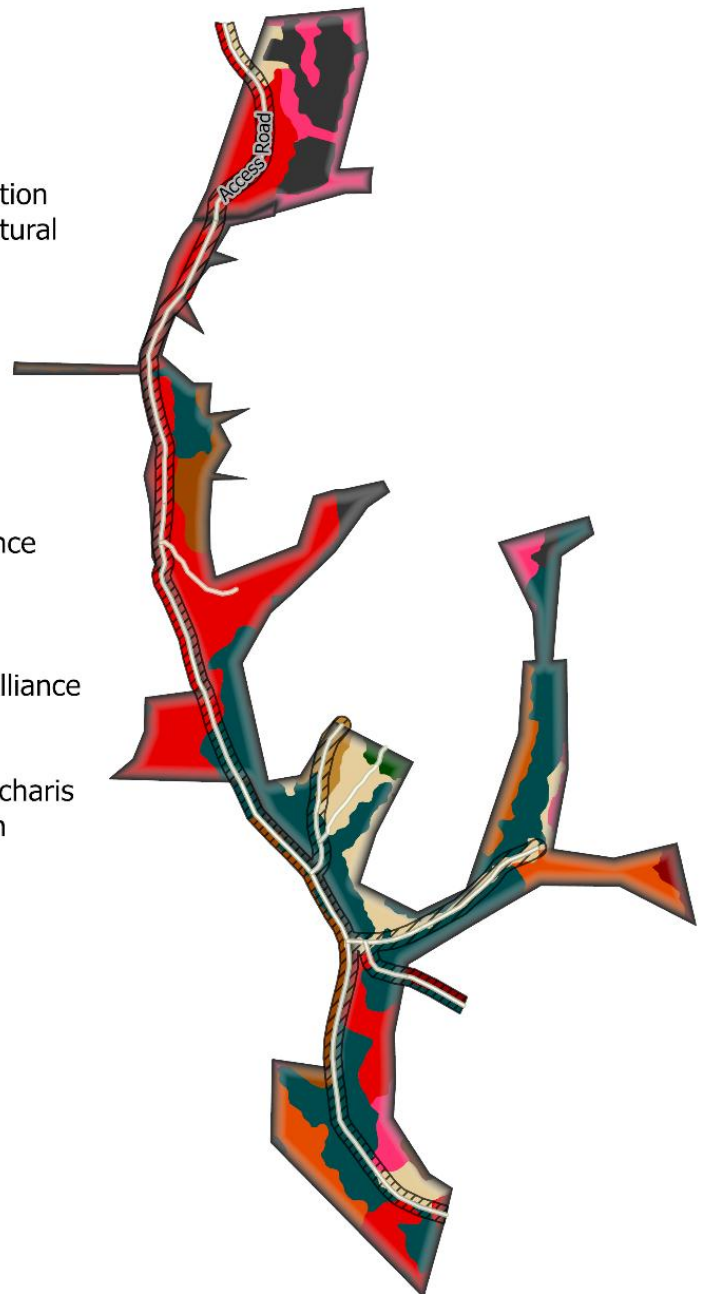
##### Riparian Shrub

-  Salix lasiolepis Alliance

##### Shrub

-  Baccharis pilularis Alliance

-  Toxicodendron diversilobum – (Baccharis pilularis) Association



# COSC Wildfire Resiliency Plan (WRP) 2020 Fine-Scale Vegetation Communities

Resource Recovery  
Facility (City  
Landfill)

Pogonip  
Open Space  
Preserve

DeLaveaga  
Park

Harvey  
West Park

Arana Gulch

Moore Creek  
Preserve

Arroyo Seco

Jessie  
St Marsh

Neary Lagoon

COSC Open Space  
Properties

## 2020 Fine-Scale Vegetation Communities

2020 Enhanced Lifeform

Annual Cropland

Aquatic Vegetation

Barren and Sparsely  
Vegetated

Deciduous Hardwood

Developed

Eucalyptus

Evergreen Hardwood

Freshwater Wetland

Herbaceous

Intensively Managed  
Hayfield

Irrigated Pasture

Major Road

Non-native Forest and  
Woodland

Non-native Herbaceous

Non-native Shrub

Nursery or Ornamental  
Horticulture Area

Orchard or Grove

Perennial Agriculture

Pine/Cypress

Redwood/Doug Fir

Riparian Forest

Riparian Shrub

Salt Marsh

Shrub

Vineyard

Water

0 0.5 1 Miles

Scale 1:48,000

Map A13



LJ 4/23/25

Map Not to 1:48,000 Scale.

