



Marin Wildfire Prevention Authority Greater Novato Shaded Fuel Break Project CaIVTP Project Specific Analysis and Addendum



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Marin Wildfire Prevention Authority

Greater Novato Shaded Fuel Break Project

CaIVTP Project Specific Analysis and Addendum

March 2023

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1 Introduction

1.1 Overview of Proposed Project

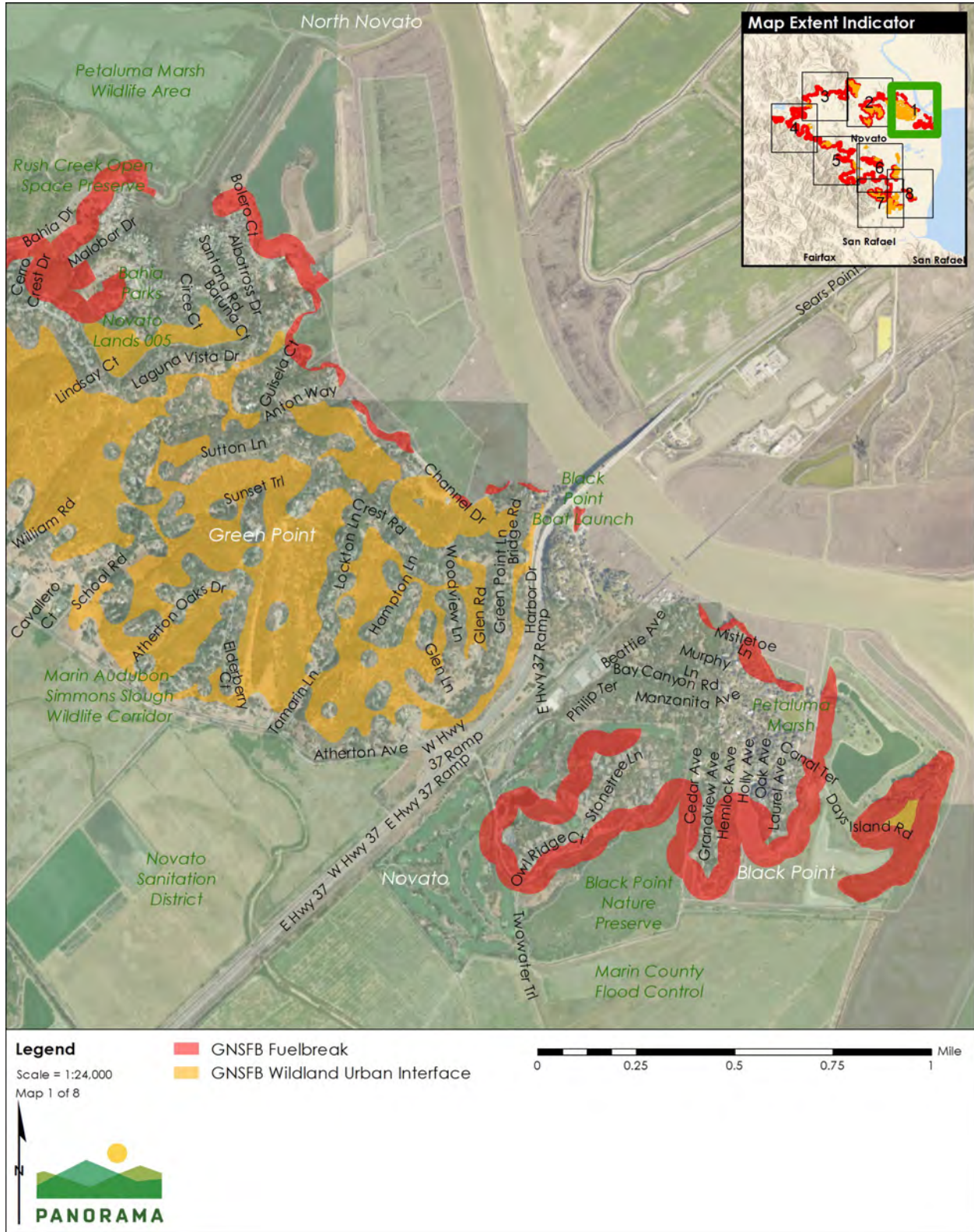
The Novato Fire District is proposing a Marin Wildfire Prevention Authority (MWPA) Core Project, referred to as the Greater Novato Shaded Fuel Break (GNSFB) project. The goal of the GNSFB project is to create and maintain a continuous reduced-fuel and forest-health-restoration zone around the communities in the greater Novato area. The proposed project would involve conducting vegetation management activities to create an approximately 60-mile-long continuous shaded fuel break within a 2,123-acre area. Wildland Urban Interface (WUI) fuels reduction areas account for up to 1,340 acres adjacent to the fuel break that may also be treated. The project areas are shown in Figure 1-1 through Figure 1-7. Refer to Attachment A for the Greater Novato Fuel Break Project Modeling and Implementation Guidance Report, which provides additional information on how the fuel break and WUI fuels reduction zones were defined through a modeling approach.¹

Of the total 3,463-acre GNSFB project area, 1,228 acres fall within the State Responsibility Area (SRA), with 2,227 acres contained within the Local Responsibility Area (LRA) and 8 acres in the Federal Responsibility Area. The LRA and FRA portions of the project area comprise the same vegetation community types and are often contiguous with the SRA portions. The PSA would provide CEQA coverage for the FRA; however, any work in the FRA would require consideration under the National Environmental Protection Act (NEPA) prior to work, if required. The entire Novato zone, within which the GNSFB project falls, is serviced by the Novato Fire District. Figure 1-8 through Figure 1-14 depict the underlying landownership across the GNSFB project.

¹ A 1.6-acre portion of the burn unit and a 24-acre portion of invasive tree removal area in the WUI was not included in the modeling as these areas were incorporated later in the process but are analyzed in the PSA. The burn unit area was included because it was deemed preferable from an operational standpoint as the paved parking lot provides a more effective control line, reducing the amount of fire line to be constructed. The tree removal area was incorporated because it would improve the function of the WUI and remove non-native trees with a higher fire risk.

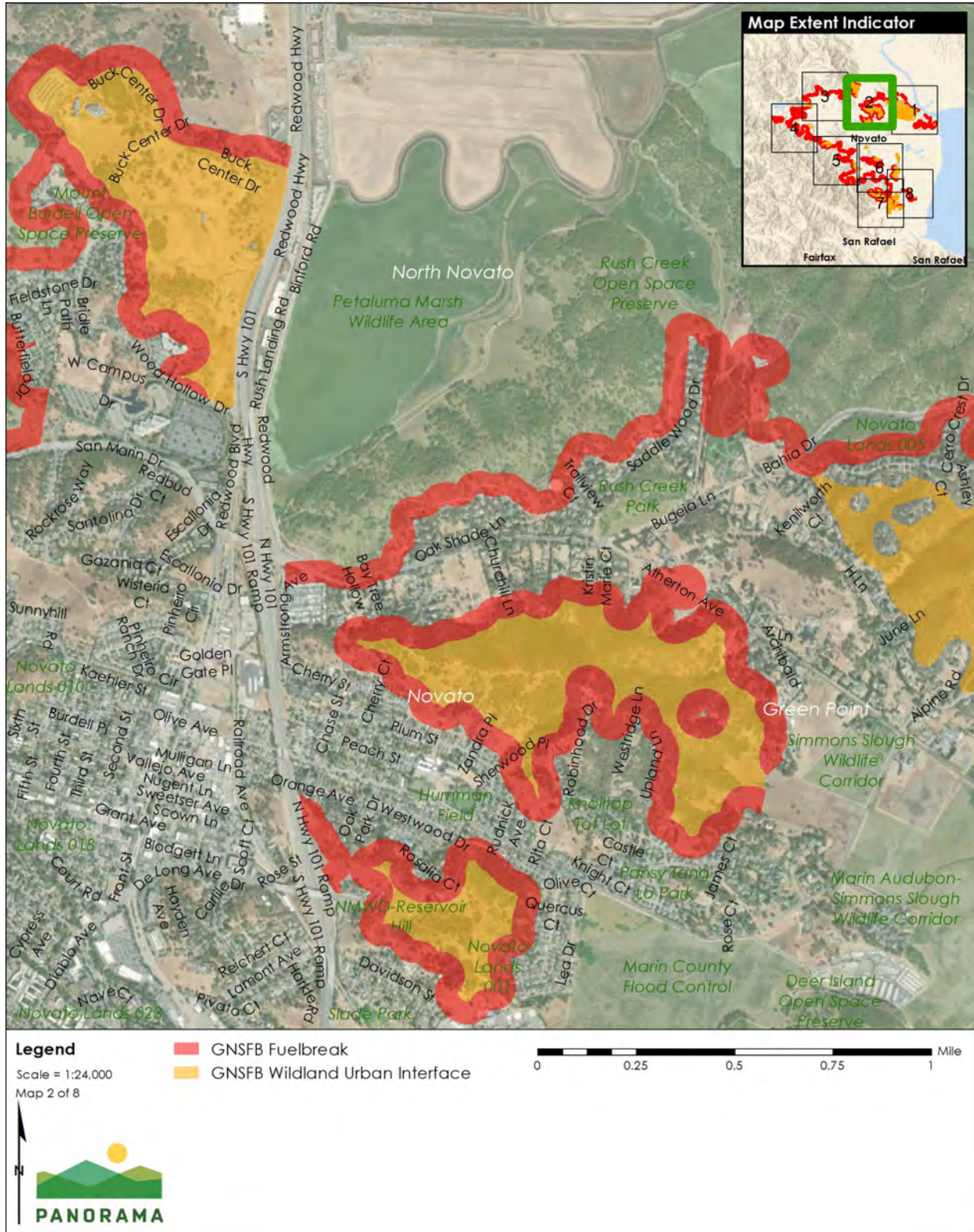
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Figure 1-1 Overall Proposed GNSFB Project (Map 1 of 8)



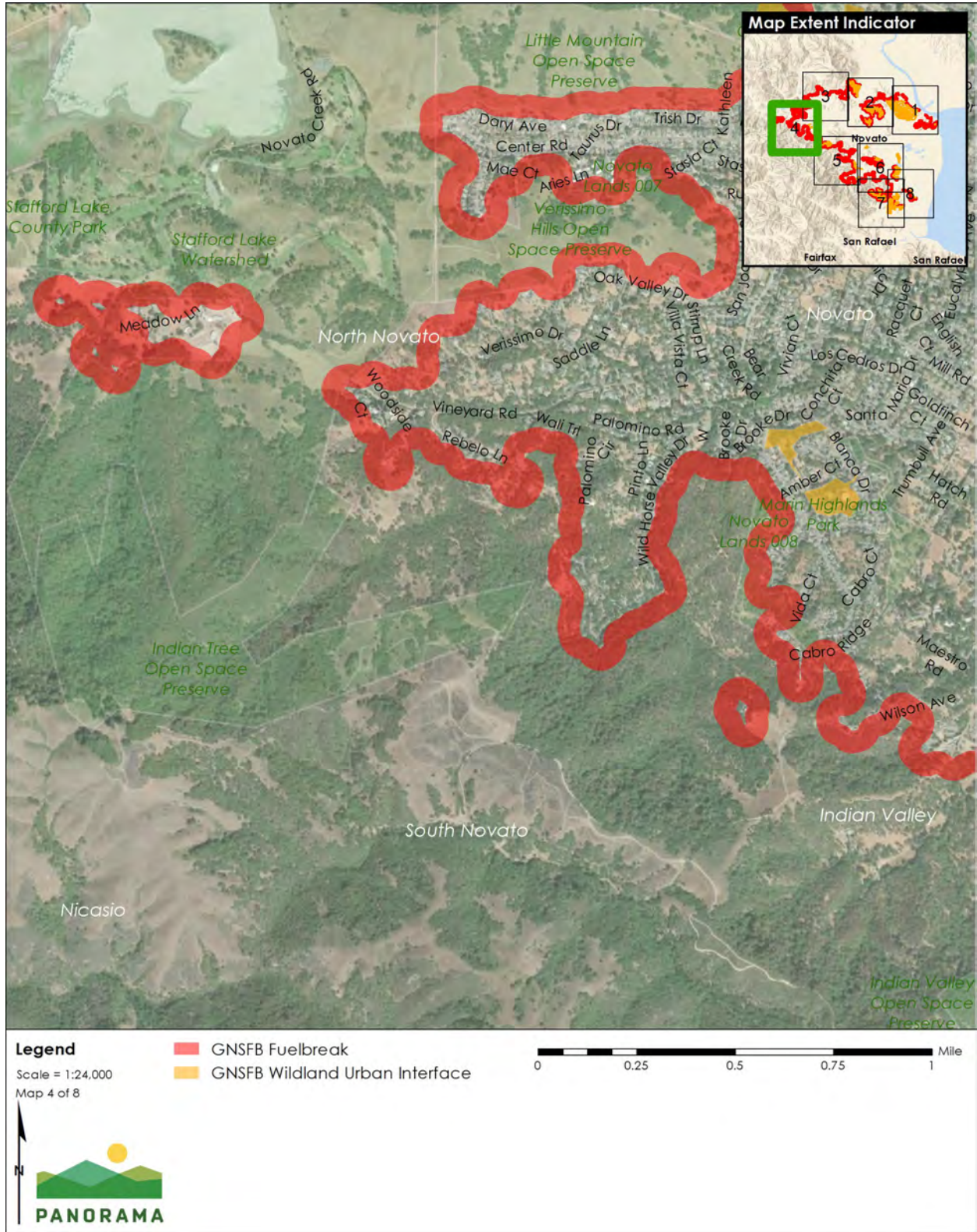
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Figure 1-2 Overall Proposed GNSFB Project (Map 2 of 8)



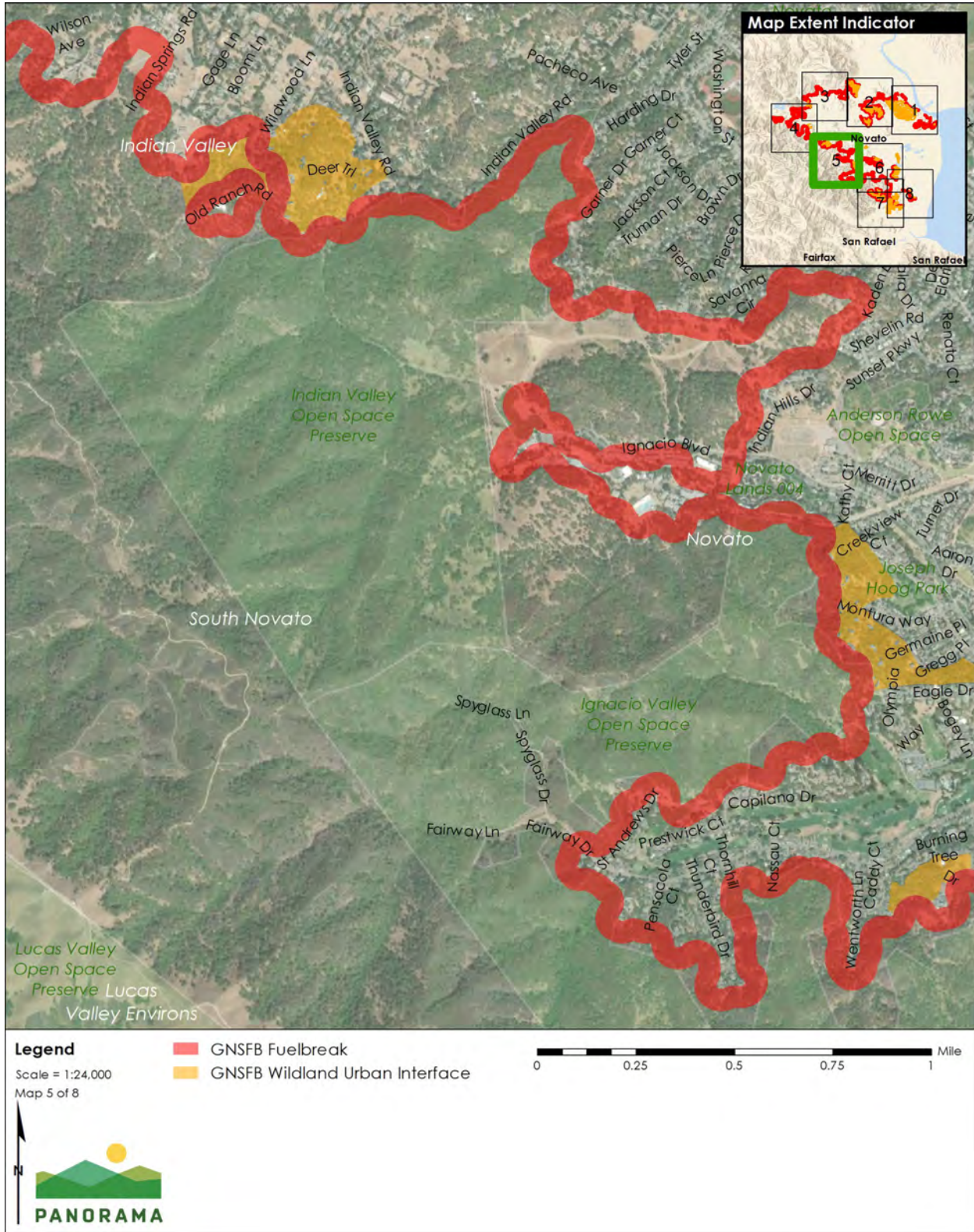
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Figure 1-4 Overall Proposed GNSFB Project (Map 4 of 8)



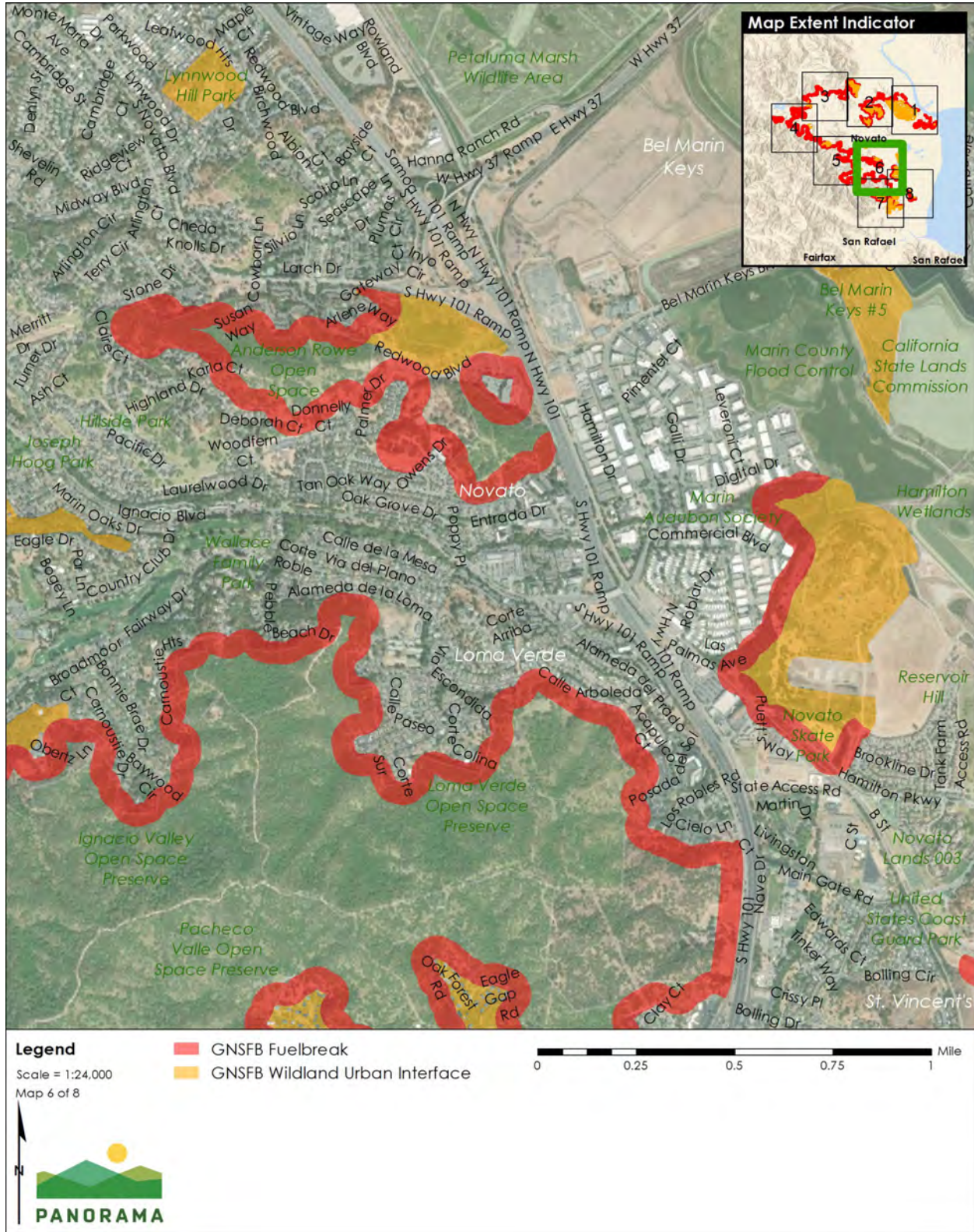
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Figure 1-5 Overall Proposed GNSFB Project (Map 5 of 8)



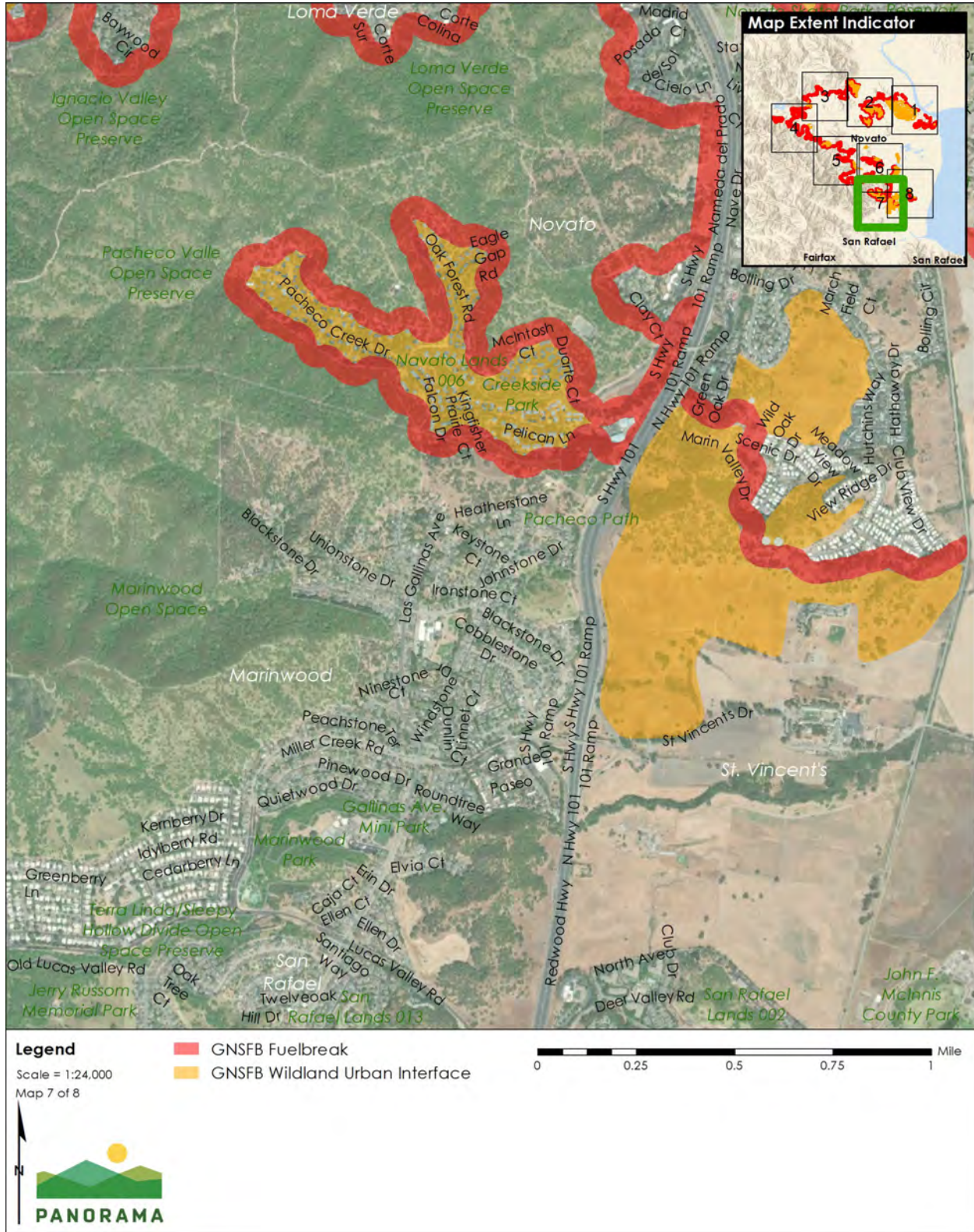
1 INTRODUCTION

Figure 1-6 Overall Proposed GNSFB Project (Map 6 of 8)



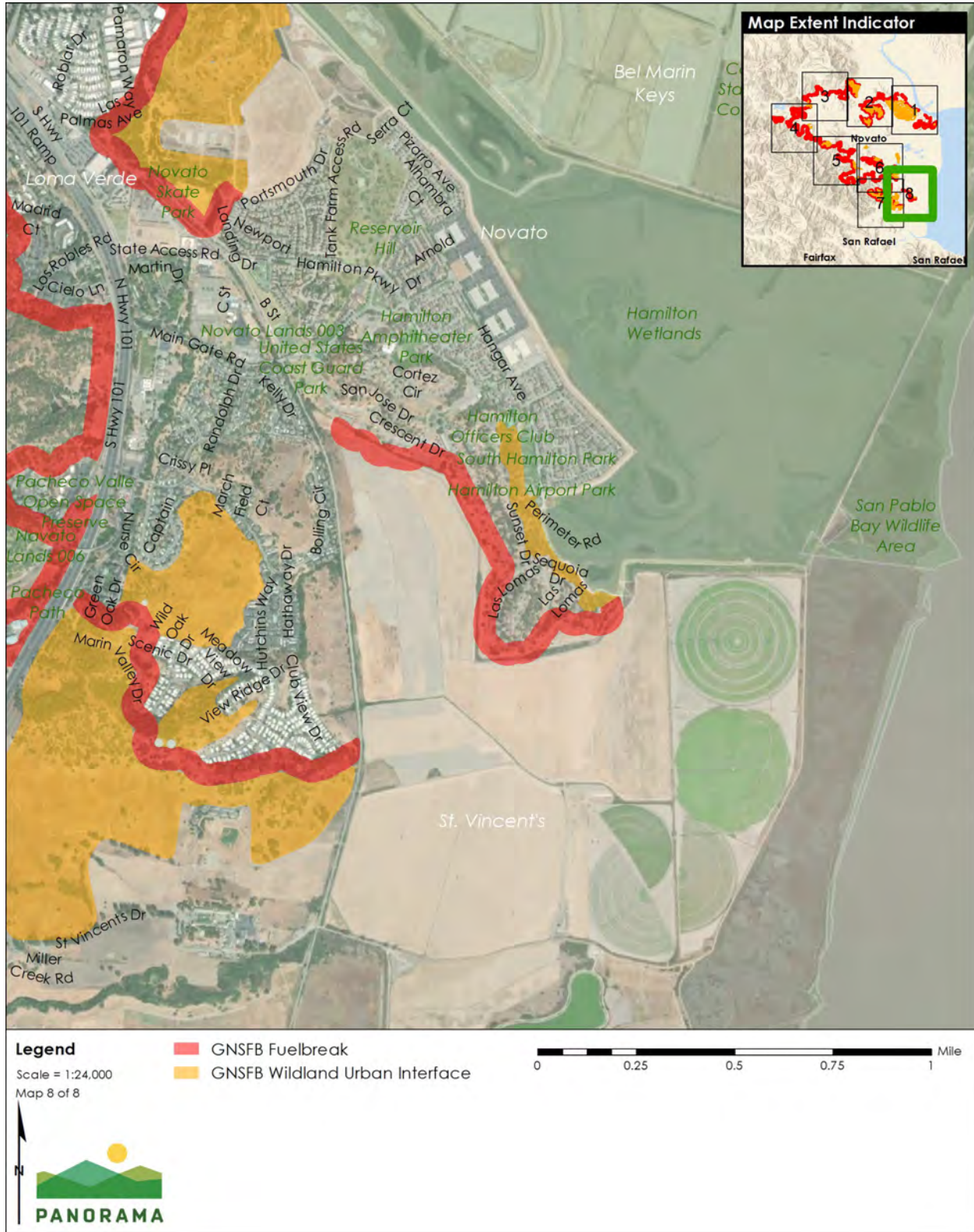
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Figure 1-7 Overall Proposed GNSFB Project (Map 7 of 8)



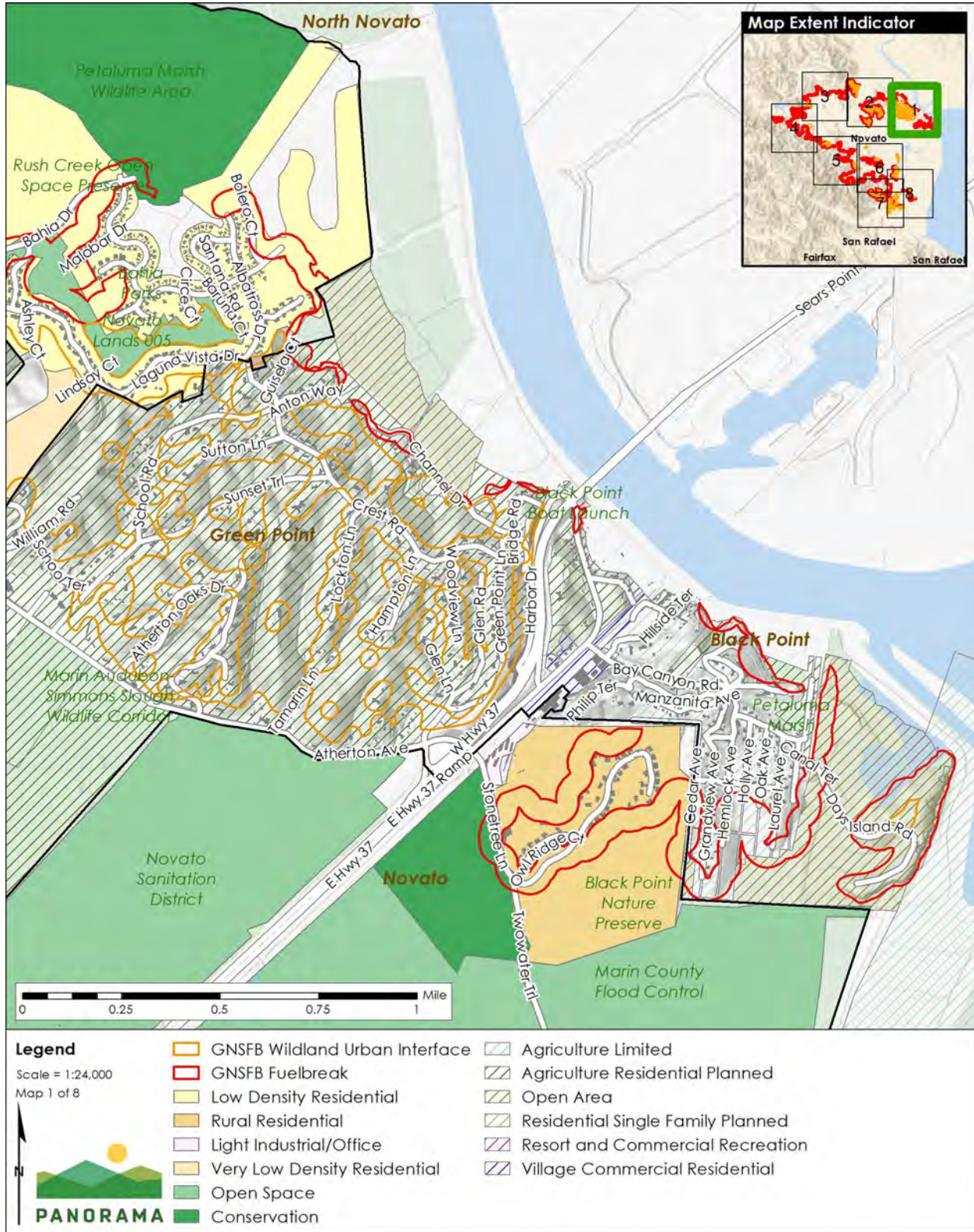
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Figure 1-8 Overall Proposed GNSFB Project (Map 8 of 8)



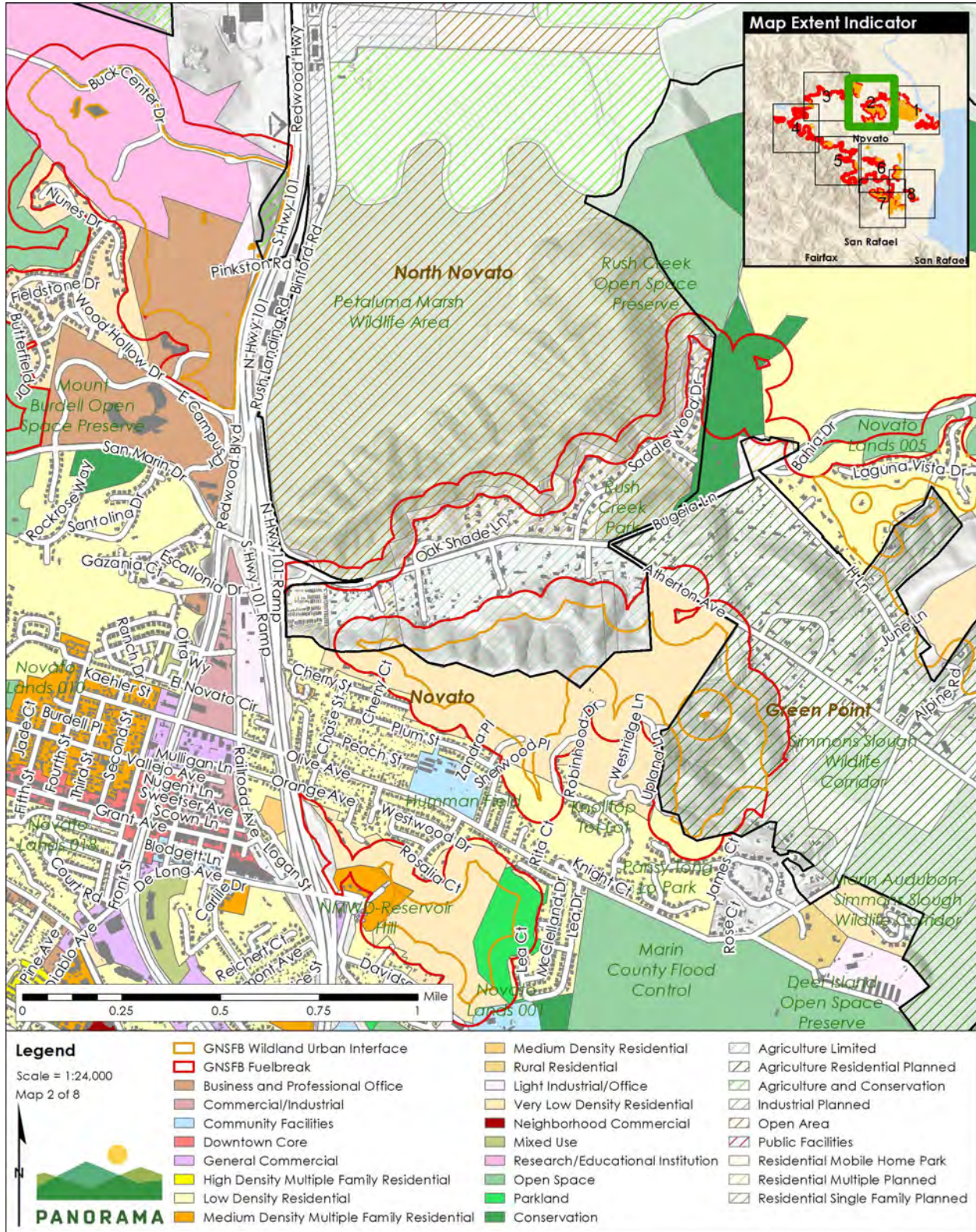
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Figure 1-9 Land Management in the Area of the Proposed Project (Map 1 of 8)



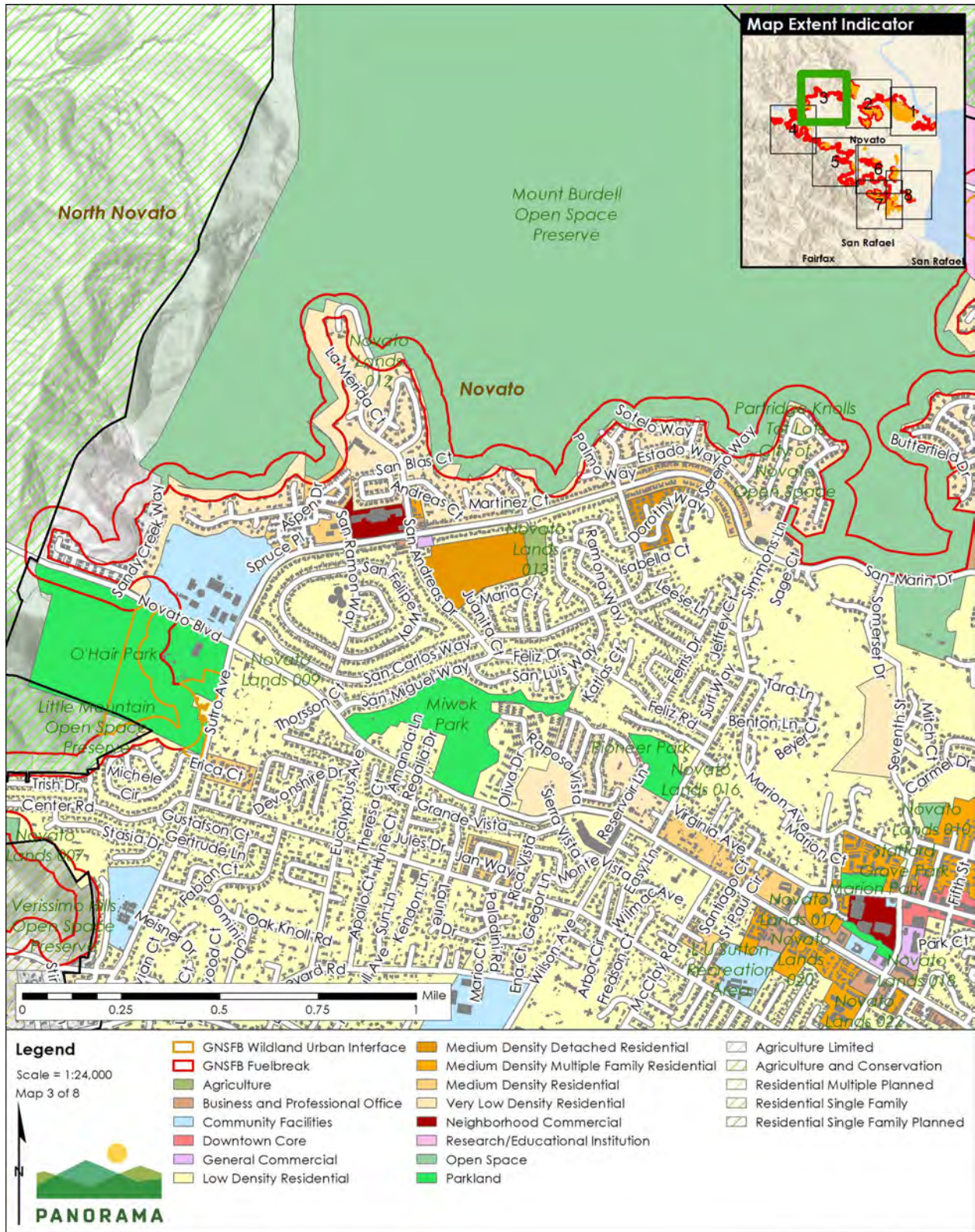
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Figure 1-10 Land Management in the Area of the Proposed Project (Map 2 of 8)



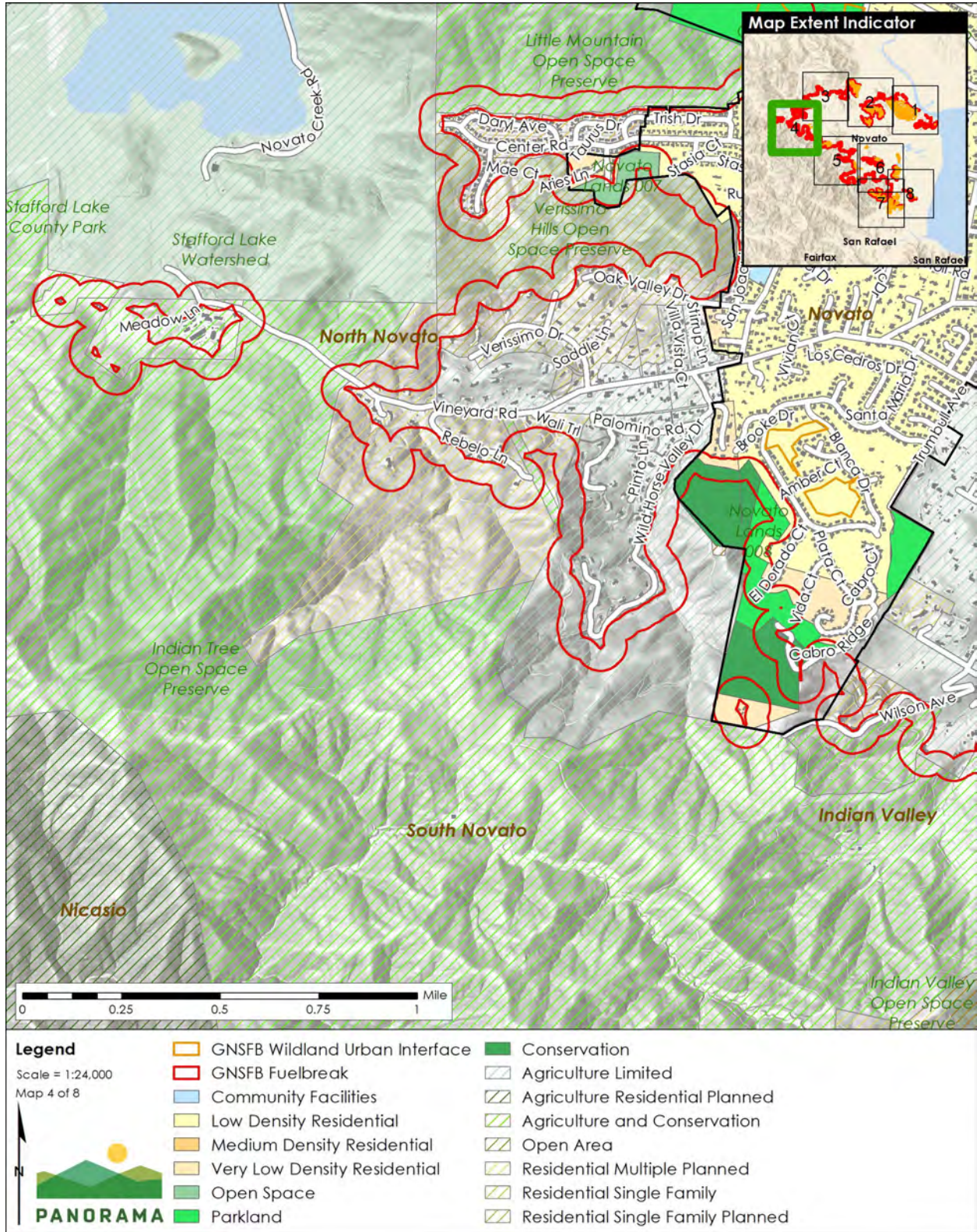
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Figure 1-11 Land Management in the Area of the Proposed Project (Map 3 of 8)



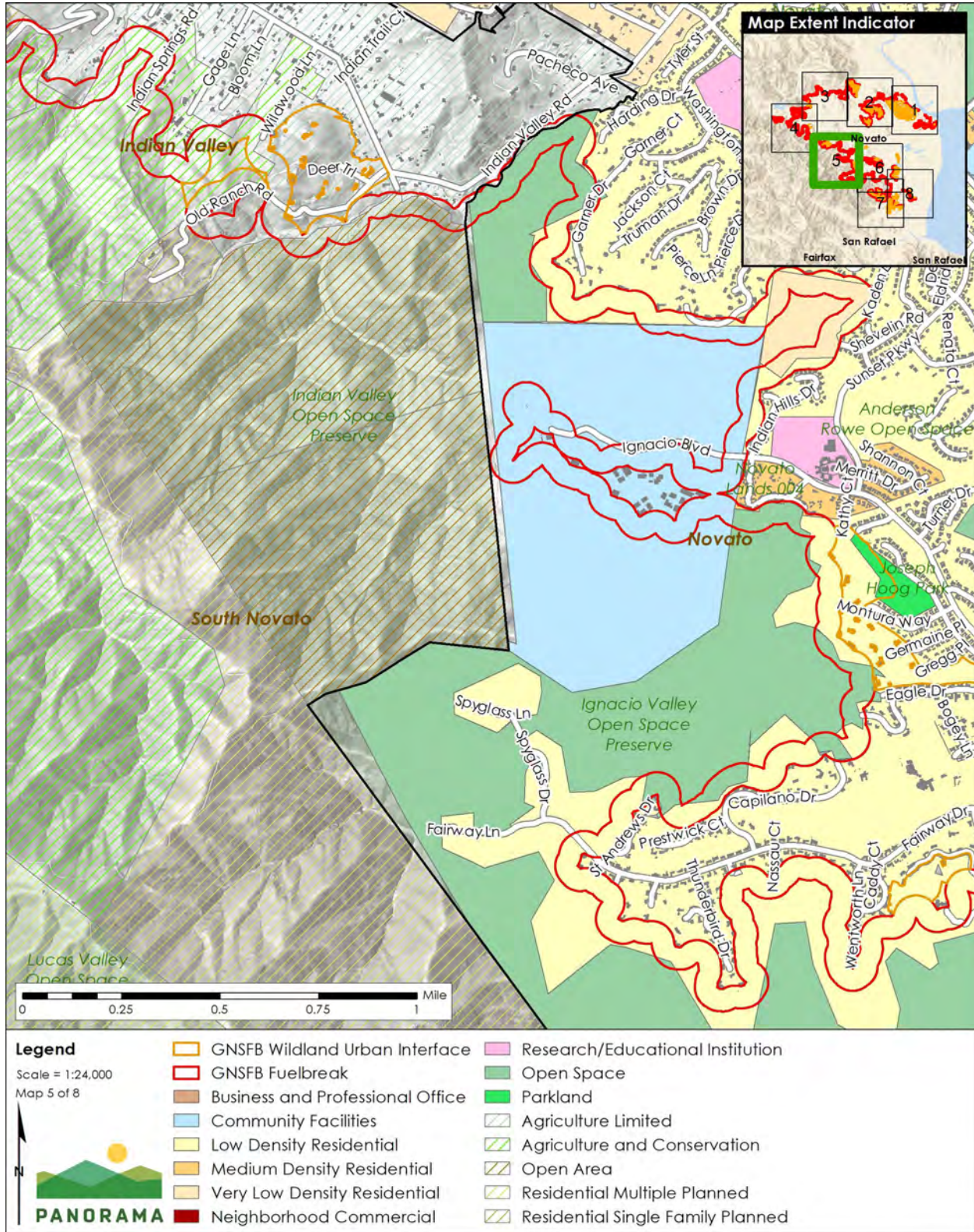
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Figure 1-12 Land Management in the Area of the Proposed Project (Map 4 of 8)



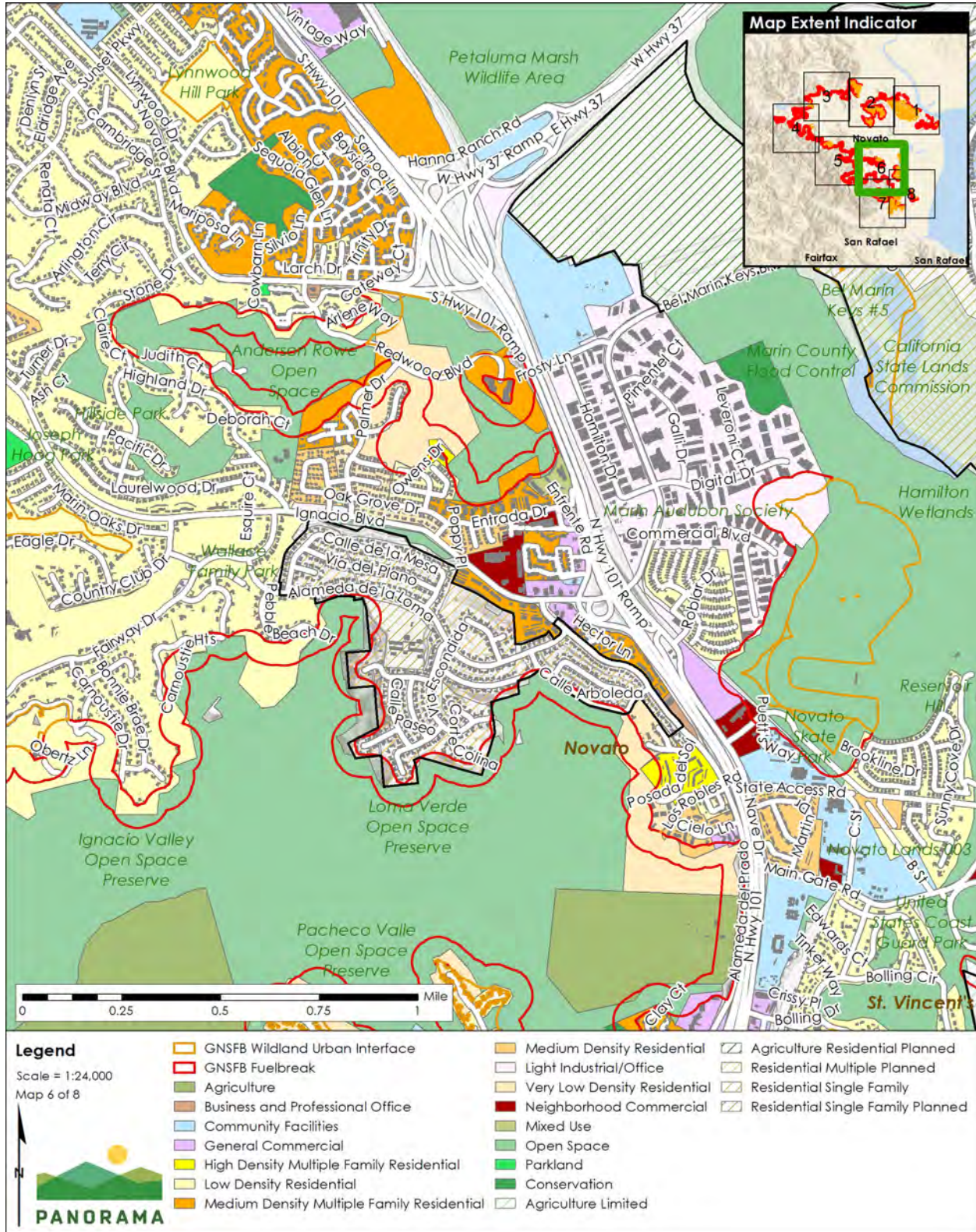
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Figure 1-13 Land Management in the Area of the Proposed Project (Map 5 of 8)



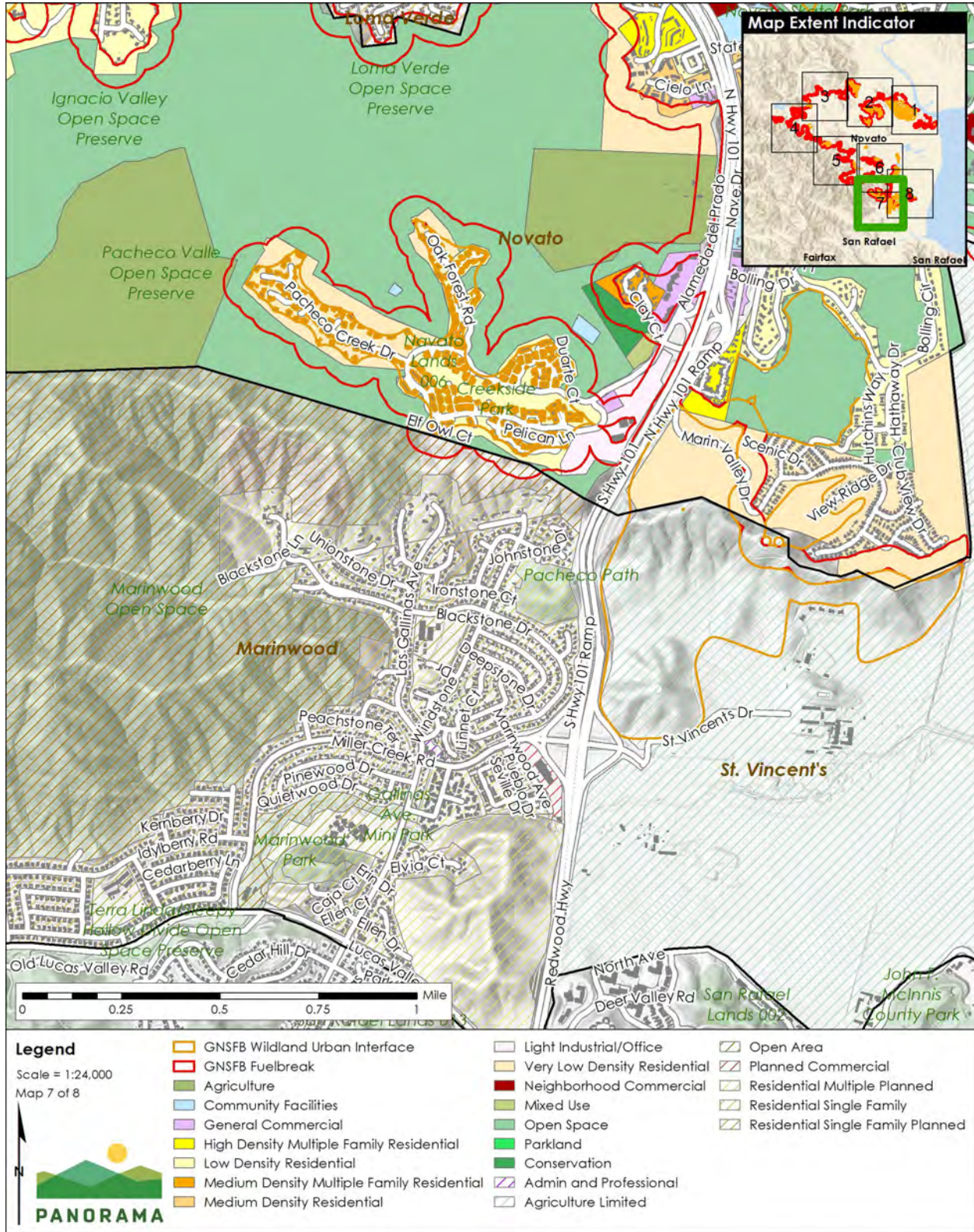
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Figure 1-14 Land Management in the Area of the Proposed Project (Map 6 of 8)



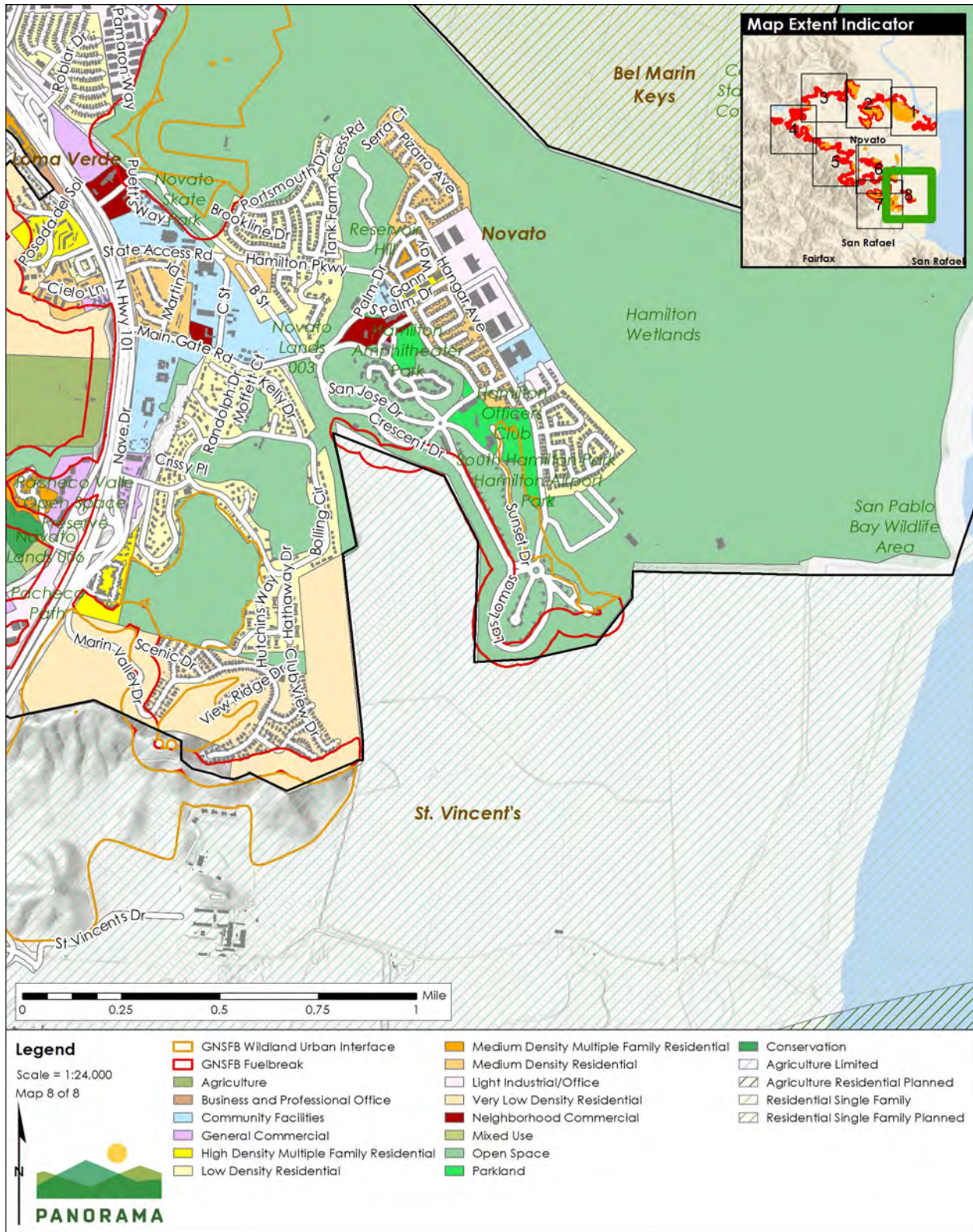
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Figure 1-15 Land Management in the Area of the Proposed Project (Map 7 of 8)



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Figure 1-16 Land Management in the Area of the Proposed Project (Map 8 of 8)



1.2 California Environmental Quality Act

The MWPA has evaluated the proposed treatments for California Environmental Quality Act (CEQA) compliance as later activities covered by CAL FIRE's California Vegetation Treatment Program (CalVTP) Program Environmental Impact Report (PEIR) using the Project-Specific Analysis (PSA) checklist herein. For the purposes of implementing the CalVTP, the MWPA is considered the project proponent, as it provides funding for the proposed vegetation treatment and is serving as the CEQA lead agency. Novato Fire District will manage the implementation of the project. Approximately 16 percent of the proposed project falls within Marin County Open Space District (MCOSED) and Marin County Parks lands. MCOSED/Marin County Parks and Novato Fire District are, therefore, responsible agencies under CEQA.

Consistent with CEQA Guidelines (Title 14, Division 6, Chapter 3 of the California Code of Regulations) section 15168(c)(2), if the potential environmental impacts of a proposed vegetation treatment project are determined to be covered by the environmental impacts analyzed in the PEIR, the project may be approved using a finding that the project is within the scope of the PEIR. Such a finding would constitute CEQA compliance under the PEIR. The PEIR identified the range of environmental impacts associated with vegetation treatment projects and required implementation of standard project requirements (SPRs) and mitigation measures (MMs) to address and minimize these impacts. In accordance with the PEIR, all relevant SPRs and MMs would be incorporated into the proposed project. Under CEQA, no additional review is required for a project that is consistent with the PEIR.

The CalVTP identifies the portion of the SRA where vegetation conditions are suitable for treatments as "the treatable landscape." Within the GNSFB project area, 1,329 acres are within the treatable landscape and 2,134 acres are outside of the modeled treatable landscape. However, under the CalVTP, areas outside the treatable landscape can be included in the PEIR through an addendum if the types of vegetation are covered already, the types of treatment methods are covered, and no new or substantially greater impacts would occur. This document, therefore, also serves as an addendum to the CalVTP PEIR for the inclusion of the additional 2,134 acres outside of the modeled treatable landscape. The analysis of the proposed project (Project ID 2023-06) presented in this PSA and addendum covers fuels reduction activities that would occur generally from 0 up to 200 feet around structures and the community on private lands in addition to public lands. An additional 100 feet are reviewed under CEQA to provide flexibility during implementation of the proposed project.

According to Public Resources Code (PRC) 4291, private homeowners are required to maintain defensible space of 100 feet around structures, but not beyond the property line unless a greater distance or fuel modification beyond the property line is required by regulation. Defensible space treatment activities conducted by private homeowners with private funding in accordance with state and local regulations does not constitute a project under CEQA (CEQA Guidelines sections 15377–15378) and, thus, private homeowners are not required to comply with CEQA. This analysis affords the opportunity for public funds to be used to implement defensible space on private property within 100 feet of structures; however, in general, these

1 INTRODUCTION

treatments would be conducted by the individual homeowners, who would not be required to comply with this PSA and addendum.

Implementation of the proposed project would be managed by the Novato Fire District and would be partially or fully funded by Measure C funds administered by the MWPA over the coming years. Grant funding for implementation of the proposed project is being considered and, if sought and awarded, would be used to implement all or portions of the proposed project over the coming years.

1.3 Purpose of the Project-specific Analysis and Addendum

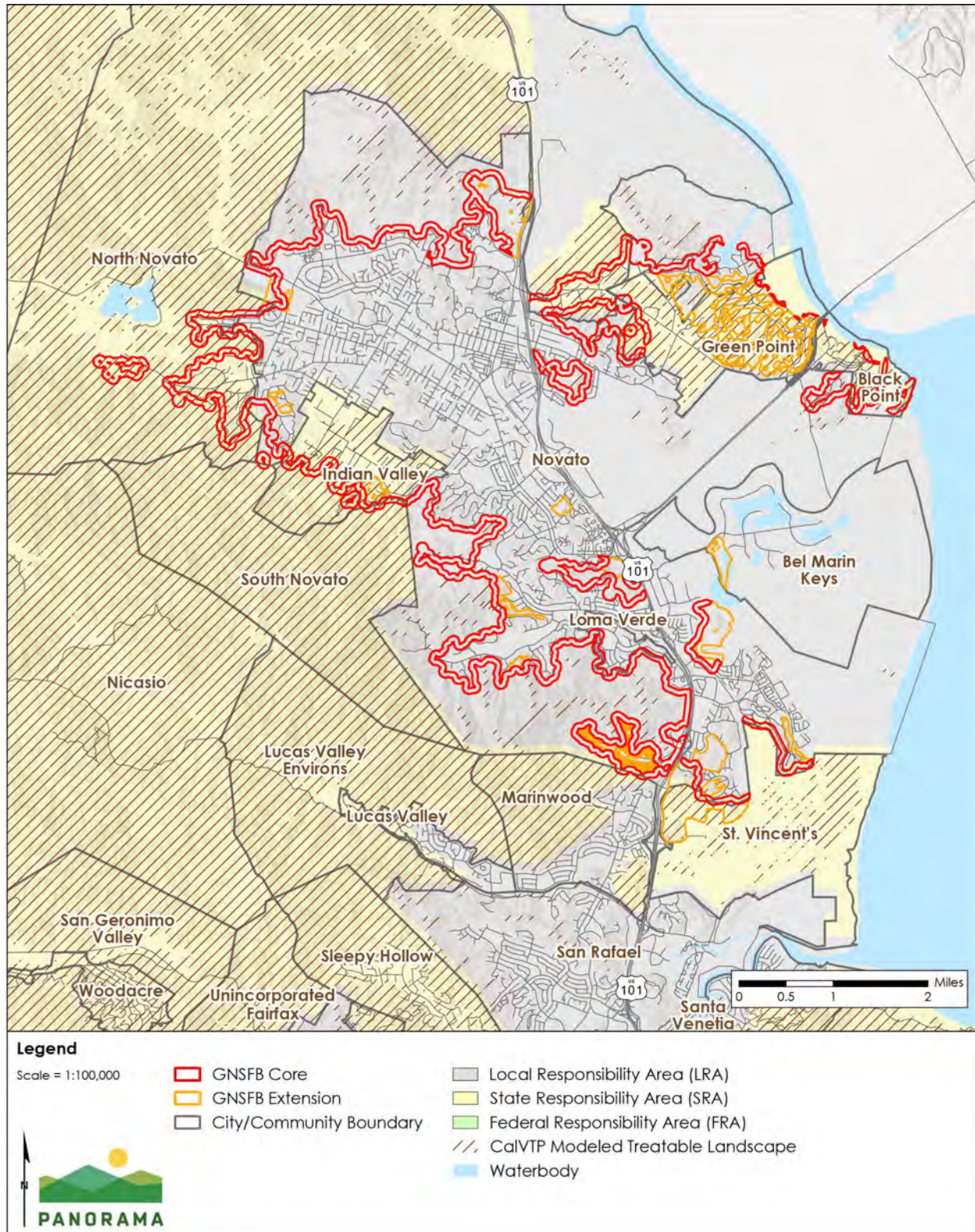
This document serves as a PSA and addendum to evaluate whether the proposed project is within the scope of the CalVTP PEIR. Proposed treatment projects qualifying as within the scope of the PEIR must be consistent with the treatment types and treatment activities covered in the CalVTP and the geographic extent of the CalVTP treatable landscape.

As further discussed in Chapter 2 Project Description, the proposed treatment types and treatment activities are all consistent with those described in the CalVTP PEIR. The project contains proposed treatment areas within and outside of the CalVTP treatable landscape due to the method by which the CalVTP treatable landscape was digitally modeled and the resulting degree of mapping resolution. These areas falling outside of the CalVTP treatable landscape are dispersed in sections of treatment areas, as shown in Figure 1-15 through Figure 1-21. The CalVTP treatable landscape was modeled using desktop applications to exclude certain vegetation types (e.g., wetlands), to apply buffers around geographic and topographic features, and to demarcate jurisdictional boundaries (e.g., SRAs and LRAs), which resulted in some disjointed and scattered treatable landscape areas. Since the areas of the proposed project outside of the CalVTP treatable landscape have essentially the same, or substantially similar, landscape conditions and vegetation cover as the adjacent areas within the treatable landscape, the environmental analysis in the PEIR is applicable.

Consistent with PRC 21166 and CEQA Guidelines sections 15162, 15163, 15164, and 15168, an addendum to an EIR is appropriate where a previously certified EIR has been prepared and some changes or revisions to the project are proposed, or the circumstances surrounding the project have changed, but none of the changes or revisions result in new or substantially more severe significant environmental impacts. For the proposed project, the proposal to treat areas outside of the CalVTP treatable landscape represents a minor revision or change to the project (i.e., the CalVTP treatable landscape). The PSA checklist (see Chapter 3 The California Vegetation Treatment Program Environmental Checklist) includes the criteria to support an addendum to the CalVTP PEIR for the inclusion of proposed treatment areas outside the CalVTP treatable landscape.

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Figure 1-17 Proposed GNSFB Project Within and Outside the CalVTP Modeled Treatable Landscape



1 INTRODUCTION

The checklist evaluates each environmental resource topic in terms of whether the proposed project, including the “changed condition” of additional and expanded geographic area, would result in significant impacts that would be substantially more severe than those covered in the PEIR and/or would result in any new impacts that were not covered in the PEIR.

This document serves as both a PSA and an addendum to the CalVTP PEIR for analysis under CEQA for the proposed project. The project-specific mitigation monitoring and reporting program, which identifies the CalVTP SPRs and MMs applicable to the proposed project, is included as Attachment F. The SPRs identified in Attachment F have been incorporated into the proposed vegetation treatments as a standard part of treatment design and implementation.

2 Project Description

2.1 Project Location

The project would involve reducing fuel loads around the City of Novato, including the neighborhoods of North Novato, Green Point, Black Point, Bel Marin Keys, Loma Verde, St. Vincent's, South Novato, and Indian Valley, bordering open spaces and within the WUI. The proposed GNSFB project passes through land owned and/or managed by local jurisdictions, MCOSED/Marin County Parks, North Marin Water District (NMWD), and private landowners. Existing or approved fuels management areas in Novato approved under separate CEQA processes and programs are included in the overall proposed project analyzed in this PSA and addendum, as these areas tie into the overall effectiveness of the proposed project. These existing or approved fuels management areas may be treated in the future under this proposed project or continue to be treated as part of the already approved projects. Wildfire hazard risk is very high or high in most of the fuel break and WUI (1,984 acres) with moderate risk as the second largest acreage (1,338 acres), as identified by the Fire Hazard Zones. This is as a result of both the spread of exotic, invasive, fire-hazardous vegetation and decades of dead vegetation accumulation due to over a hundred years of fire suppression and the increased risk of anthropogenic ignition due to the density of urban development. The proposed project area is shown in Figure 1-1 through Figure 1-8.

2.2 Description of Project

2.2.1 Purpose

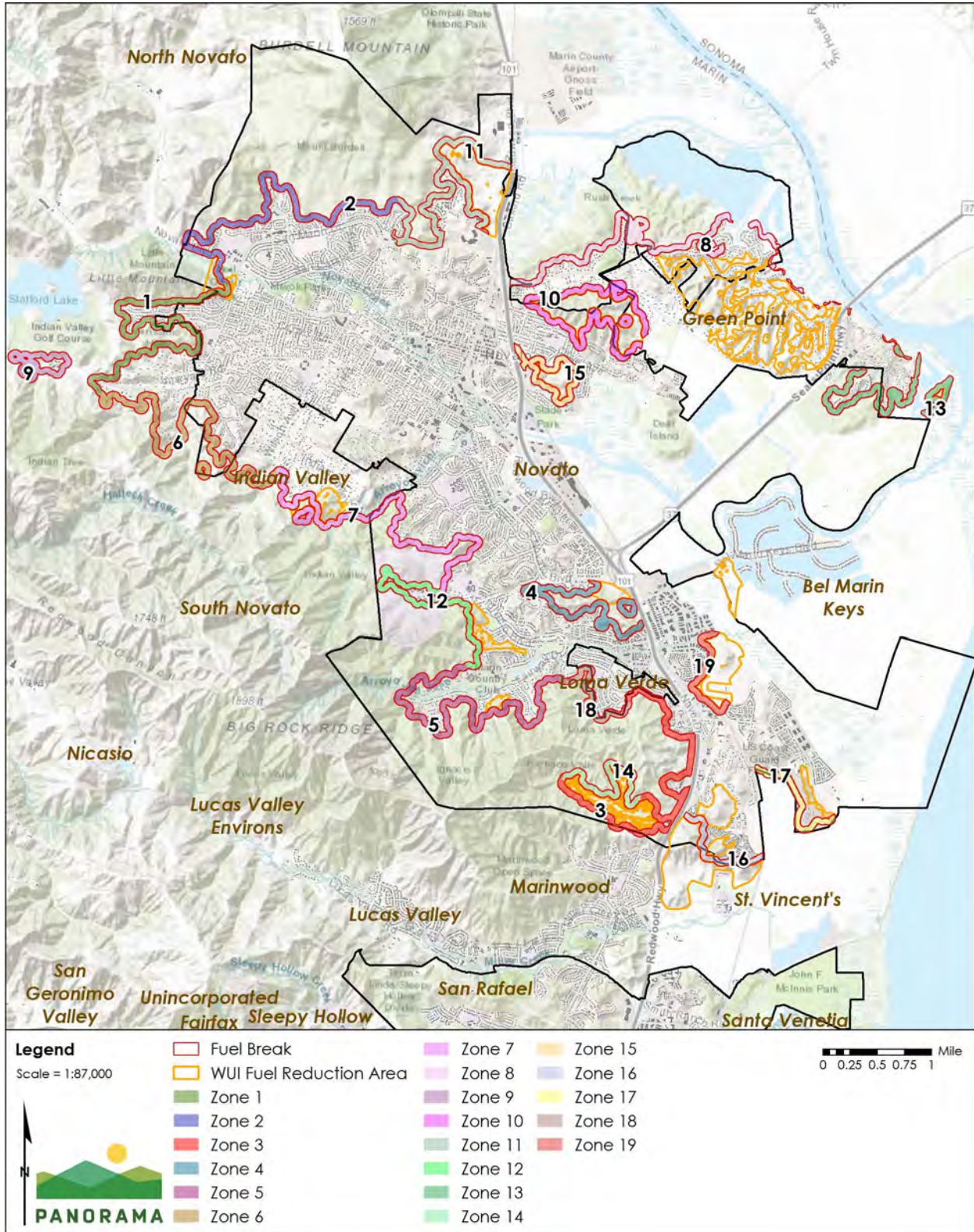
The purpose of the project is to create and maintain a continuous reduced-fuel and forest-health-restoration zone around the community of Novato to reduce wildfire hazards, including wildfire intensity and rate of spread, and to provide strategic locations for firefighters and emergency personnel to fight a wildfire in the event of ignition. To achieve this goal, the project would reduce excess and ladder fuels within a fuel break generally 200 feet wide (but up to 300 feet) and adjacent wildland areas and restoring forest health by enhancing native, fire-resilient plant communities, primarily through invasive species removal, removing lower tree limbs, thinning small trees and shrubs, and removal of dead and down woody debris.

2.2.2 Proposed CalVTP Treatments

The proposed project is broken up according to prioritized segments, shown in Figure 2-1, and land ownership, which is shown in Table 2-1. The project areas by vegetation type are shown in

2 PROJECT DESCRIPTION

Figure 2-1 Proposed GNSFB Project Modeled Prioritization



2 PROJECT DESCRIPTION

Table 2-2. The proposed CalVTP treatments for both initial and maintenance treatments are listed in Table 2-3 and shown in Figure 2-2 through Figure 2-9.

Table 2-1 Project Segments by Land Ownership and Size

Project segments (see Section 2.2.3)	Land manager	Acres	Total acres	Estimated schedule for initial treatments ^a
1	Marin County Open Space District	76.4	151.8	Spring/summer 2023
	North Marin Water District	6.7		
	City of Novato	14.7		
	Private/other	54.0		
2	Marin County Open Space District	73.2	148.2	Spring/summer 2023
	City of Novato	17.7		
	Private/other	57.3		
3	Marin County Open Space District	58.4	150.9	Spring 2023 to January 2024
	Marin County Parks Department	0.7		
	Marinwood Community Services District	0.9		
	City of Novato	5.6		
	Private/other	85.3		
4	City of Novato	54.9	114.0	Spring 2023 to January 2024
	Private/other	59.1		
5	Marin County Open Space District	48.3	153.9	Spring 2023 to January 2024
	Private/other	105.6		
6	City of Novato	15.1	170.1	Spring 2023 to January 2024
	Private/other	155.1		
7	Marin County Open Space District	33.9	168.7	Spring 2023 to January 2024
	Private/other	134.8		

2 PROJECT DESCRIPTION

Project segments (see Section 2.2.3)	Land manager	Acres	Total acres	Estimated schedule for initial treatments ^a
8	California Department of Fish and Wildlife	1.5	164.9	Spring 2025 to January 2026
	Marin County Open Space District	38.7		
	City of Novato	22.0		
	Private/other	102.7		
9	North Marin Water District	20.4	61.6	Spring 2024 to January 2025
	Private/other	41.2		
10	Private/other	154.1	154.1	Spring 2025 to January 2026
11	Marin County Open Space District	70.3	149.7	Spring 2025 to January 2026
	Private/other	79.4		
12	Marin County Open Space District	14.1	94.8	Spring 2024 to January 2025
	City of Novato	1.9		
	Private/other	78.8		
13	California Department of Fish and Wildlife	46.5	130.4	Spring 2023 to January 2026
	Marin County Parks Department	7.8		
	Private/other	76.1		
14	Marin County Open Space District	48.3	62.8	Spring 2024 to January 2025
	Private/other	14.5		
15	North Marin Water District	2.7	68.0	Spring 2025 to January 2026
	City of Novato	17.2		
	Private/other	48.1		
16	Private/other	42.1	42.1	Spring 2023 to January 2024

2 PROJECT DESCRIPTION

Project segments (see Section 2.2.3)	Land manager	Acres	Total acres	Estimated schedule for initial treatments ^a
17	Private/other	45.6	45.6	Spring 2024 to January 2025
18	Marin County Open Space District	36.3	44.7	Spring 2024 to January 2025
	Private/other	8.4		
19	City of Novato	1.4	44.3	Spring 2024 to January 2025
	Private/other	42.7		
WUI fuels reduction area	California Department of Fish and Wildlife	2.2	1,340	As needed
	California State Coastal Conservancy	13.3		
	California State Lands Commission	12.6		
	Marin County Open Space District	3.5		
	Marin County Public Works Dept./Flood Control	3.8		
	North Marin Water District	2.8		
	City of Novato	97.8		
	Private/other	1,202.4		
	Total GNSFB project	private		
	public	872.8		

Notes:

^a Timing may change based on funding sources, resource availability, and changing conditions. More segments may be completed sooner should grant funding be available or if work has already been completed in some areas. Maintenance of earlier segments may overlap initial treatments on later segments.

^b Numbers may not add due to rounding.

Table 2-2 Project Areas by Vegetation Type

Vegetation community	Vegetation type	Acres	Percentage
WUI fuels reduction area			

2 PROJECT DESCRIPTION

Vegetation community	Vegetation type	Acres	Percentage
Developed	Developed	56.6	5.1
	Major road	0.1	0.0
	<i>Subtotal</i>	<i>56.7</i>	<i>5.1</i>
Forest fragment ^a	Forest fragment	7.3	0.7
Freshwater Wetland	Arid West Freshwater Marsh Group	3.2	0.3
	Vancouverian Freshwater Wet Meadow & Marsh Group	25.6	2.3
	<i>Subtotal</i>	<i>28.8</i>	<i>2.6</i>
Herbaceous	Californian Annual & Perennial Grassland	371.9	33.8
Native forest	<i>Acer macrophyllum</i> – <i>Alnus rubra</i> Alliance	1.2	0.1
	<i>Arbutus menziesii</i> Alliance	3.7	0.3
	<i>Salix gooddingii</i> – <i>Salix laevigata</i> Alliance	0.3	0.0
	Umbellularia Californica Alliance	148.6	13.4
	<i>Subtotal</i>	<i>153.8</i>	<i>13.9</i>
Oak forest alliance	<i>Quercus agrifolia</i> Alliance	237.1	17.7
	<i>Quercus douglasii</i> Alliance	263.7	23.9
	<i>Quercus garryana</i> Alliance	78.6	7.1
	<i>Quercus lobata</i> Alliance	52.9	4.8
	<i>Subtotal</i>	<i>632.3</i>	<i>35.9</i>
Native shrub	<i>Baccharis pilularis</i> Alliance	31.2	5.7
	<i>Salix lasiolepis</i> Alliance	17.8	1.6
	<i>Subtotal</i>	<i>49.0</i>	<i>4.4</i>
Non-native forest	<i>Eucalyptus (globulus, camaldulensis)</i> Provisional Semi-Natural Association	7.5	0.7
	Non-native forest	10.5	1.0
	<i>Subtotal</i>	<i>17.8</i>	<i>1.6</i>
Non-native herbaceous	<i>Conium maculatum</i> – <i>Foeniculum vulgare</i> Semi-Natural Alliance	1.7	0.2

2 PROJECT DESCRIPTION

Vegetation community	Vegetation type	Acres	Percentage
	Non-native herbaceous	3.3	0.3
	<i>Subtotal</i>	<i>5.0</i>	<i>0.5</i>
Non-native shrub	<i>Rubus armeniacus</i> Semi-Natural Association	9.2	0.8
Shrub fragment	Shrub fragment	3.9	0.4
Tidal wetland	<i>Bolboschoenus maritimus</i> Alliance	0.8	0.1
	<i>Distichlis spicata</i> Alliance	0.4	0.0
	<i>Sarcocornia pacifica</i> (<i>Salicornia depressa</i>) Alliance	0.6	0.1
	<i>Subtotal</i>	<i>1.8</i>	<i>0.2</i>
Water	Water	1.4	0.1
Total WUI fuels reduction area		1,340	100
Shaded fuel break			
Annual cropland	Annual cropland	1.4	0.1
Barren	Barren and sparsely vegetated	1.4	0.1
Developed	Developed	154.2	7.3
	Major road	2.6	0.1
	Vineyard	3.1	0.2
	<i>Subtotal</i>	<i>159.9</i>	<i>7.5</i>
Forest fragment ^a	Forest fragment	6.2	0.3
Freshwater wetland	Arid West Freshwater Marsh Group	1.8	0.1
	Vancouverian Freshwater Wet Meadow & Marsh Group	8.9	0.4
	<i>Subtotal</i>	<i>10.7</i>	<i>0.5</i>
Herbaceous	Californian Annual & Perennial Grassland	531.3	25.0
Intensively managed hayfield	Intensively managed hayfield	6.2	0.3
Native forest	<i>Acer macrophyllum</i> – <i>Alnus rubra</i> Alliance	2.4	0.1
	<i>Arbutus menziesii</i> Alliance	83.4	3.8

2 PROJECT DESCRIPTION

Vegetation community	Vegetation type	Acres	Percentage
	Deciduous hardwood (urban window ^d)	1.2	0.1
	<i>Pseudotsuga menziesii</i> Mapping Unit	1.7	0.1
	<i>Salix gooddingii</i> – <i>Salix laevigata</i> Alliance	0.5	0.0
	<i>Sequoia sempervirens</i> Alliance	1.0	0.0
	<i>Umbellularia californica</i> Alliance	391.5	18.4
	<i>Subtotal</i>	<i>481.7</i>	<i>22.5</i>
Oak forest alliance	<i>Quercus agrifolia</i> Alliance	497.7.9	23.4
	<i>Quercus douglasii</i> Alliance	137.4	6.4
	<i>Quercus garryana</i> Alliance	30.8	1.4
	<i>Quercus kelloggii</i> Alliance	11.1	0.5
	<i>Quercus lobata</i> Alliance	144.9	6.7
	<i>Subtotal</i>	<i>821.9</i>	<i>38.4</i>
Native shrub	<i>Adenostoma fasciculatum</i> Alliance	1.8	0.1
	<i>Baccharis pilularis</i> Alliance	44.4	2.1
	<i>Salix lasiolepis</i> Alliance	23.0	1.1
	<i>Subtotal</i>	<i>69.2</i>	<i>3.3</i>
Non-native forest	<i>Eucalyptus (globulus, camaldulensis)</i> Provisional Semi-Natural Association	7.6	0.3
	Non-native forest	8.8	0.4
	<i>Subtotal</i>	<i>16.4</i>	<i>0.7</i>
Non-native shrub	Non-native shrub	5.7	0.3
Nursery or ornamental horticulture area	Nursery or ornamental horticulture area	1.3	0.1
Orchard or grove	Orchard or grove	2.1	1.8
Shrub fragment	Shrub fragment	5.1	0.2
Tidal wetland	<i>Sarcocornia pacifica (Salicornia depressa)</i> Alliance	1.0	0.1
	<i>Subtotal</i>	<i>1.0</i>	<i>0.1</i>

2 PROJECT DESCRIPTION

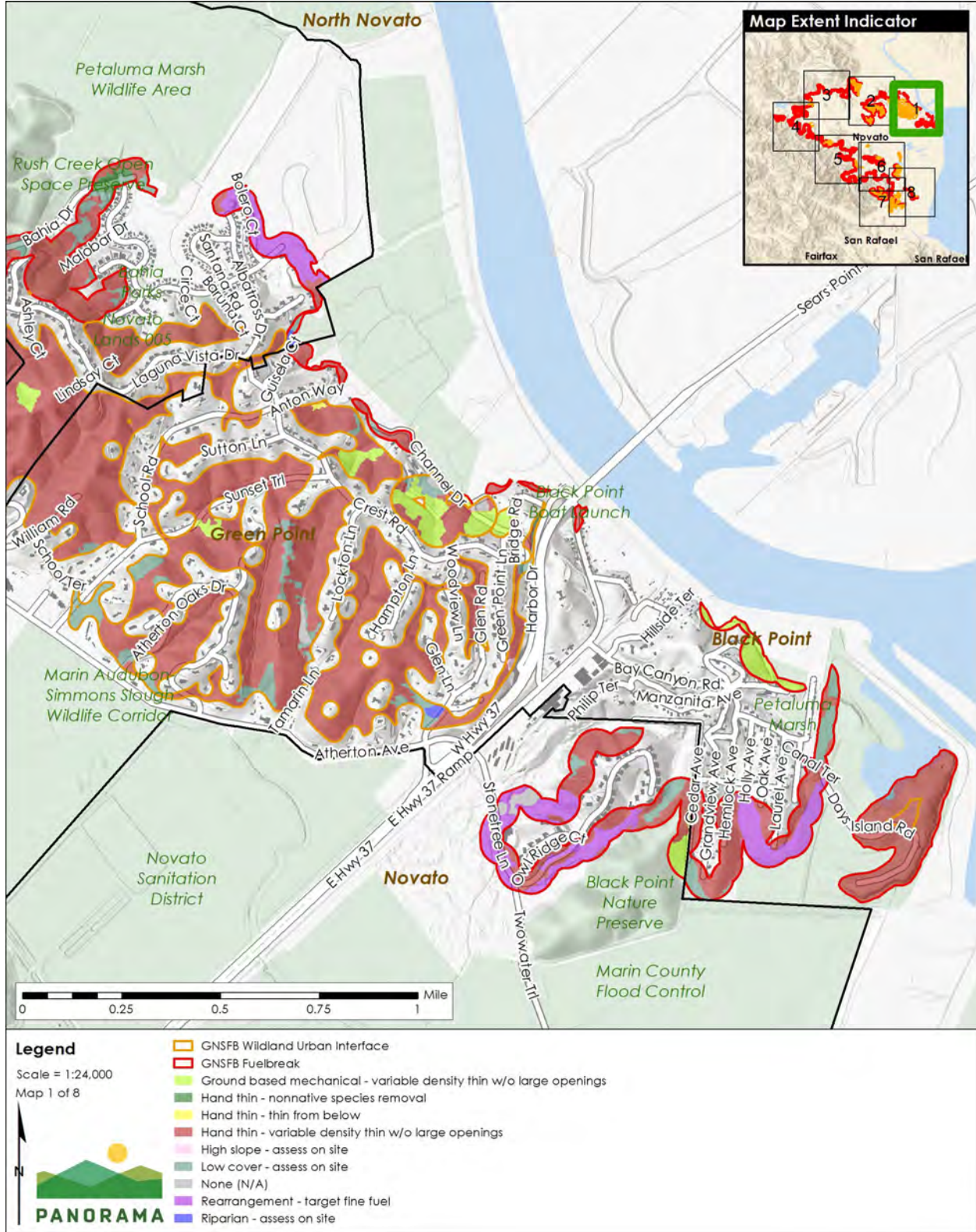
Vegetation community	Vegetation type	Acres	Percentage
Water	Water	2.1	0.1
Total shaded fuel break		2,123.5	100
Total GNSFB		3,463	

Notes:

- ^a Vegetation communities with less than 0.1 acre were not included in the table.
- ^b Water is not a vegetation type but a part of the mapped shaded fuel break area.
- ^c Forests surrounded by non-forest
- ^d Shrub or hardwood habitats within an urban core

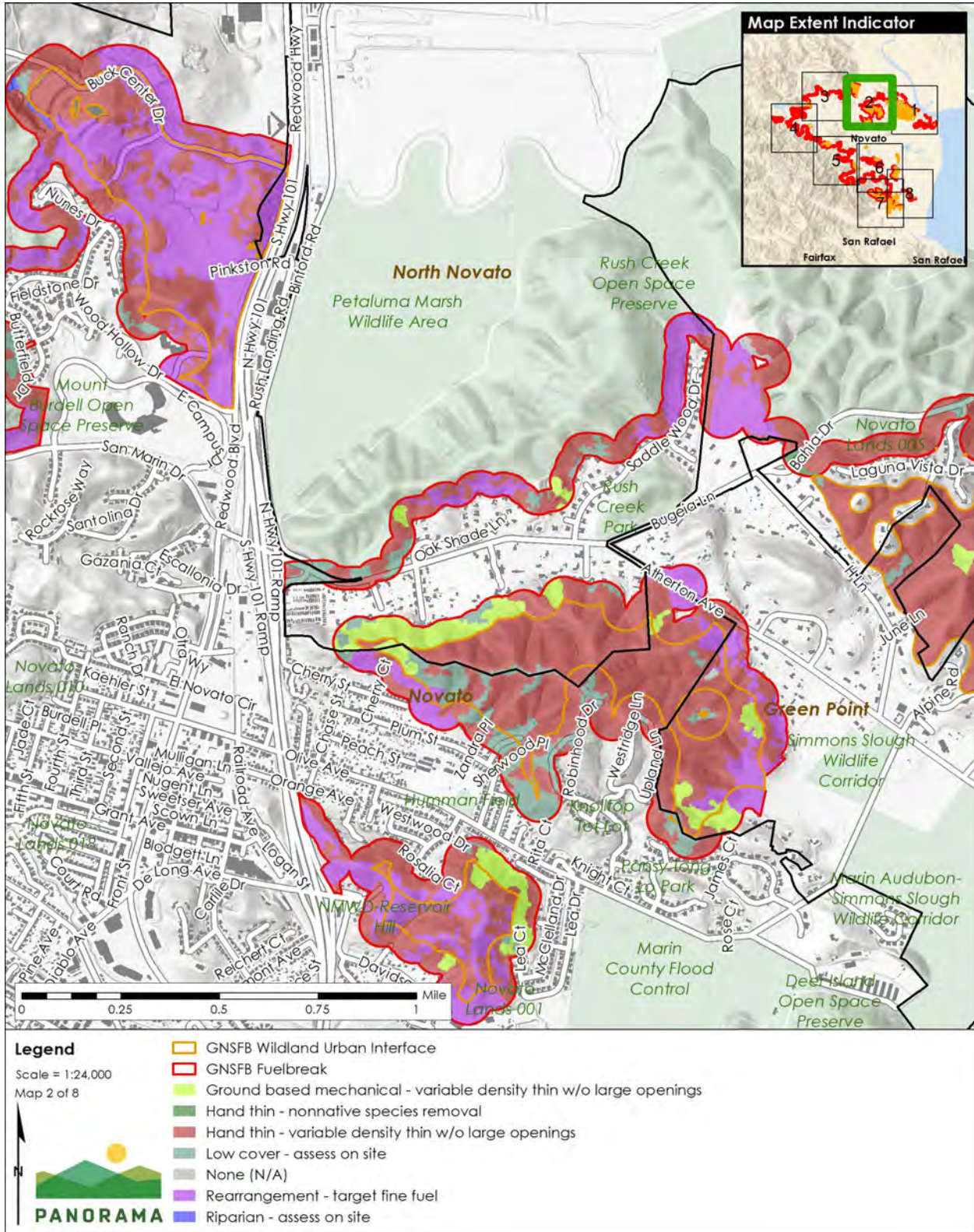
2 PROJECT DESCRIPTION

Figure 2-2 GNSFB Project Modeled Treatments (Map 1 of 8)



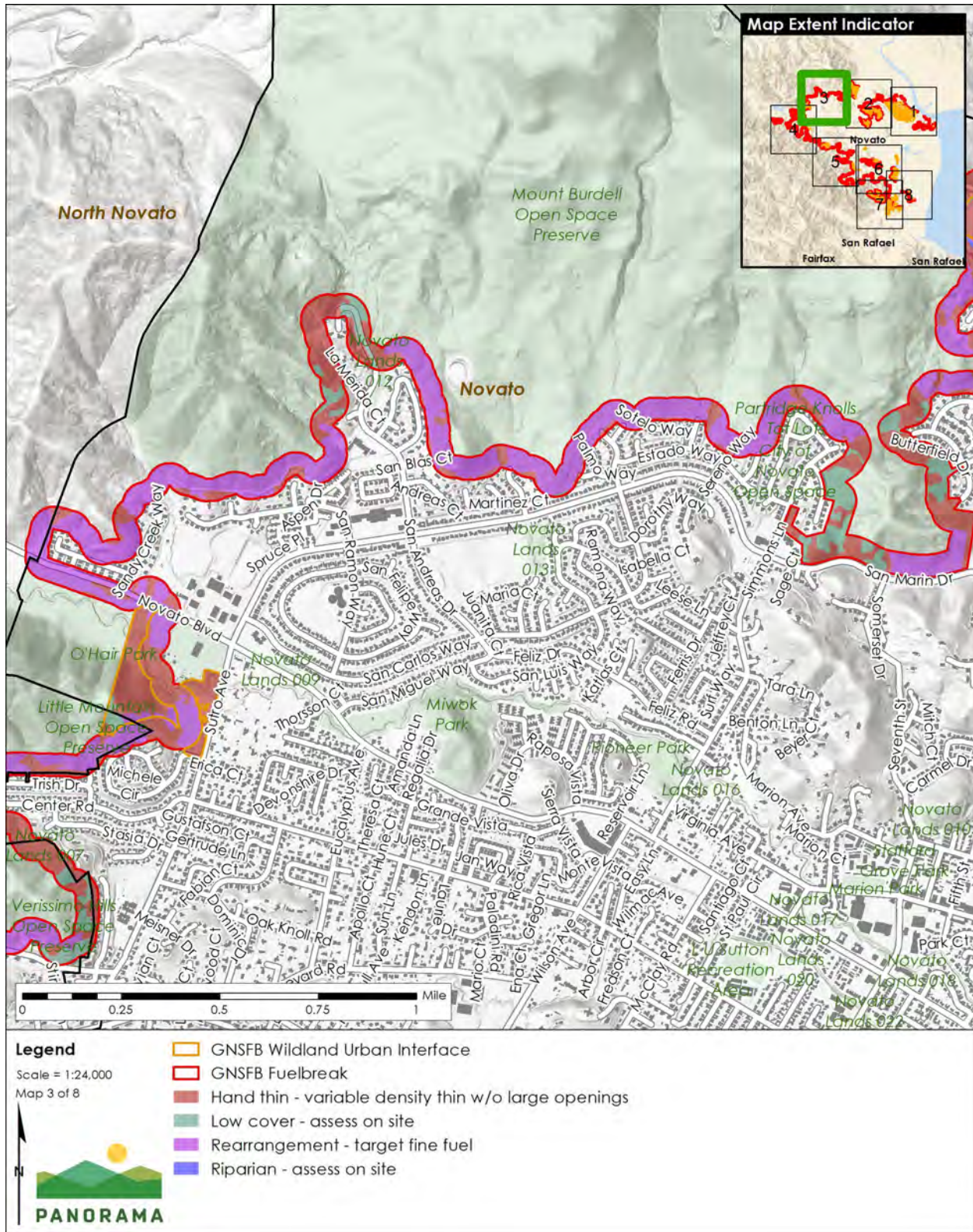
2 PROJECT DESCRIPTION

Figure 2-3 GNSFB Project Modeled Treatments (Map 2 of 8)



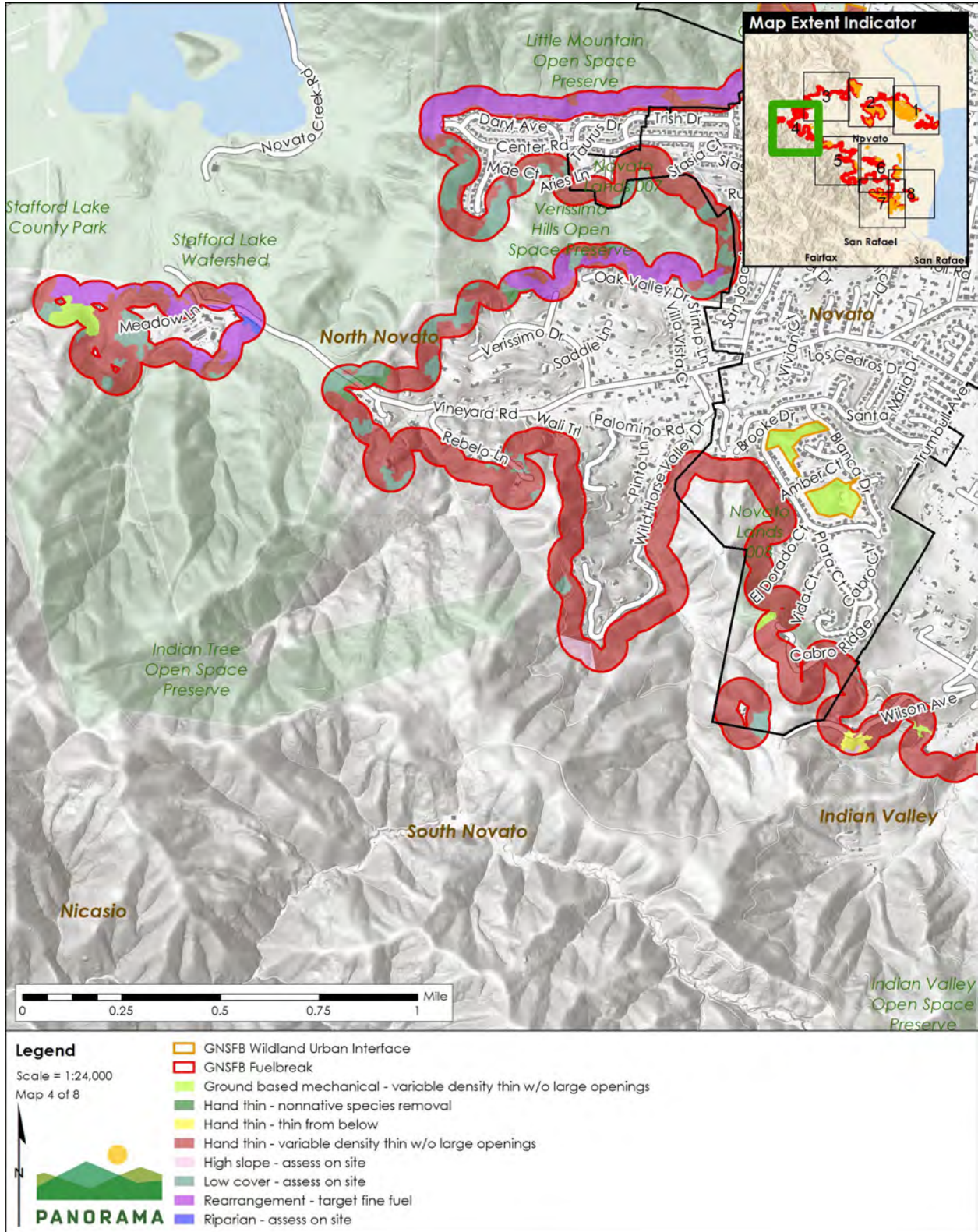
2 PROJECT DESCRIPTION

Figure 2-4 GNSFB Project Modeled Treatments (Map 3 of 8)



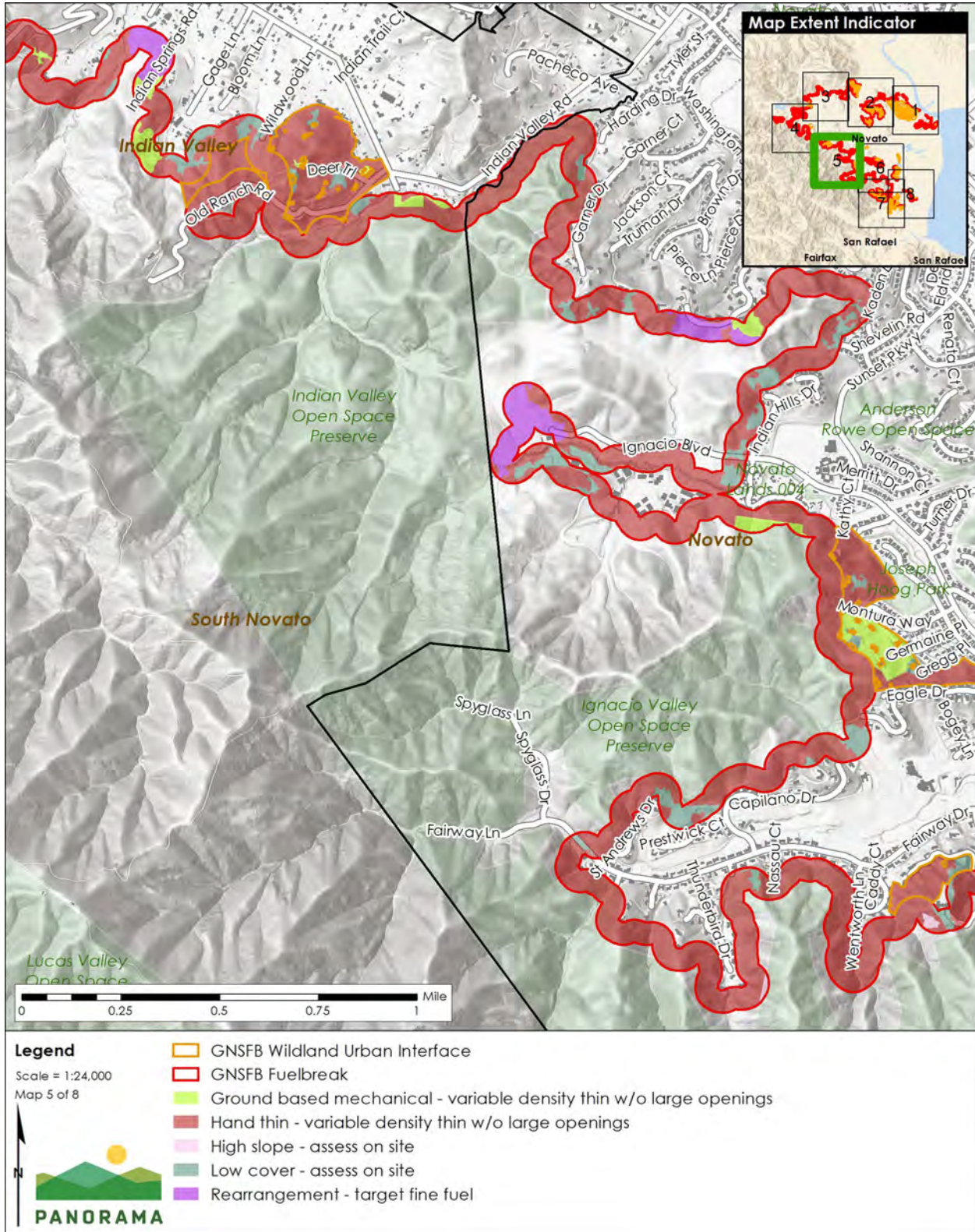
2 PROJECT DESCRIPTION

Figure 2-5 GNSFB Project Modeled Treatments (Map 4 of 8)



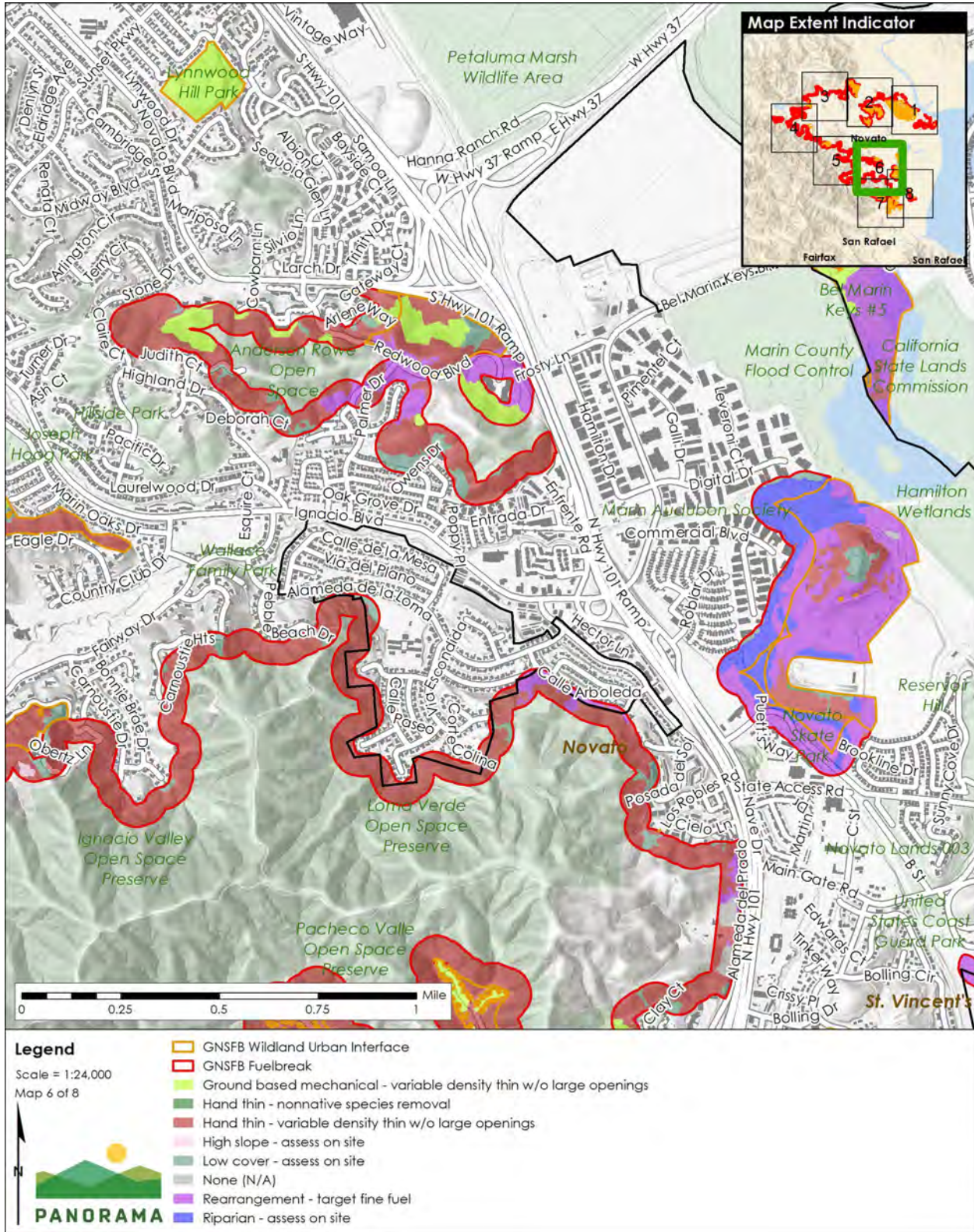
2 PROJECT DESCRIPTION

Figure 2-6 GNSFB Project Modeled Treatments (Map 5 of 8)



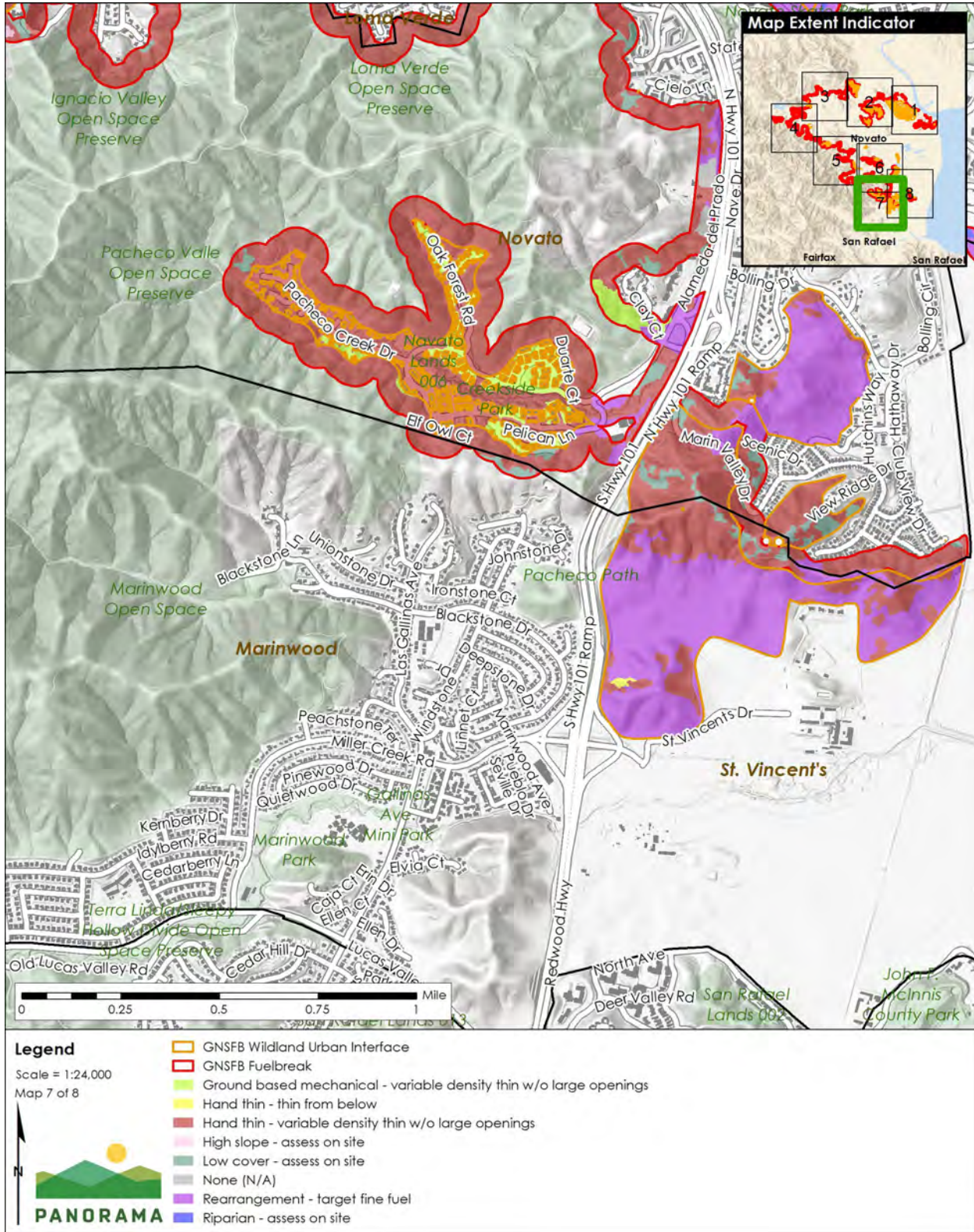
2 PROJECT DESCRIPTION

Figure 2-7 GNSFB Project Modeled Treatments (Map 6 of 8)



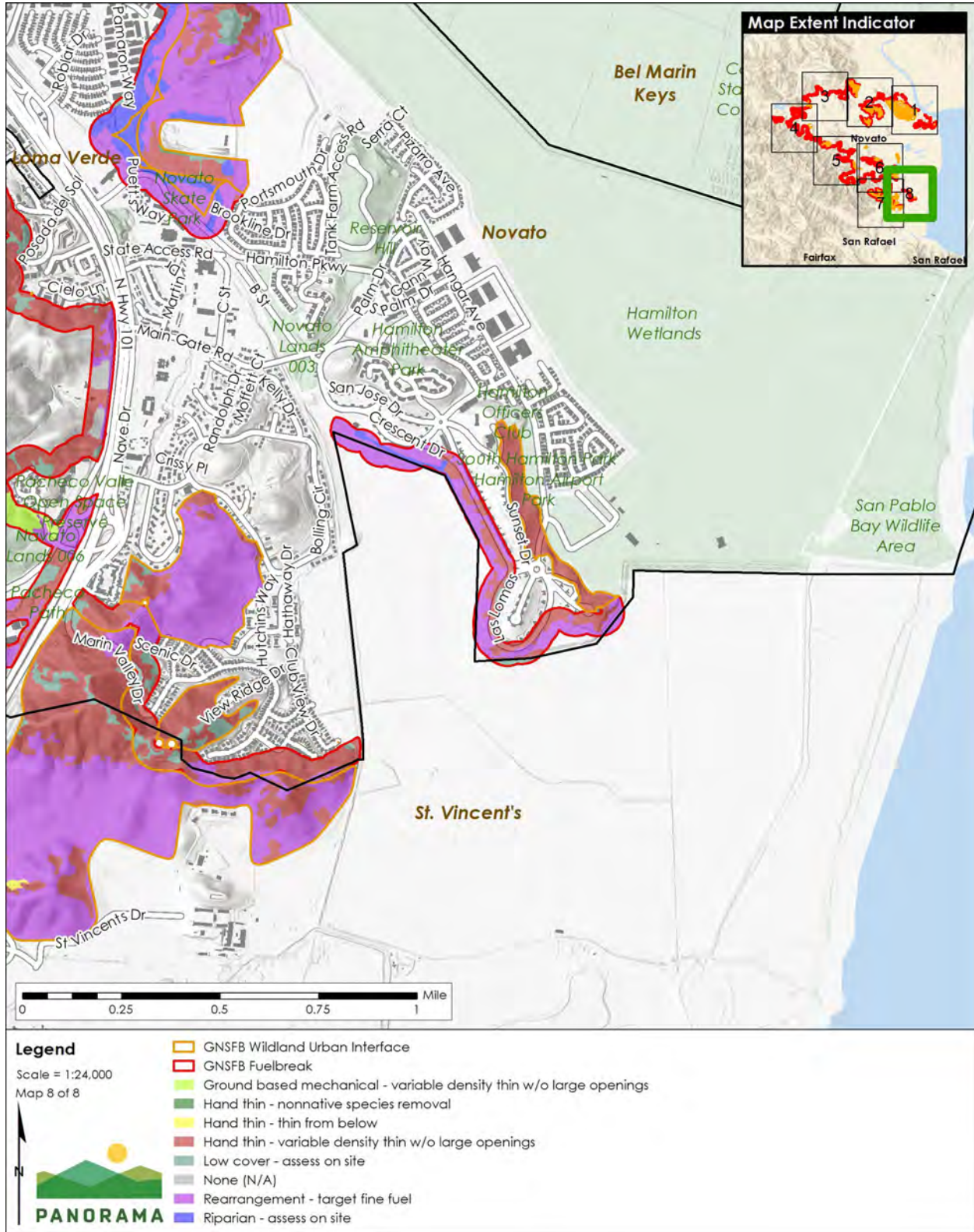
2 PROJECT DESCRIPTION

Figure 2-8 GNSFB Project Modeled Treatments (Map 7 of 8)



2 PROJECT DESCRIPTION

Figure 2-9 GNSFB Project Modeled Treatments (Map 8 of 8)



2 PROJECT DESCRIPTION

Table 2-3 Proposed CalVTP Project Initial Treatments

CalVTP treatment type	Treatment description	CalVTP treatment activity	Treatment size (acres) – max	Equipment used for treatments	Timing of initial treatments
Shaded fuel break	Creation of a continuous fuel break approximately 200 feet, but up to 300 feet, in width, including thinning of understory and invasive species removal	Manual treatments (all hand thinning and assess on site)	1,332 (up to 1,553) ^a	Chainsaws, pole pruners, loppers, and string trimmers	Phased over 5 years, with work generally occurring outside the nesting season, from August through January each year
		Ground-based mechanical treatments (includes rearrangement, e.g. mowing)	566	Skid steers or tractors with mounted masticators, or mowers; ride mowers	
		Prescribed herbivory	An estimated up to 482 acres may also be treated with prescribed herbivory	Livestock; goats, sheep, cattle, horses	As needed
		Herbicide	Targeted spot treatment before, during, or after other treatments within the entire shaded fuel break area, where allowed per local regulation (very limited locations within up to 2,118 acres)	Herbicide and applicator materials	As needed
		Pile burn	As needed with material removed within the entire fuel break area (up to 2,118 acres)	Drip torch	As needed
		None	6.3	None	None
	<i>Subtotal</i>	<i>2,124</i>			

2 PROJECT DESCRIPTION

CalVTP treatment type	Treatment description	CalVTP treatment activity	Treatment size (acres) – max	Equipment used for treatments	Timing of initial treatments
Wildland-urban interface (WUI) fuels reduction area	Fuels reduction in open spaces to reduce wildfire hazards	Manual treatments (all hand thinning and asses of site)	796 (up to 876) ^b	Chainsaws, pole pruners, loppers, and string trimmers	Phased over 5 years, with work generally occurring outside the nesting season, from August through January each year
		Ground-based mechanical treatments (includes rearrangement, i.e. mowing)	461 ^c	Skid steers or tractors with mounted masticators, or mowers; and ride mowers	
		Prescribed herbivory	An estimated up to 353 acres may be treated with prescribed herbivory	Livestock; goats, sheep, cattle, horses	As needed
		Herbicide	Targeted spot treatment before, during, or after other treatments within the entire shaded fuel break area, where allowed per local regulation (very limited locations within up to 1,310 acres)	Herbicide and applicator materials	As needed
		Pile burn	As needed with material removed within the entire fuel break area (up to 1,310 acres)	Drip torch	As needed
		Broadcast burn	92 acres	Drip torch, fire engines, and water truck	Phased over up to 5 years
		None	3.1	None	None
		<i>Subtotal</i>	<i>1,340</i>		

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CalVTP treatment type	Treatment description	CalVTP treatment activity	Treatment size (acres) – max	Equipment used for treatments	Timing of initial treatments
Total acres			3,463^d		

Notes:

- ^a Includes 220 acres of areas that were determined through modeling to be too steep, have too low of canopy cover, or are riparian or wetlands. These areas would be assessed on site, and treatment in these areas is not precluded if the fire agency determines through site inspections that treatment is necessary and possible.
- ^b Includes 80 acres of areas that were determined through modeling to be too steep, have too low of canopy cover, or are riparian. These areas would be assessed on site and treatment in these areas is not precluded if the fire agency determines through site inspections that treatment is necessary and possible.
- ^c A 1.6-acre portion of the burn unit and a 24-acre portion of invasive tree removal area in the WUI were not included in the modeling. This acreage was included in ground-based mechanical treatment based on conversation with the Novato Fire District.
- ^d Includes approximately 6 acres for the fuel break and 3 acres for the WUI fuels reduction area that were not identified for treatment due to habitats that would not require treatment such as water features and wetlands.