## Appendix B: LE-100/Infrastructure Assessment Scores<sup>34</sup>

Facility Name	Average Defensible Space Score (0-30 ft.)	Average Reduced Fuel Zone Score (30-100 ft.)	Defensible Space & Reduced Fuel Zone Average Score (0-100 ft.)	OVERALL AVERAGE SCORE
Armory	5.00	5.00	5	5.00
Corporation Yard	4.67	NA	5	4.71
EOC/Netcom	3.33	2.71	4.5	3.20
Resource Recovery Facility (City Landfill)	4.33	4.86	5	4.67
Waste Water Treatment Facility	5.00	NA	5	5.00
Water Department Site #1	3.50	4.80	5	4.23
Water Department Site #2	4.83	2.17	4	3.57
Water Department Site #3	3.67	4.60	5	4.23
Water Department Site #4	4.00	5.00	4.5	4.50
Water Department Site #5	4.50	5.00	5	4.77
Water Department Site #6	3.80	4.67	5	4.33
Water Department Site #7	2.50	2.67	4.5	2.86
Water Department Site #8	3.75	NA	5	4.00
Water Department Site #9	5.00	5.00	5	5.00
Water Department Site #12	3.67	4.50	5	4.21
Water Department Site #13	5.00	5.00	5	5.00
Water Department Site #14	4.33	NA	5	4.43
Water Department Site #15	4.67	3.60	5	4.25
Water Department Site #17	4.50	5.00	5	4.79
Water Department Site #18	4.50	NA	5	4.57
Water Department Site #19	3.80	4.00	5	4.07
Water Department Site #20	4.67	4.80	5	4.77
Water Department Site #21	3.33	NA	4	3.50

<sup>34</sup> Sites with NA scores indicate evaluation of zone was not completed due to property boundaries or fence lines.



## Appendix C: Treatment Prescriptions

Treatment Prescription Category	Specifications
Defensible Space <sup>35</sup>	<ul style="list-style-type: none"> <li><b>Treat</b> trees and vegetation of any size within up to 100 ft. of infrastructure or to property line, with the first 0-30 ft. as the most intensive removals, to maintain compliance with CAL FIRE LE-100 defensible space standards.</li> <li><b>Remove</b> trees and vegetation adjacent to electrical transmission, distribution, or telecommunication lines to maintain compliance with applicable California Public Utilities Commission (CPUC) regulations, Public Resources Code (PRC) statutes, or other applicable requirements.</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication), and/or prescribed herbivory. <i>Applies across all vegetation types.</i></p>
Hazard Tree	<ul style="list-style-type: none"> <li><b>Remove</b> hazard trees of any size that pose a threat to life or infrastructure. Hazard tree as defined as (1) appears dead, dangerous, or likely to fall, even after proper maintenance activities are performed to eliminate dead or dangerous parts; (2) obstructs or damages a street, trail, sidewalk, or other existing structure; (3) harbors a serious disease or infestation threatening the health of other trees; (4) interferes with vehicular or pedestrian traffic; or (5) poses any other significant hazard or potential hazard, as determined by COSC.</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork) and/or mechanical. <i>Applies across all vegetation types.</i></p>
Forest Health Fuels Reduction	<ul style="list-style-type: none"> <li><b>Remove</b> dead, dying and diseased trees of any size</li> <li><b>Selectively remove</b> live trees and understory shrubs less than or equal to 16 in. Diameter at Breast Height (DBH) that increase crown spacing, reduce competition for available resources, and reduce horizontal and vertical fuel connectivity <ul style="list-style-type: none"> <li><b>Retain</b> healthy hardwoods and conifers greater than 16 in. DBH</li> <li><b>Retain</b> a mosaic of understory trees and shrubs less than or equal to 16 in. DBH at 10-20 ft. spacing by vegetation alliance</li> <li><b>Retain</b> 1-4 snags per acre and downed woody debris for habitat complexity</li> <li><b>Maintain</b> approximately four pieces of downed woody debris greater than 16 in. in diameter and 15 ft. long per acre where feasible</li> </ul> </li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication), prescribed herbivory, and/or prescribed burning. <i>Applies in all forested vegetation types.</i></p>

<sup>35</sup> California PRC section 4291 and CAL FIRE's guidelines for implementing defensible space delineate a zone system based on 3 concentric buffers between 0-5 feet, 5-30 feet, and 30-100 feet from structures. Visit CAL FIRE Defensible Space Resources for additional guidance: <http://fire.ca.gov/dspace>, <https://readyforwildfire.org/prepare-for-wildfire/defensible-space/>.



Treatment Prescription Category	Specifications
Hardwood Restoration	<ul style="list-style-type: none"> <li>• <b>Remove</b> dead, dying and diseased trees of any size</li> <li>• <b>Selectively remove</b> live trees and understory shrubs less than or equal to 16 in. DBH that increase crown spacing, reduce encroachment on hardwoods and competition for available resources, and reduce horizontal and vertical fuel connectivity <ul style="list-style-type: none"> <li>- <b>Retain</b> healthy hardwoods greater than 16 in. DBH</li> <li>- <b>Retain</b> a mosaic of understory trees and shrubs less than or equal to 16 in. DBH at 10-20 ft. spacing by vegetation alliance</li> <li>- <b>Retain</b> 1-4 snags per acre and downed woody debris for habitat complexity</li> <li>- <b>Maintain</b> approximately four pieces of downed woody debris greater than 16 in. in diameter and 15 ft. long per acre where feasible</li> </ul> </li> <li>• <b>Selectively remove</b> Douglas-fir (<i>Pseudotsuga menziesii</i>) trees up to 36 in. DBH which have become established in woodlands due to lack of disturbance</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication), prescribed herbivory, and/or prescribed burning. <i>Applies in hardwood forests.</i></p>
Shrubland Restoration	<ul style="list-style-type: none"> <li>• <b>Remove</b> up to 65 percent of shrubs and chaparral outside the dripline of trees, on a site-specific basis</li> <li>• <b>Retain</b> a mosaic of shrubs by vegetation alliance</li> <li>• <b>Retain</b> at least 35 percent of the total chaparral-covered area outside the dripline of trees <ul style="list-style-type: none"> <li>- Consider additional protections for sensitive natural communities where feasible</li> </ul> </li> <li>• Consider shrubland restoration treatments within the natural fire return interval unless proximal to critical infrastructure</li> <li>• <b>Selectively remove</b> Douglas-fir (<i>Pseudotsuga menziesii</i>) trees up to 36 in. DBH which have become established in shrublands due to lack of disturbance</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication), prescribed herbivory, and/or prescribed burning. <i>Applies in shrublands.</i></p>
Grassland Restoration	<ul style="list-style-type: none"> <li>• <b>Remove</b> up to 100 percent woody shrubs such as coyote brush (<i>Baccharis pilularis</i>) to prevent encroachment, while maintaining rare grassland species and native grasses and forbs, where present</li> <li>• <b>Selectively remove</b> Douglas-fir (<i>Pseudotsuga menziesii</i>) trees up to 36 in. DBH which have become established in grasslands due to lack of disturbance</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication or mowing), prescribed herbivory, and/or prescribed burning. <i>Applies in grasslands.</i></p> <p><b>Note:</b> Time treatments appropriately during the year to maintain native annual seed beds, as feasible.</p>