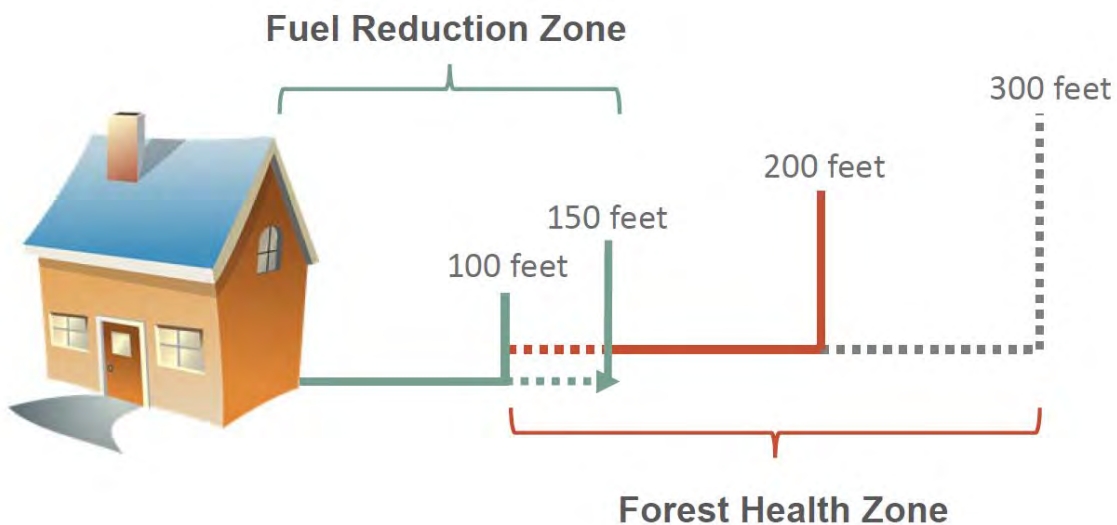
2 PROJECT DESCRIPTION

2.2.3 Initial Treatments

Fuel Break

The proposed project includes development and maintenance of a continuous reduced-fuel and forest-health-restoration zone within a typically 200-foot-wide fuel break around structures in the WUI, at the periphery of communities adjacent undeveloped open spaces. The goal is to restore treated areas to a more natural, healthy, and fire-adapted condition, reducing accumulated ground and ladder fuels and dead and down woody debris. Portions of the fuel break may extend up to 300 feet from structures or may be less than 200 feet. Width and intensity of treatment within the fuel break would vary based on locations of particular hazards (such as existing dry brush piles or dense stands of dead vegetation up to 300 feet from structures), topography, site conditions, and land management and budget constraints (such as MCOSD/Marin County Parks). Within the portion of the fuel break typically 0 to 100 or 150 feet wide, as determined appropriate by fire professionals and based on site conditions, treatments may include higher intensity fuel reduction typical of defensible space, with a focus on vertical and horizontal spacing in addition to removal of invasive species and dead and dying vegetation, if required by local fire codes or ordinances. In forest health zones, generally vegetation treatments would be lower intensity, focused primarily on removal of invasive and non-native, fire hazardous vegetation, removal of dead and dying vegetation, and limbing of native trees to mimic conditions that might exist in an environment where fires were allowed to occur naturally. For the purposes of this analysis, an area up to 300 feet has been evaluated across the entire length of the fuel break.

Figure 2-10 Example of Treatment Zones



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Wildland-urban Interface Fuels Reduction

The project area also includes fuels reduction within several extended areas of open space within the WUI that are located between the fuel break and structures. These areas are not part of the fuel break but could be treated to further increase wildland fire protections. Vegetation would be thinned to reduce density and fuel loads in these areas. In one portion of the WUI fuels reduction area, broadcast burning may be implemented. In three smaller portions of the WUI (approximately 24 acres), removal of larger non-native trees is the focus of treatment. The WUI fuels reduction areas are also shown in Figure 1-1 through Figure 1-7. Refer to the treatment prescriptions by cover type for more information.

Treatment Methods

Overview

Fuel treatment methods vary depending on cover type, condition of vegetation, topography, costs, and efficiency and in conformance with landowner/manager requirements. The primary treatment methods or activities that may be implemented include manual treatments, ground-based mechanical treatment, prescribed herbivory, targeted herbicide application, and broadcast burning (CalVTP PEIR Section 2.5.2).

Manual Treatment

Manual treatments, called hand thinning in the modeling documentation or modeling report (Attachment A), include use of hand tools and hand-operated power tools to cut, clear, girdle, or prune herbaceous woody species and remove dead woody vegetation and low-lying shrubs and brush as well as trees. These treatments are typically used where access for larger equipment is not feasible or not appropriate. Invasive species removal can be performed by hand (or mechanically). Equipment and tools that could be used include chainsaws, pole pruners, loppers, and string trimmers.

Ground-Based Mechanical Treatment

Motorized equipment would be used to cut, uproot, crush/compact, or chop existing vegetation on slopes generally less than 35 percent, or over 35 percent for limited distances or with special equipment. The equipment and tools that could be used include skid steers or tractors with mounted masticators, mowers, and ride mowers.

Prescribed Herbivory

Prescribed herbivory would be used to reduce fuel loads, typically in shrubland and forest understory, but grasslands as well, and may be used as a pretreatment before implementation of other methods. Livestock may include horses, cattle, sheep, or goats. Prescribed herbivory may require the installation of temporary fencing where natural barriers are not present and of temporary water facilities and other infrastructure (e.g., tanks, corrals, fences) as well as the deployment of guard animals and/or a shepherd.

Goats, and sometimes sheep, are often used for targeted reduction of fine fuels such as grasses and herbaceous vegetation. Goat grazing would involve transporting a herd of goats to the designated prescribed herbivory sites. Site preparation would involve installation of a portable

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electric fence to contain the goats, powered by a battery charged by a generator or solar panels and water trough. The herder would determine the area to be grazed based on site conditions; it would typically range from 1 to 2 acres but can be up to 5 acres at one time for goats, or a larger area (larger than 5 acres) for other types of livestock, such as sheep or cattle.

Herbicide Application

Herbicides would be used in a targeted manner as stump and spot spray treatments to kill or prevent regrowth of invasive and non-native species such as broom and eucalyptus. The proposed project would use herbicides, along with other methods of invasive species eradication, as part of an integrated pest management approach. Herbicides would be applied in adherence with all United States Environmental Protection Agency (USEPA) and California Environmental Protection Agency (CalEPA) regulations and in such a way as to prevent over drift. Only target plant species would be affected. Herbicides would only be used as allowable based on local regulations (e.g., City of Novato Municipal Code Division 19.35.060) and provisions in the CalVTP.

Broadcast Burning²

Broadcast burning would be used in portions of the WUI within the project area in order to reduce fuels efficiently over a larger area and with consideration of specific conditions including weather, fuel type, and other factors, as shown in Figure 2-3. Broadcast burning may include burning the understory in a wooded area, grasslands, or other selected communities.

Prescribed burning is anticipated to require at least 25 crew members. The CalVTP identifies 45 workers as the average number of workers on site for a prescribed burn. Broadcast burning, including site preparation, ignition, mop-up, and post-burn monitoring and rehabilitation. Construction line and pre-burn fuel treatment such as cutting back vegetation near the control lines can take up to two weeks. Broadcast burn for a single burn unit would typically take 1 day and monitoring and rehabilitation would typically last up to a week. Broadcast burning would only occur within a 92.8-acre WUI fuels reduction area, as indicated on Table 2-3.

Two onsite water trucks and/or two water tanks, and a nearby fire hydrant would be used for fire suppression. Permission to use the water tanks may be necessary from the Marin Municipal Water District. All burning would occur in accordance with regulations regarding the use of prescribed burning, including in the burn plan. During certain times of the year, a burn permit would be issued by the relevant fire authority. A permit to burn would always be required by the Bay Area Air Quality Management District. A Smoke Management Plan would be submitted to the Bay Area Air Quality Management District within the specified timeframe. The draft burn plan has been written by a qualified burn plan preparer, who is a qualified prescribed fire Burn Boss. The burn plan includes burn unit level information including the

² In the CalVTP PEIR, broadcast burning is one of the two categories of burning under the treatment activity referred to as “prescribed burning.” Throughout the PSA analysis, the term “broadcast burning” is used for clarity. The other category of “prescribed burning” is “pile burning.”

2 PROJECT DESCRIPTION

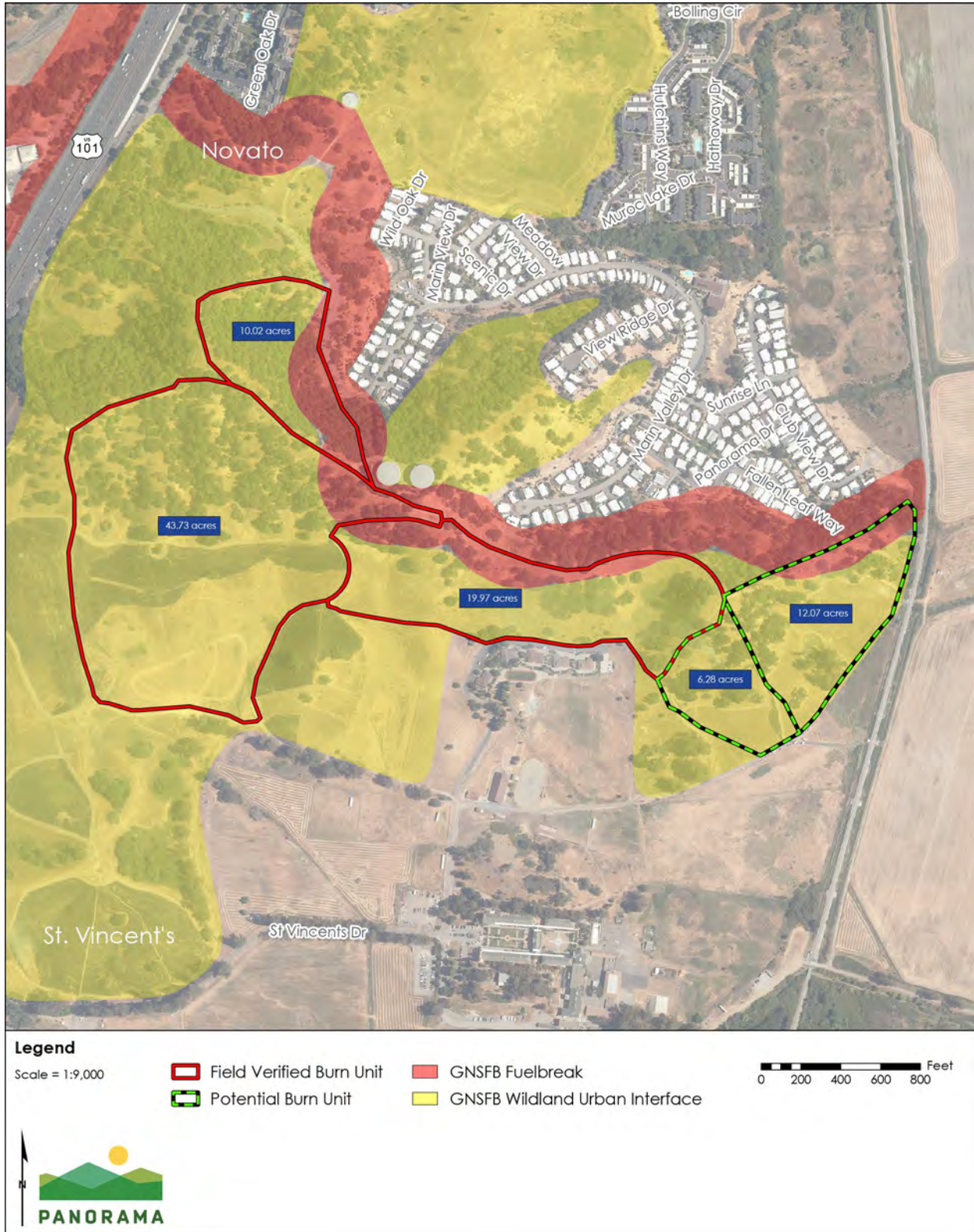
burn prescriptions, resource needs, weather parameters for burning, pre-burn prep, burn team communication protocols, and post-burn monitoring. The burn plan describes the general ignition pattern, such as a strip head fire, dot ignition, or other, with discretion given to the burn boss to use the pattern they deem most appropriate given local vegetation and weather conditions.

Broadcast burning would be performed as stated in the CalVTP. Generally speaking, that would entail the following. Prior to burning, the burn unit would be identified. Burn units are typically bounded by existing infrastructure, such as roads and trails, that act as control lines. Existing control lines may be improved, or new control lines may need to be installed within a few weeks or days of a burn event. A new control line may be installed through mowing, mastication, scraping, discing, or wetting. Additional pre-treatment of fuels in a burn unit may be needed for operational safety. A prescribed burn would be ignited using approved ignition devices, which in most cases would be a drip torch, but may include other equipment such as hand-held flares (“fusee”), hand launched devices, or similar methods. Control during the burn would be accomplished by or with hand crews, fire engines, hose lays, portable pumps, backpack pumps, and hand tools. Other equipment needed on site could include fire engines and chainsaws as well as equipment for making a fuel containment perimeter (masticators and/or track chippers).

Following the burn, mop up would occur, which is the process by which the prescribed fire is safely put out. Select snags or trees may need to be taken down because of fire inside their trunks. Logs may need to be trenched to prevent rolling after an area has burned. Putting out any flames or stirring up a hot spot that is smoking is also done. The work starts along the back or cooler sides of an active fire as soon as possible. Depending upon multiple factors (e.g., fire behavior, weather forecast), some crew members may remain on site for extended periods (overnight). Mop-up work is generally performed all the way around a fire’s edge. Mop up would be conducted using hand crews, equipment, hose lays, or other methods as described in the burn plan. Rehabilitation consists of the decommissioning of control lines as well as follow-up weed control after a prescribed fire. Control line decommissioning is generally limited to the manual re-distribution of duff and brush back into the previously cleared lines. This spreads native seed back into the lines to facilitate natural revegetation.

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Figure 2-11 GNSFB Broadcast Burn Area



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Biomass Disposal

Overview

Project debris would generally be processed through chipping and hauling, chipping, and broadcasting or by pile burns. The cut vegetation materials may be processed in a variety of ways if off-hauled, including but not limited to use in pyrolysis-biomass conversion or enhanced composting. Approximately 20 to 30 cubic yards of material could be off-hauled from a single treatment area for processing each workday.

Chipping

An All-Terrain Vehicle (ATV) and tracked towable chipper may be used to process cut vegetative materials. The vegetative material would be fed through the chipper and broadcast at treatment areas or hauled away for processing. Chipped material spread on site would be chipped to under 3 inches in size and would be applied no more than 2 to 4 inches in depth to minimize wildfire risk. Vegetative material, if removed, would be hauled to West Marin Compost, Redwood Landfill, or Marin Resource Recovery Center or another appropriate biomass processing facility.

Pile Burning³

Cut material may be pile burned, depending upon access and the conditions of the treatment area. Suitable treatment areas are typically flat or gentle slopes and have open areas away from tree canopies and power lines. Areas selected would be those away from waterways. Piles would generally be 4 feet in diameter and 4 feet in height. Multiple piles may be burned on a single day. Pile burning would be conducted in compliance with CAL FIRE and BAAQMD Regulation 5 for open burning and burn day restrictions.

Treatment Prescriptions by Cover Type

Overview

Treatments would occur in the three fuel types—tree, shrub, and grass—as described in the CalVTP PEIR Section 2.4.1. The vegetation communities in the proposed project area are generally characterized by oak and mixed woodland, grasslands, and shrub communities. Treatments vary depending on the cover type, as described in the following sections. Healthy, mature native trees would typically be left intact and in place unless removal were required due to structural or health defects that place infrastructure or lives at risk or should tree densities pose a fire hazard risk.

Oak and Mixed Woodland

Treatment Methods

Woodland would be treated with manual and mechanical tools to remove and thin understory shrubs and brush as well as dead and dying trees and invasive or non-native trees. Thinning of

³ In the CalVTP PEIR, pile burning is one of the two categories of burning under the treatment activity referred to as “prescribed burning”. Throughout the PSA analysis, the term “pile burning” is used for clarity.

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shrubs would prioritize the removal first of invasive species and then of fire-prone species to achieve desired fuels reduction. Maintenance would also be accomplished through manual and mechanical methods. Herbicide spot treatment would be employed to prevent invasive tree and shrub regrowth.

Prescription

Fuels reduction work within woodland treatment areas would include pruning tree branches 8 to 10 feet above ground (not to exceed 1/3 of the tree's height), removal of dead/down branches and dead standing trees, and the removal of live native trees with a typical diameter up to 8 to 10 inches dbh to achieve horizontal spacing. Smaller, mature native trees would typically be retained, unless the densities pose a fire hazard risk, but may be pruned. Understory ladder fuels including non-native, invasive Scotch broom and French broom, along with shrub-like understory tree saplings, would be removed, as may hazardous trees (e.g., dead or dying trees) identified by an arborist or qualified fire professional. One snag would be retained per acre if the snag does not pose a hazard. Non-native or invasive trees would be cut and treated to prevent resprouting. Understory ladder fuel including non-native and invasive broom, shrubs, and shrub-like understory tree saplings would also be removed in woodland communities. The intent of the woodland treatment would be to minimize ladder fuels and fuel loads and promote native trees.

Grasslands

Treatment Methods

Treatment within grassland would be conducted with manual and mechanical removal of grasses and dead woody vegetation and with removal of low-lying shrubs and brush to achieve horizontal spacing and reduce overall fuel loading. Prescribed herbivory may be implemented in areas of shrub encroachment. Herbicide spot treatment would be employed to prevent invasive tree and shrub regrowth.

Prescriptions

Cutting of grasses and forbs would be conducted. Isolated Monterey pine and Douglas fir tree or other non-native tree individuals growing in the grassland would be cut and piled for burning or removed for chipping. Larger trees encroaching on or distributed throughout grasslands may have lower limbs removed to reduce vertical fuel continuity. Small trees and brush would be cut. Broom plants or other invasive shrubs encountered in the grasslands would either be pulled (when soils are moist) or cut for follow-up weed treatment in subsequent years.

Shrub Communities

Treatment Methods

Treatment within the chaparral and shrub communities of the site would involve fine fuel management by manual and mechanical thinning to remove dead woody vegetation and shrubs and common coyote brush where needed to achieve horizontal spacing—although areas of shrub communities are fairly limited (4.2 percent) within the proposed project area. Initial

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treatments may involve more manual and mechanical treatments than maintenance. Herbicide spot treatment would be employed to prevent invasive tree and shrub regrowth.

Prescription

Work related to trees in this area would be limited to the removal of encroaching conifers or other non-native trees and removal of limbs from larger trees, as appropriate. Native stands of brush would be thinned to a spacing of up to 5 to 10 feet, depending upon the site conditions, to achieve horizontal spacing. Non-native plant species such as broom would be removed. Non-native species would be pulled by hand, for smaller individuals or during the wet season, but larger individuals may be cut.

Workers

A single contractor crew would consist of 3 to 7 workers at a single location. The Marin County Fire Tamalpais Crew or inmate/CAL FIRE crew would conduct treatments and would consist of 10 to 12 workers per crew. Crew sizes may vary but would be less than 25. Multiple crews may be working across the project area at the same time. A qualified professional with appropriate experience would also be on site during implementation to direct activities in compliance with this PSA.

Site Access

Treatment areas would be accessed via existing fire roads and trails to the maximum extent feasible. Private residences may be used as access points, contingent on the landowner's consent. Vehicles and equipment would be staged at the contractor's yard daily or, given landowner consent, on the property.

Schedule and Duration

Manual and mechanical treatments would occur during weekdays between 8:00 am and 5:00 pm. Initial treatment is anticipated to begin in spring 2023 and would be conducted over several years.

Treatment areas within the fuel break (segments) have been identified and prioritized based on proximity to open-space interfacing assets at risk, vegetation composition and condition, slope, aspect, fire hazard, and historic wildfire ignition potential. Fire-behavior modeling was performed to evaluate treatment effects to further determine whether potential treatments would reduce fire threat ratings at the segment level. Treatment areas that were shown to have the most potential to reduce fire behavior were prioritized for treatment. The proposed potential phasing is shown in Table 2-1 and Figure 2-1.

Generally, field verification is expected to begin in project segment 1, as this project was modeled to be the highest priority area, then progress to project segments 2 through 19, in consecutive order.

Maintenance Treatments

The condition of the treatment areas after treatment would be monitored annually or as appropriate depending upon the vegetation types and presence of broom. Maintenance in

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grasslands or areas where initial treatments were less intense could occur annually. Maintenance would typically occur every 3 to 5 years in woodlands and forests. Areas with broom are anticipated to be treated every 1 to 3 years, depending upon the condition of the sites. Subsequent treatments are anticipated to be the same as the proposed project activities but are subject to change depending on the site's condition and response to initial treatment.

Prior to implementing a maintenance treatment, the project proponent would verify that the expected site conditions as described in the PSA are present in the treatment area. As time passes, the continued relevance of the PSA would be considered by the project proponent in light of potentially changed conditions or circumstances. Where the project proponent determines the PSA is no longer sufficiently relevant, the project proponent would determine whether a new PSA or other environmental analysis is warranted. For example, the project proponent may conduct a reconnaissance survey to verify that conditions are substantially similar to those anticipated in the PSA. Updated information would be documented.

2.3 Project Design and Implementation Features

The project proponent plans to meet the appropriate SPRs under the CalVTP PEIR, as noted in Section 3. Additionally, the MWPA has developed specific design and implementation features adapted from several source documents that would be incorporated as applicable into the project design and implementation for each of its projects. The Project Design and Implementation Features (PDIFs) appropriate to the proposed project are listed in Table 3 in Attachment B. PDIFs are not needed to address any new impacts but are a standard part of MWPA Core Projects. Table 2-3 also notes which PDIFs would meet the SPRs, where appropriate, and which PDIFs do not have a comparable SPR but are relevant to the proposed project. As discussed under Workers (Section 2.2.3, above), a qualified professional with appropriate experience would also be on site during implementation to direct activities in compliance with this PSA. Attachment A also includes an Implementation Plan that describes how fuel treatments are defined and implemented on the ground in compliance with the mitigation measures, SPRs, and PDIFs.

3 The California Vegetation Treatment Program Environmental Checklist

Project Information

- | | |
|--|---|
| 1. Project title | Greater Novato Shaded Fuel Break |
| 2. Project proponent name and address | Marin Wildfire Prevention Authority
1600 Los Gamos Dr. Suite 345 & 335
San Rafael, CA 94903 |
| 3. Contact person information and phone number | Anne Crealock, Planning and Program Manager
(415) 231-3913 |
| 4. Project location | City of Novato, Marin County, CA. See Figure 1-1 to Figure 1-7 |
| 5. Total area to be treated (acres) | 2,124-acre fuel break; 1,313-acre WUI fuel reduction area |
| 6. Description of project (Describe the whole action involved, including any phasing of initial treatments as well as planned treatment maintenance, including equipment to be used and planned duration of treatments. Provide cross reference to specific subsections and page numbers from Chapter 2 of the PEIR to demonstrate that treatments are consistent with those analyzed in the PEIR. Attach additional sheets if necessary.) | |
| | See Chapter 2, Project Description |
| 7. Treatment types (See description in CalVTP PEIR Section 2.5.1. Check every applicable category; provide detail in Description of Project.) | |

- Wildland-urban interface fuel reduction
- Fuel break
- Ecological restoration

8. Treatment activities (See description in CalVTP PEIR Section 2.5.2. Check every applicable category; include number of acres subject to each treatment activity; provide detail in description of Initial Treatment.)

- Prescribed burning (broadcast), 92 acres
- Prescribed burning (pile burning), of fuel collected from up to 3,463 acres
- Mechanical treatment: 1,027 acres (838 acres of mowing and 189 acres of mechanical) of fuel break
- Manual treatment, up to 2,429 acres of fuel break
- Prescribed herbivory, as and where appropriate on up to an estimated 835 acres

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Herbicide application, as and where appropriate very limited locations within areas of the up to 3,463-acre project area

9. Fuel type (See description in CalVTP PEIR Section 2.4.1. Check every applicable category; provide detail in description of Initial Treatment]

Grass fuel type

Shrub fuel type

Tree fuel type

10. Geographic scope (see Figure 1-15 to Figure 1-21)

The treatment site is entirely within the CalVTP treatable landscape.

The treatment site is NOT entirely within the CalVTP treatable landscape.

11. Surrounding and uses and setting

The project area is in the city of Novato and surrounding areas in northern Marin County. The proposed project would be implemented on private and public lands within Marin County and the City of Novato as well as on lands managed by the MCOSD/Marin County Parks and other local jurisdictions. The area is a mixture of rural open space and an urban community, predominantly residences at the outskirts of the existing city, at the WUI. The project area is dominated by native forest habitat types, with significant portions of grassland, developed land, and non-native forest. The vegetation communities in the project area include grassland, shrub, and oak and mixed woodland.

12. Other Public Agencies Whose Approval is Potentially Required

Agency	Approval or notification	Component of program
California Department of Transportation (Caltrans)	encroachment permits	for trimming or removal of trees within and encroachment on Caltrans right-of-way
	transportation permits	for oversize or overweight vehicles traveling on Caltrans right-of-way
California Department of Forestry and Fire Protection	burn permit	for any pile burn activities in the State Responsibility Area
California Department of Fish and Wildlife	streambed alteration agreement	for work within jurisdictional waters
Bay Area Air Quality Management District	Open Burning Regulation 5 Notification Form	for any pile burn activities
	Burn Plan	for any broadcast burn activities
San Francisco Regional Water Quality Control Board	waste discharge requirement	for potential impacts to waters of the state that are not waters of the U.S.
MCOSD/Marin County Parks	right-to-enter permit	for treatment activities and other access to MCOSD/Marin County Parks lands

3 CALVTP PSA CHECKLIST

Marin County	Tree removal permit	For removal of native or protected trees
City of Novato public works	encroachment permit, planning permits, tree permit	for encroachment into roadways to perform work, for any new fire protection infrastructure that may be needed, for impacts on local trees

Coastal Act compliance

- The proposed project is NOT within the Coastal Zone.
- The proposed project is within the Coastal Zone (check one of the following boxes).
 - A coastal development permit been applied for or obtained from the local Coastal Commission district office or local government with a certified Local Coastal Plan, as applicable.
 - The local Coastal Commission district office or local government with a certified Local Coastal Plan (in consultation with the local Coastal Commission district office) has determined that a coastal development permit is not required.

13. Native American consultation

(Pursuant to PRC Sections 21080.3.1, 21080.3.2, and 21082.3, lead agencies undertaking CEQA review must, upon written request of a California Native American tribe, begin consultation before the release of an Environmental Impact Report, Negative Declaration, or Mitigated Negative Declaration. For treatment projects that require additional CEQA review and documentation, have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.? Note: For treatment projects that are within the scope of this PEIR, AB 52 consultation has been completed. The Board of Forestry and Fire Protection and CAL FIRE completed consultation pursuant to Public Resources Code section 21080.3.1 in preparation of the PEIR.) Pursuant to SPR CUL-2, MWPA contacted culturally affiliated tribes via email on September 2, 2022 with project information and a solicitation for any relevant information regarding the project area. No responses have been received to date. The project is within the scope of the PEIR and does not require additional CEQA review and documentation.

14. Use of the PSA for treatment maintenance

(Prior to implementing a maintenance treatment, the project proponent would verify that the expected site conditions as described in the PSA are present in the treatment area. As time passes, the continued relevance of the PSA would be considered by the project proponent in light of potentially changed conditions or circumstances. Where the project proponent determines that the PSA is no longer sufficiently relevant, the project proponent would determine whether a new PSA or other environmental analysis is warranted. In addition to verifying that the PSA continues to provide relevant CEQA coverage for treatment maintenance, the project proponent would update the PSA at the time a maintenance treatment is needed when more than 10 years have passed since the approval of the PSA or the latest PSA update. For example, the project proponent may conduct a reconnaissance survey to verify that conditions are substantially similar to those anticipated in the PSA. Updated information should be documented.)

Prior to re-treating any area within the project boundary, Novato Fire District would verify that site conditions described in the PSA are still relevant. Maintenance treatments would be ongoing and are covered under this PSA, but this PSA would be updated as appropriate.

15. Standard project requirements and mitigation measures

(Refer to Attachment B to identify which SPRs and Mitigation Measures apply to the project. Complete Attachment B to document the responsible party for each applicable SPR and Mitigation Measure. Check one box below.)

3 CALVTP PSA CHECKLIST

- All applicable SPRs and Mitigation Measures are feasible and will be implemented.
- There is NO new information which would render mitigation measures previously considered infeasible or not considered in the CalVTP EIR now feasible OR such mitigation measures have been adopted (Guidelines Sec. 15162 [a][3]; PRC Sec. 21166[c])
- All applicable SPRs and Mitigation Measures are NOT feasible or will NOT be implemented (*provide explanation*).

Explanation:

Determination

On the basis of this initial evaluation:

- I find that all the effects of the proposed project (a) have been covered in the CalVTP PEIR, and (b) all applicable Standard Project Requirements and mitigation measures identified in the CalVTP PEIR will be implemented. The proposed project is, therefore, WITHIN THE SCOPE of the CalVTP PEIR. NO ADDITIONAL CEQA DOCUMENTATION is required.
- I find that the proposed project will have effects that were not covered in the CalVTP PEIR. These effects are less than significant without any mitigation beyond what is already required pursuant to the CalVTP PEIR. A NEGATIVE DECLARATION will be prepared.
- I find that the proposed project will have effects that were not covered in the CalVTP PEIR or will have effects that are substantially more severe than those covered in the CalVTP PEIR. Although these effects may be significant in the absence of additional mitigation beyond the CalVTP PEIR's measures, revisions to the proposed project or additional mitigation measures have been agreed to by the project partners that would avoid or reduce the effects so that clearly no significant effects would occur. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed project will have significant environmental effects that are (a) new and were not covered in the CalVTP PEIR and/or (b) substantially more severe than those covered in the CalVTP PEIR. Because one or more effects may be significant and cannot be clearly mitigated to less than significant, an ENVIRONMENTAL IMPACT REPORT will be prepared.



Signature

Anne Crealock

Printed Name

April 20, 2023

Date

Planning and Program Manager

Title

Evaluation of Environmental Impacts

1. A brief explanation is required for each impact, standard project requirement (SPR), and mitigation measure (MM) identified in the Project-Specific Analysis Checklist (PSA Checklist). The information provides clarity for review and/or provides direction to the field staff that will implement the project utilizing the checklist (persons familiar with the project and preparation of the document may vary throughout the lifespan of the document). Answers should consider whether the proposed project would result in new or more substantial environmental effects than described in the CalVTP PEIR, after incorporation of applicable SPRs and MM required by the CalVTP PEIR.
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and short-term as well as long-term impacts. Refer to the applicable resource analysis section in the CalVTP PEIR for each environmental topic.
3. Once the project proponent has evaluated the environmental effect that may occur, then the checklist answers must indicate whether the impact is (definitions located in the CalVTP PEIR Chapter 3 Environmental Settings, Impacts, and Mitigation Measures, Section 3.1.4 Terminology Used In the PEIR):
 - a. **Less than significant (LTS):** An impact, either on its own or with incorporation of SPRs, does not exceed the defined thresholds of significance (no mitigation required) or is potentially significant and can be reduced to less than significant through implementation of feasible mitigation measures.
 - b. **Less than significant with mitigation (LTSM):** An impact was identified within the PEIR that was viewed in totality as potentially significant and/or significantly unavoidable, and the mitigation measures and SPRs and MMs provided in the PEIR will be implemented, mitigating to a point of less than significance.
 - c. **Potentially significant (PS):** An impact treated as if it were a significant impact. "Potentially" is used to convey that not every qualifying treatment will result in impacts to the reasonably maximum degree that they are disclosed in this PEIR.
 - d. **Potentially significant and unavoidable (PSU):** An impact is considered significant and unavoidable if it would result in a substantial adverse change in the environment that cannot be feasibly avoided or mitigated to a less-than-significant level. "Potentially" is used to convey that not every qualifying treatment will result in impacts to the reasonably maximum degree that they are disclosed in this PEIR.
 - e. **Significant and unavoidable (SU):** An impact is considered significant and unavoidable if it would result in a substantial adverse change in the environment that cannot be feasibly avoided or mitigated to a less-than-significant level.

3 CALVTP PSA CHECKLIST

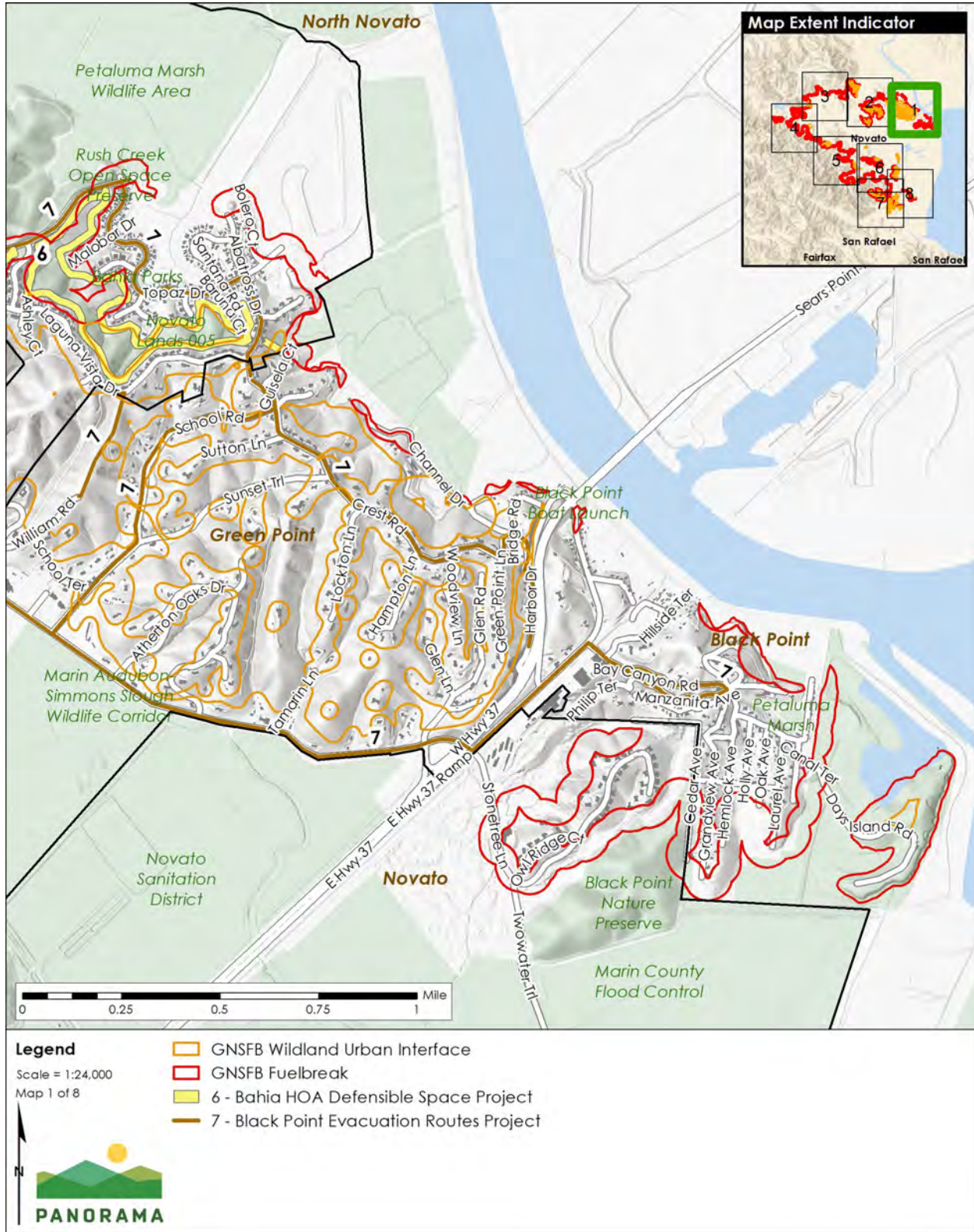
- f. **Not applicable (N/A):** If the impact is determined to be the same or equal to the impact in the PEIR, the PEIR can be utilized without a Negative Declaration, Mitigated Negative Declaration, or EIR. If there are one or more entries where the impact is evaluated to be greater than the impact in the PEIR, additional documentation is required.
4. Where a Negative Declaration or Mitigated Negative Declaration is required, the environmental review would be guided by the directions for use of the PEIR with later activities in Section 15168. Where an EIR is required, the environmental review would be guided by Sections 15162 and 15163. In the preparation of any environmental document, the environmental analysis may incorporate by reference the analysis from the CalVTP PEIR and focus the environmental analysis solely on issues that were not addressed in the CalVTP PEIR.
5. Standard project requirements (SPRs) and mitigations measures (MMs).
 - a. **Applicable (yes/no).** Document whether the SPR or mitigation measure is applicable to the project (*yes* or *no*). The applicability should be substantiated in the Environmental Checklist Discussion.
 - b. **Implementing entity.** The implementing entity is the individual or organization responsible for carrying out the requirement. This could include the project proponent's project manager, a technical specialist (e.g., archaeologist or biologist), a vegetation management contractor, a partner agency or organization, or other entities that are primarily responsible for carrying out each project requirement.
 - c. **Verifying/monitoring entity.** The verifying/monitoring entity is the individual or organization responsible for ensuring that the requirement is implemented. The verifying/monitoring entity may be different from the implementing entity.
 - d. **Note:** The cited SPRs and MMs are summarized to manage the template size. Refer to Attachments B and F for the approved CalVTP

Cumulative Scenario

The CalVTP PEIR included a cumulative analysis following the State CEQA Guidelines. This analysis assumed 250,000 acres treated annually under the CalVTP spanning the State of California. It also considered related programs such as other activities conducted by CAL FIRE, plans, projects, and activities that would affect the same resources as the CalVTP in similar ways, and activities conducted by other entities outside of the SRA (within the Federal Responsibility Area [FRA] and LRA) that would affect the same resources as the CalVTP in similar ways (PEIR, page 4-1). The broad nature of the cumulative analysis in the CalVTP PEIR would already take into account projects occurring in the Novato area that are not specifically identified in the CalVTP PEIR analysis. However, in order to inform the public about known cumulative projects in the area of the GNSFB, Figure 3-1 through Figure 3-7, along with Table 3-1, were created.

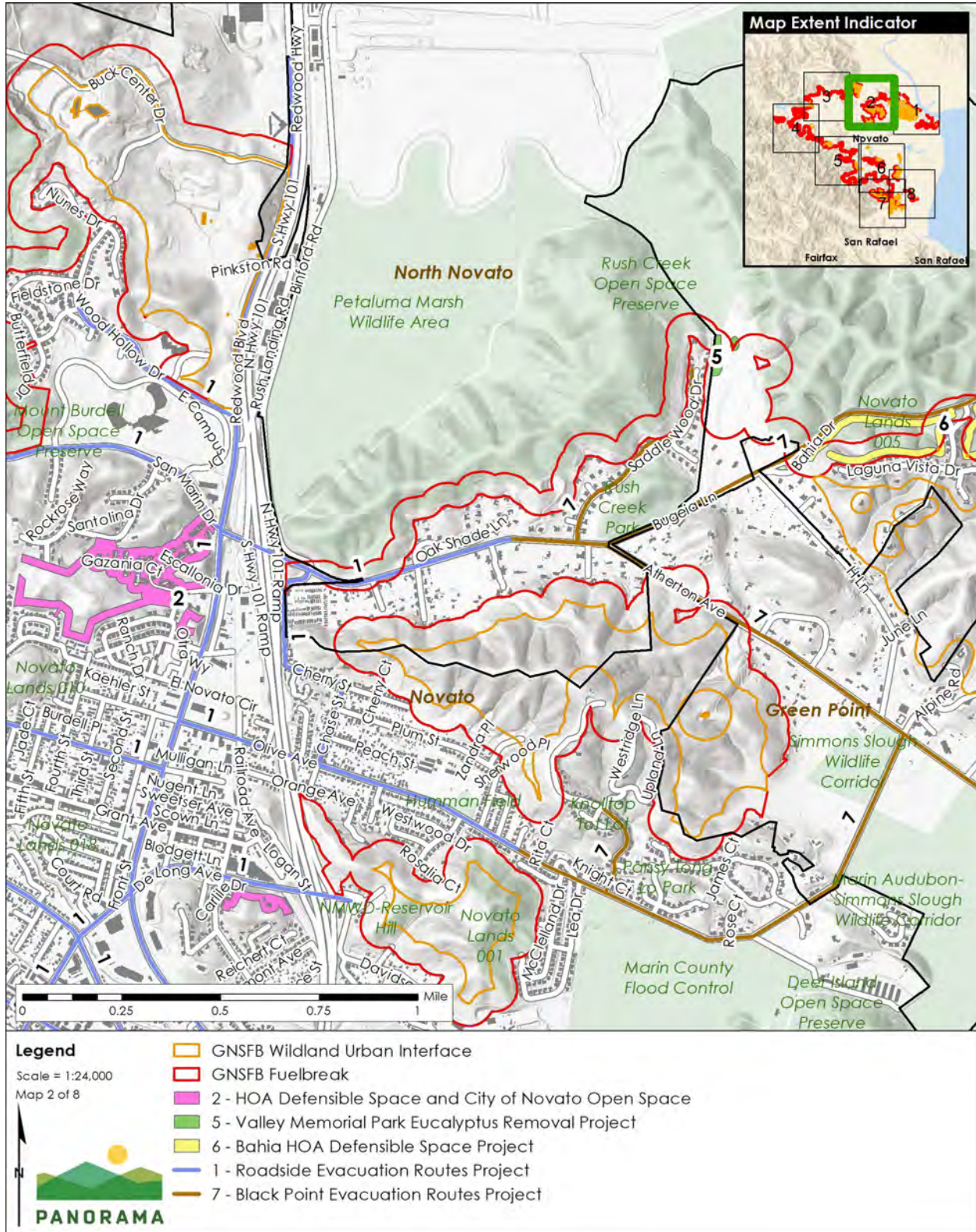
3 CALVTP PSA CHECKLIST

Figure 3-1 Cumulative Projects (Map 1 of 8)



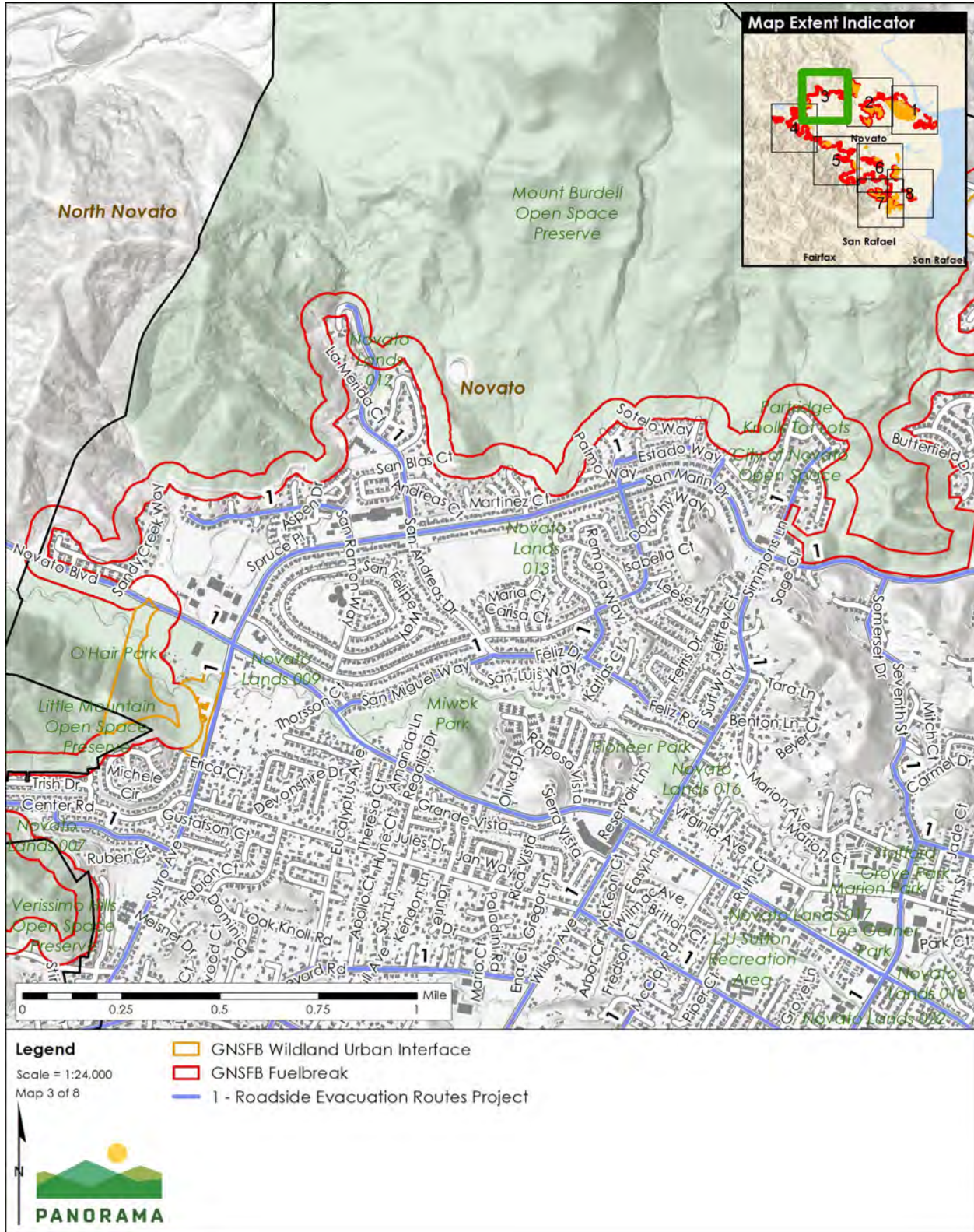
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Figure 3-2 Cumulative Projects (Map 2 of 8)



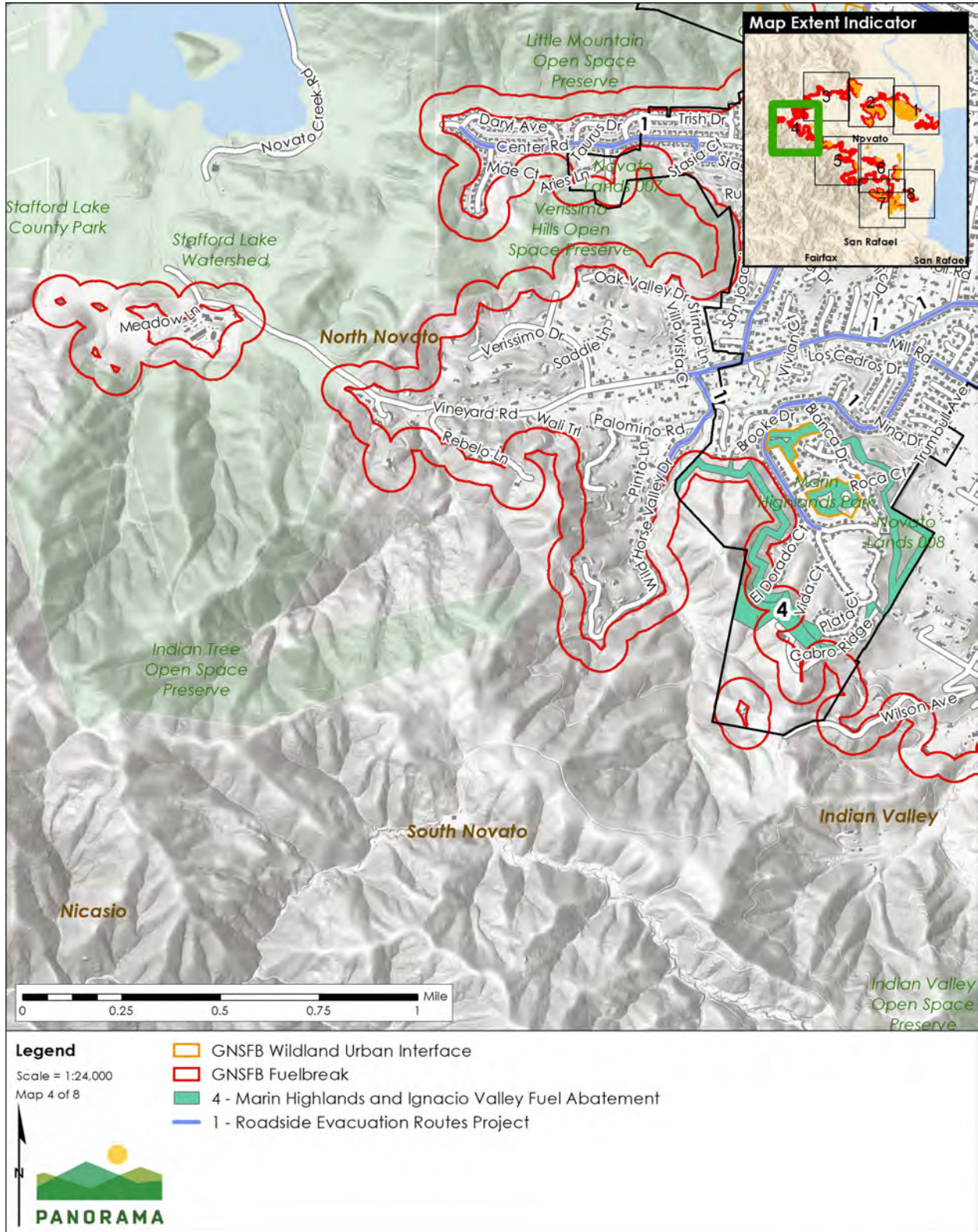
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Figure 3-3 Cumulative Projects (Map 3 of 8)



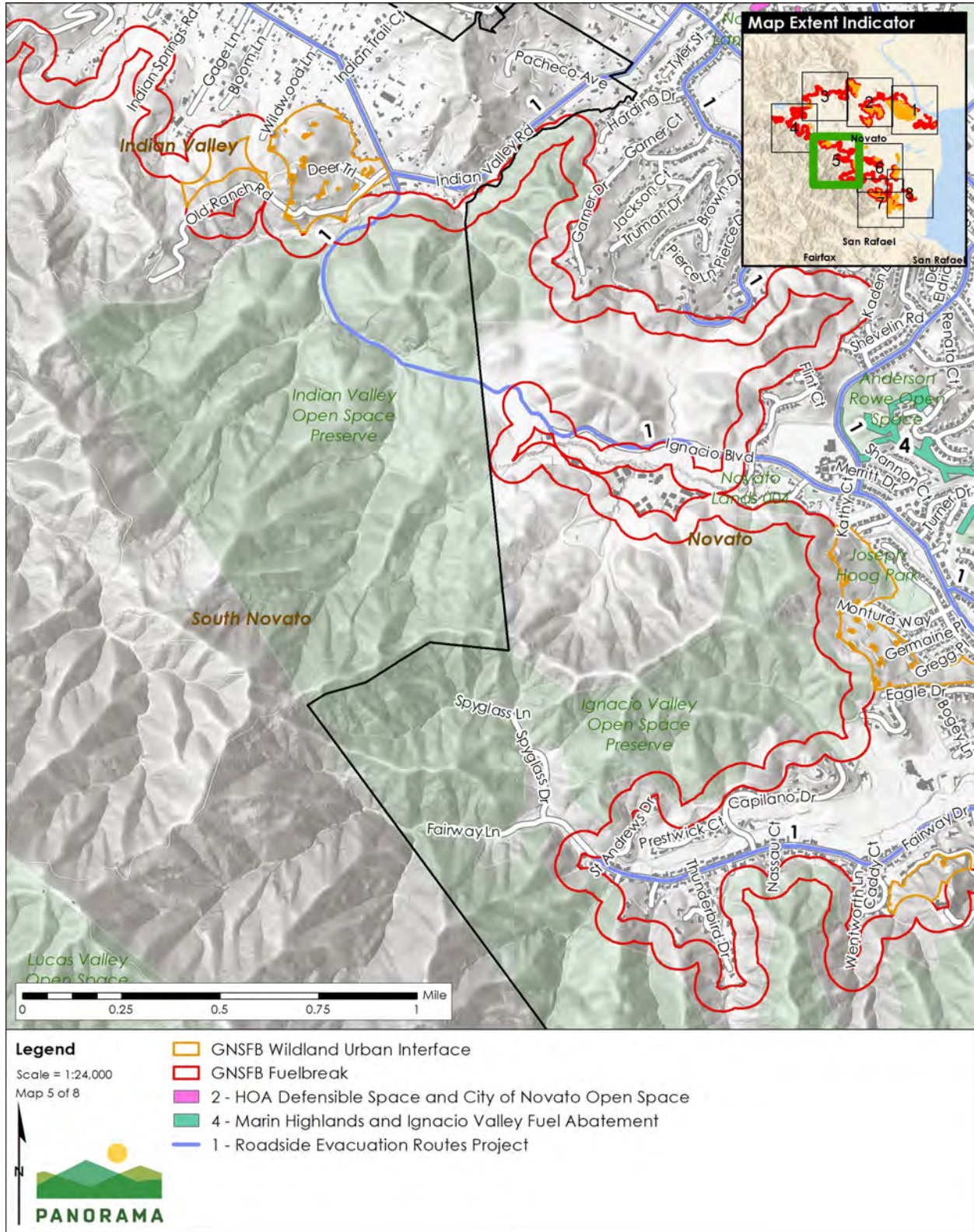
3 CALVTP PSA CHECKLIST

Figure 3-4 Cumulative Projects (Map 4 of 8)



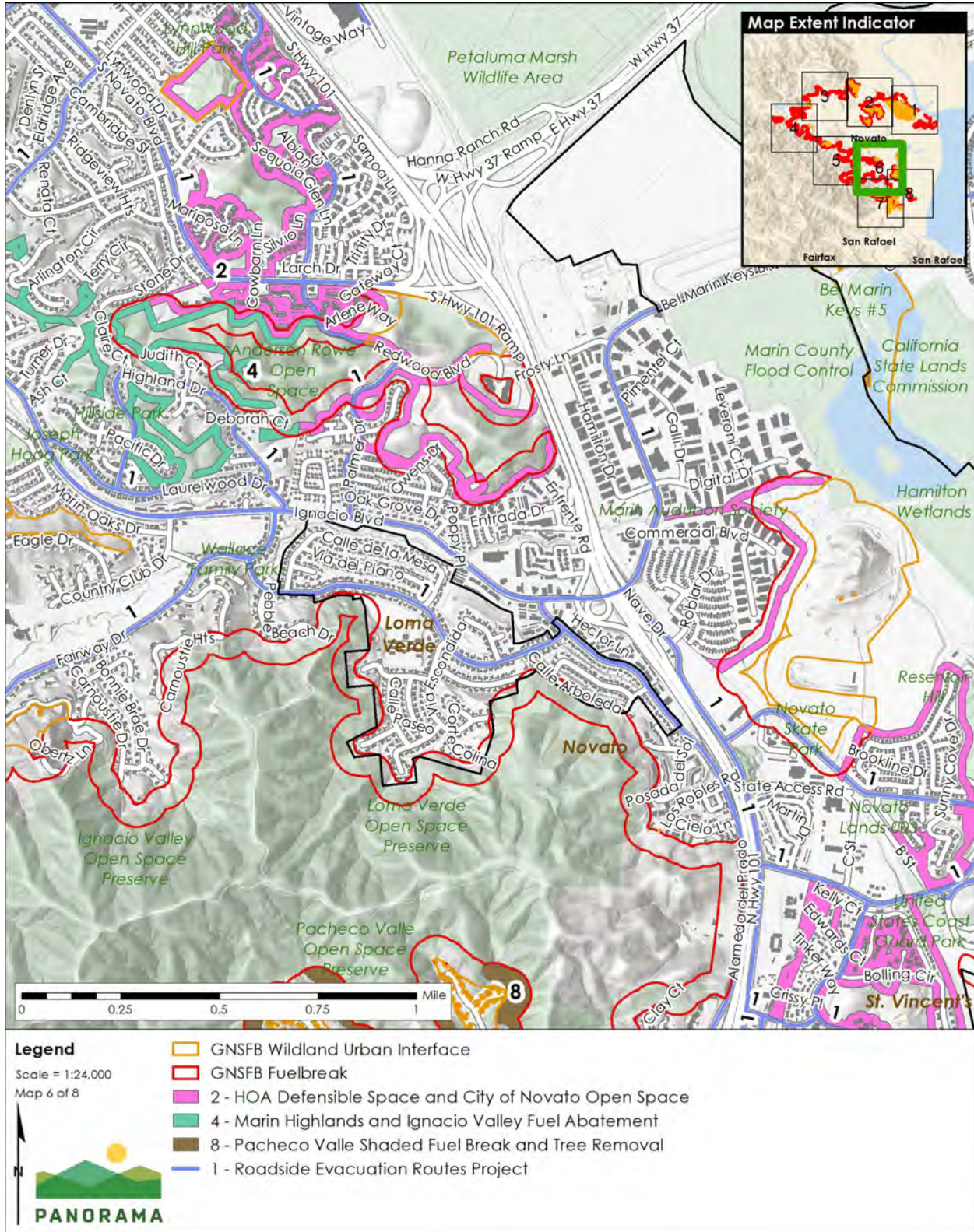
3 CALVTP PSA CHECKLIST

Figure 3-5 Cumulative Projects (Map 5 of 8)



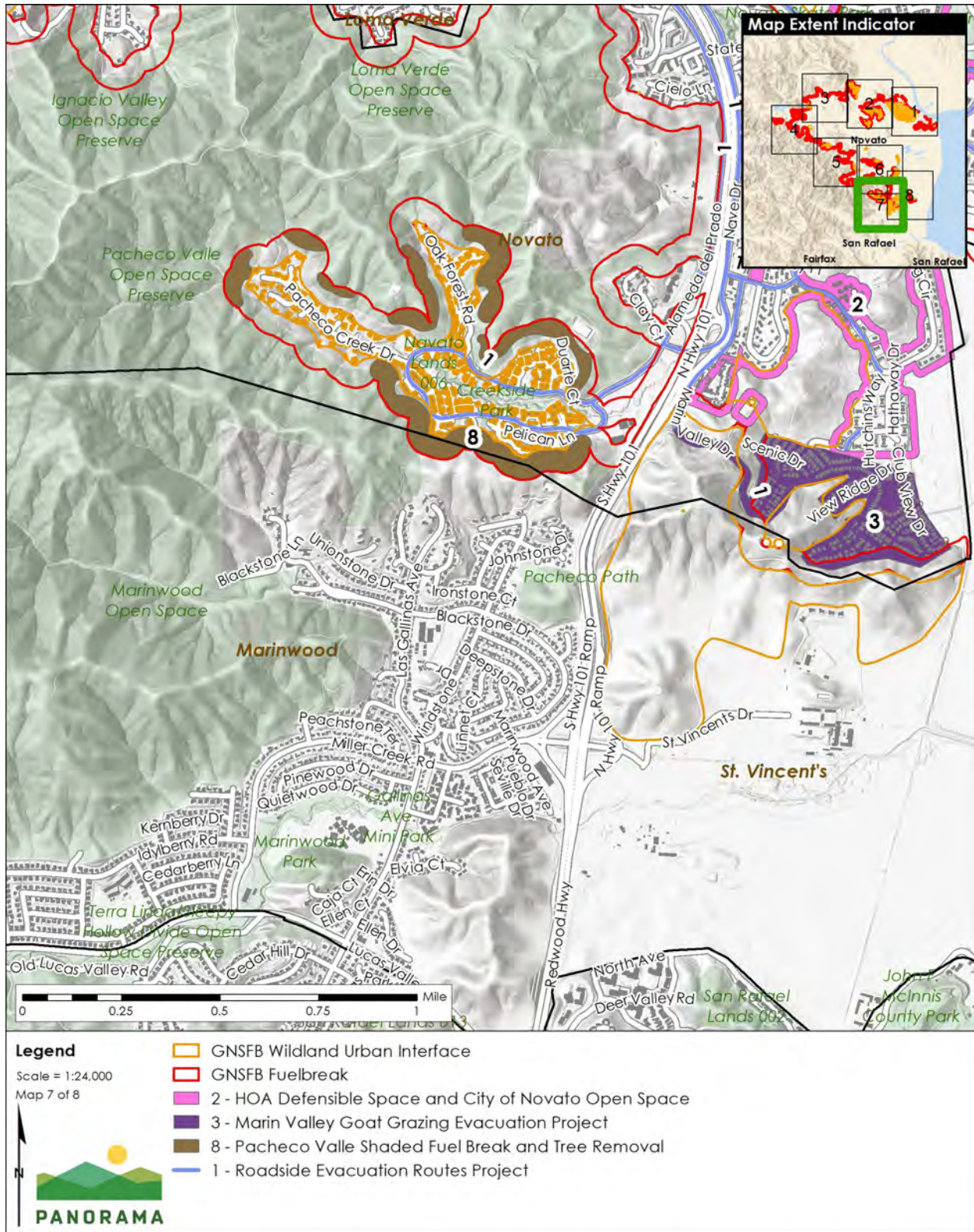
3 CALVTP PSA CHECKLIST

Figure 3-6 Cumulative Projects (Map 6 of 8)



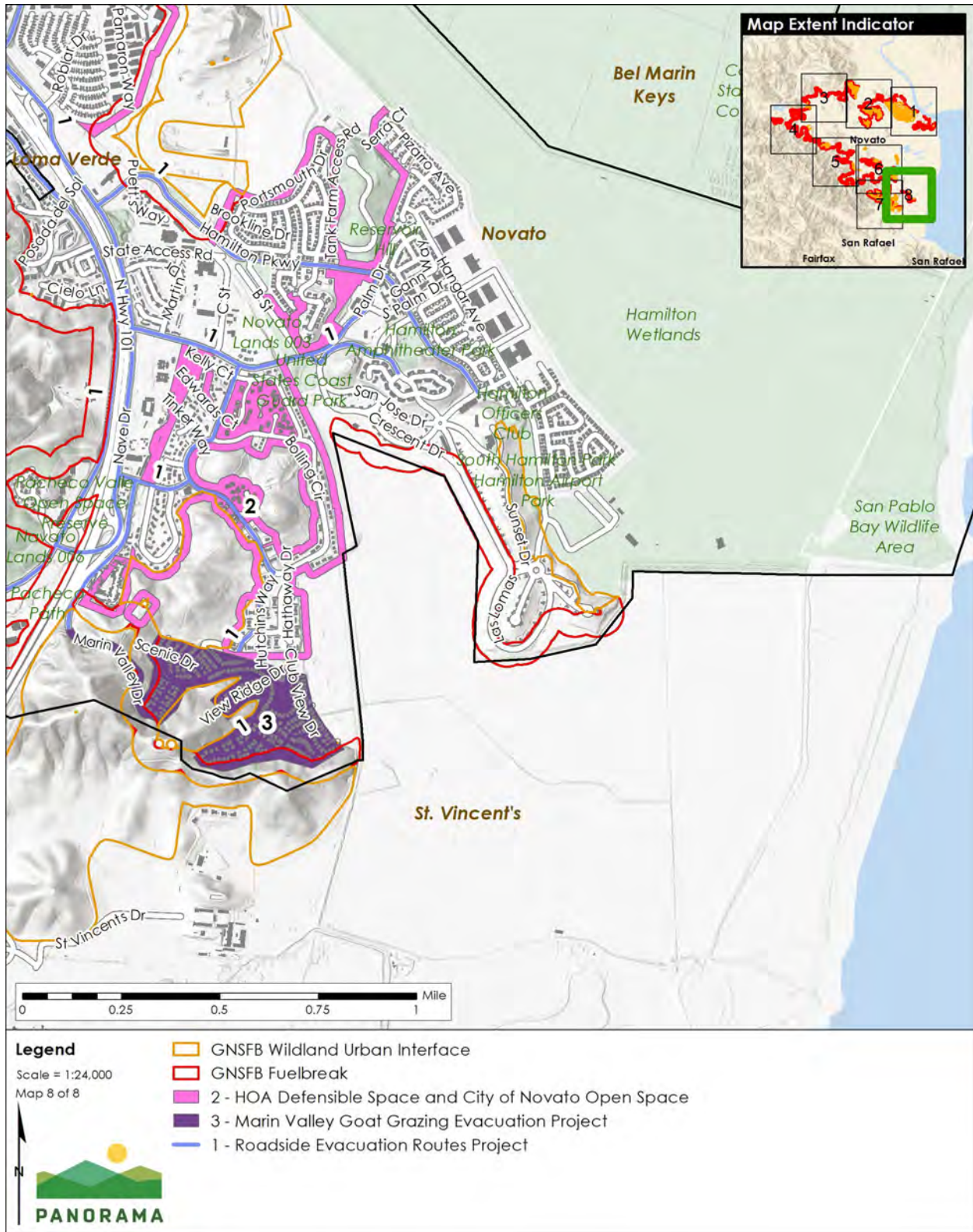
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Figure 3-7 Cumulative Projects (Map 7 of 8)



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Figure 3-8 Cumulative Projects (Map 8 of 8)



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Table 3-1 Novato Region Vegetation Management Projects

Number	Cumulative Project name	Description	Cumulative project acres/miles	Within treatable landscape (miles/acres)
1	Roadside Evacuation Routes Project	Vegetation thinning and mowing up to 100 feet from the road edge on evacuation routes throughout the City of Novato	64 miles	6.4 miles
2	HOA Defensible Space and City of Novato Open Space Project	Fuel reduction along the boundary of private lands, HOA open space areas, and City of Novato-owned open space areas. The project would treat vegetation within 100 feet of structures and roadways.	284 acres	0 acres
3	Marin Valley Goat Grazing Evacuation Project	Goat grazing to create defensible space within the Marin Valley Mobile Home Park property and fire roads.	63-acres of goat grazing and 0.35 mile of fire roads	2.4 acres
4	Marin Highlands and Ignacio Valley Fuel Abatement Project	The project would create defensible space up to 100 feet from structures and 10 feet from roadsides within the Ignacio Valley and Marin Highlands open space areas. Fuel reduction treatments would occur on 83 acres of land with an additional 5 acres of forest health and invasive species removal treatments.	88 acres	0 acres
5	Valley Memorial Park Eucalyptus Removal Project	The project would remove non-native eucalyptus trees on Valley Memorial Park property. The project area would be restored with native riparian and upland species.	1.4 acres	0 acres
6	Bahia HOA Defensible Space Project	Fuel reduction treatments between open space and the residence structures within the Bahia HOA and Bahia Drive. Treatments would include vegetation thinning and mowing up to 100 feet from structures.	39 acres	8.4 acres
7	Black Point Evacuation Routes Project	Fuel reduction treatments along 11 miles of prioritized roads in the Black Point neighborhood. Treatments would focus on thinning and mowing roadside vegetation up to 15 feet above the road surface and up to 10 feet from road edges.	11 miles	4.2 miles
8	Pacheco Valle Shaded Fuel Break and Tree Removal	Fuel reduction treatments and chipping within 16.2 acres in the 60-acre Pacheco Valley area.	16.2 acres	12 acres
9	Novato Flood Control Project	Annual vegetation management along Novato Creek and Rush Creek tributaries	15 miles	N/A

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Number	Cumulative Project name	Description	Cumulative project acres/miles	Within treatable landscape (miles/acres)
10	Pacific Gas & Electric Vegetation Management	Vegetation management along distribution lines in areas which overlap the City of Novato that are elevated to Tier 2 risk of fire	N/A	N/A
11	City of Novato Vegetation Management	Routine vegetation management activities on City of Novato-owned property	N/A	N/A
12	MCOSD/Marin County Parks	Routine vegetation management activities on MCOSD/Marin County Parks-owned and managed property	N/A	N/A

Note: Projects 9 through 12 are not mapped but would occur throughout the Novato area annually.

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3.1 Aesthetics and Visual Resources

3.1.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact AES-1: Result in short-term, substantial degradation of a scenic vista or visual character or quality of public views, or damage to scenic resources in a state scenic highway from treatment activities?	LTS	Impact AES-1, pp. 3.2-16 – 3.2-19	yes	AES-2, AQ-2, AQ-3, REC-1	NA	LTS	no	yes
Impact AES-2: Result in long-term, substantial degradation of a scenic vista or visual character or quality of public views, or damage to scenic resources in a State scenic highway from WUI fuel reduction, ecological restoration, or shaded fuel break treatment types?	LTS	Impact AES-2, pp. 3.2-20 – 3.2-25	yes	AD-4, REC-1, AES-1, AES-2, AES-3	NA	LTS	no	yes

3 CALVTP PSA CHECKLIST

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Impact AES-3: Result in long-term substantial degradation of a scenic vista or visual character or quality of public views, or damage to scenic resources in a state scenic highway from the non-shaded fuel break treatment type?	SU	Impact AES-3, pp. 3.2-25 – 3.2-27	no	NA	none	no impact	no	yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New aesthetic and visual resource impacts: Would the treatment result in other impacts to aesthetics and visual resources that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.1.2 Discussion

Impact AES-1

The proposed project would develop and maintain a fuel break and WUI fuels reduction areas through use of manual treatments, ground-based mechanical treatments, prescribed herbivory, broadcast burning, and targeted herbicide application as well as biomass disposal, including pile burning. The potential for these treatment activities to result in short-term degradation of the visual character of a treatment area was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.2.3, pages 3.2-16–3.2-19). The visual character within the fuels reduction zone is characterized by primarily residential and forested, grassland, and oak woodlands recreational areas and open space. The treatments would occur on private lands as well as publicly owned lands managed by the MCOSED/Marin County Parks and other local agencies.

The City of Novato General Plan 2035 identifies ridgelines and other scenic resources within the City of Novato’s planning area, including hillsides, Bay Plains, and Bay shorelines. Mount Burdell, Pinheiro Ridge, and Big Rock Ridge are examples of the significant scenic vistas in the City of Novato. The proposed project would be within and directly adjacent to the City of Novato’s scenic hills and ridges and scenic conservation areas (City of Novato, 2020). Some treatment areas are also in close proximity to and may be visible from a segment of Highway 101 and Highway 37, both of which are eligible State Scenic Highways.⁴ Viewers in the vicinity of the treatment areas would be mostly residents or recreationalists from existing trails, and potentially some people traveling by vehicle. Equipment and trucks performing the work and chipped and cut vegetation debris would be temporarily visible along or staged near these fuel reduction zones. Smoke from pile burning or broadcast burning may be visible from public viewpoints, including from City of Novato’s scenic hillsides and ridges and eligible state scenic highways, and would occur during limited timeframes, likely a few days, and in limited areas at any given time. Implementation of SPRs AES-2, REC-1, AQ-2, and AQ-3 requires that treatment-related equipment be stored outside of the public viewshed, that recreational users be notified of any temporary recreation area closures, and that a Smoke Management Plan be submitted for prescribed burning activities that trigger the threshold (17 CCR Section 80160) to minimize the generation and visibility of smoke from burning activities. The potential for the project to result in short-term substantial degradation of the visual character near the project or damage to a scenic highway visible to the project is within the scope of the PEIR because the proposed treatment activities are consistent with those analyzed in the PEIR. Impacts would be less than significant.

⁴ Highway 101 between 19.1 and 20.9 post mile is an eligible state scenic highway, and Highway 37 between 0.0 and 11.2 post mile is an eligible state scenic highway (Caltrans, 2019).

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The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a change to the geographic extent presented in the PEIR. However, the existing scenic resources are essentially the same within and outside of the treatable landscape because the vegetation types and visual context are the same and are contiguous to the treatable landscape. From the viewer's perspective, they would not differentiate between portions of the project within and outside the treatable landscape. Therefore, the short-term aesthetic impact to the lands within the CalVTP treatable landscape and outside the treatable landscape is the same, with the same SPRs applicable to minimize effects (SPR AQ-2 and SPR AQ-3). This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR. Impacts would be less than significant.

Impact AES-2

Initial and maintenance treatments would include shaded fuel break and WUI fuels reduction treatment types. The potential for these treatment types to result in long-term degradation of the visual character of an area was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.2.3, pages 3.2-20–3.2-22). Removal of hazard trees and fire-hazardous native and non-native trees, as well as the thinning of native and non-native shrub, and broadcast burning, would result in a change in views. As noted in the PEIR Impact AES-2, in the case of a shaded fuel break, because not all of the existing vegetation would be cleared and large native trees would remain, vividness, intactness, and unity of views would remain, and the treatments would not substantially affect views. The PEIR Impact AES-2 also notes that prescribed burning in a WUI would typically retain some vegetation and while it could result in a short term and temporary adverse change, especially in grass fuel types, the grass would be expected to grow back the following year. This is true for the proposed project which would retain tree canopy in forested areas and include thinning of understory branches and vegetation and could use broadcast burning in grass fuel types. The proposed project would be designed to improve habitat quality and create a landscape appearance closer to pre-fire suppression conditions, and as noted in the PEIR, it could result in long-term beneficial visual impacts. Treatment areas may, however, be visible from public viewpoints and nearby eligible scenic highways (Highway 101 and 37). The aesthetic impacts would be temporary and short-term, and the natural characteristics of the treatment areas would remain. Implementation of SPRs AES-1, AES-2, and AES-3 minimizes long-term degradation of the visual character by thinning and feathering adjacent vegetation to break up or screen linear edges and providing vegetation screening within and adjacent to treatment areas. The potential for the project to result in long-term substantial degradation of the visual character of the project area is less than significant and is consistent with the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the existing visual character is essentially the same within and outside of the treatable landscape because the vegetation types and visual context are the same and are contiguous with the treatable landscape. From the viewer's perspective, they would not differentiate between portions of the project within and outside the treatable landscape. Therefore, the long-term aesthetic impact is also the same, with the same SPRs applicable to minimize effects (SPR AQ-2

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and SPR AQ-3) and is less than significant. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact AES-3

The proposed treatments would not include the non-shaded fuel break treatment type as specifically defined in the PEIR (CalVTP Final PEIR Section 2.5.1, page 2-11).⁵ The proposed project would not result in the potential for long-term substantial degradation of the visual character due to non-shaded fuel break treatment types.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to the approximately up to 250,000 treated acres annually that are located within the 20.3-million-acre treatable landscape. The geographic scope of the aesthetic and visual resource cumulative impact analysis from the CalVTP PEIR is the treatable landscape and surrounding areas with public views of the treatable landscape. In addition to the lands treated under the CalVTP PEIR, there are several similar past, present, and reasonably foreseeable projects that have affected and likely would affect vegetation and, thus, aesthetics and visual resources within and surrounding the treatable landscape (CalVTP Final PEIR Section 4.4.1 page 4-11). Table 31-~~06~~ includes a list of vegetation treatment projects occurring within the Novato area. Based on review of the CalVTP PEIR cumulative analysis, the cumulative projects listed in Table 3-1 and the proposed project, including lands within and outside the CalVTP treatable landscape, are adequately addressed by the PEIR cumulative analysis for aesthetics. Therefore, the cumulative aesthetic impact analysis for the proposed project, including the areas outside the treatable landscape, is the same as described in the PEIR and is not cumulatively considerable for Impact AES-1 and Impact AES-2. The PEIR found that impacts are cumulatively considerable for Impact AES-3; however, since the proposed project does not include any non-shaded fuel break treatment types, the proposed project would not contribute to the significant cumulative impact.

New Aesthetic and Visual Resources Impacts

The site-specific characteristics of the proposed project are consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.2.1 Environmental Setting and Section 3.2.2 Regulatory Setting in Volume II of the Final PEIR). The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a change to the geographic extent presented in the PEIR. However, within the project area, the existing environmental conditions pertinent to aesthetics and visual resources that are present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape, as previously described. The proposed project is consistent with the types of projects covered in the PEIR. No changed circumstances are present, and the

⁵ **Non-shaded fuel breaks** are typically created where there is a natural change in vegetation type, such as from forest or shrubland to grassland, and all vegetation is removed from the fuel break.

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inclusion of areas outside of the CalVTP treatable landscape would not constitute a new or substantially more severe significant impact than what was included in the PEIR. Therefore, no new impacts related to aesthetics and visual resources would occur.

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3.2 Agriculture and Forestry Resources

3.2.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact AG-1: Directly result in the loss of forest land or conversion of forest land to a non-forest use or involve other changes in the existing environment which, due to their location or nature, could result in conversion of forest land to non-forest use?	LTS	Impact AG-1, pp. 3.3-7 – 3.3-8	yes	NA	NA	LTS	no	yes
Note:								
<ul style="list-style-type: none"> • NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact. • None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project. 								

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New agricultural and forestry resources impacts: Would the treatment result in other impacts to agriculture and forestry that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.2.2 Discussion

Impact AG-1

The proposed project would involve implementation and maintenance of a shaded fuel break and WUI fuels reduction areas. The vegetation communities in the project area include grasslands, shrublands, and oak and mixed woodland. Treatment within the project area may include the removal of trees that are hazardous, fire-hazardous native trees, and trees that are non-native. Tree cover within woodlands and forested areas remaining after treatment would be consistent with the definition of forest land used in PRC 12220(g): land that can support 10 percent native tree cover of any species under natural conditions. Treatments would include the removal of trees in the overstory and mid-level canopy to improve forest health and reduce wildfire risk; however, treatments would not affect the forest stand conditions directly or indirectly in a way that could result in conversion to a non-forest use. Vegetation management has the potential to improve the forest stand conditions by removing competitive non-native or overcrowded native vegetation and returning the forests to more natural conditions. The impacts to forestry resources of the proposed project are within the scope of the PEIR because the proposed treatment activities are consistent with those analyzed in the PEIR. Impacts of the proposed project would be less than significant, and no SPRs or mitigation are required.

The proposed project includes treatment on land that is outside the CalVTP treatable landscape, which constitutes a minor change to the geographic extent presented in the PEIR. Within the boundary of the project area, the existing conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because the vegetation types are the same and are contiguous with the treatable landscape. This impact would also be less than significant and within the scope of the PEIR because the impacts to forested land as defined in PRC 12220(g) is essentially the same within and outside the treatable landscape, as previously described. No SPRs are applicable to this impact. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 acres treated annually that are located within the 20.3-million-acre treatable landscape. The geographic scope for agricultural and forestry resources is the treatable landscape (CalVTP Final PEIR Section 4.4.2, page 4-12). The cumulative projects listed in Table 3-1 are consistent with the cumulative projects identified in the CalVTP EIR. The inclusion of treatment outside the treatable landscape would expand the geographic scope for the cumulative analysis but would not result in the loss of forest land or conversion of forest land to a non-forest use. Although treatment activities

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would alter forest land through vegetation removal, the activities would be temporary and, once complete, the area would remain undeveloped, existing forest. Therefore, the proposed project's contribution to the loss of forest land or conversion of forest land to a non-forest use would not be cumulatively considerable and would be consistent with the analysis in the PEIR.

New Agriculture and Forestry Resource Impacts

The site-specific characteristics of the proposed treatment project have been considered and found to be consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.3.1 Environmental Setting and Section 3.3.2 Regulatory Setting in Volume II of the Final PEIR). The project proponent has determined that the inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a change to the geographic extent presented in the PEIR. However, the conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because the vegetation types are the same and are contiguous with the treatable landscape. No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impacts. Therefore, no new impact related to agriculture and forestry resources would occur that is not covered in the PEIR.

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3.3 Air Quality

3.3.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact AQ-1: Generate emissions of criteria air pollutants and precursors during treatment activities that would exceed CAAQS or NAAQS?	SU	Table 3.4-1; Impact AQ-1, pp. 3.4-26 – 3.4-32; Appendix AQ-1	Yes	AD-4, AQ-1 through AQ-6	AQ-1	PSU	no	yes
Impact AQ-2: Expose people to diesel particulate matter emissions and related health risk?	LTS	Table 3.4-6; Impact AQ-2, pp. 3.4-33 – 3.4-34; Appendix AQ-1	yes	AQ-1, HAZ-1, NOI-4, NOI-5	NA	LTS	no	yes
Impact AQ-3: Expose people to fugitive dust emissions containing naturally occurring asbestos and related health risk?	LTS	Section 3.4.2; Impact AQ-3, pp. 3.4-34 – 3.4-35	yes	AQ-4, AQ-5	NA	LTS	no	yes

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Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Impact AQ-4: Expose people to toxic air contaminants emitted by prescribed burns and related health risk?	SU	Section 3.4.2; Impact AQ-4, pp. 3.4-35 – 3.4-37	yes	AD-4, AQ-2, AQ-3, AQ-6	NA (no feasible mitigation available)	PSU	no	yes
Impact AQ-5: Expose people to objectionable odors from diesel exhaust?	LTS	Impact AQ-5, pp. 3.4-37 – 3.4-38	yes	HAZ-1, NOI-4, NOI-5	NA	LTS	no	yes
Impact AQ-6: Expose people to objectionable odors from smoke during prescribed burning?	SU	Section 2.5.2; Impact AQ-6; pp. 3.4-38	yes	AD-4, AQ-2, AQ-3, AQ-6	NA (No feasible mitigation available)	PSU	no	yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New air quality impacts: Would the treatment result in other impacts to air quality that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.3.2 Discussion

Impact AQ-1

The proposed project would use vehicles, equipment, mechanical hand tools, and pile and broadcast burning during treatments, which could generate criteria air pollutants that could cause or substantially contribute to the violation of California ambient air quality standards (CAAQS) or national ambient air quality standards (NAAQS) for the San Francisco Bay Area Air Basin (SFBAAB) (California Air Resources Board, 2014). Marin County is currently in non-attainment status for fine particulate matter (PM_{2.5}) and ozone for the NAAQS and non-attainment for fine particulate matter (PM_{2.5}), coarse particulate matter (PM₁₀), and ozone for the CAAQS (USEPA 2022; CARB 2022). The potential for emissions of criteria pollutants to result in an exceedance or contribute to exceedances of CAAQS or NAAQS thresholds was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.4.3, pages 3.4-26–3.4-33). Emissions of criteria air pollutants related to the proposed treatments are within the scope of the PEIR because the associated equipment and duration of use, and types of treatments, are consistent with those analyzed in the PEIR.

Table 3-2 (Table 3.4-6 of the CalVTP PEIR) provides estimated emissions per acre for different types of vegetation treatments and fuel types. Based on these emission rates, in any single year, an up to 92-acre broadcast burn is anticipated to generate the largest amount of emissions per acre⁶ as well as overall compared to the other vegetation treatments anticipated for the proposed project. Based on estimates, it is assumed that the GNSFB project would exceed Bay Area Air Quality Management District (BAAQMD) annual significance thresholds, primarily due to broadcast burning, and would therefore likely contribute to CAAQS and NAAQS exceedances in the SFBAAB. Prescribed burning in tandem with other vegetation treatments could potentially reduce the intensity of a wildland fire in the project area, should one occur, could potentially limit wildland fire spread, and could slow the progress of a wildland fire to allow for more rapid containment. Wildland fires statewide and in SFBAAB emit significantly greater criteria air pollutant emissions annually than non-agricultural prescribed burning (CARB, 2020c). Studies have found that particulate matter emission rates for wildland fires are more than two times higher than for prescribed burns in the western United States (Liu et al. 2017).

⁶ The proposed project does not include a broadcast burn on an annual basis. Broadcast burning may be required every 3 to 5 years. During the years where broadcast burn is required, it would generate the largest amount of emissions associated with the proposed project.

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Table 3-2 Emissions of Criteria Air Pollutants and Precursors Associated with a Single Treatment Crew During a One-Acre Treatment (Table 3.4-6 from the CalVTP PEIR)

	Emissions per acre treated (lb/acre) ROG	Emissions per acre treated (lb/acre) NO _x	Emissions per acre treated (lb/acre) PM ₁₀	Emissions per acre treated (lb/acre) PM _{2.5}
Prescribed burning^a				
Tree fuel type	2,186.6	166.0	1,421.3	1,421.3
Shrub fuel type	352.8	44.4	142.1	142.1
Grass fuel type	166.4	21.9	84.5	84.5
Mechanical treatment				
Tree fuel type	3.0	5.3	0.3	0.2
Shrub fuel type	0.7	4.1	0.5	0.3
Grass fuel type	0.4	0.8	0.2	0.2
Manual treatment				
Tree fuel type	43.8	4.3	0.8	0.2
Shrub fuel type	18.0	2.6	0.6	0.2
Grass Fuel Type	0.1	0.1	0.05	<0.1
Prescribed herbivory				
Tree fuel type	0.4	0.9	0.1	0.1
Shrub fuel type	0.8	1.8	0.2	0.2
Grass Fuel type	0.8	1.8	0.2	0.2
Herbicide application				
Tree fuel type	0.5	1.6	0.2	0.1
Shrub fuel type	0.3	0.8	0.1	0.1
Grass fuel type	0.1	0.2	<0.1	<0.1

Notes:

- ^a The emissions estimates for prescribed burning, which may consist of broadcast burning or pile burning, consist of the emissions that would be generated by the combustion of vegetative fuels. Other treatment activities may be performed on the same lands prior to broadcast burning or pile burning being conducted.
- lb/acre = pounds per acre; ROG = reactive organic gases; PM₁₀ = respirable particulate matter with an aerodynamic diameter of 10 microns or less; PM_{2.5} = fine particulate matter with an aerodynamic diameter of 2.5 microns or less; NO_x = oxides of nitrogen, an ozone precursor

Source: CalVTP PEIR, Table 3.4-6

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The SPRs applicable to the proposed project include AD-4 and AQ-1 through AQ-6. SPR AD-4 requires public notification for areas with prescribed burning treatments prior to commencement of pile burning and broadcast burning activities. SPRs AQ-1 through AQ-6 require the project to comply with applicable BAAQMD air quality requirements, submit a Smoke Management Plan and Burn Plan if the pile burning triggers the threshold (17 CCR Section 80160), and follow all safety procedures required of a CAL FIRE crew. On this account, in accordance with regulatory requirements and SPRs, prior to commencing a broadcast burn or pile burning, BAAQMD would issue a final decision regarding whether burning on the planned day is permitted. BAAQMD would make this decision by reviewing meteorological forecast conditions.

In addition to the SPRs, MM AQ-1 is applicable to the proposed project and would reduce exhaust emissions from off-road equipment because it would require the implementation of emission reduction techniques including using renewable diesel fuel in diesel-powered construction equipment, substituting electric and gas-powered equipment for diesel equipment, and utilizing equipment that meets the Environmental Protection Agency's (EPA) Tier 4 emission standards. The emission reduction techniques identified in MM AQ-1 are feasible for the project. However, given the uncertainty of whether renewable diesel fuel or electric and gas-powered equipment would be available at any specific time during the implementation of the proposed project, as well as uncertainties with the associated emission reductions, the proposed project could still have impacts associated with vehicle and equipment use.

The impacts from generation of emissions from implementation of the GNSFB project would be within the scope of the impacts addressed in the PEIR, which allows for potentially significant and unavoidable impacts to occur. There are no changes in circumstances that would occur in the proposed project that were not evaluated in the PEIR. Following the implementation of applicable SPRs and MMs, this project's potential to generate emissions of criteria air pollutants and precursors during treatment activities would exceed CAAQS or NAAQS and conflict with Regional Air Quality Plans. The project's impacts would remain within the scope of the PEIR's analysis, however, as potentially significant and unavoidable. As stated in the PEIR, the amount of emission reduction as a result of implementing MM AQ-1 cannot be determined due to several variables assessed in the PEIR (CalVTP Final PEIR Volume II Section 3.4.3, page 33).

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the air quality conditions present and air basin in the areas outside the treatable landscape are the same as those within the treatable landscape. Areas inside and outside the treatable landscape are immediately adjacent to each other within the same air basin. Emissions from the proposed project are based on acreages and treatment activities (regardless of being in the mapped treatable landscape or not) and, thus, fall within the PEIR's analysis. The impacts to air quality from the proposed project are within the scope of the PEIR's determination of potentially significant and unavoidable. SPRs AD-4 and AQ-1 through AQ-6 would still be implemented.

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Impact AQ-2

Vehicles and mechanical equipment for treatment activities would emit diesel particulate matter. The potential to expose people to diesel particulate matter was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.4.3, pages 3.4-33–3.4-34). The proposed project would comply with SPRs AQ-1, HAZ-1, NOI-4, and NOI-5, which minimize the exposure of people to diesel particulate matter emissions. SPR AQ-1 requires compliance with all applicable air quality regulations, and SPR HAZ-1 requires that all diesel and gasoline-powered equipment be properly maintained to comply with all State and federal emission requirements. In addition, SPR NOI-4 requires vegetation treatment activities and staging areas be located as far as possible from human receptors, and SPR NOI-5 restricts equipment idling time. Diesel particulate matter emissions from the proposed project would be less than significant, and its impacts are within the scope of the PEIR. Treatment activities are consistent with those addressed in the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the air quality conditions and sensitive receptors present in the areas outside the treatable landscape (i.e., exposure potential) are essentially the same as those within the treatable landscape because the areas and associated receptors are immediately adjacent each other and the equipment emitting the diesel particulate matter would be the same. Therefore, the air quality impact is also the same (less than significant), as described above, with the implementation of the same SPRs. There are no changes in circumstances that would occur in the proposed project that were not evaluated in the PEIR, and the impacts of this project would remain less than significant.

Impact AQ-3

Use of vehicles and mechanical equipment during treatments would involve ground-disturbing activities. Pile and broadcast burning would not involve ground disturbance although preparation for burning could require some disturbance, such as when dragging vegetation around or implementing control lines. The potential to expose people to naturally occurring asbestos (NOA)-containing fugitive dust emissions was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.4.3, pages 3.4-34–3.4-35). While no known NOA sites are located within or adjacent to the project site, serpentine bedrock and soils, which could contain NOA, are mapped within small portions of project site near Loma Verde and Indian Valley communities as well as within a larger area mapped in the community of Mount Burdell, as shown in Figure 7 of Attachment D (USDA 2021). As discussed in the PEIR, pile burning and ground disturbing activities such as vehicle and heavy equipment usage could result in NOA becoming airborne. In accordance with SPR AQ-5, no ground-disturbing activities would occur in these areas unless an Asbestos Dust Control Plan is prepared and approved by BAAQMD. The proposed project would also implement SPR AQ-4, which minimizes fugitive dust emissions during treatment activities. Potential NOA exposure from the proposed treatments would be less than significant and is within the scope of the activities and impacts addressed in the PEIR.

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The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the existing environmental conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because they are immediately adjacent each other and are underlain by the same type of serpentine soils and would involve similar or the same types of ground-disturbing activities. Therefore, the air quality impact is also the same, as described above, and would also be less than significant with the implementation of the same SPRs. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact AQ-4

Pile and broadcast burning during treatments could expose people to toxic air contaminants. Pile burning may be used to process vegetative debris, depending on the conditions of the work area. Pile burning could occur throughout the project, and broadcast burning, which would emit air pollutants including particulate matter, would be conducted in the southern portion of the project area (refer to Figure 2-3 for location). The potential to expose people to toxic air contaminants from such prescribed burning was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.4.3, pages 3.4-35–3.4-37). The duration and parameters of the pile burn and broadcast burns are within the scope of the activities addressed in the PEIR, and the potential for exposure to toxic air contaminants is also within the scope of the PEIR. The applicable SPRs include AD-4, AQ-1, AQ-2, AQ-3, and AQ-6. The public would be notified of any pile burning, pursuant to SPR AD-4. Implementation of SPRs AQ-1 requires that the prescribed burns comply with the BAAQMD regulations, and AQ-2 and AQ-3 requires the submittal of a Smoke Management Plan and Burn Plan. Crews performing prescribed burns are required to follow all safety procedures required of a CAL FIRE crew, pursuant to SPR AQ-6. The PEIR identifies the impact from prescribed burning as significant and unavoidable. As examined in the PEIR, no additional mitigation measures are feasible, and the impact would remain significant and unavoidable. The impacts from the prescribed burning for the proposed project were not fully quantified but would fall within the finding of the PEIR of potentially significant and unavoidable.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the existing environmental conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because they are immediately adjacent to each other, would emit air pollutants, and would potentially expose the same sensitive receptors. Therefore, the air quality impact is also the same, as described above. This determination is consistent with the PEIR and would not constitute a substantially more severe impact than what was covered in the PEIR.

Impact AQ-5

Use of vehicles and mechanical equipment during treatments could expose people to objectionable odors from diesel exhaust. The potential to expose people to objectionable odors

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from diesel exhaust was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.4.3, page 37). SPRs applicable to this treatment are HAZ-1, NOI-4, and NOI-5. All diesel and gasoline-powered equipment must be properly maintained to comply with all State and federal emission requirements (SPR HAZ-1). Also, treatment activities and staging areas would be located as far as possible from sensitive receptors, and equipment idling time would be restricted (SPRs NOI-4 and NOI-5). This impact is within the scope of the PEIR because the proposed activities, as well as the associated equipment and duration of use, are consistent with those analyzed in the PEIR.

Inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the existing environmental conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because they are immediately adjacent each other and the equipment emitting the odor would be the same. Therefore, the air quality impact is also the same, as described above, with implementation of the same SPRs. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact AQ-6

Pile burning and broadcast burns could expose people to objectionable odors from smoke. The potential to expose people to objectionable odors from prescribed burning (including pile burning) was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.4.3, page 38). The duration and parameters of the prescribed burn are consistent with the activities addressed in the PEIR, and the resultant potential for exposure to objectionable odors from smoke is also within the scope of impacts covered in the PEIR. The applicable SPRs for this treatment are AD-4, AQ-2, AQ-3, and AQ-6. As discussed under Impact AQ-4, the public would be notified of any prescribed burning (SPR AD-4), a Smoke Management Plan and Burn Plan would be submitted if prescribed burning triggers the need (17 CCR Section 80160) (SPRs AQ-2 and AQ-3), and prescribed burning crews are required to follow all safety procedures required of a Cal FIRE crew (SPR AQ-6). The PEIR identifies the impact from smoke from prescribed burning as significant and unavoidable. As examined in the PEIR, no additional mitigation measures are feasible, and the impact would remain significant and unavoidable. The impacts from the pile and prescribed burning for the proposed project were not quantified but would fall within the finding of the PEIR of potentially significant and unavoidable.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the existing environmental conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because they are immediately adjacent each other and the treatment (i.e., pile burning) would be the same inside and outside the treatable landscape. Therefore, the air quality impact is also the same, as described above, and would fall within the finding of the PEIR—potentially significant and unavoidable—with implementation of the same SPRs. This

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determination would not constitute a substantially more severe significant impact than what was covered in the PEIR

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope of the air quality cumulative impact analysis from the CalVTP PEIR is the air basins within the treatable landscape. In addition to the lands treated under the CalVTP PEIR, there are several similar past, present, and reasonably foreseeable projects that have affected and likely would affect the air basin within and surrounding the treatable landscape (CalVTP Final PEIR Section 4.4.3, page 4-13). Because the treatment areas for the proposed project are within the same air basins inside the treatable landscape and outside the treatable landscape, and the treatment types would be the same, the cumulative contribution of the proposed project would be the same inside and outside the treatable landscape, and the impact conclusions from the PEIR would remain applicable. Contributions of the proposed project would be the same within the treatable landscape as outside the treatable landscape, and the cumulative air quality impact analysis would remain within the findings described in the PEIR—not cumulatively considerable for Impacts AQ-2, AQ-3, and AQ-5 and potentially cumulatively considerable for Impacts AQ-1, AQ-4, and AQ-6.