Treatment Prescription Category	Specifications
Invasive Species	<p><b>Remove</b> invasive species by utilizing the California Invasive Plant Council Inventory, COSC Integrated Pest Management (IPM) Guidance Manual or COSC resource management plans for invasive species removals for prioritization of removals and management methods<sup>36</sup></p> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication), herbicide, prescribed herbivory, and/or prescribed burning. <i>Applies across all vegetation types.</i></p>
Roadside	<p><b>Within 25 ft.</b> of the edge of roads and trails, including fuel breaks along existing roads:</p> <ul style="list-style-type: none"> <li>• <b>Maintain</b> appropriate vertical and horizontal clearance requirements for applicable fire apparatus access*</li> <li>• <b>Prune</b> lower branches of trees 6-15 ft. but not more than 33% of the tree crown where feasible</li> <li>• <b>Selectively remove</b> live trees and shrubs less than or equal to 16 in. in DBH that encroach on vertical and horizontal clearance</li> </ul> <p><b>Within 25-100 ft.</b> of the edge of roads and trails, including fuel breaks along existing roads:</p> <ul style="list-style-type: none"> <li>• <b>Remove</b> hazard trees and dead, dying, diseased trees of any size</li> <li>• <b>Retain</b> healthy hardwoods and conifers greater than 16 in. DBH</li> <li>• <b>Retain</b> a mosaic of understory trees and shrubs less than or equal to 16 in. DBH at 10-20 ft. spacing by vegetation alliance</li> <li>• <b>Maintain</b> select down woody debris and snags for appropriate habitat retention</li> </ul> <p><b>Treatment Activities:</b> Manual (handwork), mechanical (mastication or mowing), prescribed herbivory, targeted herbicide treatment, and/or prescribed burning. <i>Applies across all vegetation types.</i></p> <p>*Reference Sections I-III of the WRP for recommended site-specific fire apparatus access</p>

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<sup>36</sup> Reference the COSC Integrated Pest Management IPM Guidance Manual, as well as Department IPM coordinators, for policies and procedures related the City's IPM approach, such as pesticide use practices.

## Appendix D: Permit Decision Matrix<sup>37</sup>

Permit Implementation Strategy Matrix		
Document Type:	CalVTP PSA	Exemptions
Applicable Forest Management Actions	<u>Prescribed Fire*</u> Broadcast Burn Pile Burn <u>Weed &amp; Invasives Management</u> Herbicide <u>Manual</u> Understory Overstory <u>Mechanical</u> Understory Overstory <i>Ground-based Tractor Operations</i> <u>Biomass Utilization</u> Chipping Mastication Air Curtain Burning	Exemption Dependent
Applicable Prescription Categories	Forest Health Fuels Reduction Hardwood Restoration Shrubland Restoration Grassland Restoration Defensible Space Invasive Species Hazard Tree Roadside	Exemption Dependent
Acreage Limitiations	No	Yes, certain exemptions.
Effective Period	10+ years, or until conditions substantially change	Exemption Dependent
Includes Maintenance Treatments	Yes	Exemption Dependent
Filing	Filed once, ammendable. Unless conditions substantially change	Filed as needed
RPF Required	No	Exemption Dependent
Lead Agency	COSC	Exemption Dependent, CAL FIRE is the Lead on CAL FIRE Exemptions
Regulations	CEQA	CEQA/FPRs
Coastal Zone Compliance	Prepare a NOID through County PWP.s.	Exemption Dependent
Public Comment Required	Yes, Complete (CalVTP PEIR)	None
Limitations	Coatal Zone Act - PWP Process No Cost-Offset	
Local Ordinances, Plans & Policies	Local ordinances, plans, and policies to be evaluated at the time of permitting; including, but not limited to: Heritage Tree Ordinance, Street Tree Ordinance, and Santa Cruz County Riparian Ordinance. CWPP's, CAL Fire Unit Fire Plans, COSC 2030 General Plan, City-Wide Creeks and Wetland Management Plan, and COSC IPM Guidance Manual.	
* Prescribed broadcast burning may require a separate burn plan and coordination with CAL FIRE.		
** MTHP-FHRs do not support the removal of dominant and co-dominant overstory trees.		
*** Projects may be implemented under <b>CAL FIRE's Vegetation Management Program (VMP)</b> , which provides a pathway for CEQA compliance. The VMP may require additional permitting or CEQA documentation dependent on the scope of the project.		

<sup>37</sup> The document types in the Permit Decision Matrix are recommended for proposed actions outlined in the WRP; other permitting and CEQA compliance strategies exist for implementation of projects, including COSC OMHCP and ASHCP for covered activities and species.

## Appendix E: Treatment Cost Estimates

Treatment Site & Activity	Area (Acres)	Cost per Acre	Initial Treatment Cost
<b>OPTION 1 – Mechanical<sup>38</sup> &amp; Manual</b>			
<b>DeLaveaga – Priority Treatment Zone 1</b>			
Mechanical	3.9	\$3,000/ac.-\$4,000/ac.	\$11,700-\$15,600
Mechanical: Eucalyptus	6.0	\$15,000/ac.-\$40,000/ac.	\$90,000-\$240,000
Manual	5.9	\$8,000/ac.-\$10,000/ac.	\$47,200-\$59,000
Manual: Lop and Scatter	1.4	\$4,000/ac.-\$5,000/ac.	\$5,600-\$7,000
Fuel Break	15.4	\$7,000/ac.-\$9,000/ac.	\$107,800-\$138,600
			<b>Total: \$262,300-\$460,200</b>
<b>Water Department Sites #1-6<sup>39</sup></b>			
Total ~100 ft. Defensible Space Buffers			
Mechanical or Manual	~7.6	\$3,000/ac.-\$10,000/ac.	<b>Total: \$22,800-\$76,000</b>
<b>Pogonip – Priority Treatment Zone 1</b>			
Mechanical + Fuel Breaks (25 ft.)	51.9	\$3,000/ac.-\$4,000/ac.	\$155,700-\$207,600
Manual	14.5	\$8,000/ac.-\$10,000/ac.	\$116,000-\$145,000
			<b>Total: \$271,700-\$352,600</b>
<b>Water Department Site #7 – Priority Treatment Zone</b>			
Manual (~100 ft. Defensible Space Buffer)	~1.0	\$8,000/ac.-\$10,000/ac.	<b>Total: \$8,000-\$10,000</b>
			<b>Total Priority Treatments: \$564,800-\$898,800</b>
<b>OPTION 2 – All Manual</b>			
<b>DeLaveaga – Priority Treatment Zone 1</b>			
Manual	26.6	\$8,000/ac.-\$10,000/ac.	\$212,800-\$266,000
Mechanical: Eucalyptus <sup>40</sup>	6.0	\$15,000/ac.-\$40,000/ac.	\$90,000-\$240,000
			<b>Total: \$302,800-\$506,000</b>
<b>Water Department Sites #1-6</b>			
Total ~100 ft. Defensible Space Buffers			
Manual	~7.6	\$8,000/ac.-\$10,000/ac.	<b>Total: \$60,800-\$76,000</b>
<b>Pogonip – Priority Treatment Zone 1</b>			
Manual + Fuel Breaks (25 ft.)	66.4	\$8,000/ac.-\$10,000/ac.	<b>Total: \$531,200-\$664,000</b>
<b>Water Department Site #7 – Priority Treatment Zone</b>			
Manual (~100 ft. Infrastructure Buffer)	~1.0	\$8,000/ac.-\$10,000/ac.	<b>Total: \$8,000-\$10,000</b>
			<b>Total Priority Treatments: \$902,800-\$1,256,000</b>

<sup>38</sup> Manual treatments and other treatment activities may occur within areas mapped as mechanical treatments, as these mapped footprints indicate areas of less than approximately 35 percent slope that are generally accessible by mechanized equipment.

<sup>39</sup> Total acreages and cost estimates for Water Department Sites #1-6 do not include the Water Department Site #2 defensible space buffer; treatments for this site are accounted for in other Priority Treatment Zones in the WRP.

<sup>40</sup> Treatments designated as mechanical eucalyptus in DeLaveaga Priority Treatment Zone 1 are not suitable for manual activities; all other treatments may be implemented with manual activities.



## Appendix F: Prescribed Burning Opportunities

Pathway	Benefits	Limitations
Integrated - CAL FIRE	<ul style="list-style-type: none"> <li>• Low cost or no cost contract with a CalVTP or Vegetation Management Plan (VMP)</li> <li>• CAL FIRE provides all crew, equipment, resources and full liability coverage</li> </ul>	<ul style="list-style-type: none"> <li>• Resource availability</li> <li>• Variable or limited opportunities for community training and burning</li> </ul>
Integrated - Central Coast Prescribed Burn Association	<ul style="list-style-type: none"> <li>• Training and fire-related certification opportunities for community-led prescribed burning</li> <li>• Conducts cultural burning in collaboration and partnerships with local tribes</li> <li>• Provides all equipment, resources, and liability coverage with California State Certified Prescribed Burn Boss (CA-RX) and <a href="#">SB 926</a></li> </ul>	<ul style="list-style-type: none"> <li>• Funding – would require grant or budget allocations</li> <li>• Staff variability based on program funding</li> </ul>