New Air Quality Impacts

The site-specific characteristics of the proposed treatments are consistent with the applicable regulatory and environmental conditions presented in the CalVTP PEIR (refer to Section 3.4.1 Regulatory Setting and Section 3.4.2 Environmental Setting in Volume II of the Final PEIR). The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a change to the geographic extent presented in the PEIR, but the added acreage would not expand the total annual acreage proposed for treatment under the PEIR of 250,000 acres per year. Within the boundary of the project area, the existing environmental and regulatory conditions pertinent to air quality that are present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because they are immediately adjacent each other, the air basin is the same, and the treatment activities and associated air emissions are the same. Therefore, the impacts are the same and, for the reasons described above, impacts of the proposed treatment project are consistent with those covered in the PEIR. No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impact not addressed in the PEIR.

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3.4 Archaeological, Historical, and Tribal Cultural Resources

3.4.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact CUL-1: Cause a substantial adverse change in the significance of built historical resources?	LTS	Impact CUL-1, pp. 3.5-14 – 3.5-15	Yes	CUL-1, CUL-2, CUL-7, CUL-8	NA	LTS	No	Yes
Impact CUL-2: Cause a substantial adverse change in the significance of unique archaeological resources or subsurface historical resources?	SU	Impact CUL-2, pp. 3.5-15 – 3.5-16	Yes	CUL-1, CUL-2, CUL-3, CUL-4, CUL-5, CUL-6, CUL-8	CUL-2	LTSM	No	Yes
Impact CUL-3: Cause a substantial adverse change in the significance of a tribal cultural resource?	LTS	Impact CUL-3, pp. 3.5-17	Yes	CUL-1, CUL-2, CUL-3, CUL-4, CUL-5, CUL-6, CUL-8	None	LTS	No	Yes
Impact CUL-4: Disturb human remains?	LTS	Impact CUL-4, pp. 3.5-18	Yes	CUL-3, CUL-7	NA	LTS	No	Yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New archaeological, historical, and tribal cultural resources impacts: Would the treatment result in other impacts to archaeological, historical, and tribal cultural resources that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.4.1 Discussion

Background

Consistent with SPR CUL-1, records searches of the treatment area, including areas within and outside of the treatable landscape, were performed by the Northwest Information Center (NWIC) on August 31, 2022 (NWIC File No. 22-0230). The records search indicated 156 previous cultural resource studies within the project area. Of these 156 studies, 16 included fieldwork within the past 10 years that encompasses portions of the project area. The records search identified 100 previously recorded cultural resources within the one-quarter-mile buffer, 41 of which intersect the project area. Of the 41 intersecting resources, 31 are precontact archaeological resources, four are historic-era archaeological resources, four are historic-era built-environment resources, one is a historic district, and one is unknown. The precontact resources includes 24 shell mound sites. The historic-era resources include buildings, railroad and road alignments, a cemetery, mines and quarries, refuse deposits, and the Hamilton Army Air Field Discontiguous Historic District. The precontact archaeological sites have not been evaluated for listing on the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR). The Hamilton Army Air Field Discontiguous Historic District is listed on the NRHP. A site sensitivity analysis was prepared for the proposed project by Far Western Anthropological Group (Far Western) to identify areas of high potential sensitivity for cultural resources. The records search results and sensitivity analysis are provided in Attachment C.

The Board of Forestry sent letters to 12 Native American tribes on February 9, 2019, notifying each that the PEIR was being prepared under CEQA, as required by California Public Resources Code section 21080.3.1. Four tribes requested initiation of tribal consultation. Tribal consultation has been completed with these tribes pursuant to California Public Resources Code section 21074. No tribal cultural resources were identified during consultation conducted for the PEIR. SPR CUL-2 requires notification of geographically affiliated Native American tribe(s). The project proponent sent letters to the Federated Indians of Graton Rancheria and Guidiville Indian Rancheria with a description of the project and details of the project location in September 2022. No responses have been received to date.

Impact CUL-1

Proposed treatment activities include mechanical treatments, broadcast burning, and pile burning. These activities have some potential to damage historical resources. Use of targeted herbicides and manual treatments would generally not damage historical resources because such resources could be avoided. The cultural records search identified four historic-era archaeological resources, four historic-era built environment resources, one historic district, and one unknown resource. Of the historic resources, only the historic district is listed on the NHRP.

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None of the historic archaeological resources within the project area have been evaluated for eligibility on the NRHP and the CRHR. The potential for treatment activities to result in disturbance to, damage to, or destruction of built-environment structures, including those that have not yet been evaluated for historical significance, was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.5.3, page 3.5-14-3.5-15). SPR CUL-3 requires pre-field research prior to implementing treatments to identify any other structures that may be 50 years old or older. Structures (e.g., buildings, bridges, roadways) more than 50 years old, including the potential historical resources that have not been evaluated for historical significance and are present in the treatment area, would be avoided pursuant to SPR CUL-7. No prescribed (pile and broadcast) burning or mechanical treatment activities would occur within 100 feet of the built historical resource without consultation with, and receipt of written approval from, a qualified archaeologist. All crew members and contractors implementing treatment activities would be trained in the protection of sensitive archaeological, historic, or tribal resources (SPR CUL-8). Impacts would be less than significant with inclusion of these measures.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, because the treatments inside and outside the treatable landscape are the same, and the records search was conducted for the full proposed project area plus a 0.25-mile buffer, the potential impact to historical resources is also the same, as described above, and would be less than significant with implementation of the SPRs. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact CUL-2

Vegetation treatments would include the use of heavy equipment, pile burning, and broadcast burning that may disturb soil. These treatment activities have the potential to result in inadvertent discovery of unique archaeological resources or subsurface historical resources, as discussed in the PEIR (CalVTP Final PEIR Volume II Section 3.5.3, pages 3.5-15–3.5-16). The site sensitivity analysis prepared for the project (Attachment C) identified a very low potential for buried archaeological sites within the overall project area (Far Western, 2022). The cultural records search revealed 35 archaeological resources within the treatment areas. None of the archaeological resources have been evaluated for eligibility for listing in the NRHP or CRHR. The potential for these treatment activities to result in impacts to unique archaeological resources or subsurface historical resources was evaluated in the PEIR (CalVTP Final PEIR Volume II Section 3.5.3, pages 3.5-15–3.5-16) and was found to be potentially significant and unavoidable in the PEIR. The impact would be less than significant for the proposed project with implementation of SPRs and mitigation and is within the scope of the PEIR.

Proposed treatments for the project would primarily involve no soil disturbance or very shallow soil disturbance, limiting the potential for effects. There is always a potential for unknown unique archaeological resources or subsurface historical resources to be inadvertently damaged during treatment activities. SPRs CUL-1 through CUL-6 and CUL-8 would be implemented to minimize the risk of inadvertently damaging a previously unknown unique

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archaeological resource or subsurface historical resources during treatment activities. The applicable SPRs require the following:

- An archaeological and historical resource record search would be conducted (SPR CUL-1, already conducted for this PSA).
- All geographically affiliated Native American tribes would be contacted (SPR CUL-2, already conducted for this PSA), pre-field research would be conducted prior to treatment implementation (SPR CUL-3).
- A site-specific archaeological survey in areas with known cultural resources, areas identified as having high sensitivity for historic-era or buried resources where surveys were not conducted previously, or areas containing tribal cultural resources, as identified by geographically affiliated tribe(s), would be conducted and archaeological resources treated, if needed (SPRs CUL-4 and CUL-5).
- Culturally affiliated tribes (Graton Tribe) would be notified if cultural resources are identified within a treatment area and cannot be avoided (SPR CUL-6).
- All crew members and contractors implementing treatment activities would be trained on the protection of sensitive archaeological, historical, and tribal cultural resources (SPR CUL-8).

The proposed project would also implement MM CUL-2 to further reduce impacts to unknown unique archaeological or subsurface historical resources by ceasing all ground-disturbing activity within 100 feet of the discovery of any previously unknown resource until a qualified archaeologist or archaeologically trained resource professional assesses the significance of the find.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the treatment area, the potential for discovery of archaeological resources is essentially the same within and outside the treatable landscape because they are immediately adjacent to each other and have similar vegetation and historic use. Therefore, the potential impact to unique archaeological resources or subsurface historical resources is also the same, as described above, and would be less than significant. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact CUL-3

The Native American Heritage Commission (NAHC) was contacted on August 5, 2022, requesting a review of their Sacred Lands File for this proposed project and list of individuals/groups who might have knowledge concerning cultural and tribal resources within the project area. The NAHC's response, dated August 29, 2022, stated that there are Native American sacred sites documented within the Project area. Letters were sent on September 2, 2022, to the two tribes affiliated with the project area, according to the NAHC list. The potential for the proposed treatment activities to cause a substantial adverse change in the significance of a tribal cultural resource during vegetation treatment was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.5.3,

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page 17). As explained in the PEIR, while tribal cultural resources may be identified within the treatable landscape during development of later treatment projects, implementation of SPRs would avoid any substantial adverse change to any tribal cultural resource. Specifically, SPR CUL-6 requires that the project proponent, in consultation with the culturally affiliated tribe(s), would develop effective protection measures for important tribal cultural resources identified by the tribe(s) to be located within treatment areas. To date, no tribal cultural resources have been identified by the tribes.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the tribal cultural affiliations present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape; therefore, the potential impact to tribal cultural resources is also the same, as described above. SPRs applicable to this treatment include CUL-1 through CUL-6 and CUL-8. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact CUL-4

Initial and maintenance treatments would include mechanical treatments utilizing heavy equipment, which would result in ground-disturbing activities. The NWIC records search did not reveal any known burials or sites containing human remains. A known cemetery is within the treatment area. The potential for treatment activities to uncover human remains was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.5.3, page 3.5-17) and found to be less than significant. The potential for human remains to be uncovered during the implementation of the treatment project is minimal due to the nature of the work and the limited resultant ground disturbance from the types of activities proposed, which are mostly manual methods. The impact is within the scope of the PEIR because the treatment activities and the level of ground disturbance are consistent with those analyzed in the PEIR. Known cemeteries (historic era) would be identified per SPR CUL-3 and avoided per CUL-7 to ensure no significant impacts. Should human remains be encountered in the course of implementing the proposed project, as stated in the PEIR, compliance with the California Health and Safety Code sections 7050.5 and 7052 and PRC section 5097 would occur. In the event of discovery of human remains, no further disturbance or excavation of the site and the human remains would occur, and the site would be left undisturbed. Impacts would be less than significant.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the treatment area, the potential for discovery of human remains is essentially the same within and outside the treatable landscape because they are adjacent each other and have similar vegetation and historic use. The NCIC records search did not reveal any burials or sites containing human remains outside the treatable landscape. Any known cemeteries would be identified through SPR CUL-3 and avoided per SPR CUL-7. Therefore, the potential impact to human remains is also the same as previously described and less than

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significant. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope of the archaeological, historical, and tribal cultural resources impact analysis from the CalVTP PEIR is the state of California. In addition to the lands treated under the CalVTP PEIR, there are several similar past, present, and reasonably foreseeable projects that have affected and likely would affect cultural resources, within and surrounding the treatable landscape, and cultural resources are considered nonrenewable members of finite classes (CalVTP Final PEIR Section 4.4.4, page 4-14 and Table 3-1). Contributions of the proposed project would be the same within the treatable landscape as outside the treatable landscape, and the cumulative cultural impact analysis would remain the same as described in the PEIR. The proposed project would not constitute a cumulatively considerable contribution to an otherwise significant cumulative impact related to known unique archaeological resources, subsurface historical resources, built historical resources, or human remains.

New Archaeological, Historical, and Tribal Cultural Resource Impacts

The site-specific characteristics of the proposed treatment project are consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.5.1 Environmental Setting and Section 3.5.2 Regulatory Setting in Volume II of the Final PEIR).

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a changed circumstance to the geographic extent presented in the PEIR. However, within the boundary of the treatment area, the existing environmental and regulatory conditions pertinent to archaeological, historical, or tribal cultural resources that are present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape, as previously described. No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not constitute a new or substantially more severe significant impact than what was included in the PEIR. Therefore, no new impact related to archaeological, historical, or tribal cultural resources or human remains would occur.

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3.5 Biological Resources

3.5.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact BIO-1: Substantially affect special-status plant species either directly or through habitat modifications?	LTSM	Impact BIO-1, pp 3.6-131–3.6.138	Yes	BIO-1, BIO-2, BIO-7, BIO-9, GEO-1, GEO-3, GEO-4, GEO-5, GEO-7, HAZ-5	BIO-1a, BIO-1b	LTSM	No	Yes
Impact BIO-2: Substantially affect special-status wildlife species either directly or through habitat modifications?	LTSM	Impact BIO-2, pp 3.6-138–3.6-184	Yes	BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-8, BIO-9, BIO-10, BIO-11, HAZ-5, HAZ-6, HYD-1, HYD-2, HYD-3, HYD-4, HYD-5	BIO-2a, BIO-2b	LTSM	No	Yes
Impact BIO-3: Substantially affect riparian habitat or other sensitive natural community through direct loss or degradation that leads to loss of habitat function?	LTSM	Impact BIO-3, pp 3.6-186–3.6-191	Yes	BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-6, BIO-9, HYD-4	MM BIO-3a, MM BIO-3c	LTSM	No	Yes

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Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Impact BIO-4: Substantially affect state or federally protected wetlands?	LTSM	Impact BIO-4, pp 3.6-191–3.6-192	Yes	BIO-3, BIO-4, HYD-1, HYD-2, HYD-3, HYD-4, HYD-5	MM BIO-4	LTSM	No	Yes
Impact BIO-5: Interfere substantially with wildlife movement corridors or impede use of nurseries?	LTSM	Impact BIO-5, pp 3.6-192–3.6-196	Yes	BIO-1, BIO-2, BIO-4, BIO-5, BIO-10, BIO-11, HYD-5	MM BIO-5	LTSM	No	Yes
Impact BIO-6: Substantially reduce habitat or abundance of common wildlife?	LTS	Impact BIO-6, pp 3.6-197–3.6-198	Yes	BIO-1, BIO-2, BIO-12	NA	LTS	No	Yes
Impact BIO-7: Conflict with local policies or ordinances protecting biological resources?	No Impact	Impact BIO-7, pp 3.6-198–3.6-199	Yes	AD-3	NA	No impact	No	Yes
Impact BIO-8: Conflict with the provisions of an adopted natural community conservation plan, habitat conservation plan, or other approved habitat plan?	No impact	Impact BIO-8, pp. 3.6-199–3.6-200	No	NA	NA	No impact	No	Yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New biological resource impacts: Would the treatment result in other impacts to biological resources that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.5.2 Discussion

Baseline Studies

Field Surveys

Pursuant to SPR BIO-1, Sequoia biologists performed a desktop review of project-specific biological resources and conducted a reconnaissance-level survey of the project area. Reconnaissance-level surveys occurred between the dates of August 4 and October 26, 2022, to identify and document sensitive natural communities, habitat types, and potential sensitive resources. One additional reconnaissance-level field survey occurred January 18, 2023. During these surveys, habitat suitability determinations were made for the potential special-status plant and wildlife species listed in Attachment D.1: Sensitive Species Tables.

Identification of Sensitive Habitats with Potential to Occur

Habitat types and the presence of sensitive natural communities were examined by reviewing all available habitat data and ground-truthing in the field, including habitat alliance descriptions in *A Manual of California Vegetation* (CNPS, 2022b). CDFW's Vegetation Classification and Mapping Program, or VegCAMP (CDFW, 2013) was reviewed for sensitive natural community data. The VegCAMP data for Marin County is not yet complete and has no overlap with the project boundary; however, a second VegCAMP database focused on MCOSED lands in Marin County overlapped with 52 percent of the project boundary. This database was produced in 2008 and last updated in 2013 (CDFW, 2013). Sequoia biologists also accessed the Golden Gate National Parks Conservancy's (GGNPC) data for Marin County Fine Scale Vegetation Mapping that includes a habitat database encompassing 100 percent of the project footprint and has finer detail than the VegCAMP data (GGNPC, 2021). The GGNPC database was updated in 2021. It was confirmed that habitat data was consistent between the two datasets, all sensitive habitat types represented in VegCAMP were also present in GGNPC data, and no major contradictions were present in the data. Due to the relative completeness of this dataset, GGNPC's data was utilized for habitat-type mapping. The U.S. Fish and Wildlife's (USFWS's) National Wetland Inventory (NWI) (USFWS, 2021) and U.S. Department of Agriculture's (USDA's) Web Soil Survey data (USDA, 2021) were also reviewed to determine presence of sensitive wetland, waterway, and serpentine soil habitats.

A series of maps delineating vegetation types and potential sensitive habitats or natural communities was prepared by overlaying habitat type data over the treatment area maps (Attachment D.2, Figures 3 through 18). A second set of maps delineating wetlands and waterways was overlaid on these maps for fieldwork but has been reproduced here separately for clarity (Attachment D.2, Figure 34). This habitat data was then verified and/or corrected during the field-reconnaissance-level survey using maps loaded in ESRI's FieldMaps using iPad Airs (4th generation). Habitat types were cross-referenced against sensitive natural communities

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lists maintained by CDFW and against the suitable habitats for sensitive plant and wildlife species identified in the desktop review. Field verification of habitat types focused on delineating potentially sensitive communities to Alliance groups. The entire project footprint was accessible during reconnaissance visits.

Identification of Listed Plant and Animal Species with Potential to Occur

Appendix BIO-3 (Northern California Coast Section 263A, Tables 9a, 9b, 10a, 10b, and 19) of the PEIR was reviewed for special-status plants and wildlife that could occur within the treatment areas. Species that clearly had no potential for occurrence (e.g., crustaceans, dune-dwelling species) were excluded from considerations.

Sequoia biologists initially reviewed Tables 1a and 1b in Appendix BIO-3 of the CalVTP Final PEIR to identify species known from or with potential to occur within the Northern California Coast ecoregion and their associated California Wildlife Habitat Relationship (CWHR) types. Sensitive natural communities associated with the Northern California Coast ecoregion were also reviewed. The California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDDB) BIOS 5 (CDFW 2022) and the California Native Plant Society (CNPSa) Inventory of Rare and Endangered Plants of California database (CNPS, 2022) were used to identify the state and federally listed species that may be present within 3 miles of the treatment area (Attachment D.2, Figures 1 and 2). Other databases, including eBird and iNaturalist (2022), were also queried for special-status species that are underrepresented in the CNDDDB, such as burrowing owl (*Athene cunicularia*) and white-tailed kite (*Elanus leucurus*). The search yielded fifty-eight (58) State and federally listed threatened, endangered, or candidate species, CDFW species of special concern and candidate species, and CNPS California Rare Plant Rank (CRPR) List 1 and List 2, species. The results also produced thirty-seven (37) plant species listed on CNPS California Rare Plant Rank (CRPR) List 3 and List 4. The species reviewed are listed below, and impacts to each species are analyzed within the "Biological Resources Species List" (Attachment D.1). From the complete list of species, thirty- (34) of the special-status plants and ten (10) of the special-status wildlife were determined to have potential to occur or are known to occur within project site boundaries (Table 3-4). Accordingly, a biological resources survey would be conducted where applicable prior to project commencement (e.g., pre-work surveys), and the appropriate agency would be notified if any rare, threatened, or endangered (RTE) species are discovered.

Habitats and Sensitive Natural Communities Potentially Present

The proposed project areas are primarily dominated by grassland and oak woodland habitat types, with significant portions of developed land and non-native forest. The project area was composed of the following:

- California Annual and Perennial Grassland (25% fuel break, 34% WUI)
- *Quercus agrifolia* Alliance (23% fuel break, 24% WUI)
- *Umbellularia californica* Alliance Native Forest (18% fuel break, 13% WUI)
- *Quercus douglasii* Alliance (6.4% fuel break, 24% WUI)
- Developed (7% fuel break, 5% WUI)

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- *Quercus lobata* Alliance (6.7% fuel break, 17% WUI)
- *Quercus garryana* Alliance (1.4% fuel break, 7.1% WUI)
- *Arbutus menziesii* Alliance (3.8% fuel break%)
- *Baccharis pilularis* Alliance (2% fuel break, 5.7% WUI)
- *Salix lasiolepis* Alliance (1% fuel break, 1.6% WUI)

Several other habitat types were present but represent less than 1 percent of the total project area, including Vancouverian Freshwater Wet Meadow and Marsh Group, non-native forest, *Pseudotsuga menziesii* mapping unit, *Quercus kelloggii* Alliance, *Eucalyptus* Provisional Semi-natural Association, *Conium maculatum-Foeniculum vulgare* Semi-natural Association, shrub fragment, *Rubus armeniacus* Semi-natural Association, *Acer macrophyllum-Alnus rubra* Alliance, vineyard, non-native herbaceous, *Sarcocornia pacifica (Salicornia depressa)* Alliance, *Adenostoma fasciculatum* Alliance, *Sequoia sempervirens* Alliance, *Bolboschoenus maritimus* Alliance, *Salix gooddingii-Salix laevigata* Alliance, *Distichlis spicata* Alliance, *Aesculus californica* Alliance, *Spartina foliosa* Alliance, *Grindelia stricta* Alliance, *Calamagrostis nutkaensis* Alliance, and others.

Of these habitat types, ten are considered sensitive by CDFW, ranked S1 through S3 or G1 through G3, as shown in Table 3-3. Sensitive habitat spatial mapping is available for review in Attachment D.2, Figures 3a through 3p. A breakdown of sensitive habitat types and ranking found within the project footprint is shown below in Table 3-3. All habitat types are listed in Table 2-2.

Table 3-3 Sensitive Habitat Types Mapped within the Project Footprint

Habitat subgroup	Habitat type	Acreage	Percent cover mapped in project footprint	CDFW sensitivity ranking
Herbaceous wetland	<i>Distichlis spicata</i> Alliance	<1	<1%	GNR, S4
	<i>Sarcocornia pacifica (Salicornia depressa)</i> Alliance	2	<1%	G4, S3 – sensitive
	<i>Bolboschoenus maritimus</i> Alliance	1	<1%	G4, S3 – sensitive
Herbaceous	<i>Calamagrostis nutkaensis</i>	<1	<1%	G4, S2 – sensitive
Native forest	<i>Acer macrophyllum – Alnus rubra</i> Alliance	4	<1%	G4, S3 – sensitive
	<i>Arbutus menziesii</i> Alliance	87	3%	G4, S3 sensitive
	<i>Pseudotsuga menziesii</i> mapping unit	2	<1%	G5, S4
	<i>Quercus agrifolia</i> Alliance	735	21%	G5, S4
	<i>Quercus douglasii</i> Alliance	401	12%	G4, S4

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Habitat subgroup	Habitat type	Acreage	Percent cover mapped in project footprint	CDFW sensitivity ranking
	<i>Quercus garryana</i> Alliance	109	3%	G4, S3 – sensitive
	<i>Quercus kelloggii</i> Alliance	11	<1%	G4, S4
	<i>Quercus lobata</i> Alliance	198	6%	G3, S3 – sensitive
	<i>Sequoia sempervirens</i> Alliance	1	<1%	G3, S3-sensitive
	<i>Umbellularia californica</i> Alliance	540	16%	G4, S3-sensitive
Native shrub	<i>Adenostoma fasciculatum</i> Alliance	2	<1%	G5, S5
	<i>Baccharis pilularis</i> Alliance	76	2%	G5, S5
	<i>Salix gooddingii</i> – <i>Salix laevigata</i> Alliance	1	<1%	G4, S3-sensitive
	<i>Salix lasiolepis</i> Alliance	40	1%	G4, S4

Notes:

^a *Grindelia stricta* Alliance is ranked as G2G3, which is rounded to G2, “imperiled globally”, and S2S3, which is rounded to S2.

- G1 S1: Critically imperiled worldwide/ statewide
- G2 S2: Imperiled worldwide/statewide
- G3 S3: Vulnerable worldwide/statewide
- G4 S4: Apparently secure worldwide/statewide
- G5 S5: Demonstrably secure because of its worldwide/statewide abundance
- GNR: Unranked – global rank not yet assessed

Special-status Plants and Animals with Potential to Occur

Attachment D includes a compilation of special-status species with potential to occur within the project area, based on the SPR BIO-1 requirement for a data review of biological resources, as previously described. Table 3-4 comprises the final list of special-status plant and wildlife species with potential to occur within the treatment area based on the data review and reconnaissance-level survey. Full tables that include species that were ruled out and the justification for such are provided in Attachment D.1.

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Table 3-4 Special-Status Wildlife and Plant Species with Potential to Occur within the Project Footprint

Species	Listing Status			Habitat	Potential for Occurrence
	Federal	State	CNPS		
Wildlife					
Pallid bat (<i>Antrozous pallidus</i>)	—	SSC	—	The pallid bat roosts in large diameter trees and abandoned buildings.	Moderate. Suitable habitat is present in the project area and one occurrence is documented in the project area.
Townsend’s big-eared bat (<i>Corynorhinus townsendii</i>)	—	SSC	—	Townsend’s big-eared bat roost in caves, mines, bridges, buildings, rock crevices, tree hollows in coastal lowlands, and cultivated valleys. They prefer roosting in caves or other similar open spaces.	Low. No previous occurrences within the project area. Suitable roosting habitat was observed in the northeastern portion of the project area, and historic occurrences are documented nearby.
California giant salamander (<i>Dicamptodon ensatus</i>)	—	SSC	—	California giant salamander are found in wet coastal forests, such as coastal redwoods, in or near clear, cold permanent and semi-permanent streams and seepages.	Low. Found in and near wet streams. Treatments would typically avoid wetted streams and adjacent areas.
Western pond turtle (<i>Emys marmorata</i>)	—	SSC	—	Western pond turtles use upland and aquatic habitat in and around freshwater ponds and streams. This species nests in leaves or soil upland from water bodies in flat areas with short vegetation and dry soil.	Moderate. Suitable habitat is present in project area, and several occurrences are documented near the project area upland from water bodies where they could occur.
Foothill yellow-legged frog (<i>Rana boylei</i>)	—	CE, SSC	—	Foothill yellow-legged frogs inhabit rocky streams in a variety of habitats, including habitats such as valley foothill hardwood, valley-foothill riparian, coastal scrub, mixed conifer, mixed chaparral, and wet meadows. It is typically found in or very close to water.	Low. Rarely found away from wet streams. One stream appeared to be suitable in the Pacheco Valley neighborhood. Treatment would typically avoid wetted streams.
California red-legged frog	FT	SSC	—	California red-legged frogs utilize both permanent and temporary ponds for breeding and foraging. They can be found in a variety of habitats including; California annual	Low potential to occur. Strongly associated with water, especially during breeding season (Winter and spring); often utilize underground refugia when water sources are scarce in

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Species	Listing Status			Habitat	Potential for Occurrence
	Federal	State	CNPS		
<i>(Rana draytonii)</i>				grassland, woodlands, wetlands, scrub, and streams. Several occurrences are known at Mt. Burdell OSP.	summer and fall. Likely to disperse during rain events near known occurrences. Treatment would avoid wetted areas.
Burrowing owl <i>(Athene cunicularia)</i>	—	SSC	—	Burrowing owl utilizes large burrows in grassland habitats.	Moderate. No previous occurrences within the project area, but three occurrences have been documented within 1 mile of the project area west of Olompali State Historic Park and near Hamilton Wetlands. Overall habitat generally unsuitable within project area bounds, with minor exceptions.
White-tailed kite <i>(Elanus leucurus)</i>	FP	—	—	White-tailed kites are found in savannas, open woodlands, marshes, desert grasslands, partially cleared lands, and cultivated fields.	Moderate. Suitable habitat is present in the project area, and one occurrence is documented in the project area.
Northern spotted owl <i>(Strix occidentalis caurina)</i>	FT	CT	—	Northern spotted owls live in forests characterized by dense canopies of mature trees, abundant logs, and standing snags. They prefer to nest in mature forest stands with multi-layered canopies and open space among the lower branches to allow for foraging and dispersal.	Low. Suitable breeding habitat is generally not present in the project area footprint. Two activity centers are identified within 0.5 mile of the project area.
Plants					
Napa false indigo <i>(Amorpha Californica var. Napensis)</i>	—	—	CNPS 1B.2	This perennial shrub is found in wetlands and riparian woodland.	Moderate. One occurrence recorded north of the project area in Olompali State Historic Park; known suitable habitat scattered throughout the project area.
Bent-flowered fiddleneck <i>(Amsinckia lunaris)</i>	—	—	CNPS 1B.2	This annual herb is found in grasslands, serpentine areas, and gravelly slopes.	Moderate. Occurrences in Olompali State Historic Park and on Mount Burdell. Known suitable habitat present in northeastern portion of the project area. Effects can be avoided if work occurs outside growing season or during dormant season.

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Species	Listing Status			Habitat	Potential for Occurrence
	Federal	State	CNPS		
Coast rockcress (<i>Arabis blepharophylla</i>)	—	—	CNPS 4.3	This perennial herb is found in broadleaved upland forest, coastal bluff scrub, coastal prairie, and coastal scrub.	Low. Occurrences recorded in the county with CNPS 9-quad search. The CNDDDB records show no occurrences within 3 miles of the project area. Little broadleaf upland forest suitable habitat is present, and no coastal habitats were observed in the project area.
Mt. Tamalpais manzanita (<i>Arctostaphylos montana</i> ssp. <i>montana</i>)	—	—	CNPS 1B.3	This perennial evergreen shrub is found in chaparral and valley grassland.	High. Many occurrences within Marin County and suitable habitat in northeastern stretch of the project area and near Indian Valley Preserve.
Marin manzanita (<i>Arctostaphylos virgata</i>)	—	—	CNPS 1B.2	This perennial shrub is found in closed-cone pine forest, redwood forest, mixed evergreen forest, chaparral.	Low. Occurrences are located closer to the coast. No CNDDDB occurrences recorded within 3 miles of the project area. Little suitable habitat in the project area.
Brewer's milk-vetch (<i>Astragalus breweri</i>)	—	—	CNPS 4.2	This annual herb is found in chaparral, cismontane woodland, meadows and seeps, valley and foothill grasslands.	Low. Occurrences are located on Mt. Tamalpais and Tamalpais area. No CNDDDB occurrences recorded within 3 miles of the project area. Potential suitable habitat in northeastern and eastern sections of the project area. Effects can be avoided if work occurs outside growing season or during dormant season.
Serpentine reed grass (<i>Calamagrostis ophitidis</i>)	—	—	CNPS 4.3	This perennial herb is found in chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and rocky, serpentinite microhabitats.	Moderate. Recent occurrences within the county and suitable habitat within the project area near Mount Burdell Preserve.
Brewer's calandrinia (<i>Calandrinia breweri</i>)	—	—	CNPS 4.2	This annual herb is found in chaparral and coastal scrub.	Low. Known suitable habitat present within the project area, but no occurrences recorded within 3 miles of the project area in CNDDDB or CNPS 9-quad search. Effects can be avoided if work occurs outside growing season or during dormant season.

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Species	Listing Status			Habitat	Potential for Occurrence
	Federal	State	CNPS		
Tiburon mariposa-lily (<i>Calochortus tiburonensis</i>)	FT	CT	CNPS 1B.1	This perennial herbaceous bulb is found only in serpentine grassland.	Low. Many occurrences located within southern Marin County and suitable habitat within the project area in the northeastern section around rocky outcrops or serpentine soils. Effects can be avoided if work occurs outside growing season or during dormant season.
Oakland star-tulip (<i>Calochortus umbellatus</i>)	—	—	CNPS 4.2	This perennial herb is found in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grasslands.	Low. Occurrences are located near southern Marin County. Known suitable habitat present within the project area, but no occurrences recorded within 3 miles of the project area in CNDDDB or CNPS 9-quad search. Effects can be avoided if work occurs outside growing season or during dormant season.
Mt. Saint Helena morning-glory (<i>Calystegia collina</i> ssp. <i>Oxyphylla</i>)	—	—	CNPS 4.2	This perennial rhizomatous herb is found in chaparral, lower montane coniferous forest, valley and foothill grassland, and serpentine soils.	Moderate. Known suitable habitat present within the project area, and one recent occurrence on Loma Alta Fire Road at the intersection of Lucas Valley Road.
Tiburon paintbrush (<i>Castilleja affinis</i> var. <i>neglecta</i>)	FE	CT	CNPS 1B.2	This perennial herb is found in serpentine grassland.	High. Many occurrences within Marin County and suitable habitat within the project area.
Johnny-nip (<i>Castilleja ambigua</i> var. <i>ambigua</i>)	—	—	CNPS 4.2	This annual herb is found in coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, and vernal pools.	Low. Little suitable habitat present within the project area as coastal habitats are not present. No occurrences recorded within 3 miles of the project area in CNDDDB or CNPS 9-quad search. Effects can be avoided if work occurs outside growing season or during dormant season.

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Species	Listing Status			Habitat	Potential for Occurrence
	Federal	State	CNPS		
Baker's larkspur (<i>Delphinium bakeri</i>)	FE	CE	CNPS 1B.1	This perennial herb is found in broadleaved upland forest, coastal scrub, valley and foothill grasslands.	Low. Potential suitable habitat present within the project area near Novato Creek, but only known occurrence, updated in 2021, is near Salmon Creek, which is not in the project area.
Western leatherwood (<i>Dirca occidentalis</i>)	—	—	CNPS 1B.2	This shrub is found in riparian woodland.	Moderate. Many occurrences within western Marin County recorded in CNPS 9-quad search, and suitable habitat within the project area near wetted creek channels. No occurrences recorded in CNDDDB within 3 miles of the project area.
California bottle-brush grass (<i>Elymus californicus</i>)	—	—	CNPS 4.3	This perennial herb is found in broadleaved upland forest, cismontane woodland, North Coast coniferous forest, and riparian woodland.	High. Occurrences within Marin County along Lucas Valley Road and suitable habitat within the project area near Loma Verde Preserve, Ignacio Valley Preserve, and Indian Valley Preserve.
Streamside daisy (<i>Erigeron biolettii</i>)	—	—	CNPS 3	This perennial herb is found in broadleaved upland forest, cismontane woodland, and North Coast coniferous forests.	Moderate. Occurrences within Marin County and suitable habitat within the project area.
Tiburon buckwheat (<i>Eriogonum luteolum var. caninum</i>)	—	—	CNPS 1B.2	This perennial herb is found in chaparral, coastal prairie, valley grassland, and serpentine endemic.	High. Several occurrences recorded, and suitable habitat present within a portion of the project area, particularly at the base of Mount Burdell. Effects can be avoided if work occurs outside growing season or during dormant season.
Fragrant fritillary (<i>Fritillaria liliacea</i>)	—	—	CNPS 1B.2	This annual herb is found in heavy soil, open hills, and fields near coast.	High. Six occurrences recorded near Mount Burdell Preserve. Potentially suitable habit is present within the project area, particularly within and near Mount Burdell Preserve. Effects can be avoided if work occurs outside growing season or during dormant season.
Woolly-headed gilia (<i>Gilia capitata</i>)	—	—	CNPS 1B.1	This annual herb is found in coastal bluff scrub, valley and foothill grasslands.	Low. Potentially suitable habitat present within the project area, but no occurrences recorded within 3 miles of the project area in CNDDDB records.

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Species	Listing Status			Habitat	Potential for Occurrence
	Federal	State	CNPS		
<i>ssp. Tomentosa</i>)					Effects can be avoided if work occurs outside growing season or during dormant season.
Congested-headed hayfield tarplant (<i>Hemizonia congesta</i> ssp. <i>congesta</i>)	—	—	CNPS 1B.2	This annual herb is found in northern coastal scrub, and valley grassland.	High. Two occurrences recorded within the project area near Mount Burdell Preserve, Meadow Crest Road, and Loma Verde Preserve. Effects can be avoided if work occurs outside growing season or during dormant season.
Marin western flax (<i>Hesperolinon congestum</i>)	FT	CT	CNPS 1B.1	This annual herb is found in serpentine grassland.	High. Occurrences recorded in Mount Burdell Preserve, near San Carlos Way, and serpentine soil is found at the base of Mt. Burdell. Effects can be avoided if work occurs outside growing season or during dormant season.
Bristly leptosiphon (<i>Leptosiphon aureus</i>)	—	—	CNPS 4.2	This annual herb is found in chaparral, cismontane woodland, coastal prairie, valley and foothill grasslands.	Moderate. Occurrences near Mount Burdell Preserve. Potentially suitable habitat present within the project area. Effects can be avoided if work occurs outside growing season or during dormant season.
Woolly-headed lessingia (<i>Lessingia hololeuca</i>)	—	—	CNPS 3	This annual herb is found in broadleaved upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grasslands.	Moderate. Occurrences in Lucas Valley and Mount Burdell, potentially suitable habitat present within these portions of the project area. Effects can be avoided if work occurs outside growing season or during dormant season.
Tamalpais lessingia (<i>Lessingia micradenia</i> var. <i>micradenia</i>)	—	—	CNPS 1B.2	This annual herb is found in chaparral, valley and foothill grasslands.	Low. Most recorded occurrences located on Mount Tamalpais. No CNDDDB or CNPS 9-quad search occurrences recorded within 3 miles of project area. Potential suitable habitat in northeastern and eastern sections of the project area Effects can be avoided if work occurs outside growing season or during dormant season.

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Species	Listing Status			Habitat	Potential for Occurrence
	Federal	State	CNPS		
Mt. Diablo cottonweed (<i>Micropus amphiboles</i>)	—	—	CNPS 3.2	This annual herb is found in rocky areas in broadleaved upland forest, chaparral, cismontane woodland, valley and foothill grasslands.	Moderate. Known suitable habitat present within the eastern section of the project area. Known occurrences near San Andreas Fire Road on Mount Burdell. Effects can be avoided if work occurs outside growing season or during dormant season.
Cotula navarretia (<i>Navarretia cotulifolia</i>)	—	—	CNPS 4.2	Chaparral, cismontane woodland, valley and foothill grassland	Moderate. Two known occurrences on Mount Burdell near the San Marin Fire Road; one older occurrence near Aberdeen Road in eastern portion of project area. Effects can be avoided if work occurs outside growing season or during dormant season.
Bake's navarretia (<i>Navarretia leucocephala</i> ssp. <i>bakeri</i>)	—	—	CNPS 1B.1	This annual herb is found in freshwater wetlands, Northern oak woodland, foothill woodland, valley grassland, and wetland-riparian.	Moderate. Occurrences at Mount Burdell vernal pools and potentially suitable habitat within project area. Effects can be avoided if work occurs outside growing season or during dormant season.
Marin County navarretia (<i>Navarretia rosulate</i>)	—	—	CNPS 1B.2	This annual herb is found in chaparral and closed-cone coniferous forest.	Low. Potentially suitable habitat present within the project area. Effects can be avoided if work occurs outside growing season or during dormant season.
Mount Burdell jewelflower (<i>Streptanthus anomalus</i>)	—	—	CNPS 1B.1	This annual herb is found in the ecotone between oak woodland and grassland.	High. Recent occurrences recorded throughout Mount Burdell Preserve and potentially suitable habitat present along the northeastern corner of the project area. Effects can be avoided if work occurs outside growing season or during dormant season.
Mt. Tamalpais bristly jewelflower (<i>Streptanthus glandulosus</i>)	—	—	CNPS 1B.2	This annual herb is found in chaparral and valley grasslands.	Low. Two occurrences within 3 miles of project, and potentially suitable habitat present within the project area. Effects can be avoided if work occurs outside growing season or during dormant season.

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Species	Listing Status			Habitat	Potential for Occurrence
	Federal	State	CNPS		
<i>ssp. pulchellus</i>					
Oval-leaved viburnum (<i>Viburnum ellipticum</i>)	—	—	CNPS 2B.3	This perennial deciduous shrub is found in chaparral, cismontane woodland, and lower montane coniferous forest.	Moderate. Two occurrences on the Burdell Mountain Fire Road, northwest of the Buck Institute. known suitable habitat present within the southeastern section of the project area. Effects can be avoided if work occurs outside growing season or during dormant season.

Notes:

- FE – federally listed endangered species
- FT – federally listed threatened species
- FC – federal candidate species
- CE – California State endangered
- CT – California State threatened
- FP – fully protected
- SSC – California State Species of Special Concern
- CR – California rare
- CC – California State candidate species
- CNPS – California Native Plant Society Ranks 1B – plant species rare or endangered in California and elsewhere (not protected under ESA or CESA)
 - 0.1 – seriously threatened in California (over 80 percent of occurrences threatened; high degree and immediacy of threat)
 - 0.2 – moderately threatened in California (20 percent to 80 percent of occurrences are threatened; moderate degree and immediacy of threat)

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Impact BIO-1

The proposed project would involve initial treatment and maintenance of a fuel break and WUI fuels reduction areas. Work would focus on treatment of exotic, invasive, and fire-hazardous vegetation; healthy, mature, native trees would not be removed as a part of the proposed project. Treatments include prescribed herbivory, hand pulling of invasive vegetation, broadcast burning, and use of manual and mechanical tools, including chainsaws, pole loppers, broom pullers, chippers, and/or tractors or skid steers with a mower/masticator attachment to facilitate vegetation removal and cutting. Broadcast burning could be conducted in grasslands and forest understory in the northeastern portion of the project area. Vegetative debris may be cut and scattered in place, chipped, and/or hauled off-site. Pile burning may also be used for biomass disposal.

Special-status plant species are listed in Table 3-4. Overall, special-status plant occurrences documented within 3 miles of the proposed project are concentrated along the western and northern boundaries, where the project abuts several MCOSD open space and parks lands. Many of the sensitive species that were reviewed are associated with or endemic to serpentine soils, which occur within the northern portion of the project footprint at Mount Burdell Open Space Preserve (Attachment D.2, Figure 4b). Areas of potential habitat have been mapped in detail to facilitate identification of pre-work areas for surveys.

Manual and mechanical vegetation removal and trimming, prescribed burning, prescribed herbivory, and herbicide application could result in direct or indirect adverse effects to special-status plant species. The project areas contain known occurrences of sensitive plant species as well as potentially suitable habitat for some sensitive plant species (Table 3-3). The potential for adverse effects to special-status plant species is within the scope of the activities and impacts addressed in the CalVTP PEIR because the activities and level of disturbance resulting from implementing treatment activities are consistent with those analyzed in the PEIR (CalVTP Final PEIR Volume II Section 3.6.3, pages 3.6-131 – 3.6-138). While vegetation treatment activities may directly or indirectly impact special-status plant species, the removal of understory vegetation and invasive species could promote the regeneration of native species that support a healthier forest. Additionally, wildfire risk and the risk of catastrophic stand-replace wildfires, which may threaten sensitive plant populations, may be reduced. An analysis of potential impacts on each special-status plant species known to occur within 3 miles of the project boundaries has been performed (refer to Attachment D and Table 3-4 for details).

Applicable SPRs include the following:

- Biological resources would be reviewed and surveyed (SPR BIO-1).
- Crew members and contractors would be trained in applicable biological resources (SPR BIO-2).
- Protocol-level surveys for special-status plants in areas identified during SPR BIO-1 as suitable habitat for special-status plant species where adverse effects from the proposed project cannot be clearly avoided (SPR BIO-7). Protocol-level

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surveys for special-status plants would not be required if adverse effects can be clearly avoided such as the target special-status plant species is an herbaceous annual, stump-sprouting species, or geophyte species, and if the treatment may be carried out during the dormant season for that species or when the species has completed its annual life cycle, provided the treatment would not alter habitat in a way that would make it unsuitable for the special-status plants to reestablish following treatment or destroy seeds, stumps, or roots, rhizomes, bulbs, and other underground parts of special-status plants.

- Invasive species spread would be prevented (SPR BIO-9).
- Disturbance would be suspended during heavy precipitation (SPR GEO-1).
- Soil areas disturbed by mechanical, prescribed herbivory, and prescribed (pile and broadcast) burns that exhibit bare soil over 50 percent or more of the treatment area would be stabilized with mulch or organic matter produced from mastication (SPR GEO-3).
- Erosion would be monitored by the project proponent through an inspection for proper implementation of applicable SPRs and mitigations prior to the rainy season and an inspection of the treated areas for evidence of erosion after the first large storm or rainfall event (SPR GEO-4).
- Compacted treatment areas would be drained via water breaks (SPR GEO-5).
- Erosion would be minimized through heavy equipment and slope limitations (SPR GEO-7).
- Herbicide application would not occur within protective buffers for special-status plants to prevent drift and non-target application (SPR HAZ-5).

Impacts could be potentially significant, even with implementation of the SPRs, per the CalVTP PEIR. Therefore, MMs BIO-1a and BIO-1b would be required where sensitive species are known to occur due to protocol level surveys required per SPR BIO-7. Per MM BIO-1a and MM BIO-1b, if special-status plants are identified during protocol-level surveys, a no-disturbance buffer of at least 50 feet would be established around the area occupied by the species within which treatment would not occur unless treatment can be completed outside the growing period for sensitive annual and geophyte species (i.e., in the dormant season) and would not damage the stump, root system, or other underground parts of special-status plants or destroy the seedbank, or should a qualified biologist determine that the species would benefit from treatment in the occupied habitat area. Table 3-4 lists the geophytic, stump-sprouting, or annual species for which effects can be avoided so long as work occurs outside the growing season or during the dormant season. With implementation of the SPRs and MMs listed above, including survey protocols and trainings, impacts to special-status plant species would be less than significant. The impact is within the scope of the PEIR (Section 3.6 page 138) because the treatment activities and intensity are consistent with those analyzed in the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, general habitat characteristics are essentially the same within and outside the treatable landscape (e.g., no resource is affected outside the treatable

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landscape that would not also be similarly affected within the treatable landscape). Therefore, the potential impact on special-status plants is also the same, as described above. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact BIO-2

Summary of Impacts and Relevant SPRs and MMs

Manual and mechanical vegetation removal, prescribed burning, targeted herbicide application, and prescribed herbivory have the potential to result in direct or indirect adverse effects to special-status wildlife species or habitat. The project areas contain known occurrences of sensitive wildlife species as well as potentially suitable habitat for some sensitive wildlife species (Table 3-4). The potential impacts on special-status wildlife and suitable habitat are within the scope of the PEIR because the treatment activities and intensity are consistent with those analyzed in the PEIR (CalVTP Final PEIR Volume II Section 3.6.3, pages 3.6-138–3.6-184).

Hand and mechanical treatments, herbivory, broadcast burning, and herbicide application would result in reduced understory vegetation that may modify preferred habitats for some special-status species; however, it would promote a healthier, native forest habitat. SPRs BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-8, BIO-9, BIO-10, BIO-11, HAZ-5, HAZ-6, HYD-1, HYD-2, HYD-3, HYD-4, and HYD-5 would be implemented to minimize impacts.

Applicable SPRs not already described under Impact BIO-1 include the following:

- If sensitive natural communities or habitats cannot be avoided, then a protocol-level survey would be conducted to identify and map the limits of the potentially sensitive area (SPR BIO-3).
- Treatments would be designed to avoid loss or degradation of riparian habitat function, including retaining a minimum of 75 percent overstory and 50 percent understory canopy (SPR BIO-4).
- Type conversion would be avoided and habitat function in chaparral and coastal sage scrub communities maintained through treatment design, and a minimum of 35-percent relative cover of native chaparral and coastal sage scrub communities would be retained (SPR BIO-5).
- The proposed project would not conflict with the provisions of an adopted natural community conservation plan, habitat conservation plan, or other approved plan (BIO-8).
- Focused or protocol-level surveys would be conducted for special-status wildlife species or nursery sites with potential to be directly or indirectly affected by treatment (BIO-10).
- Install wildlife fencing that is designed to minimize the chance of wildlife entanglement, allows for wildlife jump-outs, and is highly visible to wildlife (BIO-11).
- Obtain all required licensing and permitting for herbicide application through the County Agricultural Commissioner's office (SPR HAZ-6).

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- Comply with water quality regulations including vegetation and land-disturbance related waste discharge requirements (SPR HYD-1).
- Avoid construction of new roads (HYD-2).
- Ensure that water quality is protected for prescribed herbivory (HYD-3).
- Identify and protect watercourse and lake protection zones (SPR HYD-4).
- Protect non-target vegetation and special-status species from herbicides (SPR HYD-5).

According to the CNDDDB BIOS search, four special-status wildlife species are known to occur within the project footprint: pallid bat (*Antrozous pallidus*), western pond turtle (*Emys marmorata*), burrowing owl (*Athene cunicularia*), and white-tailed kite (*Elanus leucurus*). In addition, four special-status wildlife species have a potential to occur within the project footprint: Townsend's big-eared bat (*Corynorhinus townsendii*), California giant salamander (*Dicamptodon ensatus*), foothill yellow-legged frog (*Rana boylei*), and northern spotted owl (*Strix occidentalis caurina*).

Impacts to Amphibians

Three special-status amphibian species could occur in the vicinity of the project area where it crosses waterways or wetlands: California giant salamander, foothill yellow-legged frog, and California red-legged frog. Direct and indirect impacts could occur to salamanders, foothill yellow-legged frogs, and California red-legged frogs from off-road travel, especially near streams, or from sedimentation caused by various activities, particularly activities that involve ground disturbance. Broadcast burning could desiccate salamanders traveling through upland habitat; however, the proposed broadcast burn area does not contain suitable habitat for these species.

SPR BIO-10 would apply and requires focused surveys for potential sensitive species within suitable habitats in and adjacent to treatment areas (including all access routes, parking areas, equipment staging areas, and debris storage areas). SPR BIO-2 would require staff training prior to work. SPR GEO-1 would suspend treatment activities during heavy precipitation until soils are no longer saturated, would reduce the potential for project activities to disturb ground supporting burrows occupied by amphibian species, and would reduce the potential for impacts to these species. SPR BIO-4 requires that treatments would be designed to avoid loss or degradation of riparian habitat function. SPR HYD-1 and SPR HYD-4 require compliance with water quality regulations to reduce the potential for impacts to aquatic habitat occupied by these species. Impacts could still be significant and therefore MM BIO-2a would also apply. MM BIO-2a includes avoidance of treatment in occupied habitat or outside the sensitive period in the species' life history. Additionally, more intensive work would typically occur in the late summer and early fall, when there is less rainfall and these species are less active, further reducing impacts. MM BIO-2b would also apply. Under this measure, biological monitoring would be required for treatment activities within or adjacent to sensitive habitat areas (e.g., streams, seeps, springs, talus slopes for California giant salamander or foothill yellow-legged frog), flagging areas for avoidance, relocation of individual animals, and/or other measures recommended by the CDFW as necessary to avoid injury to or mortality of these species.

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Impacts to special-status amphibians would be reduced to less than significant with implementation of these measures, consistent with the PEIR.

Impacts to Western Pond Turtles

The western pond turtle has a low potential to occur within the project area. This species uses upland and aquatic habitat in and around freshwater ponds and streams, which would be mostly avoided by project design. This species nests in leaves or soil upland from water bodies in flat areas with short vegetation and dry soil and is highly associated with ponds and streams. Four CNDDDB records were found within 3 miles of the project area, and one pond turtle was observed near the project area within a short dispersal distance during reconnaissance surveys. Manual and mechanical methods of vegetation removal could impact upland areas used for egg laying, and vehicles or livestock used for prescribed herbivory could trample pond turtles or their eggs. The broadcast burn area does not contain suitable habitat for western pond turtle. SPR BIO-10 would require focused surveys if working near ponds and streams to identify special-status species. SPR BIO-2 would require staff training prior to work to raise awareness. Impacts could still be significant. MMs BIO-2a and BIO-2b would also apply, which require avoidance and monitoring. Impacts would be less than significant with implementation of these measures, consistent with the PEIR.

Impacts to Northern Spotted Owls

During the reconnaissance surveys, biologists determined that only foraging habitat is present in a portion of the project area footprint. Two historical activity centers and historic nests, however, are present within 0.5 mile of the western portion of the project area.

Manual and mechanical removal of vegetation and pile burning could indirectly impact nesting northern spotted owls if nesting is adjacent the work areas. Since nesting is not anticipated within the project footprint, direct impacts to nests would not occur. Use of heavy equipment could temporarily elevate noise levels in areas surrounding the work zone. Should nesting occur near but outside the work zone, depending on the timing and magnitude of the related noise, nesting by northern spotted owl could be disrupted. Human activities conducted within the visual line of sight of a nest could also disturb nesting activities. Smoke from prescribed burns could also impact nesting behavior if it were to occur in close enough proximity to active nests outside the project area. Vegetation management activities could result in one or more of the above conditions while nesting is occurring, indirectly resulting in disruption of breeding and nesting or abandonment of active nests.

USFWS has provided guidance in determining if project-related noise and activities could result in the disturbance of a northern spotted owl nest and result in "take." Noise and visual disturbance may reach the level of take when at least one of the following conditions is met (USFWS, 2020):

- Project-generated sound exceeds ambient nesting conditions by 20 to 25 decibels (dB)

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- Project-generated sound, when added to existing ambient conditions, exceeds 90 dB
- Human activities occur within a visual line-of-sight distance of 330 feet or less from a nest

SPR BIO-10 requires focused surveys when working in habitats, which includes work conducted in spotted owl habitat near known nesting sites. SPR BIO-2 would require staff training prior to work. These measures would allow for the identification of any nesting pairs in close proximity to work zones and, thus, the avoidance of noise disturbance within the nesting seasons (February 1 through July 31 [CCR Title 14 § 895]) where work could result in take. These measures would reduce impacts to nesting northern spotted owl from performing the work; however, significant impacts could still occur from the alteration of foraging habitat.

In general, suitable habitat for northern spotted owl is characterized as old forests with large trees and a closed canopy (60–70% canopy cover) with multiple canopy layers (Lesmeister D. R., 2018). Most of the Marin County owls are known to use forests younger than those further north in California (MMWD, 2019). The owls also require open space in the understory or less dense habitats to allow flight under the canopy to forage (Gutierrez, Franklin, and Lahaye 2020). The proposed project activities would generally benefit foraging behaviors by opening up the understory; however, impacts could still occur from alteration of habitat should it occur at the canopy level.

MM BIO-2a would apply to areas where foraging habitat suitable for northern spotted owl was identified during reconnaissance surveys. MM BIO-2a requires that habitat function be maintained for northern spotted owl following guidance for the species, with specific requirements for high canopy cover. In tree canopy areas where existing suitable foraging habitat is present, canopy would be retained at a percentage preferred by the species. Implementation of MM BIO-2a would ensure impacts to foraging habitat are minimized to less than significant levels by maintaining foraging habitat functions.

In addition to forest structure, habitat suitability is influenced by the availability of prey, presence of competitor species, risk of predation, and availability of suitable nesting locations (Lesmeister D. R., 2018). Some vegetation management activities would involve removal of woody debris, which could result in destruction of woodrat nests, the main prey of the northern spotted owl. Given the relatively narrow width of the fuel break and WUI fuels reduction areas compared with the wildland hunting areas available to woodrats, impacts to northern spotted owl prey base would be minimal and less than significant.

The proposed treatments would likely have a beneficial effect to northern spotted owl in the long term if they reduce future losses of ecosystem structure from catastrophic wildfire and succession or better incorporate future disturbance events to improve overall forest ecosystem resilience to climate change (Ager, Finney, Kerns, & Maffei, 2007; Spies, et al., 2010).

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Impacts to Burrowing Owl

Burrowing owls have a low potential for occurrence in the project footprint. This is due to the lack of large, flat, open grasslands with burrows suitable to support burrowing owls observed during the reconnaissance surveys. Several sightings of burrowing owls were found during the CNDDDB review, and multiple sightings of burrowing owl were found on eBird; however, these observations are outside and east of the project area, in marsh habitat, and the observations were made during the non-breeding season. No individuals were observed during field reconnaissance surveys. Treatment activities could result in crushing of burrows or nest abandonment due to disturbance caused by workers, noisy equipment, or burning, resulting in impacts on burrowing owl. Surveys for nesting birds during the avian breeding season would occur ahead of work pursuant to SPR BIO-12. While unlikely, if burrowing owls are observed during the surveys, a no-disturbance buffer would be established per SPR BIO-12 and the buffer size determined by a qualified RPF or biologist. Impacts on burrowing owl would be less than significant.

Impacts to White-Tailed Kite

The white-tailed kite has a moderate potential to occur within the project footprint and surrounding areas. Suitable habitat is present along much of the project footprint, including grass fields for foraging and mature trees for nesting. One CNDDDB occurrence and many eBird occurrences throughout the project area were observed during the desktop review. No individuals were observed during field reconnaissance. Activities during the nesting season could result in direct loss of active nests or indirectly result in nest abandonment. Vegetation treatment could alter foraging and nesting habitat. If work is to occur during nesting season, pre-activity surveys would need to take place before work can proceed, per SPR BIO-12.

If, during focused or protocol surveys occurring per SPR BIO-10 or SPR BIO 12, special-status species are detected within the treatment areas, then MM BIO-2b would be implemented. Under MM BIO-2b, biological monitoring would be required for treatment activities within or adjacent sensitive habitat areas, flagging areas for avoidance, relocation of individual animals, and/or other measures recommended by the CDFW as necessary to avoid injury to or mortality of these species. These measures would reduce impacts to less than significant levels.

Impacts to Special-Status Bats

Two bat species, pallid bat and Townsend big-eared bat, may potentially occur in the project area. Suitable large-diameter trees were observed in some locations on site, and abandoned buildings that could provide suitable roosting habitat could be present on private properties where access could not be granted for surveys. Bat species such as Townsend big-eared bats that utilize caves, mines, tunnels, buildings, or bridges would not be directly impacted by vegetation removal. Loud mechanical equipment used for treatment could indirectly impact bat species using buildings or structures in the area. Tree removal activities could impact colonial bat species such as the pallid bat, which select a variety of trees and roost features, including cavities, crevices, and deep fissures in the wood or bark of a tree and exfoliating bark. Smoke from prescribed burning could also indirectly impact roosting bats by disturbing them during sleep, breeding, or hibernation. Depending on the species present, the size of the roost, the type

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of roost (e.g., maternity, day, night, hibernation) and the season when tree removal would occur, the removal of trees could affect bats through removal of the roost and injury to bats. SPR BIO-10 requires focused surveys when working in habitats, which includes work conducted in potential habitat for roosting bats, during maternity roosting season (March 1 to July 31). SPR BIO-2 would require staff training prior to work. Impacts could still be significant. MMs BIO-2a and BIO-2b would be implemented, as previously described, to avoid impacts to these species and to monitor during work, if found to occur. Impacts would be less than significant with mitigation, consistent with the PEIR.

Impacts to Special-status, Migratory, and Nesting Birds

Several special-status bird species (refer to Table 3-4) as well as migratory and nesting birds have the potential to occur within the project footprint and/or surrounding area. Other special-status bird species, such as the California black rail, do not have a potential to occur within the project area but could occur and nest in marsh habitats adjacent treatment areas. Migratory birds and birds of prey are protected under the Migratory Bird Treaty Act and sections 3503 and 3503.5 of the California Fish and Game Code.

Quality ground, shrub, and tree nesting habitats were observed throughout the project areas during reconnaissance-level surveys, and common nesting birds are expected to occur. Tree removal activities could impact nesting birds, which use cavities, snags, trees, and wood debris as nesting habitat. Nesting bird species, including special-status species nesting in nearby habitats, could be alarmed by noise from mechanical equipment operation and the presence of workers that could result in nest abandonment and failure. Prescribed herbivory would not be likely to result in the direct loss of nest trees or cavities, as herbivores target understory herbaceous or woody vegetation. Prescribed burning could directly impact nesting birds should burning occur during the breeding season. Active nests could be directly burned, damaged by falling debris, or damaged through heat scorch or smoke damage. Pile burning would not likely result in adverse effects to nesting birds because pile burning would occur in discrete locations away from suitable nesting habitat.

SPR BIO-10 requires focused surveys when working in suitable special-status species habitats. SPR BIO-2 would require staff training prior to work. Per SPR BIO-12, treatment activities would be scheduled to avoid active nesting season of nesting bird and raptor species. The active nesting season would be defined by a qualified RPF or biologist. If treatment activities cannot be scheduled to fully avoid the active nesting season, a survey for common nesting birds would be conducted by a qualified RPF or biologist, as described in SPR BIO-12. If an active nest is detected, disturbance to the nest would be avoided by establishing an appropriate buffer around the nest, modifying treatments to avoid disturbance to the nest, or deferring treatment until the nest is no longer active. These measures would allow for the identification of any nesting birds in close proximity to work zones. Impacts could still be significant to special-status bird species. MM BIO-2a and MM BIO-2b, which require avoidance and/or monitoring of special-status individuals, including nests, would also apply. Impacts would be less than significant with implementation of these measures, consistent with the PEIR.

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Impacts of the Project Outside the Treatable Landscape

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the treatment area, general habitat characteristics are essentially the same within and outside the treatable landscape because the areas are all adjacent each other, have similar vegetation, and would potentially impact the same types of sensitive wildlife. Therefore, the potential impact to special-status wildlife is also the same, as described above. This determination is consistent with the PEIR—less than significant with the SPRs and mitigation previously identified—and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact BIO-3

Summary of Impacts and Relevant SPRs and MMs

Manual and mechanical vegetation removal, prescribed burning, prescribed herbivory, and herbicide application could result in direct or indirect adverse effects to sensitive habitats, including designated sensitive natural communities and oak woodlands. The project areas contain several sensitive habitat types (Table 3-3). The potential for treatment activities to result in adverse effects to sensitive habitats was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.6.3, page 71). The potential for adverse effects to sensitive habitats is within the scope of the activities and impacts addressed in the PEIR because the treatment activities and level of disturbance as a result of the treatment activities are consistent with those analyzed in the PEIR. The SPRs that apply to this impact are SPRs BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-6, BIO-9, and HYD-4 (Attachment D). MM BIO-3a would also apply and requires the determination of the fire return interval for the specific natural community type or alliance and the design of treatments to restore the natural fire regime and return vegetation composition to its natural condition. MM BIO-3a also requires avoidance of vegetation treatments in sensitive natural communities with rarity ranks S1 and S2, and no more than 20 percent of the native vegetation cover be removed by fuel treatments in sensitive natural community vegetation with rarity rank S3 or in oak woodlands.

Applicable SPRs, not already described in Impact BIO-1 and Impact BIO-2, include the following:

- Treatment would be implemented to minimize soil disturbance and prevent the spread of plant pathogens including *Phytophthora* (SPR BIO-6).

SPR BIO-3 requires a survey for sensitive vegetation communities prior to treatment to ensure these are identified and treatment avoids these communities. Implementation of SPR BIO-1 and the survey required under SPR BIO-3 would ensure any riparian habitat, sensitive communities, or oak woodlands would be identified. If any riparian habitat occurs, SPR BIO-4 would ensure that treatment is designed to avoid or minimize impacts to these areas. SPR BIO-5 would ensure that treatment is designed to maintain or enhance habitat function of chaparral and coastal sage scrub communities; SPR BIO-6 requires that best management practices be employed to avoid

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spread of plant pathogens; and SPR BIO-9 prescribes actions to prevent the spread of invasive plants.

Review of the GGNPC habitat data resulted in identification of ten sensitive habitat types within the project area, as listed in Table 3-3 (CDFW 2022). These sensitive habitat types represent a total of 28 percent of the project footprint. A small quantity of chaparral habitat was found to be present in the project footprint, and neither chaparral habitat alliances are considered Sensitive with a S3 or S2 rank (CNPS, 2022).

Coastal Scrub and Chaparral

The treatment area contains chaparral communities defined as Northern Mixed Chaparral in the Manual of California Vegetation (see Table 3-3) (CNPS, 2022). No coastal scrub was identified in the project footprint.

The majority of the chaparral communities are characterized as *Baccharis pilularis* Alliance habitat types. These habitats have a fire return interval with a mean of 76 years, with a 20 to 120 year mean minimum and maximum (Van de Water & Safford, 2011). Fewer than 2 acres of chaparral habitat are identified as *Adenostoma fasciculatum* Alliance. These habitats have a fire return interval average of 55 years, with a 30 to 90 year mean minimum and maximum (Van de Water & Safford, 2011). Less than 1 acre of the project area is characterized as *Salix lasiolepis* Alliance chaparral, which is designated in the Point Reyes National Seashore Draft Wildland Fire Resource Advisor Guide (NPS, 2007) as having a 55-year average fire return interval, with 40- to 70-year average range. Approximately 11 acres of chaparral habitat are designated as “uncharacterized shrub fragment,” and 1 acre of shrub habitat are designated as “shrub (urban window)” in the GGNPC database. The habitats designated as “uncharacterized shrub fragment” could not be accessed during reconnaissance-level surveys to verify Alliance group but are expected to reflect similar conditions as those observed in the nearby *Baccharis*-dominated shrub areas. The “shrub (urban window)” habitat observed during the reconnaissance surveys overlapped private property.

Chaparral is generally considered a fire-adapted community. In the absence of wildfires and grazing, *Baccharis pilularis* readily invades grassland habitats on the California coast (Kidder, 2015). The lack of recent wildfires within the proposed project areas appears to have influenced gradual conversion of previously existing grassland habitat into chaparral habitat types through the encroachment of *Baccharis pilularis* and *Arctostaphylos* species. The natural fire regime would not be immediately restored by this treatment, but characteristics of fire, predominantly the regenerative action following vegetation treatment and removal of small encroaching non-native vegetation, would be conducted through hand and mechanical removal of understory vegetation, dead, dying, and diseased trees, and select live trees to create a shaded fuel break that would promote the health and resiliency of the chaparral habitat. The broadcast burn areas do not overlap with mapped chaparral habitats.

Implementation of SPR BIO-5 ensures treatment in chaparral would be conducted to retain a minimum of 35 percent of the native vegetation cover. Treatment activities in chaparral would promote heterogeneity, resiliency, and health in the residual stand by creating different

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influences of sunlight to this vegetative type, adding to a mosaic of diversity. The mosaic pattern of vegetation would retain suitable habitat for wildlife and reduce the potential for erosion following treatments. SPR BIO-9 would ensure no significant spread of invasive species from treatment activities. Impacts to this community would be less than significant, consistent with the PEIR.

Oak Woodlands

According to GGNPC and VegCAMP vegetation data (GGNPC 2021; CDFW 2013), in combination with data ground-truthing during reconnaissance-level surveys, there are approximately 1,450 acres of oak woodland present in the project footprint, representing 42 percent of the total project area. The dominant Alliance type is *Quercus agrifolia* Alliance, followed by *Quercus lobata*, *Quercus douglasii*, *Quercus lobata*, *Quercus garryana*, and *Quercus kelloggii* dominated woodlands. Approximately 300 total acres of oak woodland qualify as rank S3; these are characterized as *Quercus lobata* Alliance and *Quercus garryana* Alliance. (Table 3-3, Attachment D.2, Figures 3 through 18).

According to GGNPC vegetation data, in combination with data ground-truthing during reconnaissance-level surveys, there are approximately 400 acres of blue oak woodland (*Quercus douglasii* Alliance) habitat present in the project footprint, representing 12 percent of the total project area. Blue oak woodland habitats host a variety of wildlife species including bats, nesting birds, and various amphibians and reptiles. MCOSED recognizes large populations of blue oak woodland in Mount Burdell and Rush Creek Open Space Preserves. In both preserves, the blue oaks hybridize with white oaks, *Quercus lobata* and *Quercus garryana*. This was confirmed during the reconnaissance-level surveys where the project footprint overlaps with these preserves.

Manual and mechanical vegetation removal, prescribed burning, targeted herbicide application, and prescribed herbivory may occur in sensitive oak communities. The broadcast burn areas overlap with mapped coastal oak woodlands. The proposed treatments would occur within coastal oak woodlands that are outside of their natural fire regime, defined as short to medium interval, or approximately 5 to 45 years. Observations during reconnaissance-level surveys confirmed that the oak woodland habitat throughout site has been maintained through grazing or regular mowing. In some oak woodland habitat within the project site, the understory was not maintained and encroachment of non-native species, including broom or non-native rock rose (*Cistus* species), were observed. The natural fire regime has not been maintained in the project area, and it would not be immediately restored by this treatment; however, characteristics of fire, predominantly regenerative action following vegetation treatments and ladder fuel alteration, would be emulated through vegetation removal of understory vegetation, select live trees, and dead, dying, and diseased trees to create a shaded fuel break that would promote the health and resiliency of the residual stand.

Treatment activities have the potential to result in degradation or alteration of sensitive oak communities. Due to the presence of sensitive oak woodland communities, MM BIO-3a applies to the proposed project. Implementation of MM BIO-3a requires the determination of the fire-

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return interval for the specific natural community type or Alliance and the design of treatments to restore the natural fire regime and return vegetation compositions to their natural condition. MM BIO-3a also requires avoidance of fuel breaks in sensitive natural vegetation communities with rarity ranks S1 and S2 and that no more than 20 percent of the native vegetation cover be removed by fuel breaks in sensitive natural vegetation communities with rarity rank S3 or in oak woodlands.

Many areas in Marin County are affected by sudden oak death (SOD) and other forest diseases. Treatment would be implemented to minimize soil disturbance and prevent the spread of plant pathogens, including *Phytophthora*, in accordance with SPR BIO-6 to ensure less-than-significant effects to oak woodlands from spread of SOD. SPR BIO-9 would minimize impacts from the spread of invasive species.

With implementation of MM BIO-3a, oak woodland treatment would target understory vegetation, and at least 80 percent of the native vegetation upper canopy cover would be maintained. In treatment areas where multiple age classes are represented, the proposed treatment would promote heterogeneity, resiliency, and health in the residual stand by creating different influences of sunlight through the canopy to the forest floor. Adding to a mosaic of diversity in the understory. No S1 or S2 oak communities were documented during the desktop or field review of the project area; if these are discovered during the course of work, no treatment would occur within S1 or S2 communities. Treatment focus on vegetative understory would ensure retention of overall oak woodland habitat cover; therefore, loss of oak woodlands is not anticipated.

Redwood Forest

According to GGNPC vegetation data, in combination with data ground-truthed during reconnaissance-level surveys, there is approximately 1 acre of redwood forest habitat present in the project footprint, representing less than 1 percent of the total project area. The dominant Alliance group identified in the redwood forest habitat is *Sequoia sempervirens* Alliance (CDFW 2013; GGNPC 2021), which qualifies as an S3 (CNPS, 2022). Treatment activities have the potential to alter or damage redwood forest communities.

SPR-9 would ensure no significant spread of invasive species that could impact this community. Due to the sensitivity of this community, impacts could still be significant, depending on intensity of treatments. With implementation of MM BIO-3a, redwood forest treatment would target understory vegetation, and approximately 80 percent of the native vegetation upper canopy cover would be maintained. In treatment areas where multiple age classes are represented, the proposed treatment would promote heterogeneity, resiliency, and health in the residual stand by creating different influences of sunlight through the canopy to the forest floor, adding to a mosaic of diversity in the understory. Treatment would generally focus on vegetative understory, removal of invasive species, dead and dying vegetation, and removal of smaller diameter, fire hazardous trees. Mature, healthy redwoods would not be removed, ensuring retention of redwood forest habitat cover; therefore, loss of redwood forest sensitive

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habitats is not anticipated. Impacts would be less than significant with mitigation, consistent with the PEIR.

Other Sensitive Natural Communities – Other Hardwood Forests

An assessment of GGNPC and VegCAMP data, in combination with data ground-truthed during reconnaissance-level surveys, resulted in a total of 634 acres of “other” hardwood forests. The majority of these are characterized as *Umbellularia californica* Alliance and *Arbutus menziesii* Alliance (CDFW 2013; GGNPC 2021). *Acer macrophyllum–Alnus rubra* Alliance, *Aesculus californica* Alliance, and *Salix gooddingii–Salix laevigata* Alliance also occur in the project footprint. These Alliance groups are associated with a variety of habitat conditions, but they all generally occur on the landscape in small patches within larger areas of oak woodland. All of these hardwood habitat Alliances, except for *Arbutus menziesii* Alliance, are characterized as rank S3 in the Manual of California Vegetation (CNPS, 2022). Vegetation treatments could alter or damage sensitive hardwood forest communities. SPRs to minimize effects from forest diseases (SPR-7) and invasive species (SPR-9) would apply. Impacts could still be significant given the sensitivity of these communities. On this account, MM BIO-3a would apply to these areas to limit native vegetation cover removal to 20 percent or less. Impacts would be less than significant with mitigation, consistent with the PEIR.

Other Sensitive Natural Communities – Herbaceous and Herbaceous Wetland Habitats

An assessment of GGNPC and VegCAMP data, in combination with data ground-truthed during reconnaissance-level surveys, resulted in a total of 42 acres of herbaceous wetland habitats. The majority of these are characterized as Vancouverian Freshwater Wet Meadows and Marsh Group and *Sarcocornia pacifica (Salicornia depressa)* Alliance (CDFW 2013; GGNPC 2021). *Distichlis spicata* Alliance and *Bolboschoenus maritimus* Alliance also occur in the project footprint. These Alliance groups are associated with a variety of habitat conditions, but they all occur on the landscape in small patches along the edges of the project footprint. All of these wetland habitat Alliances, except for *Distichlis spicata* Alliance, are characterized as rank S3 in the Manual of California Vegetation (CNPS, 2022). Additionally, *Calamagrostis nutkaensis*, an herbaceous plant community with a rank S2 in the Manual of California Vegetation (CNPS, 2022), occurs within the project area. On this account, MM BIO-3a would apply to these areas should these communities be encountered during treatment activities. Impacts would be less than significant with mitigation, consistent with the PEIR.

Riparian Habitat

Treatment activities have the potential to occur in riparian habitat. The treatment activities and their potential to impact wetlands was assessed in the PEIR (CalVTP Final PEIR Volume II Section 3.6, page 189). Treatment in riparian habitats would generally be light and focus on invasive species removal, hand thinning, and removal of dead and dying vegetation. Removal of dead and dying vegetation, invasive plants, and excess understory vegetation growth can also have beneficial effects and can improve riparian habitat health. Drainages are mapped within the proposed burn areas; however, riparian habitat was not observed during the reconnaissance survey of these areas. Riparian corridors were observed in other portions of the project area during reconnaissance surveys. Activities conducted within a riparian corridor

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would be conducted so as to avoid alteration to a bed, channel, or bank of a waterway, and all debris, including sawdust, chips, or other vegetative material, would be prevented from entering the bed, channel, or bank of a waterway unless a permit from the California Department of Fish and Game is obtained under section 1600 of the California Fish and Game Code. Treatment activities would be designed to avoid the loss or degradation of riparian habitat (SPR BIO-4). SPR BIO-9 would minimize potential for invasive species spread in riparian areas. In addition, MM BIO-3c would minimize impacts to riparian habitat by compensating for any unavoidable loss of riparian habitat. With implementation of the SPRs and the mitigation measure described above, impacts to riparian habitats from treatment activities would be less than significant with mitigation incorporated. The proposed treatment activities are therefore within the scope of the PEIR.

Impacts of the Project Outside the Treatable Landscape

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the treatment area, general habitat characteristics are essentially the same within and outside the treatable landscape because the areas are all adjacent each other and the same sensitive habitats are found in both. Therefore, the potential impact to sensitive habitats is also the same, as described above, and would be less than significant with implementation of the previously identified SPRs and mitigation. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact BIO-4

Mechanical and hand treatments, prescribed burning, prescribed herbivory, and herbicide application have the potential to adversely impact wetlands if work occurs in these areas. The treatment activities and their potential to impact wetlands was assessed in the PEIR (CalVTP Final PEIR Volume II Section 3.6.3, page 193). Wetted areas tend to pose fewer risks during a wildfire, and, on this account, work is generally much lighter in these areas, focused predominantly on invasive species removal. Wetland habitat was observed in the work area during reconnaissance surveys. Maps of wetland and stream areas based on the National Wetlands Inventory are shown in Attachment D. Removal of invasive species through mechanical and manual methods would be beneficial as it would allow revegetation by native wetland species. No fill or discharge of fill material into waters of the U.S. or State would occur as part of the proposed project. Work can also generate erosion that can influence wetland habitats. Implementation of water quality protections in accordance with SPR HYD-1, identification of Watercourse and Lake Protection Zones (WLPZs) in accordance with SPR HYD-4, and delineation and avoidance of State and federally protected wetlands, per MM BIO-4, would ensure no impacts to wetlands in the identified features. In addition, SPR BIO-1 would be implemented where reconnaissance surveys have not been conducted, and the above-mentioned measures would be implemented, as needed. SPR BIO-9 would minimize potential for invasive species spread in protected wetlands. With implementation of the SPRs and the mitigation measure described above, impacts to State and federally protected wetlands from the

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treatment project would be less than significant with mitigation incorporated. The proposed treatment activities are therefore within the scope of the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the treatment area, general habitat characteristics are essentially the same within and outside the treatable landscape because the areas are all adjacent to each other and include the same types of wetland habitat. Therefore, the potential impact on wetlands is also the same, as described above. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact BIO-5

Mechanical and hand treatments as well as broadcast burning could result in direct or indirect adverse effects on wildlife corridors. Based on the desktop review and reconnaissance survey as required by SPR BIO-1, the treatment area has the potential to provide essential connectivity areas for sensitive species. One rookery at Bel Marin Keys was identified within the project area (Marin Independent Journal, 2021). Tree removal that could result in rookery abandonment would not occur. Habitat within the treatment area may be used for movement (e.g., mule deer migration) and protective cover for common wildlife species. Noise during work may impede some movement, but the treatment areas are generally within 200 feet, up to 300 feet of structures, where other human disturbances are typical. Tree removal with heavy equipment and ground-disturbing activities have the potential to impact nursery sites for native wildlife. Use of noise-generating equipment and smoke from prescribed burning could disturb roosting birds and bats, impeding use of nursery sites. Broadcast burning, including the creation of control lines, could alter the use of wildlife corridors in the short-term.

The SPRs that apply to this impact are SPR BIO-1, BIO-2, BIO-4, BIO-5, BIO-10, BIO-11, and HYD-5 and are described under Impact BIO-1 and Impact BIO-2. With implementation of the SPRs, areas of intact wildlife corridors would be retained. These wildlife corridors would continue to function by connecting treatment areas to untreated landscapes, allowing for effective wildlife dispersal. Existing habitat would remain to permit movement of wildlife species. Vegetation management activities would not block or obstruct streams or creeks. Wildlife nursery sites could still be significantly impacted if not avoided. If wildlife nursery sites are identified during surveys conducted pursuant to SPR BIO-10, MM BIO-5 would apply. This mitigation measure requires that nursery habitat be marked for avoidance during treatment activities and a non-disturbance buffer be installed around the nursery site if activities are required to occur while the site is active or occupied.

Due to the history of fire suppression and dense understory vegetative growth throughout much of the project footprint, it is expected that wildlife corridors for some species would ultimately be improved by the treatment activities. By minimizing wildfire risk and thereby increasing protection the forest ecosystem, the wildlife corridors, while slightly degraded in the short term, could be protected from high intensity wildfire in the future.

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Implementation of the SPRs and MMs listed above would minimize changes in habitat function within treatment areas that serve as wildlife movement corridors. Impacts to migratory corridors and nursery sites would be less than significant with implementation of mitigation. The proposed treatment activities are therefore within the scope of the PEIR because they are the same as those listed in the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the treatment area, general habitat characteristics are essentially the same within and outside the treatable landscape because the areas are all adjacent to each other, the vegetation is the same or similar, and the same wildlife species would use the areas as wildlife movement corridors. From the species perspective, there would be no difference between the areas within and outside the treatable landscape. Therefore, the potential impact to wildlife movement corridors is also the same, as described above. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact BIO-6

Treatments could alter habitat for many common wildlife, such as reptiles and rodents, which could impact common wildlife species. Suitable habitat for common wildlife species is present within the project area. The potential for treatment activities to result in adverse effects to habitat and abundance of common wildlife was addressed in the PEIR (CalVTP Final PEIR Volume II Section 3.6.3, page 3.6-197 – 3.6-198). The potential for adverse effects to common wildlife is within the scope of the activities and impacts addressed in the PEIR because the treatment activities and level of disturbance are consistent with those analyzed in the PEIR.

Extensive areas of similar habitats occur adjacent to the proposed fuel break and WUI fuels reduction areas, such that substantial similar habitats would remain in surrounding areas that are available to common wildlife species during and after treatment. In addition, implementation of SPR BIO-1, SPR BIO-2, SPR BIO-3, and SPR BIO-5 would limit the loss and degradation of high-quality habitat for common species within the project site. SPR BIO-2 would require worker training in sensitive biological resources. SPR BIO-3 would ensure mapping of sensitive habitats; SPR BIO-5 would result in avoidance of type-conversion in scrub habitats. Project treatments would remove vegetation and alter habitat structure locally but would not result in permanent habitat degradation or conversion. Vegetation would be retained in a mosaic pattern in forest and shrub communities, and quality of habitat may improve in the long-term in some cases. Overall diversity and abundance of common wildlife would not substantially change in the long term. The implementation of the SPRs listed above would ensure that any impact to common wildlife would be less than significant. The treatment activities are consistent with those analyzed in the PEIR and would therefore be within the scope of the PEIR. With the implementation of the applicable SPRs, any impact to the loss of habitat or abundance of wildlife would be less than significant.

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The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the treatment area, general habitat characteristics are essentially the same within and outside the treatable landscape because the areas are all adjacent each other and the vegetation is the same or similar. Therefore, the potential impact on common wildlife is also the same, as described above. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact BIO-7

Local policies or ordinances may apply to resources that occur within the proposed project area, particularly the City of Novato and Marin County tree ordinances, with permit requirements (Novato Municipal Code Section 17-1.4; Marin County Code Section 22.62.040) or noise ordinances (refer to Section 3.12.2). The potential for treatment activities to result in conflict with local policies or ordinances was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.6.3 page 199). SPR AD-3 (Consistency with Local Plans, Policies, and Ordinances) requires that the project proponent design and implement the treatment in a manner that is consistent with applicable local plans (e.g., general plans), policies, and ordinances to the extent the project is subject to them. See Section 3.11 for more information. Impacts would be less than significant and consistent with the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the treatment area, general habitat characteristics are essentially the same within and outside the treatable landscape, and the applicable county, city, and local policies are the same because the lands inside and outside the CalVTP treatable landscape are within the same jurisdictions. Therefore, the potential impact on applicable local plans, policies, and ordinances is also the same, as described above. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact BIO-8

The CalVTP recognized four Habitat Conservation Plans (HCPs) in the Northern California Coast Section (Section 3.6, page 68). The proposed project does not fall within the boundaries of any of the four HCPs. The proposed project does not fall under the jurisdiction of any known habitat conservation plans or natural community conservation plans (NCCP); therefore, this impact does not apply to the treatment areas.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope for biological resources includes the treatable landscape as well as adjacent migration and movement corridors that are connected to the treatable landscape as well as the full geographic ranges of the special-status species and sensitive natural communities that occur within the

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treatable landscape (CalVTP Final PEIR Section 4.4.5, page 4-15 – 4-18). Because the proposed project area lands outside the treatable landscape are proximate to the treatable landscape, they fall within the geographic scope identified within the PEIR. As noted in the PEIR cumulative section, SPRs would reduce the likelihood and magnitude of many potential adverse effects on biological resources; however, impacts would not be avoided entirely, and the cumulative impact analysis considers the residual cumulative impacts to biological resources. The PEIR recognizes a cumulative significant impact to special-status plants, special-status wildlife, sensitive natural communities, wetlands, wildlife movement corridors, and common native wildlife (CalVTP Final PEIR Section 4.4.5, page 4-15 to 4-18). The proposed project's contribution to these cumulative impacts, however, would be consistent with the analysis in the PEIR and, with implementation of SPRs and mitigation measures, the contribution of the proposed project would be less than cumulatively considerable since impacts would largely be temporary or avoided through implementation of these measures.

New Biological Resource Impacts

The proposed treatment is consistent with the treatment types and activities considered in the CalVTP PEIR. The project proponent has considered the site-specific characteristics of the proposed treatment project and determined that they are consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.6.1 Environmental Setting and Section 3.6.2 Regulatory Setting in Volume II of the Final PEIR). The project proponent has also determined that the inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a change to the geographic extent presented in the PEIR. However, within the boundary of the treatment area, the existing environmental and regulatory conditions pertinent to biological resources that are present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because the areas are all adjacent each other, have similar vegetation and wildlife, and would fall within the same local jurisdictions. Therefore, the impacts of the proposed treatment project are also consistent with those considered in the PEIR. No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impacts. Therefore, no new impact related to biological resources would occur.

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3.6 Geology, Soils, Paleontology, and Mineral Resources

3.6.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact GEO-1: Result in substantial erosion or loss of topsoil?	LTS	Impact GEO-1, pp. 3.7-26 – 3.7-29	yes	AD-3, AQ-3, AQ-4, GEO-1 through GEO-8, HYD-3, and HYD-4.	NA	LTS	no	yes
Impact GEO-2: Increase risk of landslide?	LTS	Impact GEO-2, pp. 3.7-29 – 3.7-30	yes	AD-3, AQ-3, GEO-1 through GEO-8.	NA	LTS	no	yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New geology, soils, paleontology, and mineral resources impacts: Would the treatment result in other impacts to geology, soils, paleontology, and mineral resources that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.6.2 Discussion

Impact GEO-1

The project area is located in Marin County and within the geomorphic province of the Northern Coast Range, which is part of the Coastal Ranges, which extend more than 370 miles from the Transverse Ranges in the south to beyond the Oregon border to the north. The dominant rock type of this geomorphic province consists of partially metamorphosed and fractured volcanic and sedimentary rocks.

Most of the project area is underlain by Tocaloma–McCullin complex (17 percent of project area) and Bressa variant-McMullin variant complete (16 percent of project area) soil types (NRCS, 2023). These soil units occur on steep to very steep hills and upland areas. The parent material for these soils consists of residuum weathered from conglomerate, sandstone and shale, and the natural drainage class is well drained.

The erosion factor of a soil indicates the susceptibility of a soil to sheet and rill erosion by water. The soil erosion factor for the two major soil types in the project area range from 0.32 to 0.37,⁷ indicating the soil is moderately susceptible to detachment, which can produce moderate runoff. (NRCS 2022; Michigan State University 2022).

Project treatments could potentially leave loose soil exposed to the erosive forces of rainfall and high winds, which would increase the potential for soil erosion and loss of topsoil. A Soils Report and Steep Slopes Analysis were completed for the project (Attachment E). Mechanical treatments using heavy machinery are the most likely to cause soil disturbance, which could lead to substantial erosion or loss of topsoil, especially in areas of steep slopes. Mechanical treatment, not including mowing, is anticipated on approximately 189 acres, but final treatments would be determined during implementation. Additionally, manual treatment such as extensive hand pulling of broom can also cause soil disturbance. Prescribed (pile and broadcast) burning can increase risk of water repellency under the burn area as well as the breakdown of soil structure, which could lead to localized increases in erosion.

⁷ Soil erosion factor (K) is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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Based on the Soils Report (Attachment E), soils in the project area with slopes greater than 50 percent include Bonnydoon–Gilroy–Typic Argixerolls, Saurin–Bonnydoon complex, Tocaloma–McMullin complex, and Tocaloma–Saurin association. The erosion hazard rating for each of these soil types ranges from high to severe (NRCS 1972).

The potential for these treatment activities to cause substantial erosion or loss of topsoil was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.7.3, pages 3.7-26–3.7-29) and was determined to be less than significant with implementation of SPRs. Implementation of SPR AD-3 requires that the treatment design be consistent with local plans, policies, and ordinances. Implementation of SPRs AQ-3 and AQ-4 require a burn plan to be designed and implemented and for dust minimization during treatments. SPRs GEO-1 through GEO-8 require the suspension of ground disturbance during heavy precipitation, limits on use of high-ground-pressure vehicles, stabilization of disturbed soil areas, erosion monitoring, use of water breaks where appropriate, minimization of burn-pile size, and treatments on slopes greater than 50 percent incline to be evaluated by an RPF or geologist to determine the necessary measures to minimize effects. Areas of slope above 50 percent constitute approximately 635 acres of the proposed project area. These areas would not be treated with mechanical equipment, and any work performed would be at the discretion of fuel and vegetation management specialists and an RPF or geologist, as required under SPR GEO-8. SPR HYD-3 and SPR HYD-4 ensure water quality protections are in place for areas with prescribed herbivory and to establish watercourse protection zones. These SPRs would avoid and minimize the risk of substantial erosion and loss of topsoil and, thereby, ensure the impacts are less than significant, consistent with the PEIR findings.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. The impacts of erosion and loss of topsoil for the areas outside the treatable landscape are within the scope of the PEIR because the soil characteristics of the project area are essentially the same within and outside the CalVTP treatable landscape due to adjacency and similar soil and geology types, and the use and type of equipment and extent of vegetation removal are consistent with those analyzed in the PEIR. Therefore, the potential impact related to soil erosion is also the same, as described above, and would be less than significant with implementation of the same SPRs.

Impact GEO-2

A large portion of the project area is within or near areas with steep slopes (Attachment E), which may increase the potential for destabilization, depending upon the soil conditions, geologic units, and known historic failures. Areas of slope above 50 percent comprise of approximately 635 acres of the proposed project area. A “landslide” refers to the downslope movement of materials such as rock, soil, or fill under the direct influence of gravity. This downward movement can occur along a surface (e.g., glide plane, landslide plane, discrete slip surface) or without a distinct failure surface. The occurrence of landslides is due to several influences and factors related to slope stability, including slope angle, weathering, climate,

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water content, vegetation, overloading, erosion, earthquakes, and human-induced factors (Marin County Community Development Agency, Planning Division , 2005).

The potential for treatment activities to increase landslide risk was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.7.3, page 3.7-29-3.7-30) and was found to be less than significant with implementation of SPRs AD-3, AQ-3, and GEO-1 through GEO-8, described under Impact GEO-1. These SPRs would avoid and minimize the risk of landslide and, thereby, ensure the impacts are less than significant. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the existing environmental conditions are the same as those within the treatable landscape because of the proximity and shared slope conditions; therefore, the potential impact related to landslide risk is also the same, as previously described, and would be less than significant with the implementation of the same SPRs.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope for geology and soils is all areas where vegetation could be treated in California's geomorphic provinces (CalVTP Final PEIR Section 4.4.6, page 4-18). The inclusion of treatment outside the treatable landscape would expand the geographic scope for the cumulative analysis but, as with the vegetation treatment activities within the treatable landscape, potentially significant geology and soils effects would be avoided and minimized through the implementation of SPRs. As noted in the CalVTP PEIR, cumulative impacts associated with erosion and landslide related to wildfire are more significant in areas not managed with vegetation treatment programs. Therefore, the proposed project's contribution to soil erosion or an increased risk of landslide would not be cumulatively considerable and would be consistent with the analysis in the PEIR.

New Geology, Soils, Paleontology, and Mineral Resource Impacts

The project proponent has considered the site-specific characteristics of the proposed treatment project and determined that the areas are consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.7.1 Environmental Setting and Section 3.7.2 Regulatory Setting in Volume II of the Final PEIR). Within the boundary of the project area, the geology, and slopes of the areas outside of the treatable landscape are essentially the same as those in the treatable landscape; thus, the impacts would be the same. There are no changed circumstances present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impacts. Therefore, no new impact related to geology and soils would occur.

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3.7 Greenhouse Gas Emissions

3.7.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment projec	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact GHG-1: Conflict with applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs?	LTS	Impact GHG-1, pp. 3.8-10 – 3.8-11	yes	None	NA	LTS	no	yes
Impact GHG-2: Generate GHG emissions through treatment activities?	PSU	Impact GHG-2, pp. 3.8-11 – 3.8-17	yes	AQ-3	GHG-2	PSU	no	yes
Note:								
<ul style="list-style-type: none"> • NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact. • None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project. 								

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New greenhouse gas impacts: Would the treatment result in other impacts to greenhouse gases that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.7.2 Discussion

Impact GHG-1

Vegetation treatments would involve manual and mechanical vegetation removal as well as broadcast burning, and biomass disposal would include chipping and pile burning, all of which would generate some greenhouse gas (GHG) emissions. Consistency of treatments under the CalVTP with applicable plans, policies, and regulations aimed at reducing GHG emissions was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.8.3, pages 3.8-10–3.8-11). The project would be consistent with the applicable policies, plans, and regulations to reduce GHG emissions as described in California’s 2017 Climate Change Scoping Plan (CARB, 2017), the California Forest Carbon Plan (Climate Forest Action Team, 2018), and the Draft California 2030 Natural and Working Lands Climate Change Implementation Plan (CARB, 2019). It would also be consistent with the 2007 Marin Countywide Plan, which contains goals, policies, and programs relevant to GHG emission generation within the county; these aim to study the effects of climate change on fire ecology and fire hazards and use this information to prepare response strategies. Additionally, it would be consistent with the Marin County Climate Action Plan Update 2020, which references preparation for more wildfires, including home hardening and community wildfire protection plans in unincorporated communities. It would also be consistent with the City of Novato – Climate Change Action Plan 2009, which references goals of coordinating with fire districts and relevant organizations to address the health and adaptability of natural systems to environmental hazards including fire protection. Impacts related to GHG emissions from these types of treatment activities are within the scope of the PEIR because the proposed activities as well as the associated equipment, duration of use, and resultant GHG emissions are consistent with those analyzed in the PEIR, which were found to be less than significant. SPR GHG-1 is not applicable to the proposed project as the project is not subject to the requirement to provide information to inform reporting under the Board of Forestry and Fire Protection’s Assembly Bill 1504 Carbon Inventory Process because this project is not a registered offset project.

The MWPA is participating in a local effort, called the Marin Biomass Project, funded by the Governor’s Office of Planning and Research, to study potential pathways for biomass utilization in Marin County in ways that minimize GHG emissions. Recommendations resulting from this 2-year study would inform future strategies for managing biomass resulting from this and other vegetation management projects.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the same plans, policies, and regulations adopted to reduce GHG emissions apply in the areas outside the treatable landscape as well as in areas

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within the treatable landscape; therefore, the GHG impact is also the same—less than significant—as described above.

Impact GHG-2

Use of vehicles and mechanical equipment and prescribed burning (broadcast and pile burning) during initial and maintenance treatments would result in GHG emissions. Table 3-5 (Table 3.8-3 of the CalVTP PEIR) provides estimated GHG emissions per acre for different types of vegetation treatments and fuel types. Based on these emission rates, in any single year, an up to 92-acre broadcast burn is anticipated to generate the largest amount of emissions per acre, as well as potentially overall, compared to the other vegetation treatments anticipated for the proposed project.

Over the last 10 years, the number of acres burned by wildland fires has generally increased in California (CAL FIRE, 2018). Wildland fires have accounted for a generally⁸ increasing quantity of GHG emissions over the last 20 years, accounting for a greater quantity of California’s overall GHG emissions (CARB, 2020). The climate is anticipated to become drier and hotter. These changes are expected to lead to increased frequency and intensity of large wildland fires and greater fire risks if fuel management activities are not expanded across the state (CNRA, 2018). One study found that implementing prescribed burning, in forest classes that historically had relatively frequent fire intervals and were determined to be amendable for burning, was modeled to reduce GHG emissions by 18 to 25 percent in statewide emissions for states in the western U.S. compared to wildland fires (Wiedinmyer & Hurteau, 2010). Wildland fires have been found to result in a greater quantity of carbon lost per acre compared to broadcast burning (CARB, 2017c). Fuels and vegetation treatments may result in a net carbon benefit in the long term, particularly in the context of avoided GHG emissions from reducing the risk of a catastrophic wildland fire. While modeling has found that emissions from all the mechanical pre-treatment plus prescribed burn emissions with a post-treatment wildland fire equaled the emissions from a comparably sized pre-treatment wildland fire, this is assuming that a pre- or post-treatment wildland fire would not burn a larger area (Hyde & Strand, 2019). Wildfire hazards, including wildfire intensity and rate of spread, could be somewhat reduced through implementation of the proposed project. These benefits from a potential reduction in wildfire risk associated with implementation of the GNSFB project are not readily quantifiable because the likelihood of a catastrophic fire, the location, and the size cannot be accurately estimated. In the long-term, the outcome of proposed project implementation may be beneficial.

Table 3-5 Greenhouse Gas Emissions Directly Associated with Treatment Activity (Table 3.8-3 from the CalVTP PEIR)

Treatment Activity	Direct GHG emissions per acre treated (MTCO _{2e} /acre)
Prescribed burning	
Tree fuel type	63.15

⁸ The high GHG emissions in 2008 are an exception.

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Treatment Activity	Direct GHG emissions per acre treated (MTCO ₂ e/acre)
Shrub fuel type	16.15
Grass fuel type	7.90
Mechanical treatment	
Tree fuel type	0.92
Shrub fuel type	0.29
Grass fuel type	0.07
Manual treatment	
Tree fuel type	0.69
Shrub fuel type	0.40
Grass fuel type	<0.01
Prescribed herbivory	
Tree fuel type	0.08
Shrub fuel type	0.55
Grass fuel type	0.55
Herbicide application	
Tree fuel type	0.02
Shrub fuel type	0.01
Grass fuel type	<0.01

Notes:

- MTCO₂e/acre = metric tons of carbon dioxide equivalent per acre
- Emissions estimates do not include emissions generated by trucks hauling equipment and livestock to and from treatment sites at the beginning and end of each treatment.
- More than one type of treatment may be performed on the same land in the same year. For example, manual treatment or herbicide application may be conducted prior to a prescribed burn.
- These emission estimates do not account for any emissions associated with the removal of vegetative biomass from treatments sites and any processing activity that may occur thereafter, including potential use as feed stock for a biomass power facility, composting, or chipping and mulching applications.

The potential for treatments under the CalVTP to generate GHG emissions was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.8.3, page 11–17). This impact is within the scope of the PEIR because the proposed activities, as well as the associated equipment and duration of use, and the intent of the treatments to reduce wildfire risk and GHG emissions related to wildfire are consistent with those analyzed in the PEIR. MM GHG-2 would be implemented and would reduce GHG emissions associated with prescribed burning by burning when fuels have a higher fuel moisture content, reducing the total area burned by mosaic burning, and

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isolating and leaving large fuels unburned and by scheduling burns before new fuels appear. Treatment activities would contribute to annual GHG emissions generated under the CalVTP, and this impact would fall within the finding of the PEIR of potentially significant and unavoidable. Methods for reducing GHG emissions from prescribed burning would be integrated into SPR AQ-3 (Burn Plan) as described in MM GHG-2.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, greenhouse gas emissions and associated climate change impacts are global in nature and are not contained within the boundary of the treatable areas. Therefore, the GHG impact is also the same, as described above. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Cumulative Impacts

As noted in CalVTP Final PEIR Section 4.4.7, because climate change is a global phenomenon, the cumulative context of this impact comprises all past, present, and reasonably foreseeable projects in the world, including GHG emission sources and carbon sinks. No single project alone would measurably contribute to an incremental change in the global average temperature or to the global climate, local climates, or microclimates. From the standpoint of CEQA, GHG impacts relative to global climate change are inherently cumulative. Because of the global context of climate change, the inclusion of lands outside the treatable areas would be consistent with the analysis in the CalVTP and would not constitute a substantially more severe cumulative impact.

New Impacts Related to GHG Emissions

The project proponent has considered the site-specific characteristics of the proposed treatments and determined they are consistent with the applicable regulatory and environmental conditions presented in the CalVTP PEIR (refer to Section 3.8.1 Regulatory Setting and Section 3.8.2 Environmental Setting in Volume II of the Final PEIR). The inclusion of land that is outside of the treatable landscapes constitutes a change to the geographic extent of the PEIR. However, the same plans, policies, and regulations adopted to reduce GHG emissions apply in the areas outside the treatable landscape as within it. Likewise, the climate conditions are the same within the treatable landscape as they are just outside of it for this project. Therefore, impacts of the proposed project are also consistent with those covered in the PEIR. No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impacts. No new impact related to GHG emissions would occur.

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3.8 Energy Resources

3.8.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact ENG-1: result in wasteful, inefficient, or unnecessary consumption of energy?	LTS	Impact ENG-1, pp. 3.9-7 – 3.9-8	yes	NA	NA	LTS	no	yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New energy impacts: Would the treatment result in other impacts to energy that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.8.2 Discussion

Impact ENG-1

The use of work vehicles, hauling vehicles, and mechanical equipment (e.g., masticators, chain saws, chippers) to implement the proposed project would result in the consumption of energy in the form of fossil fuels. The use of fossil fuels for equipment and vehicles was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.9.3, pages 3.9-7–3.9-8) and was found to be a less-than-significant impact. The consumption of energy during implementation of the project treatments is within the scope of the PEIR because the types of activities, as well as the associated equipment and duration of proposed use, are consistent with those analyzed in the PEIR. Diesel and petroleum-based fuels, such as gasoline, would be consumed from the use of heavy-duty equipment and trucks, mechanical equipment, and the transport of personnel and equipment to and from and within the project site. The primary objective of the project is to reduce wildfire risk and decrease the intensity of fires. Wildfire response requires an immediate response from emergency personnel and mobilization of equipment from across the state and even across the nation, which often results in inefficient consumption of energy.

Implementation of treatment activities would reduce wildfire risk and the intensity of fire responses. There are no SPRs applicable to this impact, and the impact would be less than significant, as consistent with the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the existing environmental and regulatory conditions are essentially the same within and outside the treatable landscape, and the types of treatment activities and associated use of energy are of the same scale and scope as analyzed in the PEIR; therefore, the energy impact is also the same. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than covered in the PEIR.

Cumulative Impact

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope for energy is the 250,000 acres of treatable land annually (CalVTP Final PEIR Section 4.4.8, page 4-19). The inclusion of 2,134 acres of treatment outside the treatable landscape would expand the geographic scope for the cumulative analysis but, as noted in the CalVTP PEIR, cumulative energy impacts are less than significant and would not produce additional electricity or natural gas demand that would trigger additional infrastructure. As noted in the CalVTP PEIR, wildfires themselves require substantial and inefficient energy consumption during response, and implementation of treatment activities under the CalVTP, combined with other similar programs and plans, would improve the efficiency of energy consumption during such events

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through improved planning. This remains accurate for the proposed project both inside and outside the treatable landscape. Therefore, the proposed project's contribution to energy use would not be cumulatively considerable and would be consistent with the analysis in the PEIR.

New Energy Resource Impacts

The project proponent has considered the site-specific characteristics of the proposed treatment project both inside and outside the treatable landscape and determined they are consistent with the applicable regulatory and environmental conditions presented in the CalVTP PEIR (refer to Section 3.9.1 Regulatory Setting and Section 3.9.2 Environmental Setting in Volume II of the Final PEIR). No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impacts. Therefore, no new impact related to energy resources would occur.

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3.9 Hazardous Materials, Public Health, and Safety

3.9.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact HAZ-1: Create a significant health hazard from the use of hazardous materials?	LTS	Impact HAZ-1, pp. 3.10-14 – 3.10-15	yes	HAZ-1, HAZ-2	NA	LTS	no	yes
Impact HAZ-2: Create a significant health hazard from the use of herbicides?	LTS	Impact HAZ-2, pp. 3.10-15 – 3.10-18	yes	HAZ 5 through HAZ-9	NA	LTS	no	yes
Impact HAZ-3: Expose the public or environment to significant hazards from disturbance to known hazardous material sites?	PS	Impact HAZ-3, pp. 3.10-18 – 3.10-19	yes	NA	HAZ-3	LTSM	no	yes

Note:

- NA: not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: there are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New hazardous materials, public health, and safety Impacts: Would the treatment result in other impacts to hazardous materials, public health, and safety that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.9.2 Discussion

Impact HAZ-1

Initial and maintenance treatments would include manual and mechanical treatments as well as pile and broadcast burning as well as targeted herbicide application, which may utilize hazardous materials, including fuels, oils, and lubricants as well as accelerant. The potential for treatment activities to cause a significant health hazard from the use of hazardous materials was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.10.3, pages 3.10-14–3.10-15). This impact is within the scope of the PEIR because the types of treatments and associated equipment (Dennis 2002) and types of hazardous materials that would be used are consistent with those analyzed in the PEIR and would be less than significant. Equipment and vehicles used for treatment would require fuels and lubricants that could cause a health hazard if accidentally released into the environment. All equipment would comply with SPR HAZ-1 to minimize leakages and ensure proper equipment maintenance. In accordance with SPR HAZ-2, all mechanical hand tools would be equipped with spark arrestors to minimize any potential ignitions. Herbicide application impacts are discussed under Impact HAZ-2, below.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the exposure potential and regulatory conditions are essentially the same within and outside the treatable landscape because the equipment would be the same, the methods to minimize exposure would be the same, and the areas are adjacent to each other. Therefore, the hazard material impact is also the same, as described above. The project would result in a less-than-significant impact related to the use of hazardous materials, and the project would not result in impacts that would be more severe than those evaluated in the PEIR.

Impact HAZ-2

Initial and maintenance treatments would include targeted stump and spot spray herbicide treatments as part of an integrated pest management approach to kill or prevent regrowth of invasive and non-native species. No aerial spraying of herbicides would occur. The potential for treatment activities to cause a significant health hazard from the use of herbicides was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.10.3, pages 3.10-15–3.10-18). This impact is within the scope of the PEIR because the types of herbicides and application methods that would be used, which are limited to ground-based applications, are consistent with those analyzed in the PEIR. Targeted herbicides would be applied by licensed applicators in compliance with all laws, regulations, and herbicide label instructions, as consistent with herbicide use described in the PEIR. The herbicides proposed under the PEIR have low levels of toxicity for humans (CalVTP Final PEIR Volume II Section 3.10.3 Table 3.10-1, pages 3.10-16–3.10-17). Potential impacts associated with creating a health hazard would be less than

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significant. The proposed project incorporates SPRs HAZ-5 through HAZ-9, which require the following: preparation of a Spill Prevention and Response Plan (SPR HAZ-5), compliance with all herbicide applications (SPR HAZ-6), triple-rinsing herbicide containers and proper herbicide disposal (SPR HAZ-7), employing techniques during application to minimize drift (SPR HAZ-8), and placing signage within 500 feet of areas receiving herbicide treatment (SPR HAZ-9). This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the exposure potential is essentially the same within and outside the treatable landscape because the herbicide types, application methods, and licensed applicators would be the same and the locations and potential receptors are immediately adjacent to each other. Therefore, the hazardous materials impact is also the same, and less than significant, as described above, with implementation of the same SPRs and MM HAZ-3.

Impact HAZ-3

The initial and maintenance treatments would include mechanical treatments, pulling of broom, and pile and broadcast burning that would disturb soils and could expose workers, the public, or the environment to hazardous material if a contaminated site is present within the project area. The potential for workers participating in treatment activities to encounter contamination that could expose them or the environment to hazardous materials was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.10.3, pages 3.10-18–3.10-19). This impact was identified as potentially significant in the PEIR because hazardous materials sites could be present within treatment sites, and soil disturbance or burning in those areas could expose people or the environment to hazards. MM HAZ-3 requires review of the DTSC EnviroStor and Cortese List if any sites are known to have previously used, stored, or disposed of hazardous materials and to avoid known sites.

For the PSA, the EnviroStor and Cortese List were reviewed, and found two related contamination site within the proposed project area located east of Highway 101 and south from the community of Bel Marin Keys (DTSC, 2023). The contamination sites are a Military Evaluation Cleanup Site and State Response site, known as the Hamilton Army Airfield (HAAF) – Ammo Hill (J09CA7084), and Hamilton General Services administration (GSA) Phase 1 (21970007). HAAF consists of approximately 1,600 acres and was acquired by the Army Corps in 1932. In 1974, the Department of Defense declared the base surplus. The proposed project would incorporate MM HAZ-3, which will mark the area if mechanical treatments or prescribed burns are proposed in the area that overlaps with the known contamination site. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. Within the

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boundary of the proposed project area, the potential to encounter hazardous materials and the regulatory conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because neither included any hazards identified on EnviroStor or the Cortese List and the locations are adjacent each other and similar in previous use and potential contaminants. Therefore, the hazardous materials impact is also the same, as described above, and less than significant with implementation of HAZ-3. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope for hazardous materials is the 250,000 acres of treatable land annually and the surrounding areas (CalVTP Final PEIR Section 4.4.9, page 4-20). Therefore, the proposed project, both inside and outside the treatable landscape, would be within the geographic scope of the cumulative analysis. Contributions of the proposed project would be the same within the treatable landscape as outside the treatable landscape, and the cumulative hazardous materials impact analysis would remain the same as described in the PEIR—not cumulatively considerable for Impacts HAZ-1, HAZ-2, and HAZ-3.

New Hazardous Materials, Public Health, and Safety Impacts

The site-specific characteristics of the proposed treatment project both inside and outside the treatable landscape are consistent with the applicable regulatory and environmental conditions presented in the CalVTP PEIR (refer to Section 3.10.2 Regulatory Setting and Section 3.10.3 Environmental Setting in Volume II of the Final PEIR). The impacts of the proposed project are consistent with those considered in the PEIR. No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impacts. Therefore, no new impact related to hazardous materials would occur.

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3.10 Hydrology and Water Quality

3.10.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact HYD-1: Violate water quality standards or waste discharge requirements, substantially degrade surface or ground water quality, or conflict with or obstruct the implementation of a water quality control plan through the implementation of prescribed burning?	LTS	Impact HYD-1, pp. 3.11-25 – 3.11-27	yes	AD-3, AQ-3, GEO-4 through GEO-8 HYD-1, HYD-4, HYD-6	NA	LTS	no	yes

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Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Impact HYD-2: Violate water quality standards or waste discharge requirements, substantially degrade surface or ground water quality, or conflict with or obstruct the implementation of a water quality control plan through the implementation of manual or mechanical treatment activities?	LTS	Impact HYD-2, pp. 3.11-27 – 3.11-29	yes	AD-3, HYD-1, HYD-2, HYD-4, HYD-5, HYD-6, GEO-1, GEO-2, GEO-3, GEO-4, GEO-5, GEO-7, GEO-8, BIO-1, BIO-4, BIO-5, HAZ-1	NA	LTS	no	yes
Impact HYD-3: Violate water quality standards or waste discharge requirements, substantially degrade surface or ground water quality, or conflict with or obstruct the implementation of a water quality control plan through prescribed herbivory?	LTS	Impact HYD-3, pp. 3.11-29	yes	AD-3, BIO-1, BIO-3, BIO-4, BIO-5, GEO-1, GEO-4, GEO-7, HYD-1, HYD-2, HYD-3, HYD-4, HYD-5, HYD-6, and HAZ-1	NA	LTS	no	yes

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Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Impact HYD-4: Violate water quality standards or waste discharge requirements, substantially degrade surface or ground water quality, or conflict with or obstruct the implementation of a water quality control plan through the ground application of herbicides?	LST	Impact HYD-4, pp. 3.11-30 – 3.11-31	yes	AD-3, BIO-1, BIO-4, BIO-5, GEO-1, GEO-7, HAZ-1, HAZ-5, HAZ-7, HYD-1, HYD-4, HYD-5, and HYD-6	NA	LTS	no	yes
Impact HYD-5: Substantially alter the existing drainage pattern of a treatment site or area?	LST	Impact HYD-5, pp. 3.11-31	yes	AD-3, BIO-4, GEO-1, GEO-2, GEO-3, GEO-4, GEO-5, GEO-6, GEO-7, HYD-1, HYD-2, HYD-4, and HYD-6	NA	LST	no	yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New hydrology and water quality impacts: Would the treatment result in other impacts to hydrology and water quality that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.10.2 Discussion

Impact HYD-1

The project area is within the northern portion of the San Francisco Bay hydrologic region, which receives an average of 20 to 25 inches of rain a year. The San Francisco Bay hydrologic region extends north from Southern Santa Clara County to Tomales Bay and encompasses over 4,500 square miles. (CAL FIRE 2019). The climate in the project area typically consists of warm and dry summers followed by cool and wet winters. During the summer months, most of the rivers, creeks, and streams remain dry. Rainfall varies from season to season, with rain predominantly occurring between October and April. The project area is primarily within the Novato Creek watershed, with a small portion in the Miller Creek and the San Antonio Creek watershed, all of which drain into the San Francisco Bay (Marin County 2020). Hydrographic features are shown in Figure 6 of Attachment D. Intermittent drainages occur throughout the project site that capture rainfall in winter and spring but are likely dry in the summer months. These drainages could eventually reach nearby surface waters or groundwater. Estuarine and marine wetlands are also adjacent the project sites, and the project is near the Petaluma River.

The proposed project would include prescribed burning, including pile burning and broadcast burning. The potential for prescribed burning to generate ash and exposed soil from the burned areas that result in runoff and cause violations of water quality regulations or degrade water quality was examined in the PEIR and was found to be a less-than-significant impact (CalVTP Final PEIR Volume II Section 3.11.3, pages 3.11-25–3.11-27). This impact is within the scope of the PEIR and is consistent with the impacts analyzed in the PEIR. Pile burning would entail burning cut vegetation material and would be conducted in areas depending upon access and site conditions. Broadcast burning would occur on up to 92 acres, as shown on Figure 2-3. Suitable treatment areas for pile burning are typically flat or with gentle slopes and have open areas away from tree canopies and power lines. Areas selected would be those away from waterways, pursuant to SPR HYD-4. Pile and broadcast burning would be conducted in compliance with CAL FIRE regulations and Bay Area Air Quality Management District (BAAQMD) Regulation 5 for open burning and burn-day restrictions. SPRs applicable to this treatment are AD-3, AQ-3, GEO-4 through GEO-8, HYD-1, HYD-4, and HYD-6. SPR AD-3 requires that the treatment design be consistent with local plans, policies, and ordinances, and SPR AQ-3 requires a burn plan. SPRs GEO-4 through GEO-8 require erosion monitoring, draining stormwater with water breaks where appropriate, minimizing burn pile size, and that all slopes greater than 50 percent be evaluated by an RPF or geologist. SPRs HYD-1, HYD-4, and HYD-6 ensure that the treatments comply with the water quality regulations, watercourses protection zones be identified, burn piles be located outside of watercourse and lake protection zones (WLPZ) ranging from 50 to 150 feet as required around any waterways, and existing drainage systems be protected. These SPRs ensure avoidance and minimization of substantial

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water quality degradation. These SPRs would reduce the potential for prescribed burns to impact water quality and would preserve unburned streamside buffers to capture runoff from treatment areas. SPR GEO-4 requires implementation of erosion controls prior to the next rainy season and inspection for evidence of erosion after the first large storm or rainfall event. Any areas of erosion that would result in substantial sediment discharge would be remediated. Impacts would be consistent with the PEIR and less than significant with implementation of these SPRs.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the existing environment, regulatory conditions, and proximity to surface waters are essentially the same in the areas within and outside the treatable landscape. Therefore, the water quality impact from prescribed burning outside the treatable landscape is also the same, as described above, and would be less than significant with the implementation of the same SPRs. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact HYD-2

The proposed project treatments would include mechanical and manual treatments. Manual treatments would include use of hand tools and hand-operated power tools such as chainsaws, pole pruners, loppers, and string trimmers, which would be used to cut, clear, or prune herbaceous woody vegetation and remove dead wood vegetation. Mechanical treatments would include motorized equipment such as skidsteers or tractors with mounted masticators or mowers as well as ride mowers. The mechanical equipment would be used to cut, uproot, crush/compact, or chop existing vegetation on slopes with less than a 35 percent incline. No fill or discharge of fill material into waters of the U.S. would occur as part of the proposed project because waters of the U.S. would be avoided. Use of equipment for vegetation removal along the banks of streams may necessitate a section 1602 permit from CDFW. The potential for mechanical and manual treatment activities to violate water quality regulations or degrade water quality was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.11.3, pages 3.11-27–3.11-29) and was found to be less than significant with the incorporation of the SPRs. A watercourse and lake protection zone (WLPZ) ranging from 50 to 150 feet is required around any waterways that are within or adjacent project treatment areas, pursuant to SPR HYD-4, and require limits to equipment within the WLPZ. SPRs applicable to these treatments are AD-3, HYD-1, HYD-2, HYD-4 through HYD-6, GEO-1 through GEO-8, BIO-1, BIO-4, BIO 5, and HAZ-1. SPRs AD-3, HYD-1, HYD-4, and GEO-4 through GEO-8 are described under Impact HYD-1. SPRs GEO-1 through GEO-3 require the suspension of ground disturbance during heavy precipitation, limit high-ground-pressure vehicles, and require stabilizing disturbed-soil areas. SPRs HYD-2 and HYD-5 ensure that the construction of new roads would be avoided and that equipment be fueled and serviced outside of WLPZs and wet areas. SPRs BIO-1, BIO-4, and BIO-5 require the review and survey of specified biological resources and that treatment design avoid loss of riparian habitat function and avoid the conversion of chaparral habitat (i.e., maintain the habitat function). SPR HAZ-1 requires that all equipment be maintained and

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regularly inspected for leaks. These SPRs would avoid and minimize the risk of substantial water quality degradation by implementation of mechanical treatment, thereby making the impacts less than significant, as consistent with the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. This impact is within the scope of the PEIR because the surface water conditions and regulatory conditions are essentially the same within and outside the CalVTP treatable landscape and the use of heavy equipment and hand-held tools to remove vegetation and associated impacts on water quality are consistent with those analyzed in the PEIR. Impacts would be the same, and less than significant, with the implementation of the same SPRs.

Impact HYD-3

Project treatments would include prescribed herbivory to reduce fuel loads in shrubland, forest understory, and grasslands and may be used as a pre-treatment before implementation of other methods or as a means of reducing fine fuels. The prescribed herbivory livestock used as part of the proposed project would typically involve use of goats and sheep but, under the CalVTP, could also include horses and cattle and may require the installation of temporary fencing where natural barriers are not present. The use of temporary water facilities for the livestock and guard animals and/or shepherd, as well as other temporary infrastructure (e.g., tanks, corrals, fences), may be required with the use of prescribed herbivory as a treatment method. Site preparation could involve installation of a portable electric fence to contain the livestock. The herder for the prescribed herbivory would determine the area to be grazed based on site conditions, which would typically range from 1 to 2 acres at one time for goats. A broader area would be grazed by other larger livestock such as cattle and horses and would be determined based on site conditions. The potential for prescribed herbivory treatment activities to violate water quality regulations or degrade water quality was examined in the PEIR and was found to be less than significant with the implementation of the SPRs (CalVTP Final PEIR Volume II Section 3.11.3, page 29). SPRs applicable to this treatment are AD-3, BIO-1, BIO-4, BIO-5, GEO-1, GEO-4, GEO-7, HYD-1, HYD-2, HYD-3, HYD-4, HYD-6, and HAZ-1. All applicable SPRs listed, except SPR HYD-3, are described in Impact HYD-1 and Impact HYD-2. SPR HYD-3 ensures that water quality protection be in place for prescribed herbivory. These SPRs avoid and minimize the risk of substantial water quality degradation by implementation of prescribed herbivory treatment, making the impact less than significant.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. This impact is within the scope of the PEIR because the surface water conditions are essentially the same within and outside the CalVTP treatable landscape because they are adjacent the treatable landscape, within the same watershed, and the use of prescribed herbivory to remove vegetation and associated impacts on water quality are consistent with those analyzed in the PEIR. The same SPRs would be applicable to ensure the less-than-significant impact. Therefore, the water quality impact from prescribed herbivory treatments is also the same. This

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determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact HYD-4

Project treatments could include targeted herbicide application, such as stump and spot spray treatments, to kill or prevent regrowth of invasive and non-native species. No aerial spraying of herbicides would occur. Herbicides would be applied with adherence to all United States Environmental Protection Agency (USEPA) and California Environmental Protection Agency (CalEPA) regulations and in such a way as to prevent overdrift. The use of herbicides has the potential to violate water quality standard regulations or degrade water quality, which was examined in the PEIR, with a finding that the impacts would be less than significant (CalVTP Final PEIR Volume II Section 3.11.3, pages 3.11-29–3.11-31). SPRs applicable to this treatment are AD-3, BIO-1, BIO-4, BIO-5, GEO-1, GEO-7, HAZ-1, HAZ-5, HAZ-7, HYD-1, HYD-4, HYD-5, and HYD-6. All applicable SPRs listed, except SPR HAZ-5 and HAZ-7, are described in Impact HYD-1 and Impact HYD-2. SPRs HAZ-5 and HAZ-7 ensure that a spill prevention and response plan is implemented and that herbicide containers be triple rinsed. These SPRs avoid and minimize the risk of substantial water quality degradation by implementation of herbicide treatment, thereby making the impacts less than significant.

The inclusion of land in the project that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. The existing environmental conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because they are adjacent the treatable landscape and have similar environmental conditions, including the same waterbodies, and the same regulatory setting. Potential impacts outside the treatable area are within the scope of the activities and impacts addressed in the PEIR because the methods of herbicide application, transportation, storage, and disposal are consistent with those analyzed in the PEIR with implementation of the same SPRs. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact HYD-5

Some of the project treatments could cause ground disturbance and minor erosion, which could directly or indirectly modify existing drainage patterns. The potential for treatments to violate water quality standard regulations or degrade water quality was examined in the PEIR, and the impacts were found to be less than significant (CalVTP Final PEIR Volume II Section 3.11.3, page 31). As described in the PEIR, these activities would have minor impacts to on-site drainage with implementation of SPRs. The potential impacts are within the scope of the activities and impacts addressed in the PEIR because the use of equipment and treatment activities are consistent with those analyzed in the PEIR. SPRs applicable to this treatment are AD-3, BIO-4, GEO-1, GEO-2, GEO-3, GEO-4, GEO-5, GEO-6, GEO-7, HYD-1, HYD-2, HYD-4, and HYD-6. All applicable SPRs listed are described in Impact HYD-1 and HYD-2. These SPRs would avoid and minimize the risk of substantial altering of the existing drainage pattern, thereby making the impacts less than significant.

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The inclusion of land that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the existing environmental conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape, and existing drainage patterns pass through both areas. Therefore, the impact related to alteration of site drainage patterns is also the same. The potential for those treatments to substantially alter the existing drainage patterns of a project site was evaluated in the PEIR and was found to be less than significant with implementation of the same SPRs. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope for hydrology and water quality is California's hydrologic regions and groundwater basins (CalVTP Final PEIR Section 4.4.10, page 4-21). The proposed project, both inside and outside the treatable landscape, would be within the geographic scope of the cumulative analysis. Because the treatment areas for the proposed project are within the same cumulative geographic scope inside the treatable landscape and outside the treatable landscape, and the treatment types and potential impacts to hydrology and water quality would be the same, the cumulative contribution of the proposed project would be the same inside and outside the treatable landscape and the impact conclusions from the PEIR would remain accurate. Contributions of the proposed project would not be cumulatively considerable for Impacts HYD-1 through HYD-5.

New Hydrology and Water Quality Impacts

The site-specific characteristics of the proposed treatment project are consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.11.1 Regulatory Setting and Section 3.11.2 Environmental Setting in Volume II of the Final PEIR). The inclusion of land that is outside of the treatable landscapes constitutes a change to the geographic extent presented in the PEIR. However, the hydrology, water quality, and treatment methods are consistent with those analyzed in the PEIR; thus, they are also within the scope of the PEIR. Additionally, the existing environmental and regulatory conditions pertinent to hydrology and water quality are also consistent within as well as outside of the treatable landscape included in the proposed project area.

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3.11 Land Use and Planning, Population and Housing

3.11.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact LU-1: Cause a significant environmental impact due to a conflict with a land use plan, policy, or regulation?	LTS	Impact LU-1, pp. 3.12-13 – 3.12-14	yes	AD-3	NA	LTS	no	yes
Impact LU-2: Induce substantial unplanned population growth?	LTS	Impact LU-2, pp. 3.12-14 – 3.12-15	yes	NA	NA	LTS	no	yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New land use and planning, population and housing impacts: Would the treatment result in other impacts to land use and planning, population and housing that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.11.2 Discussion

Impact LU-1

The proposed project would involve development and maintenance of a fuel break and WUI fuels reduction areas through use of manual treatments, ground-based mechanical treatments, prescribed herbivory, broadcast burning, and targeted herbicide application as well as biomass disposal, including pile burning. Treatments would occur on property owned by the MCOSED, Marin County Parks, CDFW, public property managed by the city of Novato and other agencies, and private property. The potential for vegetation treatment activities to cause a significant environmental impact due to a conflict with a land use plan, policy, or regulation was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.12.3, pages 3.12-13–3.12-14). The proposed project would comply with all applicable city and county general plans, policies, and ordinances (SPR AD-3). As noted in Section 3.12 Noise, treatment activities would take place during daytime hours, consistent with the Marin County Noise Ordinance (Marin County, 2022). The project would comply with Sections 4290 and 4291 of the California Resources Code, which requires property owners to establish defensible space around their properties. The project would also comply with the city-specific fire codes, such as Chapter 49 (Requirements for Wildland-Urban Interface Fire Areas) of the Novato Fire Protection District Ordinances and Chapter 16 section 16.16.010 of the Marin County Municipal Code (Adoption of California Fire Code and International Fire Code). As part of the proposed project, MWPA invited local agencies to a meeting in March 2022 to discuss the project and address any concerns.

The proposed project would comply with applicable tree ordinances, including the following:

- The City of Novato tree removal permit requirements, which allows trees to be removed without a permit if the tree is less than 24 inches dbh on private land, less than 6 inches dbh on vacant land, a hazard (in poor health/unstable), or is a fire hazard species (City of Novato, 2015)
- The Marin County Tree Removal Permit requirements, which allows trees to be removed without a permit if the tree is in poor health due to disease, damage, or age, or if the tree has been identified as a fire hazard by a fire inspector or would provide for the routine management and maintenance of public land or to construct a fuel break (Marin County Municipal Code Chapter 22.62.040 – Exemptions)

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent considered in the PEIR. However, land use in the project area is essentially the same within and outside the treatable landscape because the areas are within the same jurisdictions, are adjacent each other, and

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include the same types of private and public uses. Therefore, the land use impact is also the same, as described above, and would be less than significant. No conflict would occur because the project proponent would adhere to SPR AD-3 (design and implement the treatment in a manner that is consistent with applicable local plans, policies, and ordinances). This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than covered in the PEIR.

Impact LU-2

Contractor or volunteer crews and, potentially, crews from the Marin County Fire Tamalpais Crew or inmate/CAL FIRE crew would conduct treatments. A contractor crew typically consists of 3 to 7 workers per crew. The Marin County Fire Tamalpais Crew or inmate/CAL FIRE crew typically consist of 10 to 12 workers per crew. More crew members may be utilized, but crews are typically less than 25 workers, except potentially for the broadcast burning activities, which could require 25 to 60 workers per crew for 1 to 2 days. Multiple crews could operate at the same time. The potential for treatments to result in substantial population growth as a result of increases in demand for employees was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.12.3, pages 3.12-14–3.12-15). The CalVTP PEIR estimates the average crew size to consist of 20 to 25 workers. Impacts associated with short-term increases in the demand for workers during implementation of the treatment project are within the scope of the PEIR and would be less than significant. The number of workers required for implementation of the treatments is consistent with the crew size analyzed in the PEIR for the types of treatments proposed. The proposed project would not require the permanent hiring of new employees.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the population and housing characteristics of the project area are essentially the same within and outside the treatable landscape, they are within the same jurisdictions, and the crews who would perform the work would be the same. Therefore, the population and housing impact is also the same, as described above, and less than significant. No SPRs are applicable to this impact. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than covered in the PEIR.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to the approximately up to 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope of the land use and planning, population, and housing impacts is the treatable landscape. The inclusion of 2,134 acres of treatment outside the treatable landscape would expand the geographic scope for the cumulative analysis, but the jurisdictions and the population and housing profile would remain the same because the lands outside the treatable landscape do not include any new jurisdictions. As noted in the CalVTP PEIR, because the project is assessed for its potential to conflict with land use plans, policies, or regulations and mitigate any potential impacts, as necessary, there is not an existing significant cumulative impact related to conflicts with land use plans, policies, and regulations that are developed for

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the purpose of avoiding or mitigating an environmental effect. Therefore, the cumulative land use impact analysis for the proposed project, including the areas outside the treatable landscape, is the same as described in the PEIR and is not cumulatively considerable for Impact LU-1.

The geographic scope for the population and employment cumulative analysis is the treatable landscape and surrounding areas, which encompasses the proposed project and includes lands surrounding the treatable landscape. The proposed project would not substantially increase the employment demand because the PEIR considered employment demand for up to 500,000 acres annually and found that the combination of employment demand for CalVTP and these cumulative projects would not be a substantial cumulative increase that would exceed planned population growth throughout the state or result in cumulative growth in some areas that would result in the need for new housing, roads, or infrastructure. The cumulative impact to population and housing for the proposed project, including the areas outside the treatable landscape, is the same as described in the PEIR, and inducement of substantial population growth would not be cumulatively considerable.

New Land Use and Planning, Population and Housing Impacts

The site-specific characteristics of the proposed treatments are consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.12.1 Environmental Setting and Section 3.12.2 Regulatory Setting in Volume II of the Final PEIR).

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a change to the geographic extent presented in the PEIR. However, within the boundary of the proposed project area, the existing environmental conditions pertinent to land use and population that are present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape, as previously described. The proposed project is consistent with the types of projects covered in the PEIR. No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impact. Therefore, no new impact related to land use and population would occur.

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3.12 Noise

3.12.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact NOI-1: Result in a substantial short-term increase in exterior ambient noise levels during treatment implementation?	LTS	Impact NOI-1, pp. 3.13-9 – 3.13-12; Appendix NOI-1	yes	AD-3, NOI-1, NOI-2, NOI-3, NOI-4, NOI-5, and NOI-6.	NA	LTS	no	yes
Impact NOI-2: Result in a substantial short-term increase in truck-generated SENLs during treatment activities?	LTS	Impact NOI-2, pp. 3.13-12	yes	AD-3, NOI-1, NOI-2, NOI-3, NOI-4, NOI-5, and NOI-6.	NA	LTS	no	yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New noise impacts: Would the treatment result in other impacts to noise that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.12.2 Discussion

Impact NOI-1

The project treatment activities that have the potential for short-term increase in ambient noise level include manual treatments and ground-based mechanical treatments. Prescribed herbivory would potentially occur 24 hours a day, but as noted in the PEIR (CalVTP Final PEIR Volume II Section 3.13.3, page 3.13-9), prescribed herbivory would not require the use of heavy off-road equipment. Noise generated by this treatment type would be negligible, and it is not further discussed. The manual treatments for this project include hand-operated power tools, and the mechanical treatments, while very limited, include but are not limited to skid steers and ride mowers. Manual and mechanical treatments would occur during weekdays between 8:00 a.m. and 5:00 p.m., anticipated to begin in spring 2023. Work would be conducted over several years, including maintenance for up to 10 years. Multiple crews may be working at the same time and using mechanical and manual methods that may generate varying noise levels, temporarily increasing ambient noise in the vicinity. Due to the nature of the proposed project, private residences and other noise sensitive land uses are adjacent the work area and would temporarily be exposed to noise. The proposed project would fall within the City of Novato as well as unincorporated Marin County. The potential for treatment activities to cause substantial short-term increases in exterior ambient noise level was addressed in the PEIR (CalVTP Final PEIR Volume II Section 3.13.3, page 3.13-9–3.13-12). SPRs applicable to the proposed project include AD-3, which requires the treatments to be consistent with local plans, policies, and ordinances. Manual and mechanical treatment use would meet the Marin County and City of Novato’s construction noise requirements. Marin County limits construction to between the hours of 7:00 a.m. and 6:00 p.m. Monday through Friday and between the hours of 9:00 a.m. and 6:00 p.m. on Saturdays, provided that the noise level at any point outside of the property plane of the project shall not exceed 90 dBA (Marin County, 2022). The City of Novato’s construction noise requirements also limit construction to between the hours of 7:00 a.m. and 6:00 p.m. Monday through Friday and between the hours of 9:00 a.m. and 5:00 p.m. on Saturdays (City of Novato, 2022). All work would be conducted within the permitted times, per SPR AD-3. Additional SPRs applicable to the proposed project include NOI-1, NOI-2, NOI-3, NOI-4, NOI-5, and NOI-6. SPRs NOI-1 through NOI-6 would require that heavy equipment be used only during daytime hours, all equipment be properly maintained, engine shrouds be closed during mechanical equipment operation and idle time restricted to 5 minutes, all staging areas be placed away from noise sensitive land types, and any noise sensitive receptors be notified ahead of work to ensure impacts to ambient noise levels would be less than significant.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the existing environmental conditions present in the areas outside the treatable landscape are

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essentially the same as those within the treatable landscape because they are adjacent the treatable landscape and would be subject to the same noise ordinances and would have similar noise-sensitive receptors. Therefore, the noise impact is also the same, as described above. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact NOI-2

The project treatment activities would require large trucks to haul equipment and crews to the project site. While trucks would pass residential sensitive receptors, it is not anticipated that project traffic would result in a substantial increase in truck-generated noise along local roads. These large trucks have the potential for a substantial short-term increase in single event noise levels (SENL), but trucks would only be in use during work hours from 8:00 a.m. to 5:00 p.m. Monday through Friday, in compliance with local noise ordinances (see Impact NOI-1). The SENL describes a receiver's cumulative noise exposure from a single impulsive noise event (e.g., an automobile passing by or an aircraft flying overhead), which is defined as an acoustical event of short duration and involves a change in sound pressure above some reference value (CAL FIRE, 2019). The impacts are within the scope of the PEIR because the treatment activities and methods are the same as those analyzed in the PEIR. SPRs applicable to this treatment are AD-3, NOI-1, NOI-2, NOI-3, NOI-4, NOI-5, and NOI-6, described under Impact NOI-1. The potential for a substantial short-term increase in SENL during the project treatments was evaluated in the PEIR and was found to be less than significant with the implementation of the aforementioned SPRs.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the existing roadway network and access road used by the worker vehicles and trucks for hauling would be the same to reach the treatable landscape inside the CalVTP as outside the CalVTP. Therefore, the noise impact is also the same as described above and would be less than significant with the application of the same SPRs. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Cumulative Impacts

As noted in the CalVTP EIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope of the noise resource cumulative impact analysis from the CalVTP EIR is the entirety of the treatable landscape. In addition to the lands treated under the CalVTP PEIR, there are several similar past, present, and reasonably foreseeable projects that could generate similar noise within and surrounding the treatable landscape (CalVTP Final PEIR Section 4.4.1 page 4-23). Based on review of the CalVTP PEIR cumulative analysis, the proposed project, including lands within and outside the CalVTP treatable landscape, would fall within the cumulative analysis for noise because they would be within the 250,000 acres assumed treated annually, would have similar conditions to the cumulative setting due to their proximity to the treatable landscape

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and similar vegetation conditions, and would have the same noise sensitive receptors due to their adjacency to the treatable landscape. As noted in the PEIR, it is not anticipated that temporary noise generated by vegetation treatment activities under the CalVTP and noise related to non-CalVTP projects would simultaneously impact the same noise-sensitive receptors due to the size of the treatable landscape and duration of the vegetation treatments (CalVTP Final PEIR Section 4.4.12 page 4-23). As with the treatments inside the treatable landscape, the noise impacts would occur during a limited duration and would be reduced through SPR NOI-1, SPR AD-3, SPR NOI-6, and SPR NOI-4. Therefore, the cumulative noise impact analysis for the proposed project, including the areas outside the treatable landscape, is the same as described in the PEIR and is not cumulatively considerable.

New Noise Impacts

The site-specific characteristics of the proposed treatments are consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.13.1 Environmental Setting and Section 3.13.2 Regulatory Setting in Volume II of the Final PEIR).

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a change to the geographic extent presented in the PEIR. However, the existing environmental and regulatory conditions pertinent to noise that are present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape, as previously described. The proposed project is consistent with the types of projects covered in the PEIR. No changed circumstances would lead to new significant impacts not addressed in the PEIR. Therefore, no new impact related to noise would occur that is not analyzed in the PEIR.

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3.13 Recreation

3.13.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact REC-1: Directly or indirectly disrupt recreational activities within designated recreation areas?	LTS	Impact REC-1 pp. 3.14-6 – 3.14-7	yes	AD-3, REC-1	NA	LTS	no	yes

Notes:

- NA: not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: there are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New recreation impacts: Would the treatment result in other impacts to recreation that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.13.2 Discussion

Approximately 511 acres of the treatment area are located in recreational areas owned and managed by MCOSED and Marin County Parks. Additional lands are within the City of Novato open space, CDFW, and other agency land that may be used for recreational purposes. Recreational trails are located within and adjacent the treatment areas. Trails adjacent the work areas that are accessible to the public and residents may be closed for short durations during treatment activities. Any closures would be timed and coordinated with MCOSED and Marin County Parks as well as other agencies. The potential for vegetation treatment and maintenance activities to disrupt recreation activities was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.14.3 pages 3.14-6–3.14-7). The proposed project would comply with SPR REC-1, which requires the notification of recreational users of any temporary closure that would result from treatment activities. The proposed project would also comply with all local plans, policies, and ordinances (SPR AD-3). The potential for the proposed treatment project to impact recreation is within the scope of the PEIR and would be less than significant because the treatment activities and intensity are consistent with those analyzed in the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the availability of recreational resources within the project area is essentially the same as outside the treatable landscape because the areas are adjacent each other, the recreational trails are located within and outside the treatable landscape, and the recreational users would be the same. Impacts to recreation would be the same as previously described and would be less than significant. Implementation of SPRs AD-3 and REC-1 would minimize disruption to recreational activities within the project area. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than covered in the PEIR.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to the approximately up to 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope of the recreation cumulative impact analysis from the CalVTP PEIR is the recreational areas within the treatable landscape. As noted in the CalVTP PEIR, implementation of the CalVTP would treat vegetation within the treatable landscape and would not involve the development of residential communities or similar types of development or induce substantial population growth in an area that would require the construction or expansion of recreational facilities (CalVTP Final PEIR Section 4.4.13, page 4-24). Proposed treatment activities may temporarily restrict public access to surrounding areas for safety reasons or cause nuisance impacts related to dust, noise, safety, aesthetics, and traffic; this would disrupt the recreation experience both inside and outside the treatable landscape. These effects would be similar

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inside and outside the treatable landscape because the recreation features and trails are the same and the recreational users are the same. As noted in the PEIR, SPRs would minimize disruptions to recreational users. Impacts to recreation are not anticipated to be cumulatively considerable, and thus the proposed project would not make a significant contribution to disruption of recreational resources.

New Recreation Impacts

The site-specific characteristics of the proposed treatments are consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.14.1 Environmental Setting and Section 3.14.2 Regulatory Setting in Volume II of the Final PEIR). The inclusion of land in the proposed treatment area that is outside the treatable landscape constitutes a change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the existing environmental conditions pertinent to recreation that are present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape, as described previously. No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impacts. Therefore, no new impact related to recreation would occur.

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3.14 Transportation

3.14.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact TRAN-1: Result in temporary traffic operations impacts by conflicting with a program, plan, ordinance, or policy addressing roadway facilities or prolonged road closures?	LTS	Section 3.15.2; Impact TRAN-1 pp. 3.15-9 – 3.15-10	yes	AD-3, TRAN-1	NA	LTS	no	yes
Impact TRAN-2: Substantially increase hazards due to a design feature or incompatible uses?	LTS	Impact TRAN-2 pp. 3.15-10 – 3.15-11	yes	AD-3, TRAN-1	NA	LTS	no	yes
Impact TRAN-3: Result in a net increase in VMT for the proposed CALVTP?	PSU	Impact TRAN-3 pp. 3.15-11 – 3.15-13	yes	NA	AQ-1	LTSM	no	yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New transportation impacts: Would the treatment result in other impacts to transportation that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.14.2 Discussion

Impact TRAN-1

The project would require limited vehicular traffic along public roadways used to access existing fire roads and trails leading to the specific treatment areas. Project-related traffic would include heavy-vehicle trips to haul equipment and materials as well as trips associated with the workers commuting to and from the treatment areas. Initial treatment would likely involve more heavy equipment than subsequent maintenance. A single contractor crew could typically consist of 3 to 7 workers at a single location, and a fire crew could typically consist of 10 to 12 workers. Crew sizes may vary but would not exceed 25 workers except for the broadcast burn area, which could require at least 25 workers over a 1 to 2 day period. Work would generally occur during weekdays between 8:00 a.m. and 5:00 p.m.; therefore, the increase of vehicle traffic on the surrounding local roads would occur before 8:00 a.m. and after 5:00 p.m. The number of truck trips and worker vehicle trips to and from the project area would vary based on the size of the area being treated, the type of treatment being implemented, and the duration of the vegetation treatments. The potential for a temporary increase in vehicle traffic associated with the proposed project work to conflict with a program, plan, ordinance, or policy addressing roadway facilities, or for prolonged road closures, was examined in the PEIR (CalVTP Final PEIR Section 3.15.2, page 3.15-9 and 3.15-10) and found to be less than significant. The proposed temporary increases in traffic related to the proposed project is within the scope of the PEIR because the treatment duration and limited number of vehicles (i.e., fire engine, water tender, masticator transport, and crew vehicles for crew members) associated with the proposed treatments are consistent with those analyzed in the PEIR. The proposed treatments would not all occur concurrently nor would they all occur annually, and increases in vehicle trips associated with the treatments would be dispersed on multiple roads, including local roads. SPRs applicable to this treatment are AD-3 and TRAN-1. Implementing SPR AD-3 requires the treatments to be consistent with local plans, policies, and ordinances, and TRAN-1 would ensure that traffic control measures be placed on affected roadways during project treatment activities.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the existing transportation conditions (e.g., roadways, road use) present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because they continue beyond the treatable landscape and are under the same jurisdictions and would be subject to the same program, plan, ordinance, or policy regarding roadway facilities and closures. Therefore, the transportation impact is also the same and would be less than significant with the implementation of the same SPRs. This determination is consistent with the

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PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact TRAN-2

The project treatment activity that could potentially increase the transportation hazards during the project would be the use of prescribed burning due to the smoke produced, which could temporarily affect visibility on nearby roadways. The potential for smoke to affect visibility along roadways during implementation pile burning was examined in the PEIR (CalVTP Final PEIR Section 3.15.2, page 3.15-10 and 3.15-11) and was found to be less than significant.

Vegetation piles for burning would be approximately 4 feet in diameter and 4 feet in height, and pile burning would be conducted in compliance with CAL FIRE and Bay Area Air Quality Management District (BAAQMD) Regulation 5 for open burning and burn day restrictions. The project's broadcast burn area, described in Section 2.2.3 and shown in Figure 2-3, is near Highway 101 and would require a burn and smoke plan. SPRs applicable to this treatment are AD-3 and TRAN-1, described under Impact Tran-1. The project proponent would prepare and implement a traffic management plan (TMP) to avoid and minimize temporary transportation impacts under this SPR. Therefore, the project treatment activities would not substantially increase hazards due to a design feature or incompatible uses, and impacts would be less than significant. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

The project area includes land that is outside the CalVTP treatable landscape. While this constitutes a minor change to the geographic area considered in the PEIR, the existing environmental conditions for the land outside the treatable landscape and on the land inside the treatable landscape are essentially the same. Further, the project would use the same access roads for land inside and outside the treatable landscape. Therefore, the potential to increase hazards is the same for project areas outside the CalVTP treatable landscape as for areas within the treatable landscape. As a result, the impact to increased hazards is also the same and within the scope of the PEIR. The project would result in a less-than-significant impact related to increasing road hazards and would not result in a more significant impact than covered in the PEIR.

Impact TRAN-3

The project treatments could temporarily increase vehicle miles travelled (VMT) above baseline conditions because the project access locations are in semi-remote locations along fire roads and other small, local roadways. Project-related traffic would include heavy-vehicle trips to haul equipment and materials as well as trips associated with the workers commuting to and from the treatment areas. The number of truck trips and worker vehicle trips to and from the project area would vary based on the size of the area being treated, the type of treatment being implemented, and the duration of the vegetation treatments. This impact was identified as potentially significant and unavoidable in the PEIR (CalVTP Final PEIR Section 3.15.2, page 3.15-11 to 3.15-13) because implementation of the CalVTP would result in a net increase in VMT. However, as stated in Impact TRAN-3 of the PEIR, individual projects under the CalVTP are likely to generate fewer than 110 trips per day, which is expected to cause a less-than-significant

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transportation impact for specific later activities, as described in the Technical Advisory on Evaluating Transportation Impacts published by the Governor's Office of Planning and Research (Governor's Office of Planning and Research 2018). Per the analysis methodologies presented in the PEIR, projects that generate or attract fewer than 110 trips or 50 vehicles bringing crews and equipment to and from the project site per day generally may be assumed to cause a less-than-significant transportation impact. It is estimated that approximately 20 to 30 cubic yards of material could be disposed of each workday from a single treatment area, which would constitute 1 to 3 typical dump trucks. Because of the small sizes of the crews needed for the proposed project (likely in the range of under 12 workers), the limited equipment needed, and the limited materials to be hauled in any one day, the total VMT would not exceed 110 trips per day. Initial treatment would likely involve more vehicle trips than subsequent maintenance. Additionally, all vehicle trips would be dispersed across multiple roadways and would likely only utilize particular roadways a few times and for short durations. On this account, impacts related to a potential increase in VMT would be less than significant. Hiring local contractors would be encouraged where feasible to reduce the amount of VMT. MM AQ-1 would not apply to the impact because the impact is less than significant.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the existing transportation conditions (e.g., roadways, road use) present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because they are adjacent the treatable landscape and a continuation of the same roads. Therefore, the transportation impact is also the same, as described above, and would be less than significant. The most VMT would occur at the beginning and end of the project to haul equipment in and out of the project area. Daily VMT would consist of crew transportation to and from the site and, potentially, hauling removed material. No SPRs apply to this impact, nor would MM AQ-1, as impacts would be less than significant.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts for the proposed CalVTP would occur within and proximate to the approximately up to 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope of the transportation cumulative impact analysis from the CalVTP PEIR is the treatable landscape and the surrounding roadway network used to access individual vegetation treatment sites. In addition to the lands treated under the CalVTP PEIR, there are several similar past, present, and reasonably foreseeable projects that have affected and likely would affect transportation networks within and surrounding the treatable landscape (CalVTP Final PEIR Section 4.4.14, page 4-24). Based on review of the CalVTP PEIR cumulative analysis, the proposed project, including lands within and outside the CalVTP treatable landscape, would fall within the cumulative analysis for transportation because they would be within the 250,000 acres assumed treated annually and would have similar conditions to the cumulative setting due to their proximity to the treatable landscape and the use of the same roadways. As noted in the PEIR, the cumulative analysis would generally be based on the number of projects using the

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same roadways as the project. The PEIR found that, given the scattered locations of the vegetation projects and the limited duration of work at any one location, it is unlikely that cumulative impacts would occur (CalVTP Final PEIR Section 4.4.14, page 4-24). Implementation of SPRs also reduce the contribution of the project to any potentially cumulative impact, regardless of whether the use of the roadways is inside or outside the treatable landscape. Therefore, the cumulative transportation impact analysis for the proposed project, including the areas outside the treatable landscape, is the same as described in the PEIR and is not cumulatively considerable for Impact TRANS-1 and TRANS-2. The PEIR found that impacts are cumulatively considerable for Impact TRANS-3 and, while the VMT from the project would be minor, they would still contribute to the significant cumulative impact—in spite of the recognition that a net VMT reduction could be reasonably expected to occur in the long term and that impacts from individual vegetation treatments would likely be less than significant pursuant to the thresholds identified in OPR's Technical Advisory on Evaluating Transportation Impacts. The proposed project, however, given its limited duration and location, would not result in a cumulatively considerable contribution to an otherwise significant cumulative effect.

New Transportation Impacts

The site-specific characteristics of the proposed treatments are consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.15.1 Environmental Setting and Section 3.15.2 Regulatory Setting in Volume II of the Final PEIR).

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the existing environmental conditions pertinent to transportation that are present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape, as previously described. The proposed project is consistent with the types of projects covered in the PEIR. No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impact. Therefore, no new impact related to transportation would occur.

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3.15 Public Services, Utilities and Service Systems

3.15.1 Checklist

Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact UTIL-1: Result in physical impacts associated with provision of sufficient water supplies, including related infrastructure needs?	LTS	Section 3.16.1 pp. 3.16-2 – 3.16-3; Impact UTIL-1 p. 3.16-9	yes	NA	NA	LTS	no	yes
Impact UTIL-2: Generate Solid Waste in Excess of State Standards or Exceed Local Infrastructure Capacity?	PSU	Section 3.16.1 pp. 3.16-3 -3.16-5; Impact UTIL-2 pp. 3.16-10 – 3.16-12	yes	AD-3, UTIL-1	NA	LTS	no	yes

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Impact in the PEIR			Project-specific checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Impact UTIL-3: Comply with federal, state, and local management and reduction goals, statutes, and regulations related to solid waste?	LTS	Section 3.16.2 pp. 3.16-6 – 3.16-7; Impact UTIL-2 p. 3.16-12	yes	AD-3, UTIL-1	NA	LTS	no	yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

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New public services, utilities, and service systems impacts: Would the treatment result in other impacts to public services, utilities, and service systems that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
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3.15.2 Discussion

Impact UTIL-1

The proposed project would involve the implementation and maintenance of a shaded fuel break and WUI fuels reduction areas using manual treatments, ground-based mechanical treatments, prescribed herbivory, broadcast burning, and targeted herbicide application as well as biomass disposal, including pile burning. A minimal amount of water would be required for fire suppression during pile and broadcast burning activities and for dust control during mechanical treatments. Depending on the location of the pile/broadcast burning or mechanical treatments, water would be supplied via nearby fire hydrants or be transported via fire trucks. The potential increased demand for water was examined in the PEIR (CalVTP Final PEIR Section 3.16.3 page 3.16-9) and was found to be a less-than-significant impact. This impact is within the scope of the activities and impacts addressed in the PEIR because the amount of water and the water source are consistent with those analyzed in the PEIR. The water would be a minimal demand on local water providers. Implementation of the project treatments would not result in a physical impact associated with provision of sufficient water supplies, including related infrastructure needs, and this impact would be less than significant. No SPRs are applicable to this impact.

The proposed project includes land in the proposed treatment area that is outside the CalVTP treatable landscape, which constitutes a minor change to the geographic extent presented in the PEIR. Within the boundary of the project area, the existing conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because the water service providers would be the same. This impact would also be less than significant and within the scope of the PEIR because the water use and the water providers are essentially the same within and outside the treatable landscape. The treatment activities and intensity of the treatments would be consistent with those analyzed in the PEIR. Therefore, the impact to water providers is also the same and would be less than significant, as previously described. No SPRs are applicable to this impact. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than what was covered in the PEIR.

Impact UTIL-2

Manual and mechanical treatments would generate biomass as a result of vegetation removal within the project treatment areas. Biomass generated by mechanical and manual treatments would be processed by chipping and hauling, chipping and broadcasting, or pile burning. The chipped biomass would be broadcast on site, with chipped materials cut to under 3 inches in size, and would be applied at a depth of 2 to 4 inches at most to minimize wildfire risk. The remaining biomass that could not be broadcast on site would be hauled off site to West Marin

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Compost, Redwood Landfill, or Marin Resource Recovery Center. It is estimated that approximately 20 to 30 cubic yards of material could be disposed of each workday from a single treatment area. The potential to generate solid waste in excess of state standards was examined in the PEIR (CalVTP Final PEIR Section 3.16.3 page 3.16-10 – 3.16-12) and was found to be a less than significant impact. SPRs AD-3 and UTIL-1 would apply to this this potential impact. AD-3 requires the project proponent to design and implement the project consistent with local plans and ordinances, and UTIL-1 requires the project proponent to prepare a Solid Organic Waste Disposition Plan to guide biomass disposal. The potential biomass impact is within the scope of the activities and impacts identified in the PEIR as the conditions for removing biomass are consistent with the analysis in the PEIR. This impact of generating solid waste in excess of state standards or exceeding local infrastructure capacity was identified as potentially significant and unavoidable in the PEIR due to the possibility of generating waste in excess of infrastructure capacity and reflects CEQA's mandate of good-faith disclosure of all potential effects.

Locally, Marin Sanitary facility indicates they have available capacity to receive the project's solid organic waste and also has the ability to transport it to composting facilities. Marin Sanitary Transfer Station has the permitted capacity to receive 2,640 tons per day of waste and a permitted traffic volume of 1,170 vehicles per day (Marin County Environmental Health Services, 2019). Composting facilities that could process the organic solid waste include West Marin Compost, with a capacity of 514 tons per day, and WM Earthcare of Marin, with a capacity of 200 tons per day (CalRecycle). Therefore, the impact on solid waste disposal is less than significant. This determination is consistent with the PEIR and would not constitute a substantially more severe impact than identified in the PEIR. The MWPA is participating in a local effort, called the Marin Biomass Project and funded by the Governor's Office of Planning and Research, to study potential pathways for biomass utilization in Marin County.

Recommendations resulting from this two-year study could inform future strategies to manage solid organic waste from the GRVSFB and other projects.

The inclusion of land that is outside of the treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, the land included has essentially the same environmental conditions as those assessed within the treatable landscape so would result in a similar amount of biomass material for disposal and would use the same local facilities for disposal. The same SPRs would be implemented to ensure consistency with local plans and ordinances and ensure a disposition plan. Therefore, the impact generated from solid waste in excess of State standards outside the treatable landscape is less than significant. The proposed project entails a lesser impact than that of the statewide program, and the determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than identified in the PEIR.

Impact UTIL-3

Project treatments, as a result of vegetation removal within the project site, would generate biomass, which would be disposed of by pile burning, chipping and broadcasting, or chipping and hauling. The potential to conflict with federal, State, and local waste management requirements was examined in the PEIR (CalVTP Final PEIR Section 3.16.3 page 3.16-12) and

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was found to be a less-than-significant impact. Approximately 20 to 30 cubic yards of material could be disposed of each workday from a single treatment area. The biomass that remains after pile burning and broadcasting would be transported to West Marin Compost, Redwood Landfill, or Marin Resource Recovery Center. As discussed under Impact UTIL-2, the locations have sufficient permitting capacity to receive the input from the project. The project was evaluated for compliance with the federal, State and local goals related to solid waste, as examined in the PEIR. The project would apply SPR UTIL-1, which requires a Solid Organic Waste Disposition Plan. In addition, SPR UTIL-1 would be applied to this project, which would ensure that the project proponent prepares a Solid Organic Waste Disposition Plan prior to initiating treatment activities. The project is within the scope of activities and impacts identified in the PEIR.

The inclusion of land outside the treatable landscape constitutes a minor change to the geographic extent of the PEIR. However, the environmental conditions outside the treatable landscape are essentially the same as those within the treatable landscape because they are adjacent to the treatable landscape, would generate a similar amount of solid waste, and would use the same waste disposal facilities. Therefore, the impact related to compliance with federal, State, and local goals and regulations regarding solid waste is less than significant. Although the proposed project entails a lesser impact than that of the statewide program, the determination is consistent with the PEIR and would not constitute a substantially more severe impact than identified in the PEIR.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope for public services, utilities, and service systems is the treatable landscape (CalVTP Final PEIR Section 4.4.15, page 4-25). The inclusion of treatment areas outside the treatable landscape would expand the geographic scope for the cumulative analysis, but as with the vegetation treatment activities within the treatable landscape, it would not result in an impact to public services because it would result in a minimal amount of additional water use. Treatment activities would result in an increase in solid organic waste transported off site for processing but, as previously noted, the waste facilities would not exceed existing infrastructure capacities. Use of alternative disposal methods, such as transporting waste to composting sites or using pile burning, would further reduce the waste transported to typical waste treatment facilities. The PEIR identifies potential for a cumulatively significant impact. The proposed project's contribution to cumulative impact to public service, utilities, and service systems, however, would not be cumulatively considerable and would be consistent with the analysis in the PEIR.

New Impacts to Public Services, Utilities, and Service Systems

The site-specific characteristics of the proposed treatments have been considered and found to be consistent with the applicable environmental and regulatory conditions presented in the CalVTP PEIR (refer to Section 3.16.1 Environmental Setting and Section 3.16.2 Regulatory Setting in Volume II of the Final PEIR). The inclusion of land in the proposed treatment area

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that is outside the CalVTP treatable landscape constitutes a change to the geographic extent presented in the PEIR. However, the conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape, as described above. Therefore, no new impact related to public service, utilities, and service systems would occur that is not covered in the PEIR.

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3.16 Wildfire

3.16.1 Checklist

Impact in the PEIR			Project-Specific Checklist					
Environmental impact covered in the PEIR	Identify impact significance in the PEIR	Identify location of impact analysis in the PEIR	Does the impact apply to the treatment project?	List SPRs applicable to the treatment project	List MMs applicable to the treatment project	Identify impact significance for treatment project	Would this be a substantially more severe significant impact than identified in the PEIR?	Is this impact within the scope of the PEIR?
Would the project:								
Impact WIL-1: Substantially exacerbate fire risk and expose people to uncontrolled spread of a wildfire	LTS	Section 3.17.1; Impact WIL-1 pp. 3.17-14 – 3.17-15	yes	HAZ-2, HAZ-3, HAZ-4	NA	LTS	no	yes
Impact WIL-2: Expose people or structures to substantial risks related to post-fire flooding or landslides	LTS	Section 3.17.1; Impact WIL-2 pp. 3.17-15 – 3.17-16	yes	HAZ-2, HAZ-3, HAZ-4	NA	LST	no	yes

Notes:

- NA: Not applicable; there are no SPRs and/or MMs identified in the PEIR for this impact.
- None: There are SPRs and/or MMs identified in the PEIR for this impact, but none are applicable to the treatment project.

3 PSA CHECKLIST

New wildfire impacts: Would the treatment result in other impacts to wildfire resources that are not evaluated in the CalVTP PEIR?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, provide explanation in discussion.
--	------------------------------	--	--

3.16.2 Discussion

Impact WIL-1

The primary goal of the project is to create a fuel break and WUI fuels reduction areas in order to provide improved site access for firefighter and equipment staging in the event of a fire as well as to reduce the intensity of or slow down the spread of wildfires or to mitigate the threat of wildfires to surrounding communities. The project would also create ecological resiliency in these areas and would be designed to improve habitat quality and create a landscape appearance closer to pre-fire-suppression conditions. Treatments would include prescribed burning, pile and broadcast, and mechanical treatments, which could result in temporary risks associated with uncontrolled wildfire and accidental wildfire ignition. The potential increase in exposure to wildfire during implementation of treatments was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.17.3, pages 3.17-13–3.17-14). Increased wildfire risk associated with prescribed burning and use of heavy equipment in vegetated areas is within the scope of the PEIR. SPRs HAZ-2, HAZ-3, and HAZ-4 would be implemented to reduce the risk of exposure to wildfire by requiring spark arrestors on mechanical hand tools, smoking would be prohibited in vegetated areas, and crews would carry one fire extinguisher per chainsaw. This determination is consistent with the PEIR and would not constitute a substantially more severe significant impact than covered in the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the existing environmental conditions present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape because they are immediately adjacent each other and have a similar wildfire risk profile, and the type of equipment and treatment duration of the proposed project outside the treatable landscape are consistent with those analyzed in the PEIR. The same SPRs would be required to reduce the risk of wildfire. Therefore, the wildfire impact is also the same and less than significant, as previously described.

Impact WIL-2

Initial and maintenance treatments would include prescribed burning, mechanical treatment using heavy equipment, and prescribed herbivory. The potential for post-fire flooding and landslides was examined in the PEIR (CalVTP Final PEIR Volume II Section 3.17.3, pages 3.17-14–3.17-15). Treatment would generally occur on slopes with an incline of less than 35 percent but may occur on slopes with an incline of over 35 percent for limited distances or using special equipment. The proposed project would comply with SPR GEO-8, which requires an RPF or geologist to evaluate treatment areas with slopes with an incline of greater than 50 percent for unstable areas and soils. Implementation of SPRs GEO-3 and GEO-5 would stabilize soil disturbed during mechanical and prescribed herbivory treatments and drain compacted and/or

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bare linear-treatment areas capable of generating storm runoff via water breaks. The project proponent would also inspect all treatment areas for the proper implementation of erosion control SPRs and mitigations (SPR GEO-4) to minimize potential for landslides. The proposed project treatments would retain up to 50 percent of existing vegetation, which would help to maintain stability of the soil, ensuring impacts would be less than significant and within the scope of the PEIR.

The inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a minor change to the geographic extent presented in the PEIR. However, within the boundary of the project area, the post-fire landslide risk of the project area is essentially the same within and outside the treatable landscape because they are immediately adjacent each other, and the slopes and risk of post-fire flooding or landslides would be similar. Therefore, the wildfire impact outside the treatable landscape is also the same and less than significant, as described above, with implementation of the same SPRs. The impact outside the treatable landscapes would be consistent with the lands analyzed in the PEIR.

Cumulative Impacts

As noted in the CalVTP PEIR (CalVTP Final PEIR Section 4.1.1, page 4-1), impacts of the proposed CalVTP would occur within and proximate to approximately 250,000 annually treated acres that are located within the 20.3-million-acre treatable landscape. The geographic scope for wildfire is the treatable landscape and adjacent areas because impacts related to wildfire (i.e., uncontrolled spread of wildfire or post-fire flooding or landslides) are location specific, and only projects within or adjacent CalVTP treatment areas could combine to result in cumulative wildfire impacts (CalVTP Final PEIR Section 4.4.16, page 4-26). Because the lands outside the treatable landscape are proximate to the treatable landscape, they fall within the geographic scope identified within the PEIR. As noted in the PEIR, while the treatments could result in short-term increase in fire risk from prescribed burning, in this case—pile burning and broadcast burning—the treatments reduce overall wildfire risk and would have a beneficial effect related to wildfire. The PEIR does not identify potentially cumulatively significant impacts to wildfire, and the proposed project's contribution to wildfire risk would be consistent with the analysis in the PEIR and would not be cumulatively considerable. Therefore, pile burning and broadcast burning under the proposed project would be consistent with the CalVTP PEIR and would not expose people or structures to substantial risks from post-prescribed-burning landslides or flooding, and the project's contribution to impacts related to post-fire flooding or landslides from implementation of treatment activities would not be cumulatively considerable.

New Impacts to Wildfire

The site-specific characteristics of the proposed treatment project have been considered and found to be consistent with the applicable regulatory and environmental conditions presented in the CalVTP PEIR (refer to Section 3.17.1 Regulatory Setting and Section 3.17.2 Environmental Setting in Volume II of the Final PEIR). The project proponent has also determined that the inclusion of land in the proposed treatment area that is outside the CalVTP treatable landscape constitutes a change to the geographic extent presented in the PEIR. However, within the

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boundary of the project area, the existing environmental and regulatory conditions pertinent to wildfire that are present in the areas outside the treatable landscape are essentially the same as those within the treatable landscape, as described above. Therefore, the impacts of the proposed treatment project are also consistent with those covered in the PEIR. No changed circumstances are present, and the inclusion of areas outside of the CalVTP treatable landscape would not give rise to any new significant impacts not addressed in the PEIR. Therefore, no new impact related to wildfire risk would occur that is not covered in the PEIR.

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APPENDIX

Appendix A: Project Definition Report



BEFORE

AFTER

**Marin Wildfire Prevention Authority and Novato
Fire District
Greater Novato Shaded Fuel Break
Modeling and Implementation Guidance Report**

February 2023

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Marin Wildfire Prevention Authority and Novato Fire District Greater Novato Shaded Fuel Break Modeling and Implementation Guidance Report

February 2023

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Summary

This report details Vibrant Planet’s contributions to the work that Panorama Environmental, Inc., is performing for the Marin Wildfire Prevention Authority (MWPA). Part of this work involves a planning effort to develop a comprehensive vegetation treatment approach within an identified shaded fuel break and adjacent fuel reduction areas (known as the Greater Novato Shaded Fuel Break [GNSFB]) to reduce fuels and improve ecological health along a 60-mile fuel break around the greater Novato area in Marin County (Figure 1). Small portions of the GNSFB were not included in the modeling because the project was revised during the assessment process to incorporate these additional locations that would improve the effectiveness of the project. Treatments in areas not modeled were defined by the Novato Fire District. As with all proposed treatments, on the ground verification to determine treatment type and intensity would be required prior to completing the work.

This report identifies the processes, methods, and results specific to each step in developing the fuel break treatment plan as well as describing how implementation will be undertaken, including the process for refinement of treatment units closer to the time of work. The fuel break was segmented into operable treatment units, with attributes then applied to each segment (polygon) to specify forest structure, fire hazard, and potential treatments. Optimal project implementation areas were identified based on a combination of fire-threat rating and community exposure. Potential treatments were then modeled to predict the effect of the treatment on altering fire behavior. Maps have been prepared to present 19 sequenced project segments along with information associated with treatment opportunities and how proposed treatments will reduce the fire hazard. Recent and best available data was used to perform the assessment and develop the treatments. FireSafe Marin’s preparation of the 2020 Marin Community Wildfire Protection Plan (CWPP) entailed fire modeling and the development of a lidar-derived fine scale vegetation map, surface fuel model, and parcel-level risk assessment (among other datasets), which were used in this assessment.

This report is accompanied by key outputs including maps and geospatial data documenting the segmentation of the fuel break into prioritized treatment units along with associated attributes (e.g., potential treatments). This information can be used on the ground for further planning of segments.

SUMMARY

Figure 1 Greater Novato Shaded Fuel Break Project

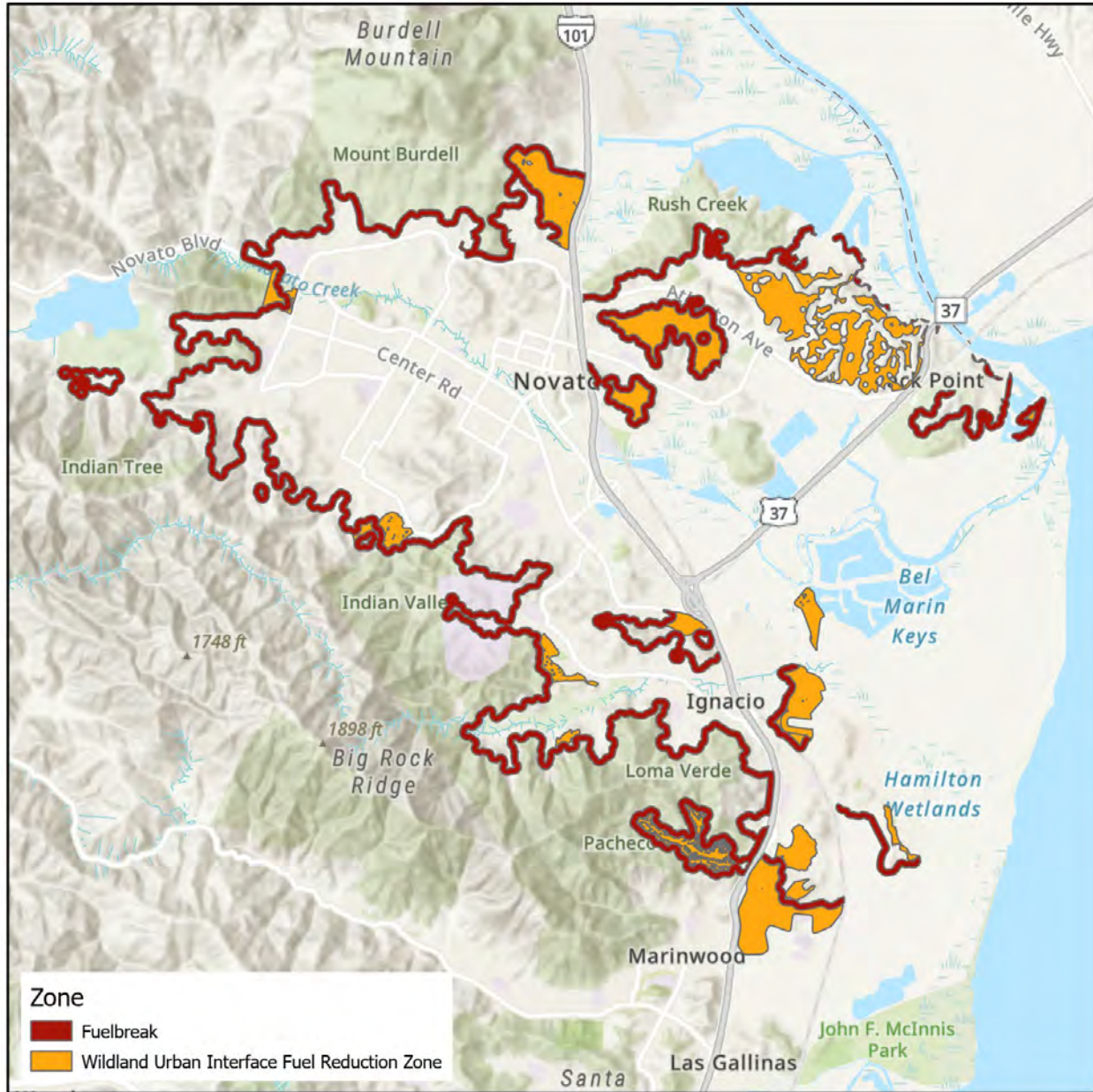


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1 Greater Novato Shaded Fuel Break Methods and Outputs

1.1 Overview

The Novato Fire District is proposing a Marin Wildfire Prevention Authority (MWPA) Core Project, referred to as the Greater Novato Shaded Fuel Break project (GNSFB project or proposed project). The goal of the GNSFB project is to create and maintain a continuous reduced-fuel and forest-health-restoration zone around the community of Novato, within Marin County, California. The proposed project would involve conducting vegetation management activities to create an approximately 60-mile-long continuous shaded fuel break within a 2,124-acre area. Wildland Urban Interface (WUI) fuels reduction areas account for up to 1,313 acres adjacent the fuel break that may also be treated.¹ The proposed project represents a new approach to landscape-scale fuels management methods. The MWPA has prepared a review of literature that evaluates the effectiveness of shaded fuel breaks in mitigating wildfire hazards, including their role in reducing wildfire intensity and rate of spread as well as providing strategic attack points for firefighters.

A modeling approach was undertaken to create an effective project based on the most recent data and up-to-date wildfire science research. The fuel break and WUI fuels reduction areas have been thus designed to optimize treatment efforts and resources as well as to prioritize the areas where the greatest impacts to wildfire hazards and forest resilience would be seen. Vibrant Planet undertook several steps to define the proposed project areas. These steps are presented in Section 1.2, below.

1.2 Steps in Development of Fuel Break Treatments

1.2.1 Step 1: Develop Core Fuel Break Area

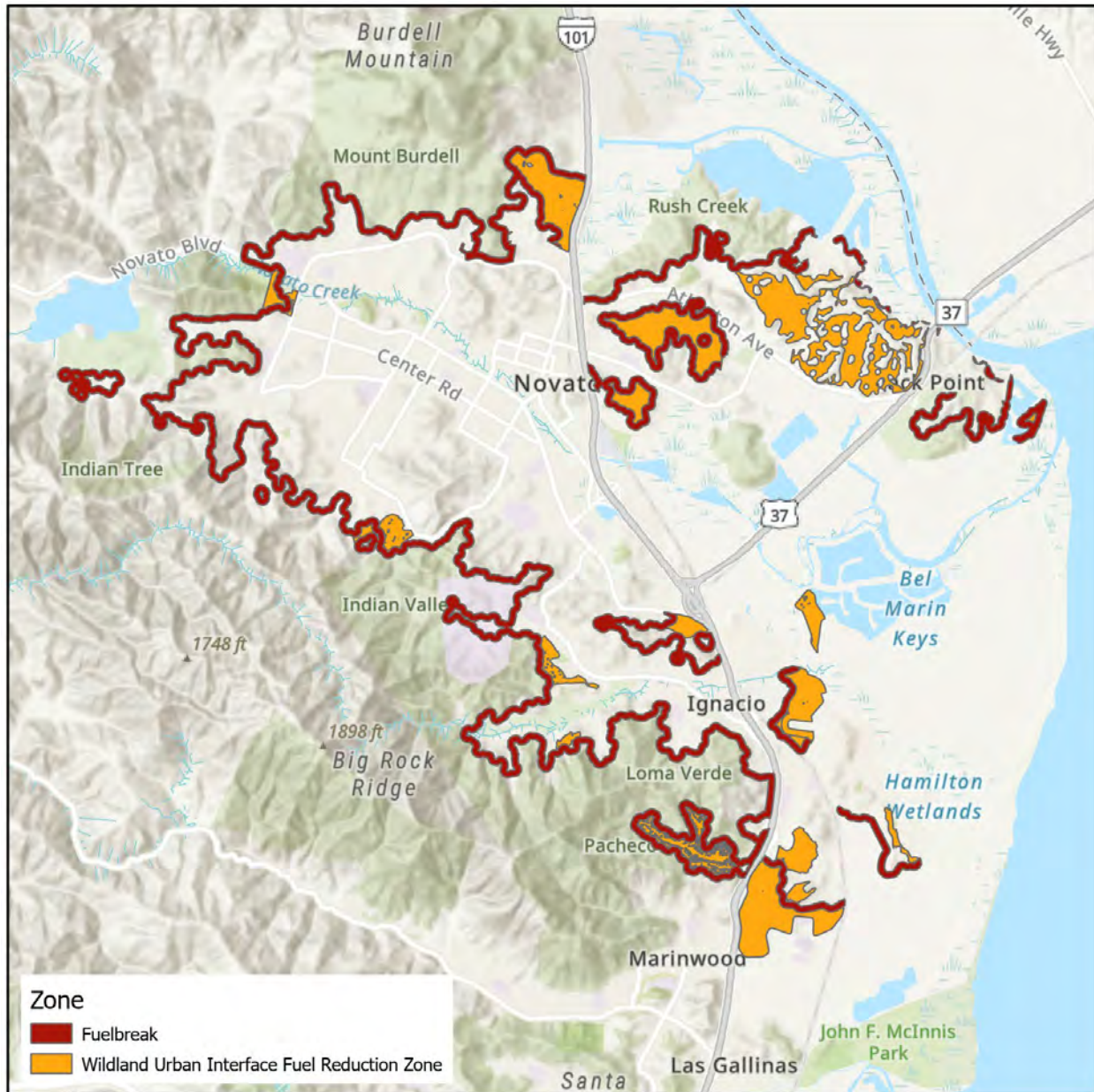
After reviewing a preliminary proposed project area map (developed by Panorama in coordination with the Novato Fire District), Vibrant Planet made revisions, based on the best available data and communications with Panorama and Novato Fire District, to refine the fuel break and to avoid sensitive resources. Vibrant Plant used two methods to delineate the fuel break: 1) using the Marin buildings layer and ArcGIS Pro to define a 300-foot-wide area

¹ Small portions of the GNSFB were not included in the modeling because the project was revised during the assessment process to incorporate these additional locations that would improve the effectiveness of the project. Treatments in areas not modeled were defined by the Novato Fire District. As with all proposed treatments, on the ground verification to determine treatment type and intensity would be required prior to completing the work

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bordering the developed area of Novato as the main peripheral fuel break area; and 2) manual digitization of interior portions of the Novato community to include as WUI fuel reduction areas or zones (Figure 2).

Figure 2 Fuel Break and Fuels Reduction Area (Wildlife–Urban Interface) Zones



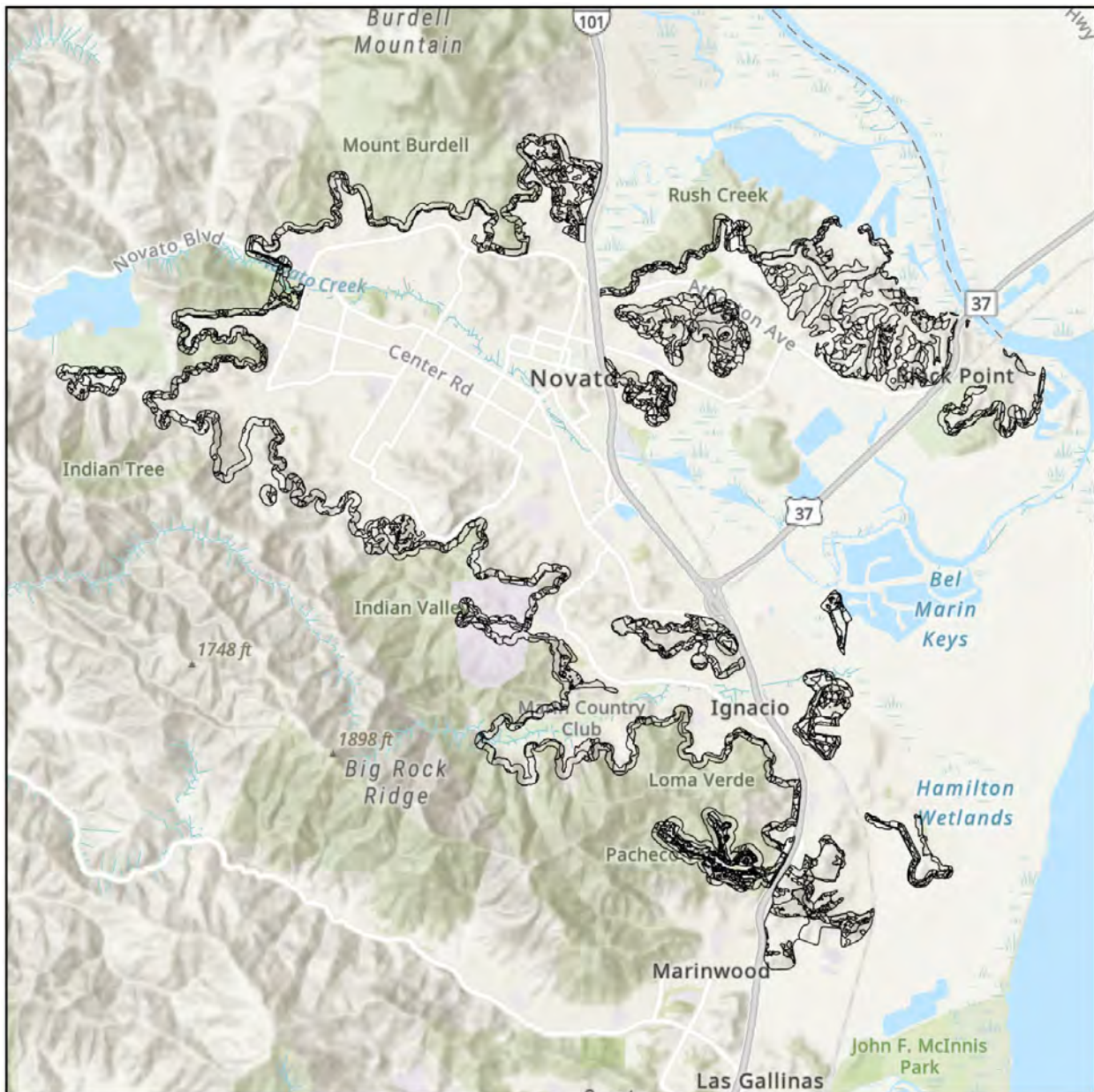
1.2.2 Step 2: Segment Fuel Break

This task involved using vegetation and fuel conditions data to segment the GNSFB into polygons that represent potential forest health treatment units (Figure 3). The segments (including WUI fuel reduction areas) were defined using a combination of the following:

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- Marin Fine Scale Vegetation Map: <https://www.nps.gov/articles/000/marin-county-fine-scale-vegetation-map-complete.htm>
- Fuel models produced by the 2020 Marin Community Wildfire Protection Plan, updated to current conditions (see step 5a: update fuelscape): <https://firesafemarin.org/resources/marin-community-wildfire-protection-plan>
- California public lands dataset: https://gis.data.ca.gov/datasets/f73858e200634ca888b19ca8c78e3aed_0/explore
- Manual cleanup work in ArcGIS Pro

Figure 3 Segmented Fuel Break and Fuels Reduction Areas by Forest Health Treatment Units



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1.2.3 Step 3: Attribute Fuel Break

Each segment was then attributed with biophysical characteristics including segment size, topography (i.e., slope), and vegetation conditions (i.e., Map class, canopy cover, ladder fuels, and tree size), which were used to assign potential vegetation treatments. Attributions were finalized for each polygon using raster inputs and either a mean or a majority zonal statistics calculation, depending on whether the characteristic was continuous or categorical. Vegetation treatments were assigned using a ruleset based on these characteristics as well as a minimum-acres requirement for ground-based mechanical work (see step 4 regarding treatments).

1.2.4 Step 4: Development of Forest Health Restoration Treatments

This task involved developing a ruleset relating vegetation-treatment suitability to given conditions of ownership, slope, vegetation characteristics, and other attributes from the GNSFB segments (Figure 4). For ease of hand-off from the planning phase to environmental review and implementation, treatment methods available for use with the GNSFB (Table 1) directly correspond to those approved for implementation in the California Department of Forestry and Fire Prevention (CAL FIRE) Vegetation Treatment Plan (CalVTP). Treatments that would reduce invasive species cover, maintain native tree canopy, reduce the likelihood of crown fire, and reduce potential tree mortality following a wildfire were identified as providing forest health benefits.

The potential efficacy of treatments was determined using the impact of treatment on fire behavior layers (i.e., burn probability, flame length, and rate of spread) from hazard modeling efforts. Recommended primary and secondary treatments, along with estimated cost of treatments, were determined for each GNSFB segment (Table 2).

Eighteen treatment methods were evaluated (Table 1) and feasible treatments identified for each polygon. For polygons within which multiple treatment methods were determined feasible, primary treatments were assigned based on the following order of priority:

1. ground-based mechanical – using mechanical equipment to target woody vegetation
2. hand thinning – using hand tools to target woody vegetation
3. rearrangement – predominantly mowing
4. herbivory – predominantly goat grazing
5. invasive, non-native species treatments – mostly hand tools to remove invasive species and potentially targeted herbicide application

This order of priority is used to select among multiple feasible treatments for the highest effectiveness at modifying vegetation and favorably altering fire behavior. Among the polygons for which a treatment method was determined feasible, five treatments were identified as the priority treatments (identified in Table 1 with bolded text and gray shading). Following the application of the rulesets shown in Table 2, Vibrant Planet reassigned treatment methods in non-treatable vegetation types or vegetation types that require assessment on site (e.g., vineyard, water, riparian shrub, riparian forest, tidal wetland). In oak woodlands or where

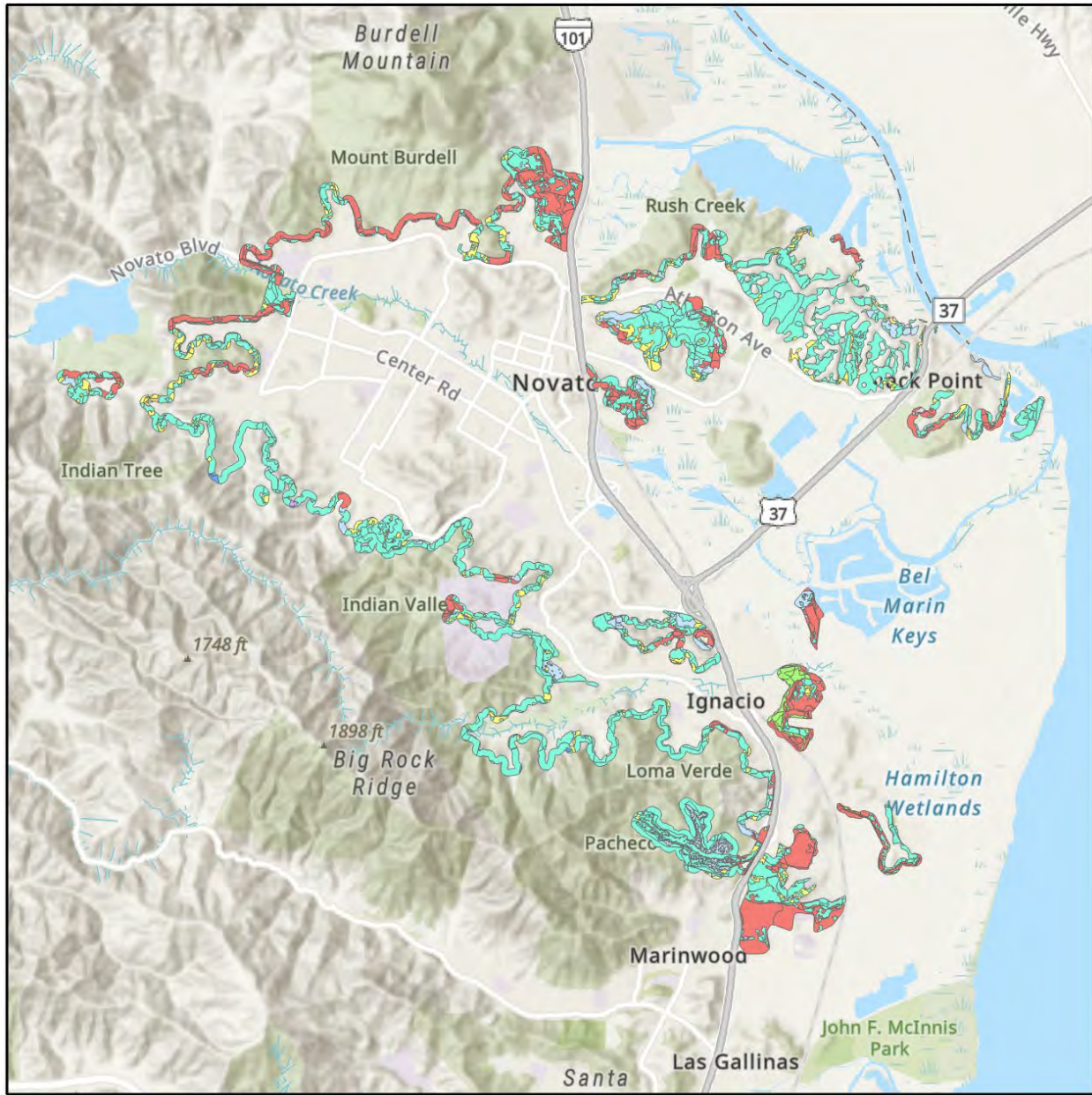
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work would overlap intermittent and perennial streams, ground-based mechanical work was converted to hand thinning, in accordance with direction provided by Novato Fire District.

Two hundred seventy-nine polygons (~310 acres for the fuel break and WUI fuel reduction areas combined) were identified as having no suitable treatment method because the polygons were either “too steep” (>65% slope) or had “low canopy cover” (<30%) and no invasive species present based on available data, or they comprise non-treatable vegetation types (vineyard, water, tidal wetland) (Table 2). Some polygons identified by modeling to have no feasible treatment could be determined by on-site assessment to have feasible treatments and were identified as assess on site.

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Figure 4 Map of Treatments within the GNSFB



- | | |
|---|--|
| Hand thin - variable density thin w/o large openings | None (N/A) |
| Rearrangement - target fine fuel | Hand thin - nonnative species removal |
| Low cover - assess on site | High slope - assess on site |
| Ground based mechanical - variable density thin w/o large openings | Hand thin - thin from below |
| Riparian - assess on site | |

Note: Map of treatments assigned within the Greater Novato Shaded Fuel Break for analysis of impacts on reducing fire behavior. See treatment methods definitions (Section 2) for more detail on treatment descriptions.

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Table 1 Potential Treatments Considered for Assignments

Treatment method	Minimum acres	Average slope (%)	Canopy height	Canopy cover	Ladder fuel	Invasive species present	Priority
Ground-based mechanical – variable density thin, no large openings; biomass removal	5	≤ 40	N/A	> 50	≥ 50	Y or N	1
Ground-based mechanical – variable density thin, no large openings	5	≤ 40	N/A	> 50	≤ 50	Y or N	2
Ground-based mechanical – thin from below; biomass removal	5	≤ 40	N/A	> 50	≥ 50	Y or N	3
Ground-based mechanical – biomass removal	5	≤ 40	N/A	> 50	≥ 50	Y or N	4
Ground-based mechanical – thin from below	5	≤ 40	N/A	> 50	0	Y or N	5
Ground-based mechanical – overstory removal; biomass removal	5	≤ 40	N/A	> 50	≥ 50	Y or N	6
Ground-based mechanical – overstory removal	5	≤ 40	N/A	> 50	0	Y or N	7
Hand thinning – variable density thin, no large openings	0	≤ 65	< 150 ft	≥ 30	≤ 50,	Y or N	8
Hand thinning – thin from below	0	≤ 65	< 150 ft	≥ 30	≥ 20	Y or N	9
Rearrangement – thin from below	5	≤ 40	< 150 ft	≥ 30	N/A	Y or N	10
Rearrangement – grapple/machine piling	5	≤ 40	< 150 ft	≥ 30	N/A	Y or N	11
Rearrangement – target fine fuel	5	≤ 40	< 150 ft	≥ 30,	N/A	Y or N	12
Rearrangement – shallow tillage	5	≤ 40	< 150 ft	≥ 30	N/A	Y or N	13
Herbivory – targeted-fuels focused; hand thinning – variable density thin, no large openings	0	≤ 65	N/A	≥ 30	≥ 20	Y or N	14
Herbivory – targeted-fuels focused; hand thinning – thin from below	0	≤ 65	N/A	≥ 30	≥ 20	Y or N	15
Herbivory – targeted-fuels focused	0	≤ 65	N/A	≥ 30	≥ 20	Y or N	16
Hand thinning – invasive species removal	0	≤ 65	N/A	N/A	N/A	Y	17
Herbicides – targeted application	0	≤ 65	N/A	N/A	N/A	Y	18

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Table 2 Priority Treatment Methods, Including Number of Segments and Acres to be Treated by Each Method (Fuel Break and WUI Fuel Reduction Area)

Treatment method	Number of segments	Acres
Priority treatment methods		
Hand thinning – variable density thin, no large openings	915	2,116.6
Rearrangement – target fine fuels	359	834.8
Ground-based mechanical – variable density thin, no large openings	68	165.2
Hand thinning – invasive species removal	7	7.6
Hand thinning – thin from below	4	3.1
<i>Subtotal</i>	--	<i>3,127.3</i>
No treatments identified – assess on site		
Low canopy cover – assess on site	263	251.2
Riparian – assess on site	33	45.1
High slope/too steep – assess on site	6	4.5
None ^a	10	9.4
<i>Subtotal</i>	--	<i>310.2</i>
Total	--	3,438

^a Areas where no treatment was needed due to the presence of water, vineyard, or tidal wetland.

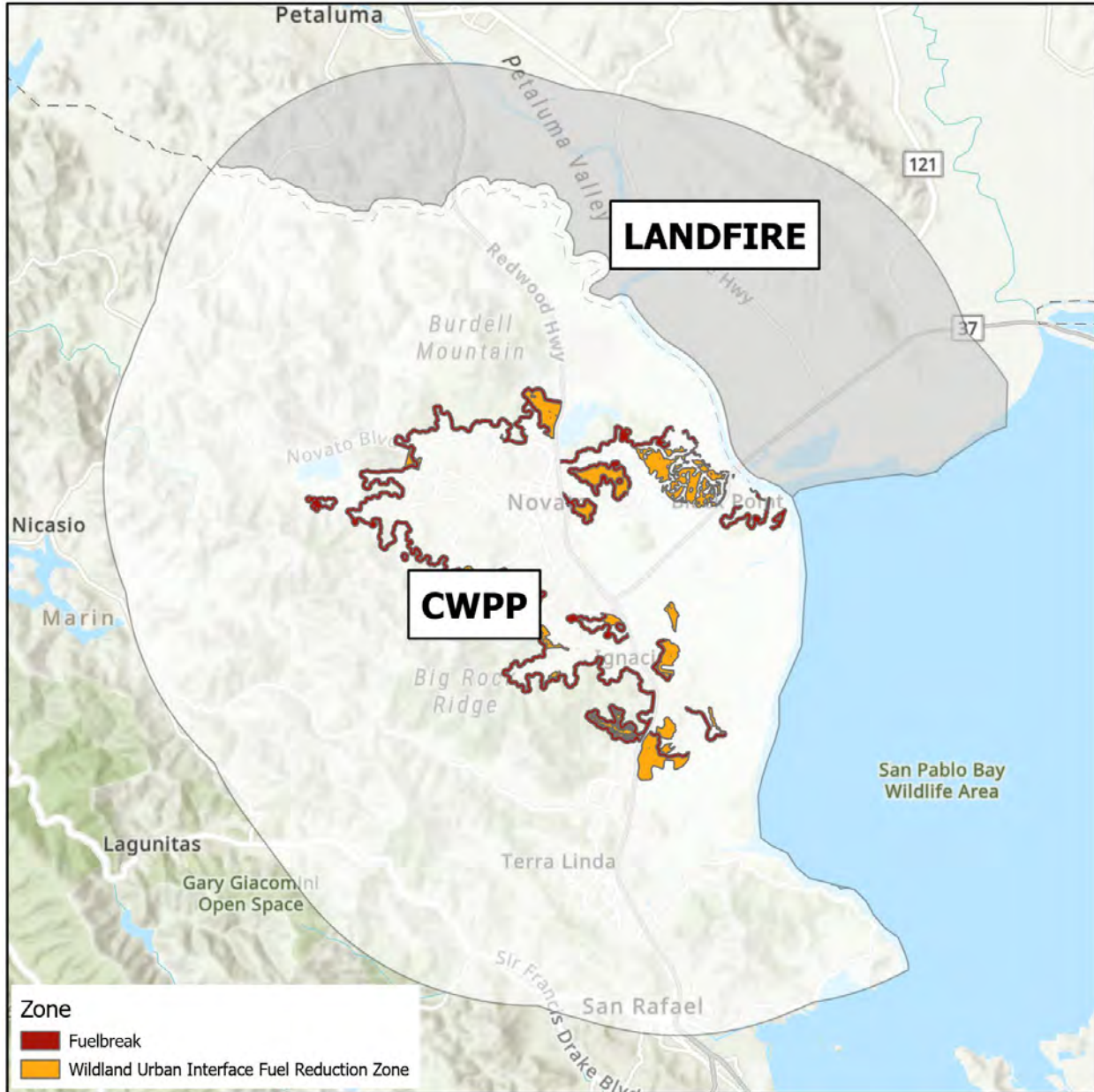
1.2.5 Step 5a: Update Fuelscape

A fuelscape is a quantitative raster representation of the fuel, vegetation, and topography of a landscape. The base fuelscape for the area used the lidar-generated data produced by the 2020 Marin Community Wildfire Protection Plan (Fire Safe Marin 2020). This dataset covered all of Marin County but was not complete across the full modeling extent. Therefore, LANDFIRE (LF) 2022 data was used to fill in areas north of Petaluma River (Figure 5) (LANDFIRE).

The fuelscape data was updated to reflect, to the extent possible, current conditions. The two main tasks performed were 1) mapping the extent of fires (prescribed or wildfire) that occurred in the modeling extent since 2018 and 2) updating surface fuel models in the Petaluma Valley slough area (see Figure 6).

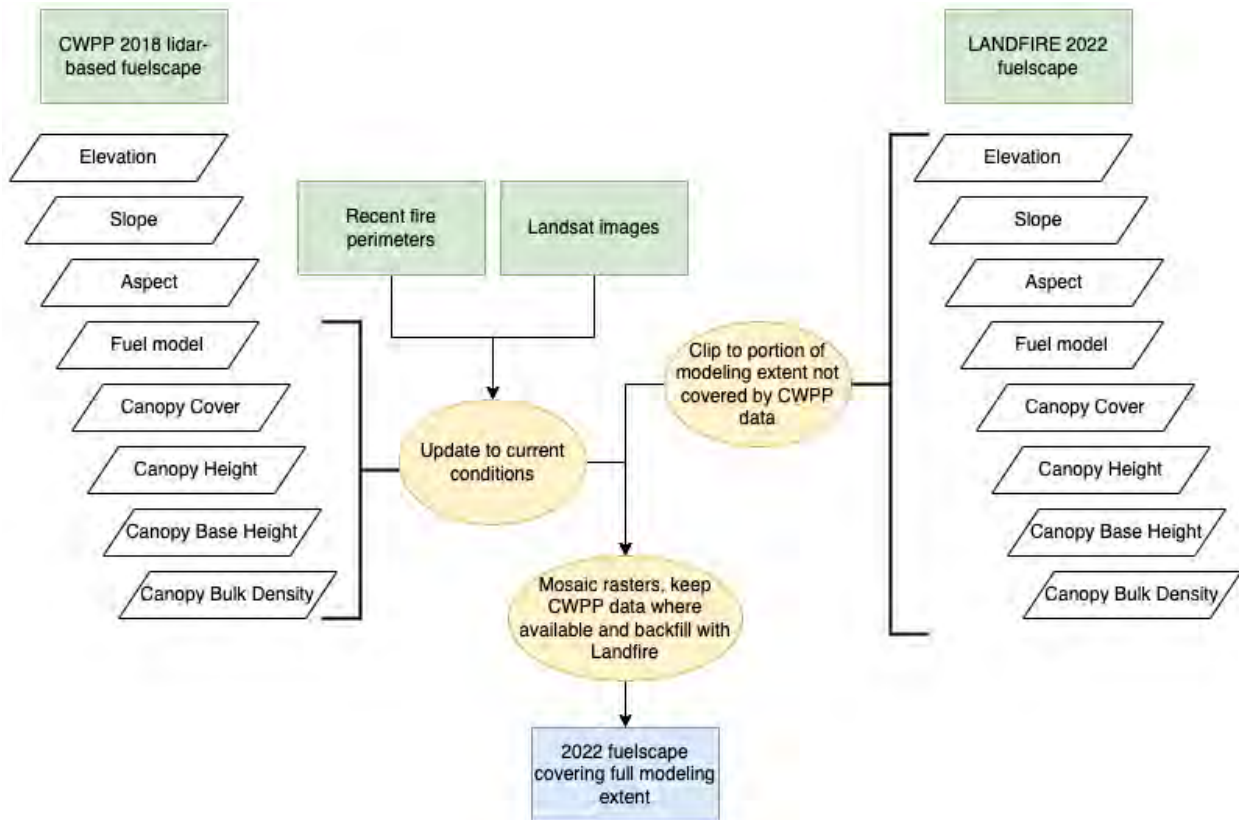
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Figure 5 2018 CWPP Fuelscape Coverage and 2022 LANDFIRE Data Coverage



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Figure 6 Workflow for Updating 2018 Fuelscape and Backfilling Modeling Extent with 2022 LANDFIRE Fuelscape Data



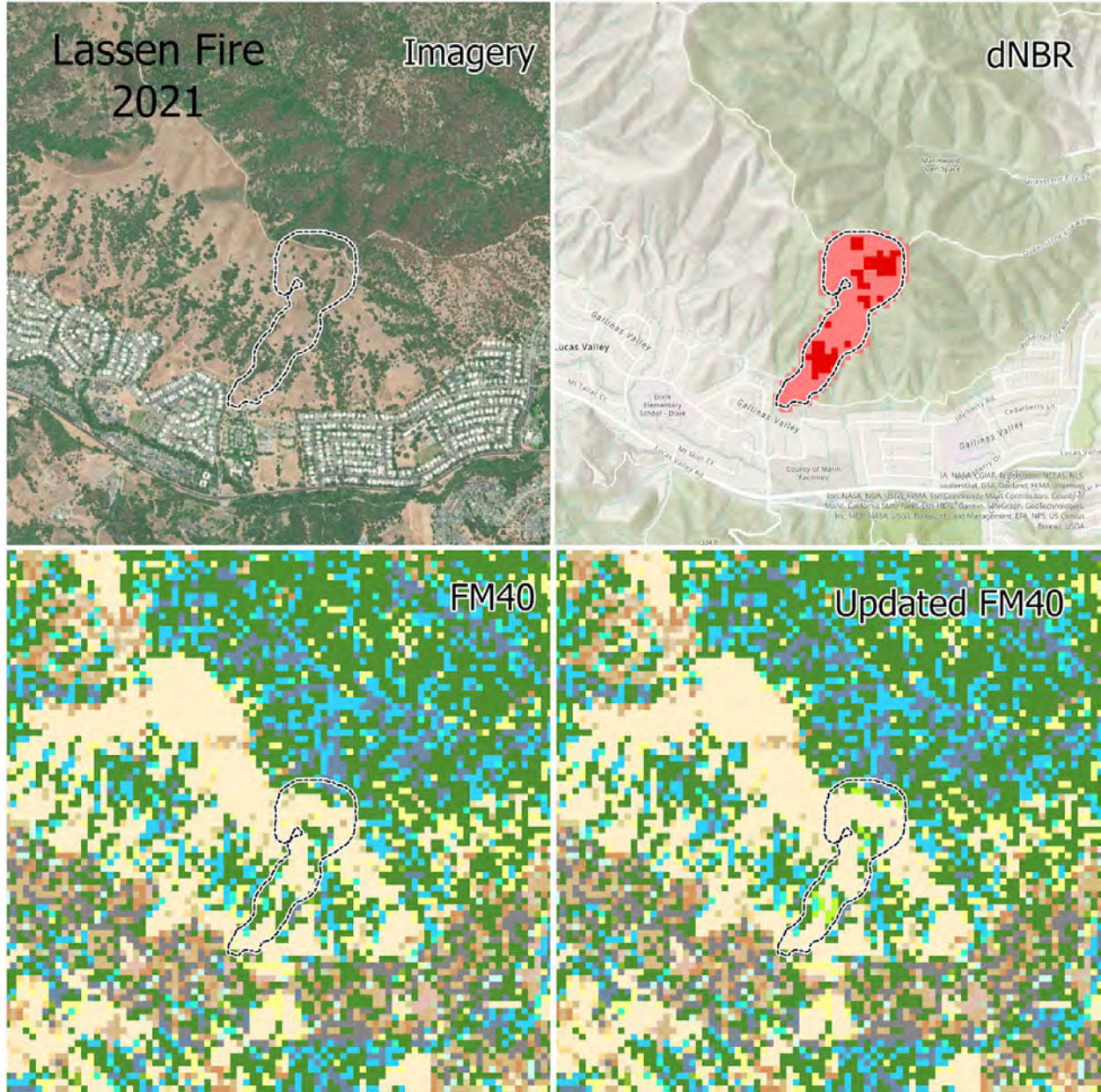
For recently burned areas (2018 to present), the fires severities were mapped using Landsat imagery to calculate the differenced Normalized Burn Ratio (dNBR).² The dNBR was then reclassified from moderate to low severity and the resulting categories used to update surface and canopy fuels (Figure 7, Figure 8).

Fuel models in the Petaluma Valley slough area were modified from high load dry climate grass to moderate load dry climate grass due to the better match with expected fire behavior. The area for which the fuel model is modified was selected using the Marin Fine Scale Vegetation Map where the forest lifeform in 2018 was one of the following: tidal wetland, mudflat, or water (Golden Gate National Parks Conservancy 2021).

² The Normalized Burn Ratio is used to identify burned area. The Normalized Burn Ratio is most powerful as a tool to better understand fire extent and severity when used after calculating the difference between pre and post fire conditions, known as the dNBR (Earth Lab 2020).

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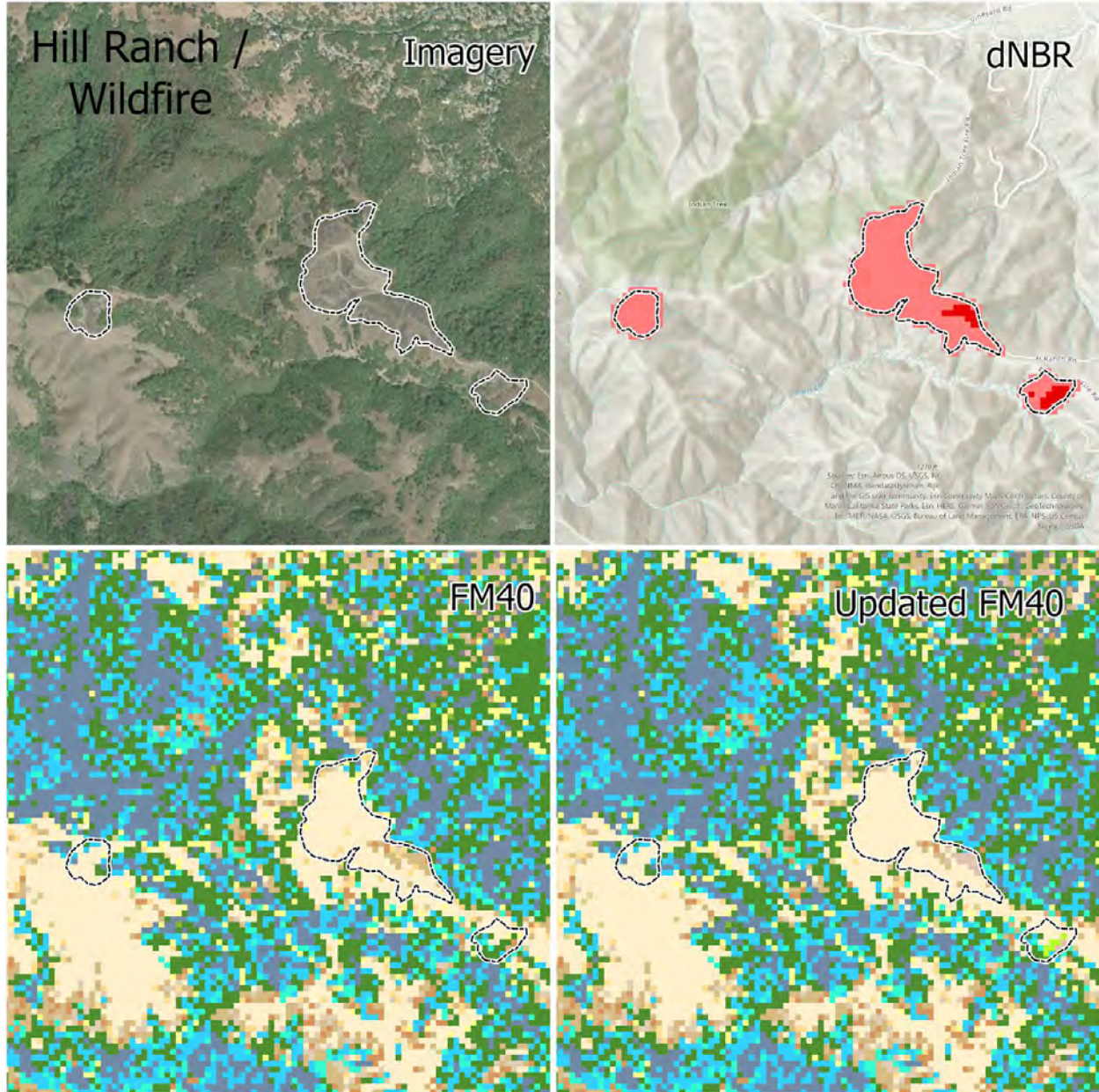
Figure 7 Map of Lassen fire (2021) perimeter



Note: Classified dNBR (light red = low severity, dark red = moderate severity), 2018 fuel model, and updated fuel model

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Figure 8 Map of Hill Ranch wildfire perimeter



Note: Classified dNBR (light red = low severity, dark red = moderate severity), 2018 fuel model, and updated fuel model

1.2.6 Step 5b: Modify Fuelscape to Reflect Treatment

Using the outputs from the updated fuelscape and the assigned treatments, Vibrant Planet generated post-treatment fuelscapes using the FlamMap landscape file (Table 3, Table 4). Surface and canopy fuels were adjusted based on the selected treatments to reflect what the fuels will be after treatment.

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Table 3 Fuel Model Crosswalk used to Update FlamMap Landscape File

Treatment method	NB 1	NB 8	NB 9	GR1	GR 2	GR4	GR7	SH1	SH 2	SH5	SH7	TU1	TU3	TU 4	TU 5	TL1	TL2	TL6	TL9
Ground based mechanical, variable density thin, no large openings	NB 1	NB 8	NB 9	GR1	GR 2	GR4	GR7	SH1	SH 2	SH5	SH5	TU1	TU3	TL2	TU 1	TL1	TL2	TL2	TL2
Hand thinning, thin from below	NB 1	NB 8	NB 9	GR1	GR 2	GR4	GR7	SH1	SH 2	SH2	SH2	TU1	TU1	TL2	TL2	TL1	TL2	TL2	TL6
Hand thinning, variable density thin, no large openings	NB 1	NB 8	NB 9	GR1	GR 2	GR4	GR7	SH1	SH 2	SH2	SH5	TU1	TU1	TL2	TL2	TL1	TL2	TL2	TL6
Hand thinning, non-native species removal	NB 1	NB 8	NB 9	GR1	GR 2	GR4	GR7	SH1	SH 2	SH5	SH7	TU1	TU3	TU 4	TU 5	TL1	TL2	TL6	TL9
Rearrangement, target fine fuel	NB 1	NB 8	NB 9	GR1	GR 1	GR2	GR2	SH1	SH 2	SH5	SH7	TU1	TU1	TU 4	TU 1	TL1	TL2	TL6	TL9

Notes:

NB = non-burnable fuels, GR = grass fuels, SH = shrub fuels, TU = timber understory fuels, TL = timber litter fuels.

See treatment guide for more detail on treatment descriptions. Fuel model numbers are Scott & Burgan model descriptions (Scott and Burgan 2005).

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Table 4 Changes to Canopy Characteristics in FlamMap

Treatment Method	Canopy cover target (% cover)	Bulk density (% change reduction)	Canopy base height target (ft)	Canopy height (% change increase)
Ground-based mechanical, variable density thin, no large openings	50	15	8	10
Hand thinning, variable density thin, no large openings	40	20	8	5
Hand thinning, thin from below	40	20	8	5
Rearrangement, target fine fuel	NA	NA	0	0
Hand thinning, non-native species removal	NA	NA	NA	0

1.2.7 Step 5c: Model Fire Behavior

Fire modeling was conducted in FlamMap, a U.S. Forest Service application that computes potential fire characteristics.³ The outputs used in this analysis included burn probability, rate of spread, and flame length. Burn probability was modeled using the Minimum Travel Time (MTT) algorithm, with 7,500 randomly located ignitions within the modeling extent. Each simulation was run at 30-meter resolution, a maximum simulation time of 720 minutes, and a spot fire probability of 0.2⁴ (Table 5). Fuel moisture values were used from the 2020 Marin Community Wildfire Protection Plan,⁵ and wind speed and wind direction values were assessed using the Robinhood RAWS station (see Table 6 for the fuel moistures, wind speeds; see Figure 9 for the wind directions used in the fire modeling).

Two fire weather scenarios were modeled: a peak fire conditions scenario based on standard 97th percentile weather conditions (from July through October) and a Diablo wind conditions scenario where winds were from the northeast (from August through November).

³ <https://www.fs.usda.gov/rmrs/tools/flammap>

⁴ The spotting probability input (0%–100%) controls how many of the pixels in which crown fire is initiated actually launch embers that can “spot” to start new fires. A spotting probability of 20 percent (or 0.2, as noted above) is the recommended input and the default in the Interagency Fuel Treatment Decision Support System (IFTDSS).

⁵ <https://firesafemarin.org/resources/marin-community-wildfire-protection-plan>

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Table 5 FlamMap parameters used for scenario runs

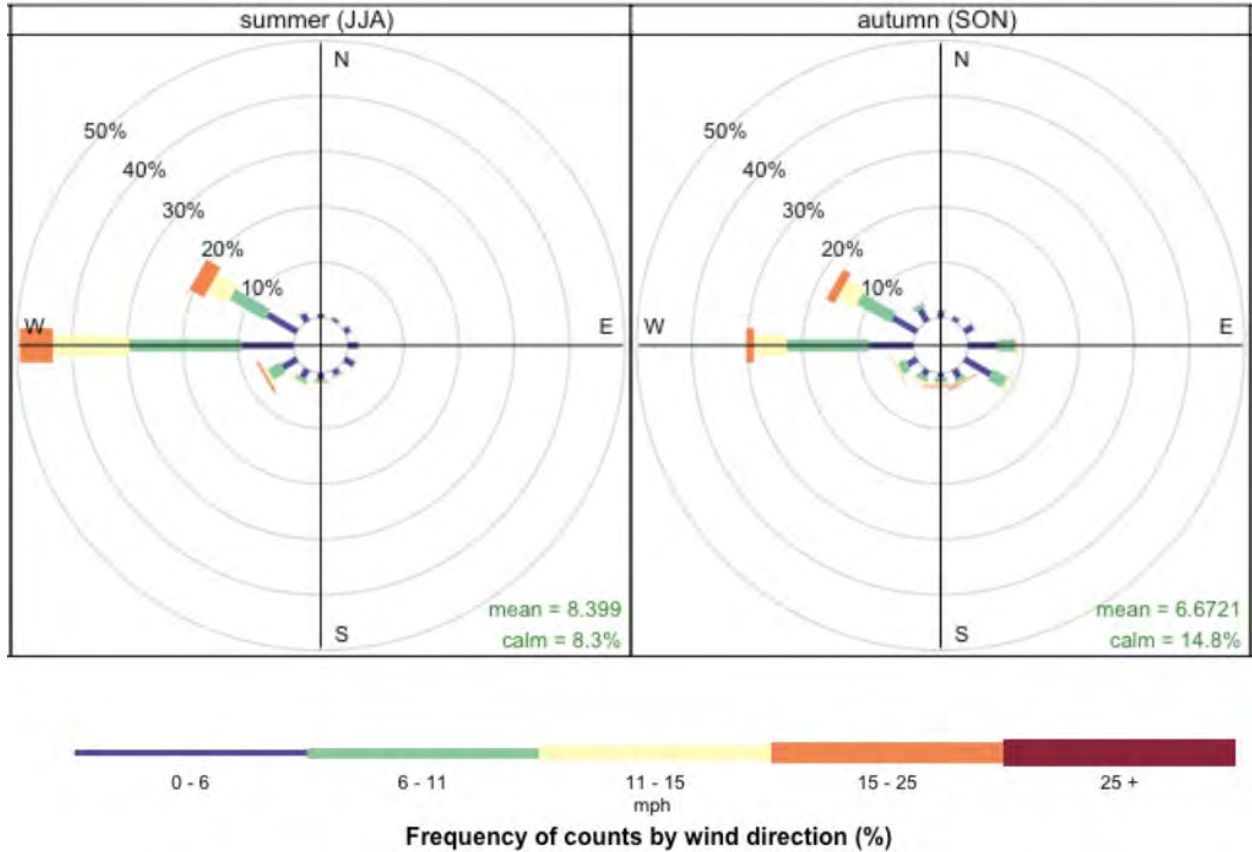
FlamMap parameter	Value
Crown fire calculation method	Scott and Reinhardt (2001)
Resolution of calculations	30 <i>m</i>
Maximum simulation time	720 min.
Interval for minimum travel paths	500
Spot probability	0.2
Spotting delay	0 min.
Lateral search depth	4
Vertical search depth	6

Table 6 Fuel moistures, wind speeds, and wind directions used in fire modeling

Parameter (units)	Peak fire conditions scenario	Extreme Diablo wind conditions scenario
1-hour fuel moisture	3%	3%
10-hour fuel moisture	4%	4%
100-hour fuel moisture	6%	6%
Herbaceous fuel moisture	4%	3%
Live wood fuel moisture	68%	67%
Wind speed	26 miles per hour	22 miles per hour
Wind direction	267°	47° (from the northeast)

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Figure 9 Summer and autumn wind roses for the Big Rock RAWS site



For both current and post-treatment fuelscapes, outputs for burn probability, flame length, and rate of spread were combined for the peak and Diablo conditions. Because Vibrant Planet used the outputs to develop a Fire Threat Rating based on the 2020 Marin CWPP (Fire Safe Marin 2020), Vibrant Planet combined each weather scenario's outputs after classifying data according to the parameters listed in Table 7. The breaks for classifying burn probability were adjusted from the CWPP outputs to account for the difference in the distributions of the modeled data. Vibrant Planet applied a 4-class "kmeans" approach to classifying burn probability using the combined distribution of the peak and Diablo outputs on the current-conditions fuelscape. Then, the categorized data were mosaicked based on the maximum value of the two input datasets. Two composite maps were generated (current conditions, post-treatment conditions) for each of the three fire behavior variables (burn probability, flame length, rate of spread). The composite maps were then averaged for the current condition landscape and the post-treatment condition landscape separately. The difference between these two datasets indicated the potential effectiveness of the assigned treatments to result in a reduction in fire behavior within the segmented areas (Figure 10).

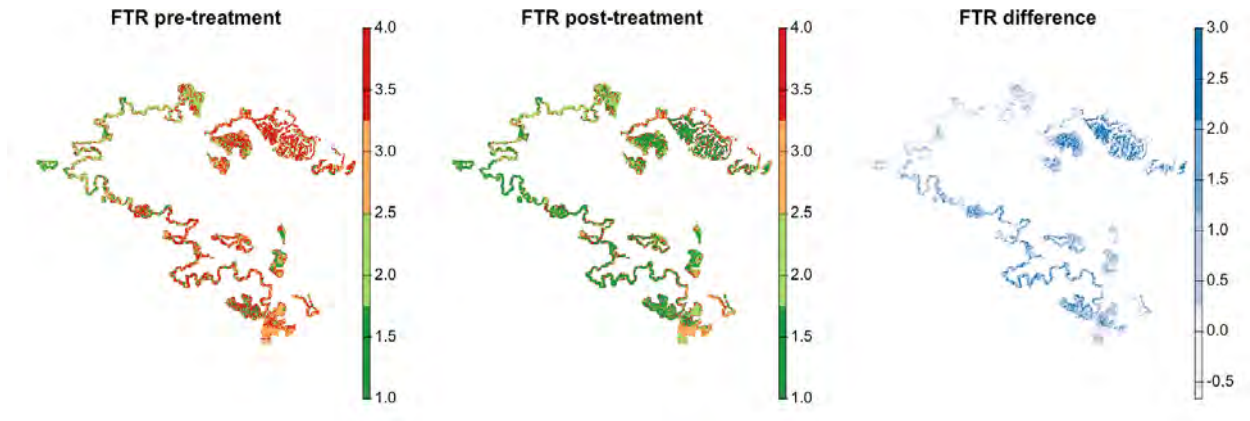
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Table 7 **Reclassification Scheme Used for Fire Threat Rating Input Layers in Marin County CWPP**

Class	Flame length (ft)	Rate of spread (chains/hour)	Randig burn probability
1	≤4	≤5	≤0.006
2	>4 through ≤8	>5 through ≤10	>0.006 through ≤0.043
3	>8 through ≤12	>10 through ≤30	>0.043 through ≤0.082
4	>12	>30	>0.082

Note: Fire behavior inputs (flame length, rate of spread, and burn probability) were used in this analysis.

Figure 10 **Fire Threat Rating (FTR) Reduction (Current Fuelscape Fire Threat Rating Minus Post-Treatment Fuelscape Fire Threat Rating)**



Note: The FTR reduction (right) captures where treatments would be most effective at reducing fire threat rating in the fuelbreak and wildland–urban interface zones.

1.2.8 Step 6: Prioritize Fuel Break Segments

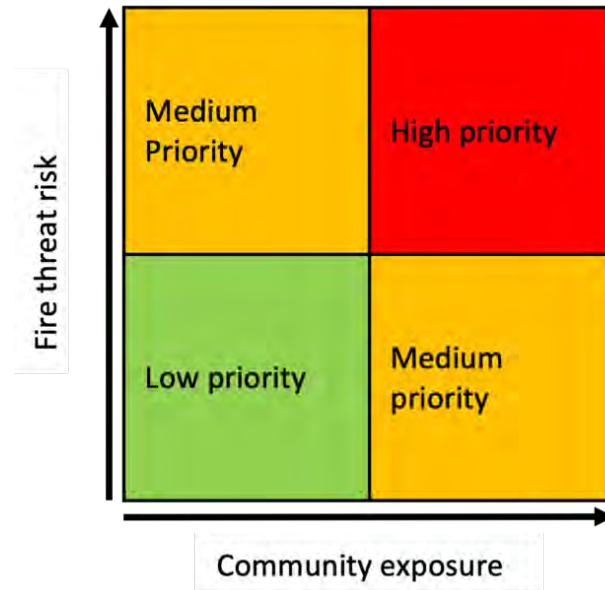
Fire hazards for each GNSFB segment were identified using a combination of fire threat and community exposure, where high fire threat and high community exposure segments would be identified as high priority for treatment. For prioritization, the potential reduction in fire threat rating (model fire behavior) was combined with a community wildfire exposure dataset (Bunzel, et al. 2022). In order to combine the two datasets with different scales, each was rescaled from 0 to 1 using the following equation:

$$x_{normalized} = \frac{(x - x_{min})}{(x_{max} - x_{min})}$$

After rescaling the inputs from 0 to 1, they were averaged together. In this combined dataset, a value of 0 would represent an area both in which it was difficult to reduce fire behavior through treatment (i.e., low FTR difference) and that was not a source of community transmission (i.e., low community wildfire exposure) (Figure 11). Values of 1 would represent areas that were high in both inputs, whereas values between 0 and 1 could be low in one, high in another, or moderate in both.

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Figure 11 Conceptual Model of Fire Hazard Based on the Fire Threat Rating and Community Exposure

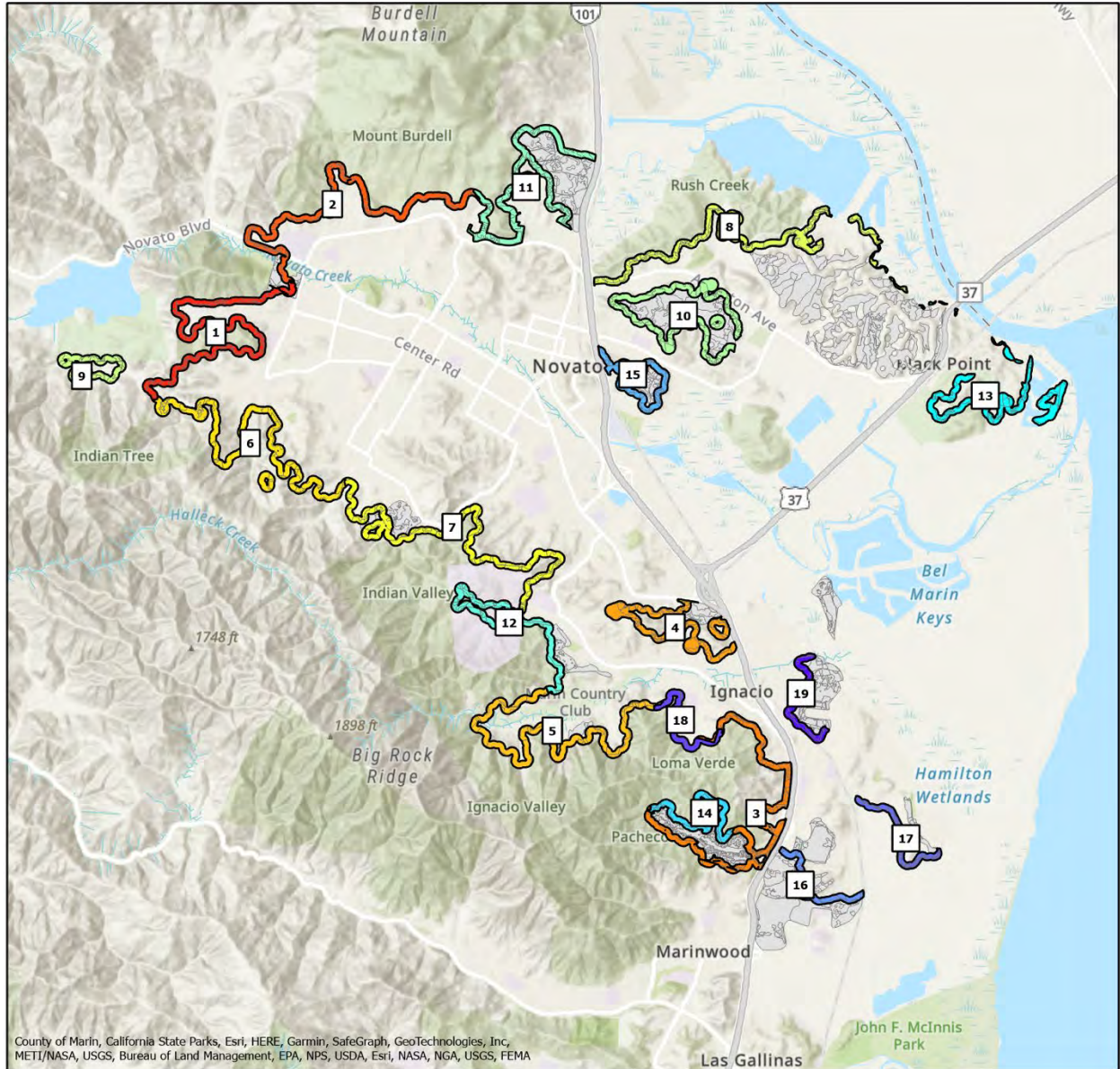


The main fuel break area (zone = “fuel break”) was prioritized using project segments of approximately 50 to 150 acres using the scenario modeling platform ForSys (ForSys 2017). This model groups many adjacent segments into a single project segment based on a maximized value, in this case the combination of fire threat rating reduction and community wildfire exposure.

Substantial slack was allowed in this target size of project segments due to isolated areas of the fuel break that were not adjacent to the main area (Figure 12). After prioritization, any segments not assigned to a project segment were lumped with the closest nearby project segment to ensure they would be evaluated during implementation. The WUI (zone = “wildland urban interface”) area was excluded from prioritization, and segments in that area were not assigned a project segment number. Finally, project segments were grouped into tiers based on their overall objective score (the value output during optimization) (Figure 13).

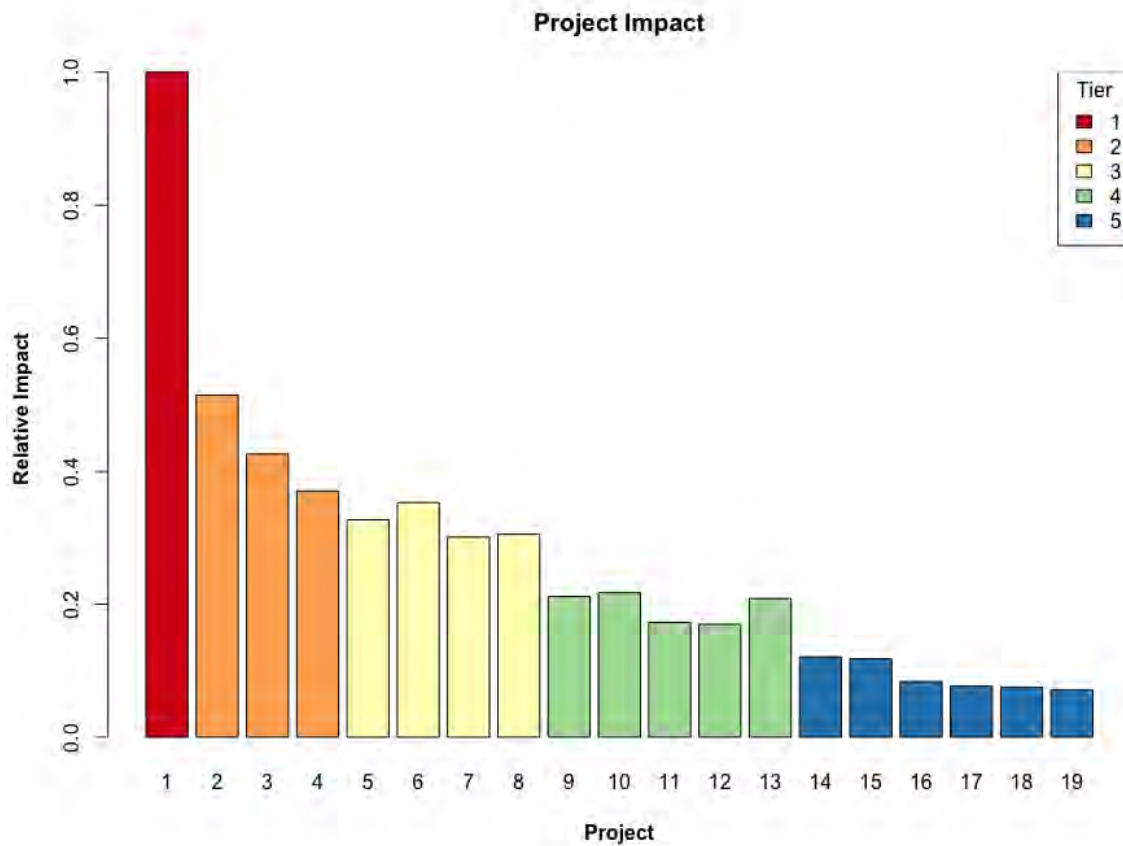
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Figure 12 Potential Project Segment Sequencing Based on Combination of Fire Threat Risk and Community Exposure



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Figure 13 Project Segments Assigned to Tiers Based on Objective Score (Relative Impact)



This graph depicts the relative impact each project segment has on reducing wildfire risk to the community relative to the highest impact project segment (Project Segment 1). It is important to note that, while project areas are generally categorized from highest to lowest impact, many of the project areas have very similar impact on reducing risk to the community. This graph demonstrates that implementation among the 19 project segments may not necessarily occur in order, and some swapping of project areas to facilitate implementation in the field should be expected.

Costs were estimated for each project based on the priority project segment and the following base costs:

- Ground-based mechanical: \$5,000/acre
- Hand thinning (excluding burning of piles) including invasive species removal: \$2,500/acre for very light work; \$7,000/acre to \$8,500/acre for moderate slopes and intensity of work; up to \$12,000/acre to \$20,000/acre for intense work, steep slopes, and difficult access
- Herbivory: \$1,000/acre
- Rearrangement (fine fuels): \$1,500/acre

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Final consolidated project segments contained from 12 to 130 segments and ranged from 42 to 170 acres after manual adjustments (Table 8). Ownership and treatment opportunities are summarized for each project (Table 4 and Table 5). Treatment opportunity is presented for priority treatments as identified in Table 2. If, after site visits (refer to Section 3, Implementation Plan for more information), the priority treatment identified is deemed not suitable, a list of alternative treatments for each project segment can be found in the spatial dataset. Additionally, there is an opportunity to improve overall ecological health when visiting units for fire hazard reduction by implementing invasive species removal work simultaneously (at a minimum, have invasive species present per the data available; see Appendix A). The breakdown of vegetation class within each project segment is included in Appendix A. Regarding ownership, a dataset that maps public lands was used and, therefore, private ownership was assumed when segments fell outside of the mapped categories.

Table 8 Number of Segments, Acres by Land Manager, and Estimated Costs for Each Project

Project segments (see Section 2.2.3)	Land manager	Acres	Total acres	Estimated Costs
1	Marin County Open Space District	76.0	151.6	\$660,625
	North Marin Water District	6.4		
	City of Novato	14.7		
	Private/other	54.5		
2	Marin County Open Space District	72.8	148.6	\$464,600
	City of Novato	17.9		
	Private/other	57.9		
3	Marin County Open Space District	71.5	151.8	\$936,150
	Marin County Parks Department	0.7		
	Marinwood Community Services District	0.8		
	City of Novato	6.1		
	Private/other	72.7		
4	City of Novato	55.1	114.7	\$704,475
	Private/other	59.6		
5	Marin County Open Space District	50.7	153.9	\$1,945,325

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Project segments (see Section 2.2.3)	Land manager	Acres	Total acres	Estimated Costs
	Private/other	103.2		
6	City of Novato	14.9	170.4	\$1,506,950
	Private/other	155.5		
7	Marin County Open Space District	34	169	\$1,194,800
	Private/other	135		
8	California Department of Fish and Wildlife	1.5	164.8	\$859,175
	Marin Audubon Society	9.4		
	Marin County Open Space District	41.2		
	City of Novato	22.2		
	Private/other	90.5		
9	North Marin Water District	10.5	61.7	\$293,450
	Private/other	51.2		
10	Private/other	154.5	154.5	\$767,225
11	Marin County Open Space District	70.4	150.4	\$672,225
	Private/other	80		
12	Marin County Open Space District	14	94.6	\$582,925
	City of Novato	1.9		
	Private/other	78.7		
13	California Department of Fish and Wildlife	48.6	130.3	\$675,550
	Marin County Parks Department	7.7		
	Private/other	74		
14	Marin County Open Space District	48.2	62.8	\$479,725
	Private/other	14.6		

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Project segments (see Section 2.2.3)	Land manager	Acres	Total acres	Estimated Costs
15	North Marin Water District	2.8	68.4	\$328,600
	City of Novato	17		
	Private/other	48.6		
16	Private/other	42.2	42.2	\$296,650
17	Department of Defense	8.3	45.5	\$144,925
	Private/other	37.2		
18	Marin County Open Space District	36.3	44.7	\$335,725
	Private/other	8.4		
19	City of Novato	1.5	44.3	\$33,675
	Private/other	42.8		
Total fuel break	private	1,361	2,124	\$12,882,775
	public	763		
WUI fuel reduction area	Marin County Open Space District	4.2	1,314	\$7,443,450
	City of Novato	15.8		
	Private/other	1,294		
Total GNSFB project	private	2,655	3,438	\$20,326,225
	public	783		

Note: Numbers may not add due to rounding.

Table 9 Summary of Priority Treatments by Project Segment

Project segment	Treatment	Acres	Cost (\$)
1	Hand thin - nonnative species removal	3.2	\$31,400
1	Hand thin - variable density thin w/o large openings	64.6	\$563,350
1	Low cover - assess on site	31.1	\$0
1	Rearrangement - target fine fuel	52.7	\$65,875
2	Hand thin - variable density thin w/o large openings	43	\$339,850

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Project segment	Treatment	Acres	Cost (\$)
2	Low cover - assess on site	5.8	\$0
2	Rearrangement - target fine fuel	99.8	\$124,750
3	Ground based mechanical - variable density thin w/o large openings	7.0	\$35,000
3	Hand thin - variable density thin w/o large openings	111.4	\$874,900
3	Low cover - assess on site	9.3	\$0
3	None (N/A)	3.1	\$0
3	Rearrangement - target fine fuel	21	\$26,250
4	Ground based mechanical - variable density thin w/o large openings	15.7	\$78,500
4	Hand thin - variable density thin w/o large openings	68.3	\$601,100
4	Low cover - assess on site	10.8	\$0
4	Rearrangement - target fine fuel	19.9	\$24,875
5	Hand thin - variable density thin w/o large openings	143.6	\$1,945,325
5	High slope - assess on site	1.2	\$0
5	Low cover - assess on site	9.1	\$0
6	Ground based mechanical - variable density thin w/o large openings	1.2	\$6,000
6	Hand thin - thin from below	1.8	\$13,950
6	Hand thin - variable density thin w/o large openings	157.7	\$1,487,000
6	High slope - assess on site	2.9	\$0
6	Low cover - assess on site	6.8	\$0
7	Ground based mechanical - variable density thin w/o large openings	8.9	\$44,500
7	Hand thin - variable density thin w/o large openings	130	\$1,134,550
7	Low cover - assess on site	17.5	\$0
7	Rearrangement - target fine fuel	12.6	\$15,750
8	Ground based mechanical - variable density thin w/o large openings	2.4	\$12,000
8	Hand thin - nonnative species removal	3.9	\$30,225
8	Hand thin - variable density thin w/o large openings	92.5	\$758,950

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Project segment	Treatment	Acres	Cost (\$)
8	Low cover - assess on site	17.9	\$0
8	None (N/A)	1	\$0
8	Rearrangement - target fine fuel	46.4	\$58,000
8	Riparian - assess on site	0.7	\$0
9	Ground based mechanical - variable density thin w/o large openings	4.6	\$23,000
9	Hand thin - variable density thin w/o large openings	30.8	\$246,950
9	Low cover - assess on site	6.8	\$0
9	Rearrangement - target fine fuel	18.8	\$23,500
9	Riparian - assess on site	0.7	\$0
10	Ground based mechanical - variable density thin w/o large openings	21.3	\$106,500
10	Hand thin - variable density thin w/o large openings	80.9	\$626,975
10	Low cover - assess on site	25.3	\$0
10	Rearrangement - target fine fuel	27	\$33,750
11	Hand thin - variable density thin w/o large openings	70.2	\$596,850
11	Low cover - assess on site	19	\$0
11	Rearrangement - target fine fuel	60.3	\$75,375
11	Riparian - assess on site	0.9	\$0
12	Ground based mechanical - variable density thin w/o large openings	2.8	\$14,000
12	Hand thin - variable density thin w/o large openings	71.4	\$554,175
12	Low cover - assess on site	8.6	\$0
12	Rearrangement - target fine fuel	11.8	\$14,750
13	Ground based mechanical - variable density thin w/o large openings	9.7	\$48,500
13	Hand thin - variable density thin w/o large openings	75.7	\$586,675
13	Low cover - assess on site	10.5	\$0
13	None (N/A)	2.1	\$0
13	Rearrangement - target fine fuel	32.3	\$40,375

1 METHODS AND OUTPUTS

Project segment	Treatment	Acres	Cost (\$)
14	Hand thin - variable density thin w/o large openings	61.9	\$479,725
14	Low cover - assess on site	0.9	\$0
15	Ground based mechanical - variable density thin w/o large openings	9.9	\$49,500
15	Hand thin - variable density thin w/o large openings	31.9	\$247,225
15	Low cover - assess on site	1.1	\$0
15	Rearrangement - target fine fuel	25.5	\$31,875
16	Hand thin - variable density thin w/o large openings	29.6	\$287,150
16	Low cover - assess on site	5	\$0
16	Rearrangement - target fine fuel	7.6	\$9,500
17	Hand thin - variable density thin w/o large openings	14.2	\$110,050
17	Low cover - assess on site	1.5	\$0
17	Rearrangement - target fine fuel	27.9	\$34,875
17	Riparian - assess on site	1.9	\$0
18	Hand thin - variable density thin w/o large openings	43	\$335,725
18	Low cover - assess on site	1.7	\$0
19	Hand thin - variable density thin w/o large openings	1.2	\$9,300
19	Low cover - assess on site	1.9	\$0
19	Rearrangement - target fine fuel	19.5	\$24,375
19	Riparian - assess on site	21.7	\$0
Total		2,124.2	\$12,882,775

1.3 WUI Fuels Reduction Areas

The primary focus of the modeling was the shaded fuel break, comprising the 300-foot swath adjacent to buildings and structures at the WUI. However, in developing the fuel break during step 1, several additional areas of open space and undeveloped private parcels of land were found extending into the community areas or in areas of concern. The treatment of these areas, if feasible, would provide added protection between the overall fuel break and community structures. These areas were identified as the “WUI fuels reduction area.”

1 METHODS AND OUTPUTS

An analysis was performed to segment the WUI fuels reduction area adjacent the fuel break and to assign potential treatments. Segmentation in the WUI fuels reduction area was performed following the same procedure described for the fuel break, using a combination of fuel modeling and fine scale vegetation forest lifeform. The assignment of treatments similarly followed the methods from the shaded fuel break; Figure 4 includes treatments identified for the extended areas. Areas not assigned treatment included those that were too steep or had very low canopy cover. Treatment costs per acre were estimated based on the costs above. Ground-based mechanical treatment was considered likely only for areas that exceeded 5 acres (when adjacent segments were combined); however, areas in the original shaded fuel break were also allowed into the sum. The WUI fuels reduction area treatments are shown in Figure 4 and listed in Table 8.

Table 10 WUI Fuels Reduction Area by Treatment Type and Costs

Treatment method	Acreage	Cost
Ground based mechanical - variable density thin w/o large openings	81.5	\$409,500
Hand thin – nonnative species removal	0.4	\$3,100
Hand thin – thin from below	1.3	\$10,075
Hand thin – variable density thin w/o large openings	794.1	\$6,580,025
High slope – assess on site	0.3	\$0
Low cover – assess on site	60.3	\$0
None (N/A)	3.1	\$0
Rearrangement - target fine fuel	352.5	\$440,750
Riparian – assess on site	19.2	\$0
Total	1,313	\$7,443,450

2 Treatment Methods Definitions

2.1 Introduction

This section provides detailed descriptions of treatment methods. Treatment method descriptions in this document are intended to describe the recommended treatment types that may occur within the entirety of any particular treatment polygon or project segment. On-site ground verification will occur prior to any implementation (refer to Section 3) and may refine and revise recommended treatment, but these descriptions provide a baseline for the prescriptions that will be used in the field. While treatment types are assigned on a polygon basis, the intensity of the treatment may vary depending on vegetation density and other factors. Generally, where treatment units abut structure, treatment intensity will be higher near structures and lessen in intensity as work progresses away from structures.

Treatments are presented here based on the modeling, but the relevant CalVTP treatment types are also discussed. The scope of the modeling efforts does not include use of broadcast burning but does not preclude use of this fuels reduction method or other methods that could achieve desired conditions similar to those treatments that were modeled.

2.2 Prescription Intensities within the Fuel Break

It is expected that treatment prescriptions will vary in intensity depending on several factors including distance from structures, locations of particular hazards (e.g., existing dry brush piles, dense stands of dead vegetation up to 300 feet from structures), topography, site conditions, and land management constraints (e.g., Marin County Parks/Open Space District). Within the portion of the fuel break typically 0 to 100 or 150 feet wide, as determined appropriate by fire professionals and based on site conditions, treatments may include higher intensity fuels reduction typical of defensible space, with a focus on vertical and horizontal spacing in addition to removal of invasive species and dead and dying vegetation, if required by local fire codes or ordinances. In forest health zones, vegetation treatments would generally be lower intensity, focused primarily on removal of invasive and non-native, fire hazardous vegetation, removal of dead and dying vegetation, and limbing of native trees to mimic conditions that might exist in a natural environment where natural fires were allowed to occur.

2 TREATMENT METHODS DEFINITIONS

2.3 Modeled Treatment Types

2.3.1 Introduction

Several assumptions were made when defining the treatment types in order to run the response function. The general definitions of the types of treatments used in the modeling are provided below. The majority of treatment types (approximately 70 percent) will be hand-thinning and manual removal based on the modeling.

2.3.2 Hand (Manual) Thinning or Removal

Hand thinning generally only affects woody vegetation. Herbaceous vegetation such as grass and forbs are generally unaffected except in target-invasive-species treatment.

Hand thinning is a part of the following treatment types of work that could be implemented. Hand thinning and removal is always complimented with some type of woody debris removal or processing. It could include piling and burning, chipping and leaving on site (limited in use and chip depth), chipping or dragging and hauling off site, and lop and scatter.

Variable density thin, no large openings	Treatment is generally variable and is applied so as to mimic vegetation structure patterns that would exist in the area's intact disturbance regime.
Thin from below	Treatment is generally consistently and equally applied across an area and is focused on significantly reducing the effects of high-intensity fire.
Pile burn	In some cases, pile burning may be necessary following thinning. While pile burning is not specifically identified, it is used when prescribed fire is used to ignite piles of cut vegetation. Piles are generally burned during the wet season to confine burning to the pile footprint.
Hand removal of invasive species	Hand removal of invasive species can include removal of trees, shrubs, or herbaceous forbs and graminoids. Removal may use tools such as saws, shovels, and hands. Only target species are removed, however, depending on species and cover of target species.

2.3.3 Ground-based Mechanical

Prescriptions may be applied to achieve one or many goals. Goals include, but are not limited to, reducing severities of planned or unplanned fire, increasing forest resilience to drought, improving ecological function, and site change for development. Ground-based mechanical treatments generally only target woody vegetation. Herbaceous vegetation such as grass and forbs are generally not targeted but can be affected.

2 TREATMENT METHODS DEFINITIONS

Ground-based mechanical treatments are a part of the following types of work that could be implemented, as described below.

Variable density thin, no large openings	Treatment is generally variable and is applied so as to mimic vegetation structure patterns that would exist in the area’s intact disturbance regime and includes some smaller openings of less than 1 acre.
Biomass processing	Biomass includes materials from trees. This may occur pre or post fuel removal or concurrently with fuel removal activities and includes both byproducts of trees removed (e.g., limbs, tips) and small trees up to 9.9 inches dbh. Overstory vegetation is generally unaffected.

2.3.4 Ground-based Mechanical – Rearrangement

Rearrangement is a type of ground based mechanical treatment with methodologies intended to remove air from the combustible triangle equation by rearranging fuels and distributing them relatively evenly across the treated ground. Treatment intensity is determined by the need to reduce the effects of unplanned disturbance, existing vegetation management plans, and operational or social limitations. Different prescriptions target either woody or herbaceous vegetation, rarely altering the structure of both significantly at the same time.

Target fine fuel	Predominantly achieved by mowing. Treatment is generally consistently and equally applied across an area and is focused on significantly reducing fine fuels and a fire’s rate of spread.
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2.3.5 Prescribed Herbivory

Herbivory may be used prior to or after other treatment methods or may be used in isolation for fine fuels reduction. Prescribed herbivory would occur as described below and could also be used for fine fuels rearrangement. As previously noted, the limits are the maximum envelope and not necessarily typical.

Targeted fuels focused	Predominantly achieved by goats or sheep, which are used for fuels reduction and are confined to a specific area (less than 5 acres) for an amount of time. Grazing helps reduce fine fuels and a fire’s rate of spread as well as providing some reduction in ladder fuel, which reduces flame lengths.
Non-targeted	Achieved by cattle, horses, or goats grazing over a large range (at least 5 acres). Grazing helps reduce fine fuels and therefore a fire’s rate of spread as well as providing some reduction in ladder fuel, which reduces flame lengths.

2 TREATMENT METHODS DEFINITIONS

2.3.6 Assess on Site – No Treatment Identified

Assess on site is used to identify areas that have a high slope or low cover or that may be within a riparian corridor. These areas are complex, environmentally sensitive, or too dangerous to assign a treatment for based on the analysis conducted as part of this report. It is suggested that these areas are reviewed on site as part of the implementation planning and, if necessary, site-specific treatments are assigned at that time.

2.3.7 Invasive Species Removal

Invasive species removal treatment occurs where invasives are known and no other treatment is anticipated to be needed.⁶ Invasive species removal may also occur with other treatment types.

Hand removal of invasive species	Hand removal of invasive species can include removal of trees, shrubs, or herbaceous forbs and graminoids. Removal may use tools such as saws, shovels, and hands. Only target species are removed, however, depending on species and cover of target species.
Targeted herbicide application	Project treatments could include targeted herbicide application, such as stump and spot spray treatments, to kill or prevent regrowth of invasive and non-native species. No aerial spraying of herbicides would occur. Targeted herbicide application is limited to a defined operational area, and methods are established to prevent drift outside of the area. All herbicides are regulated by the Environmental Protection Agency (EPA), and all applicable rules and guidelines are followed. Only target plant species will be impacted. There will be limited to no impacts to other plant species or soil.

2.4 CalVTP Treatment Types

Treatment types from the modeling effort were cross walked to the CalVTP treatment types. Table 9 summarizes the treatment types as they are described in the CalVTP.

⁶ Due to timing of the PSA and supporting documentation, the non-native/invasive species digitized during the biological reconnaissance surveys were not included in the modeling but will be used during implementation of the project.

2 TREATMENT METHODS DEFINITIONS

Table 11 Proposed CalVTP Treatments

CalVTP treatment type	Treatment description	CalVTP treatment activity	Treatment size (acres) – max	Equipment used for treatments	Timing of initial treatments
Shaded fuel break	creation of a continuous fuel break approximately 200 feet, but up to 300 feet, in width, including thinning of understory and invasive species removal	manual treatments	1,332, up to 1,553 ^a	chainsaws, pole pruners, loppers, and string trimmers	phased over 5 years
		ground-based mechanical treatments	566	skid steers or tractors with mounted masticators, or mowers, ride mowers	
		prescribed herbivory	up to 482	livestock; goats, sheep, cattle, horses	as needed
		herbicide	very limited locations within up to 2,118 acres ^b	herbicide and applicator materials	as needed
		pile burn	within up to 2,118 for material removal	drip torch	as needed
		none	6.3	none	none
		<i>subtotal</i>	<i>2,124</i>		

2 TREATMENT METHODS DEFINITIONS

CalVTP treatment type	Treatment description	CalVTP treatment activity	Treatment size (acres) – max	Equipment used for treatments	Timing of initial treatments
Wildland–urban interface (WUI) fuel reduction area	fuels reduction in open spaces to reduce wildfire hazards	manual treatments	796, up to 876 ^c	chainsaws, pole pruners, loppers, and string trimmers	phased over 5 years
		ground-based mechanical treatments	434	skid steers or tractors with mounted masticators, or mowers, ride mowers	
		prescribed herbivory	up to 353	livestock: goats, sheep, cattle, horses	as needed
		herbicide	very limited locations within up to 1,310 ^b	herbicide and applicator materials	as needed
		pile burn	within up to 1,310 for material removal	drip torch	as needed
		broadcast burn	92 ^d	drip torch, fire engines, and water truck	phased over up to 5 years
		none	3.1	none	none
	<i>subtotal</i>	<i>1,313</i>			
Total acres		up to 3,438^e			

2 TREATMENT METHODS DEFINITIONS

CalVTP treatment type	Treatment description	CalVTP treatment activity	Treatment size (acres) – max	Equipment used for treatments	Timing of initial treatments
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Notes:

- ^a Includes 220 acres of areas that were determined through modeling to be too steep, have too low of canopy cover, or are riparian. These areas would be assessed on site, and treatment in these areas is not precluded if the fire agency determines through site inspections that treatment is necessary and possible.
- ^b Targeted spot treatment will occur as needed before, during, or after other treatments, where allowed per local regulation.
- ^c Includes 80 acres of areas that were determined through modeling to be too steep, have too low of canopy cover, or are riparian. These areas would be assessed on site, and treatment in these areas is not precluded if the fire agency determines through site inspections that treatment is necessary and possible.
- ^d The broadcast burn location was not included in the modeling, it was defined by Novato Fire District.
- ^e Includes approximate 6 acres for the fuel break and 3 acres for the WUI fuels reduction area that were not identified for treatment.

3 Implementation Plan

3.1 Overview

Planning and implementation activities for the GNSFB will likely occur throughout the year. As previously described, the GNSFB is being approved through the CalVTP process under the Program EIR, pursuant to CEQA. Once the CEQA process is completed for the GNSFB project, each year, additional field studies (e.g., biological surveys, cultural resource surveys) and planning of treatment-area units will be needed. This section describes the implementation steps, from pre-season planning through completion of work.

3.2 Land Ownership

3.2.1 Overview

A major factor in the planning and implementation of the work will be coordinating with the landowners and land managers for implementation of the various project segments of the GNSFB. Ultimately, these entities will have a role in defining and implementing the treatments on their lands. The various types of landowners are summarized below.

3.2.2 Marin County Open Space District

Many project segments overlap lands owned by MCOSD. Approximately 15 percent of the project areas fall within MCOSD lands, including the following preserves:

- Pacheco Valle Preserve
- Loma Verde Preserve
- Ignacio Valley Preserve
- Indian Valley Preserve
- Verissimo Hills Preserve
- Little Mountain Preserve
- Mount Burdell Preserve
- Rush Creek Preserve

The Novato Fire District and MWPA will work with MCOSD to refine and implement the treatments on their lands. Treatments may be modified to meet the goals and objectives of the MCOSD, who holds ultimate responsibility for their lands, particularly in cases where sensitive resources are present.

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3.2.3 City of Novato

Approximately seven percent of the GNSFB overlaps with City of Novato lands. The Novato Fire District and MWPA will work with the City of Novato to refine and implement the treatments on City lands and to ensure the project completes the vegetation management work the City of Novato is already implementing on their lands.

3.2.4 Private Lands

The GRNFB project also overlaps with multiple private parcels. Map books have been prepared that show land ownership and parcel information. Approximately 2,557 acres of the project are on private parcels. Responsibility for completion of fuel break work on private lands may fall on homeowners as part of required defensible space treatments, up to 100 feet, and through assistance by the Novato Fire District for areas on private land beyond 100 feet. Coordination will be required for access and to treat these areas, which means treatments may not always be completed as modeled.

3.3 Implementation Steps

3.3.1 Planning Work

Determining Annual Treatment Units and Landowner Coordination

Before each fire season and during the development of the MWPA Work Plan (January through May), planning for the upcoming work should commence. The planning phase should include a desktop review of this report and supporting prioritization data to assist in determining the priority areas to treat for the upcoming treatment season.

During the initial planning phase each year, the priority areas should be identified for that year and then crosswalked with the treatment methods modeled for the area to help define the specific prescriptions per project segment (e.g., hand thinning, mowing) and intensity of work needed based on ground conditions and other parameters, as previously discussed. The treatment units may then be mapped and summarized in a specification (a short document that provides the refined treatment locations and methods) to share with landowning partner agencies, for grant proposals, and/or for the MWPA Work Plan.

Once the areas for treatment for the upcoming year are determined, the landowners or land managers will be contacted to plan the work and secure access. If the work is on private lands, outreach may include direct contact via mail, phone, email, or flyers and even door-to-door. Agreements to perform work on private lands may be needed. Access to the site may need to be secured if access is through private homeowner properties.

Regulatory Review

A regulatory review should also occur. The process includes review of the upcoming treatment areas against the CalVTP-approved Project Specific Analysis (PSA) requirements and any other permitting requirements (e.g., section 1600 [of the California Fish and Game Code] Stream and

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Lakebed Alteration Agreement if working in a riparian zone). A key component of this step will be to identify the areas and types of surveys that need to be performed, including botanical, special-status species, wetland, riparian, and cultural resources. Many of these studies are time sensitive, and so even if work is not to commence until the fall, the surveys will need to be performed in the spring. Based on the assessment of resources, the list of relevant project design and implementation features (PDIFs), standard project requirements (SPRs), and mitigation measures will be reviewed to ensure that any constraints are included in the planning of the work for the year and to ensure that crews performing the work are also aware of the requirements.

Other permits and approvals to consider based on the treatment area and type include the following:

- **Tree ordinances and herbicide ordinances for the local jurisdiction:** The specifications should be modified to exclude any trees that may be protected by a local ordinance, or to ensure compliance with local ordinances for use of herbicides. If protected trees must be removed, tree removal permits will be obtained.
- **Encroachment permits for roads:** Staging of equipment, chippers, and vegetation management along roadways may require the need for an encroachment permit from the relevant jurisdiction. Any permits should be identified and obtained early.
- **Work in riparian corridors:** Work that could occur within a riparian corridor could trigger the need for a permit from the California Department of Fish and Wildlife under section 1600 (of the California Fish and Game Code) for a Lake and Streambed Alteration Agreement.

Field Assessment and Preparing the Treatment Specification

Field assessments will be performed to ground-truth and refine the prescriptions. Ground-truthing is needed to ensure the specification is appropriate and to verify access and staging. Each project segment is approximately 50 acres, up to 150 acres, within which a variety of treatment methods may be identified as the most effective based on modeling. Treatment methods and treatment prescriptions within these 19 project areas and adjacent WUI fuel reduction areas may vary depending on equipment or personnel access, vegetation density, or other factors. After the field visit, detailed mapping of the units to be treated may also be provided with the written specification that can be provided to crews and followed in the field. Alternatively, qualified field managers may provide verbal specifications to crews in the field.

It is expected that treatment prescriptions will vary in intensity depending on several factors as well as distance from structures. Treatments may be modified based on various regulatory requirements for work in riparian areas, wetlands, and sensitive habitats and near cultural sites, in accordance with the CalVTP and PEIR requirements.

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The specification may include the following components:

- Scope of the work
- Project location and description
- Maps
- Estimated start date and time
- Restrictions on work
- Licenses and insurance requirements (if performed by contractors)
- Technical requirements
 - Definitions
 - Specifications
 - Contractor furnished equipment (if performed by contractors)
 - Furnished property
 - Public safety
 - Special contract provisions (e.g., environmental)

Contracting

If contractors are to be used, contracting procedures will be undertaken.

3.3.2 Pre-work Surveys and Unit Layout

Layout of Units

A forester, fire professional, or qualified field oversight manager with understanding of the forestry practices in the plan will conduct in-field layout and marking of units with flagging for treatment, marking/flagging of avoided resources (this may instead be done by the relevant resource specialist), marking/flagging of access routes, marking/flagging of trees and shrubs for removal or sensitive plant species to leave in place or avoid, and areas of refugia. A flagging method will be clearly articulated to the crews in the environmental awareness training.

Environmental Resource Surveys and Reports

Surveys for nesting birds or other biological and cultural resources identified during the planning work phase will be carried out. A short report of the findings of surveys will be prepared in accordance with CalVTP PEIR SPRs and mitigation measures as well as MWPA PDIFs. Results of the surveys will be articulated to the project manager and field oversight manager to ensure that any additional protection measures (e.g., nest avoidance buffers) are implemented.

3.3.3 Implementation of Vegetation Management Treatment Activities

Environmental Awareness Training

An environmental awareness tailgate training will be performed and can be led by the field oversight manager, a biologist, and/or other qualified staff knowledgeable of resource protection particular to the site. The environmental training will consist of a review of the specification, access, allowable actions, trees, and other resources to protect or avoid, spill

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prevention and control, smoking, and other provisions to ensure successful work with minimal effects to the community and environment.

Oversight of Work

Each project will be overseen by someone with expertise in vegetation management who will serve as the field oversight manager for the project. This person will direct work, make decisions as they come up regarding treatments and disposal, address any emergency situations or complaints, and report on the progress of the work.

Biological/Cultural or Other Environmental Monitors

In some situations, biological or cultural resource monitors will need to be on site during the implementation of the work to ensure no damage to sensitive resources. The monitors will be on site when work is occurring in proximity of the resource and will have the authority to direct or stop work as needed to ensure the protection of the resource. Monitors will report on their monitoring at the end of each phase of the project (or annually); however, issues that arise will be addressed immediately in the field.

3.3.4 Post-field Reporting, Adaptive Management and Planning, and Funding Planning

Annual Reporting and Adaptive Management

Throughout each year, the Novato Fire District should document treatment efforts, including acres, methods, and cost. A short analysis of work completed in the previous year should be prepared and should utilize graphs and figures/images to portray information. The summary should include evaluation of the effectiveness of the treatments, including any new tools or technology, to identify whether the activities undertaken are meeting the overall objectives of the work, and should make recommendations to modify methods in the planning of future activities. This annual analysis process should aid in decision-making on future treatment areas, methods, and scale. The analysis of the previous year should be prepared in January through March of the following year, in time for the planning of MWPA's subsequent year's Work Plan.

As part of the post-work efforts, areas of previous treatment should also be monitored to better understand effectiveness of the treatment over time to adapt treatments in the future and to further characterize and refine maintenance intervals (i.e., adaptive management). Lessons learned in the analysis should also be carried forward into the subsequent year's planning efforts as part of an adaptive management approach.

Updates to GIS/Modeling and Database Management

Data will be collected annually to the extent appropriate within the framework of the PSA Addendum, including adding GIS layer files from surveys and treatments to create a database.

Updates can include revisions to methods, revisions to priorities, and updates to the modeling effort as new tools and technology become available. The wildfire modeling may also be updated based on completed treatments, if appropriate and relevant.

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3.3.5 Grant Funding and Budget Planning

Budget planning should occur during the post-work period from the previous year and the planning period for upcoming work (January through April). Throughout the year, grant opportunities may also arise that should be considered.

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APPENDIX A

Appendix A: Fine Scale Mapping Vegetation Classes by Project

The following table was generated to summarize each fine scale vegetation Map classes by segment. Invasive species that were considered for invasive project work are identified in grey, but the list is neither exclusive nor comprehensive.

Map Class by Segment

Project	Map class	Acres
1	<i>Baccharis pilularis</i> alliance	4.7
	Californian Annual & Perennial Grassland mapping unit	86.1
	Developed	5.2
	Forest fragment	2.1
	Non-native forest	1.3
	Non-native shrub	1.1
	Nursery or ornamental horticulture area	1.3
	<i>Quercus agrifolia</i> alliance	10.2
	<i>Quercus lobata</i> alliance	12.8
	Shrub fragment	1.2
	<i>Umbellularia californica</i> alliance	25.6
	2	<i>Baccharis pilularis</i> alliance
Californian Annual & Perennial Grassland mapping unit		95.6
Deciduous hardwood (urban window)		0.8
Developed		12.6
Major road		2.6
Non-native forest		3.8
<i>Quercus agrifolia</i> alliance		13.7
<i>Quercus lobata</i> alliance		7.6
<i>Umbellularia californica</i> alliance		11.5
<i>Arbutus menziesii</i> alliance		25.4
3	<i>Baccharis pilularis</i> alliance	2.5

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Project	Map class	Acres
	Californian Annual & Perennial Grassland mapping unit	18.6
	Developed	11.3
	Forest fragment	0.5
	<i>Quercus agrifolia</i> alliance	36.7
	<i>Quercus kelloggii</i> alliance	8.4
	<i>Quercus lobata</i> alliance	22.7
	<i>Umbellularia californica</i> alliance	22.6
	Vineyard	3.1
4	<i>Arbutus menziesii</i> alliance	9.6
	<i>Baccharis pilularis</i> alliance	2.7
	Californian Annual & Perennial Grassland mapping unit	21.1
	Developed	9.4
	<i>Quercus agrifolia</i> alliance	21.3
	<i>Quercus douglasii</i> alliance	27.1
	<i>Quercus garryana</i> alliance	1.9
	Shrub fragment	0.6
	<i>Umbellularia californica</i> alliance	21
5	<i>Arbutus menziesii</i> alliance	37.1
	<i>Baccharis pilularis</i> alliance	0.9
	Californian Annual & Perennial Grassland mapping unit	3.8
	Deciduous hardwood (urban window)	0.5
	Developed	6.5
	Eucalyptus (globulus, camaldulensis) provisional semi-natural association	0.3
	<i>Quercus agrifolia</i> alliance	93.2
	Shrub fragment	0.7
	<i>Umbellularia californica</i> alliance	10.9
6	<i>Adenostoma fasciculatum</i> alliance	1.8
	<i>Baccharis pilularis</i> alliance	1.3
	Californian Annual & Perennial Grassland mapping unit	5.3

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Project	Map class	Acres
	Developed	4.6
	<i>Eucalyptus (globulus, camaldulensis)</i> provisional semi-natural association	0.7
	Forest fragment	0.4
	<i>Pseudotsuga menziesii</i> mapping unit	1.7
	<i>Quercus agrifolia</i> alliance	43.1
	<i>Quercus garryana</i> alliance	1.8
	<i>Quercus kelloggii</i> alliance	2.7
	<i>Quercus lobata</i> alliance	8.5
	<i>Sequoia sempervirens</i> alliance	1
	Shrub fragment	0.5
	<i>Umbellularia californica</i> alliance	97
7	<i>Arbutus menziesii</i> alliance	6.2
	<i>Baccharis pilularis</i> alliance	0.7
	Californian Annual & Perennial Grassland mapping unit	28.9
	Developed	1.6
	Forest fragment	0.5
	<i>Quercus agrifolia</i> alliance	49.9
	<i>Quercus garryana</i> alliance	0.6
	<i>Quercus lobata</i> alliance	40
	<i>Umbellularia californica</i> alliance	40.6
8	Arid west freshwater marsh group	1.4
	<i>Baccharis pilularis</i> alliance	0.4
	Barren and sparsely vegetated	1.4
	Californian Annual & Perennial Grassland mapping unit	49.5
	Developed	21.8
	<i>Eucalyptus (globulus, camaldulensis)</i> provisional semi-natural association	4.7
	Forest fragment	0.5
	Non-native forest	1.2
	Non-native shrub	0.5

APPENDIX A

Project	Map class	Acres
	<i>Quercus agrifolia</i> alliance	18.1
	<i>Quercus douglasii</i> alliance	38.3
	<i>Quercus garryana</i> alliance	16.9
	<i>Quercus lobata</i> alliance	1.8
	<i>Rubus armeniacus</i> semi-natural association	0.6
	<i>Salix lasiolepis</i> alliance	0.7
	<i>Sarcocornia pacifica (Salicornia depressa)</i> alliance	1
	Shrub fragment	0.3
	<i>Umbellularia californica</i> alliance	5.7
9	<i>Baccharis pilularis</i> alliance	2.7
	Californian Annual & Perennial Grassland mapping unit	23.5
	Developed	2.3
	<i>Quercus agrifolia</i> alliance	0.3
	<i>Quercus lobata</i> alliance	1.2
	<i>Salix lasiolepis</i> alliance	0.7
	Shrub fragment	0.6
	<i>Umbellularia californica</i> alliance	30.4
10	<i>Arbutus menziesii</i> alliance	1.7
	<i>Baccharis pilularis</i> alliance	7.4
	Californian Annual & Perennial Grassland mapping unit	45.7
	Developed	7.5
	<i>Eucalyptus (globulus, camaldulensis)</i> provisional semi-natural association	1
	Forest fragment	0.5
	Non-native forest	0.3
	Orchard or grove	1.8
	<i>Quercus agrifolia</i> alliance	27.3
	<i>Quercus douglasii</i> alliance	35.9
	<i>Quercus lobata</i> alliance	1.5
	Shrub fragment	0.6

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Project	Map class	Acres
11	<i>Umbellularia californica</i> alliance	23.3
	Arid west freshwater marsh group	0.4
	<i>Baccharis pilularis</i> alliance	3.1
	Californian Annual & Perennial Grassland mapping unit	78.2
	Developed	7.3
	Forest fragment	1.2
	Non-native shrub	1.2
	<i>Quercus agrifolia</i> alliance	20.7
	<i>Quercus lobata</i> alliance	27.9
	<i>Salix lasiolepis</i> alliance	0.9
	<i>Umbellularia californica</i> alliance	9.5
12	Annual cropland	1.4
	Californian Annual & Perennial Grassland mapping unit	6.9
	Developed	17.9
	Orchard or grove	0.4
	<i>Quercus agrifolia</i> alliance	35.3
	<i>Quercus lobata</i> alliance	2.6
	<i>Umbellularia californica</i> alliance	30.1
13	<i>Arbutus menziesii</i> alliance	2.6
	<i>Baccharis pilularis</i> alliance	10.4
	Californian Annual & Perennial Grassland mapping unit	10.5
	Developed	22.3
	Forest fragment	0.5
	<i>Quercus agrifolia</i> alliance	34.4
	<i>Quercus douglasii</i> alliance	34.9
	<i>Quercus garryana</i> alliance	0.2
	Shrub fragment	0.6
	<i>Umbellularia californica</i> alliance	8.3
	Vancouverian freshwater wet meadow & marsh group	3.5
Water	2.1	

APPENDIX A

Project	Map class	Acres
14	<i>Arbutus menziesii</i> alliance	0.8
	Californian Annual & Perennial Grassland mapping unit	1.8
	Developed	1
	<i>Quercus agrifolia</i> alliance	54.6
	<i>Quercus lobata</i> alliance	2.2
	<i>Umbellularia californica</i> alliance	2.4
15	<i>Baccharis pilularis</i> alliance	2
	Californian Annual & Perennial Grassland mapping unit	23.3
	Developed	4.5
	<i>Eucalyptus (globulus, camaldulensis)</i> provisional semi-natural association	0.9
	<i>Quercus agrifolia</i> alliance	21.6
	<i>Quercus douglasii</i> alliance	1.1
	<i>Quercus lobata</i> alliance	6
	<i>Umbellularia californica</i> alliance	9
16	<i>Baccharis pilularis</i> alliance	2.9
	Californian Annual & Perennial Grassland mapping unit	11.9
	Developed	1.2
	<i>Quercus agrifolia</i> alliance	8.4
	<i>Quercus garryana</i> alliance	9.2
	<i>Quercus lobata</i> alliance	3
	<i>Umbellularia californica</i> alliance	5.6
17	<i>Baccharis pilularis</i> alliance	1.9
	Californian Annual & Perennial Grassland mapping unit	15.7
	Developed	6.4
	Intensively managed hayfield	6.5
	Non-native forest	2.1
	<i>Quercus agrifolia</i> alliance	5.4
	<i>Quercus lobata</i> alliance	5.6
	<i>Salix lasiolepis</i> alliance	1.9

APPENDIX A

Project	Map class	Acres
18	Californian Annual & Perennial Grassland mapping unit	0.4
	Developed	1.6
	<i>Quercus agrifolia</i> alliance	3.1
	<i>Quercus lobata</i> alliance	1.5
	<i>Umbellularia californica</i> alliance	38.1
19	<i>Acer macrophyllum</i> <i>Alnus rubra</i> alliance	2.3
	<i>Baccharis pilularis</i> alliance	0.4
	Californian Annual & Perennial Grassland mapping unit	4.9
	Developed	8.9
	Non-native shrub	3
	<i>Salix gooddingii</i> <i>Salix laevigata</i> alliance	0.5
	<i>Salix lasiolepis</i> alliance	18.9
WUI fuels reduction area	Vancouverian freshwater wet meadow & marsh group	5.4
	<i>Baccharis pilularis</i> alliance	31
	Californian Annual & Perennial Grassland mapping unit	364
	Developed	55
	<i>Eucalyptus (globulus, camaldulensis)</i> provisional semi-natural association	7
	Forest fragment	7
	Non-native forest	11
	<i>Quercus agrifolia</i> alliance	234
	<i>Quercus douglasii</i> alliance	264
	<i>Quercus garryana</i> alliance	79
	<i>Quercus lobata</i> alliance	42
	<i>Rubus armeniacus</i> semi-natural association	9
	<i>Salix lasiolepis</i> alliance	18
	<i>Umbellularia californica</i> alliance	147
Vancouverian freshwater wet meadow & marsh group	26	
Other	20	

Grey highlights indicate non-native vegetation communities.

Appendix B: Greater Novato Geoprocessing Steps

Step 1: Generate up-to-date Landscape (LCP) file for modeling

- Define analysis area
 - Buffered Novato city polygon by 5 miles
 - Clipped to land
- Gather local LCP and LANDFIRE (LF) LCP to backfill
 - Import local LCP, convert to correct units to use as TIF.
 - Divide CBD by 10 (as per discussion with Sonoma Tech)
 - Resample to 30 meters (m) (using nearest neighbor)
 - Crop/mask to analysis area
 - Create mask to use for LF where local LCP does not cover analysis area
 - Project LF data to match local LCP
 - Crop/mask to analysis + mask to area in analysis outside of local LCP coverage
 - Mosaic local LCP and LF LCP together
 - Negative buffer mosaic dataset by -60 m to remove edge artifacts
 - Update combined LCP using the following rule: if any of the CC/CH/CBD pixel values is zero, then all four canopy rasters (including CBH) get set to zero
- Update for recent treatments + disturbances
 - Gather/map recent treatments and fire perimeters
 - Digitize treatments + fire perimeters
 - Heads up digitizing in ArcGIS Pro-based on imagery from client and basemap initially
 - Updated version after evaluating dNBR
 - Calculate dNBR within fire perimeters
 - Landsat imagery:
 - Pre-fire: LC08_CU_001008_20201028_20210504_02_SR
 - Post-fire: LC08_CU_001008_20211015_20211029_02_SR
 - Prep severity levels
 - Mask dNBR by Lassen fire perimeter
 - Classify to severity levels

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Table 5. Categorization of severity classes based on dNBR values as suggested by Key & Benson (2006).

Severity level	dNBR range
Enhanced regrowth (high)	-0.5 to -0.251
Enhanced regrowth (low)	-0.25 to -0.101
Unburned	-0.1 to 0.099
Low severity	0.1 to 0.269
Moderate-low severity	0.27 to 0.439
Moderate-high severity	0.44 to 0.659
High severity	0.66 to 1.3

- Update LCP values
 - **Surface fuel** transitions in recent disturbances:
 - Everywhere in disturbance mask:
 - GR7 → GR2
 - GR4/GR2 → GR1
 - Where dNBR > 0.1:
 - TU5 → TU2
 - SH5/SH7 → SH2
 - No change to TLs (mostly TL2, which has low fire behavior to begin with)
 - **(Tree) Canopy cover** modifications in recent disturbances
 - Where dNBR > 0.1:
 - If CC > 40%:
 - (i) Reduce CC by 20% with a floor of 40% (cannot reduce CC to less than 40%)
 - No modifications for (tree) CANOPY height, bulk density, or CBH for this fuelscape.
- Reviewed initial fire modeling results and imagery and decided to propose to client to alter GR7 in marshlands to GR4.
 - Created a mask for where to make this change using the fine scale veg
 - Selected features where Lifeform in '18 equaled one of the following:
 - "Tidal wetland"
 - "Mudflat"

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- “Water”
- This generous polygon mask allowed us to capture 30m FM40 pixels that might align slightly differently.
- Change (update to GR4) was only applied to GR7 pixels falling within the mask.

Step 2: Run Fire Modeling

- Determine WX conditions
 - Currently using peak and Diablo winds defined in Marin County CWPP

Parameter (units)	Average Fire Season Scenario	Peak Fire Conditions Scenario	Extreme Diablo Wind Conditions Scenario
1-hour fuel moisture	8%	3%	3%
10-hour fuel moisture	8%	4%	4%
1,000-hour fuel moisture	13%	6%	6%
Herbaceous fuel moisture	35%	4%	3%
Live wood fuel moisture	99%	68%	67%
Wind speed	6 miles per hour	13 miles per hour	30 miles per hour
Wind direction	308°	293°	45°

- Gather RAWS data for stations in the area
 - Identify RAWS stations of interest

42308	BARNABE
42309	WOODACRE
42310	BIG ROCK
42312	MIDDLE PEAK
42313	ROBINHOOD
- Purchase RAWS data from WRCC
- Use FireFamily Plus / R scripts to determine the wx conditions using Big Rock RAWS
 - Copy Big Rock wx to new file, remove headers
 - Import to R, format for FF+
 - Import to FF+, output hourly listings

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Select Output Variables for Hourly Listing

Date Format

- MM/DD/YYYY
- MMDDYYYY
- YYYYMMDD
- MM/DD
- MMDD

Time Format

- HH:MM
- HHMM
- None

Fire Outputs

- Number of Fires
- Number of Large Fires
- Large Fire Day (Acres):
- Number per Size Class
- Total Acres
- Station ID each Record

General

- Report Header
- Column Header
- Date/Time Stamp
- Export to Table

Fire Cause Filter

- All
- Lightning
- Human

Available Variables

- Solar Radiation
- Spread Component
- State of Weather
- Vapor Pressure Deficit Avg
- Vapor Pressure Deficit Max
- Wet Flag
- Wind Azimuth
- Mean Temperature
- Relative Humidity

Selected Variables

- Energy Release Component
- 1-Hour Fuel Moisture
- 10-Hour Fuel Moisture
- 100-Hour Fuel Moisture
- Herbaceous Fuel Moisture
- Woody Fuel Moisture
- Wind Speed
- Wind Direction

Select All

Remove All

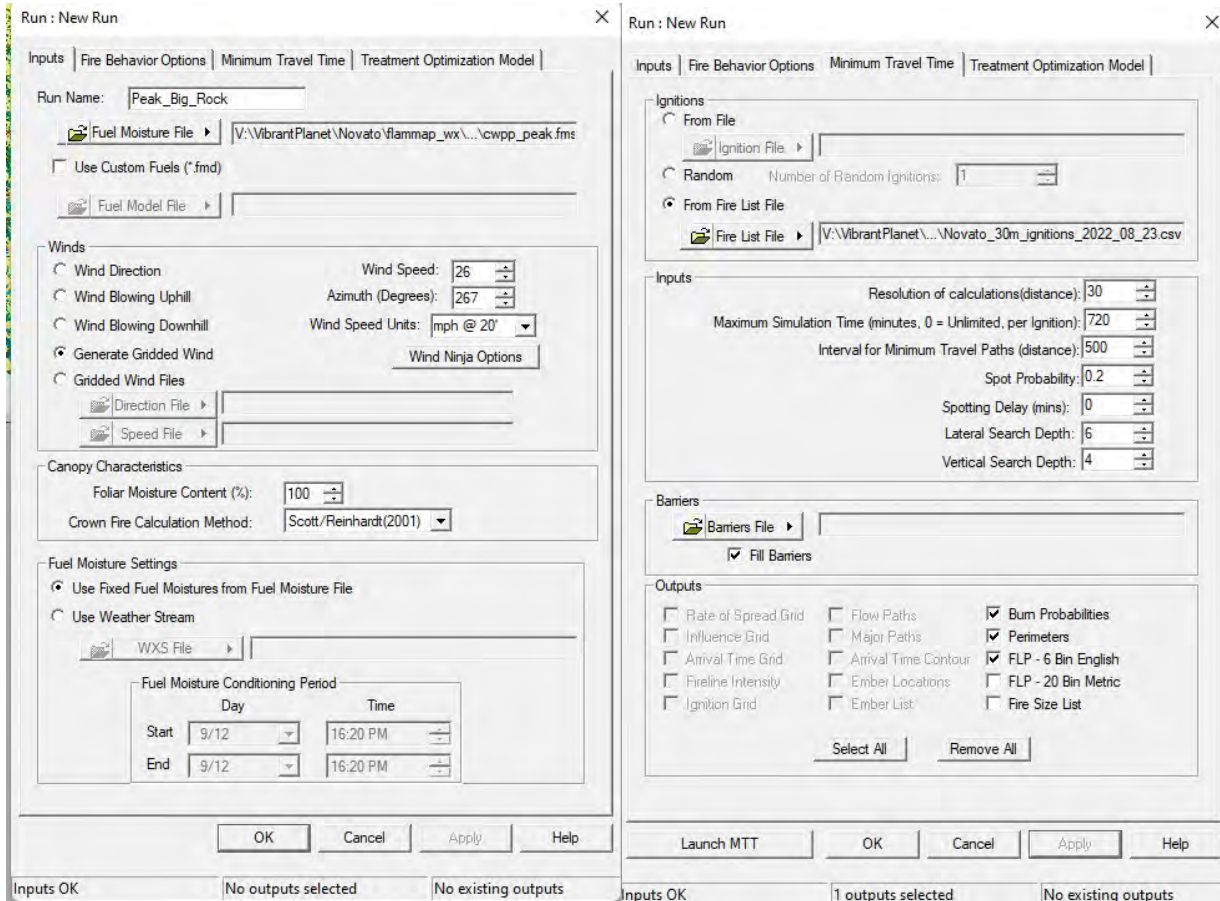
OK

Cancel

- Use R script to calculate weather parameters for peak and diablo scenarios
 - 97th percentile
 - (i) FM1 2
 - FM10 6
 - FM100 19
 - FMH 3
 - FMW 60
 - Winds: 20 mph avg (25 mph for modeling)
 - Dir: 266
 - Diablo
 - (i) Same FM as peak
 - Winds: 20 mph avg (25 mph for modeling)
 - Dir: 47
- Decision: use CWPP fuel moistures, RAWS wind speeds/directions
 - **Big Rock peak winds: 26 mph**
 - **Big Rock peak wind direction: 267degrees**

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- **Big Rock Diablo winds: 22 mph**
 - **Big Rock Diablo wind direction: 47 degrees**
 - Robinhood peak winds: 13 mph
 - Robinhood peak direction: 259 degrees
 - Robinhood Diablo winds: 14 mph
 - Robinhood Diablo wind direction: 46 degrees
- Create ignition layer
 - Randomly locate points on burnable pixels within LCP
 - Started with 7,500 ignitions (also test to 0.013 proportion of burnable pixels)
 - Output csv of ignition locations
 - Set simulation time
 - Gridded winds, Scott/Reinhardt (2001) crown fire method
 - Starting at 720 mins on 30 m grid
 - Output burn probability, flp, perimeters



- Run modeling
 - Big rock peak
 - Big rock Diablo
 - Upllope

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- Convert FLP csv to raster
 - Run script that uses burn probability raster and flp csv to generate CFL raster
- QC outputs
 - Check ignition sufficiency
Big Rock winds, peak fuel moistures: 0.99

Step 3: Delineate fuel break area

- Create layer of structures within fuel break area based on Microsoft Buildings layer
- Use Python script to buffer/reverse buffer off structures
- Manual revisions to split/merge where it makes sense
- Talk w/ client and revise

Step 4: Segment fuel break

- Integerize fuel models from 30 m lcp (done in ArcGIS)
- Run Kevin Mcgarigal's "dissolve" tool on AWS.
 - Command used: dissolve_launcher -x dissolve.exe -i
C:\software-kmcgarigal-main\Dissolve\lcp_combined_fm_int.tif -o
C:\software-kmcgarigal-main\Dissolve\lcp_comined_fm_int_1_30.tif -s 1 -w 30
-p
C:\software-kmcgarigal-main\proj4
- Prep Ownership layer
 - CA statewide ownership
 - MCOSED
 - Clip both to Analysis area
 - Export from clipped statewide non MCOSED polygons
 - Erase MCOSED from (ii) output
 - Merge MCOSED with (iii) output
- Run segmentation script
Inputs:
 - core fuel break area
 - extended fuel break area
 - fine scale vegetation map
 - dissolved fuel model
 - ownership

Step 5: Attribute fuel break

- Pre-existing data fields

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- Gather layers for attribution
 - Treatment-rules
 - Average slope
 - Height
 - Canopy cover (2-8 m, 2+ m)
 - Other attributes
 - Ownership
 - Ladder fuel
 - Woody canopy
 - ~~— Burn probability~~
 - ~~— Conditional flame length~~
 - ~~— Flame length~~
 - ~~— Rate of spread~~
 - ~~— Buildings affected expected~~
 - ~~— Weighted overlay~~
 - ~~— Weighted overlay x buildings affected expected~~
 - Map class
 - Tree cover
 - Shrub cover
 - Standing dead

Step 6: Treatment Development

- Use MWPA treatment spreadsheet
- Create dataframe of True/False for each treatment based on ruleset
 - Determine priority choices for each polygon
 - Complete MMU details
- Costs
 - Assign costs for each treatment

Step 7: Post treatment fuel models/fire sim

- Use treatment menu/fuel models ruleset to update LCP for post-treatment fire simulations
- Run FlamMap using post trt LCP file
 - Peak and Diablo weather
 - BP, FL, ROS
 - Same parameterization as fire modeling above

Step 8: Combine peak and Diablo, weighted overlay

- Combine peak and Diablo fire simulations within fuel break area
 - Classify burn probability, flame length, rate of spread
 - Mosaic rasters for peak and Diablo, choosing the max classified value between peak and Diablo
 - Weighted overlay: average combined/classified values for bp, fl, ros
 - Repeat a–c for post-treatment rasters
 - Subtract weighted overlay for post-trt landscape from pre-trt (higher values mean greater reduction in fire behavior)
- Combine weighted overlay output with buildings affected expected layer
 - Range normalize weighted overlay difference raster within treatment area
 - Range normalize buildings affected expected raster within treatment area
 - Average range normalized outputs

Step 9: Project area prioritization

- Attribute treatment area with fire modeling outputs, weighted overlay, buildings affected expected, combined weighted overlay/buildings affected expected layer
- Merge treatment attribution and fuel prioritization attribution
- Run prioritization using ForSys script

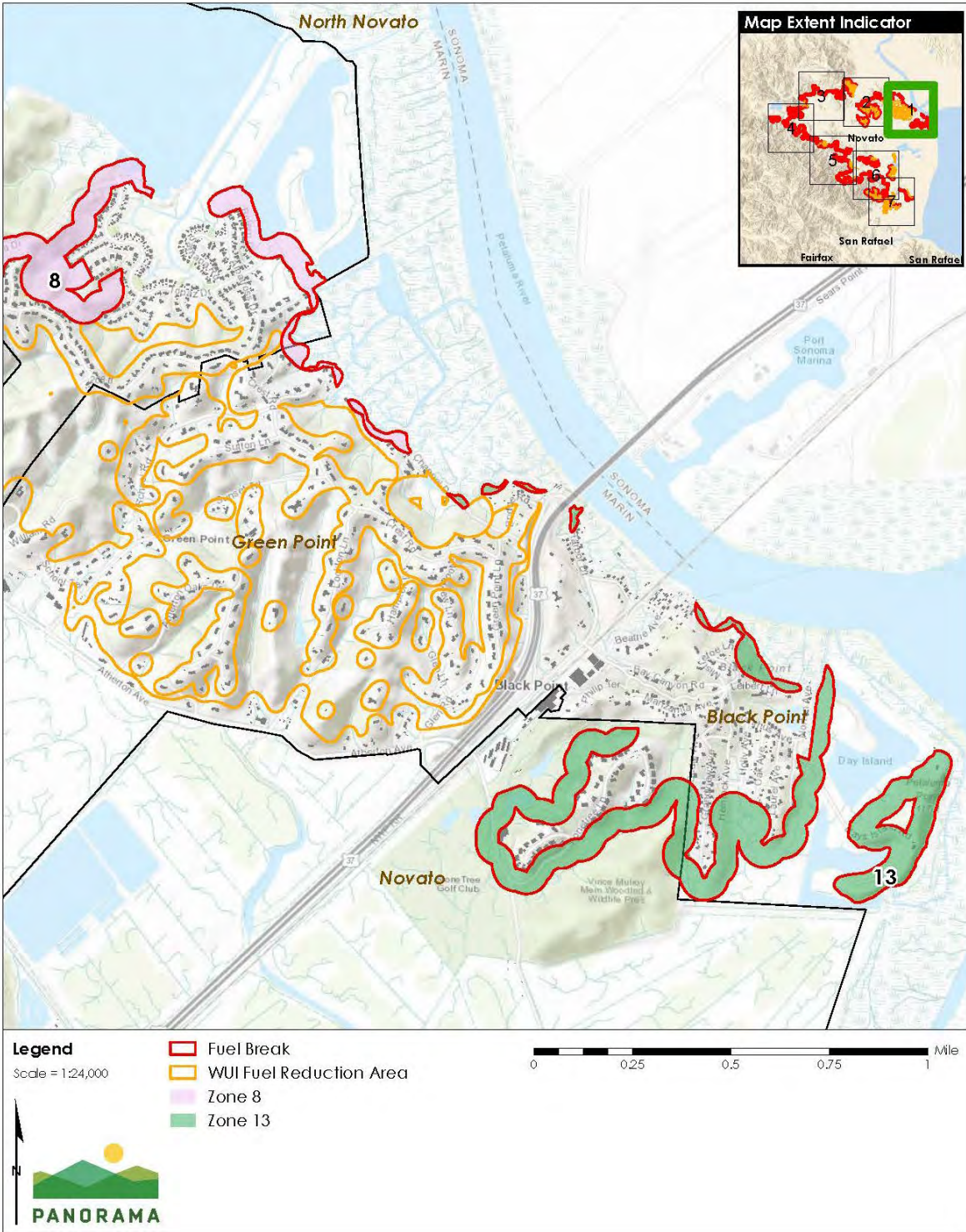
Step 10: Final products

- Create map series of individual projects
- Combine core areas that have been prioritized and extended zone, rename attributes, drop unnecessary fields, round stuff
- Construct tables that cover full area stats

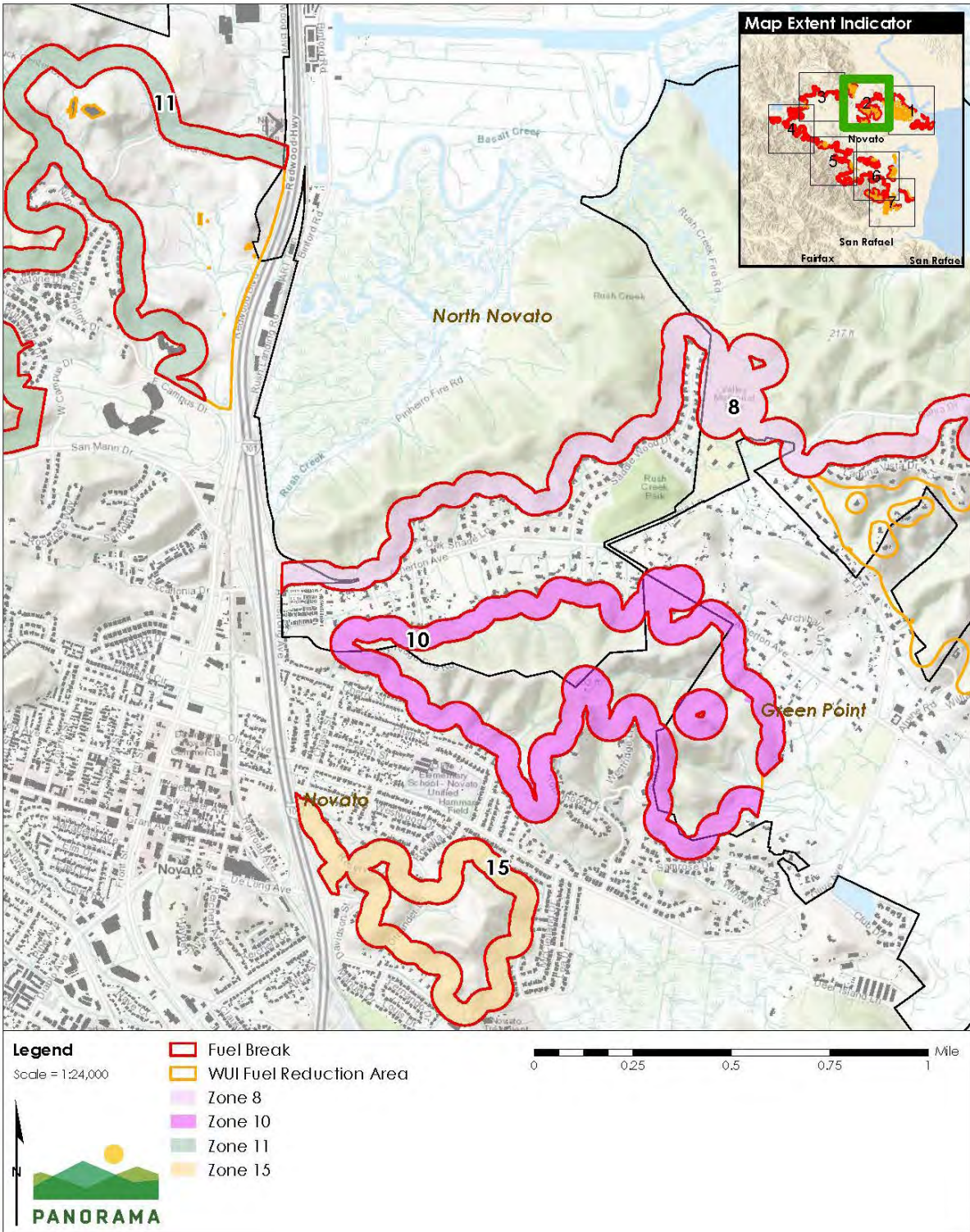
Appendix C: Detailed Map Books

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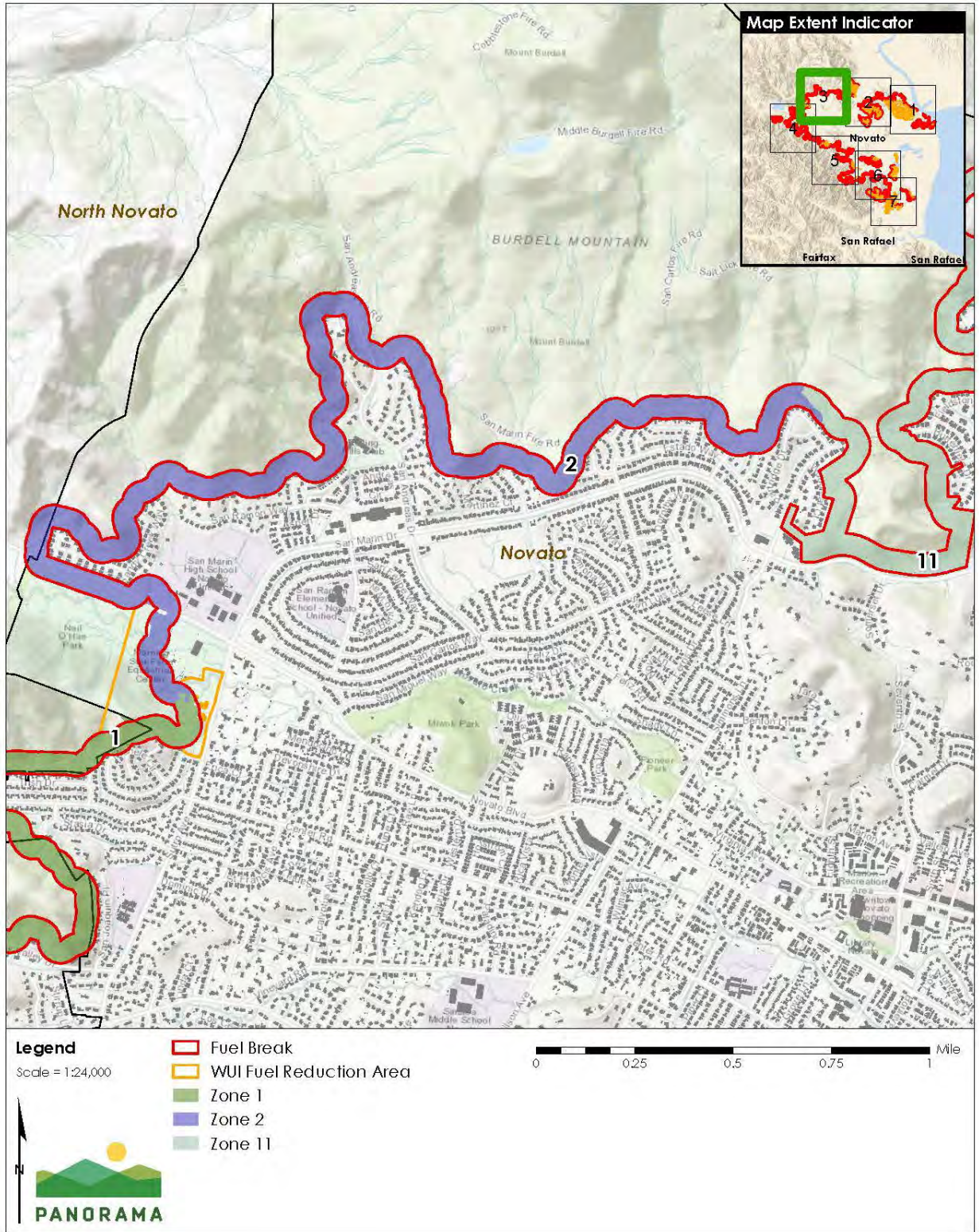
Prioritization Zones Map Book



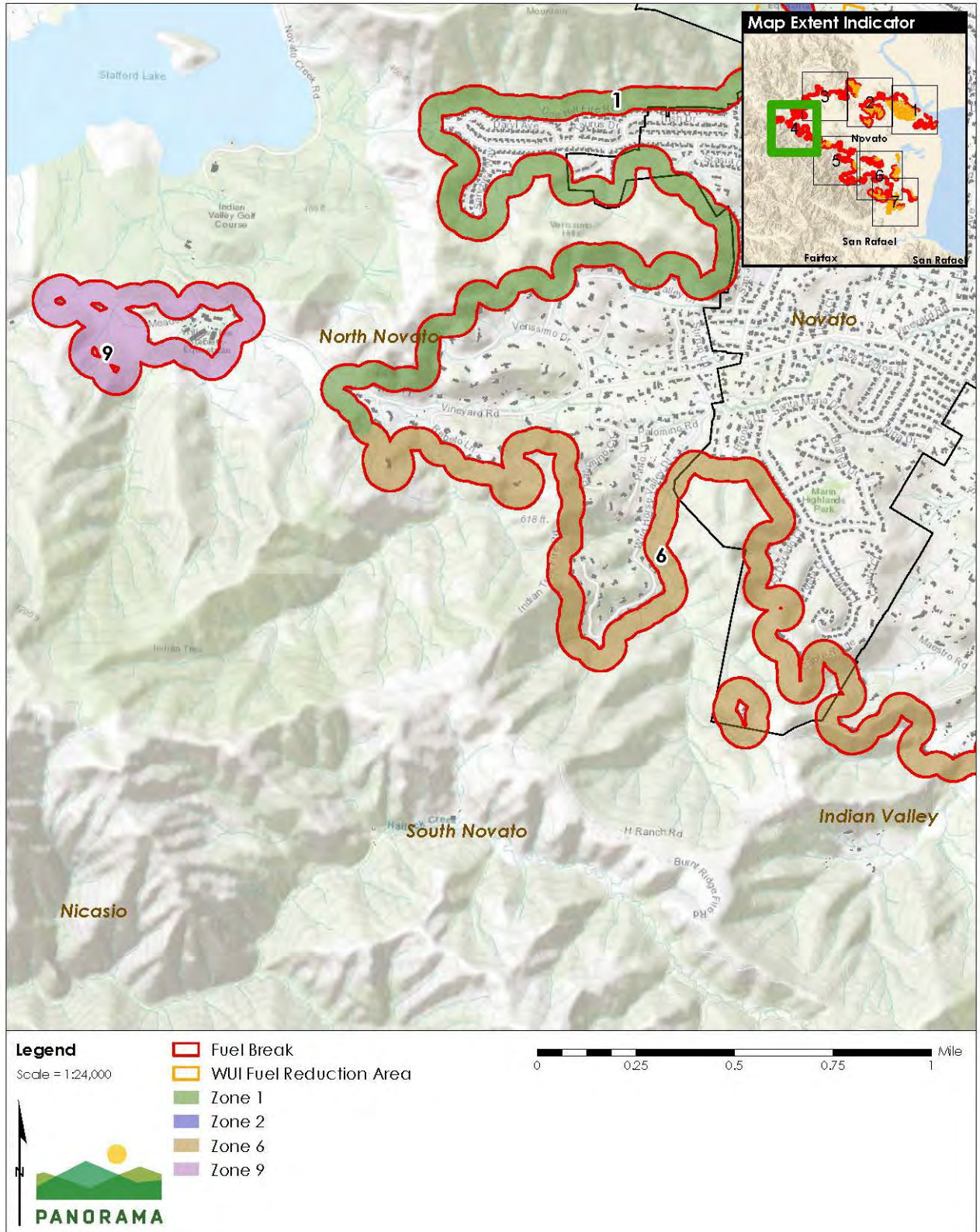
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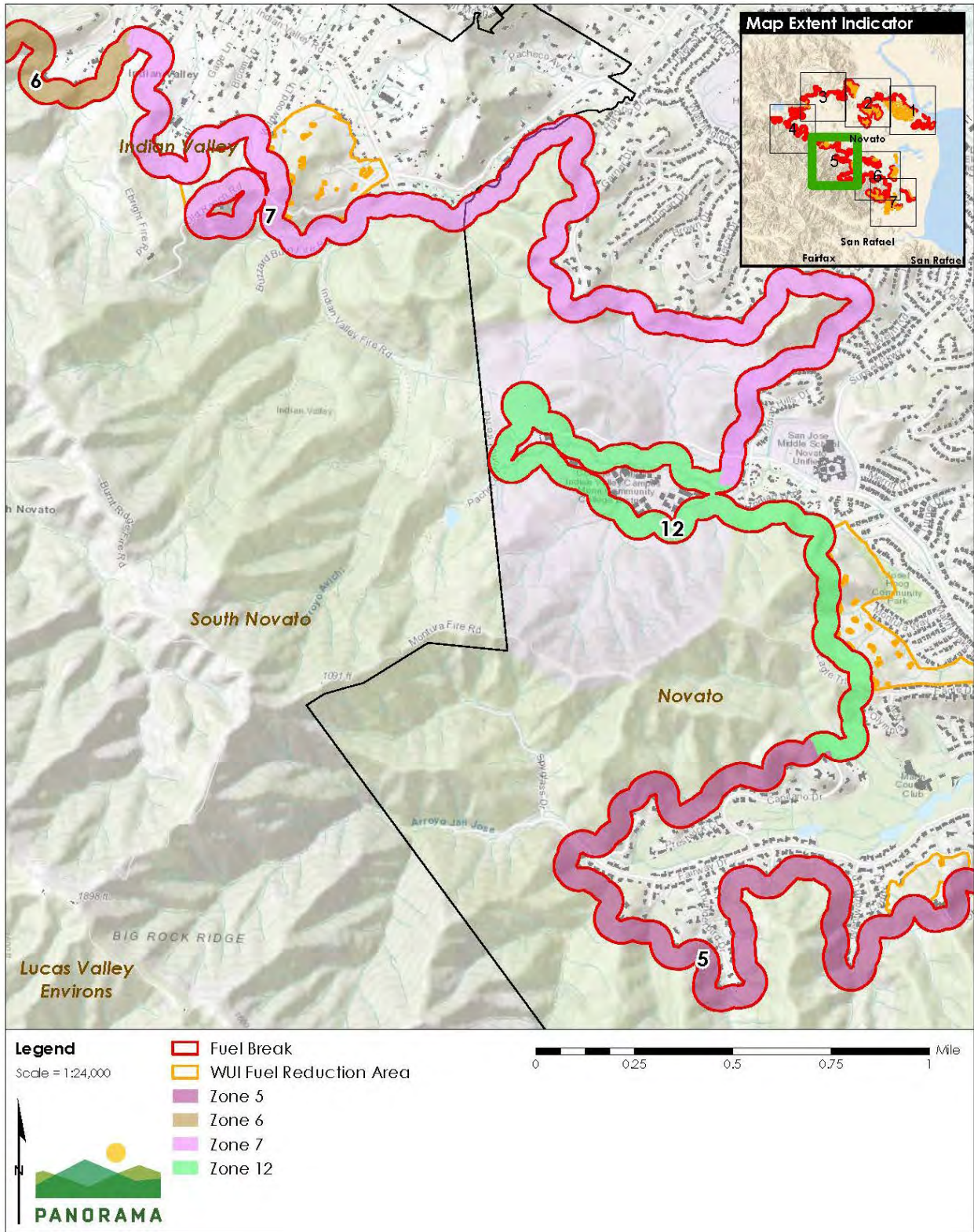
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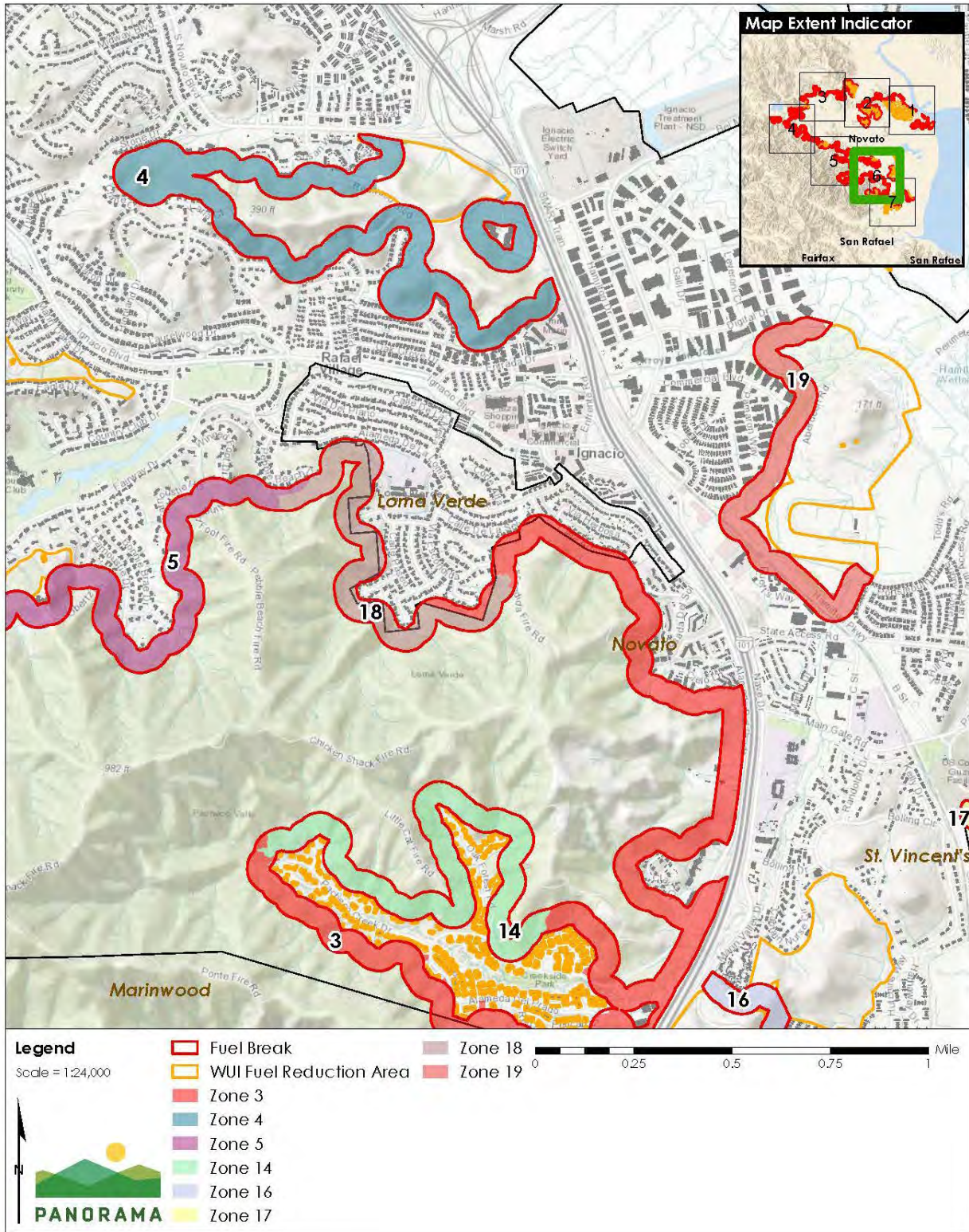
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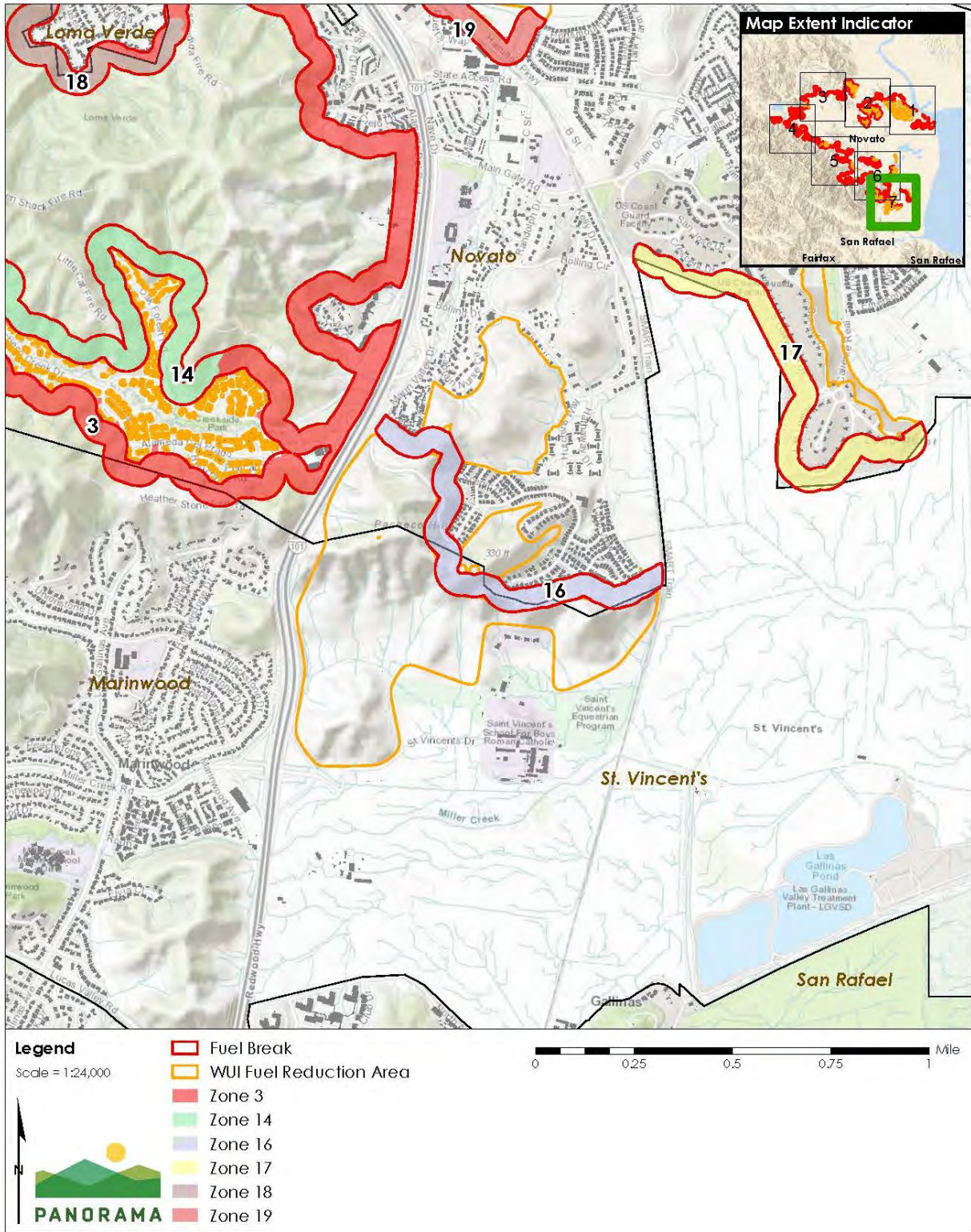
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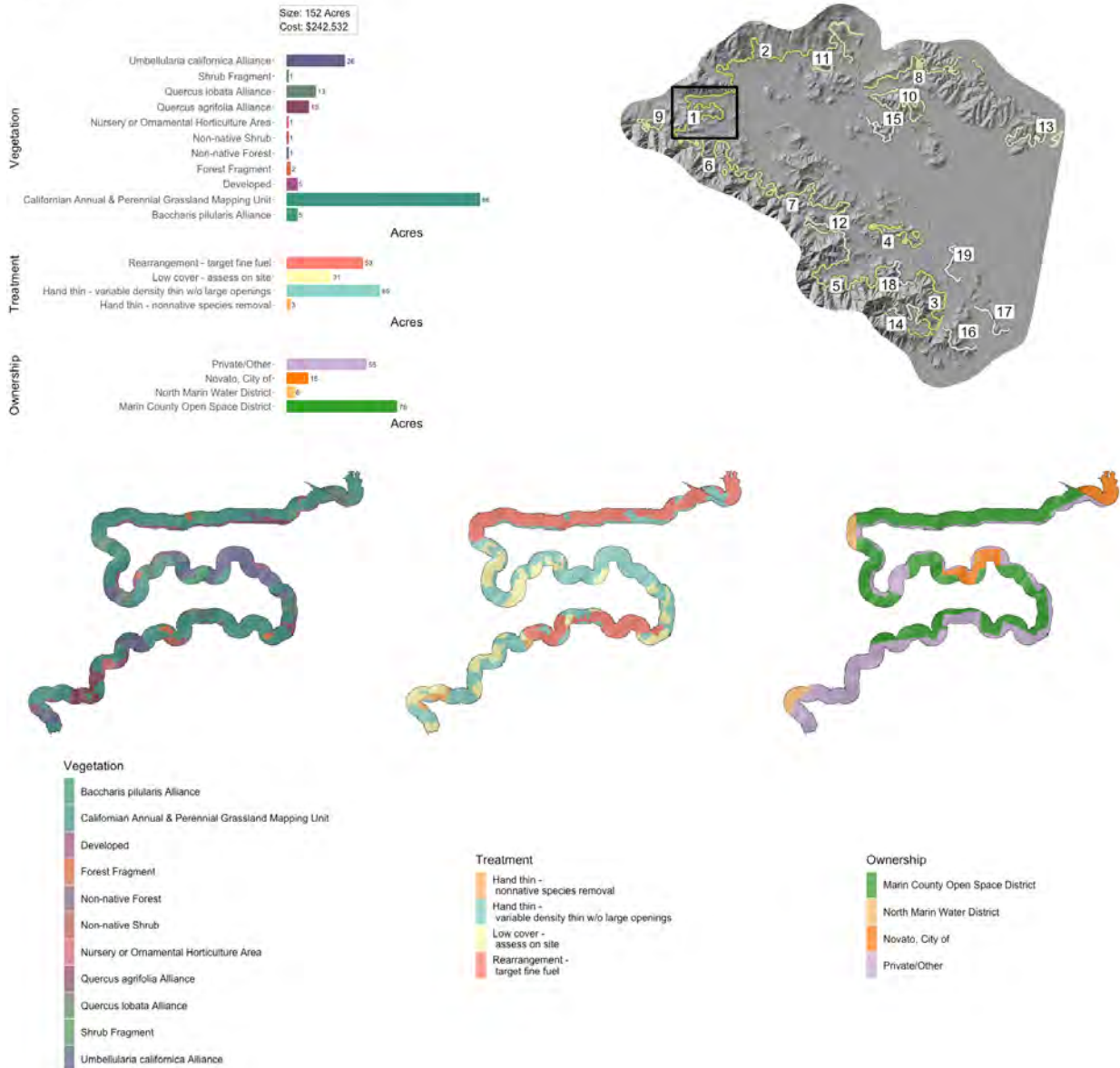
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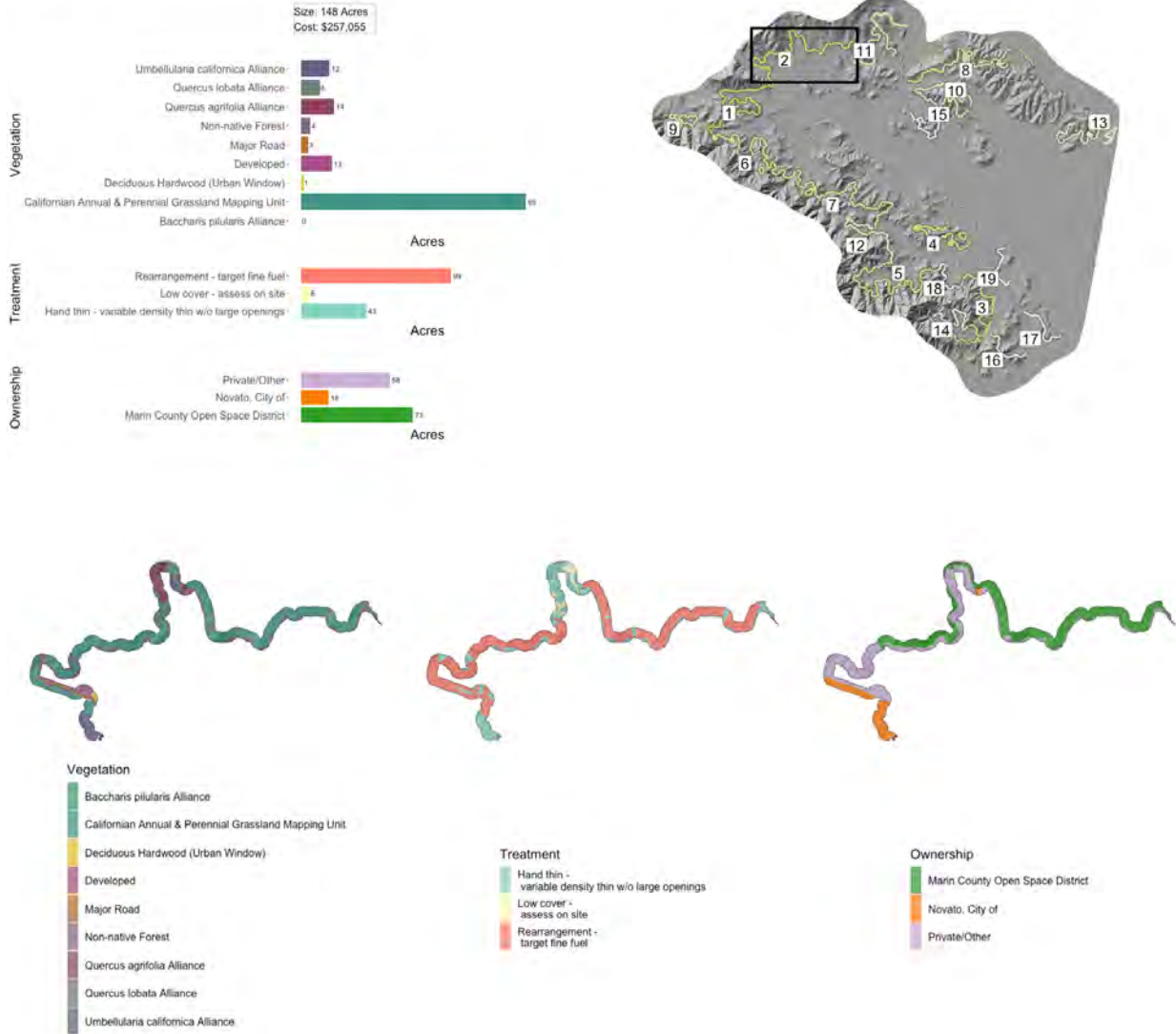
Treatment and Land Management Map Book

Project 1



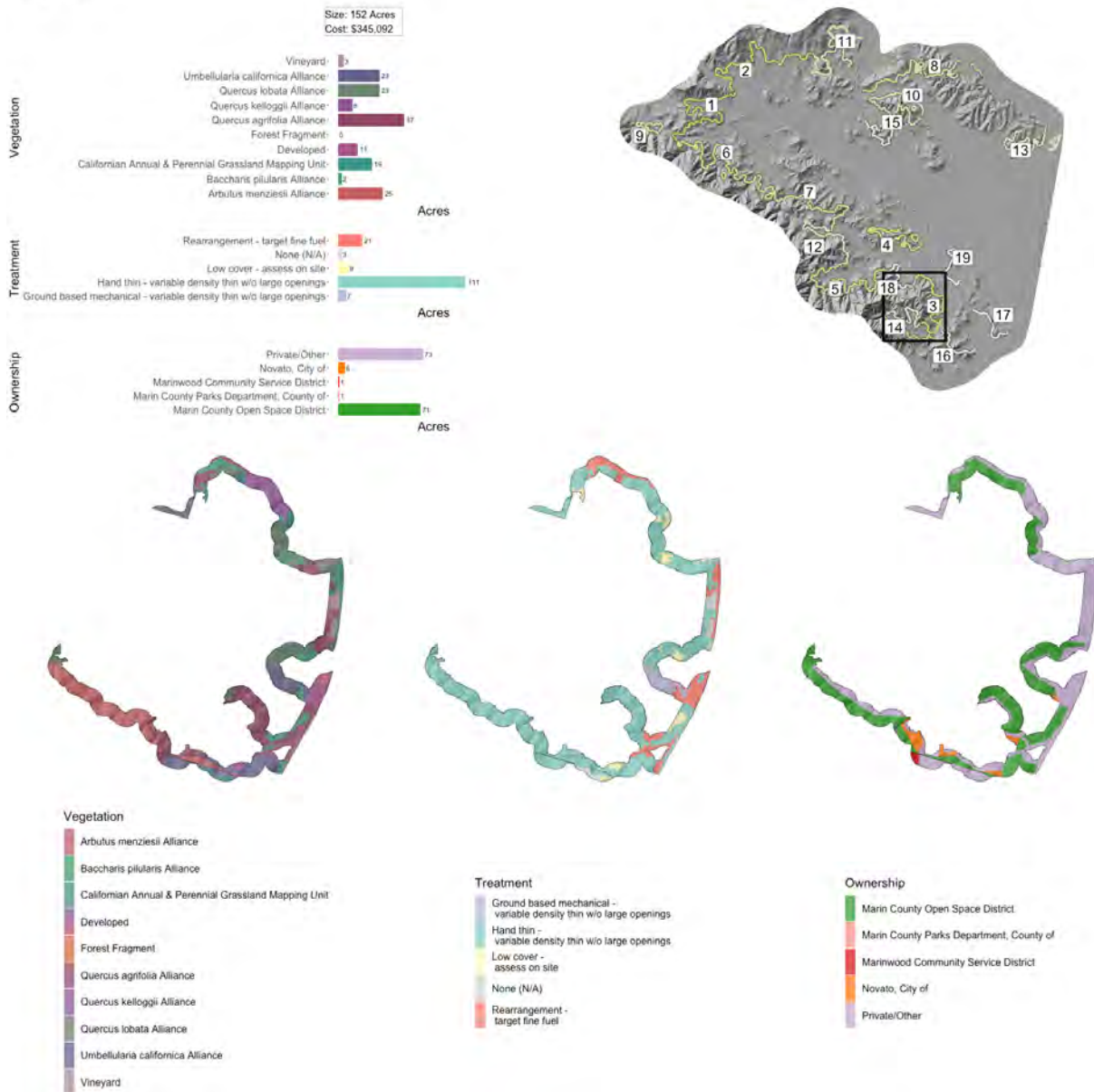
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Project 2



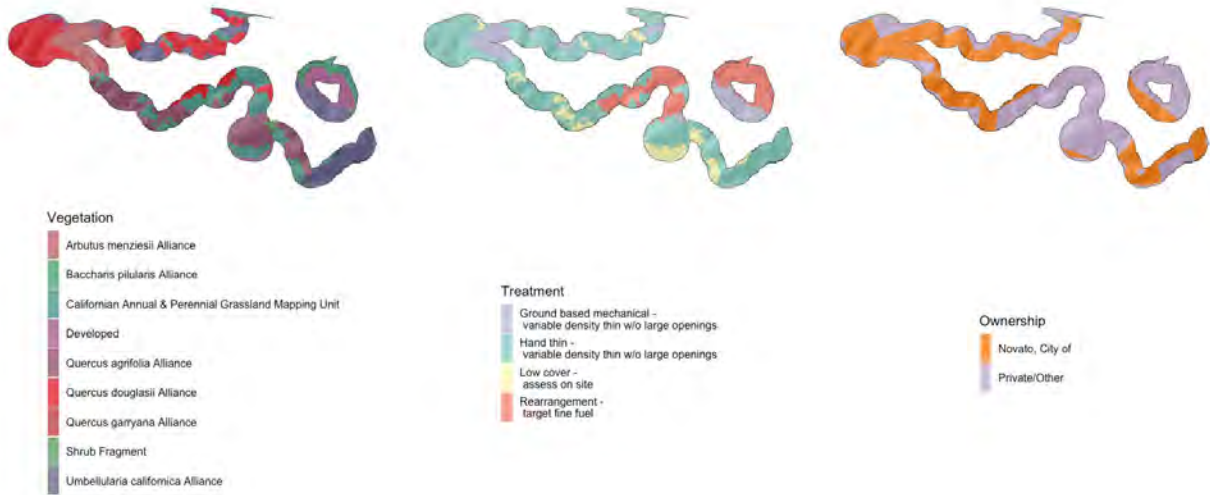
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Project 3



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Project 4



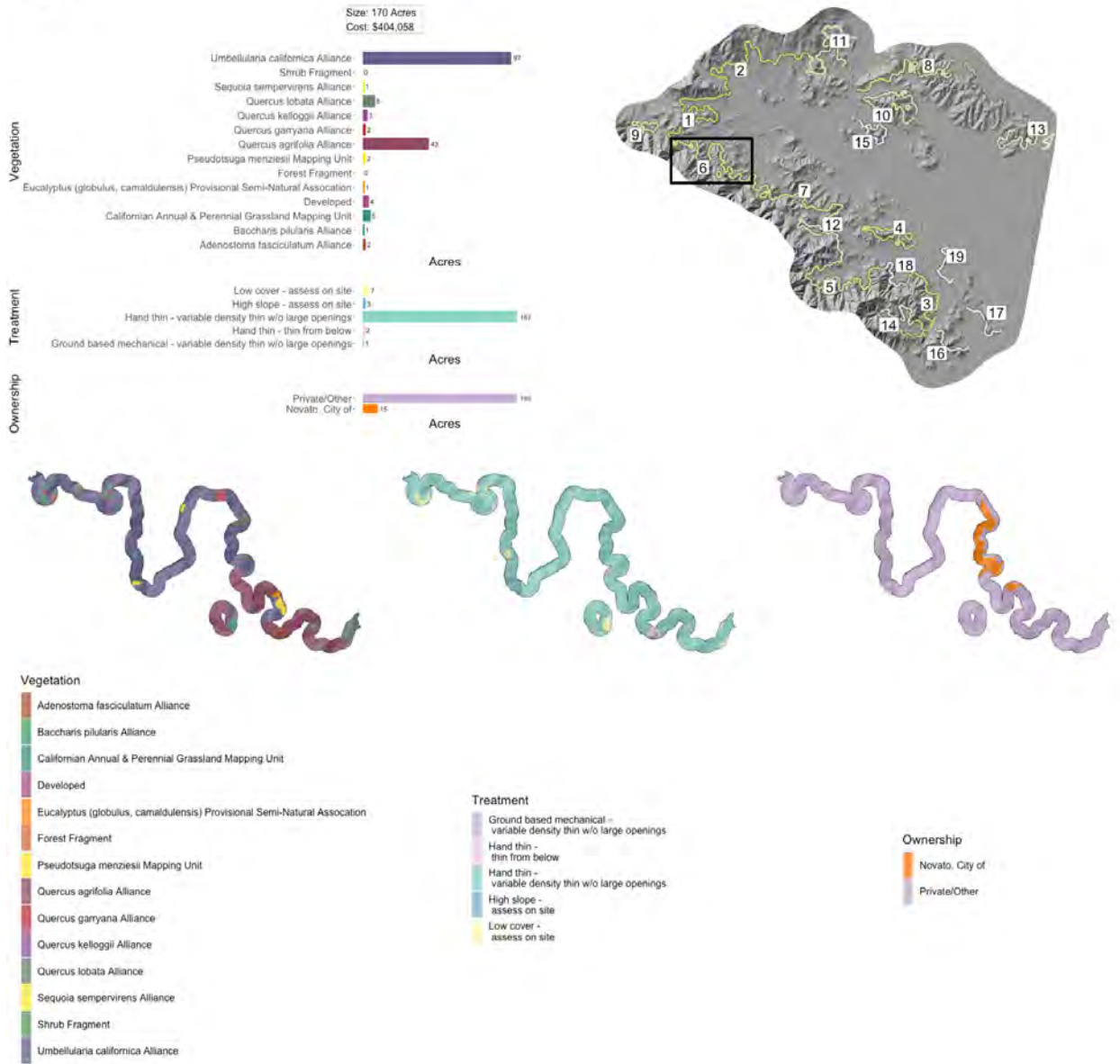
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Project 5



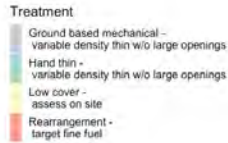
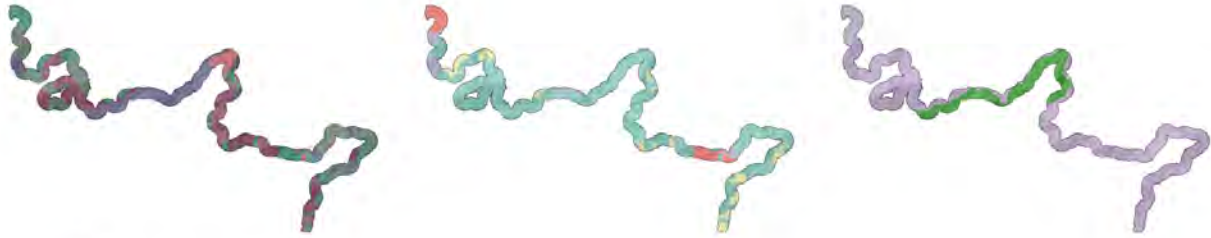
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Project 6



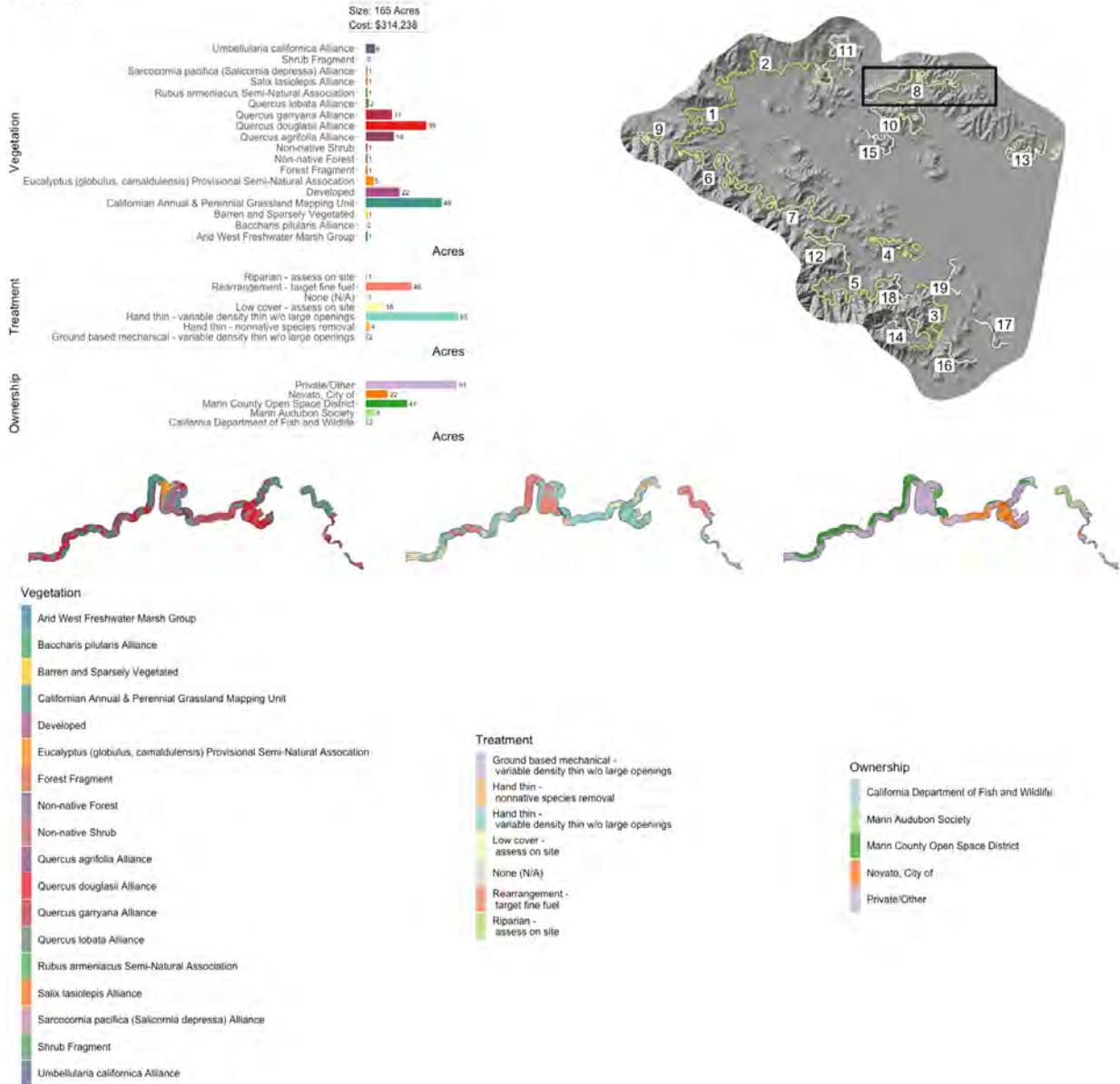
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Project 7



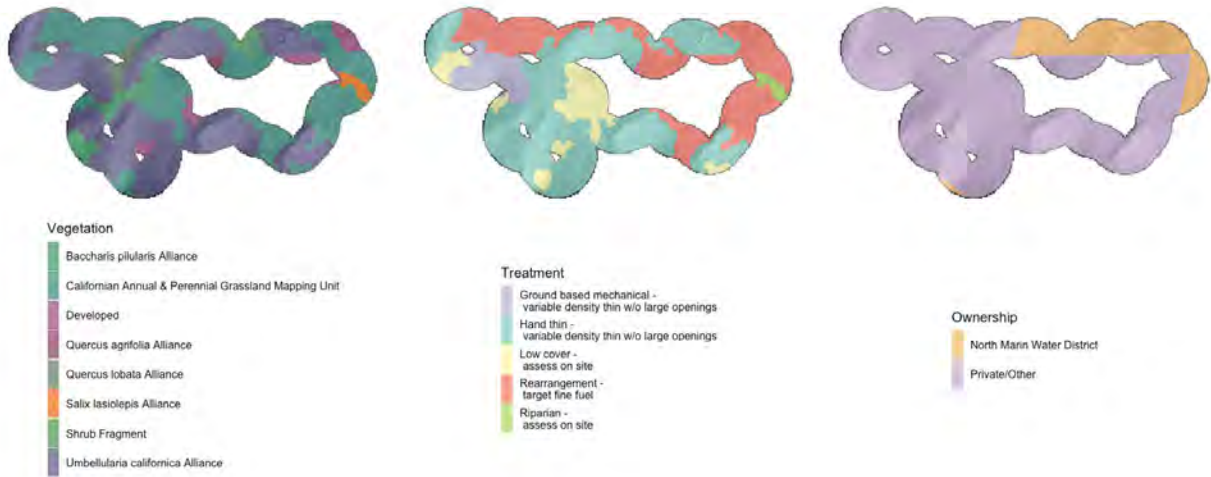
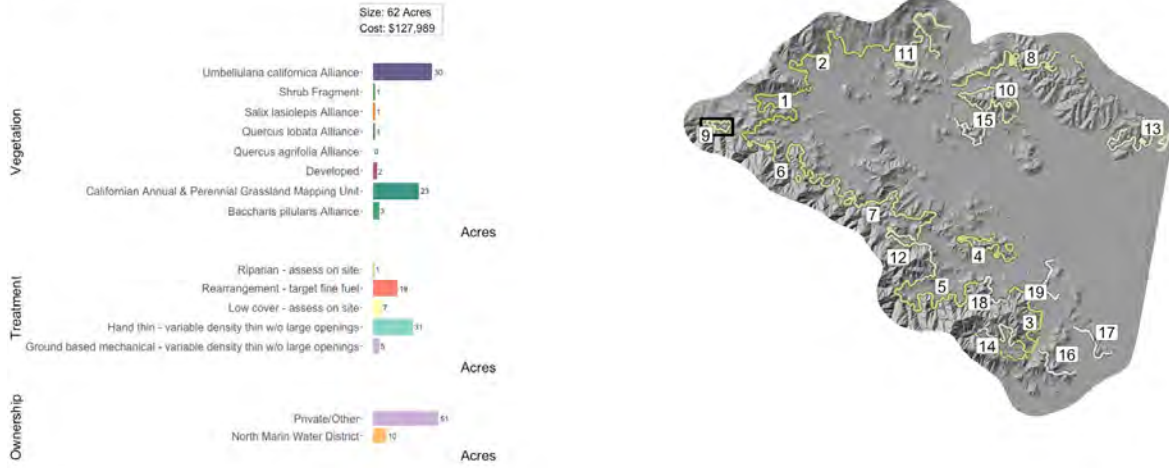
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Project 8



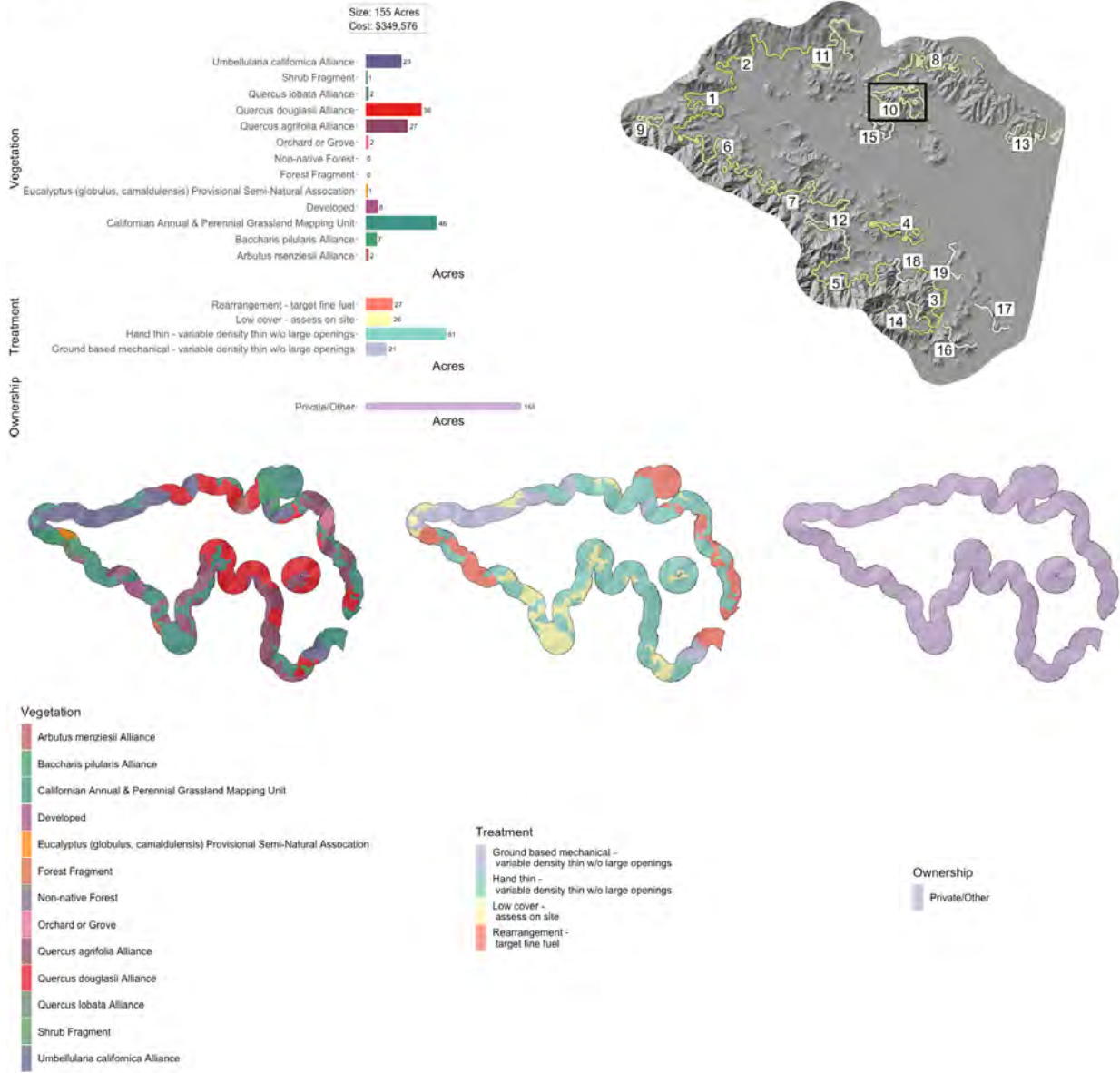
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Project 9



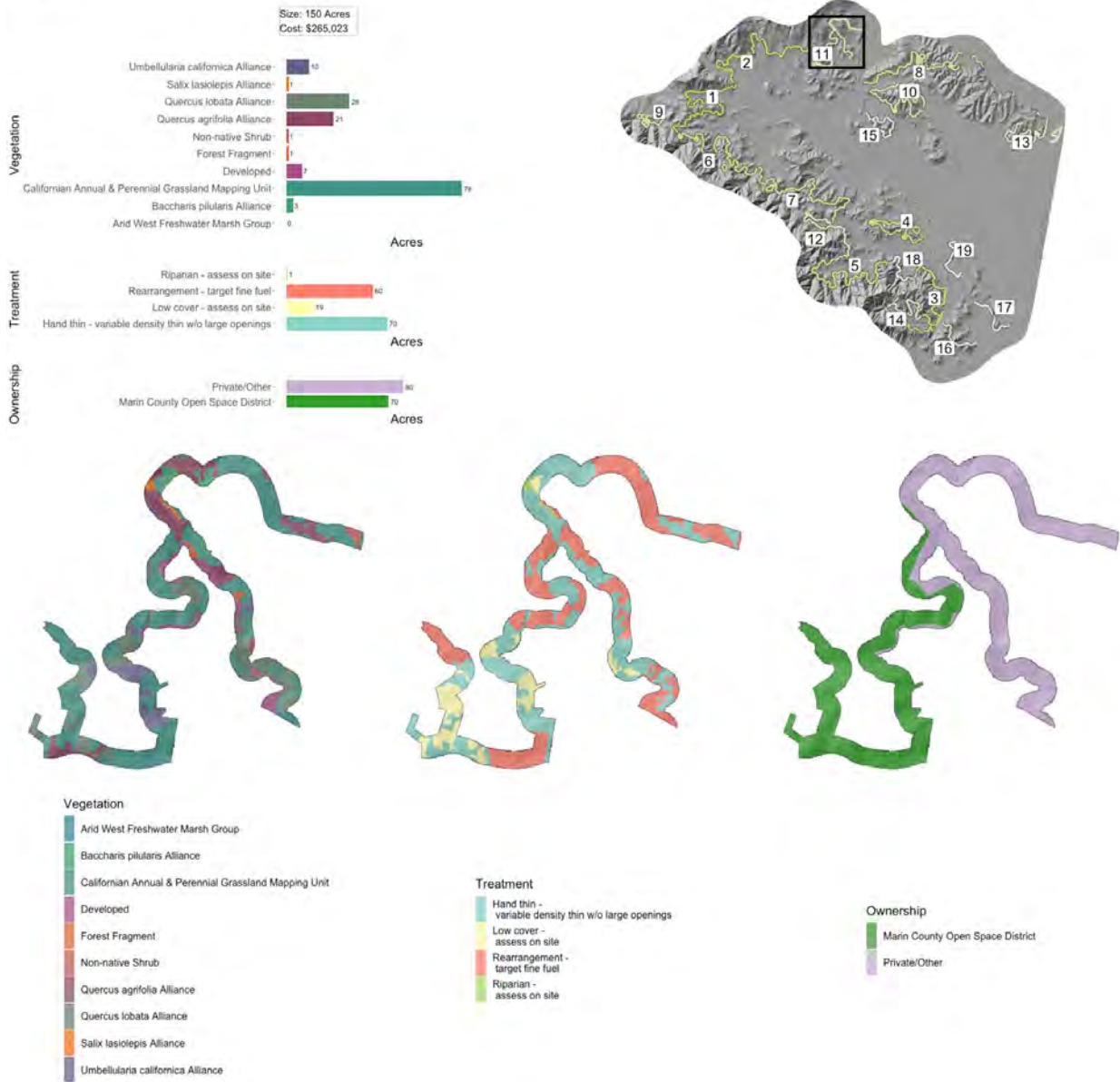
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Project 10



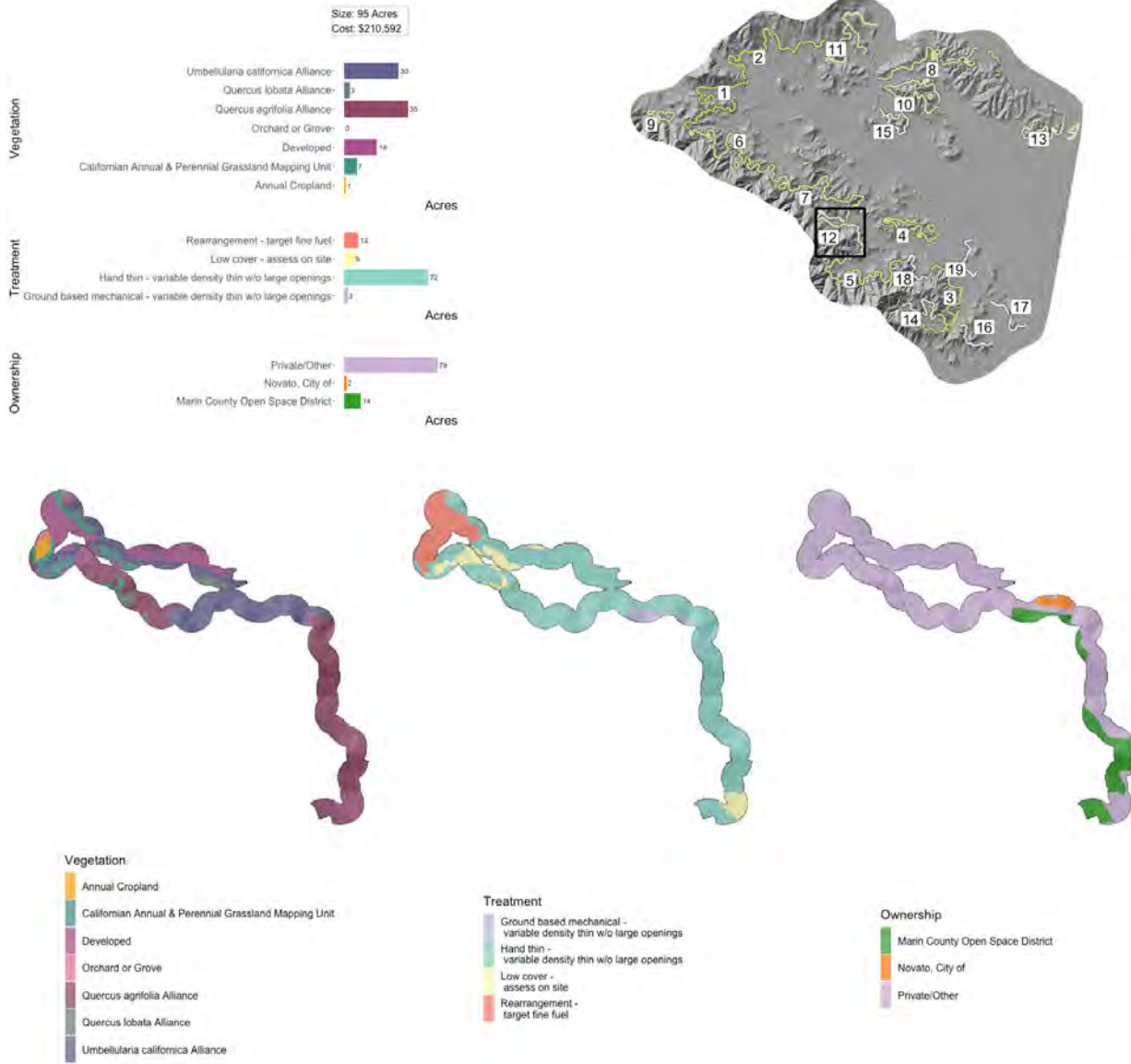
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Project 11



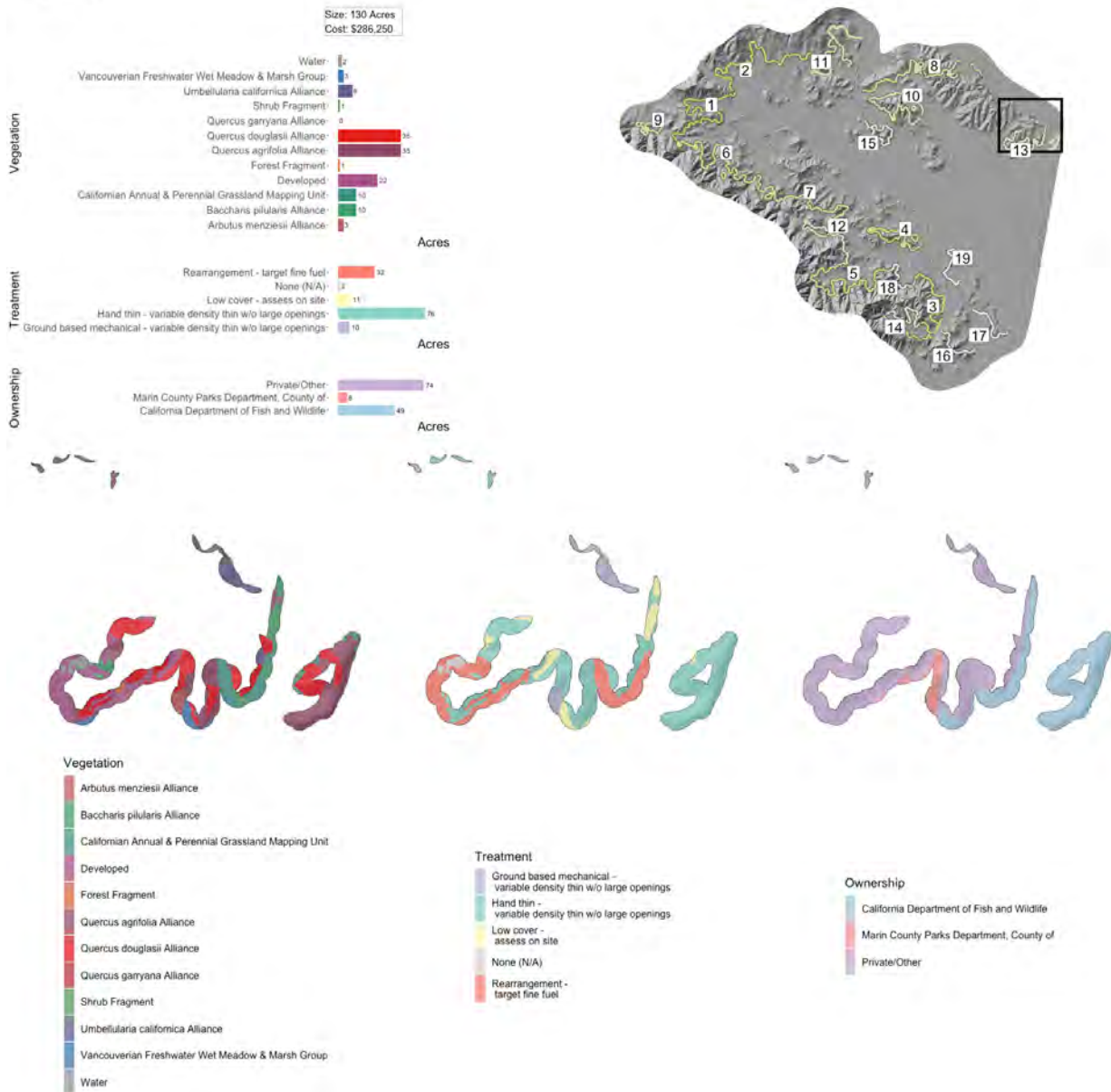
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Project 12



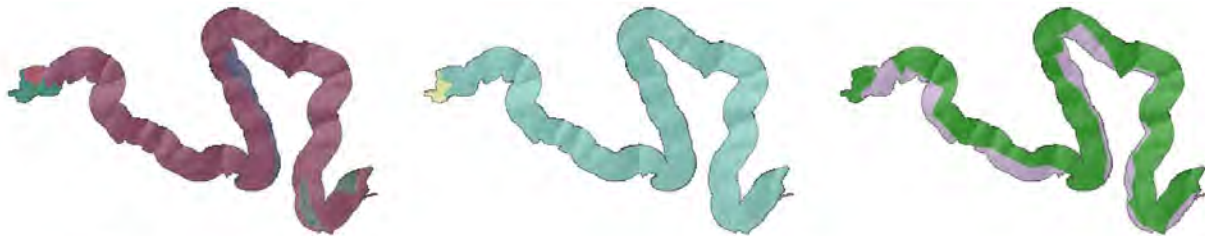
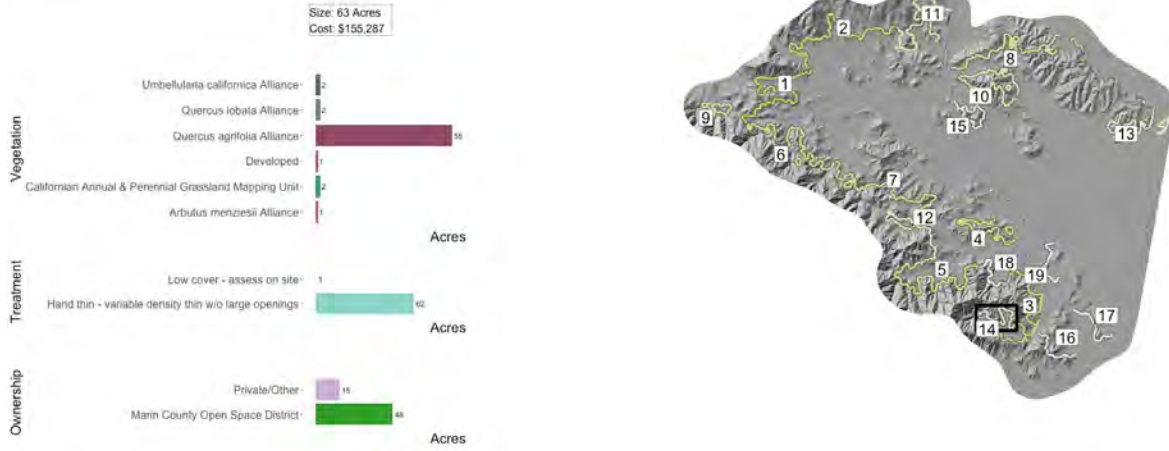
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Project 13



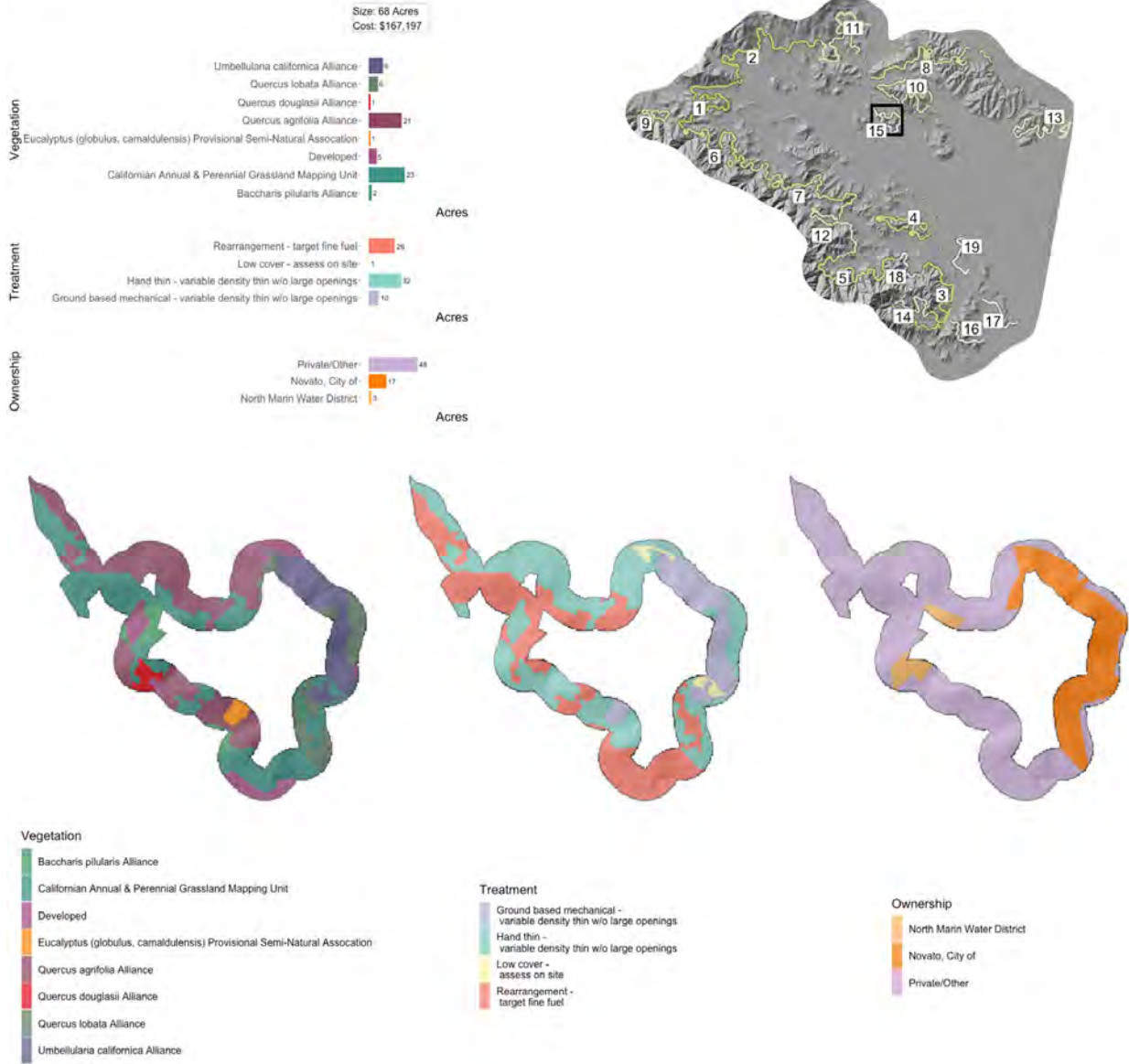
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Project 14



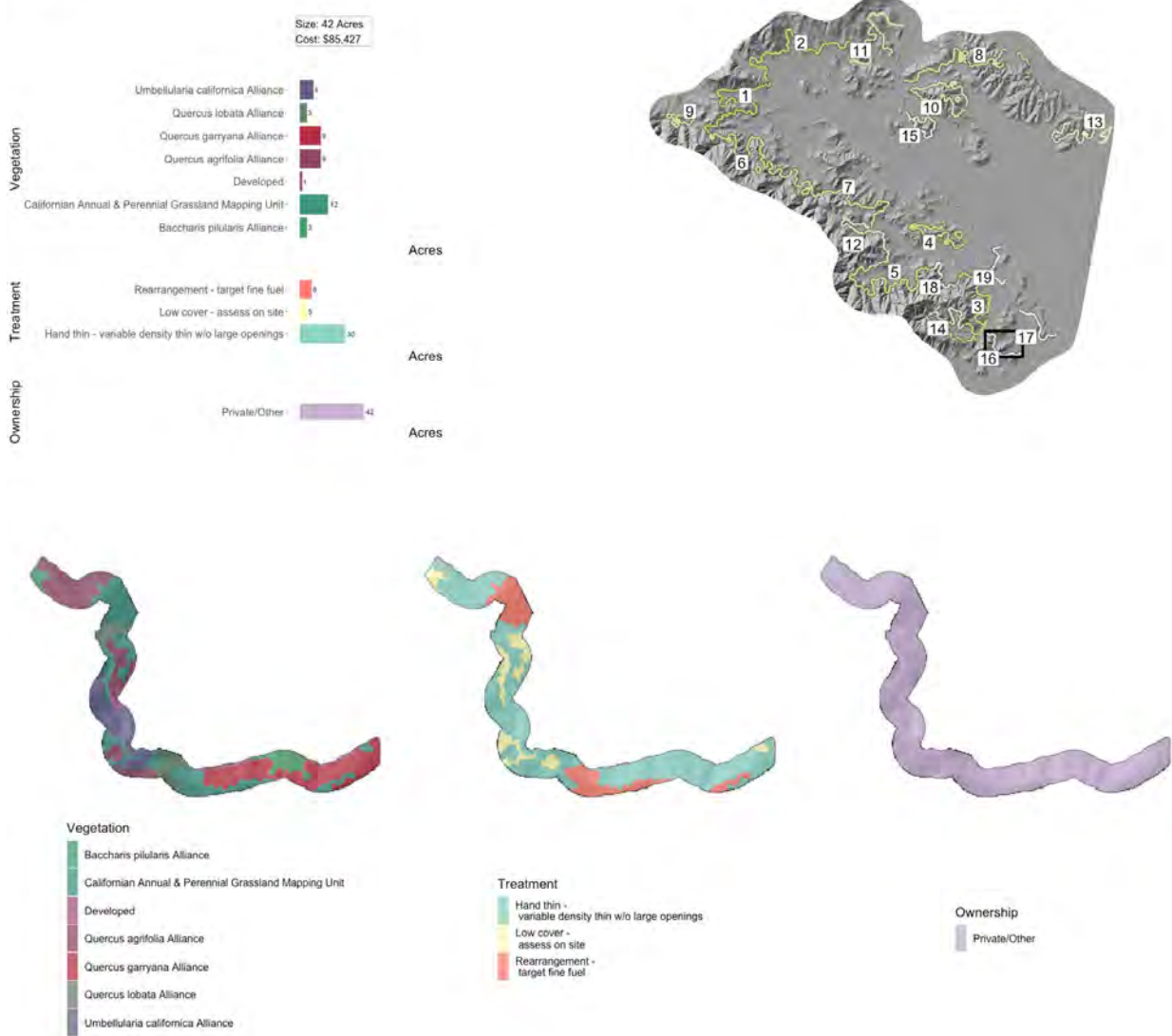
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Project 15



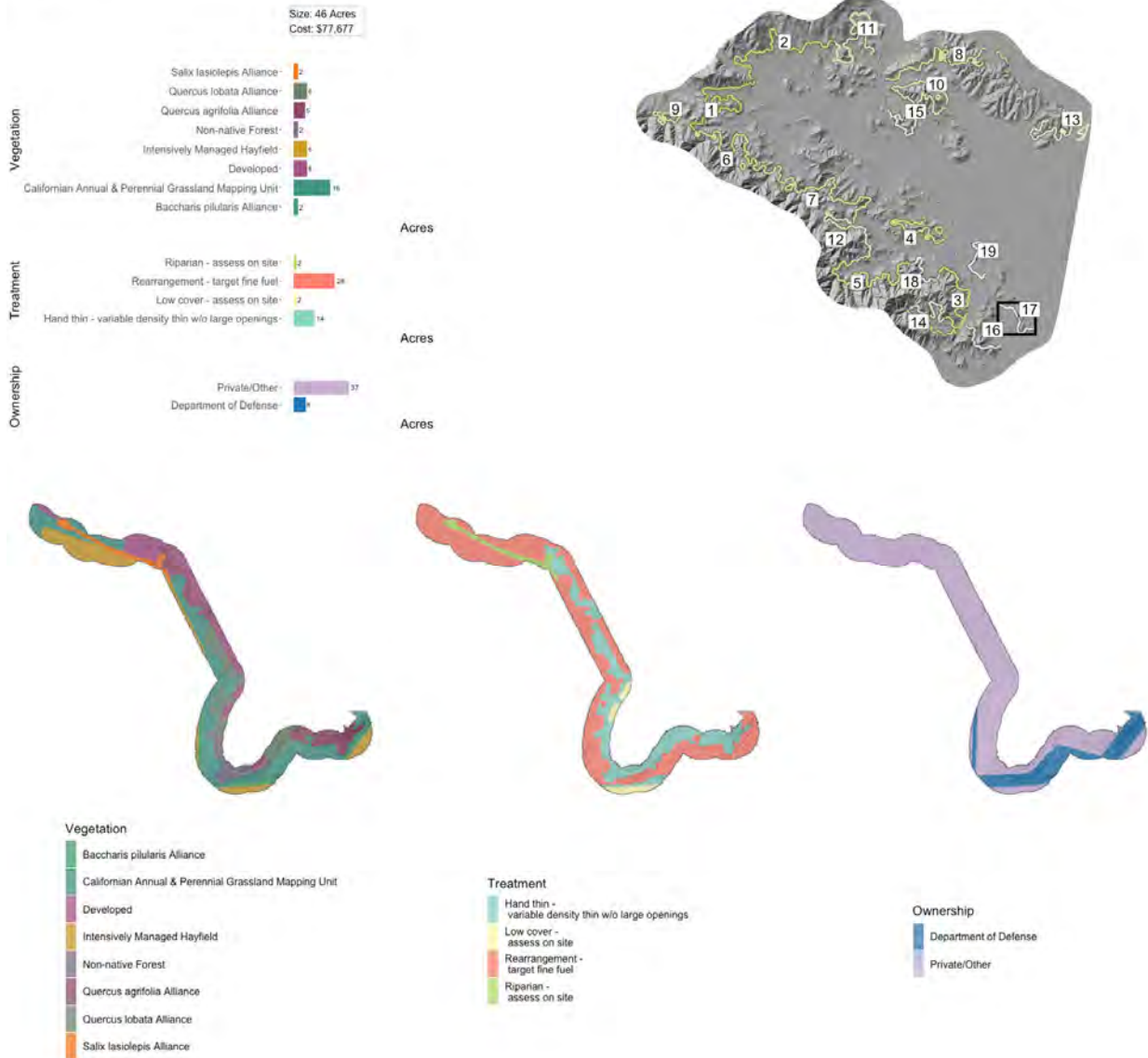
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Project 16



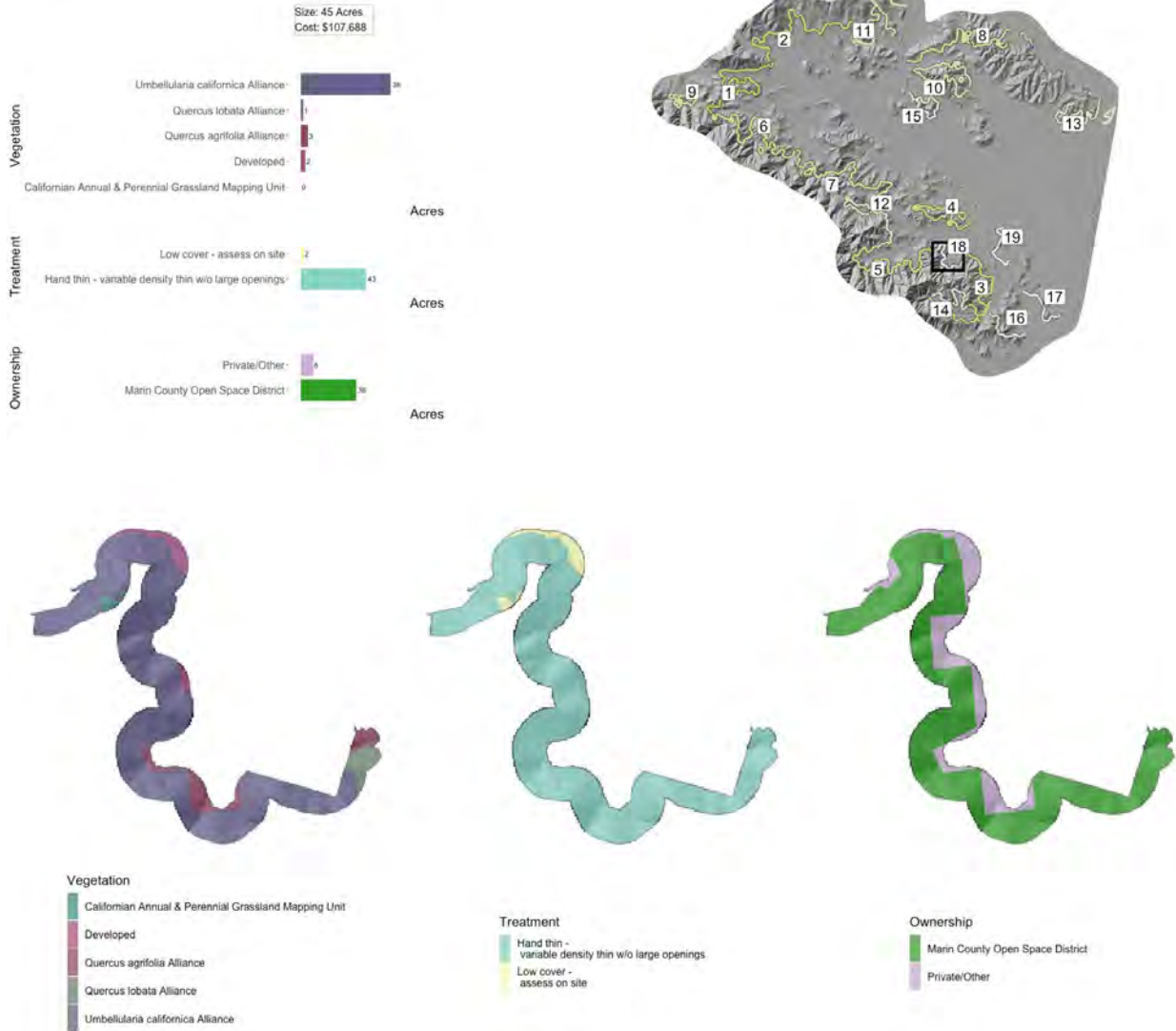
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Project 17



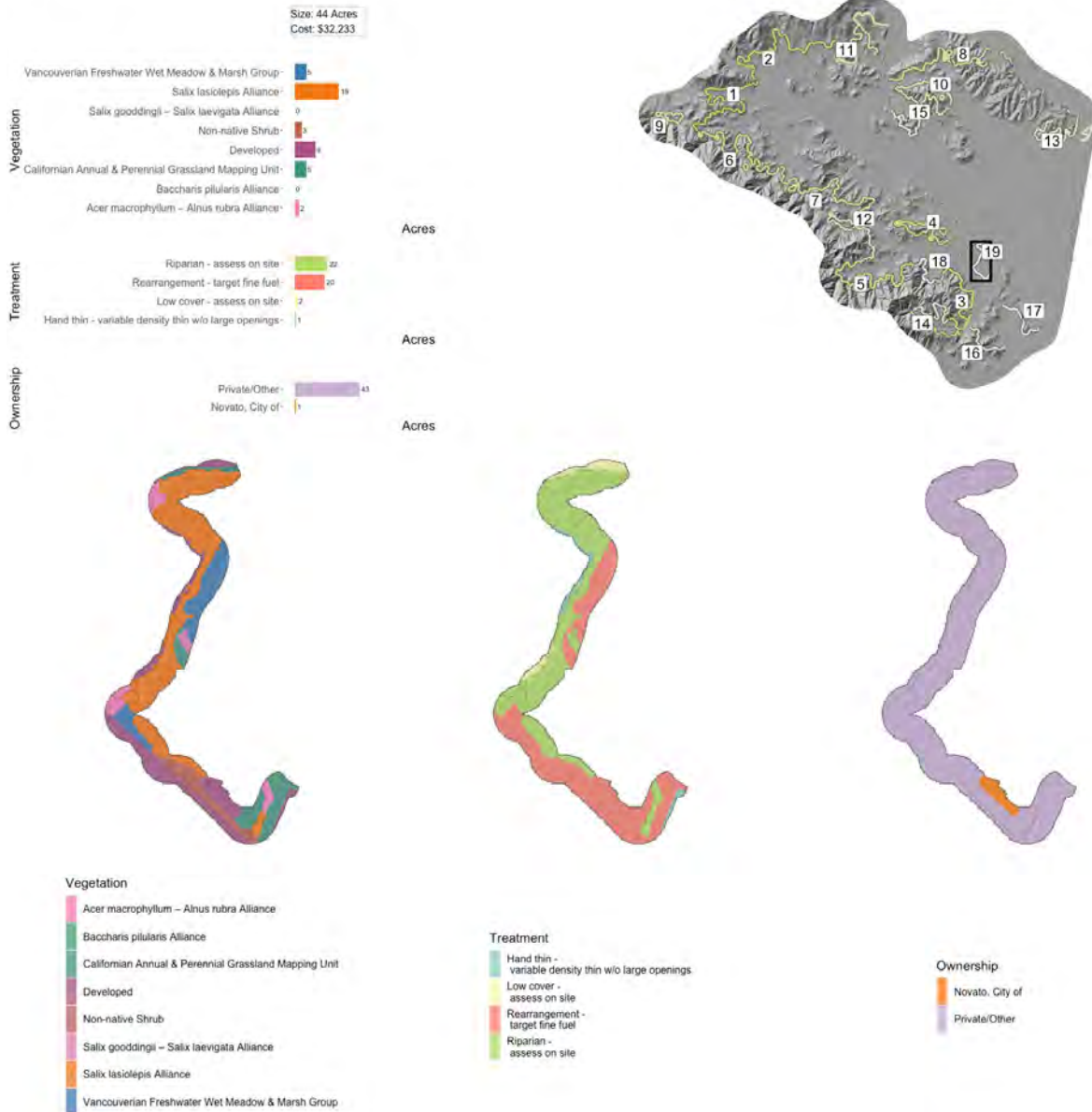
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Project 18



APPENDIX C

Project 19



APPENDIX D

Appendix D: Greater Novato Shaded Fuel Break Product Guide

The Greater Novato Shaded Fuel Break was segmented into meaningful project areas. Each segment (polygon) was then attributed with data on property ownership, structural vegetation characteristics, fire risk from existing modeling, and estimated vegetation health condition. These attributes were used to identify treatment opportunities and priority projects. In this guide, fields are presented in the order that they appear in the shapefile. The guide lists the field name as it appears in the shapefile, field description, and comments including information on methods and data sources from which the value of its field is derived.

Field name	Field description	Comments
Unit_ID	Unit (segment) identification number	Unique segment number to identify each polygon
Zone	Location of polygon relative to fuel break or wildland–urban interface	Location of polygon in delineated fuel break and wildland–urban interface zones (see project report for description of methods)
Acres	Area of polygon in acres	Precise calculation of the polygon area
Slope	Average slope in percentage	Derived from a lidar bare earth digital elevation model (DEM) at 4-meter resolution. The DEM was obtained from ONE TAM: https://gis.marinpublic.com/arcgis/rest/services/LIDAR/Slope/ImageServer
FSV_FLF	Forest lifeform	Dominant forest lifeform based on the 2021 Marin County Fine Scale Vegetation Map (forest lifeform in '18). Data was obtained from ONE TAM: https://parksconservancy.maps.arcgis.com/home/item.html?id=14b57b6d94cc4516841a6f753326848d
MapClass	Map class with the highest proportional cover	National Vegetation Classification (NVCS) Map class label for all stands. 2021 Marin County Fine Scale Vegetation Map (Fine scale Map class in '18). Data was obtained from ONE TAM: https://parksconservancy.maps.arcgis.com/home/item.html?id=14b57b6d94cc4516841a6f753326848d
CanCovMaj	Identifies the dominant canopy (woody or not woody)	Identifies if woody canopy greater than 15 ft tall is >50% (woody) or ≤50% (not woody). Data is based on 2021 Marin County Fine Scale Vegetation Map (Canopy Closure) https://parksconservancy.maps.arcgis.com/home/item.html?id=61d3dffe1e18476db3cb810af76267df

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LadderFuel	Percent cover between 1 and 4 meters	Provides information about the density of living and dead vegetation in the vertical stratum between 1 and 4 meters above the ground (i.e., represents the density of lidar returns between 1 and 4 m). Integrated from the 2019 lidar-derived ladder fuels raster using the zonal statistics function. The ladder fuel metric is a 0 to 1 metric. 0 is lowest; 1 is highest. The fuel metric was then multiplied by 100. Raw ladder fuel data was obtained from: https://parksconservancy.maps.arcgis.com/home/item.html?id=629155a9a3d14721b9c477e65f429da8
ShrubCov	Absolute % shrub cover in '18	Absolute shrub cover for herbaceous and shrub stands based on the 2021 Marin County Fine Scale Vegetation Map manual image interpretation of '18 imagery. Data was obtained from ONE TAM: https://parksconservancy.maps.arcgis.com/home/item.html?id=14b57b6d94cc4516841a6f753326848d
TreeCov	Absolute % Tree Canopy Cover in '19	Absolute cover of trees greater than 15 feet in height based on the 2021 Marin County Fine Scale Vegetation Map using lidar. Data was obtained from ONE TAM: https://parksconservancy.maps.arcgis.com/home/item.html?id=14b57b6d94cc4516841a6f753326848d
CC2_8	Canopy cover 2–8 m	Raw lidar data from Golden Gates Parks Conservancy was used to estimate canopy cover between 2 and 8 meters using first return only. This information can be used as a proxy for ladder fuel. Although the accuracy of this measurement decreases as the cover above 8 meters increases, it serves as a good proxy for understory vegetation densities and may be more indicative of small tree densities than smaller size class tree counts.
CC2_plus	Canopy cover over 2 m	Raw lidar data from Golden Gates Parks Conservancy was used to estimate canopy cover >2 meters using first return only. Canopy cover can be calculated below 2 meters; however, the certainty that lidar returns have been intercepted by vegetation and not rocks/down logs decreases precipitously below that height.
TreeCount	Total number of trees within the segment	Raw lidar data from Golden Gates Parks Conservancy was used to estimate total number of trees based on lidar-derived TAOs. Higher canopy cover estimates with higher understory tree densities will yield greater omission errors for detecting trees.
TreeAvgHt	Average tree height (feet)	Raw lidar data from Golden Gates Parks Conservancy was used to estimate average tree dominant height based on lidar derived TAOs.
WO_BAE	Prioritization value, based on weighed overlay (fire threat rating) and buildings affected expected	Weighted overlay using updated fire modeling based on burn probability, conditional flame length, and rate of spread (see project report for description of methods); estimate of the annual number of structures exposed to wildfire. Data provided by Ager; methods found here: https://www.fs.fed.us/rm/pubs_series/rmrs/gtr/rmrs_gtr392.pdf

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Treatment	Prioritized treatment for treatment effects	Identifies preferred treatment for the segment (see project report for description of methods)
TrtCost_ac	Cost per acre of treatment	Cost per acre of preferred treatment (see project report for description of methods)
TrtCost	Total cost of treatment	Total cost of treatment (cost per acre of preferred treatment * acres) (see project report for description of methods).
Project	Project sequence	Project sequence (see project report for description of methods)

Appendix B: Standard Project Requirements Checklist and Mitigation Measures Checklist, and Project Design and Implementation Feature and Standard Project Requirement Comparison Table

Attachment B – Standard Project Requirements Checklist and Mitigation Measures Checklist, and Project Design and Implementation Feature and Standard Project Requirement Comparison Table

SPRs Checklist and MMs Checklist Overview

Applicable. The standard project requirements (SPRs) or mitigation measures (MMs) from the California Vegetation Treatment Program (CalVTP) Program Environmental Impact Report (PEIR) and listed below in Table 1 and Table 2 are applicable to the initial treatment and/or maintenance of the proposed project. A yes/no (Y/N) is placed next to the initial treatment and treatment maintenance to indicate if it is applicable to that stage of treatment. MMs and SPRs not applicable to initial or maintenance treatments for the proposed project were removed from the tables.

Timing. This column identifies the time frame in which the SPR or mitigation measure will be implemented (e.g., prior to treatment, during treatment, etc.) (Table 1 and Table 2).

Implementing Entity. The implementing entity is the agency or organization responsible for carrying out the requirement. Fire Agency (Novato Fire District), Contractor, Fire Agency & Contractor, or MWPA is indicated in this column to identify which entity will be the responsible party (Table 1 and Table 2). In the future MWPA may manage implementation of portions of the proposed project, but at this time it is assumed that the Novato Fire District is managing implementation.

Verifying/Monitoring Entity. The verifying/monitoring entity is the agency or organization responsible for ensuring that the requirement is implemented. The verifying/monitoring entity may be different from the implementing entity. See Table 1 and Table 2.

PDIFs and SPRs Comparison Table Overview

In addition to the SPRs and MMs, MWPA has developed specific design and implementation features adapted from several source documents that will be incorporated as applicable into the project design and implementation for each of its projects. The Project Design and Implementation Features (PDIFs) relevant to the proposed project in comparison to the CalVTP PEIR SPRs are listed in Table 3.

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Standard Project Requirements

Table 1 Standard Project Requirements Applicable to the Greater Novato Shaded Fuel Break Project

Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
Administrative Standard Project Requirements				
<p>SPR AD-3 Consistency with Local Plans, Policies, and Ordinances: The project proponent will design and implement the treatment in a manner that is consistent with applicable local plans (e.g., general plans, Community Wildfire Protection Plans, CAL FIRE Unit Fire Plans), policies, and ordinances to the extent the project is subject to them. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Fire Agency	MWPA
<p>SPR AD-4 Public Notifications for Prescribed Burning: At least days prior to the commencement of prescribed burning operations, the project proponent will: 1) post signs along the closest public roadway to the treatment area describing the activity and timing, and requesting persons in the area to contact a designated representative of the project proponent (contact information will be provided with the notice) if they have questions or smoke concerns; 2) publish a public interest notification in a local newspapers or other widely distributed media source describing the activity, timing, and contact information; 3) send the local county supervisor and county administrative officer (or equivalent official responsible for distribution of public information) a notification letter describing the activity, its necessity, timing, and measures being taken to protect the environment and prevent prescribed burn escape. This SPR applies only to prescribed burn treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior	Fire Agency	MWPA
Aesthetic and Visual Resource Standard Project Requirements				
<p>SPR AES-1 Vegetation Thinning and Edge Feathering: The project proponent will thin and feather adjacent vegetation to break up or screen linear edges of the clearing and mimic forms of natural clearings as reasonable or appropriate for vegetation conditions. In general, thinning and feathering in</p>	<p>Initial Treatment: Y</p>	During	Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
irregular patches of varying densities, as well as a gradation of tall to short vegetation at the clearing edge, will achieve a natural transitional appearance. The contrast of a distinct clearing edge will be faded into this transitional band. This SPR only applies to mechanical and manual treatment activities and all treatment types, including treatment maintenance.	Treatment Maintenance: Y			
SPR AES-2 Avoid Staging within Viewsheds: The project proponent will store all treatment-related materials, including vehicles, vegetation treatment debris, and equipment, outside of the viewshed of public trails, parks, recreation areas, and roadways to the extent feasible. The project proponent will also locate materials staging and storage areas outside of the viewshed of public trails, parks, recreation areas, and roadways to the extent feasible. This SPR applies to all treatment activities and treatment types, including treatment maintenance.	Initial Treatment: Y Treatment Maintenance: Y	Prior-During	Fire Agency & Contractor	MWPA
SPR AES-3 Provide Vegetation Screening: The project proponent will preserve sufficient vegetation within, at the edge of, or adjacent to treatment areas to screen views from public trails, parks, recreation areas, and roadways as reasonable or appropriate for vegetation conditions. This SPR applies to all treatment activities and all treatment types, including treatment maintenance.	Initial Treatment: Y Treatment Maintenance: Y	Prior-During-After	Contractor	MWPA
Air Quality Standard Project Requirements				
SPR AQ-1 Comply with Air Quality Regulations: The project proponent will comply with the applicable air quality requirements of air districts within whose jurisdiction the project is located. This SPR applies to all treatment activities and all treatment types, including treatment maintenance.	Initial Treatment: Y Treatment Maintenance: Y	During	Fire Agency & Contractor	MWPA
SPR AQ-2 Submit Smoke Management Plan: The project proponent will submit a smoke management plan for all prescribed burns to the applicable air district, in accordance with 17 CCR Section 80160. Pursuant to this regulation a smoke management plan will not be required for burns less than 10 acres that also will not be conducted near smoke sensitive areas, unless	Initial Treatment: Y	Prior	Fire Agency	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
otherwise directed by the air district. Burning will only be conducted in compliance with the burn authorization program of the applicable air district(s) having jurisdiction over the treatment area. Example of a smoke management plan is in Appendix PD-2. This SPR applies only to prescribed burning treatment activities and all treatment types, including treatment maintenance.	Treatment Maintenance: Y			
SPR AQ-3 Create Burn Plan: The project proponent will create a burn plan using the CAL FIRE burn plan template for all prescribed burns. The burn plan will include a fire behavior model output of First Order Fire Effects Model and BEHAVE or other fire behavior modeling simulation and that is performed by a qualified fire behavior technical specialist that predicts fire behavior, calculates consumption of fuels, tree mortality, predicted emissions, greenhouse gas emissions, and soil heating. The project proponent will minimize soil burn severity from broadcast burning to reduce the potential for runoff and soil erosion. The burn plan will be created with input from a qualified technician or certified State burn boss. This SPR applies only to prescribed burning treatment activities and all treatment types, including treatment maintenance.	Initial Treatment: Y Treatment Maintenance: Y	Prior	Fire Agency	MWPA
SPR AQ-4 Minimize Dust: To minimize dust during treatment activities, the project proponent will implement the following measures: <ul style="list-style-type: none"> Limit the speed of vehicles and equipment traveling on unpaved areas to 15 miles per hour to reduce fugitive dust emissions, in accordance with the California Air Resources Board (CARB) Fugitive Dust protocol. If road use creates excessive dust, the project proponent will wet appurtenant, unpaved, dirt roads using water trucks or treat roads with a non-toxic chemical dust suppressant (e.g., emulsion polymers, organic material) during dry, dusty conditions. Any dust suppressant product used will be environmentally benign (i.e., non-toxic to plants and will not negatively impact water quality) and its use will not be prohibited by ARB, EPA, or the State Water Resources Control Board (SWRCB). The project proponent will not over-water exposed areas such that the water results in runoff. The type of dust suppression method will be selected by 	Initial Treatment: Y Treatment Maintenance: Y	During	Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>the project proponent based on soil, traffic, site-specific conditions, and air quality regulations.</p> <ul style="list-style-type: none"> Remove visible dust, silt, or mud tracked-out on to public paved roadways where sufficient water supplies and access to water is available. The project proponent will remove dust, silt, and mud from vehicles at the conclusion of each workday, or at a minimum of every 24 hours for continuous treatment activities, in accordance with Vehicle Code Section 23113. Suspend ground-disturbing treatment activities, including land clearing and bulldozer lines, when there is visible dust transport (particulate pollution) outside the treatment boundary, if the particulate emissions may "cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property," per Health and Safety Code Section 41700. <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>				
<p>SPR AQ-5 Avoid Naturally Occurring Asbestos: The project proponent will avoid ground-disturbing treatment activities in areas identified as likely to contain naturally occurring asbestos (NOA) per maps and guidance published by the California Geological Survey, unless an Asbestos Dust Control Plan (17 CCR Section 93105) is prepared and approved by the air district(s) with jurisdiction over the treatment area. Any NOA-related guidance provided by the applicable air district will be followed. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Fire Agency & Contractor	MWPA
<p>SPR AQ-6: Prescribed Burn Safety Procedures: Prescribed burns planned and managed by non-CAL FIRE crews will follow all safety procedures required of CAL FIRE crew, including the implementation of an approved Incident Action Plan (IAP). The IAP will include the burn dates; burn hours; weather limitations; the specific burn prescription; a communications plan; a</p>	<p>Initial Treatment: Y</p>	During	Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>medical plan; a traffic plan; and special instructions such as minimizing smoke impacts to specific local roadways. The IAP will also assign responsibilities for coordination with the appropriate air district, such as conducting onsite briefings, posting notifications, weather monitoring during burning, and other burn related preparations. This SPR applies only to prescribed burning treatment activities and all treatment types, including treatment maintenance.</p>	<p>Treatment Maintenance: Y</p>			
Archaeological, Historical, and Tribal Cultural Resources Standard Project Requirements				
<p>SPR CUL-1 Conduct Record Search: An archaeological and historical resource record search will be conducted per the applicable state or local agency procedures. Instead of conducting a new search, the project proponent may use recent record searches containing the treatment area requested by a landowner or other public agency in accordance applicable agency guidance. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: N</p>	<p>Prior</p>	<p>MWPA</p>	<p>MWPA</p>
<p>SPR CUL-2 Contact Geographically Affiliated Native American Tribes: The project proponent will obtain the latest Native American Heritage Commission (NAHC) provided Native Americans Contact List. Using the appropriate Native Americans Contact List, the project proponent will notify the California Native American Tribes in the counties where the treatment activity is located. The notification will contain the following:</p> <ul style="list-style-type: none"> • A written description of the treatment location and boundaries. • Brief narrative of the treatment objectives. • A description of the activities used (e.g., prescribed burning, mastication) and associated acreages. • A map of the treatment area at a sufficient scale to indicate the spatial extent of activities. <ul style="list-style-type: none"> – A request for information regarding potential impacts to cultural resources from the proposed treatment. 	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: N</p>	<p>Prior</p>	<p>MWPA</p>	<p>MWPA</p>

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> A detailed description of the depth of excavation, if ground disturbance is expected. <p>In addition, the project proponent will contact the NAHC for a review of their Sacred Lands File. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>				
<p>SPR CUL-3 Pre-field Research: The project proponent will conduct research prior to implementing treatments as part of the cultural resource investigation. The purpose of this research is to properly inform survey design, based on the types of resources likely to be encountered within the treatment area, and to be prepared to interpret, record, and evaluate these findings within the context of local history and prehistory. The qualified archaeologist and/or archaeologically-trained resource professional will review records, study maps, read pertinent ethnographic, archaeological, and historical literature specific to the area being studied, and conduct other tasks to maximize the effectiveness of the survey. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: N</p>	Prior	MWPA	MWPA
<p>SPR CUL-4 Archaeological Surveys: The project proponent will coordinate with an archaeologically trained resource professional and/or qualified archaeologist to conduct a site-specific survey of the treatment area. The survey methodology (e.g., pedestrian survey, subsurface investigation) depends on whether the area has a low, moderate, or high sensitivity for resources, which is based on whether the records search, pre-field research, and/or Native American consultation identifies archaeological or historical resources near or within the treatment area. A survey report will be completed for every cultural resource survey completed. The specific requirements will comply with the applicable state or local agency procedures. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: N</p>	Prior	MWPA	MWPA
<p>SPR CUL-5 Treatment of Archaeological Resources: If cultural resources are identified within a treatment area, and cannot be avoided, a qualified archaeologist will notify the culturally affiliated tribe(s) based on information provided by NAHC and assess, whether an archaeological find qualifies as a</p>	<p>Initial Treatment: Y</p>	Prior-During	MWPA	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>unique archaeological resource, an historical resource, or in coordination with said tribe(s), as a tribal cultural resource. The project proponent, in consultation with culturally affiliated tribe(s), will develop effective protection measures for important cultural resources located within treatment areas. These measures may include adjusting the treatment location or design to entirely avoid cultural resource locations or changing treatment activities so that damaging effects to cultural resources will not occur. These protection measures will be written in clear, enforceable language, and will be included in the survey report in accordance with applicable state or local agency procedures. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Treatment Maintenance: Y</p>			
<p>SPR CUL-6 Treatment of Tribal Cultural Resources: The project proponent, in consultation with the culturally affiliated tribe(s), will develop effective protection measures for important tribal cultural resources located within treatment areas. These measures may include adjusting the treatment location or design to entirely avoid cultural resource locations or changing treatment activities so that damaging effects to cultural resources will not occur. The project proponent will provide the tribe(s) the opportunity to submit comments and participate in consultation to resolve issues of concern. The project proponent will defer implementing the treatment until the tribe approves protection measures, or if agreement cannot be reached after a good-faith effort, the proponent determines that any or all feasible measures have been implemented, where feasible, and the resource is either avoided or protected. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	MWPA	MWPA
<p>SPR CUL-7 Avoid Built Historical Resources: If the records search identifies built historical resources, as defined in Section 15064.5 of the State CEQA Guidelines, the project proponent will avoid these resources. Within a buffer of 100 feet of the built historical resource, there will be no prescribed burning or mechanical treatment activities. Buffers less than 100 feet for built historical resources will only be used after consultation with and receipt of written approval from a qualified archaeologist. If the records search does</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
not identify known historical resources in the treatment area, but structures (i.e., buildings, bridges, roadways) over 50 years old that have not been evaluated for historic significance are present in the treatment area, they will similarly be avoided. This SPR applies to all treatment activities and treatment types, including treatment maintenance.				
<p>SPR CUL-8 Cultural Resource Training: The project proponent will train all crew members and contractors implementing treatment activities on the protection of sensitive archaeological, historical, or tribal cultural resources. Workers will be trained to halt work if archaeological resources are encountered on a treatment site and the treatment method consists of physical disturbance of land surfaces (e.g., soil disturbance). This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior	MWPA	MWPA
Biological Resources Standard Project Requirements				
<p>SPR BIO-1: Review and Survey Project-Specific Biological Resources: The project proponent will require a qualified RPF or biologist to conduct a data review and reconnaissance-level survey prior to treatment, no more than one year prior to the submittal of the PSA, and no more than one year between completion of the PSA and implementation of the treatment project. The data reviewed will include the biological resources setting, species and sensitive natural communities tables, and habitat information in this PEIR for the ecoregion(s) where the treatment will occur. It will also include review of the best available, current data for the area, including vegetation mapping data, species distribution/range information, CNDDDB, California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California, relevant BIOS queries, and relevant general and regional plans. Reconnaissance-level biological surveys will be general surveys that include visual and auditory inspection for biological resources to help determine the environmental setting of a project site. The qualified surveyor will 1.) identify and document sensitive resources, such as riparian or other sensitive habitats, sensitive natural community, wetlands, or wildlife nursery site or habitat (including bird nests), and 2.) assess the suitability of habitat for</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior	MWPA	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>special-status plant and animal species. The surveyor will also record any incidental wildlife observations. For each treatment project, habitat assessments will be completed at a time of year that is appropriate for identifying habitat and no more than one year prior to the submittal of the PSA, unless it can be demonstrated in the PSA that habitat assessments older than one year remain valid (e.g., site conditions are unchanged and no treatment activity has occurred since the assessment). If more than one year passes between completion of the PSA and initiation of the treatment project, the project proponent will verify the continued accuracy of the PSA prior to beginning the treatment project by reviewing for any data updates and/or visiting the site to verify conditions. Based on the results of the data review and reconnaissance-level survey, the project proponent, in consultation with a qualified RPF or biologist, will determine which one of the following best characterizes the treatment:</p> <p>1. Suitable Habitat Is Present but Adverse Effects Can Be Clearly Avoided. If, based on the data review and reconnaissance-level survey, the qualified RPF or biologist determines that suitable habitat for sensitive biological resources is present but adverse effects on the suitable habitat can clearly be avoided through one of the following methods, the avoidance mechanism will be implemented prior to initiating treatment and will remain in effect throughout the treatment:</p> <ol style="list-style-type: none"> a. by physically avoiding the suitable habitat, or b. by conducting treatment outside of the season when a sensitive resource could be present within the suitable habitat or outside the season of sensitivity (e.g., outside of special-status bird nesting season, during dormant season of sensitive annual or geophytic plant species, or outside of maternity and rearing season at wildlife nursery sites). <p>Physical avoidance will include flagging, fencing, stakes, or clear, existing landscape demarcations (e.g., edge of a roadway) to delineate the boundary of the avoidance area around the suitable habitat. For physical avoidance, a buffer may be implemented as determined necessary by the qualified RPF or biologist.</p>				

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>2. Suitable Habitat is Present and Adverse Effects Cannot Be Clearly Avoided. Further review and surveys will be conducted to determine presence/absence of sensitive biological resources that may be affected, as described in the SPRs below. Further review may include contacting USFWS, NOAA Fisheries, CDFW, CNPS, or local resource agencies as necessary to determine the potential for special-status species or other sensitive biological resources to be affected by the treatment activity. Focused or protocol-level surveys will be conducted as necessary to determine presence/absence. If protocol surveys are conducted, survey procedures will adhere to methodologies approved by resource agencies and the scientific community, such as those that are available on the CDFW webpage at: https://www.wildlife.ca.gov/Conservation/Survey-Protocols. Specific survey requirements are addressed for each resource type in relevant SPRs (e.g., additional survey requirements are presented for special-status plants in SPR BIO-7).</p> <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>				
<p>SPR BIO-2: Require Biological Resource Training for Workers. The project proponent will require crew members and contractors to receive training from a qualified RPF or biologist prior to beginning a treatment project. The training will describe the appropriate work practices necessary to effectively implement the biological SPRs and mitigation measures and to comply with the applicable environmental laws and regulations. The training will include the identification, relevant life history information, and avoidance of pertinent special-status species; identification and avoidance of sensitive natural communities and habitats with the potential to occur in the treatment area; impact minimization procedures; and reporting requirements. The training will instruct workers when it is appropriate to stop work and allow wildlife encountered during treatment activities to leave the area unharmed and when it is necessary to report encounters to a qualified RPF, biologist, or biological technician. The qualified RPF, biologist, or biological technician will immediately contact CDFW or USFWS, as appropriate, if any wildlife</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior	MWPA	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
protected by the California Endangered Species Act (CESA) or Federal Endangered Species Act (ESA) is encountered and cannot leave the site on its own (without being handled). This SPR applies to all treatment activities and treatment types, including treatment maintenance.				
Sensitive Natural Communities and Other Sensitive Habitats				
<p>SPR BIO-3: Survey Sensitive Natural Communities and Other Sensitive Habitats: If SPR BIO-1 determines that sensitive natural communities or sensitive habitat may be present and adverse effects cannot be avoided, the project proponent will:</p> <ul style="list-style-type: none"> require a qualified RPF or biologist to perform a protocol-level survey following the CDFW “Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities” (current version dated March 20, 2018) of the treatment area prior to the start of treatment activities for sensitive natural communities and sensitive habitats. Sensitive natural communities will be identified using the best means possible, including keying them out using the most current edition of <i>A Manual of California Vegetation</i> (including updated natural communities data at http://vegetation.cnps.org/), or referring to relevant reports (e.g., reports found on the VegCAMP website). map and digitally record, using a Global Positioning System (GPS), the limits of any potential sensitive habitat and sensitive natural community identified in the treatment area. <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>Prior</p>	<p>MWPA</p>	<p>MWPA</p>
<p>SPR BIO-4: Design Treatment to Avoid Loss or Degradation of Riparian Habitat Function: Project proponents, in consultation with a qualified RPF or qualified biologist, will design treatments in riparian habitats to retain or improve habitat functions by implementing the following within riparian habitats:</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>Prior</p>	<p>Fire Agency & Contractor</p>	<p>MWPA</p>

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> • Retain at least 75 percent of the overstory and 50 percent of the understory canopy of native riparian vegetation within the limits of riparian habitat identified and mapped during surveys conducted pursuant to SPR BIO-3. Native riparian vegetation will be retained in a well distributed multi-storied stand composed of a diversity of species similar to that found before the start of treatment activities. • Treatments will be limited to removal of uncharacteristic fuel loads (e.g., removing dead or dying vegetation), trimming/limbing of woody species as necessary to reduce ladder fuels, and select thinning of vegetation to restore densities that are characteristic of healthy stands of the riparian vegetation types characteristic of the region. This includes hand removal (or mechanized removal where topography allows) of dead or dying riparian trees and shrubs, invasive plant removal, selective thinning, and removal of encroaching upland species. • Removal of large, native riparian hardwood trees (e.g., willow, ash, maple, oak, alder, sycamore, cottonwood) will be minimized to the extent feasible and 75 percent of the pretreatment native riparian hardwood tree canopy will be retained. Because tree size varies depending on vegetation type present and site conditions, the tree size retention parameter will be determined on a site-specific basis depending on vegetation type present and setting; however, live, healthy, native trees that are considered large for that type of tree and large relative to other trees in that location will be retained. A scientifically-based, project-specific explanation substantiating the retention size parameter for native riparian hardwood tree removal will be provided in the Biological Resources Discussion of the PSA. Consideration of factors such as site hydrology, erosion potential, suitability of wildlife habitat, presence of sufficient seed trees, light availability, and changes in stream shading may inform the tree size retention requirements. • Removed trees will be felled away from adjacent streams or waterbodies and piled outside of the riparian vegetation zone (unless there is an ecological reason to do otherwise that is approved by applicable regulatory agencies, such as adding large woody material to a stream to 				

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>enhance fish habitat, e.g., see Accelerated Wood Recruitment and Timber Operations: Process Guidance from the California Timber Harvest Review Team Agencies and National Marine Fisheries Service).</p> <ul style="list-style-type: none"> • Vegetation removal that could reduce stream shading and increase stream temperatures will be avoided. • Ground disturbance within riparian habitats will be limited to the minimum necessary to implement effective treatments. This will consist of the minimum disturbance area necessary to reduce hazardous fuels and return the riparian community to a natural fire regime (i.e., Condition Class 1) considering historic fire return intervals, climate change, and land use constraints. • Only hand application of herbicides approved for use in aquatic environments will be allowed and only during low-flow periods or when seasonal streams are dry. • The project proponent will notify CDFW when required by California Fish and Game Code Section 1602 prior to implementing any treatment activities in riparian habitats. Notification will identify the treatment activities, map the vegetation to be removed, identify the impact avoidance identification methods to be used (e.g., flagging), and appropriate protections for the retention of shaded riverine habitat, including buffers and other applicable measures to prevent erosion into the waterway. • In consideration of spatial variability of riparian vegetation types and condition and consistent with California Forest Practice Rules Section 916.9(v) (February 2019 version), a different set of vegetation retention standards and protection measures from those specified in the above bullets may be implemented on a site-specific basis if the qualified RPF and the project proponent demonstrate through substantial evidence that alternative design measures provide a more effective means of achieving the treatment goals objectives and would result in effects to the Beneficial Functions of Riparian Zones equal or more favorable than those expected to result from application of the above measures. Deviation from the above design specifications, different protection 				

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>measures and design standards will only be approved when the treatment plan incorporates an evaluation of beneficial functions of the riparian habitat and with written concurrence from CDFW.</p> <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>				
<p>SPR BIO-5: Avoid Environmental Effects of Type Conversion and Maintain Habitat Function in Chaparral and Coastal Sage Scrub: The project proponent will design treatment activities to avoid type conversion where native coastal sage scrub and chaparral are present. An ecological definition of type conversion is used in the CalVTP PEIR for assessment of environmental effects: a change from a vegetation type dominated by native shrub species that are characteristic of chaparral and coastal sage scrub vegetation alliances to a vegetation type characterized predominantly by weedy herbaceous cover or annual grasslands. For the PEIR, type conversion is considered in terms of habitat function, which is defined here as the arrangement and capability of habitat features to provide refuge, food source, and reproduction habitat to plants and animals, and thereby contribute to the conservation of biological and genetic diversity and evolutionary processes (de Groot et al. 2002). Some modification of habitat characteristics may occur provided habitat function is maintained (i.e., the location, essential habitat features, and species supported are not substantially changed). During the reconnaissance-level survey required in SPR BIO-1, a qualified RPF or biologist will identify chaparral and coastal sage scrub vegetation to the alliance level and determine the condition class and fire return interval departure of the chaparral and/or coastal sage scrub present in each treatment area.</p> <p>For all treatment types in chaparral and coastal sage scrub, the project proponent, in consultation with a qualified RPF or qualified biologist will:</p> <ul style="list-style-type: none"> Develop a treatment design that avoids environmental effects of type conversion in chaparral and coastal sage scrub vegetation alliances, which will include evaluating and determining the appropriate spatial scale at which the proponent would consider type conversion, and 	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior	Fire Agency & Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>substantiating its appropriateness. The project proponent will demonstrate with substantial evidence that the habitat function of chaparral and coastal sage scrub would be at least maintained within the identified spatial scale at which type conversion is evaluated for the specific treatment project. Consideration of factors such as site hydrology, erosion potential, suitability of wildlife habitat, spatial needs of sensitive species, presence of sufficient seed plants and nurse plants, light availability, and edge effects may inform the determination of an appropriate spatial scale.</p> <ul style="list-style-type: none"> The treatment design will maintain a minimum percent cover of mature native shrubs within the treatment area to maintain habitat function; the appropriate percent cover will be identified by the project proponent in the development of treatment design and be specific to the vegetation alliances that are present in the identified spatial scale used to evaluate type conversion. Mature native shrubs that are retained will be distributed contiguously or in patches within the stand. If the stand consists of multiple age classes, patches representing a range of middle to old age classes will be retained to maintain and improve heterogeneity, to the extent needed to avoid type conversion. <p>These SPR requirements apply to all treatment activities and all treatment types, including treatment maintenance.</p> <p>Additional measures will be applied to ecological restoration treatment types:</p> <ul style="list-style-type: none"> For ecological restoration treatment types, complete removal of the mature shrub layer will not occur in native chaparral and coastal sage scrub vegetation types. Ecological restoration treatments will not be implemented in vegetation types that are within their natural fire return interval (i.e., time since last burn is less than the average time listed as the fire return interval range in Table 3.6-1) unless the project proponent demonstrates with substantial evidence that the habitat function of chaparral and coastal sage scrub would be improved. 				

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> A minimum of 35 percent relative cover of existing shrubs and associated native vegetation will be retained at existing densities in patches distributed in a mosaic pattern within the treated area or the shrub canopy will be thinned by no more than 20 percent from baseline density (i.e., if baseline shrub canopy density is 60 percent, post treatment shrub canopy density will be no less than 40 percent). A different percent relative cover can be retained if the project proponent demonstrates with substantial evidence that alternative treatment design measures would result in effects on the habitat function of chaparral and coastal sage scrub that are equal or more favorable than those expected to result from application of the above measures. Biological considerations that may inform a deviation from the minimum 35 percent relative cover retention include but are not limited to soil moisture requirements, increased soil temperatures, changes in light/shading, presence of sufficient seed plants and nurse plants, erosion potential, and site hydrology. If the stand within the treatment area consists of multiple age classes, patches representing a range of middle to old age classes will be retained to maintain and improve heterogeneity. <p>These SPR requirements apply to all treatment activities and only the ecosystem restoration treatment type, including treatment maintenance.</p> <p>A determination of compliance with the SB 1260 prohibition of type conversion in chaparral and coastal sage scrub is a statutory issue separate from CEQA compliance that may involve factors additional to the ecological definition and habitat functions presented in the PEIR, such as geographic context. It is beyond the legal scope of the PEIR to define SB 1260 type conversion and statutory compliance. The project proponent, acting as lead agency for the proposed later treatment project, will be responsible for defining type conversion in the context of the project and making the finding that type conversion would not occur, as required by SB 1260. The project proponent will determine its criteria for defining and avoiding type conversion and, in making its findings, may draw upon information presented in this PEIR.</p>				

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>SPR BIO-6: Prevent Spread of Plant Pathogens. When working in sensitive natural communities, riparian habitats, or oak woodlands that are at risk from plant pathogens (e.g., lone chaparral, blue oak woodland), the project proponent will implement the following best management practices to prevent the spread of <i>Phytophthora</i> and other plant pathogens (e.g., pitch canker (<i>Fusarium</i>), goldspotted oak borer, shot hole borer, bark beetle):</p> <ul style="list-style-type: none"> • clean and sanitize vehicles, equipment, tools, footwear, and clothes before arriving at a treatment site and when leaving a contaminated site, or a site in a county where contamination is a risk; • include training on <i>Phytophthora</i> diseases and other plant pathogens in the worker awareness training; • minimize soil disturbance as much as possible by limiting the number of vehicles, avoiding off-road travel as much as possible, and limiting use of mechanized equipment; • minimize movement of soil and plant material within the site, especially between areas with high and low risk of contamination; • clean soil and debris from equipment and sanitize hand tools, buckets, gloves, and footwear when moving from high risk to low risk areas or between widely separated portions of a treatment area; and • follow the procedures listed in Guidance for plant pathogen prevention when working at contaminated restoration sites or with rare plants and sensitive habitat (Working Group for <i>Phytoptheras</i> in Native Habitats 2016). <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA
<p>Special-Status Plants</p>				
<p>SPR BIO-7: Survey for Special-Status Plants. If SPR BIO-1 determines that suitable habitat for special-status plant species is present and cannot be avoided, the project proponent will require a qualified RPF or botanist to conduct protocol-level surveys for special-status plant species with the potential to be affected by a treatment prior to initiation of the treatment. The</p>	<p>Initial Treatment: Y</p>	Prior	MWPA	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>survey will follow the methods in the current version of CDFW’s “Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.”</p> <p>Surveys to determine the presence or absence of special-status plant species will be conducted in suitable habitat that could be affected by the treatment and timed to coincide with the blooming or other appropriate phenological period of the target species (as determined by a qualified RPF or botanist), or all species in the same genus as the target species will be assumed to be special-status.</p> <p>If potentially occurring special-status plants are listed under CESA or ESA, protocol-level surveys to determine presence/absence of the listed species will be conducted in all circumstances, unless determined otherwise by CDFW or USFWS.</p> <p>For other special-status plants not listed under CESA or ESA, as defined in Section 3.6.1 of this PEIR, surveys will not be required under the following circumstances:</p> <ul style="list-style-type: none"> • If protocol-level surveys, consisting of at least two survey visits (e.g., early blooming season and later blooming season) during a normal weather year, have been completed in the 5 years before implementation of the treatment project and no special-status plants were found, and no treatment activity has occurred following the protocol-level survey, treatment may proceed without additional plant surveys. • If the target special-status plant species is an herbaceous annual, stump-sprouting, or geophyte species, the treatment may be carried out during the dormant season for that species or when the species has completed its annual lifecycle without conducting presence/absence surveys provided the treatment will not alter habitat or destroy seeds, stumps, or roots, rhizomes, bulbs and other underground parts in a way that would make it unsuitable for the target species to reestablish following treatment. <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Treatment Maintenance: N</p>			

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
Invasive Plants and Wildlife				
<p>SPR BIO-9: Prevent Spread of Invasive Plants, Noxious Weeds, and Invasive Wildlife: The project proponent will take the following actions to prevent the spread of invasive plants, noxious weeds, and invasive wildlife (e.g., New Zealand mudsnail):</p> <ul style="list-style-type: none"> • clean clothing, footwear, and equipment used during treatments of soil, seeds, vegetative matter, other debris or seed-bearing material, or water (e.g., rivers, streams, creeks, lakes) before entering the treatment area or when leaving an area with infestations of invasive plants, noxious weeds, or invasive wildlife; • for all heavy equipment and vehicles traveling off road, pressure wash, if feasible, or otherwise appropriately decontaminate equipment at a designated weed-cleaning station prior to entering the treatment area from an area with infestations of invasive plants, noxious weeds, or invasive wildlife. Anti-fungal wash agents will be specified if the equipment has been exposed to any pathogen that could affect native species; • inspect all heavy equipment, vehicles, tools, or other treatment-related materials for sand, mud, or other signs that weed seeds or propagules could be present prior to use in the treatment area. If the equipment is not clean, the qualified RPF or biological technician will deny entry to the work areas; • stage equipment in areas free of invasive plant infestations unless there are no uninfested areas present within a reasonable proximity to the treatment area; • identify significant infestations of invasive plant species (i.e., those rated as invasive by Cal-IPC or designated as noxious weeds by California Department of Food and Agriculture) during reconnaissance-level surveys and target them for removal during treatment activities. Treatment methods will be selected based on the invasive species present and may include herbicide application, manual or mechanical treatments, prescribed burning, and/or herbivory, and will be designed to 	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>During</p>	<p>Contractor</p>	<p>MWPA</p>

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>maximize success in killing or removing the invasive plants and preventing reestablishment based on the life history characteristics of the invasive plant species present. Treatments will be focused on removing invasive plant species that cause ecological harm to native vegetation types, especially those that can alter fire cycles;</p> <ul style="list-style-type: none"> • treat invasive plant biomass onsite to eliminate seeds and propagules and prevent reestablishment or dispose of invasive plant biomass offsite at an appropriate waste collection facility (if not kept on site); transport invasive plant materials in a closed container or bag to prevent the spread of propagules during transport; and • implement Fire and Fuel Management BMPs outlined in the “Preventing the Spread of Invasive Plants: Best Management Practices for Land Mangers” (Cal-IPC 2012, or current version). <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>				
Wildlife				
<p>SPR BIO-10: Survey for Special-Status Wildlife and Nursery Sites: If SPR BIO-1 determines that suitable habitat for special-status wildlife species or nurseries of any wildlife species is present and cannot be avoided, the project proponent will require a qualified RPF or biologist to conduct focused or protocol-level surveys for special-status wildlife species or nursery sites (e.g., bat maternity roosts, deer fawning areas, heron or egret rookeries, monarch overwintering sites) with potential to be directly or indirectly affected by a treatment activity. The survey area will be determined by a qualified RPF or biologist based on the species and habitats and any recommended buffer distances in agency protocols.</p> <p>The qualified RPF or biologist will determine if following an established protocol is required, and the project proponent may consult with CDFW and/or USFWS for technical information regarding appropriate survey protocols. Unless otherwise specified in a protocol, the survey will be conducted no more than 14 days prior to the beginning of treatment activities. Focused or protocol surveys for a special-status species with</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: N</p>	Prior	MWPA	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>potential to occur in the treatment area may not be required if presence of the species is assumed.</p> <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>				
<p>SPR BIO-11. Install Wildlife-Friendly Fencing (Prescribed Herbivory). If temporary fencing is required for prescribed herbivory treatment, a wildlife-friendly fencing design will be used. The project proponent will require a qualified RPF or biologist to review and approve the design before installation to minimize the risk of wildlife entanglement. The fencing design will meet the following standards:</p> <ul style="list-style-type: none"> • Minimize the chance of wildlife entanglement by avoiding barbed wire, loose or broken wires, or any material that could impale or snag a leaping animal; and, if feasible, keeping electric netting-type fencing electrified at all times or laid down while not in use. • Charge temporary electric fencing with intermittent pulse energizers; continuous output fence chargers will not be permitted. • Allow wildlife to jump over easily without injury by installing fencing that can flex as animals pass over it and installing the top wire low enough (no more than approximately 40 inches high on flat ground) to allow adult ungulates to jump over it. The determination of appropriate fence height will consider slope, as steep slopes are more difficult for wildlife to pass. • Be highly visible to birds and mammals by using high-visibility tape or wire, flagging, or other markers. <p>This SPR applies only to prescribed herbivory and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior	Contractor	MWPA
<p>SPR BIO-12. Protect Common Nesting Birds, Including Raptors. The project proponent will schedule treatment activities to avoid the active nesting season of common native bird species, including raptors, that could be present within or adjacent to the treatment site, if feasible. Common native birds are species not otherwise treated as special status in the CalVTP PEIR. The active nesting season will be defined by the qualified RPF or biologist.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Fire Agency & Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>If active nesting season avoidance is not feasible, a qualified RPF or biologist will conduct a survey for common nesting birds, including raptors. Existing records (e.g., CNDDDB, eBird database, State Wildlife Action Plan) should be reviewed in advance of the survey to identify the common nesting birds, including raptors, that are known to occur in the vicinity of the treatment site. The survey area will encompass reasonably accessible areas of the treatment site and the immediately surrounding vicinity viewable from the treatment site. The survey area will be determined by a qualified RPF or biologist, based on the potential species in the area, location of suitable nesting habitat, and type of treatment. For vegetation removal or project activities that would occur during the nesting season, the survey will be conducted at a time that balances the effectiveness of detecting nests and the reasonable consideration of potential avoidance strategies. Typically, this timeframe would be up to 3 weeks before treatment. The survey will occur in a single survey period of sufficient duration to reasonably detect nesting birds, including raptors, typically one day for most treatment projects (depending on the size, configuration, and vegetation density in the treatment site), and conducted during the active time of day for target species, typically close to dawn and/or dusk. The survey may be conducted concurrently with other biological surveys, if they are required by other SPRs. Survey methods will be tailored by the qualified RPF or biologist to site and habitat conditions, typically involving walking throughout the survey area, visually searching for nests and birds exhibiting behavior that is typical of breeding (e.g., delivering food).</p> <p>If an active nest is observed (i.e., presence of eggs and/or chicks) or determined to likely be present based on nesting bird behavior, the project proponent will implement a feasible strategy to avoid disturbance of active nests, which may include, but is not limited to, one or more of the following:</p> <ul style="list-style-type: none"> Establish Buffer. The project proponent will establish a temporary, species-appropriate buffer around the nest sufficient to reasonably expect that breeding would not be disrupted. Treatment activities will be implemented outside of the buffer. The buffer location will be determined by a qualified RPF or biologist. Factors to be considered for determining 				

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>buffer location will include: presence of natural buffers provided by vegetation or topography, nest height above ground, baseline levels of noise and human activity, species sensitivity, and expected treatment activities. Nests of common birds within the buffer need not be monitored during treatment. However, buffers will be maintained until young fledge or the nest becomes inactive, as determined by the qualified RPF, biologist, or biological technician.</p> <ul style="list-style-type: none"> • Modify Treatment. The project proponent will modify the treatment in the vicinity of an active nest to avoid disturbance of active nests (e.g., by implementing manual treatment methods, rather than mechanical treatment methods). Treatment modifications will be determined by the project proponent in coordination with the qualified RPF or biologist. • Defer Treatment. The project proponent will defer the timing of treatment in the portion(s) of the treatment site that could disturb the active nest. If this avoidance strategy is implemented, treatment activity will not commence until young fledge or the nest becomes inactive, as determined by the qualified RPF, biologist, or biological technician. <p>Feasible actions will be taken by the project proponent to avoid loss of common native bird nests. The feasibility of implementing the avoidance strategies will be determined by the project proponent based on whether implementation of this SPR will preclude completing the treatment project within the reasonable period of time necessary to meet CalVTP program objectives, including, but not limited to, protection of vulnerable communities. Considerations may include limitations on the presence of environmental and atmospheric conditions necessary to execute treatment prescriptions (e.g., the limited seasonal windows during which prescribed burning can occur when vegetation moisture, weather, wind, and other physical conditions are suitable). If it is infeasible to avoid loss of common bird nests (not including raptor nests), the project proponent will document the reasons implementation of the avoidance strategies is infeasible in the PSA. After completion of the PSA and prior to or during treatment implementation, if there is any change in the feasibility of avoidance strategies from those explained in the PSA, this will be documented in the</p>				

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>post-project implementation report (referred to by CAL FIRE as a Completion Report).</p> <p>The following avoidance strategies may also be considered together with or in lieu of other actions for implementation by a project proponent to avoid disturbance to raptor nests:</p> <ul style="list-style-type: none"> Monitor Active Raptor Nest During Treatment. A qualified RPF, biologist, or biological technician will monitor an active raptor nest during treatment activities to identify signs of agitation, nest defense, or other behaviors that signal disturbance of the active nest is likely (e.g., standing up from a brooding position, flying off the nest). If breeding raptors are showing signs of nest disturbance, one of the other avoidance strategies (establish buffer, modify treatment or defer treatment) will be implemented or a pause in the treatment activity will occur until the disturbance behavior ceases. Retention of Raptor Nest Trees. Trees with visible raptor nests, whether occupied or not, will be retained. <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>				
Geology, Soils, and Mineral Resource Standard Project Requirements				
<p>SPR GEO-1 Suspend Disturbance during Heavy Precipitation: The project proponent will suspend mechanical, prescribed herbivory, and herbicide treatments if the National Weather Service forecast is a “chance” (30 percent or more) of rain within the next 24 hours. Activities that cause mechanical soil disturbance may resume when precipitation stops and soils are no longer saturated (i.e., when soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur). Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials. This SPR</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>During</p>	<p>Contractor</p>	<p>MWPA</p>

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
applies only to mechanical, prescribed herbivory, and herbicide treatment activities and all treatment types, including treatment maintenance.				
<p>SPR GEO-2 Limit High Ground Pressure Vehicles: The project proponent will limit heavy equipment that could cause soil disturbance or compaction to be driven through treatment areas when soils are wet and saturated to avoid compaction and/or damage to soil structure. Saturated soil means that soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. If use of heavy equipment is required in saturated areas, other measures such as operating on organic debris, using low ground pressure vehicles, or operating on frozen soils/snow covered soils will be implemented to minimize soil compaction. Existing compacted road surfaces are exempted as they are already compacted from use. This SPR applies only to mechanical treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA
<p>SPR GEO-3 Stabilize Disturbed Soil Areas: The project proponent will stabilize soil disturbed during mechanical, prescribed herbivory treatments, and prescribed burns that result in exposure of bare soil over 50 percent or more of the treatment area with mulch or equivalent immediately after treatment activities, to the maximum extent practicable, to minimize the potential for substantial sediment discharge. If mechanical, prescribed herbivory, or prescribed burn treatment activities could result in substantial sediment discharge from soil disturbed by machinery, animal hooves, or being bare, organic material from mastication or mulch will be incorporated onto at least 75 percent of the disturbed soil surface where the soil erosion hazard is moderate or high, and 50 percent of the disturbed soil surface where soil erosion hazard is low to help prevent erosion. Where slash mulch is used, it will be packed into the ground surface with heavy equipment so that it is sufficiently in contact with the soil surface. This SPR only applies to mechanical, prescribed herbivory, and prescribed burns that result in exposure of bare soil over 50 percent of the project area treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>SPR GEO-4 Erosion Monitoring: The project proponent will inspect treatment areas for the proper implementation of erosion control SPRs and mitigations prior to the rainy season. If erosion control measures are not properly implemented, they will be remediated prior to the first rainfall event per SPR GEO-3 and GEO-8. Additionally, the project proponent will inspect for evidence of erosion after the first large storm or rainfall event (i.e., ≥ 1.5 inches in 24 hours) as soon as is feasible after the event. Any area of erosion that will result in substantial sediment discharge will be remediated within 48 hours per the methods stated in SPRs GEO-3 and GEO-8. This SPR applies only to mechanical, prescribed herbivory, and prescribed burning treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>During-After</p>	<p>Fire Agency & Contractor</p>	<p>MWPA</p>
<p>SPR GEO-5 Drain Stormwater via Water Breaks: The project proponent will drain compacted and/or bare linear treatment areas capable of generating storm runoff via water breaks using the spacing and erosion control guidelines contained in Sections 914.6, 934.6, and 954.6(c) of the California Forest Practice Rules (February 2019 version). Where waterbreaks cannot effectively disperse surface runoff, including where waterbreaks cause surface run-off to be concentrated on downslopes, other erosion controls will be installed as needed to maintain site productivity by minimizing soil loss. This SPR applies only to mechanical, manual, and prescribed burn treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>During</p>	<p>Contractor</p>	<p>MWPA</p>
<p>SPR GEO-6 Minimize Burn Pile Size: The project proponent will not create burn piles that exceed 20 feet in length, width, or diameter, except when on landings, road surfaces, or on contour to minimize the spatial extent of soil damage. In addition, burn piles will not occupy more than 15 percent of the total treatment area (Busse et al. 2014). The project proponent will not locate burn piles in a Watercourse and Lake Protection Zone as defined in SPR HYD-4. This SPR applies to mechanical, manual, and prescribed burning treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>During</p>	<p>Contractor</p>	<p>MWPA</p>

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>SPR GEO-7 Minimize Erosion: To minimize erosion, the project proponent will:</p> <ul style="list-style-type: none"> (1) Prohibit use of heavy equipment where any of the following conditions are present: <ul style="list-style-type: none"> (i) Slopes steeper than 65 percent. (ii) Slopes steeper than 50 percent where the erosion hazard rating is high or extreme. (iii) Slopes steeper than 50 percent that lead without flattening to sufficiently dissipate water flow and trap sediment before it reaches a watercourse or lake. (2) On slopes between 50 percent and 65 percent where the erosion hazard rating is moderate, and all slope percentages are for average slope steepness based on sample areas that are 20 acres, or less, heavy equipment will be limited to: <ul style="list-style-type: none"> (i) Existing tractor roads that do not require reconstruction, or (ii) New tractor roads flagged by the project proponent prior to the treatment activity. (3) Prescribed herbivory treatments will not be used in areas with over 50 percent slope. <p>This SPR applies to all treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA
<p>SPR GEO-8 Steep Slopes: The project proponent will require a Registered Professional Forester (RPF) or licensed geologist to evaluate treatment areas with slopes greater than 50 percent for unstable areas (areas with potential for landslide) and unstable soils (soil with moderate to high erosion hazard). If unstable areas or soils are identified within the treatment area, are unavoidable, and will be potentially directly or indirectly affected by the treatment, a licensed geologist (P.G. or C.E.G.) will determine the potential for landslide, erosion, of other issue related to unstable soils and identify measures (e.g., those in SPR GEO-7) that will be implemented by the project proponent such that substantial erosion or loss of topsoil would not occur.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Fire Agency & Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>This SPR applies only to mechanical treatment activities and WUI fuel reduction, non-shaded fuel breaks, and ecological restoration treatment types, including treatment maintenance.</p>				
<p>Hazardous Material and Public Health and Safety Standard Project Requirements</p>				
<p>SPR HAZ-1 Maintain All Equipment: The project proponent will maintain all diesel- and gasoline-powered equipment per manufacturer’s specifications, and in compliance with all state and federal emissions requirements. Maintenance records will be available for verification. Prior to the start of treatment activities, the project proponent will inspect all equipment for leaks and inspect everyday thereafter until equipment is removed from the site. Any equipment found leaking will be promptly removed. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>Prior- During- After</p>	<p>Contractor</p>	<p>MWPA</p>
<p>SPR HAZ-2 Require Spark Arrestors: The project proponent will require mechanized hand tools to have federal- or state-approved spark arrestors. This SPR applies only to manual treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>During</p>	<p>Contractor</p>	<p>MWPA</p>
<p>SPR HAZ-3 Require Fire Extinguishers: The project proponent will require tree cutting crews to carry one fire extinguisher per chainsaw. Each vehicle would be equipped with one long-handled shovel and one axe or Pulaski consistent with PRC Section 4428. This SPR applies only to manual treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>During</p>	<p>Contractor</p>	<p>MWPA</p>
<p>SPR HAZ-4 Prohibit Smoking in Vegetated Areas: The project proponent will require that smoking is only permitted in designated smoking areas barren or cleared to mineral soil at least 3 feet in diameter (PRC Section 4423.4). This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>During</p>	<p>Contractor</p>	<p>MWPA</p>

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>SPR HAZ-5 Spill Prevention and Response Plan: The project proponent or licensed Pest Control Advisor (PCA) will prepare a Spill Prevention and Response Plan (SPRP) prior to beginning any herbicide treatment activities to provide protection to onsite workers, the public, and the environment from accidental leaks or spills of herbicides, adjuvants, or other potential contaminants. The SPRP will include (but not be limited to):</p> <ul style="list-style-type: none"> • a map that delineates staging areas, and storage, loading, and mixing areas for herbicides; • a list of items required in an onsite spill kit that will be maintained throughout the life of the activity; • procedures for the proper storage, use, and disposal of any herbicides, adjuvants, or other chemicals used in vegetation treatment. <p>This SPR applies only to herbicide treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>Prior</p>	<p>Fire Agency & Contractor</p>	<p>MWPA</p>
<p>SPR HAZ-6 Comply with Herbicide Application Regulations: The project proponent will coordinate pesticide use with the applicable County Agricultural Commissioner(s), and all required licenses and permits will be obtained prior to herbicide application. The project proponent will prepare all herbicide applications to do the following:</p> <ul style="list-style-type: none"> • Be implemented consistent with recommendations prepared annually by a licensed PCA. • Comply with all appropriate laws and regulations pertaining to the use of pesticides and safety standards for employees and the public, as governed by the EPA, DPR, and applicable local jurisdictions. • Adhere to label directions for application rates and methods, storage, transportation, mixing, container disposal, and weather limitations to application such as wind speed, humidity, temperature, and precipitation. • Be applied by an applicator appropriately licensed by the State. <p>This SPR applies only to herbicide treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>Prior-During</p>	<p>Fire Agency & Contractor</p>	<p>MWPA</p>

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>SPR HAZ-7 Triple Rinse Herbicide Containers: The project proponent will triple rinse all herbicide and adjuvant containers with clean water at an approved site, and dispose of rinsate by placing it in the batch tank for application per 3 CCR Section 6684. The project proponent will puncture used containers on the top and bottom to render them unusable, unless said containers are part of a manufacturer’s container recycling program, in which case the manufacturer’s instructions will be followed. Disposal of non-recyclable containers will be at legal dumpsites. Equipment will not be cleaned, and personnel will not be washed in a manner that would allow contaminated water to directly enter any body of water within the treatment area or adjacent watersheds. Disposal of all herbicides will follow label requirements and waste disposal regulations.</p> <p>This SPR applies only to herbicide treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA
<p>SPR HAZ-8 Minimize Herbicide Drift to Public Areas: The project proponent will employ the following herbicide application parameters during herbicide application to minimize drift into public areas:</p> <ul style="list-style-type: none"> • application will cease when weather parameters exceed label specifications or when sustained winds at the site of application exceeds 7 miles per hour (whichever is more conservative); • low nozzle pressures (30-70 pounds per square inch) will be utilized to minimize drift; and • spray nozzles will be kept within 24 inches of vegetation during spraying. <p>This SPR applies only to herbicide treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA
<p>SPR HAZ-9 Notification of Herbicide Use in the Vicinity of Public Areas: For herbicide applications occurring within or adjacent to public recreation areas, residential areas, schools, or any other public areas within 500 feet, the project proponent will post signs at each end of herbicide treatment areas and any intersecting trails notifying the public of the use of herbicides. The signs will include the signal word (i.e., Danger, Warning or Caution),</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior	Fire Agency	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>product name, and manufacturer; active ingredient; EPA registration number; target pest; treatment location; date and time of application; restricted entry interval, if applicable per the label requirements; date which notification sign may be removed; and a contact person with a telephone number. Signs will be posted prior to the start of treatment and notification will remain in place for at least 72 hours after treatment ceases. This SPR applies only to herbicide treatment activities and all treatment types, including treatment maintenance.</p>				
<p>Hydrology and Water Quality Standard Project Requirements</p>				
<p>SPR HYD-1 Comply with Water Quality Regulations: Project proponents must also conduct proposed vegetation treatments in conformance with appropriate RWQCB timber, vegetation, and land disturbance related Waste Discharge Requirements (WDRs) and/or related Conditional Waivers of Waste Discharge Requirements (Waivers), and appropriate Basin Plan Prohibitions. Where these regulatory requirements differ, the most restrictive will apply. If applicable, this includes compliance with the conditions of general waste discharge requirements (WDR) and waste discharge requirement waivers for timber or silviculture activities where these waivers are designed to apply to non-commercial fuel reduction and forest health projects. In general, WDR and Waivers of waste discharge requirements for fuel reduction and forest health activities require that wastes, including but not limited to petroleum products, soil, silt, sand, clay, rock, felled trees, slash, sawdust, bark, ash, and pesticides must not be discharged to surface waters or placed where it may be carried into surface waters; and that Water Board staff must be allowed reasonable access to the property in order to determine compliance with the waiver conditions. The specifications for each WDR and Waiver vary by region. Regions 2 (San Francisco Bay), 4 (Los Angeles), 8 (Santa Ana), and 7 (Colorado River) are highly urban or minimally forested and do not offer WDRs or Waivers for fuel reduction or vegetation management activities. The current applicable WDRs and Waivers for timber and vegetation management activities are</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>Prior- During- After</p>	<p>Contractor</p>	<p>MWPA</p>

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
included in Appendix HYD-1. This SPR applies to all treatment activities and treatment types, including treatment maintenance.				
<p>SPR HYD-2 Avoid Construction of New Roads: The project proponent will not construct or reconstruct (i.e., cutting or filling involving less than 50 cubic yards/0.25 linear road miles) any new roads (including temporary roads). This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA
<p>SPR HYD-3 Water Quality Protections for Prescribed Herbivory: The project proponent will include the following water quality protections for all prescribed herbivory treatments:</p> <ul style="list-style-type: none"> Environmentally sensitive areas such as waterbodies, wetlands, or riparian areas will be identified in the treatment prescription and excluded from prescribed herbivory project areas using temporary fencing or active herding. A buffer of approximately 50 feet will be maintained between sensitive and actively grazed areas. Water will be provided for grazing animals in the form of an on-site stock pond or a portable water source located outside of environmentally sensitive areas. Treatment prescriptions will be designed to protect soil stability. Grazing animals will be herded out of an area if accelerated soil erosion is observed. <p>This SPR applies to prescribed herbivory treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Fire Agency & Contractor	MWPA
<p>SPR HYD-4 Identify and Protect Watercourse and Lake Protection Zones: The project proponent will establish Watercourse and Lake Protection Zones (WLPZs) on either side of watercourses as defined in the table below, which is based on 14 CCR Section 916 .5 of the California Forest Practice Rules (February 2019 version). WLPZ's are classified based on the uses of the stream and the presence of aquatic life. Wider WLPZs are required for steep slopes.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Fire Agency & Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
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Procedures for Determining Watercourse and Lake Protection Zone (WLPZ) widths

Water Class	Class I	Class II	Class III	Class IV
Water Class Characteristics or Key Indicator Beneficial Use	1) Domestic supplies, including springs, on site and/or within 100 feet downstream of the operations area and/or 2) Fish always or seasonally present onsite, includes habitat to sustain fish migration and spawning.	1) Fish always or seasonally present offsite within 1000 feet downstream and/or 2) Aquatic habitat for nonfish aquatic species. 3) Excludes Class III waters that are tributary to Class I waters.	No aquatic life present, watercourse showing evidence of being capable of sediment transport to Class I and II waters under normal high-water flow conditions after completion of timber operations.	Man-made watercourses, usually downstream, established domestic, agricultural, hydroelectric supply or other beneficial use.

WLPZ Width (ft) – Distance from top of bank to the edge of WLPZ			
< 30 % Slope	75	50	Sufficient to prevent the degradation of downstream beneficial uses of water. Determined on a site-specific basis.
30-50 % Slope	100	75	
>50 % Slope	150	100	

Source: 14 CCR Section 916.5 [936.5, 956.5] (February 2019 version)

The following WLPZ protections will be applied for all treatments:

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> • Treatment activities with WLPZs will retain at least 75 percent surface cover and undisturbed area to act as a filter strip for raindrop energy dissipation and for wildlife habitat. If this percentage is reduced a qualified RPF will provide the project proponent with a site- and/or treatment activity-specific explanation for the percent surface cover reduction, which will be included in the PSA. After completion of the PSA and prior to or during treatment implementation, if there is any deviation (e.g., further reduction) from the reduced percent as explained in the PSA, this will be documented in the post-project implementation report (referred to by CAL FIRE as a Completion Report). This requirement is based on 14 CCR Section 916.4 [936.4, 956.4] Subsection (b)(6) (February 2019 version) and 14 CCR Section 916.5 (February 2019 version). • Equipment, including tractors and vehicles, must not be driven in wet areas or WLPZs, except over existing roads or watercourse crossings where vehicle tires or tracks remain dry. • Equipment used in vegetation removal operations will not be serviced in WLPZs, within wet meadows or other wet areas, or in locations that would allow grease, oil, or fuel to pass into lakes, watercourses, or wet areas. • WLPZs will be kept free of slash, debris, and other material that harm the beneficial uses of water. Accidental deposits will be removed immediately. • Burn piles will be located outside of WLPZs. • No fire ignition (nor use of associated accelerants) will occur within WLPZs however low intensity backing fires may be allowed to enter or spread into WLPZs. • Within Class I and Class II WLPZs, locations where project operations expose a continuous area of mineral soil 800 square feet or larger shall be treated for reduction of soil loss. Treatment shall occur prior to October 15th and disturbances that are created after October 15th shall be treated within 10 days. Stabilization measures shall be selected that will prevent significant movement of soil into water bodies and may 				

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>include but are not limited to mulching, rip-rap, grass seeding, or chemical soil stabilizers.</p> <ul style="list-style-type: none"> Where mineral soil has been exposed by project operations on approaches to watercourse crossings of Class I, II, or III within a WLPZ, the disturbed area shall be stabilized to the extent necessary to prevent the discharge of soil into watercourses or lakes in amounts that would adversely affect the quality and beneficial uses of the watercourse. Where necessary to protect beneficial uses of water from project operations, protection measures such as seeding, mulching, or replanting shall be used to retain and improve the natural ability of the ground cover within the WLPZ to filter sediment, minimize soil erosion, and stabilize banks of watercourses and lakes. Equipment limitation zones (ELZs) will be designated adjacent to Class III and Class IV watercourses with minimum widths of 25 feet where side-slope is less than 30 percent and 50 feet where side-slope is 30 percent or greater. An RPF will describe the limitations of heavy equipment within the ELZ and, where appropriate, will include additional measures to protect the beneficial uses of water. <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>				
<p>SPR HYD-5 Protect Non-Target Vegetation and Special-status Species from Herbicides: The project proponent will implement the following measures when applying herbicides:</p> <ul style="list-style-type: none"> Locate herbicide mixing sites in areas devoid of vegetation and where there is no potential of a spill reaching non-target vegetation or a waterway. Use only herbicides labeled for use in aquatic environments when working in riparian habitats or other areas where there is a possibility the herbicide could come into direct contact with water. Only hand application of herbicides will be allowed in riparian habitats and only during low-flow periods or when seasonal streams are dry. 	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> No terrestrial or aquatic herbicides will be applied within WLPZs of Class I and II watercourses, if feasible. If this is not feasible, hand application of herbicides labeled for use in aquatic environments may be used within the WLPZ provided that the project proponent notifies the applicable regional water quality control board no fewer than 15 days prior to herbicide application. The feasibility of avoiding herbicide application within WLPZ of Class I and II watercourses will be determined by the project proponent and may be based on whether doing so will preclude achieving CalVTP program objectives, including, but not limited to, protection of vulnerable communities. The reasons for infeasibility will be documented in the PSA. No herbicides will be applied within a 50-foot buffer of ESA or CESA listed plant species or within 50 feet of dry vernal pools. For spray applications in and adjacent to habitats suitable for special-status species, use herbicides containing dye (registered for aquatic use by DPR, if warranted) to prevent overspray. Application will cease when weather parameters exceed label specifications or when sustained winds at the site of application exceeds 7 miles per hour (whichever is more conservative); No herbicide will be applied during precipitation events or if precipitation is forecast 24 hours before or after project activities. <p>This SPR applies to herbicide treatment activities and all treatment types, including treatment maintenance.</p>				
<p>SPR HYD-6 Protect Existing Drainage Systems: If a treatment activity is adjacent to a roadway with stormwater drainage infrastructure, the existing stormwater drainage infrastructure will be marked prior to ground disturbing activities. If a drainage structure or infiltration system is inadvertently disturbed or modified during project activities, the project proponent will coordinate with owner of the system or feature to repair any damage and restore pre-project drainage conditions. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Fire Agency & Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
Noise Standard Project Requirements				
<p>SPR NOI-1 Limit Heavy Equipment Use to Daytime Hours: The project proponent will require that operation of heavy equipment associated with treatment activities (heavy off-road equipment, tools, and delivery of equipment and materials) will occur during daytime hours if such noise would be audible to receptors (e.g., residential land uses, schools, hospitals, places of worship). Cities and counties in the treatable landscape typically restrict construction-noise (which would apply to vegetation treatment noise) to particular daytime hours. If the project proponent is subject to local noise ordinance, it will adhere to those to the extent the project is subject to them. If the applicable jurisdiction does not have a noise ordinance or policy restricting the time-of-day when noise-generating activity can occur noise-generating vegetation treatment activity will be limited to the hours of 7:00 a.m. to 6:00 p.m., Monday through Saturday, and between 9:00 a.m. and 6:00 p.m. on Sunday and federal holidays. If the project proponent is not subject to local ordinances (e.g., CAL FIRE), it will adhere to the restrictions stated above or may elect to adhere to the restrictions identified by the local ordinance encompassing the treatment area. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA
<p>SPR NOI-2 Equipment Maintenance: The project proponent will require that all powered treatment equipment and power tools will be used and maintained according to manufacturer specifications. All diesel- and gasoline-powered treatment equipment will be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. This SPR applies to all activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Contractor	MWPA
<p>SPR NOI-3 Engine Shroud Closure: The project proponent will require that engine shrouds be closed during equipment operation. This SPR applies only to mechanical treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>SPR NOI-4 Locate Staging Areas Away from Noise-Sensitive Land Uses: The project proponent will locate treatment activities, equipment, and equipment staging areas away from nearby noise-sensitive land uses (e.g., residential land uses, schools, hospitals, places of worship), to the extent feasible, to minimize noise exposure. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Fire Agency & Contractor	MWPA
<p>SPR NOI-5 Restrict Equipment Idle Time: The project proponent will require that all motorized equipment be shut down when not in use. Idling of equipment and haul trucks will be limited to 5 minutes. This SPR applies to all treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA
<p>SPR NOI-6 Notify Nearby Off-Site Noise-Sensitive Receptors: For treatment activities utilizing heavy equipment, the project proponent will notify noise-sensitive receptors (e.g., residential land uses, schools, hospitals, places of worship) located within 1,500 feet of the treatment activity. Notification will include anticipated dates and hours during which treatment activities are anticipated to occur and contact information, including a daytime telephone number, of the project representative. Recommendations to assist noise-sensitive land uses in reducing interior noise levels (e.g., closing windows and doors) will also be included in the notification. This SPR applies only to mechanical treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior	Fire Agency	MWPA
<p>Recreation Standard Project Requirements</p>				
<p>SPR REC-1 Notify Recreational Users of Temporary Closures: If a treatment activity would require temporary closure of a public recreation area or facility, the project proponent will coordinate with the owner/manager of that recreation area or facility. If temporary closure of a recreation area or facility is required, the project proponent will work with the owner/manager to post notifications of the closure at least 2 weeks prior to the commencement of the treatment activities. Additionally, notification of the</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior	Fire Agency	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>treatment activity will be provided to the Administrative Officer (or equivalent official responsible for distribution of public information) of the county(ies) in which the affected recreation area or facility is located. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>				
Transportation Standard Project Requirements				
<p>SPR TRAN-1 Implement Traffic Control during Treatments: Prior to initiating vegetation treatment activities the project proponent will work with the agency(ies) with jurisdiction over affected roadways to determine if a Traffic Management Plan (TMP) is needed. A TMP will be needed if traffic generated by the project would result in obstructions, hazards, or delays exceeding applicable jurisdictional standards along access routes for individual vegetation treatments. If needed, a TMP will be prepared to provide measures to reduce potential traffic obstructions, hazards, and service level degradation along affected roadway facilities. The scope of the TMP will depend on the type, intensity, and duration of the specific treatment activities under the CalVTP. Measures included in the TMP could include (but are not be limited to) construction signage to provide motorists with notification and information when approaching or traveling along the affected roadway facilities, flaggers for lane closures to provide temporary traffic control along affected roadway facilities, treatment schedule restrictions to avoid seasons or time periods of peak vehicle traffic, haul-trip, delivery, and/or commute time restrictions that would be implemented to avoid peak traffic days and times along affected roadway facilities. If the TMP identifies impacts on transportation facilities outside of the jurisdiction of the project proponent, the TMP will be submitted to the agency with jurisdiction over the affected roadways prior to commencement of vegetation treatment projects. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p> <p>Smoke generated during prescribed burn operations could potentially affect driver visibility and traffic operations along nearby roadways. Direct smoke impacts to roadway visibility and indirect impacts related to driver</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Fire Agency & Contractor	MWPA

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Standard Project Requirements	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>distraction will be considered during the planning phase of burning operations. Smoke impacts and smoke management practices specific to traffic operations during prescribed fire operations will be identified and addressed within the TMP. The TMP will include measures to monitor smoke dispersion onto public roadways, and traffic control operations will be initiated in the event burning operations could affect traffic safety along any roadways. This SPR applies only to prescribed burn treatment activities and all treatment types, including treatment maintenance.</p>				
<p>Public Services and Utilities Standard Project Requirements</p>				
<p>SPR UTIL-1: Solid Organic Waste Disposition Plan: For projects requiring the disposal of material outside of the treatment area, the project proponent will prepare an Organic Waste Disposition Plan prior to initiating treatment activities. The Solid Organic Waste Disposition Plan will include the amount (e.g., tons) of solid organic waste to be managed onsite (i.e., scattering of wood materials, generating unburned piles, and pile burning) and transported offsite for processing (i.e., biomass power plant, wood product processing facility, composting). If the project proponent intends to transport solid organic waste offsite, the Solid Organic Waste Disposition Plan will clearly identify the location and capacity of the intended processing facility, consistent with local and state regulations to demonstrate that adequate capacity exists to accept the treated materials. This SPR applies only to mechanical and manual treatment activities and all treatment types, including treatment maintenance.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: N</p>	<p>Prior</p>	<p>Fire Agency</p>	<p>MWPA</p>

Mitigation Measures

Table 2 Mitigation Measures Applicable to the Greater Novato Shaded Fuel Break Project

Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
Air Quality				
<p>Mitigation Measure AQ-1: Implement On-Road Vehicle and Off-Road Equipment Exhaust Emission Reduction Techniques</p> <p>Where feasible, project proponents will implement emission reduction techniques to reduce exhaust emissions from off-road equipment. It is acknowledged that due to cost, availability, and the limits of current technology, there may be circumstances where implementation of certain emission reduction techniques will not be feasible. The project proponent will document the emission reduction techniques that will be applied and will explain the reasons other techniques that could reduce emissions are infeasible.</p> <p>Techniques for reducing emissions may include, but are not limited to, the following:</p> <ul style="list-style-type: none"> • Diesel-powered off-road equipment used in construction will meet EPA’s Tier 4 emission standards as defined in 40 CFR 1039 and comply with the exhaust emission test procedures and provisions of 40 CFR Parts 1065 and 1068. Tier 3 models can be used if a Tier 4 version of the equipment type is not yet produced by manufacturers. This measure can also be achieved by using battery-electric off-road equipment as it becomes available. Prior to implementation of treatment activities, the project proponent will demonstrate the ability to supply the compliant equipment. A copy of each unit’s certified tier specification or model year specification and operating permit (if applicable) will be available upon request at the time of mobilization of each unit of equipment. • Use renewable diesel fuel in diesel-powered construction equipment. Renewable diesel fuel must meet the following criteria: <ul style="list-style-type: none"> – meet California’s Low Carbon Fuel Standards and be certified by CARB Executive Officer; 	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Contractor	MWPA

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> - be hydrogenation-derived (reaction with hydrogen at high temperatures) from 100 percent biomass material (i.e., non-petroleum sources), such as animal fats and vegetables; - contain no fatty acids or functionalized fatty acid esters; and - have a chemical structure that is identical to petroleum-based diesel and complies with American Society for Testing and Materials D975 requirements for diesel fuels to ensure compatibility with all existing diesel engines. • Electric- and gasoline-powered equipment will be substituted for diesel-powered equipment. • Workers will be encouraged to carpool to work sites, and/or use public transportation for their commutes. • Off-road equipment, diesel trucks, and generators will be equipped with Best Available Control Technology for emission reductions of NO_x and PM. 				
Archaeological, Historical, and Tribal Cultural Resources				
<p>Mitigation Measure CUL-2: Protect Inadvertent Discoveries of Unique Archaeological Resources or Subsurface Historical Resources</p> <p>If any prehistoric or historic-era subsurface archaeological features or deposits, including locally darkened soil (“midden”), that could conceal cultural deposits, are discovered during ground-disturbing activities, all ground-disturbing activity within 100 feet of the resources will be halted and a qualified archaeologist will assess the significance of the find. The qualified archaeologist will work with the project proponent to develop a primary records report that will comply with applicable state or local agency procedures. If the archaeologist determines that further information is needed to evaluate significance, a data recovery plan will be prepared. If the find is determined to be significant by the qualified archaeologist (i.e., because the find constitutes a unique archaeological resource, subsurface historical resource, or tribal cultural resource), the archaeologist will work with the project proponent to develop appropriate procedures to protect the</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>During-After</p>	<p>Contractor</p>	<p>MWPA</p>

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>integrity of the resource. Procedures could include preservation in place (which is the preferred manner of mitigating impacts to archaeological sites), archival research, subsurface testing, or recovery of scientifically consequential information from and about the resource. Any find will be recorded standard DPR Primary Record forms (Form DPR 523) will be submitted to the appropriate regional information center.</p>				
Biological Resources				
<p>Mitigation Measure BIO-1a: Avoid Loss of Special-Status Plants Listed under ESA or CESA</p> <p>If listed plants are determined to be present through application of SPR BIO-1 and SPR BIO-7, the project proponent will avoid and protect these species by establishing a no-disturbance buffer around the area occupied by listed plants and marking the buffer boundary with high-visibility flagging, fencing, stakes, or clear, existing landscape demarcations (e.g., edge of a roadway), exceptions to this requirement are listed later in this measure. The no-disturbance buffers will generally be a minimum of 50 feet from listed plants, but the size and shape of the buffer zone may be adjusted if a qualified RPF or botanist determines that a smaller buffer will be sufficient to avoid killing or damaging listed plants or that a larger buffer is necessary to sufficiently protect plants from the treatment activity. The appropriate buffer size will be determined based on plant phenology at the time of treatment (e.g., whether the plants are in a dormant, vegetative, or flowering state), the individual species' vulnerability to the treatment method being used, and environmental conditions and terrain. For example, paint-on or wicking application of herbicides to invasive plants may be implemented within 50 feet of listed plant species without posing a risk, especially if the listed plants are dormant at the time of application. Consideration of factors such as site hydrology, changes in light, edge effects, and potential introduction of invasive plants and noxious weeds may inform the determination of buffer width. If a no-disturbance buffer is reduced below 50 feet from a listed plant, a qualified RPF or botanist will provide the project proponent with a site- and/or treatment activity-specific explanation for the buffer reduction, which will be</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>Prior-During</p>	<p>Fire Agency & Contractor</p>	<p>MWPA</p>

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>included in the PSA. After completion of the PSA and prior to or during treatment implementation, if there is any deviation (e.g., further reduction) from the reduced buffer as explained in the PSA, this will be documented in the post-project implementation report (referred to by CAL FIRE as a Completion Report) with a science-based justification for the deviation. No fire ignition (nor use of associated accelerants) will occur within 50 feet of listed plants.</p> <p>For species listed under ESA or CESA, if the project proponent cannot avoid loss by implementing no-disturbance buffers, the project proponent will implement Mitigation Measure BIO-1c.</p> <p>The only exception to this mitigation approach is in cases where it is determined by a qualified RPF or botanist, in consultation with CDFW and USFWS, as appropriate depending on species status and location, that the listed plants would benefit from treatment in the occupied habitat area even though some of the listed plants may be lost during treatment activities. For a treatment to be considered beneficial to listed special-status plants, the qualified RPF or botanist will demonstrate with substantial evidence that habitat function is reasonably expected to improve with implementation of the treatment (e.g., by citing scientific studies demonstrating that the species (or similar species) has benefitted from increased sunlight due to canopy opening, eradication of invasive species, or otherwise reduced competition for resources), and the substantial evidence will be included in the PSA. If it is determined that treatment activities would be beneficial to listed plants, no compensatory mitigation for loss of individuals will be required.</p>				
<p>Mitigation Measure BIO-1b: Avoid Loss of Special-Status Plants Not Listed Under ESA or CESA</p> <p>If non-listed special-status plant species (i.e., species not listed under ESA or CESA, but meeting the definition of special-status as stated in Section 3.6.1 of the Program EIR) are determined to be present through application of SPR BIO-1 and SPR BIO-7, the project proponent will implement the following measures to avoid loss of individuals and maintain habitat function of occupied habitat:</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Fire Agency & Contractor	MWPA

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> • Physically avoid the area occupied by the special-status plants by establishing a no-disturbance buffer around the area occupied by species and marking the buffer boundary with high-visibility flagging, fencing, stakes, or clear, existing landscape demarcations (e.g., edge of a roadway). The no-disturbance buffers will generally be a minimum of 50 feet from special-status plants, but the size and shape of the buffer zone may be adjusted if a qualified RPF or botanist determines that a smaller buffer will be sufficient to avoid loss of or damaging to special-status plants or that a larger buffer is necessary to sufficiently protect plants from the treatment activity. The appropriate size and shape of the buffer zone will be determined by a qualified RPF or botanist and will depend on plant phenology at the time of treatment (e.g., whether the plants are in a dormant, vegetative, or flowering state), the individual species' vulnerability to the treatment method being used, and environmental conditions and terrain. Consideration of factors such as site hydrology, changes in light, edge effects, and potential introduction of invasive plants and noxious weeds may inform an appropriate buffer size and shape. • Treatments may be conducted within this buffer if the potentially affected special-status plant species is a geophytic, stump-sprouting, or annual species, and the treatment can be conducted outside of the growing season (e.g., after it has completed its annual life cycle) or during the dormant season using only treatment activities that would not damage the stump, root system or other underground parts of special-status plants or destroy the seedbank. • Treatments will be designed to maintain the function of special-status plant habitat. For example, for a fuel break proposed in treatment areas occupied by special-status plants, if the removal of shade cover would degrade the special-status plant habitat despite the requirement to physically or seasonally avoid the special-status plant itself, habitat function would be diminished and the treatment would need to be modified or precluded from implementation. 				

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> No fire ignition (nor use of associated accelerants) will occur within the special-status plant buffer. <p>A qualified RPF or botanist with knowledge of the special-status plant species habitat and life history will review the treatment design and applicable impact minimization measures (potentially including others not listed above) to determine if the anticipated residual effects of the treatment would be significant under CEQA because implementation of the treatment would not maintain habitat function of the special-status plant habitat (i.e., the habitat would be rendered unsuitable) or because the loss of special-status plants would substantially reduce the number or restrict the range of a special-status plant species. If the project proponent determines the impact on special-status plants would be less than significant, no further mitigation will be required. If the project proponent determines that the loss of special-status plants or degradation of occupied habitat would be significant under CEQA after implementing feasible treatment design alternatives and impact minimization measures, then Mitigation Measure BIO-1c will be implemented.</p> <p>The only exception to this mitigation approach is in cases where it is determined by a qualified RPF or botanist that the special-status plants would benefit from treatment in the occupied habitat area even though some of the non-listed special-status plants may be killed during treatment activities. For a treatment to be considered beneficial to non-listed special-status plants, the qualified RPF or botanist will demonstrate with substantial evidence that habitat function is reasonably expected to improve with implementation of the treatment (e.g., by citing scientific studies demonstrating that the species (or similar species) has benefitted from increased sunlight due to canopy opening, eradication of invasive species, or otherwise reduced competition for resources), and the substantial evidence will be included in the PSA. If it is determined that treatment activities would be beneficial to special-status plants, no compensatory mitigation will be required.</p>				

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>Mitigation Measure BIO-2a: Avoid Mortality, Injury, or Disturbance and Maintain Habitat Function for Listed Wildlife Species and California Fully Protected Species (All Treatment Activities)</p> <p>If California Fully Protected Species or species listed under ESA or CESA are observed during reconnaissance surveys (conducted pursuant to SPR BIO-1) or focused or protocol-level surveys (conducted pursuant to SPR BIO-10), the project proponent will avoid adverse effects to the species by implementing the following.</p> <p><u>Avoid Mortality, Injury, or Disturbance of Individuals</u></p> <p>The project proponent will implement one of the following 2 measures to avoid mortality, injury, or disturbance of individuals:</p> <ol style="list-style-type: none"> 1. Treatment will not be implemented within the occupied habitat. Any treatment activities outside occupied habitat will be a sufficient distance from the occupied habitat such that mortality, injury, or disturbance of the species will not occur, as determined by a qualified RPF or biologist using the most current and commonly-accepted science and considering published agency guidance; OR 2. Treatment will be implemented outside the sensitive period of the species' life history (e.g., outside the breeding or nesting season) during which the species may be more susceptible to disturbance, or disturbance could result in loss of eggs or young. For species present year-round, CDFW and/or USFWS/NOAA Fisheries will be consulted to determine if there is a period of time within which treatment could occur that would avoid mortality, injury, or disturbance of the species. <ul style="list-style-type: none"> - For species listed under ESA or CESA, if the project proponent cannot avoid mortality, injury or disturbance by implementing one of the two options listed above, the project proponent will implement Mitigation Measure BIO-2c. - Injury or mortality of California Fully Protected Species is prohibited pursuant to Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code and will be avoided. 	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Fire Agency & Contractor	MWPA

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<u>Maintain Habitat Function</u>				
<ul style="list-style-type: none"> • The project proponent will design treatment activities to maintain the habitat function, by implementing the following: <ul style="list-style-type: none"> – While performing review and surveys for SPR BIO-1 and SPR BIO-10, a qualified RPF or biologist will identify any habitat features that are necessary for survival (e.g., habitat necessary for breeding, foraging, shelter, movement) of the affected wildlife species (e.g., trees with complex structure, trees with large cavities, trees with nesting platforms; dens; tree snags; large raptor nests [including inactive nests]; downed woody debris; food sources). These habitat features will be marked and treatments applied to the features will be designed to minimize or avoid the loss or degradation of suitable habitat for listed species during treatments. Identification and treatment of these features will be based on the life history and habitat requirements of the affected species and the most current, commonly accepted science. – If it is determined during implementation of SPR BIO-1 and SPR BIO-10 that listed or fully protected wildlife with specific requirements for high canopy cover (e.g., Humboldt marten, fisher, spotted owl, coastal California gnatcatcher, riparian woodrat) are present within a treatment area, then tree or shrub canopy cover within existing suitable areas will be retained at the percentage preferred by the species (as determined by expert opinion, published habitat association information, or other documented standards that are commonly accepted [e.g., 50 percent for coastal California gnatcatcher]) such that habitat function is maintained. • A qualified RPF or biologist will determine if, after implementation of the impact avoidance measures listed above, the habitat function will remain for the affected species after implementation of the treatment. Because this measure pertains to species listed under CESA or ESA or are fully protected, the qualified RPF or biologist will consult with CDFW and/or USFWS/NOAA Fisheries regarding the determination that habitat 				

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
function is maintained. If consultation determines that the treatment will not maintain habitat function for the special-status species, the project proponent will implement Mitigation Measure BIO-2c.				
<p>Mitigation Measure BIO-2b: Avoid Mortality, Injury, or Disturbance and Maintain Habitat Function for Other Special-Status Wildlife Species (All Treatment Activities)</p> <p>If other special-status wildlife species (i.e., species not listed under CESA or ESA or California Fully Protected but meeting the definition of special status as stated in Section 3.6.1 of the Program EIR) are observed during reconnaissance surveys (conducted pursuant to SPR BIO-1) or focused or protocol-level surveys (conducted pursuant to SPR BIO-10), the project proponent will avoid or minimize adverse effects to the species by implementing the following.</p> <p><u>Avoid Mortality, Injury, or Disturbance of Individuals</u></p> <ul style="list-style-type: none"> The project proponent will implement the following to avoid mortality, injury, or disturbance of individuals: <p>For all treatment activities except prescribed burning, the project proponent will establish a no-disturbance buffer around occupied sites (e.g., nests, dens, roosts, middens, burrows, nurseries). Buffer size will be determined by a qualified RPF or biologist using the most current, commonly accepted science and will consider published agency guidance; however, buffers will generally be a minimum of 100 feet, unless site conditions indicate a smaller buffer would be sufficient for protection or a larger buffer would be needed. Factors to be considered in determining buffer size will include, but not be limited to, the species' tolerance to disturbance; the presence of natural buffers provided by vegetation or topography; nest height; locations of foraging territory; baseline levels of noise and human activity; and treatment activity. Buffer size may be adjusted if the qualified RPF or biologist determines that such an adjustment would not be likely to adversely affect (i.e., cause mortality, injury, or disturbance to) the species within the nest, den, burrow, or other occupied site. If a no-disturbance buffer is reduced below 100 feet from an occupied site, a qualified RPF or biologist will provide</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	During	Fire Agency & Contractor	MWPA

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>the project proponent with a site- and/or treatment activity-specific explanation for the buffer reduction, which will be included in the PSA. After completion of the PSA and prior to or during treatment implementation, if there is any deviation (e.g., further reduction) from the reduced buffer as explained in the PSA, this will be documented in the post-project implementation report (referred to by CAL FIRE as a Completion Report).</p> <ul style="list-style-type: none"> No-disturbance buffers will be marked with high-visibility flagging, fencing, stakes, or clear, existing landscape demarcations (e.g., edge of a roadway). No activity will occur within the buffer areas until the qualified RPF or biologist has determined that the young have fledged or dispersed; the nest, den, or other occurrence is no longer active; or reducing the buffer would not likely result in disturbance, mortality, or injury. A qualified RPF, biologist, or biological technician will be required to monitor the effectiveness of the no-disturbance buffer around the nest, den, burrow, or other occurrence during treatment. If treatment activities cause agitated behavior of the individual(s), the buffer distance will be increased, or treatment activities modified until the agitated behavior stops. The qualified RPF, biologist, or biological technician will have the authority to stop any treatment activities that could result in mortality, injury or disturbance to special-status species. For prescribed burning, the project proponent will implement the treatment outside the sensitive period of the species' life history (e.g., outside the breeding or nesting season) during which the species may be more susceptible to disturbance, or disturbance could result in loss of eggs or young. For species present year-round, the qualified RPF or biologist will determine the period of time within which prescribed burning could occur that will avoid or minimize mortality, injury, or disturbance of the species. The project proponent may consult with CDFW and/or USFWS for technical information regarding appropriate limited operating periods. <p><u>Maintain Habitat Function</u></p>				

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> • For all treatment activities, the project proponent will design treatment activities to maintain the habitat function by implementing the following: <ul style="list-style-type: none"> – While performing review and surveys for SPR BIO-1 and SPR BIO-10, a qualified RPF or biologist will identify any habitat features that are necessary for survival (e.g., habitat necessary for breeding, foraging, shelter, movement) of the affected wildlife species (e.g., trees with complex structure, trees with large cavities, trees with nesting platforms; tree snags; large raptor nests [including inactive nests]; downed woody debris). These habitat features will be marked and treatments applied to the features will be designed to minimize or avoid the loss or degradation of suitable habitat for listed species during treatments. Identification and treatment of these features will be based on the life history and habitat requirements of the affected species and the most current, commonly accepted science. – If it is determined during implementation of SPR BIO-1 and SPR BIO-10 that special-status wildlife with specific requirements for high canopy cover (e.g., northern goshawk, Sierra Nevada snowshoe hare) are present within a treatment area, then tree or shrub canopy cover within existing suitable areas will be retained at the percentage preferred by the species (as determined by expert opinion, published habitat association information, or other documented standards that are commonly accepted) such that the habitat function is maintained. – A qualified RPF or biologist will determine if, after implementation of the impact avoidance measures listed above, the habitat function will remain for the affected species after implementation of the treatment. The qualified RPF or biologist may consult with CDFW and/or USFWS for technical information regarding habitat function. <p>A qualified RPF or biologist with knowledge of the special-status wildlife species habitat and life history will review the treatment design and applicable impact minimization measures (potentially including others not listed above) to determine if the anticipated residual effects of the treatment would be significant under CEQA because implementation of the treatment</p>				

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>will not maintain habitat function of the special-status wildlife species' habitat or because the loss of special-status wildlife would substantially reduce the number or restrict the range of a special-status wildlife species. If the project proponent determines the impact on special-status wildlife would be less than significant, no further mitigation will be required. If the project proponent determines that the loss of special-status wildlife or degradation of occupied habitat would be significant under CEQA after implementing feasible treatment design alternatives and impact minimization measures, then Mitigation Measure BIO-2c will be implemented.</p> <p>The only exception to this mitigation approach is in cases where it is determined by a qualified RPF or biologist that the non-listed special-status wildlife would benefit from treatment in the occupied habitat area even though some of the non-listed special-status wildlife may be killed, injured, or disturbed during treatment activities. For a treatment to be considered beneficial to non-listed special-status wildlife, the qualified RPF or biologist will demonstrate with substantial evidence that habitat function is reasonably expected to improve with implementation of the treatment (e.g., by citing scientific studies demonstrating that the species (or similar species) has benefitted from increased sunlight due to canopy opening, eradication of invasive species, or otherwise reduced competition for resources), and the substantial evidence will be included in the PSA. If it is determined that treatment activities would be beneficial to special-status wildlife, no compensatory mitigation will be required. The qualified RPF or biologist may consult with CDFW and/or USFWS for technical information regarding the determination that a non-listed special-status species would benefit from the treatment.</p>				
<p>Mitigation Measure BIO-3a: Design Treatments to Avoid Loss of Sensitive Natural Communities and Oak Woodlands</p> <p>The project proponent will implement the following measures when working in treatment areas that contain sensitive natural communities identified during surveys conducted pursuant to SPR BIO-3:</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	<p>Prior</p>	<p>Fire Agency & Contractor</p>	<p>MWPA</p>

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> • Reference the <i>Manual of California Vegetation</i>, Appendix 2, Table A2, <i>Fire Characteristics</i> (Sawyer et al. 2009 or current version, including updated natural communities' data at http://vegetation.cnps.org/) or other best available information to determine the natural fire regime of the specific sensitive natural community type (i.e., alliance) present. The condition class and fire return interval departure of the vegetation alliances present will also be determined. • Design treatments in sensitive natural communities and oak woodlands to restore the natural fire regime and return vegetation composition and structure to their natural condition to maintain or improve habitat function of the affected sensitive natural community. Treatments will be designed to replicate the fire regime attributes for the affected sensitive natural community or oak woodland type including seasonality, fire return interval, fire size, spatial complexity, fireline intensity, severity, and fire type as described in <i>Fire in California's Ecosystems</i> (Van Wagtenonk et al. 2018) and the <i>Manual of California Vegetation</i> (Sawyer et al. 2009 or current version, including updated natural communities data at http://vegetation.cnps.org/). Treatments will not be implemented in sensitive natural communities that are within their natural fire return interval (i.e., time since last burn is less than the average time required for that vegetation type to recover from fire) or within Condition Class 1. • To the extent feasible, no fuel breaks will be created in sensitive natural communities with rarity ranks of S1 (critically imperiled) and S2 (imperiled). • To the extent feasible, fuel breaks will not remove more than 20 percent of the native vegetation relative cover from a stand of sensitive natural community vegetation in sensitive natural communities with a rarity rank of S3 (vulnerable) or in oak woodlands. In forest and woodland sensitive natural communities with a rarity rank of S3, and in oak woodlands, only shaded fuel breaks will be installed, and they will not be installed in more than 20 percent of the stand of sensitive natural community or oak 				

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>woodland vegetation (i.e., if the sensitive natural community covers 100 acres, no more than 20 acres will be converted to create the fuel break).</p> <ul style="list-style-type: none"> Use prescribed burning as the primary treatment activity in sensitive natural communities that are fire dependent (e.g., closed-cone forest and woodland alliances, chaparral alliances characterized by fire-stimulated, obligate seeders), to the extent feasible and appropriate based on the fire regime attributes as described in <i>Fire in California's Ecosystems</i> (Van Wagtendonk et al. 2018) and the <i>Manual of California Vegetation</i> (Sawyer et al. 2009 or current version, including updated natural communities data at http://vegetation.cnps.org/). Time prescribed herbivory to occur when non-target vegetation is not susceptible to damage (e.g. non-target vegetation is dormant or has completed its reproductive cycle for the year). For example, use herbivores to control invasive plants growing in sensitive habitats or sensitive natural communities when sensitive vegetation is dormant but invasive plants are growing. Timing of herbivory to avoid non-target vegetation will be determined by a qualified botanist, RPF, or biologist based on the specific vegetation alliance being treated, the life forms and life conditions of its characteristic plant species, and the sensitivity of the non-target vegetation to the effects of herbivory. <p>The feasibility of implementing the avoidance measures will be determined by the project proponent based on whether implementation of this mitigation measure will preclude completing the treatment project within the reasonable period of time necessary to meet CalVTP program objectives, including, but not limited to, protection of vulnerable communities. If the avoidance measures are determined by the project proponent to be infeasible, the project proponent will document the reasons implementation of the avoidance strategies are infeasible in the PSA. After completion of the PSA and prior to or during treatment implementation, if there is any change in the feasibility of avoidance strategies from those explained in the PSA, this will be documented in the post-project implementation report (referred to by CAL FIRE as a Completion Report).</p>				

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>A qualified RPF or botanist with knowledge of the affected sensitive natural community will review the treatment design and applicable impact minimization measures (potentially including others not listed above) to determine if the anticipated residual effects of the treatment would be significant under CEQA because implementation of the treatment will not maintain habitat functions of the sensitive natural community or oak woodland. If the project proponent determines the impact on sensitive natural communities or oak woodlands would be less than significant, no further mitigation will be required. If the project proponent determines that the loss or degradation of sensitive natural communities or oak woodlands would be significant under CEQA after implementing feasible treatment design alternatives and impact minimization measures, then Mitigation Measure BIO-3b will be implemented.</p> <p>The only exception to this mitigation approach is in cases where it is determined by a qualified RPF or botanist that the sensitive natural community or oak woodland would benefit from treatment in the occupied habitat area even though some loss may occur during treatment activities. For a treatment to be considered beneficial to a sensitive natural community or oak woodland, the qualified RPF or botanist will demonstrate with substantial evidence that habitat function is reasonably expected to improve with implementation of the treatment (e.g., by citing scientific studies demonstrating that the community (or similar community) has benefitted from increased sunlight due to canopy opening, eradication of invasive species, or otherwise reduced competition for resources), and the substantial evidence will be included in the PSA. If it is determined that treatment activities would be beneficial to sensitive natural communities or oak woodlands, no compensatory mitigation will be required.</p>				
<p>Mitigation Measure BIO-4: Avoid State and Federally Protected Wetlands</p> <p>Impacts to wetlands will be avoided using the following measures:</p> <ul style="list-style-type: none"> The qualified RPF or biologist will delineate the boundaries of federally protected wetlands according to methods established in the USACE wetlands delineation manual (Environmental Laboratory 1987) and the 	Initial Treatment: Y	Prior-During	Fire Agency & Contractor	MWPA

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>appropriate regional supplement for the ecoregion in which the treatment is being implemented.</p> <ul style="list-style-type: none"> • The qualified RPF or biologist will delineate the boundaries of wetlands that may not meet the definition of waters of the United States, but would qualify as waters of the state, according to the state wetland procedures (California Water Boards 2019 or current procedures). • A qualified RPF or biologist will establish a buffer around wetlands and mark the buffer boundary with high-visibility flagging, fencing, stakes, or clear, existing landscape demarcations (e.g., edge of a roadway). The buffer will be a minimum width of 25 feet but may be larger if deemed necessary. The appropriate size and shape of the buffer zone will be determined in coordination with the qualified RPF or biologist and will depend on the type of wetland present (e.g., seasonal wetland, wet meadow, freshwater marsh, vernal pool), the timing of treatment (e.g., wet or dry time of year), whether any special-status species may occupy the wetland and the species' vulnerability to the treatment activities, environmental conditions and terrain, and the treatment activity being implemented. • A qualified RPF or biological technician will periodically inspect the materials demarcating the buffer to confirm that they are intact and visible, and wetland impacts are being avoided. • Within this buffer, herbicide application is prohibited. • Within this buffer, soil disturbance is prohibited. Accordingly, the following activities are not allowed within the buffer zone: mechanical treatments, prescribed herbivory, equipment and vehicle access or staging. • Only prescribed (broadcast) burning may be implemented in wetland habitats if it is determined by a qualified RPF or biologist that: <ul style="list-style-type: none"> – No special-status species are present in the wetland habitat – The wetland habitat function would be maintained. 	<p>Treatment Maintenance: Y</p>			

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<ul style="list-style-type: none"> - The prescribed burn is within the normal fire return interval for the wetland vegetation types present - Fire containment lines and pile burning are prohibited within the buffer - No fire ignition (and associated use of accelerants) will occur within the wetland buffer 				
<p>Mitigation Measure BIO-5: Retain Nursery Habitat and Implement Buffers to Avoid Nursery Sites</p> <p>The project proponent will implement the following measures while working in treatment areas that contain nursery sites identified in surveys conducted pursuant to SPR BIO-10:</p> <ul style="list-style-type: none"> • Retain Known Nursery Sites. A qualified RPF or biologist will identify the important habitat features of the wildlife nursery and, prior to treatment activities, will mark these features for avoidance and retention during treatment • Establish Avoidance Buffers. The project proponent will establish a non-disturbance buffer around the nursery site if activities are required while the nursery site is active/occupied. The appropriate size and shape of the buffer will be determined by a qualified RPF or biologist, based on potential effects of project-related habitat disturbance, noise, visual disturbance, and other factors. No treatment activity will commence within the buffer area until a qualified RPF or biologist confirms that the nursery site is no longer active/occupied. Monitoring of the effectiveness of the non-disturbance buffer around the nursery site by a qualified RPF, biologist, or biological technician during and after treatment activities will be required. If treatment activities cause agitated behavior of the individual(s), the buffer distance will be increased, or treatment activities modified until the agitated behavior stops. The qualified RPF, biologist, or biological technician will have the authority to stop any treatment activities that could result in potential adverse effects to special-status species. 	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Fire Agency & Contractor	MWPA

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
Greenhouse Gas Emissions				
<p>Mitigation Measure GHG-2. Implement GHG Emission Reduction Techniques During Prescribed Burns</p> <p>When planning for and conducting a prescribed burn, project proponents implementing a prescribed burn will incorporate feasible methods for reducing GHG emissions, including the following, which are identified in the National Wildfire Coordinating Group Smoke Management Guide for Prescribed Fire (NWCG 2018):</p> <ul style="list-style-type: none"> • reduce the total area burned by isolating and leaving large fuels (e.g., large logs, snags) unburned; • reduce the total area burned through mosaic burning; • burn when fuels have a higher fuel moisture content; • reduce fuel loading by removing fuels before ignition. Methods to remove fuels include mechanical treatments, manual treatments, prescribed herbivory, and biomass utilization; and • schedule burns before new fuels appear. <p>As the science evolves, other feasible methods or technologies to sequester carbon could be incorporated, such as conservation burning, a technique for burning woody material that reduces the production of smoke particulates and carbon released into the atmosphere and generates more biochar. Biochar is produced from the material left over after the burn and spread with compost to increase soil organic matter and soil carbon sequestration. Technologies to reduce greenhouse gas emissions may also include portable units that perform gasification to produce electricity or pyrolysis that produces biooil that can be used as liquid fuel and/or syngas that can be used to generate electricity.</p> <p>The project proponent will document in the Burn Plan required pursuant to SPR AQ-3 which methods for reducing GHG emissions can feasibly be integrated into the treatment design.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior-During	Contractor	MWPA
Hazardous Materials, Public Health and Safety				

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Mitigation Measures	Applicable? (Y/N)	Timing	Implementing Entity	Verifying/Monitoring Entity
<p>Mitigation Measure HAZ-3: Identify and Avoid Known Hazardous Waste Sites</p> <p>Prior to the start of vegetation treatment activities requiring soil disturbance (i.e., mechanical treatments) or prescribed burning, CAL FIRE and other project proponents will make reasonable efforts to check with the landowner or other entity with jurisdiction (e.g., California Department of Parks and Recreation) to determine if there are any sites known to have previously used, stored, or disposed of hazardous materials. If it is determined that hazardous materials sites could be located within the boundary of a treatment site, the project proponent will conduct a DTSC EnviroStor web search (https://www.envirostor.dtsc.ca.gov/public/) and consult DTSC's Cortese List to identify any known contamination sites within the project site. If a proposed mechanical treatment or prescribed burn is located on a site included on the DTSC Cortese List as containing potential soil contamination that has not been cleaned up and deemed closed by DTSC, the area will be marked and no prescribed burning or soil disturbing treatment activities will occur within 100 feet of the site boundaries. If it is determined through coordination with landowners or after review of the Cortese List that no potential or known contamination is located on a project site, the project may proceed as planned.</p>	<p>Initial Treatment: Y</p> <p>Treatment Maintenance: Y</p>	Prior	Fire Agency & Contractor	MWPA

Project Design and Implementation Features

As noted, the MWPA has developed PDIFs adapted from several source documents that are incorporated as applicable into the project design and implementation for each of its projects. The PDIFs appropriate to the proposed project are listed in Table 3 and include:

- PDIFs that would meet the SPRs
- PDIFs that are less stringent than the SPRs where the SPR would be used to meet the PDIF requirements
- PDIFs that do not have a corresponding SPR and would be implemented as part of the MWPA best practices

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Table 3 Project Design and Implementation Features and Comparable Standard Project Requirements Applicable to the Greater Novato Shaded Fuel Break Project

PDIFs	SPR
PDIFs that meet SPRs	
<p>CUL-1 Training: For all activities with the potential for ground disturbance (excluding prescribed herbivory, vegetation and tree trimming, and hand pulling smaller vegetation) all contractors and crew will receive training prepared by and/or conducted by a qualified archaeologist (who meets the U.S. Secretary of Interior’s professional standards set forth in 48 FR Parts 44738-44739 and Appendix A to 36 CFR 61) prior to beginning work. The Tribal Heritage Preservation Officer(s) (THPO) from a local tribe (Federated Indians of Graton Rancheria [Graton Rancheria]) will be notified of the opportunity to attend and/or train crews. The training will address the potential for encountering subsurface cultural resources, recognizing basic signs of a potential resource, understanding required procedures if a potential resource is identified including reporting the resource to a qualified archaeologist and/or THPO, as appropriate, and understanding all procedures required under Health and Safety Code § 7050.5 and PRC §§ 5097.94, 5097.98, and 5097.99 for the discovery of human remains.</p> <p>CUL-2 Unanticipated Discovery: In the event that a previously unidentified cultural resource is discovered during implementation of an activity all work within a minimum of 150 feet of the discovery will be halted. The resource will be located, identified, and recorded in the MWPA cultural resources GIS database.</p> <p>The boundaries around the buffered resource will be temporarily marked, such as with fencing or flagging. A qualified archaeologist will inspect the discovery and determine whether further investigation is required. Data regarding archaeological resources will be kept confidential per law. As appropriate, the qualified archaeologist will inform Graton Rancheria’s THPO of the discovery. If the discovery can be avoided and no further impacts will occur, the resource will be documented on California State Department of Parks and Recreation cultural resource record forms and no further effort will be required. If the project proponent wishes to continue work in the area, only work performed</p>	<p>SPR CUL-8 Cultural Resource Training: The project proponent will train all crew members and contractors implementing treatment activities on the protection of sensitive archaeological, historical, or tribal cultural resources. Workers will be trained to halt work if archaeological resources are encountered on a treatment site and the treatment method consists of physical disturbance of land surfaces (e.g., soil disturbance). This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p> <p>SPR CUL-5 Treatment of Archaeological Resources: If cultural resources are identified within a treatment area, and cannot be avoided, a qualified archaeologist will notify the culturally affiliated tribe(s) based on information provided by NAHC and assess, whether an archaeological find qualifies as a unique archaeological resource, an historical resource, or in coordination with said tribe(s), as a tribal cultural resource. The project proponent, in consultation with culturally affiliated tribe(s), will develop effective protection measures for important cultural resources located within treatment areas. These measures may include adjusting the treatment location or design to entirely avoid cultural resource locations or changing treatment activities so that damaging effects to cultural resources will not occur. These protection measures will be written in clear, enforceable language, and will be included in the survey report in accordance with</p>

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<p>using hand tools or powered hand tools is allowed, work cannot include ground disturbance and the work area can only be accessed on foot as determined acceptable by the qualified cultural resource specialist/archaeologist.</p> <p>Alternatively, the qualified archaeologist and/or THPO or tribal monitor will evaluate the resource and determine whether it is:</p> <ul style="list-style-type: none">• Eligible for the CRHR (and a historical resource for purposes of CEQA),• A unique archaeological resource as defined by CEQA, and/or• A potential tribal cultural resource (all archaeological resources could be a tribal cultural resource). <p>If the resource is determined to be neither a unique archaeological, an historical resource, nor a potential tribal cultural resource, work may commence in the area.</p> <p>If the resource meets the criteria for either a historical resource, unique archaeological resource, and/or tribal cultural resource, work will remain halted in the buffered area around the resource. No work will occur within the buffered area except those methods previously discussed as determined acceptable by the qualified archaeologist and/or THPO or tribal monitor. After work is completed, all cultural resource delineators (e.g., flags or fencing) will be removed in order to avoid potential vandalism, unauthorized excavation(s), etc.</p>	<p>applicable state or local agency procedures. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>
<p>CUL-3 Cultural Resource Investigation: Prior to implementation of vegetation management activities that have potential for intensive ground disturbance below the ground surface, significant heat from a burn, or use of heavy equipment off established roads and trails, a qualified archaeologist will conduct a records search and/or site-specific survey of the project areas where such disturbances could occur. Outreach with Graton Rancheria will be conducted as early as feasible to obtain information regarding culturally sensitive areas and/or the location of tribal cultural resources within the project areas. Any information provided by Graton Rancheria and/or tribal monitor(s) is confidential and exempt from public disclosure in accordance with statutory and regulatory requirements (Gov. Code § 6254(r), 6254.10; PRC § 5097.98(c); Cal. Code Regs. § 15120(d)). Records searches and field survey results will be shared with Graton Rancheria, as appropriate. Resources found during the</p>	<p>SPR CUL-3 Pre-field Research: The project proponent will conduct research prior to implementing treatments as part of the cultural resource investigation. The purpose of this research is to properly inform survey design, based on the types of resources likely to be encountered within the treatment area, and to be prepared to interpret, record, and evaluate these findings within the context of local history and prehistory. The qualified archaeologist and/or archaeologically trained resource professional will review records, study maps, read pertinent ethnographic, archaeological, and historical literature specific to the area being studied, and conduct other tasks to maximize the effectiveness of the survey. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>

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records search, tribal outreach, and/or survey will be flagged for avoidance with an appropriate buffer identified by the qualified archaeologist, or the qualified archaeologist may identify modifications to the prescriptions using only hand tools or powered hand tools and access by foot with no ground disturbance, provided it would avoid all impacts to the resources. Any resource found during the site survey will be documented on California State Department of Parks and Recreation cultural resource record forms and a survey report will be completed for every cultural resource survey completed. The specific requirements will comply with the applicable state or local agency procedures.

ET-1 Environmental Training for Biological Resources: All crew members and contractors will receive training from a qualified registered professional forester (RPF) or biologist prior to beginning a treatment project where sensitive biological resources could occur in the work areas. The training will describe the appropriate work practices necessary to effectively implement the appropriate project design and implementation features and to comply with the applicable environmental laws and regulations. The training will include the identification, relevant life history information, and avoidance of potentially present special-status species with potential to occur; identification and avoidance of sensitive natural communities and habitats with the potential to occur in the treatment area; best management practices; and reporting requirements. As appropriate, the training will include protocols for work, such as specific trimming methods, where applicable. The training will instruct workers when it is appropriate to stop work and allow wildlife encountered during treatment activities to leave the area unharmed and when it is necessary to report encounters to a qualified RPF or biologist. The qualified RPF or biologist will immediately contact the California Department of Fish and Wildlife (CDFW) or United States Fish and Wildlife Service (USFWS), as appropriate, if any wildlife protected by the CE Species Act (CESA) or Federal Endangered Species Act (ESA) is encountered and cannot leave the site on its own (without being handled).

GEO-1 Erosion and Soils Loss Stabilization Measures: Soils will be stabilized if a vegetation management activity may leave less than 70 percent groundcover or native mulch/organic material.

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SPR BIO-2 Require Biological Resource Training for Workers: The project proponent will require crew members and contractors to receive training from a qualified RPF or biologist prior to beginning a treatment project. The training will describe the appropriate work practices necessary to effectively implement the biological SPRs and mitigation measures and to comply with the applicable environmental laws and regulations. The training will include the identification, relevant life history information, and avoidance of pertinent special-status species; identification and avoidance of sensitive natural communities and habitats with the potential to occur in the treatment area; impact minimization procedures; and reporting requirements. The training will instruct workers when it is appropriate to stop work and allow wildlife encountered during treatment activities to leave the area unharmed and when it is necessary to report encounters to a qualified RPF, biologist, or biological technician. The qualified RPF, biologist, or biological technician will immediately contact CDFW or USFWS, as appropriate, if any wildlife protected by the California Endangered Species Act (CESA) or Federal Endangered Species Act (ESA) is encountered and cannot leave the site on its own (without being handled). This SPR applies to all treatment activities and treatment types, including treatment maintenance.

SPR GEO-3 Stabilize Disturbed Soil Areas: The project proponent will stabilize soil disturbed during mechanical, prescribed herbivory treatments, and prescribed burns that result in exposure of bare soil over 50 percent or

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<p>For areas between 50 percent and 70 percent ground cover left:</p> <ul style="list-style-type: none">• Sow native grasses and other suitable native vegetation on denuded areas where natural colonization or other replanting will not occur rapidly; use slash or chips to prevent erosion on such areas.• Use surface mounds, depressions, logs, rocks, trees and stumps, slash and brush, the litter layer, and native herbaceous vegetation downslope of denuded areas to reduce sedimentation and erosion, as necessary to prevent erosion or slope destabilization.• Install approved, biodegradable erosion-control measures and non-filament-based geotextiles (e.g., coir, jute) when:• Conducting substantial ground-disturbing work (e.g., use of heavy equipment, pulling large vegetation) within 100 feet and upslope of currently flowing or wet wetlands, streams, lakes, and riparian areas;• Causing soil disturbance on moderate to steep (10 percent slope and greater) slopes; and• Removing invasive plants from stream banks to prevent sediment movement into watercourses and to protect bank stability.• Sediment-control devices, if installed, will be certified weed-free, as appropriate. Sediment control devices will be inspected daily during active work to ensure that they are repaired and working as needed to prevent sediment transport into the waterbodies. <p>For areas with less than 50 percent ground cover:</p> <ul style="list-style-type: none">• Any of the above measures• Stabilize with mulch or equivalent immediately after project activities, to the maximum extent practicable.• If project activities could result in substantial sediment discharge from soil disturbance, as determined by the qualified personnel (e.g., RPF), organic material from mastication or mulch will be incorporated onto at least 75 percent of the disturbed soil surface where the soil erosion hazard is moderate or high, and 50 percent of the disturbed soil surface where soil erosion hazard is low to help prevent erosion.	<p>more of the treatment area with mulch or equivalent immediately after treatment activities, to the maximum extent practicable, to minimize the potential for substantial sediment discharge. If mechanical, prescribed herbivory, or prescribed burn treatment activities could result in substantial sediment discharge from soil disturbed by machinery, animal hooves, or being bare, organic material from mastication or mulch will be incorporated onto at least 75 percent of the disturbed soil surface where the soil erosion hazard is moderate or high, and 50 percent of the disturbed soil surface where soil erosion hazard is low to help prevent erosion. Where slash mulch is used, it will be packed into the ground surface with heavy equipment so that it is sufficiently in contact with the soil surface. This SPR only applies to mechanical, prescribed herbivory, and prescribed burns that result in exposure of bare soil over 50 percent of the project area treatment activities and all treatment types, including treatment maintenance.</p>

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- Where slash mulch is used, it will be packed into the ground surface with heavy equipment so that it is sufficiently in contact with the soil surface.

Once work is completed, the areas will be inspected at least annually if accessible, until groundcover exceeds 70 percent or slopes have stabilized, as determined by a qualified professional. At that time, erosion-control and slope-stability devices may be removed.

GEO-3 Soil Saturation and Rain Event Measures: The following measures will be implemented to prevent soil loss and erosion during rain events and following rain events:

- Shut down use of off-road heavy equipment, skidding, and truck traffic when soils become saturated (from rain event) and unable to support the machines. Saturated soil means that soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur.
- Off-road heavy equipment work will be suspended if the National Weather Service forecast is a “chance” (30 percent or more) of rain within the next 24 hours
- Ground disturbing work (e.g., use of heavy equipment, pulling large vegetation) will not occur during rain events (i.e., 0.5 inch of rain within a 48-hour or greater period \geq 1.5 inches in 24 hours) and may resume when precipitation stops and soils are no longer saturated. Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials.
- For activities that involve ground disturbing work and have not been stabilized, inspect for evidence of erosion after the first rain event (i.e., 0.5 inch of rain within a 48-hour or greater period) as soon as is feasible after the event. Any area of erosion that will result in substantial sediment discharge will be remediated within 48 hours.
- For activities that involve ground disturbing work, inspect project areas for the proper implementation of erosion control, as necessary and determined

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SPR GEO-1 Suspend Disturbance during Heavy Precipitation: The project proponent will suspend mechanical, prescribed herbivory, and herbicide treatments if the National Weather Service forecast is a “chance” (30 percent or more) of rain within the next 24 hours. Activities that cause mechanical soil disturbance may resume when precipitation stops and soils are no longer saturated (i.e., when soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur). Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials. This SPR applies only to mechanical, prescribed herbivory, and herbicide treatment activities and all treatment types, including treatment maintenance.

SPR GEO-4 Erosion Monitoring: The project proponent will inspect treatment areas for the proper implementation of erosion control SPRs and mitigations prior to the rainy season. If erosion control measures are not properly implemented, they will be remediated prior to the first rainfall event per SPR GEO-3 and GEO-8. Additionally, the project proponent will inspect for evidence of erosion after the first large storm or rainfall event (i.e., \geq 1.5 inches in 24 hours) as soon as is feasible after the event. Any area of erosion that will result in substantial sediment discharge will be remediated within 48 hours per the methods stated in SPRs GEO-3 and GEO-8. This SPR applies only to mechanical, prescribed herbivory, and prescribed burning

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<p>by the qualified personnel (e.g., RPF), prior to the rainy season. If erosion control measures are not properly implemented, the measures will be remediated prior to the first rainfall event.</p>	<p>treatment activities and all treatment types, including treatment maintenance.</p>
<p>GEO-2 Prescribed Herbivory Erosion and Trail Control Measures: Methods will be implemented to reduce the potential creation of prescribed herbivory trails and erosional features, including the following:</p> <ul style="list-style-type: none"> • Implement methods, which could include rotating or providing multiple feeding areas to minimize excessive congregation of animals in any one location for too long, as determined by a qualified professional. • If prescribed herbivory trails or damaged areas form, the bare area will be remediated by decompacting the soil and discontinuing prescribed herbivory in the area until the trails are revegetated, as determined by a qualified professional. • Manage livestock grazing on steep slopes (generally slopes with more than 35 percent grade) to reduce potential for erosion. Management can include (but is not limited to) reducing or limiting the number of animals or duration on slopes above 35% (using stocking equation) to avoid erosion and avoid placing water and feeding troughs on steep slopes. • Grazing will not occur during a storm event or under muddy conditions, when hooves may sink into the ground. 	<p>SPR GEO-7 Minimize Erosion: To minimize erosion, the project proponent will: [...]</p> <p>(3) Prescribed herbivory treatments will not be used in areas with over 50 percent slope.</p> <p>This SPR applies to all treatment activities and all treatment types, including treatment maintenance.</p>
<p>HAZ-1 Leak Prevention and Spill Cleanup: The project proponent will, at a minimum, implement measures that address the following procedures related to the use of hazardous materials during work:</p> <ul style="list-style-type: none"> • Proper disposal or management of contaminated soils and materials (i.e., clean up materials) • Daily inspection of vehicles and equipment for leaks and spill containment procedures • Emergency response and reporting procedures to address hazardous material releases • Emergency spill supplies and equipment will be available to respond in a timely manner if an incident should occur 	<p>SPR HAZ-1 Maintain All Equipment: The project proponent will maintain all diesel- and gasoline-powered equipment per manufacturer’s specifications, and in compliance with all state and federal emissions requirements. Maintenance records will be available for verification. Prior to the start of treatment activities, the project proponent will inspect all equipment for leaks and inspect everyday thereafter until equipment is removed from the site. Any equipment found leaking will be promptly removed. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>

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<ul style="list-style-type: none">• Response materials such as oil-absorbent material, tarps, and storage drums will be available in the plan area at all times during management activities and will be used as needed to contain and control any minor releases• The absorbent material will be removed promptly and disposed of properly• Use of secondary containment and spill rags when fueling• Discourage “topping-off” fuel tanks• Workers using fuels or other hazardous materials must be knowledgeable of the specific procedures necessary for hazardous materials cleanup and emergency response• All diesel and gasoline powered equipment will be maintained per manufacturer’s specification, and in compliance with all state and federal emission requirements	
<p>HAZ-2 Wildfire Risk Reduction: The following measures will be implemented during activities that involve the use of equipment that can generate sparks or heat:</p> <ul style="list-style-type: none">• Maintain fire suppression equipment (e.g., shovel, extinguisher) in work vehicles and ensure workers are trained in use• Closely monitor for ignited vegetation from equipment and tool use• Train workers to properly handle and store flammable materials to minimize potential ignition sources• Prohibit smoking in vegetated areas• Avoid use of spark- and/or heat-generating equipment during high fire danger days (e.g., Red Flag Days and Fire Weather Watch)• Outfit off-road diesel vehicles and equipment with spark arrestors• Avoid metal string or blade weed trimmers• Maintain one fire extinguisher for each chainsaw	<p>SPR HAZ-2 Require Spark Arrestors: The project proponent will require mechanized hand tools to have federal- or state-approved spark arrestors. This SPR applies only to manual treatment activities and all treatment types, including treatment maintenance.</p> <p>SPR HAZ-3 Require Fire Extinguishers: The project proponent will require tree cutting crews to carry one fire extinguisher per chainsaw. Each vehicle would be equipped with one long-handled shovel and one axe or Pulaski consistent with PRC Section 4428. This SPR applies only to manual treatment activities and all treatment types, including treatment maintenance.</p>
<p>HAZ-4 Application of Herbicides</p> <ul style="list-style-type: none">• Projects will comply with all herbicide application regulations and ecologically sound integrated pest management principles.	<p>SPR HAZ-7 Triple Rinse Herbicide Containers: The project proponent will triple rinse all herbicide and adjuvant containers with clean water at an approved site and dispose of rinsate by placing it in the batch tank for application per 3 CCR Section 6684. The project proponent will puncture used containers on the top and bottom to render them unusable, unless said</p>

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<ul style="list-style-type: none"> • Herbicide containers will be triple rinsed with clean water at an approved site, and rinsate will be disposed of by placing it in the batch tank for application. • Herbicide drift to public areas or sensitive areas will be minimized through the following measures: <ul style="list-style-type: none"> – Application will cease when weather parameters exceed label specifications or when sustained winds at the site of application exceeds 7 miles per hour (whichever is more conservative). – No herbicide will be applied during precipitation events or if precipitation is forecast 24 hours before or after project activities. – Spray nozzles will be configured to produce the largest appropriate droplet size to minimize drift. – Low nozzle pressures will be utilized. – Spray nozzles will be kept within 24 inches of vegetation if spraying. • For herbicide applications occurring within or adjacent to public recreation areas, residential areas, schools, or any other public areas within 500 feet, signs will be posted at each end of herbicide application areas and any intersecting trails notifying the public of the use of herbicides at a minimum 1 day before and 1 day after herbicide use. 	<p>containers are part of a manufacturer’s container recycling program, in which case the manufacturer’s instructions will be followed. Disposal of non-recyclable containers will be at legal dumpsites. Equipment will not be cleaned, and personnel will not be washed in a manner that would allow contaminated water to directly enter any body of water within the treatment area or adjacent watersheds. Disposal of all herbicides will follow label requirements and waste disposal regulations.</p> <p>This SPR applies only to herbicide treatment activities and all treatment types, including treatment maintenance.</p> <p>SPR HAZ-8 Minimize Herbicide Drift to Public Areas: The project proponent will employ the following herbicide application parameters during herbicide application to minimize drift into public areas:</p> <ul style="list-style-type: none"> • application will cease when weather parameters exceed label specifications or when sustained winds at the site of application exceeds 7 miles per hour (whichever is more conservative); • low nozzle pressures (30-70 pounds per square inch) will be utilized to minimize drift; and • spray nozzles will be kept within 24 inches of vegetation during spraying. <p>This SPR applies only to herbicide treatment activities and all treatment types, including treatment maintenance.</p>
<p>HAZ-5 Protect Vegetation and Special-Status Species from Herbicides</p> <p>The project proponent will implement their approved integrated pest management (IPM) procedures when utilizing herbicides, or the following measures if no IPM is in place that addresses herbicide use in sensitive areas:</p> <ul style="list-style-type: none"> • Locate herbicide mixing sites in areas devoid of vegetation and where there is no potential of a spill reaching non-target vegetation or a waterway. • Use only herbicides labeled for use in aquatic environments when working in riparian habitats or other areas where there is a possibility the herbicide could come into direct contact with water. Only hand application of 	<p>SPR HYD-5 Protect Non-Target Vegetation and Special-status Species from Herbicides: The project proponent will implement the following measures when applying herbicides:</p> <ul style="list-style-type: none"> • Locate herbicide mixing sites in areas devoid of vegetation and where there is no potential of a spill reaching non-target vegetation or a waterway. • Use only herbicides labeled for use in aquatic environments when working in riparian habitats or other areas where there is a possibility the herbicide could come into direct contact with water. Only hand

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<p>herbicides will be allowed in riparian habitats and only during low-flow periods or when seasonal streams are dry.</p> <ul style="list-style-type: none"> • No terrestrial or aquatic herbicides will be applied within Watercourse and Lake Protection Zones (WLPZs) of Class I and II watercourses, if feasible. If this is not feasible, hand application of herbicides labeled for use in aquatic environments may be used within the WLPZ provided that the project proponent notifies the applicable regional water quality control board no fewer than 15 days prior to herbicide application. • No herbicides will be applied within a 50-foot buffer of federal Endangered Species Act (ESA) or California ESA listed plant species or within 50 feet of dry vernal pools. • For spray applications in and adjacent to habitats suitable for special-status species, use herbicides containing dye (registered for aquatic use by California Department of Pesticide Regulation, if warranted) to prevent overspray. 	<p>application of herbicides will be allowed in riparian habitats and only during low-flow periods or when seasonal streams are dry.</p> <ul style="list-style-type: none"> • No terrestrial or aquatic herbicides will be applied within WLPZs of Class I and II watercourses, if feasible. If this is not feasible, hand application of herbicides labeled for use in aquatic environments may be used within the WLPZ provided that the project proponent notifies the applicable regional water quality control board no fewer than 15 days prior to herbicide application. The feasibility of avoiding herbicide application within WLPZ of Class I and II watercourses will be determined by the project proponent and may be based on whether doing so will preclude achieving CalVTP program objectives, including, but not limited to, protection of vulnerable communities. The reasons for infeasibility will be documented in the PSA. • No herbicides will be applied within a 50-foot buffer of ESA or CESA listed plant species or within 50 feet of dry vernal pools. • For spray applications in and adjacent to habitats suitable for special-status species, use herbicides containing dye (registered for aquatic use by DPR, if warranted) to prevent overspray. • Application will cease when weather parameters exceed label specifications or when sustained winds at the site of application exceeds 7 miles per hour (whichever is more conservative); • No herbicide will be applied during precipitation events or if precipitation is forecast 24 hours before or after project activities. <p>This SPR applies to herbicide treatment activities and all treatment types, including treatment maintenance.</p>
<p>HYD-1 Prescribed Herbivory Treatments: The following water quality protections will apply for all prescribed herbivory treatments:</p> <ul style="list-style-type: none"> • Limit the duration of prescribed herbivory within 50 feet of lakes/reservoirs, creeks, streams, riparian corridors, and wetlands to prevent soil erosion that could affect water quality (see SH-1) 	<p>SPR HYD-3 Water Quality Protections for Prescribed Herbivory: The project proponent will include the following water quality protections for all prescribed herbivory treatments:</p> <ul style="list-style-type: none"> • Environmentally sensitive areas such as waterbodies, wetlands, or riparian areas will be identified in the treatment prescription and excluded

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<ul style="list-style-type: none"> Water will be provided for grazing animals in the form of an on-site stock pond or a portable water source located outside of environmentally sensitive areas. Treatment prescriptions will be designed to protect soil stability. Grazing animals will be herded out of an area if accelerated soil erosion is observed. <p>SH-2 Grazing and Sensitive Habitats: Avoid grazing in sensitive habitats including serpentine-associated communities, chaparral, and across waterways and within a 50 foot buffer if there is a need for protection of riparian vegetation from grazing. Limited grazing may be allowed if it would be beneficial to plant and wetland communities, including serpentine-associated communities, without causing harm (e.g., removal of invasive species) and would not result in erosion.</p> <p>NOI-1 Minimization of Noise Disruption to Nearby Neighbors and Sensitive Receptors: All projects will comply with applicable local noise ordinances. All powered equipment and power tools will be used and maintained according to manufacturer specifications. All diesel- and gasoline-powered treatment equipment will be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations.</p> <p>Measures to minimize noise disruption to nearby neighbors and sensitive receptors will be implemented as needed. These measures may include but are not limited to:</p> <ul style="list-style-type: none"> Using noise control technologies on equipment (e.g., mufflers, ducts, and acoustically attenuating shields) Locating stationary noise sources (e.g., pumps and generators) away from sensitive receptors Closing engine shrouds during equipment operations Shutting down equipment when not in use. Equipment will not be idled unnecessarily Operating heavy equipment during daytime hours if such noise would be audible to receptors (e.g., residential land uses, schools, hospitals, places of worship) 	<p>from prescribed herbivory project areas using temporary fencing or active herding. A buffer of approximately 50 feet will be maintained between sensitive and actively grazed areas.</p> <ul style="list-style-type: none"> Water will be provided for grazing animals in the form of an on-site stock pond or a portable water source located outside of environmentally sensitive areas. Treatment prescriptions will be designed to protect soil stability. Grazing animals will be herded out of an area if accelerated soil erosion is observed. <p>This SPR applies to prescribed herbivory treatment activities and all treatment types, including treatment maintenance.</p> <p>SPR NOI-1 Limit Heavy Equipment Use to Daytime Hours: The project proponent will require that operation of heavy equipment associated with treatment activities (heavy off-road equipment, tools, and delivery of equipment and materials) will occur during daytime hours if such noise would be audible to receptors (e.g., residential land uses, schools, hospitals, places of worship). Cities and counties in the treatable landscape typically restrict construction-noise (which would apply to vegetation treatment noise) to particular daytime hours. If the project proponent is subject to local noise ordinance, it will adhere to those to the extent the project is subject to them. If the applicable jurisdiction does not have a noise ordinance or policy restricting the time-of-day when noise-generating activity can occur noise-generating vegetation treatment activity will be limited to the hours of 7:00 a.m. to 6:00 p.m., Monday through Saturday, and between 9:00 a.m. and 6:00 p.m. on Sunday and federal holidays. If the project proponent is not subject to local ordinances (e.g., CAL FIRE), it will adhere to the restrictions stated above or may elect to adhere to the restrictions identified by the local ordinance encompassing the treatment area. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p> <p>SPR NOI-2 Equipment Maintenance: The project proponent will require that all powered treatment equipment and power tools will be used and</p>

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<ul style="list-style-type: none"> Locating project activities, equipment, and equipment staging areas away from nearby noise-sensitive land uses (e.g., residential land uses, schools, hospitals, places of worship), to the extent feasible 	<p>maintained according to manufacturer specifications. All diesel- and gasoline-powered treatment equipment will be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. This SPR applies to all activities and all treatment types, including treatment maintenance.</p> <p>SPR NOI-3 Engine Shroud Closure: The project proponent will require that engine shrouds be closed during equipment operation. This SPR applies only to mechanical treatment activities and all treatment types, including treatment maintenance.</p> <p>SPR NOI-4 Locate Staging Areas Away from Noise-Sensitive Land Uses: The project proponent will locate treatment activities, equipment, and equipment staging areas away from nearby noise-sensitive land uses (e.g., residential land uses, schools, hospitals, places of worship), to the extent feasible, to minimize noise exposure. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p> <p>SPR NOI-5 Restrict Equipment Idle Time: The project proponent will require that all motorized equipment be shut down when not in use. Idling of equipment and haul trucks will be limited to 5 minutes. This SPR applies to all treatment activities and all treatment types, including treatment maintenance.</p>
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<p>CUL-4 Native American Project Notification: For core projects subject to a CEQA determination or compliance and requiring MWPA Board of Directors' approval, Graton Rancheria will be notified and project maps and/or spatial data provided for projects that will potentially entail ground disturbance. Any input from Graton Rancheria regarding specific known resources that could be affected will be considered during project implementation through the methods of avoidance as described in CUL-3.</p>	<p>SPR CUL-2 Contact Geographically Affiliated Native American Tribes: The project proponent will obtain the latest Native American Heritage Commission (NAHC) provided Native Americans Contact List. Using the appropriate Native Americans Contact List, the project proponent will notify the California Native American Tribes in the counties where the treatment activity is located. The notification will contain the following:</p> <ul style="list-style-type: none"> A written description of the treatment location and boundaries. Brief narrative of the treatment objectives. A description of the activities used (e.g., prescribed burning, mastication) and associated acreages.

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	<ul style="list-style-type: none">• A map of the treatment area at a sufficient scale to indicate the spatial extent of activities.<ul style="list-style-type: none">– A request for information regarding potential impacts to cultural resources from the proposed treatment.• A detailed description of the depth of excavation, if ground disturbance is expected. <p>In addition, the project proponent will contact the NAHC for a review of their Sacred Lands File. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p> <p>SPR CUL-6 Treatment of Tribal Cultural Resources: The project proponent, in consultation with the culturally affiliated tribe(s), will develop effective protection measures for important tribal cultural resources located within treatment areas. These measures may include adjusting the treatment location or design to entirely avoid cultural resource locations or changing treatment activities so that damaging effects to cultural resources will not occur. The project proponent will provide the tribe(s) the opportunity to submit comments and participate in consultation to resolve issues of concern. The project proponent will defer implementing the treatment until the tribe approves protection measures, or if agreement cannot be reached after a good-faith effort, the proponent determines that any or all feasible measures have been implemented, where feasible, and the resource is either avoided or protected. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>
<p>ES-1 Environmental Surveys for Rare Plants: Within areas where rare and special-status plants have a moderate to high potential to occur, based on desktop data of habitat types, known site-specific information, and the professional judgement of qualified biologists, surveys will be conducted prior to any activity that has the potential to damage perennial plants or is proposed to occur during the flowering season for the specific annual plant species that has the potential to damage the flowering body and seeds of these plant species. Activities that have the potential to damage the flowering body may include but may not be limited to mowing, weed whacking, off-road vehicle and heavy equipment use, discing, and prescribed burning.</p>	<p>SPR BIO-7: Survey for Special-Status Plants. If SPR BIO-1 determines that suitable habitat for special-status plant species is present and cannot be avoided, the project proponent will require a qualified RPF or botanist to conduct protocol-level surveys for special-status plant species with the potential to be affected by a treatment prior to initiation of the treatment. The survey will follow the methods in the current version of CDFW’s “Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities.”</p> <p>Surveys to determine the presence or absence of special-status plant species will be conducted in suitable habitat that could be affected by the</p>

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<p>Surveys for rare plants will occur for these species across the entire project footprint. Surveys will occur during the blooming period, if feasible, and will occur prior to work for the specified special-status plant. If blooming period surveys are not feasible and the sensitive plant in question can be keyed to genus outside of the blooming period, surveys will be conducted for all members of the genus. Individuals will be flagged for avoidance or modified methods. Physical avoidance will include flagging, fencing, stakes, or clear, existing landscape demarcations (e.g., edge of a roadway) to delineate the boundary of the avoidance area around the suitable habitat and removal after completion. For physical avoidance, a buffer may be implemented as determined necessary by the biologist. Sensitive species damage or loss avoidance may include implementation of appropriate species-specific no-activity buffers around sensitive resources. Temporary fencing will also be implemented, as and where determined necessary based on the species tolerance, if grazing is prescribed in the area of flagged individuals for avoidance or modified methods (WILD-1).</p>	<p>treatment and timed to coincide with the blooming or other appropriate phenological period of the target species (as determined by a qualified RPF or botanist), or all species in the same genus as the target species will be assumed to be special-status.</p> <p>If potentially occurring special-status plants are listed under CESA or ESA, protocol-level surveys to determine presence/absence of the listed species will be conducted in all circumstances, unless determined otherwise by CDFW or USFWS.</p> <p>For other special-status plants not listed under CESA or ESA, as defined in Section 3.6.1 of this PEIR, surveys will not be required under the following circumstances:</p> <ul style="list-style-type: none">• If protocol-level surveys, consisting of at least two survey visits (e.g., early blooming season and later blooming season) during a normal weather year, have been completed in the 5 years before implementation of the treatment project and no special-status plants were found, and no treatment activity has occurred following the protocol-level survey, treatment may proceed without additional plant surveys.• If the target special-status plant species is an herbaceous annual, stump-sprouting, or geophyte species, the treatment may be carried out during the dormant season for that species or when the species has completed its annual lifecycle without conducting presence/absence surveys provided the treatment will not alter habitat or destroy seeds, stumps, or roots, rhizomes, bulbs and other underground parts in a way that would make it unsuitable for the target species to reestablish following treatment. <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>
<p>IP-1 Clean Equipment: All crew members, surveyors, and other personnel on site related to project activities will clean clothing, footwear, and equipment used during treatments of soil, seeds, vegetative matter, other debris or seed-bearing material, or water (e.g., rivers, streams, creeks, lakes) before entering</p>	<p>SPR BIO-6 Prevent Spread of Plant Pathogens: When working in sensitive natural communities, riparian habitats, or oak woodlands that are at risk from plant pathogens (e.g., lone chaparral, blue oak woodland), the project proponent will implement the following best management practices to</p>

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<p>the treatment area or when leaving an area with infestations of invasive plants, noxious weeds, known plant pathogens, or invasive wildlife.</p>	<p>prevent the spread of Phytophthora and other plant pathogens (e.g., pitch canker (Fusarium), goldspotted oak borer, shot hole borer, bark beetle):</p> <p>clean and sanitize vehicles, equipment, tools, footwear, and clothes before arriving at a treatment site and when leaving a contaminated site, or a site in a county where contamination is a risk;</p> <ul style="list-style-type: none"> • include training on Phytophthora diseases and other plant pathogens in the worker awareness training; • minimize soil disturbance as much as possible by limiting the number of vehicles, avoiding off-road travel as much as possible, and limiting use of mechanized equipment; • minimize movement of soil and plant material within the site, especially between areas with high and low risk of contamination; • clean soil and debris from equipment and sanitize hand tools, buckets, gloves, and footwear when moving from high risk to low risk areas or between widely separated portions of a treatment area; and • follow the procedures listed in Guidance for plant pathogen prevention when working at contaminated restoration sites or with rare plants and sensitive habitat (Working Group for Phytoptheras in Native Habitats 2016). <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>
<p>IP-2 Prevent the Spread of Invasive Species and Plant Pathogens: Segregate and treat soils and vegetation contaminated with invasive plant seeds and propagules. Treat, as appropriate, to prevent the spread of invasive plants. Treatment may include disposal on site within already infested areas, chipping or pile burning and mulching to eliminate viable seeds, or disposal at an approved cogeneration plant or green waste facility.</p> <p>Minimize soil disturbance to the greatest extent possible to reduce the potential for introducing or spreading invasive plants or plant pathogens, to protect topsoil resources, and to reduce available habitat for the establishment of new invasive plants.</p>	<p>SPR BIO-9 Prevent Spread of Invasive Plants, Noxious Weeds, and Invasive Wildlife: The project proponent will take the following actions to prevent the spread of invasive plants, noxious weeds, and invasive wildlife (e.g., New Zealand mudsnail):</p> <ul style="list-style-type: none"> • clean clothing, footwear, and equipment used during treatments of soil, seeds, vegetative matter, other debris or seed-bearing material, or water (e.g., rivers, streams, creeks, lakes) before entering the treatment area or when leaving an area with infestations of invasive plants, noxious weeds, or invasive wildlife; • for all heavy equipment and vehicles traveling off road, pressure wash, if feasible, or otherwise appropriately decontaminate equipment at a

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	<p>designated weed-cleaning station prior to entering the treatment area from an area with infestations of invasive plants, noxious weeds, or invasive wildlife. Anti-fungal wash agents will be specified if the equipment has been exposed to any pathogen that could affect native species;</p> <ul style="list-style-type: none">• inspect all heavy equipment, vehicles, tools, or other treatment-related materials for sand, mud, or other signs that weed seeds or propagules could be present prior to use in the treatment area. If the equipment is not clean, the qualified RPF or biological technician will deny entry to the work areas;• stage equipment in areas free of invasive plant infestations unless there are no uninfested areas present within a reasonable proximity to the treatment area;• identify significant infestations of invasive plant species (i.e., those rated as invasive by Cal-IPC or designated as noxious weeds by California Department of Food and Agriculture) during reconnaissance-level surveys and target them for removal during treatment activities. Treatment methods will be selected based on the invasive species present and may include herbicide application, manual or mechanical treatments, prescribed burning, and/or herbivory, and will be designed to maximize success in killing or removing the invasive plants and preventing reestablishment based on the life history characteristics of the invasive plant species present. Treatments will be focused on removing invasive plant species that cause ecological harm to native vegetation types, especially those that can alter fire cycles;• treat invasive plant biomass onsite to eliminate seeds and propagules and prevent reestablishment or dispose of invasive plant biomass offsite at an appropriate waste collection facility (if not kept on site); transport invasive plant materials in a closed container or bag to prevent the spread of propagules during transport; and• implement Fire and Fuel Management BMPs outlined in the “Preventing the Spread of Invasive Plants: Best Management Practices for Land Mangers” (Cal-IPC 2012, or current version).

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<p>IP-4 Retain Native Plants: When removing vegetation, focus first on removing invasive and highly flammable species, and dead or diseased vegetation. Retain beneficial, low-fire risk native plant species whenever possible.</p>	<p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p> <p>SPR BIO-5 Avoid Environmental Effects of Type Conversion and Maintain Habitat Function in Chaparral and Coastal Sage Scrub: The project proponent will design treatment activities to avoid type conversion where native coastal sage scrub and chaparral are present. An ecological definition of type conversion is used in the CalVTP PEIR for assessment of environmental effects: a change from a vegetation type dominated by native shrub species that are characteristic of chaparral and coastal sage scrub vegetation alliances to a vegetation type characterized predominantly by weedy herbaceous cover or annual grasslands. For the PEIR, type conversion is considered in terms of habitat function, which is defined here as the arrangement and capability of habitat features to provide refuge, food source, and reproduction habitat to plants and animals, and thereby contribute to the conservation of biological and genetic diversity and evolutionary processes (de Groot et al. 2002). Some modification of habitat characteristics may occur provided habitat function is maintained (i.e., the location, essential habitat features, and species supported are not substantially changed).</p> <p>During the reconnaissance-level survey required in SPR BIO-1, a qualified RPF or biologist will identify chaparral and coastal sage scrub vegetation to the alliance level and determine the condition class and fire return interval departure of the chaparral and/or coastal sage scrub present in each treatment area.</p> <p>For all treatment types in chaparral and coastal sage scrub, the project proponent, in consultation with a qualified RPF or qualified biologist will:</p> <ul style="list-style-type: none">• Develop a treatment design that avoids environmental effects of type conversion in chaparral and coastal sage scrub vegetation alliances, which will include evaluating and determining the appropriate spatial scale at which the proponent would consider type conversion and substantiating its appropriateness. The project proponent will demonstrate with substantial evidence that the habitat function of chaparral and coastal sage scrub would be at least maintained within the

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identified spatial scale at which type conversion is evaluated for the specific treatment project. Consideration of factors such as site hydrology, erosion potential, suitability of wildlife habitat, spatial needs of sensitive species, presence of sufficient seed plants and nurse plants, light availability, and edge effects may inform the determination of an appropriate spatial scale.

- The treatment design will maintain a minimum percent cover of mature native shrubs within the treatment area to maintain habitat function; the appropriate percent cover will be identified by the project proponent in the development of treatment design and be specific to the vegetation alliances that are present in the identified spatial scale used to evaluate type conversion. Mature native shrubs that are retained will be distributed contiguously or in patches within the stand. If the stand consists of multiple age classes, patches representing a range of middle to old age classes will be retained to maintain and improve heterogeneity, to the extent needed to avoid type conversion.

These SPR requirements apply to all treatment activities and all treatment types, including treatment maintenance.

Additional measures will be applied to ecological restoration treatment types:

- For ecological restoration treatment types, complete removal of the mature shrub layer will not occur in native chaparral and coastal sage scrub vegetation types.
- Ecological restoration treatments will not be implemented in vegetation types that are within their natural fire return interval (i.e., time since last burn is less than the average time listed as the fire return interval range in Table 3.6-1) unless the project proponent demonstrates with substantial evidence that the habitat function of chaparral and coastal sage scrub would be improved.
- A minimum of 35 percent relative cover of existing shrubs and associated native vegetation will be retained at existing densities in patches distributed in a mosaic pattern within the treated area or the shrub canopy will be thinned by no more than 20 percent from baseline density (i.e., if

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	<p>baseline shrub canopy density is 60 percent, post treatment shrub canopy density will be no less than 40 percent). A different percent relative cover can be retained if the project proponent demonstrates with substantial evidence that alternative treatment design measures would result in effects on the habitat function of chaparral and coastal sage scrub that are equal or more favorable than those expected to result from application of the above measures. Biological considerations that may inform a deviation from the minimum 35 percent relative cover retention include but are not limited to soil moisture requirements, increased soil temperatures, changes in light/shading, presence of sufficient seed plants and nurse plants, erosion potential, and site hydrology.</p> <ul style="list-style-type: none">• If the stand within the treatment area consists of multiple age classes, patches representing a range of middle to old age classes will be retained to maintain and improve heterogeneity. <p>These SPR requirements apply to all treatment activities and only the ecosystem restoration treatment type, including treatment maintenance.</p> <p>A determination of compliance with the SB 1260 prohibition of type conversion in chaparral and coastal sage scrub is a statutory issue separate from CEQA compliance that may involve factors additional to the ecological definition and habitat functions presented in the PEIR, such as geographic context. It is beyond the legal scope of the PEIR to define SB 1260 type conversion and statutory compliance. The project proponent, acting as lead agency for the proposed later treatment project, will be responsible for defining type conversion in the context of the project and making the finding that type conversion would not occur, as required by SB 1260. The project proponent will determine its criteria for defining and avoiding type conversion and, in making its findings, may draw upon information presented in this PEIR.</p>
<p>SH-1 Riparian Resources – Project Design: Work will be limited in riparian and wetland areas to removal of uncharacteristic fuel loads (e.g., removing dead or dying vegetation), trimming/limbing of woody species as necessary to reduce ladder fuels, and select thinning of vegetation to restore densities that are representative of healthy stands of the riparian vegetation types that are</p>	<p>SPR BIO-4: Design Treatment to Avoid Loss or Degradation of Riparian Habitat Function. Project proponents, in consultation with a qualified RPF or qualified biologist, will design treatments in riparian habitats to retain or improve habitat functions by implementing the following within riparian habitats:</p>

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<p>characteristic of the region. Work will only be permitted in dry conditions, where soil is not saturated and no rain (precipitation of 0.5 inch or greater) has occurred in the past 24 hours. Allowable activities include hand removal of dead or dying riparian trees and shrubs, invasive plant removal, selective thinning, and removal of encroaching upland species. Mature, healthy trees will not be removed from a riparian corridor. No foot traffic or equipment will be permitted to enter a wetted channel at any time. Any activities conducted within a riparian corridor will be conducted to avoid alteration to a bed, channel, or bank of a waterway and all debris, including sawdust, chips, or other vegetative material, will be prevented from entering the bed, channel, or bank of a waterway, unless a permit from the California Department of Fish and Game under Section 1600 is obtained.</p>	<ul style="list-style-type: none">• Retain at least 75 percent of the overstory and 50 percent of the understory canopy of native riparian vegetation within the limits of riparian habitat identified and mapped during surveys conducted pursuant to SPR BIO-3. Native riparian vegetation will be retained in a well distributed multi-storied stand composed of a diversity of species similar to that found before the start of treatment activities.• Treatments will be limited to removal of uncharacteristic fuel loads (e.g., removing dead or dying vegetation), trimming/limbing of woody species as necessary to reduce ladder fuels, and select thinning of vegetation to restore densities that are characteristic of healthy stands of the riparian vegetation types characteristic of the region. This includes hand removal (or mechanized removal where topography allows) of dead or dying riparian trees and shrubs, invasive plant removal, selective thinning, and removal of encroaching upland species.• Removal of large, native riparian hardwood trees (e.g., willow, ash, maple, oak, alder, sycamore, cottonwood) will be minimized to the extent feasible and 75 percent of the pretreatment native riparian hardwood tree canopy will be retained. Because tree size varies depending on vegetation type present and site conditions, the tree size retention parameter will be determined on a site-specific basis depending on vegetation type present and setting; however, live, healthy, native trees that are considered large for that type of tree and large relative to other trees in that location will be retained. A scientifically based, project-specific explanation substantiating the retention size parameter for native riparian hardwood tree removal will be provided in the Biological Resources Discussion of the PSA. Consideration of factors such as site hydrology, erosion potential, suitability of wildlife habitat, presence of sufficient seed trees, light availability, and changes in stream shading may inform the tree size retention requirements.• Removed trees will be felled away from adjacent streams or waterbodies and piled outside of the riparian vegetation zone (unless there is an ecological reason to do otherwise that is approved by applicable regulatory agencies, such as adding large woody material to a stream to enhance fish habitat, e.g., see Accelerated Wood Recruitment and Timber

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- Operations: Process Guidance from the California Timber Harvest Review Team Agencies and National Marine Fisheries Service).
- Vegetation removal that could reduce stream shading and increase stream temperatures will be avoided.
 - Ground disturbance within riparian habitats will be limited to the minimum necessary to implement effective treatments. This will consist of the minimum disturbance area necessary to reduce hazardous fuels and return the riparian community to a natural fire regime (i.e., Condition Class 1) considering historic fire return intervals, climate change, and land use constraints.
 - Only hand application of herbicides approved for use in aquatic environments will be allowed and only during low-flow periods or when seasonal streams are dry.
 - The project proponent will notify CDFW pursuant to California Fish and Game Code Section 1602 prior to implementing any treatment activities in riparian habitats. Notification will identify the treatment activities, map the vegetation to be removed, identify the impact avoidance identification methods to be used (e.g., flagging), and appropriate protections for the retention of shaded riverine habitat, including buffers and other applicable measures to prevent erosion into the waterway.
 - In consideration of spatial variability of riparian vegetation types and condition and consistent with California Forest Practice Rules Section 916.9(v) (February 2019 version), a different set of vegetation retention standards and protection measures from those specified in the above bullets may be implemented on a site-specific basis if the qualified RPF and the project proponent demonstrate through substantial evidence that alternative design measures provide a more effective means of achieving the treatment objectives and would result in effects to the Beneficial Functions of Riparian Zones equal or more favorable than those expected to result from application of the above measures. Deviation from the above design specifications, different protection measures and design standards will only be approved when the treatment plan incorporates an evaluation of beneficial functions of the riparian habitat and with written concurrence from CDFW.

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<p>NB-1 Nesting Bird Season Avoidance: Whenever possible, schedule work outside of the bird nesting season, which is generally from February 1 through July 3. Not all species nest between the regulatory season, and active nests that are encountered year-round are protected.</p>	<p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>
<p>NB-2 Nesting Bird Surveys: If work that has the potential to impact nesting birds commences between February 1 and July 31 (during the nesting season), a qualified biologist (whose qualifications have been approved by the MWPA or lead public agency) will conduct a pre-activity survey for nesting birds.</p> <p>Nesting bird surveys are recommended during the nesting season for work involving mowing with heavy equipment, other vegetation (including tree) removal or limbing and trimming activities, and prescribed (broadcast and pile) burning. Low-impact activities including goat grazing, hand-pulling weeds, and herbicide application do not generally require nesting bird surveys. Determination of need for surveys for low-impact activities should be evaluated on a case-by-case basis in consultation with a qualified biologist or RPF.</p> <p>Nesting bird surveys will occur within no more than 7 days prior to work to ensure that no nests will be disturbed during vegetation management work. If work pauses for more than 7 days, a follow-up survey will be conducted prior to the restarting of work. Appropriate survey areas will be determined by the qualified biologist depending on the project footprint, type of activity proposed, and suitable habitat for nesting birds. Surveys will be conducted during periods of high bird activity (i.e., 1-3 hours after sunrise and 1-3 hours before sunset). If the qualified biologist determines that visibility is significantly obstructed due to on-site conditions (such as access issues, rain, fog, smoke, or sound disturbance [including high wind]), surveys will be deferred until conditions are suitable for nest detection</p>	<p>SPR BIO-12. Protect Common Nesting Birds, Including Raptors. The project proponent will schedule treatment activities to avoid the active nesting season of common native bird species, including raptors, that could be present within or adjacent to the treatment site, if feasible. Common native birds are species not otherwise treated as special status in the CalVTP PEIR. The active nesting season will be defined by the qualified RPF or biologist.</p> <p>If active nesting season avoidance is not feasible, a qualified RPF or biologist will conduct a survey for common nesting birds, including raptors. Existing records (e.g., CNDDDB, eBird database, State Wildlife Action Plan) should be reviewed in advance of the survey to identify the common nesting birds, including raptors, that are known to occur in the vicinity of the treatment site. The survey area will encompass reasonably accessible areas of the treatment site and the immediately surrounding vicinity viewable from the treatment site. The survey area will be determined by a qualified RPF or biologist, based on the potential species in the area, location of suitable nesting habitat, and type of treatment. For vegetation removal or project activities that would occur during the nesting season, the survey will be conducted at a time that balances the effectiveness of detecting nests and the reasonable consideration of potential avoidance strategies. Typically, this timeframe would be up to 3 weeks before treatment. The survey will occur in a single survey period of sufficient duration to reasonably detect nesting birds, including raptors, typically one day for most treatment projects (depending on the size, configuration, and vegetation density in the treatment site), and conducted during the active time of day for target species, typically close to dawn and/or dusk. The survey may be conducted concurrently with other biological surveys, if they are required by other SPRs. Survey methods will be tailored by the qualified RPF or biologist to site and habitat conditions, typically involving walking throughout the survey area, visually searching for nests and birds exhibiting behavior that is typical of breeding (e.g., delivering food).</p>
<p>NB-3 Nesting Birds: Active Nest Avoidance: If active nests (i.e., presence of eggs and/or chicks) are observed in areas that could be directly or indirectly disturbed (including noise disturbance), a temporary, species-appropriate no-disturbance buffer zone will be created around the nest sufficient to reasonably</p>	

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<p>expect that breeding would not be disrupted. No work will occur inside the buffer zone.</p> <p>The size of the buffer zone will be determined by the biologist, by considering factors including but not limited to the following:</p> <ul style="list-style-type: none">• Noise and human disturbance levels at the site at the time of the survey and the noise and disturbance expected during the work;• Distance and amount of vegetation or other screening between the site and the nest; and• Sensitivity of individual nesting species and behaviors of the nesting birds, considering factors such as topography, visibility to source of disturbance, noise/vibration, nesting phase, and other case-by-case specifics. <p>Buffer sizes may be altered during work at the recommendation of the biologist. Raptor nests are subject to additional protections, including during the “branching” phase, when fledglings begin to fly but do not fully leave the nest. Buffers will be maintained until young fledge or the nest becomes inactive, as determined by the qualified biologist.</p> <p>If work must occur within the buffer, proceed to NB-4.</p>	<p>If an active nest is observed (i.e., presence of eggs and/or chicks) or determined to likely be present based on nesting bird behavior, the project proponent will implement a feasible strategy to avoid disturbance of active nests, which may include, but is not limited to, one or more of the following:</p> <ul style="list-style-type: none">• Establish Buffer. The project proponent will establish a temporary, species-appropriate buffer around the nest sufficient to reasonably expect that breeding would not be disrupted. Treatment activities will be implemented outside of the buffer. The buffer location will be determined by a qualified RPF or biologist. Factors to be considered for determining buffer location will include presence of natural buffers provided by vegetation or topography, nest height above ground, baseline levels of noise and human activity, species sensitivity, and expected treatment activities. Nests of common birds within the buffer need not be monitored during treatment. However, buffers will be maintained until young fledge or the nest becomes inactive, as determined by the qualified RPF, biologist, or biological technician.• Modify Treatment. The project proponent will modify the treatment in the vicinity of an active nest to avoid disturbance of active nests (e.g., by implementing manual treatment methods, rather than mechanical treatment methods). Treatment modifications will be determined by the project proponent in coordination with the qualified RPF or biologist.• Defer Treatment. The project proponent will defer the timing of treatment in the portion(s) of the treatment site that could disturb the active nest. If this avoidance strategy is implemented, treatment activity will not commence until young fledge or the nest becomes inactive, as determined by the qualified RPF, biologist, or biological technician. <p>Feasible actions will be taken by the project proponent to avoid loss of common native bird nests. The feasibility of implementing the avoidance strategies will be determined by the project proponent based on whether implementation of this SPR will preclude completing the treatment project within the reasonable period necessary to meet CalVTP program objectives, including, but not limited to, protection of vulnerable communities. Considerations may include limitations on the presence of environmental and atmospheric conditions necessary to execute treatment prescriptions</p>

NB-4 Nesting Birds - Active Nest Monitoring: If an avoidance buffer is not achievable, a qualified biologist may monitor the nest(s) during work activities within the recommended nest buffer to document that no take of the nest (nest failure) has occurred related to work activities. If it is determined that work activity is resulting in nest disturbance, work should cease immediately.

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	<p>(e.g., the limited seasonal windows during which prescribed burning can occur when vegetation moisture, weather, wind, and other physical conditions are suitable). If it is infeasible to avoid loss of common bird nests (not including raptor nests), the project proponent will document the reasons implementation of the avoidance strategies is infeasible in the PSA. After completion of the PSA and prior to or during treatment implementation, if there is any change in the feasibility of avoidance strategies from those explained in the PSA, this will be documented in the post-project implementation report (referred to by CAL FIRE as a Completion Report).</p> <p>The following avoidance strategies may also be considered together with or in lieu of other actions for implementation by a project proponent to avoid disturbance to raptor nests:</p> <ul style="list-style-type: none">• Monitor Active Raptor Nest During Treatment. A qualified RPF, biologist, or biological technician will monitor an active raptor nest during treatment activities to identify signs of agitation, nest defense, or other behaviors that signal disturbance of the active nest is likely (e.g., standing up from a brooding position, flying off the nest). If breeding raptors are showing signs of nest disturbance, one of the other avoidance strategies (establish buffer, modify treatment, or defer treatment) will be implemented or a pause in the treatment activity will occur until the disturbance behavior ceases.• Retention of Raptor Nest Trees. Trees with visible raptor nests, whether occupied or not, will be retained. <p>This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p>
<p>TR-2 Traffic Control Measures: Traffic control measures will be implemented to maintain traffic and pedestrian circulation on streets affected by project activities. The following measures may include:</p> <ul style="list-style-type: none">• All traffic control devices will conform to the latest edition of the MUTCD, and as amended by the latest edition of the MUTCD California supplement.• Any work that disturbs normal traffic signal operations and ensure proper temporary traffic control (lane shifts, lane closures, detours etc.) will be	<p>SPR TRAN-1 Implement Traffic Control during Treatments: Prior to initiating vegetation treatment activities the project proponent will work with the agency(ies) with jurisdiction over affected roadways to determine if a Traffic Management Plan (TMP) is needed. A TMP will be needed if traffic generated by the project would result in obstructions, hazards, or delays exceeding applicable jurisdictional standards along access routes for individual vegetation treatments. If needed, a TMP will be prepared to provide measures to reduce potential traffic obstructions, hazards, and</p>

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<p>coordinated with the agency having jurisdiction, at least 72 hours prior to commencing work.</p> <ul style="list-style-type: none">• Flagger and/or warning signage of work ahead.• A minimum of twelve (12) foot travel lanes on public roads must be maintained unless otherwise approved.• Maintaining access to driveways and private roads at all times unless other arrangements have been made.• Traffic control devices will be removed from view or covered when not in use.• Sidewalks for pedestrians will remain open if safe for pedestrians. Alternate routes and signing will be provided if pedestrian routes are to be closed.• Scheduling truck trips during non-peak hours to the extent feasible.	<p>service level degradation along affected roadway facilities. The scope of the TMP will depend on the type, intensity, and duration of the specific treatment activities under the CalVTP. Measures included in the TMP could include (but are not limited to) construction signage to provide motorists with notification and information when approaching or traveling along the affected roadway facilities, flaggers for lane closures to provide temporary traffic control along affected roadway facilities, treatment schedule restrictions to avoid seasons or time periods of peak vehicle traffic, haul-trip, delivery, and/or commute time restrictions that would be implemented to avoid peak traffic days and times along affected roadway facilities. If the TMP identifies impacts on transportation facilities outside of the jurisdiction of the project proponent, the TMP will be submitted to the agency with jurisdiction over the affected roadways prior to commencement of vegetation treatment projects. This SPR applies to all treatment activities and treatment types, including treatment maintenance.</p> <p>Smoke generated during prescribed burn operations could potentially affect driver visibility and traffic operations along nearby roadways. Direct smoke impacts to roadway visibility and indirect impacts related to driver distraction will be considered during the planning phase of burning operations. Smoke impacts and smoke management practices specific to traffic operations during prescribed fire operations will be identified and addressed within the TMP. The TMP will include measures to monitor smoke dispersion onto public roadways, and traffic control operations will be initiated in the event burning operations could affect traffic safety along any roadways. This SPR applies only to prescribed burn treatment activities and all treatment types, including treatment maintenance.</p>
<p>WILD-1 Temporary Fencing: If temporary fencing is required for prescribed herbivory treatment, a wildlife-friendly recyclable fencing design will be used. The design should consider the following:</p> <ul style="list-style-type: none">• Minimize the chance of wildlife entanglement by minimizing barbed wire, loose or broken wires.• If feasible, keep electric netting-type fencing electrified at all times or laid down while not in use.	<p>SPR BIO-11 Install Wildlife-Friendly Fencing (Prescribed Herbivory): If temporary fencing is required for prescribed herbivory treatment, a wildlife-friendly fencing design will be used. The project proponent will require a qualified RPF or biologist to review and approve the design before installation to minimize the risk of wildlife entanglement. The fencing design will meet the following standards:</p>

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<ul style="list-style-type: none"> • Charge temporary electric fencing with intermittent pulse energizers. • Allow wildlife to jump over easily without injury by installing fencing that can flex as non-target animals pass over it and installing the top wire low enough (no more than approximately 40 inches high on flat ground) to allow adult ungulates to jump over it, while keeping grazing animals safely within the fence. The determination of appropriate fence height will consider slope, as steep slopes are more difficult for wildlife to pass. • Fences should be highly visible to birds and mammals by using high-visibility tape or wire, flagging, or other markers. 	<ul style="list-style-type: none"> • Minimize the chance of wildlife entanglement by avoiding barbed wire, loose or broken wires, or any material that could impale or snag a leaping animal; and, if feasible, keeping electric netting-type fencing electrified at all times or laid down while not in use. • Charge temporary electric fencing with intermittent pulse energizers; continuous output fence chargers will not be permitted. • Allow wildlife to jump over easily without injury by installing fencing that can flex as animals pass over it and installing the top wire low enough (no more than approximately 40 inches high on flat ground) to allow adult ungulates to jump over it. The determination of appropriate fence height will consider slope, as steep slopes are more difficult for wildlife to pass. • Be highly visible to birds and mammals by using high-visibility tape or wire, flagging, or other markers. <p>This SPR applies only to prescribed herbivory and all treatment types, including treatment maintenance.</p>
PDIFS with no corresponding SPR	
<p>CUL-5 Cultural Resources Monitoring: Based on the results of CUL-3 and -4, cultural resources monitoring may be conducted to avoid impacts to known resources. In addition to flagging the resource for avoidance (as described in CUL-2 or CUL-3) if monitoring is conducted, a qualified archaeologist will be present during ground disturbance work to ensure the known or previously unidentified resources are avoided and protected during project implementation, and if the resource is identified to be pre-contact archaeological and/or a tribal cultural resource, a tribal monitor will be invited to attend during the ground disturbance work.</p>	NA
<p>IP-3 Treat Invasive Plants Prior to Seeding: Schedule activities to maximize the effectiveness of control efforts and minimize introduction and spread of invasive plants as feasible, with consideration for project objectives and location (e.g., install and maintain fuel breaks, disc lines, and other work before non-native plants set seeds).</p>	NA

ATTACHMENT B

PDFs	SPR
<p>NSO-1 Northern Spotted Owl Nesting Season Avoidance. Each project will be reviewed by a qualified biologist to determine if northern spotted owls have potential to occur near proposed project activities. Within areas where northern spotted owl have the potential to occur, work, including mowing with heavy equipment, the mechanical removal of vegetation, or prescribed burning, including pile and broadcast burning, will occur outside of the northern spotted owl nesting season to the extent feasible (February 1 to July 31).</p> <p>If work must occur during the northern spotted owl nesting season, either NSO-2 or NSO-3 will apply.</p>	NA
<p>NSO-2 Work During Northern Spotted Owl Nesting Season – Surveys</p> <p>Within an area where northern spotted owl has the potential to occur, when work will occur during the northern spotted owl nesting season (February 1 through July 31), and work is not considered low-impact by a qualified biologist the following measure will apply. Low impact type activities include, but are not limited to, goat grazing, hand pulling of weeds, hand trimming of trees and vegetation with non-mechanized equipment, chipping from existing roadways in residential areas, and use of mechanized equipment adjacent to roads or in residential areas that is a typical noise for the environment. In contrast, high-impact activities may include operation of heavy machinery in wildlands with lower baseline environmental noise, or work which produces noise disturbance for a longer duration than is typical in the environment.</p> <p>The biologists will determine if a known breeding pair is found within 0.25 mile of the proposed activity (i.e., from existing surveys that season or historic data) and perform a nest check to confirm presence. If no survey data for the season has been completed for the areas, two surveys will be conducted by a qualified biologist (whose qualifications have been approved by the MWPA or lead public agency) for nesting northern spotted owls during the months of April and May preceding the commencement of these activities. At a minimum, the survey area will include all suitable nesting habitats within 0.25 mile of any planned activity sites, and then one of the two options listed below will be implemented. If access cannot be secured for surveys, then work should be delayed until after the nesting season, unless it can be shown that noise generation from the activities and the activities proposed would be below noise</p>	NA

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PDFs	SPR
<p>and visual disturbance levels for northern spotted owls (refer to USFWS Revised Transmittal of Guidance: Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California) at the nest site, if known.</p> <ul style="list-style-type: none"> • If it is conclusively determined that there are nesting northern spotted owls, planned activities that generate noise (e.g., mowing, heavy equipment usage, crews with hand tools that generate noise) in areas without regular human disturbances from human residency (e.g., leaf blowers, home construction and remodeling, roadways), that are within 0.25-mile of an identified active nest will not begin prior to September 1 unless the young have fledged, at which time work may begin no earlier than July 10. Prescribed burns may only occur within suitable northern spotted owl habitat (as determined by a qualified biologist) during the nesting season if protocol surveys have determined that northern spotted owl nesting is not occurring in the area of planned activity. • If work must occur within 0.25 mile, and work has been determined to have the potential to impact an active northern spotted owl nest, CDFW and USFWS would be consulted to determine if take could occur and whether further permits are required. 	
<p>NSO-3 Northern Spotted Owl Habitat Alteration</p> <p>For projects involving removal of large trees (10-inches DBH or greater) in potential northern spotted owl roosting, or nesting habitat (as identified during the desktop review) in areas without regular human disturbances from human residency, habitat alteration within core use areas (nesting and roosting habitat) will be planned in consultation with a qualified northern spotted owl biologist.</p>	NA
<p>NSO-4 Retain Dusky-footed Woodrat Nests</p> <p>Dusky-footed woodrats are important prey for northern spotted owls. Wherever feasible, project activities will leave dusky-footed wood rat nests intact. If possible, maintain a 3-foot buffer of vegetation around dusky-footed woodrat middens.</p>	NA

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PDFs	SPR
<p>RB-1 Prework Survey: If vegetation management activities would (1) occur in trees with potential for roosting bat species, (2) would include removal or trimming of trees where a bat could be roosting, or (3) would involve removal or trimming of a tree with mechanized equipment adjacent to trees or structures that could have roosting bats and (4) the work would commence between March 1 and July 31, during the bat maternity period, a pre-activity survey will be conducted for roosting bats within 2 weeks prior to work to ensure that no roosting bats will be disturbed during work. This survey can be conducted concurrent with other surveys for other sensitive species. Trees and shrubs within the work footprint that have been determined to be unoccupied by roosting bats, or that are located outside the avoidance buffer for active roosting sites may be removed. Roosting initiated during work is presumed to be unaffected, and no buffer would be necessary.</p>	NA
<p>RB-2 Avoidance of Maternity Roosts and Day Roosts: If active maternity roosts or day roosts are found within the project site, or in areas subject to disturbance from work activities, avoidance buffers will be implemented. The buffer size will be determined in consultation with the qualified biologist or RPF.</p>	NA
<p>RB-3 Bat Roosting Tree Removal – Seasonal Restrictions: If it is determined that a colonial maternity roost is potentially present, the roost will be avoided and will not be removed during the breeding season (March 1 through July 31) unless removal is necessary to address an imminent safety hazard.</p> <p>Operation of mechanical equipment producing high noise levels (e.g., chainsaws, heavy equipment) in proximity to buildings/structures supporting or potentially supporting a colonial bat roost will be restricted to periods of seasonal bat activity (as defined above), when possible.</p>	NA
<p>RB-4 Bat Roosting Tree Removal – Emergency Removals: Potential non-colonial roosts that must be removed to address a safety hazard, can be removed after consultation with a biologist. Removal will occur on warm days in late morning to afternoon when any bats present are likely to be warm and able to fly. Appropriate methods will be used to minimize the potential of harm to bats during tree removal. Such methods may include using a two-step tree removal process. This method is conducted over two consecutive days and works by</p>	NA

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<p>creating noise and vibration by cutting non-habitat branches and limbs from habitat trees using chainsaws only (no excavators or other heavy machinery) on Day 1. The noise and vibration disturbance, together with the visible alteration of the tree, is very effective in causing bats that emerge nightly to feed, to not return to the roost that night. The remainder of the tree is removed on Day 2.</p>	
<p>SH-3 Minimization of Pile Burning Disturbance: Pile burning will not be performed in sensitive habitats, such as serpentine-associated communities, wetlands, or riparian areas. If piles are burned on a different day than piled, the piles should be moved prior to burning to ensure wildlife is not present, such as by re-piling by hand, or a qualified biologist will inspect the pile prior to burning to ensure wildlife are not present. If moving or inspection of the piles is not feasible, the pile will be lit from one side and allowed to burn slowly to the other side, to allow any wildlife to relocate, rather than lighting the entire pile at once.</p>	NA
<p>HAZ-3 Pile Burning: The following measures will be implemented to reduce hazards associated with pile burning:</p> <ul style="list-style-type: none"> • Pile burning will only be allowed on days when fire is less likely to spread (e.g., wind speeds are less than 15 mph). • Piles will only be constructed in areas where burning can be safely controlled, for example, on the flattest area possible. Bottoms of steep, vegetated hills will be avoided. • Piles should be constructed with 10 feet of clearance around them. • Piles will be set back from public roads and trails at a distance to minimize risk to the public or cordoned off from the public. • All requirements of CAL FIRE, the local fire department, and/or the BAAQMD will be met, including any permit, notification, burn bans, and reporting requirements. • Have fire suppression crews on-site during the fire season determined by CAL FIRE or the local fire department (typically mid-May to mid-November) during curtain and pile burns. • Pile burning will adhere to BAAQMD criteria pollutant thresholds and Regulation 5 for open burning. 	NA

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PDIFs	SPR
<p>TR-1 Emergency Access to Project Areas: The following measures will be implemented to maintain emergency access:</p> <ul style="list-style-type: none">• At least one week prior to temporary lane or full closure of a public road for vegetation management-related work, the appropriate emergency response agency/agencies will be contacted with jurisdiction to ensure that each agency is notified of the closure and any temporary detours in advance and obtain all required encroachment permits• In the event of any emergency, roads blocked or obstructed for maintenance activities will be cleared to allow the vehicles to pass.• During temporary lane or road closures on public roads, flaggers equipped with two-way radios will be utilized where needed to control traffic. During an emergency, flaggers will radio to the crew to cease operations and reopen the public road to emergency vehicles.• All authorized vehicles at the treatment site will be parked to not block roads when no operator is present to move the vehicle.	NA

APPENDIX

Appendix C: Archaeological Resources Inventory for the Greater Novato Shaded Fuel Break Project, Marin County, California (Confidential)

Appendix D: Biological Resources Supporting Materials



Attachment D: Biological Resources Supporting Materials



Attachment D.1: Sensitive Species Tables

The following are rare, threatened, endangered, and Species of Special Concern which are known to occur within 3 miles of the proposed project.

Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
Sensitive Plants								
<i>Amorpha californica</i> var. <i>napensis</i>	Napa false indigo	CNPS 1B.2	1	Wetland, riparian woodland, woodlands	April - July	Moderate, one occurrence recorded north of project area in Olompali State Historic Park, and known suitable habitat scattered throughout the project area.	Botanical Surveys	No
<i>Amsinckia lunaris</i>	bent-flowered fiddleneck	CNPS 1B.2	60	Cismontane woodland, coastal bluff scrub, valley and foothill grassland	Mar-Jun	Moderate, occurrences in Olompali State Historic Park and on Mount Burdell. Known suitable habitat present in northeastern portion of the project area.	Avoid work during the blooming period or botanical surveys	Yes
<i>Arabis blepharophylla</i>	coast rockcress	CNPS 4.3	0	Broadleaf upland forest, coastal bluff scrub,	Feb-May	Low, occurrences recorded in the county with CNPS 9-quad search. The CNDDDB	Avoid work during the blooming period or	Yes



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
				coastal prairie, coastal scrub		records show no occurrences within 3 miles of project area, and little broadleaf upland forest suitable habitat is present and no coastal habitats were observed in project area.	botanical surveys	
<i>Arctostaphylos montana ssp. montana</i>	Mt. Tamalpais manzanita	CNPS 1B.3	2	Chaparral, valley and foothill grassland	Feb-Apr	High, many occurrences within county and suitable habitat in northeastern stretch of the project area and near Indian Valley Preserve.	Botanical Surveys	No
<i>Arctostaphylos virgata</i>	Marin manzanita	CNPS 1B.2	7	Broadleaf upland forest, chaparral, closed-cone coniferous forest, North Coast coniferous forest	Jan-Mar	Low, occurrences are located closer to the coast. No CNDDDB occurrences recorded within 3 miles of project area. Little suitable habitat in project area.	Botanical Surveys	No
<i>Astragalus breweri</i>	Brewer's milk-vetch	CNPS 4.2	0	Chaparral, cismontane woodland,	Apr-Jun	Low, occurrences are located on Mt. Tamalpais and	Avoid work during the blooming	Yes



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
				meadows and seeps, valley and foothill grassland		Tamalpais area. No CNDDDB occurrences recorded within 3 miles of project area. Potential suitable habitat in northeastern and eastern sections of the project area.	period or botanical surveys	
<i>Calamagrostis ophitidis</i>	serpentine reed grass	CNPS 4.3	0	Chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland	Apr-Jul	Moderate, recent occurrences within the county and suitable habitat within project area near Mount Burdell Preserve.	Avoid work during the blooming period or botanical surveys	Yes
<i>Calandrinia breweri</i>	Brewer's calandrinia	CNPS 4.2	0	Chaparral, coastal scrub	(Jan) Mar-Jun	Low, known suitable habitat present within the project area, but no occurrences recorded within 3 miles of the project area in CNDDDB or CNPS 9-quad search.	Avoid work during the blooming period or botanical surveys	Yes
<i>Calochortus tiburonensis</i>	Tiburon mariposa-lily	CT, FT, CNPS 1B.1	1	Valley and foothill grassland	Mar-Jun	Low, many occurrences located within southern Marin County and suitable habitat within project area in	Avoid work during the blooming period or	Yes



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
						the northeastern section around rocky outcrops or serpentine soils.	botanical surveys	
<i>Calochortus umbellatus</i>	Oakland star-tulip	CNPS 4.2	0	Broadleaf upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland	Mar-May	Low, occurrences are located near southern Marin County. Known suitable habitat present within the project area, but no occurrences recorded within 3 miles of the project area in CNDDDB or CNPS 9-quad search.	Avoid work during the blooming period or botanical surveys	Yes
<i>Calystegia collina ssp. oxyphylla</i>	Mt. Saint Helena morning-glory	CNPS 4.2	0	Chaparral, lower montane coniferous forest, valley and foothill grassland	Apr-Jun	Moderate, known suitable habitat present within the project area, and one recent occurrence on Loma Alta Fire Road at the intersection of Lucas Valley Road.	Botanical Surveys	No
<i>Castilleja affinis var. neglecta</i>	Tiburon paintbrush	CT, FE, CNPS 1B.2	7	Valley and foothill grassland	Apr-Jun	High, many occurrences within county and suitable habitat within project area	Botanical Surveys	No



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
<i>Castilleja ambigua</i> var. <i>ambigua</i>	Johnny-nip	CNPS 4.2	0	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools	Mar-Aug	Low, little suitable habitat present within the project area, coastal habitats are not present. No occurrences recorded within 3 miles of the project area in CNDDDB or CNPS 9-quad search.	Avoid work during the blooming period or botanical surveys	Yes
<i>Ceanothus masonii</i>	Mason's ceanothus	CR, CNPS 1B.2	3	Chaparral	Mar-Apr	None, no suitable habitat included in project area.	No avoidance required; not expected to occur	No
<i>Chloropyron maritimum</i> ssp. <i>palustre</i>	Point Reyes salty bird's-beak	CNPS 1B.2	2	Coastal salt marsh	June - October	None, no suitable habitat included in project area.	No avoidance required; not expected to occur	Yes
<i>Chloropyron molle</i> ssp. <i>molle</i>	soft salty bird's-beak	FE, CNPS 1B.2	1	Salt grass/pickleweed marshes at or near the limits of tidal action	June-Nov	None, no suitable habitat included in project area	No avoidance required; not expected to occur	Yes
<i>Cirsium hydrophilum</i> var. <i>vaseyi</i>	Mt. Tamalpais thistle	CNPS 1B.2	5	Seeps and serpentinite	May-Aug	None, does not occur outside of Mt Tamalpais.	No avoidance required; not expected to occur	Yes



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
<i>Cypripedium californicum</i>	California lady's-slipper	CNPS 4.2	0	Bogs and fens, lower montane coniferous forest	Apr-Aug(Sep)	None, no suitable habitat included in project area	No avoidance required; not expected to occur	No
<i>Delphinium bakeri</i>	Baker's larkspur	CE, FE, CNPS 1B.1	4	Broadleaf upland forest, coastal scrub, valley and foothill grassland	Mar-May	Low, potential suitable habitat present within the project area near Novato Creek, but only known occurrence, updated in 2021, is near Salmon Creek.	Botanical Surveys	No
<i>Dirca occidentalis</i>	western leatherwood	CNPS 1B.2	71	Broadleaf upland forest, chaparral, cismontane woodland, closed-cone coniferous forest, North Coast coniferous forest, riparian forest, riparian woodland	Jan-Mar(Apr)	Moderate, many occurrences within western Marin County recorded in CNPS 9-quad search, and suitable habitat within project area near wetted creek channels. No occurrences recorded in CNDDDB within 3 miles of the project area.	Botanical Surveys	No
<i>Elymus californicus</i>	California bottle-brush grass	CNPS 4.3	0	Broadleaf upland forest, cismontane woodland, North	May-Aug(Nov)	High, occurrences within county along Lucas Valley Road and suitable habitat within	Botanical Surveys	No



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
				Coast coniferous forest, riparian woodland		project area near Loma Verde Preserve, Ignacio Valley Preserve, and Indian Valley Preserve.		
<i>Erigeron biolettii</i>	streamside daisy	CNPS 3	10+	Broadleaf upland forest, cismontane woodland, North Coast coniferous forest	Jun-Oct	Moderate, occurrences within county and suitable habitat within project area. Multiple observations of species at Mt. Burdell.	Botanical Surveys	No
<i>Eriogonum luteolum var. caninum</i>	Tiburon buckwheat	CNPS 1B.2	5	Chaparral, coastal prairie, valley grassland, serpentine endemic	May - September	High, several occurrences recorded, and suitable habitat present within a portion of the project area, particularly at the base of Mt. Burdell.	Avoid work during the blooming period or botanical surveys	Yes
<i>Erysimum franciscanum</i>	San Francisco wallflower	CNPS 4.2	0	Chaparral, Coastal dunes, Coastal scrub, valley and foothill grassland	Mar-Jun	None, no suitable habitat included in project area	No avoidance required; not expected to occur	No
<i>Entosthodon kochii</i>	Koch's cord moss	CNPS 1B.3	1	Riverbanks on newly exposed soil	No blooming period	None; work will not occur along riparian areas or riverbanks.	No avoidance required; not expected to occur	Yes



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
<i>Fritillaria liliacea</i>	fragrant fritillary	CNPS 1B.2	3	Heavy soil, open hills, fields near coast	Feb-Apr	High, six occurrences recorded near Mt. Burdell Preserve. Potentially suitable habitat is present within the project area, particularly within and near Mt. Burdell Preserve.	Avoid work during the blooming period or botanical surveys	Yes
<i>Gilia capitata ssp. tomentosa</i>	woolly-headed gilia	CNPS 1B.1	8	Coastal bluff scrub, valley and foothill grassland	May-Jul	Low, potentially suitable habitat present within the project area, but no occurrences recorded within 3 miles of the project area in CNDDDB records.	Avoid work during the blooming period or botanical surveys	Yes
<i>Hemizonia congesta ssp. congesta</i>	congested-headed hayfield tarplant	CNPS 1B.2	2	Northern coastal scrub, valley grassland	April - November	High, two occurrences recorded within the project area near Mt. Burdell Preserve, Meadow Crest Road, and Loma Verde Preserve.	Avoid work during the blooming period or botanical surveys	Yes
<i>Hesperolinon congestum</i>	Marin western flax	FT, CT,	5	Serpentine, grassland	April - July	High, occurrences recorded in Mt. Burdell Preserve, near San	Full serpentine avoidance or	Yes



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
		CNPS 1B.1				Carlos Way, and serpentine soil is found at the base of Mt. Burdell.	botanical surveys	
<i>Kopsiopsis hookeri</i>	small groundcone	CNPS 2B.3	10	North Coast coniferous forest	Apr-Aug	None, no suitable habitat included in project area	No avoidance required; not expected to occur	No
<i>Leptosiphon aureus</i>	bristly leptosiphon	CNPS 4.2	10	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland	Apr-Jul	Moderate, occurrences near Mount Burdell Preserve and east of Stafford lake Park. Potentially suitable habitat present within the project area.	Avoid work during the blooming period or botanical surveys	Yes
<i>Lessingia hololeuca</i>	woolly-headed lessingia	CNPS 3	7	Broadleaf upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland	Jun-Oct	Moderate, occurrences in Lucas Valley and Mt. Burdell, potentially suitable habitat present within a portion of the project area.	Avoid work during the blooming period or botanical surveys	Yes
<i>Lessingia micradenia</i> var. <i>micradenia</i>	Tamalpais lessingia	CNPS 1B.2	3	Chaparral, valley and foothill grassland	(Jun)Jul-Oct	Low, most recorded occurrences located on Mt. Tamalpais. No CNDDDB or CNPS 9-quad	Avoid work during the blooming period or	Yes



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
						search occurrences recorded within 3 miles of project area. Potential suitable habitat in northeastern and eastern sections of the project area	botanical surveys	
<i>Micropus amphibolus</i>	Mt. Diablo cottonweed	CNPS 3.2	0	Broadleaf upland forest, chaparral, cismontane woodland, valley and foothill grassland	Mar-May	Moderate, known suitable habitat present within the eastern section of the project area. Known occurrences near San Andreas Fire Road on Mt. Burdell.	Avoid work during the blooming period or botanical surveys	Yes
<i>Navarretia cotulifolia</i>	Cotula navarretia	CNPS 4.2	3	Chaparral, cismontane woodland, valley and foothill grassland	May-June	Moderate, 2 known occurrences on Mt. Burdell near the San Marin Fire road; one older occurrence near Aberdeen Rd. in eastern portion of project area.	Avoid work during the blooming period or botanical surveys	Yes
<i>Navarretia leucocephala ssp. bakeri</i>	Baker's navarretia	CNPS 1B.2	23	Freshwater wetlands, Northern oak woodland,	April - July	Moderate, occurrences at Mt. Burdell vernal pools and potentially	Avoid work during the blooming period or	Yes



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
				foothill woodland, valley grassland, wetland-riparian		suitable habitat within project area.	botanical surveys	
<i>Navarretia rosulata</i>	Marin County navarretia	CNPS 1B.2	7	Chaparral, closed-cone coniferous forest	May-July	Low, potentially suitable habitat present within the project area.	Avoid work during the blooming period or botanical surveys	Yes
<i>Pentachaeta bellidiflora</i>	white-rayed pentachaeta	CE, FE, CNPS 1B.1	1	Cismontane woodland, valley and foothill grassland	Mar-May	None, no recorded occurrences north of San Rafael.	No avoidance required; not expected to occur	Yes
<i>Perideridia gairdneri</i> ssp. <i>gairdneri</i>	Gairdner's yampah	CNPS 4.2	0	Broadleaf upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools	Jun-Oct	None, no suitable habitat included in project area.	No avoidance required; not expected to occur	No
<i>Polygonum marinense</i>	Marin knotweed	CNPS 3.1	5	Marshes and swamps	(Apr) May-Aug (Oct)	None; work will not occur along marshes or swamp areas.	No avoidance required; not expected to occur	Yes



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
<i>Quercus parvula</i> var. <i>tamalpaisensis</i>	Tamalpais oak	CNPS 1B.3	8	Lower montane coniferous forest	Mar-Apr	None, only known occurrences are on Mt. Tam and in the Tamalpais area.	Botanical surveys	No
<i>Ranunculus lobbii</i>	Lobb's aquatic buttercup	CNPS 4.2	0	Aquatic species found in Cismontane woodland, North Coast coniferous forest, valley and foothill grassland, vernal pools	Feb-May	None; work will not occur along aquatic areas within project.	No avoidance required; not expected to occur	No
<i>Stebbinsoseris decipiens</i>	Santa Cruz microseris	CNPS 1B.2	4	Broadleaf upland forest, chaparral, closed-cone coniferous forest, coastal prairie, coastal scrub, valley and foothill grassland	Apr-May	None, no recorded occurrences north of San Rafael.	No avoidance required; not expected to occur	Yes
<i>Streptanthus anomalus</i>	Mount Burdell jewelflower	CNPS 1B.1	2	Ecotone between oak woodland and grassland	May - June	High, recent occurrences recorded throughout Mount Burdell Preserve and potentially suitable habitat present along	Avoid work during the blooming period or	Yes



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	Blooming Period	Potential to Occur in Treatment Areas	Recommended Avoidance Strategy	Can impacts be avoided if treatment occurs outside growing or blooming season?
<i>Streptanthus glandulosus</i> ssp. <i>pulchellus</i>	Mt. Tamalpais bristly jewelflower	CNPS 1B.2	2	Chaparral, valley grassland	May - July	the northeastern corner of the project area.	botanical surveys	
<i>Viburnum ellipticum</i>	oval-leaved viburnum	CNPS 2B.3	15	Chaparral, cismontane woodland, lower montane coniferous forest	May-Jun	Moderate, two occurrences on the Burdell Mountain Fire Road, northwest of the Buck Institute. known suitable habitat present within the southeastern section of the project area.	Botanical surveys	No



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	USFWS-designated Critical Habitat In project Area?	Potential to Occur in Treatment Areas
SENSITIVE WILDLIFE						
<i>Antrozous pallidus</i>	pallid bat	SSC	3	The pallid bat roosts in large diameter trees and abandoned buildings	N/A	Moderate; suitable habitat is present in project area and one occurrence is documented in the project area.
<i>Athene cunicularia</i>	burrowing owl	SSC	4	Utilizes large burrows in grassland habitats.	N/A	Moderate, no previous occurrences within project area, but three occurrences within 1 mile of project area west of Olompali State Historic Park and near Hamilton Wetlands. Overall habitat generally unsuitable within project area bounds with minor exceptions.
<i>Charadrius nivosus nivosus</i>	western snowy plover	FT, SSC	1	Nests in coastal dunes and salt ponds	N/A	None, no suitable habitat within project area.
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	SSC	1	Townsend's big-eared bat roost in caves, mines, bridges, building, rock crevices, tree hollows in coastal lowlands, and cultivated valleys. They	N/A	Low, no previous occurrences within project area. Suitable roosting habitat was observed in the northeastern portion of the project area, and historic occurrences are documented nearby.



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	USFWS-designated Critical Habitat In project Area?	Potential to Occur in Treatment Areas
				prefer roosting in caves or other similar open spaces.		
<i>Dicamptodon ensatus</i>	California giant salamander	SSC	1	Wet coastal forests, such as coastal redwoods, in or near clear, cold permanent and semi-permanent streams and seepages	N/A	Low, found in wet streams. Treatments would typically avoid wetted streams and adjacent areas.
<i>Elanus leucurus</i>	white-tailed kite	FP	1	Savannas, open woodlands, marshes, desert grasslands, partially cleared lands, and cultivated fields	N/A	Moderate; suitable habitat is present in project area and one occurrence is documented in the project area.



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	USFWS-designated Critical Habitat In project Area?	Potential to Occur in Treatment Areas
<i>Emys marmorata</i>	western pond turtle	SSC	4	Western pond turtles use upland and aquatic habitat in and around freshwater ponds and streams. This species nests in leaves or soil upland from water bodies in flat areas with short vegetation and dry soil.	N/A	Moderate; suitable habitat is present in project area and several occurrences are documented near the project area.
<i>Geothlypis trichas sinuosa</i>	saltmarsh common yellowthroat	SSC	3	Coastal riparian and wetland areas, Requires thick continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting	N/A	None, found in wetlands and marshes. Habitat will be avoided by project design.
<i>Laterallus jamaicensis coturniculus</i>	California black rail	FT, FP	8	The California black rail is found in tidal and freshwater wetlands and marshes. It is typically found in the shallow, dry portions of wetlands with dense canopy cover.	None	None, secretive species found in wetlands and marshes. Habitat will be avoided by project design.
<i>Melospiza melodia samuelis</i>	San Pablo song sparrow	SSC	3	The San Pablo song sparrow is found year-round in tidal	N/A	None, found in wetlands and marshes. Habitat will be avoided by project design.



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	USFWS-designated Critical Habitat In project Area?	Potential to Occur in Treatment Areas
				salt marshes and wetlands fringing the San Pablo Bay.		
<i>Rallus obsoletus obsoletus</i>	California Ridgway's rail	FE, CE, FP	6	The California Ridgway's rail is found in tidal and freshwater wetlands, marshes, and swamps.	None	None, secretive species found in wetlands and marshes. Habitat will be avoided by project design.
<i>Rana boylei</i>	foothill yellow-legged frog	CE, SSC	2	Foothill yellow-legged frogs inhabit rocky streams in a variety of habitats, including habitats such as valley foothill hardwood, valley-foothill riparian, coastal scrub, mixed conifer, mixed chaparral, and wet meadows. It is typically found in or very close to water.	N/A	Low, rarely found away from wet streams. One stream appeared to be suitable in the Pacheco Valley neighborhood. Treatment would typically avoid wetted streams.
<i>Rana draytonii</i>	California red-legged frog	FT, SSC		California red-legged frogs utilize both permanent and temporary ponds for breeding and foraging. They can be found in a variety of habitats including; California annual grassland, woodlands, wetlands, scrub, and streams. Several	N/A	Low potential to occur. Strongly associated with water, especially during breeding season (Winter and spring); often utilize underground refugia when water sources are scarce in summer and fall. Likely to disperse during rain events near known occurrences. Treatment would avoid wetted areas.



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	USFWS-designated Critical Habitat In project Area?	Potential to Occur in Treatment Areas
				occurrences are known at Mt. Burdell OSP.		
<i>Reithrodontomys raviventris</i>	salt-marsh harvest mouse	FE, CE, FP	2	Salt marsh harvest mouse can be found in brackish and salt marshes and wetland edges in the San Francisco Bay, especially those characterized by an abundance of pickleweed (<i>Salicornia</i> sp.).	N/A	None, found in pickleweed marshes. Habitat will be avoided by project design.
<i>Spirinchus thaleichthys</i>	longfin smelt	FC, CT	1	Longfin smelt is a fully aquatic fish known to use estuaries and brackish portions of freshwater streams.	N/A	None, occurs in bay waters.



Scientific Name	Common Name	Listing Status	Number of Occurrences Within 3 Miles	Habitat	USFWS-designated Critical Habitat In project Area?	Potential to Occur in Treatment Areas
<i>Strix occidentalis caurina</i>	northern spotted owl	FT, CT	82	Northern spotted owls live in forests characterized by dense canopies of mature trees, abundant logs, and standing snags. They prefer to nest in mature forest with multi-layered canopies and open space among the lower branches to allow for foraging and dispersal.	No	Low; suitable nesting habitat not present in project area footprint. Two activity centers are identified within 0.5 mile of project area.

Note: Species with occurrences within 3 miles of project areas were examined. Species which are considered “extirpated” or those with occurrence data greater than 75 years old were removed from the analysis as they are not anticipated to occur in the vicinity of the work area. Species with occurrence data which was greater than 50 years old was examined for inclusion on a case-by-case basis.

FE	Federally Endangered	CR	California Rare
FT	Federally Threatened	CC	California State Candidate
FC	Federal Candidate	FP	Fully Protected
CE	California State Endangered	SSC	California State Species of Special Concern
CT	California State Threatened	CRPR	California Rare Plant Ranks



Attachment D.2 Relevant Maps

Figure 1. CNDDDB plants documented within a 3-mile buffer of the project boundary.

Figure omitted to protect special-status wildlife and plant species

Figure 2. CNDDDB wildlife documented within a 3-mile buffer of the project boundary.

Figure omitted to protect special-status wildlife and plant species

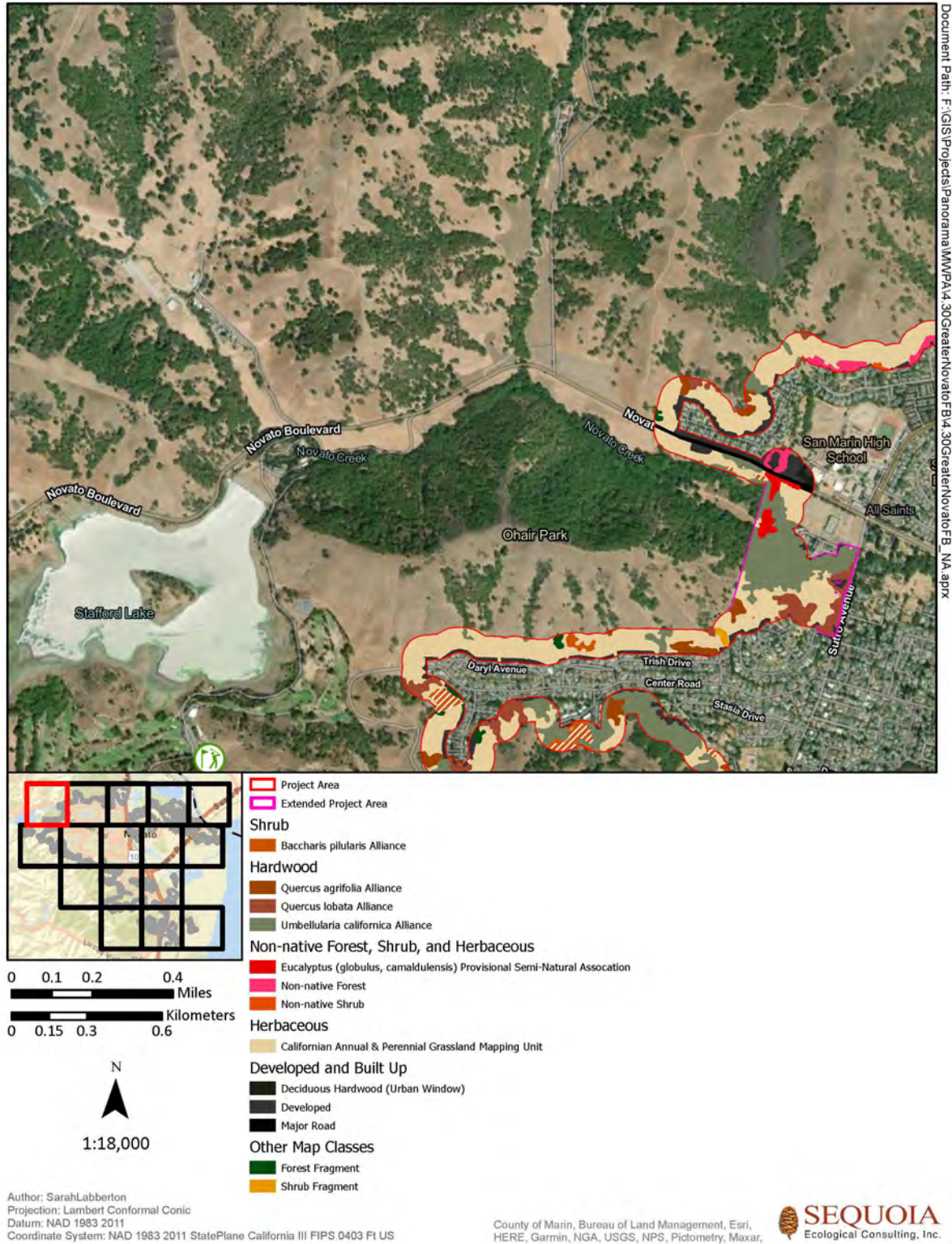
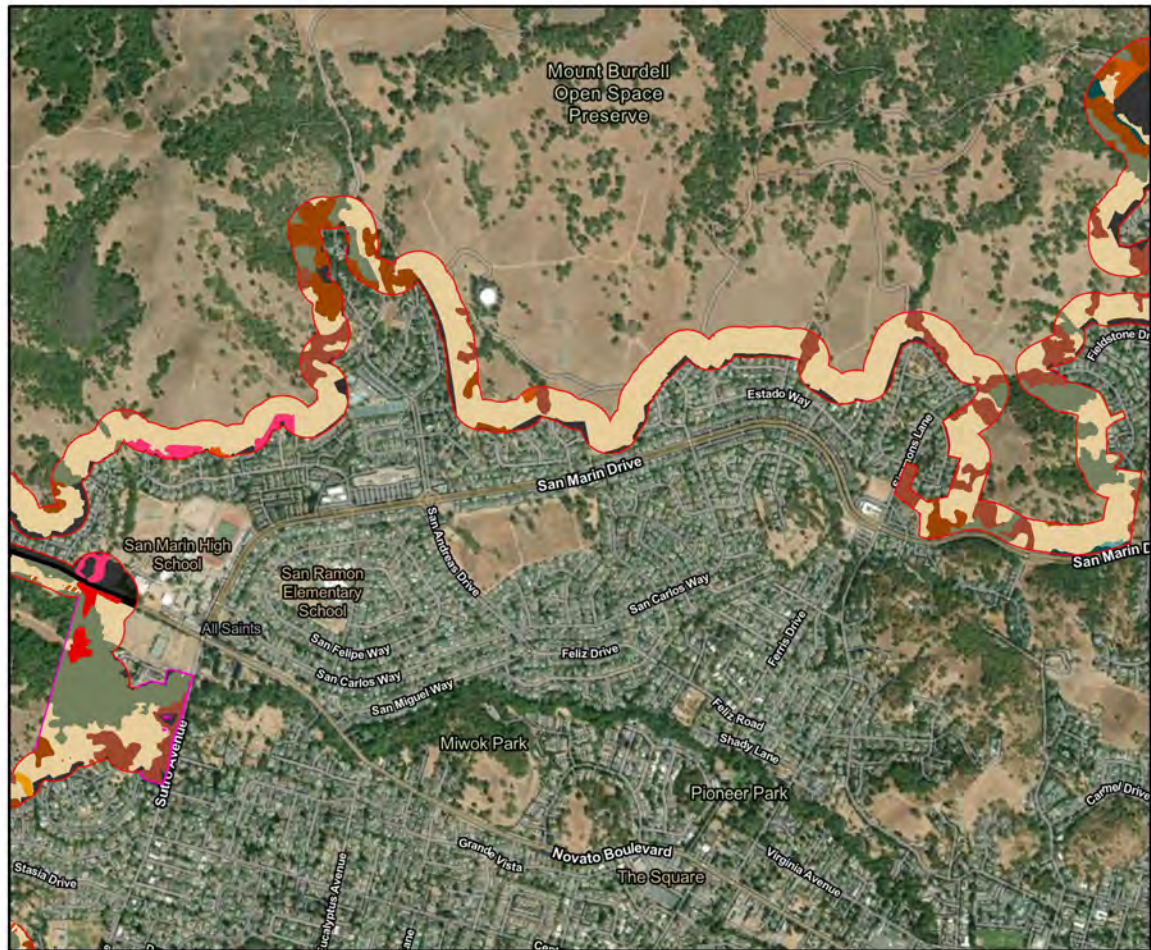
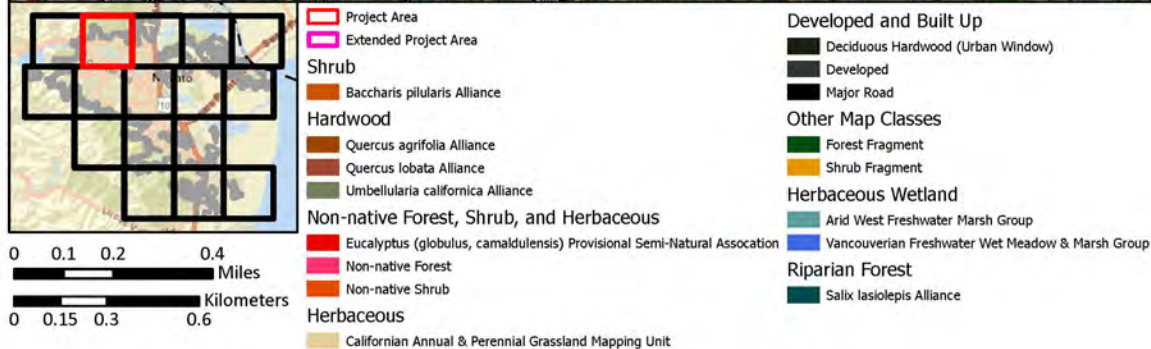


Figure 3a. Vegetation types documented within the project boundary North Quadrant 1.



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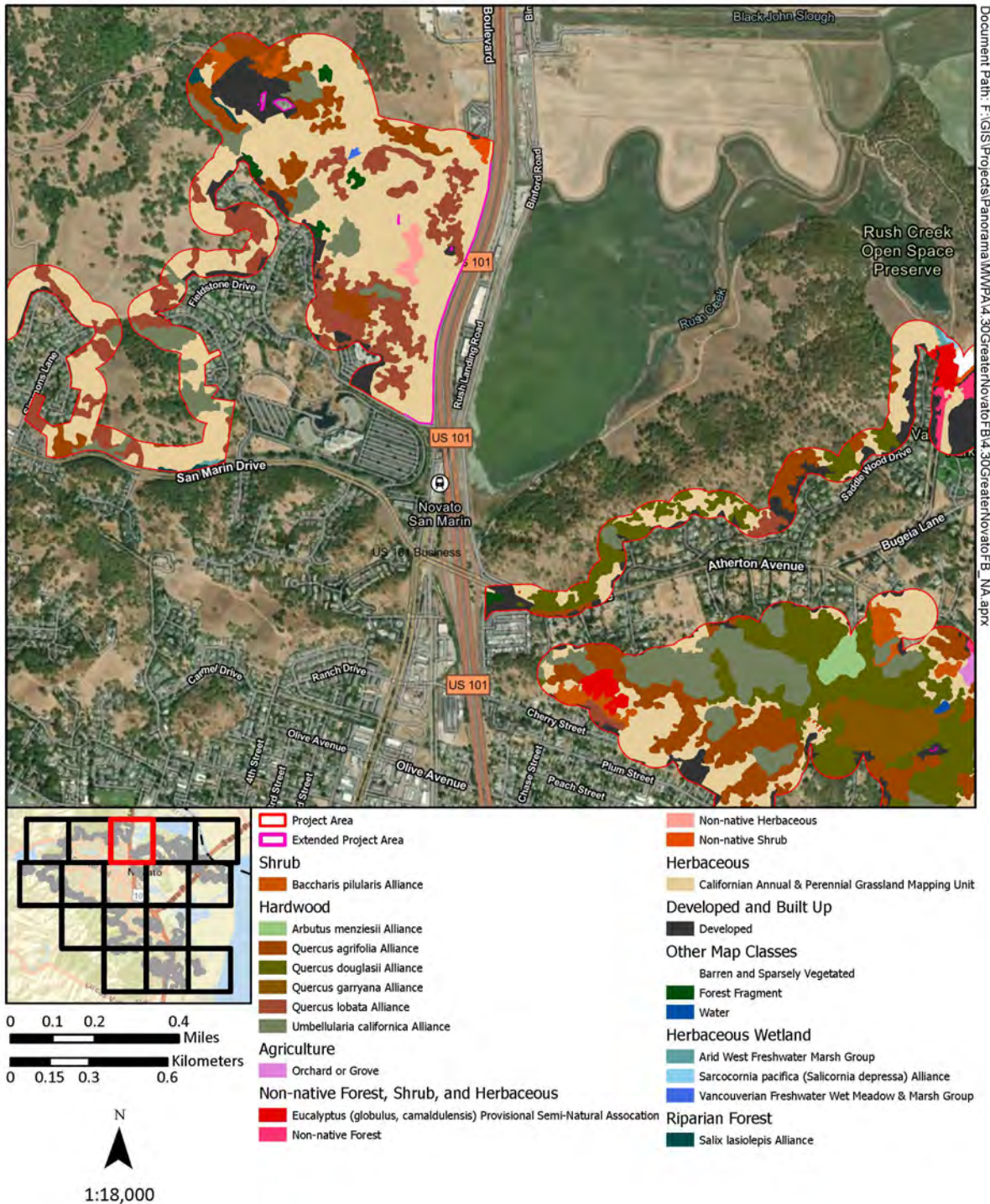


Author: SarahLabberton
 Projection: Lambert Conformal Conic
 Datum: NAD 1983 2011
 Coordinate System: NAD 1983 2011 StatePlane California III FIPS 0403 Ft US

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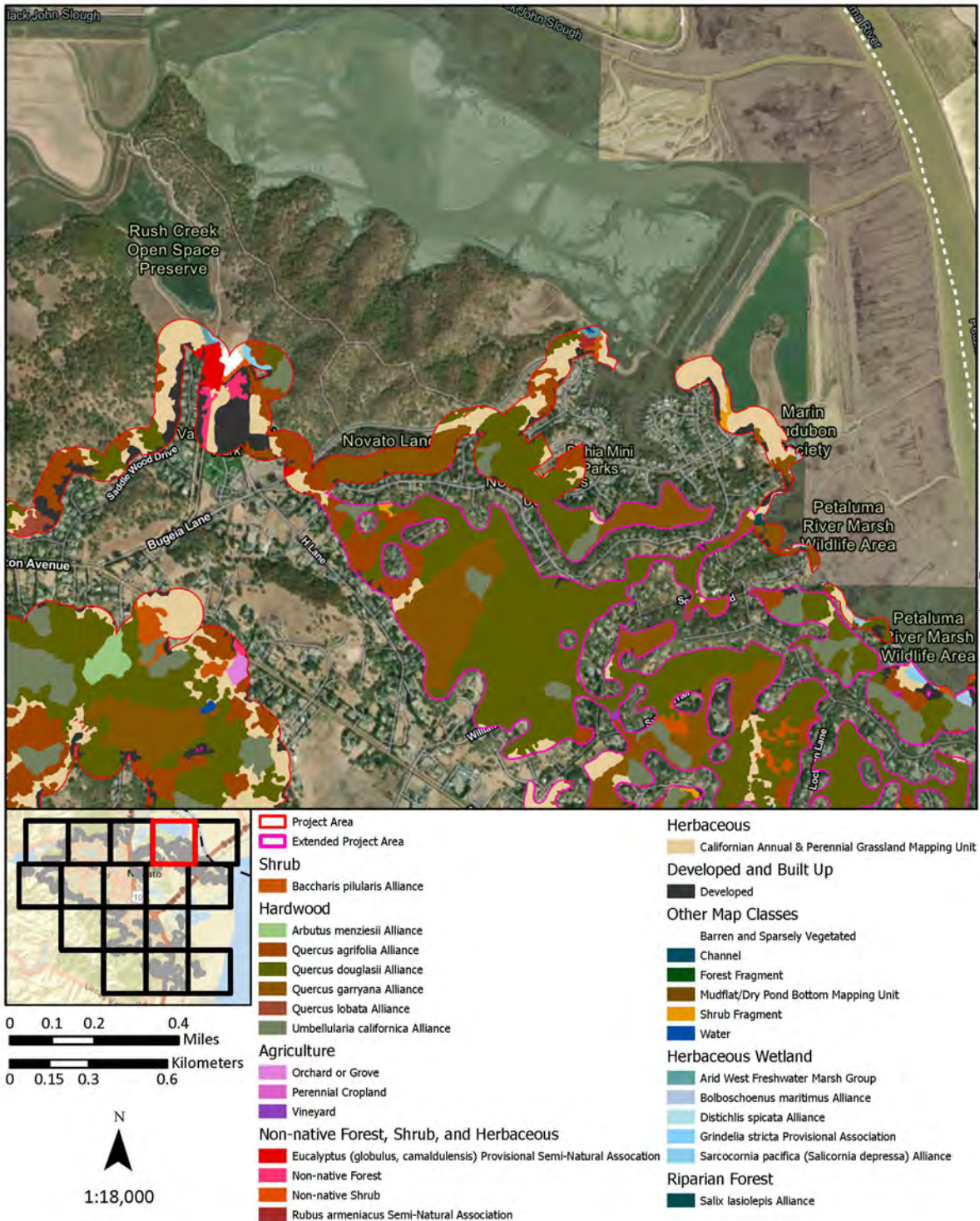
Figure 3b. Vegetation types documented within the project boundary North Quadrant 2.



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 Projection: Lambert Conformal Conic
 Datum: NAD 1983 2011
 Coordinate System: NAD 1983 2011 StatePlane California III FIPS 0403 FI US

County of Marin, Bureau of Land Management, Esri,
 HERE, Garmin, NGA, USGS, NPS, Pictometry, Maxar, **SEQUOIA**
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Figure 3c. Vegetation types documented within the project boundary North Quadrant 3.

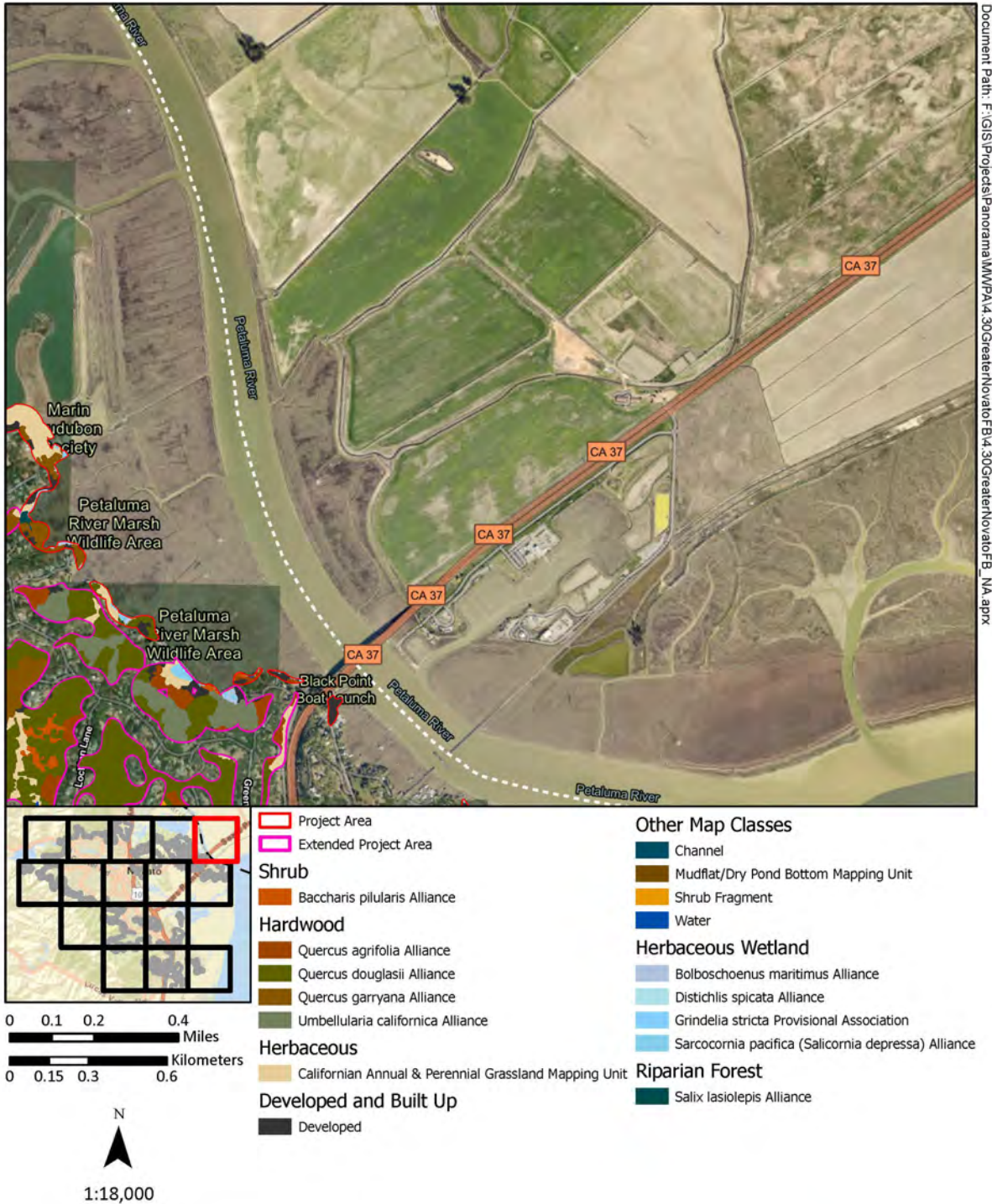


Author: SarahLabberton
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
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Figure 3d. Vegetation types documented within the project boundary North Quadrant 4.

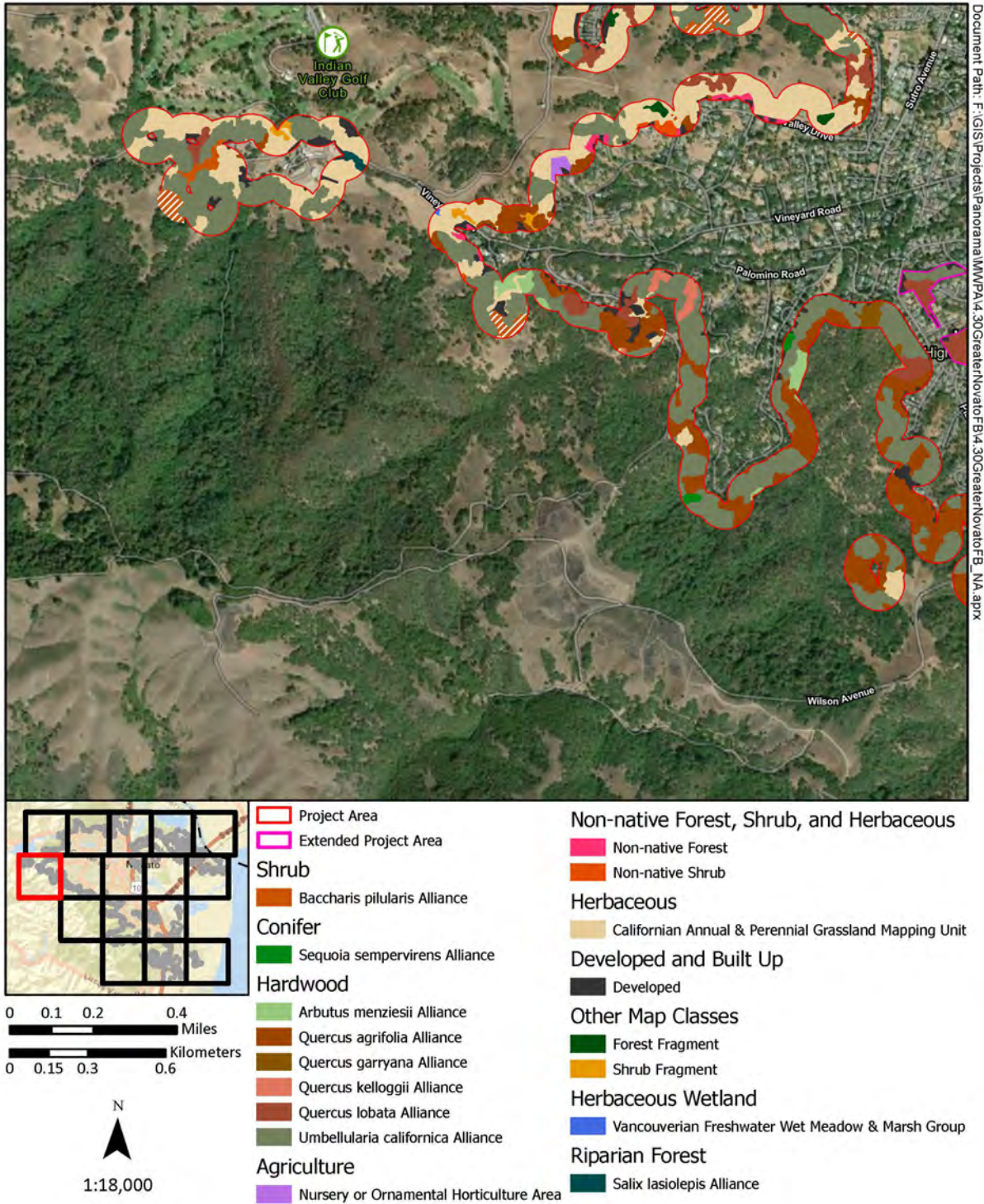


Author: Sarah Labberton
Projection: Lambert Conformal Conic
Datum: NAD 1983 2011
Coordinate System: NAD 1983 2011 StatePlane California III FIPS 0403 FT US

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Figure 3e. Vegetation types documented within the project boundary North Quadrant 5.

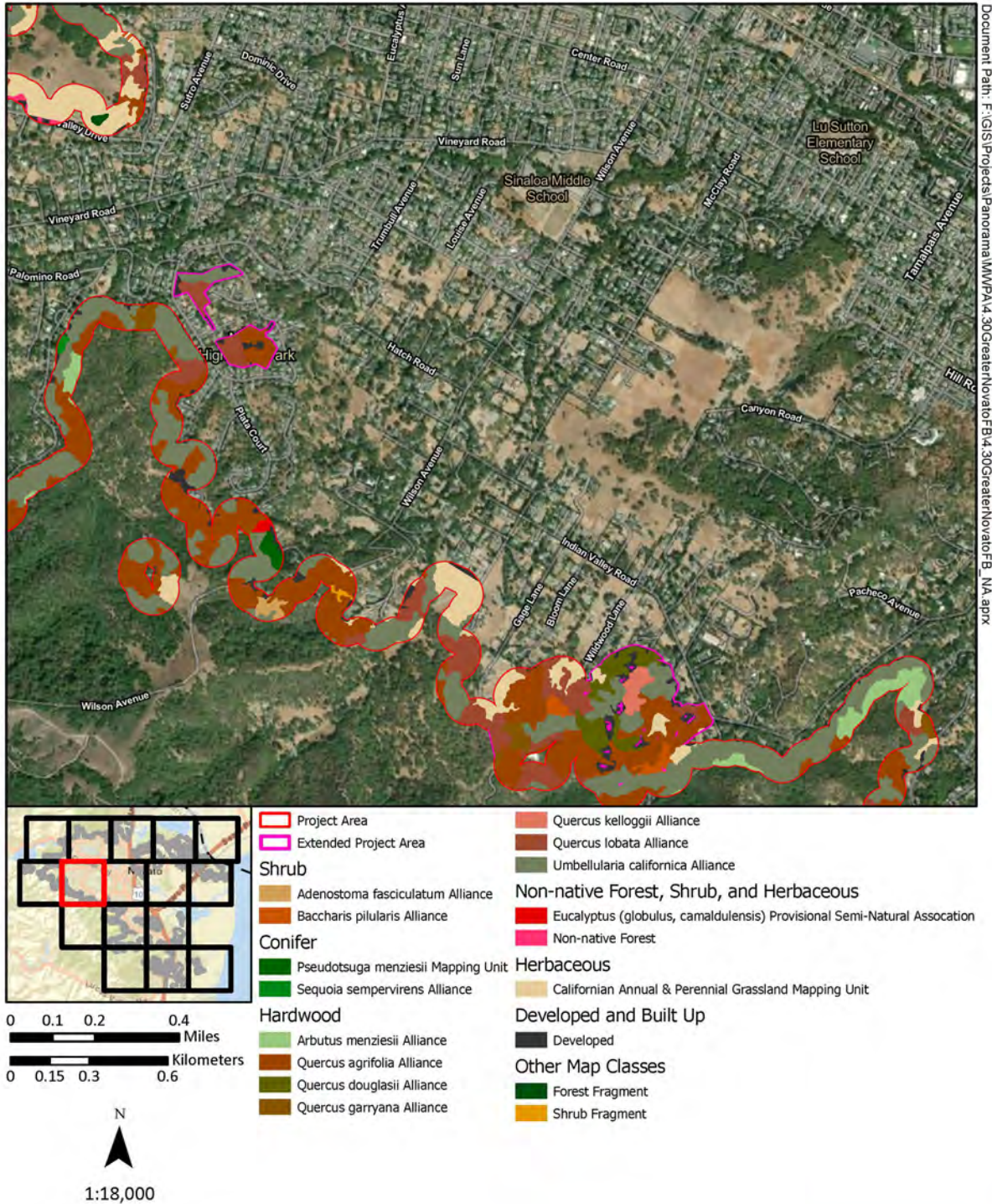


Author: SarahLabberton
 Projection: Lambert Conformal Conic
 Datum: NAD 1983 2011
 Coordinate System: NAD 1983 2011 StatePlane California III FIPS 0403 F1 US

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Figure 3f. Vegetation types documented within the project boundary Central Quadrant 6.



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Figure 3g. Vegetation types documented within the project boundary Central Quadrant 7.



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Figure 3h. Vegetation types documented within the project boundary Central Quadrant 8.

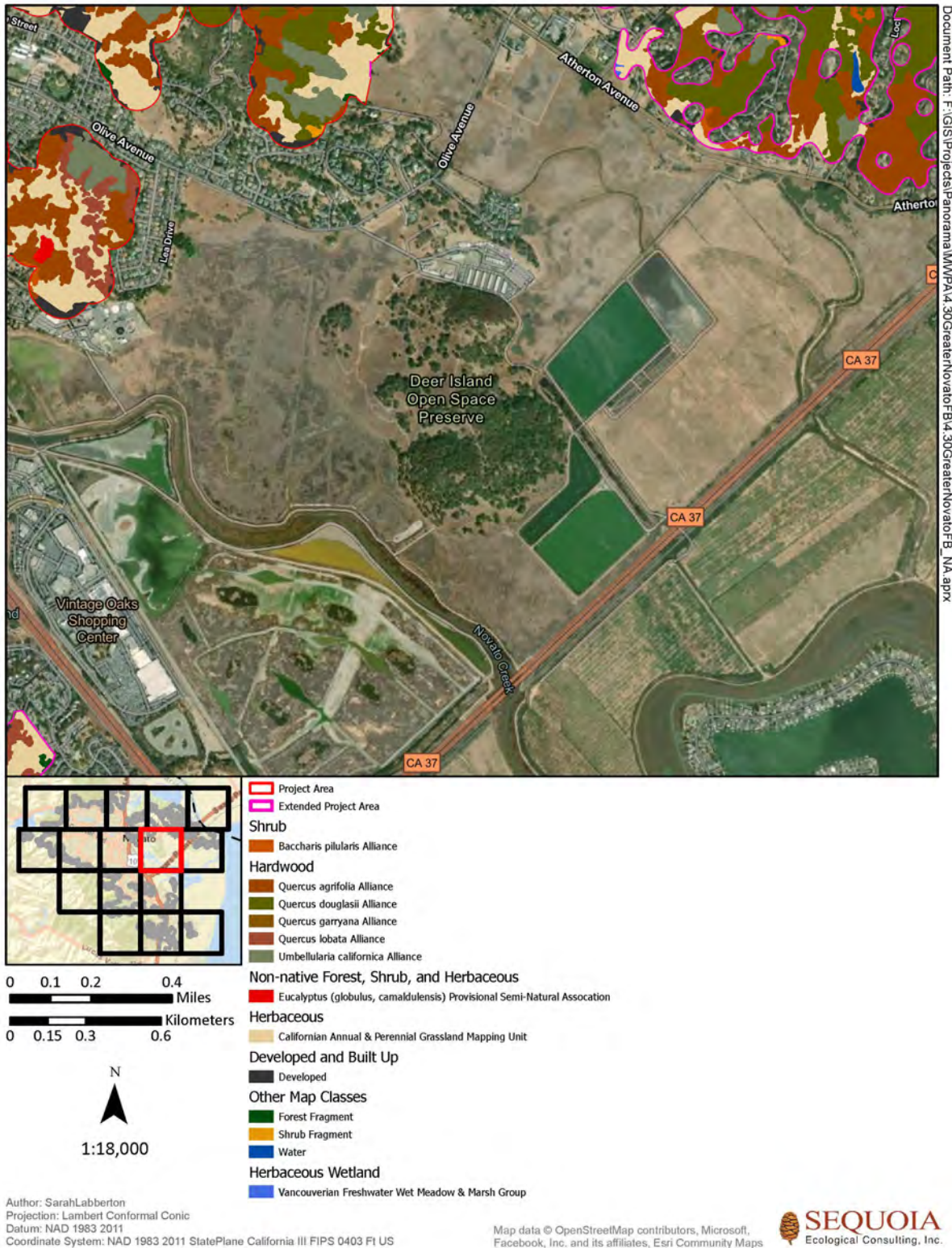
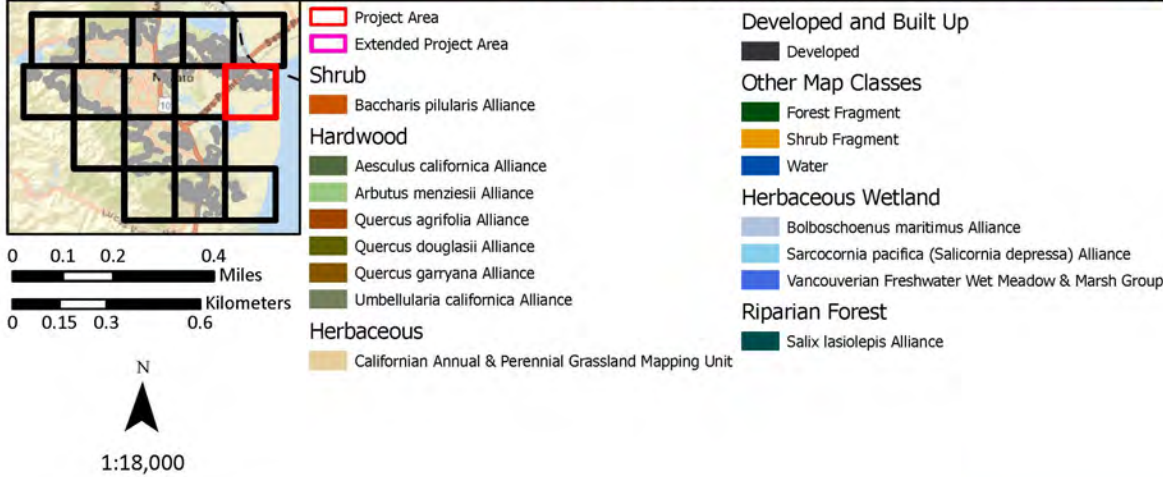


Figure 3i. Vegetation types documented within the project boundary Central Quadrant 9.



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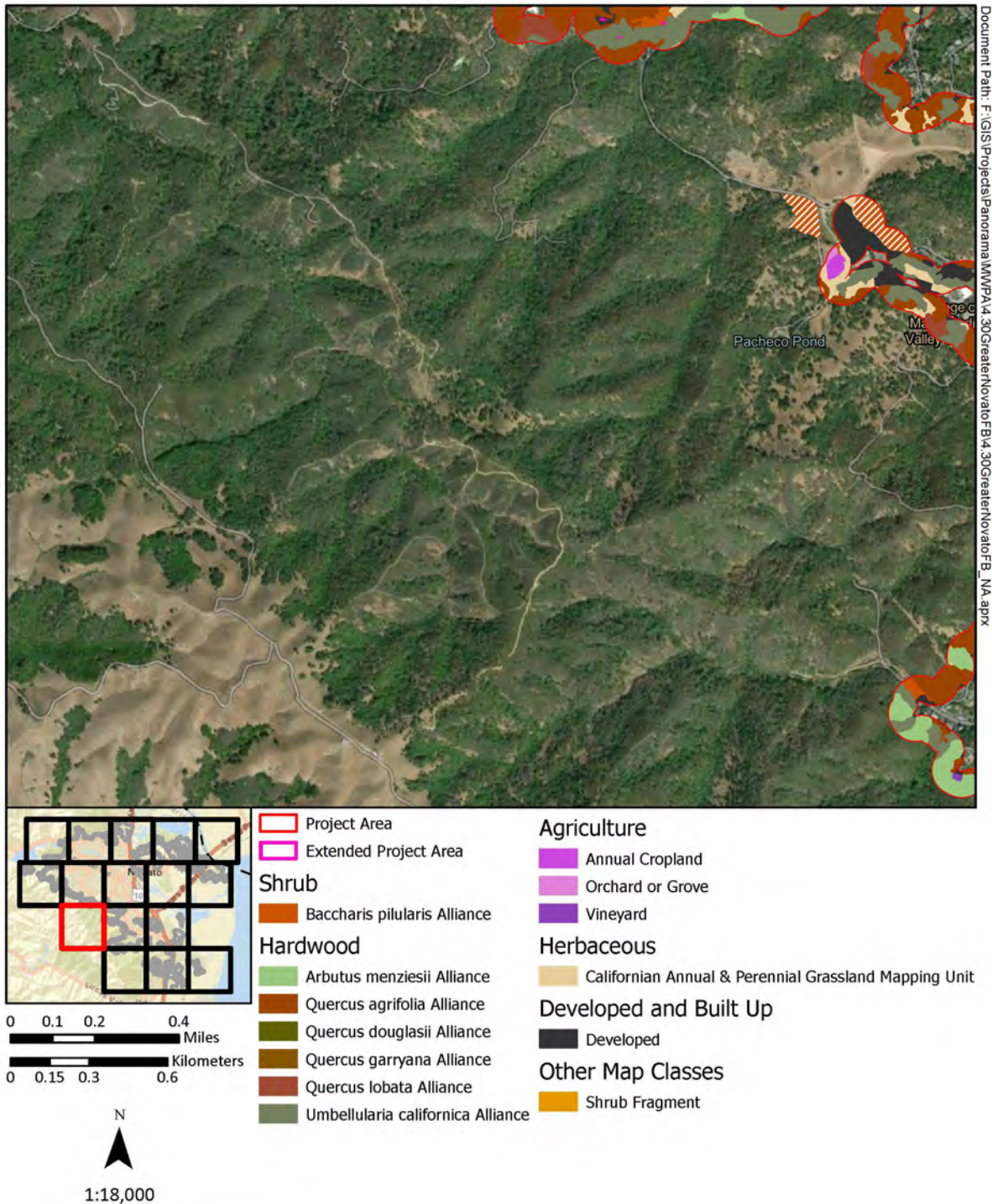


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Figure 3j. Vegetation types documented within the project boundary Central Quadrant 10.

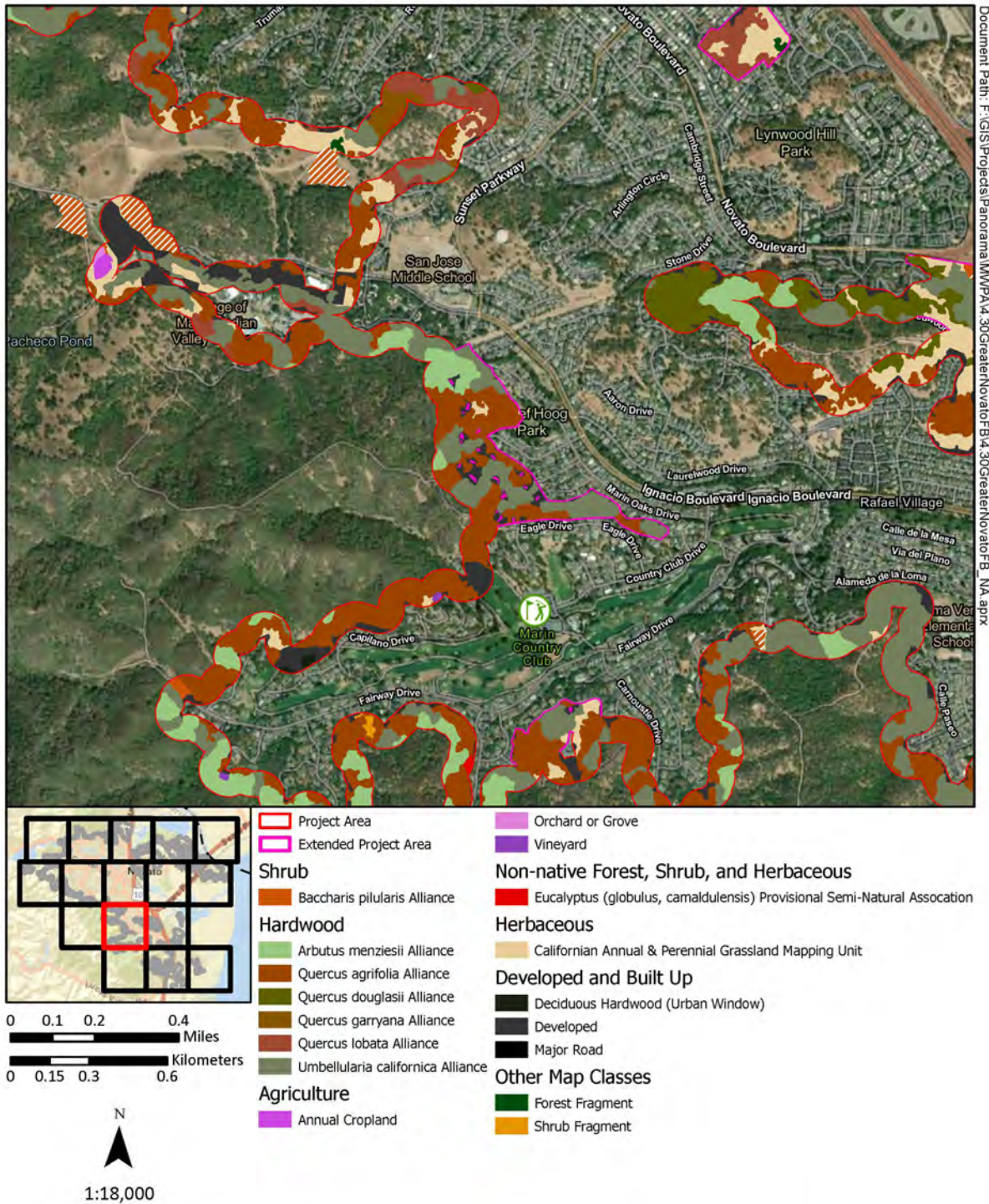


Author: Sarah Labberlon
Projection: Lambert Conformal Conic
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Coordinate System: NAD 1983 2011 StatePlane California III FIPS 0403 Ft US

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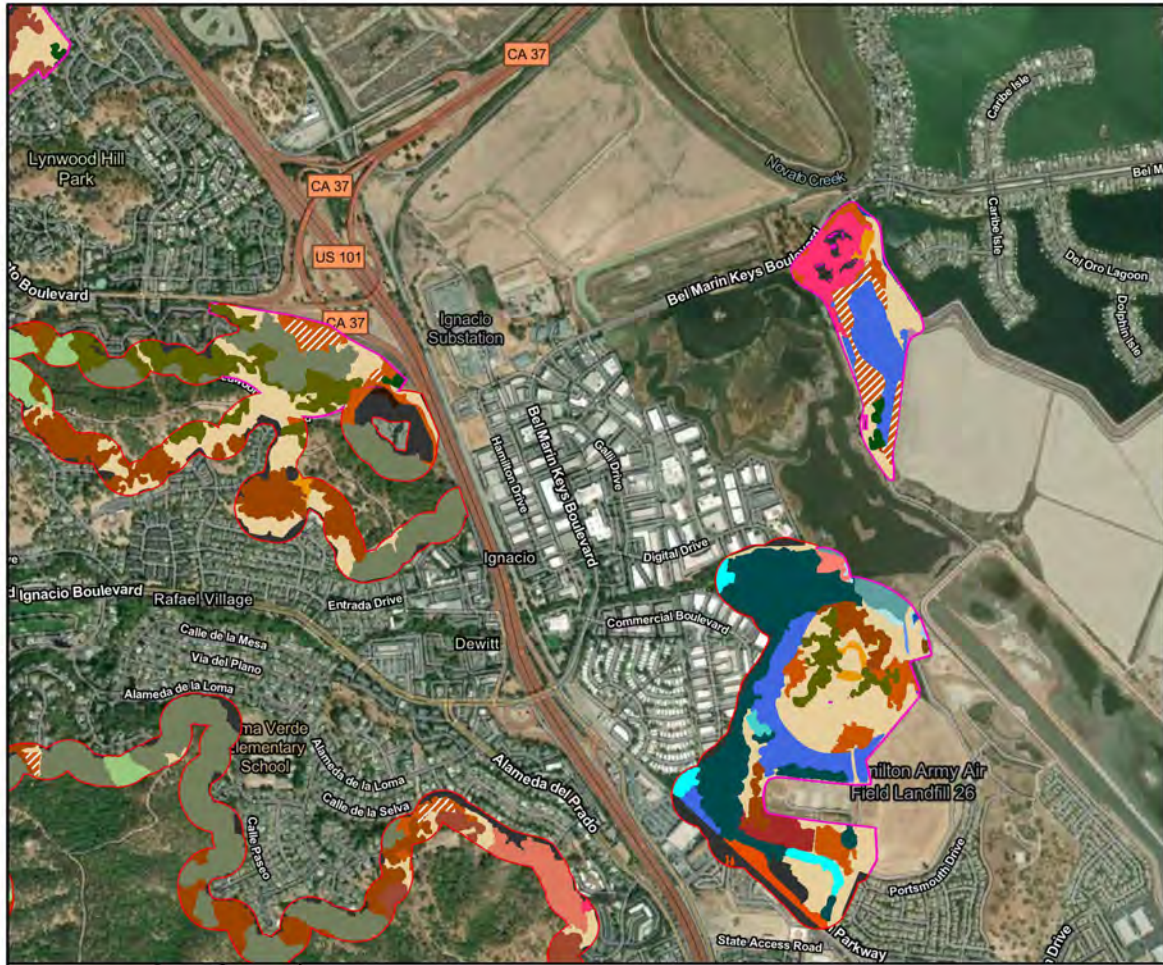
Figure 3k. Vegetation types documented within the project boundary Central Quadrant 11.



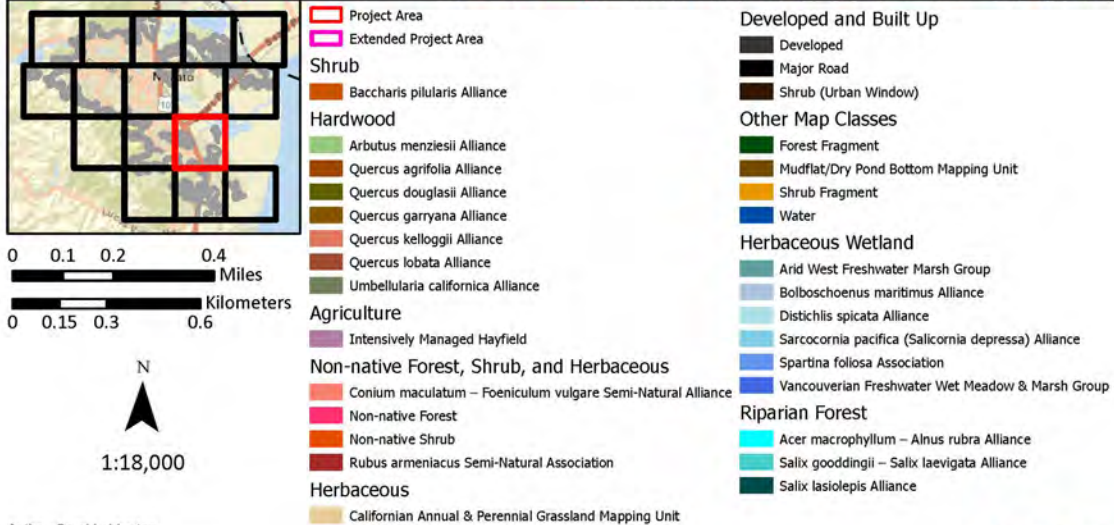
Author: Sarah Labberton
 Projection: Lambert Conformal Conic
 Datum: NAD 1983 2011
 Coordinate System: NAD 1983 2011 StatePlane California III FIPS 0403 Ft US

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Figure 3I. Vegetation types documented within the project boundary Central Quadrant 12.



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Figure 3m. Vegetation types documented within the project boundary Central Quadrant 13.

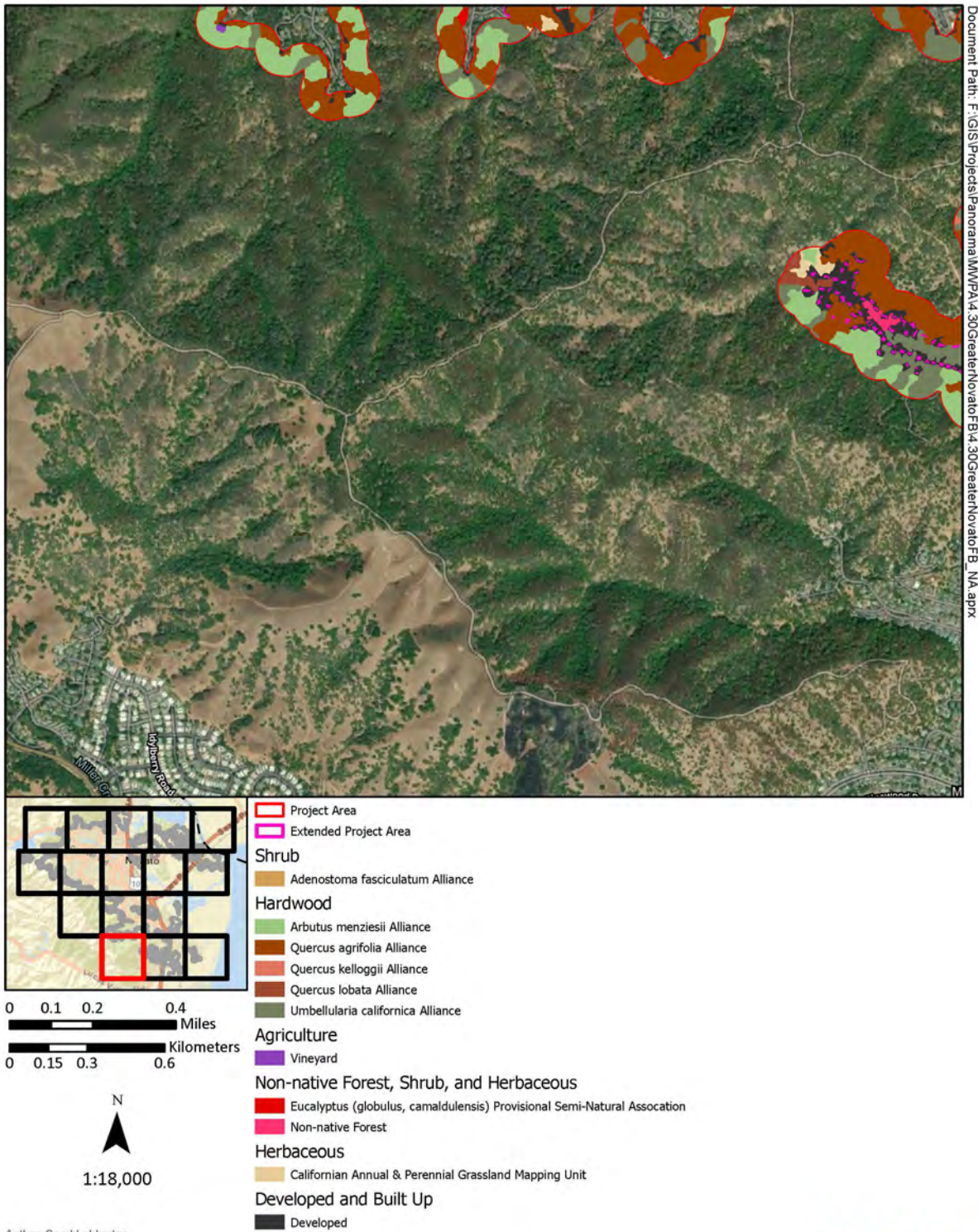
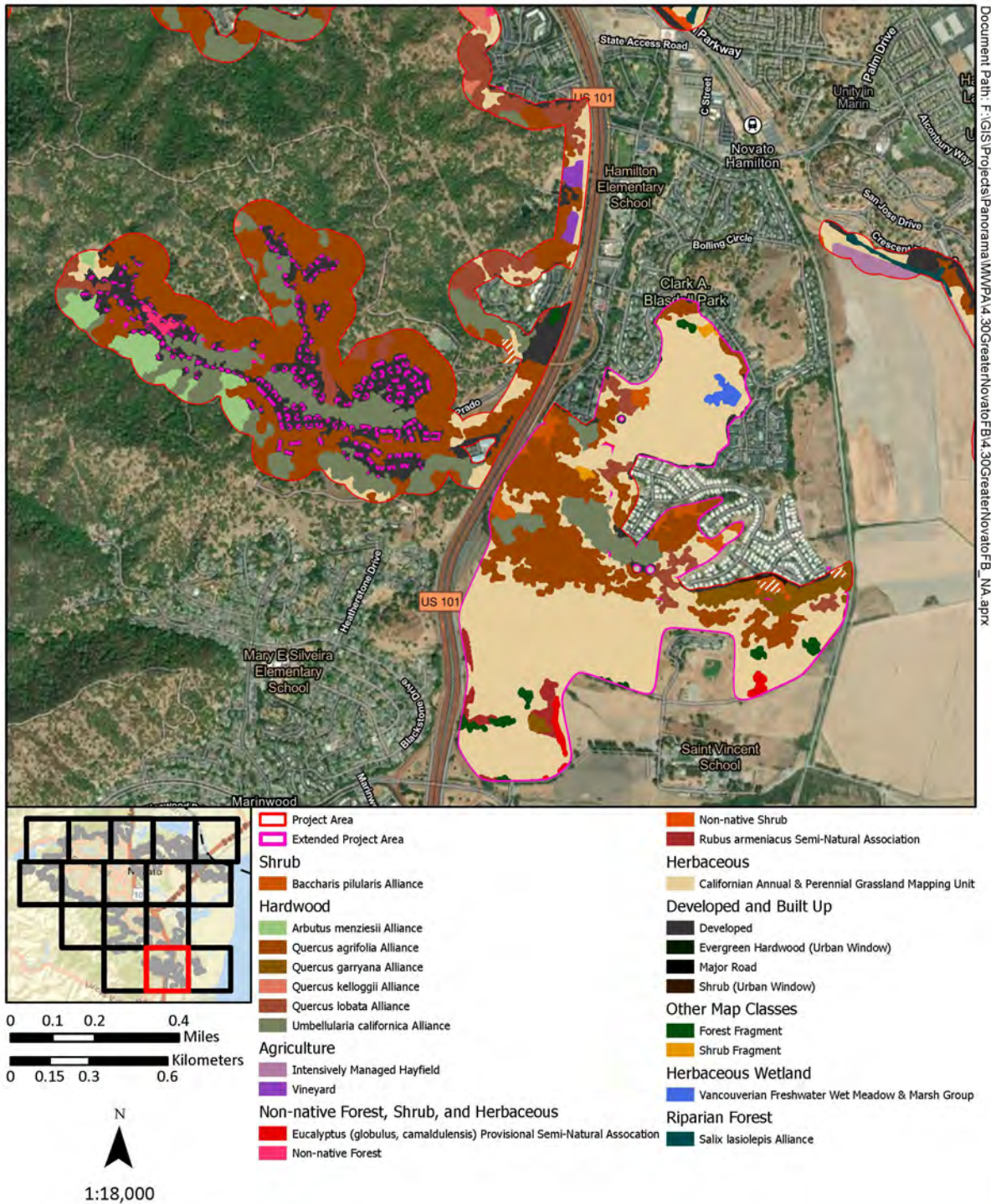


Figure 3n. Vegetation types documented within the project boundary South Quadrant 14.



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 Projection: Lambert Conformal Conic
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 Coordinate System: NAD 1983 2011 StatePlane California III FIPS 0403 Ft US

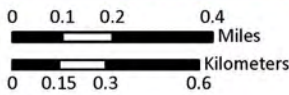
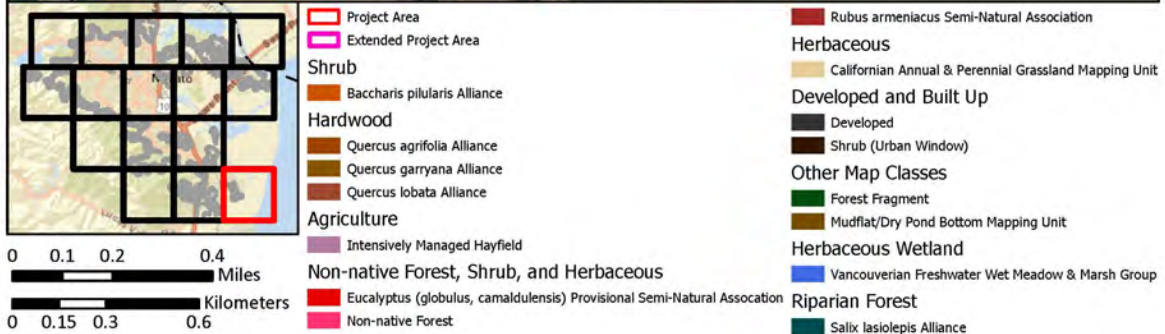
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Figure 30. Vegetation types documented within the project boundary South Quadrant 15.



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Figure 3p. Vegetation types documented within the project boundary South Quadrant 16.

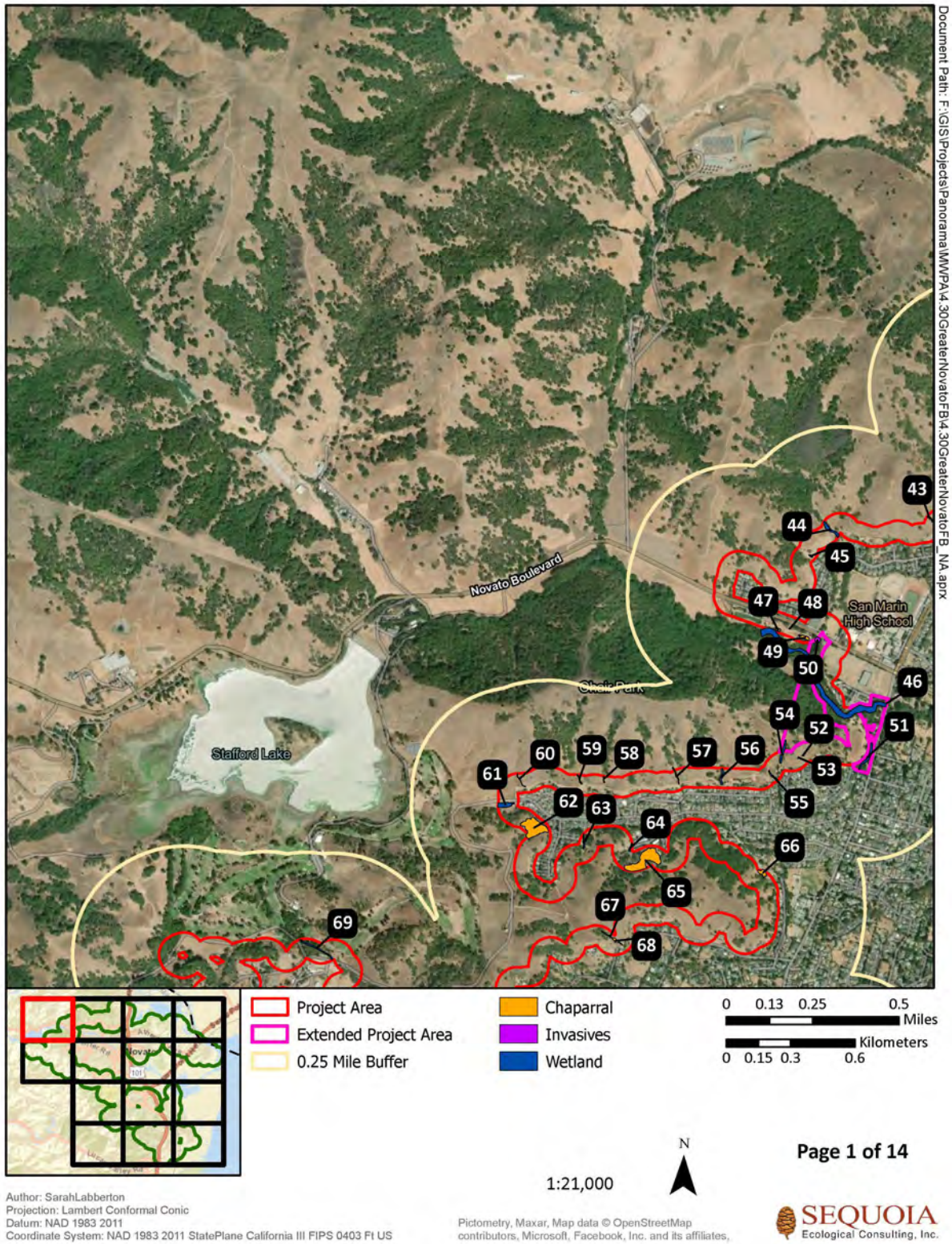
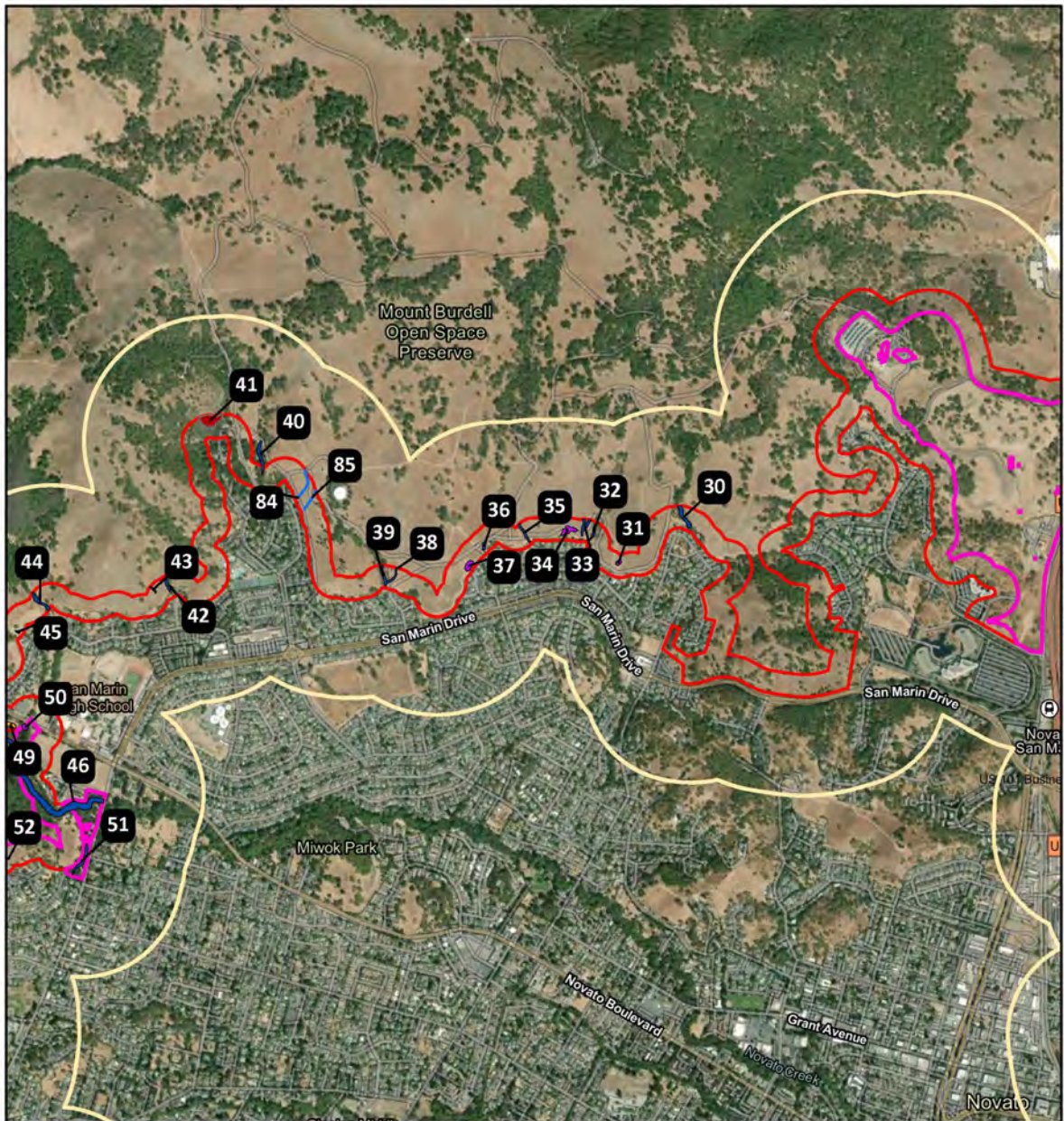


Figure 4a. Habitats observed in the field within the project boundary North Quadrant 1.



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Figure 4b. Habitats observed in the field within the project boundary North Quadrant 2.

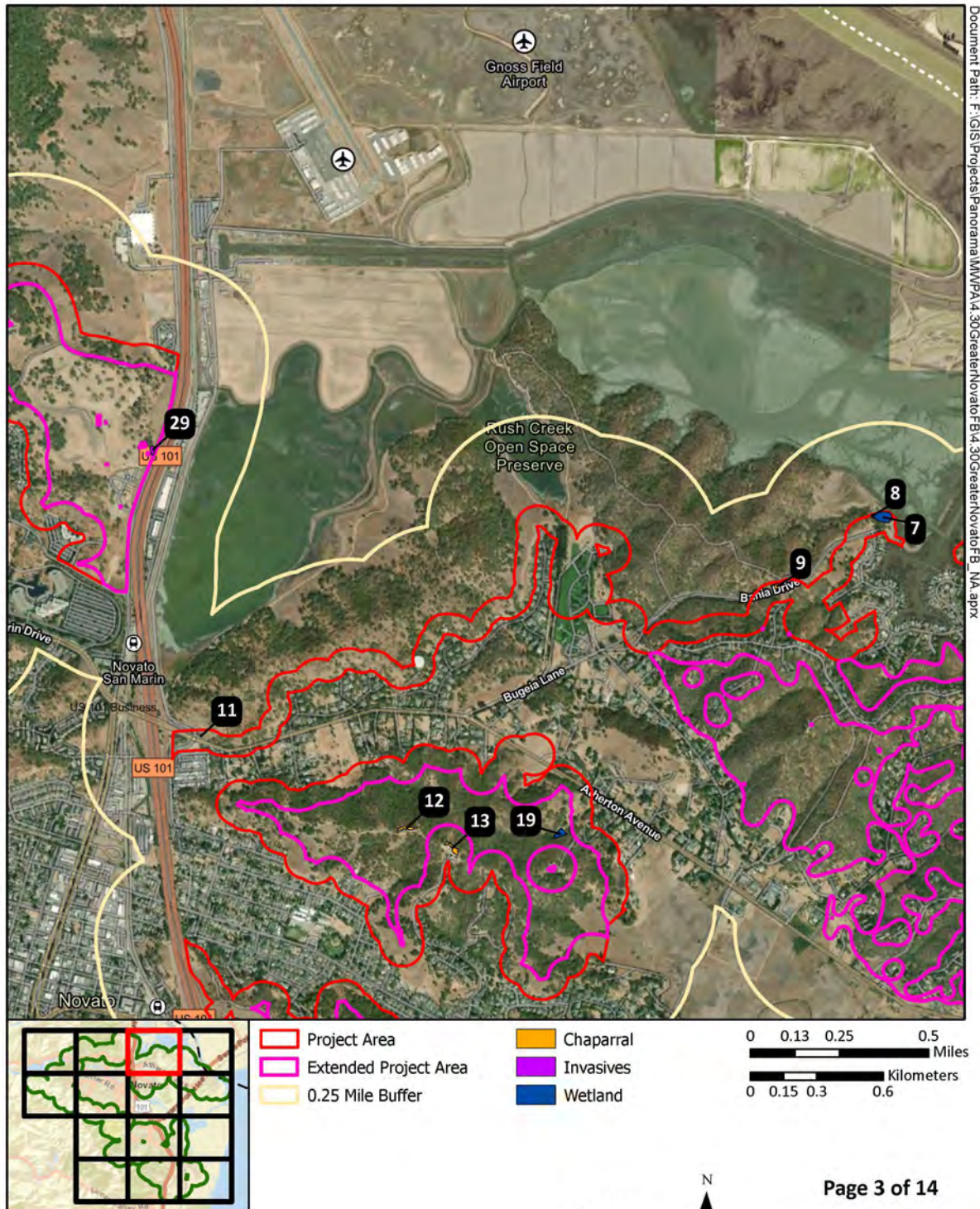
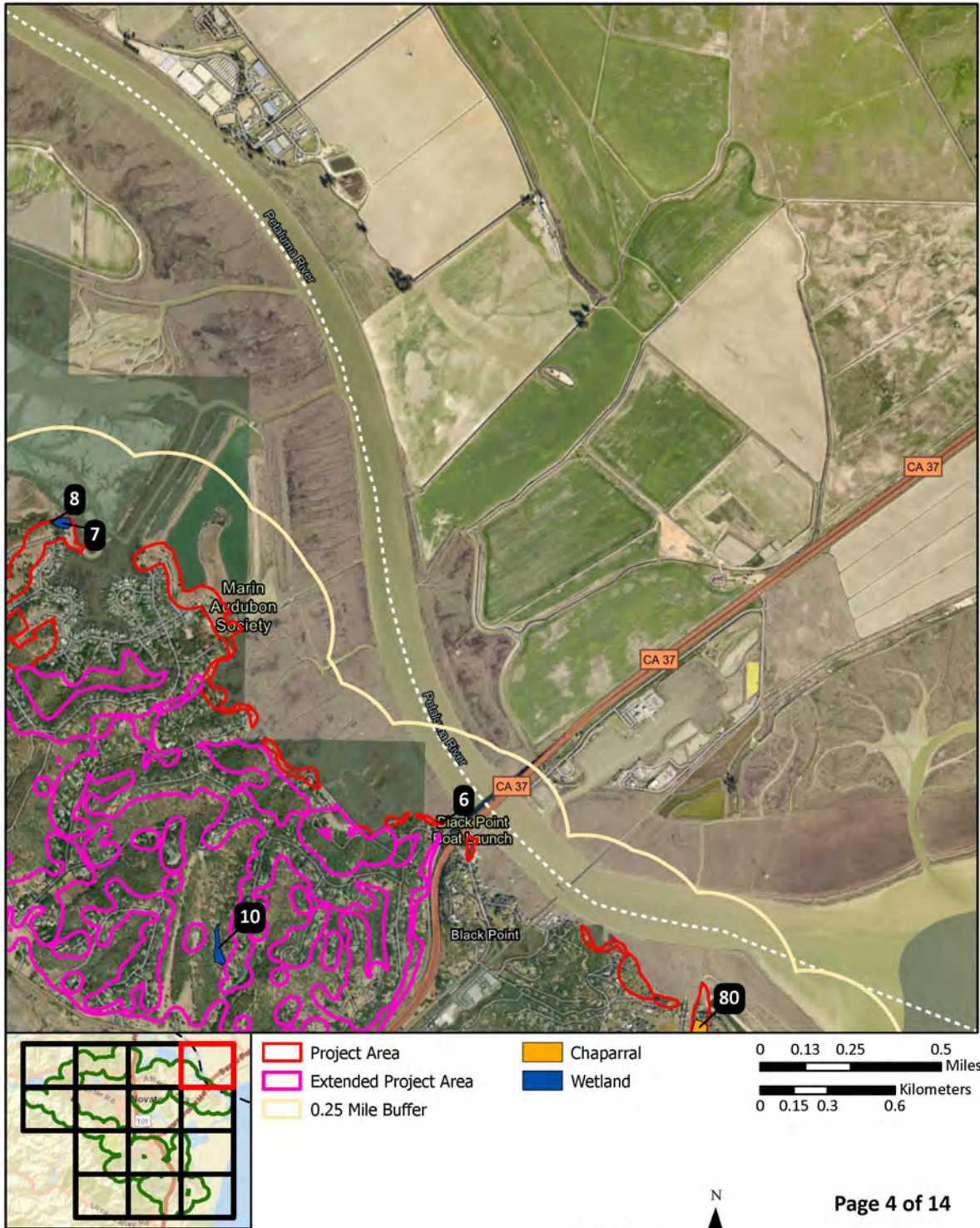


Figure 4c. Habitats observed in the field within the project boundary North Quadrant 3.



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Figure 4d. Habitats identified in the field within the project boundary North Quadrant 4.

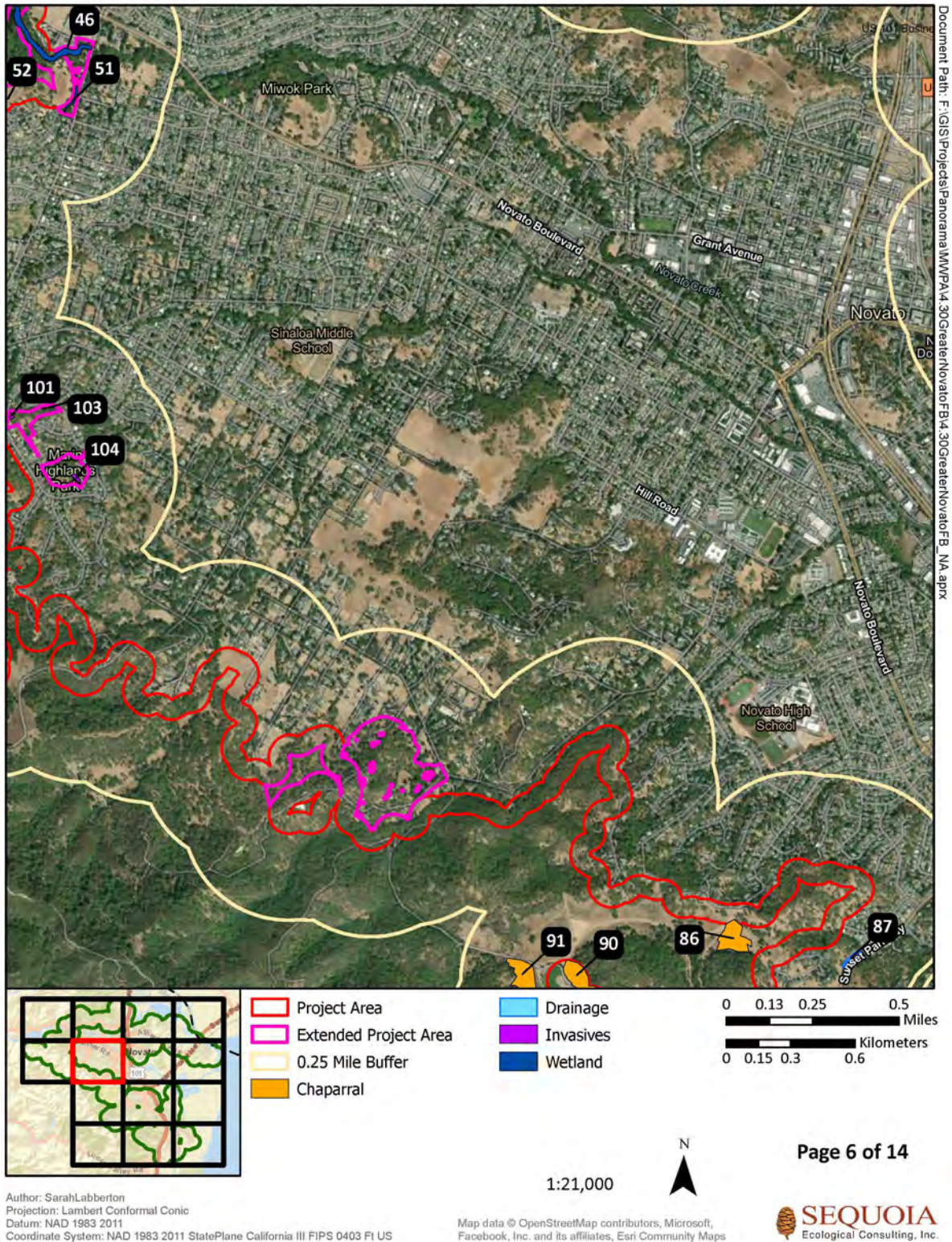


Figure 4f. Habitats identified in the field within the project boundary Central Quadrant 6.

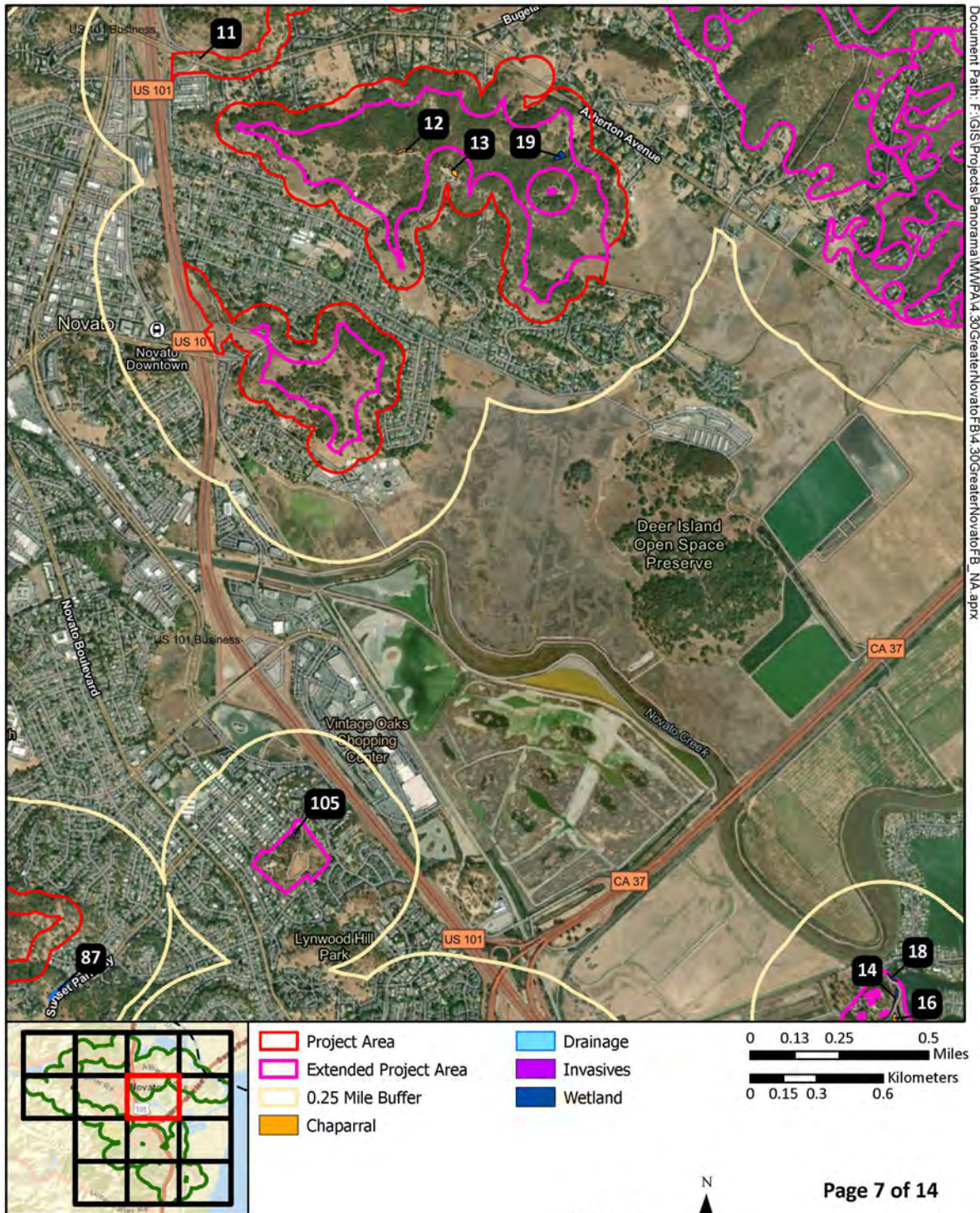


Figure 4g. Habitats identified in the field within the project boundary Central Quadrant 7.

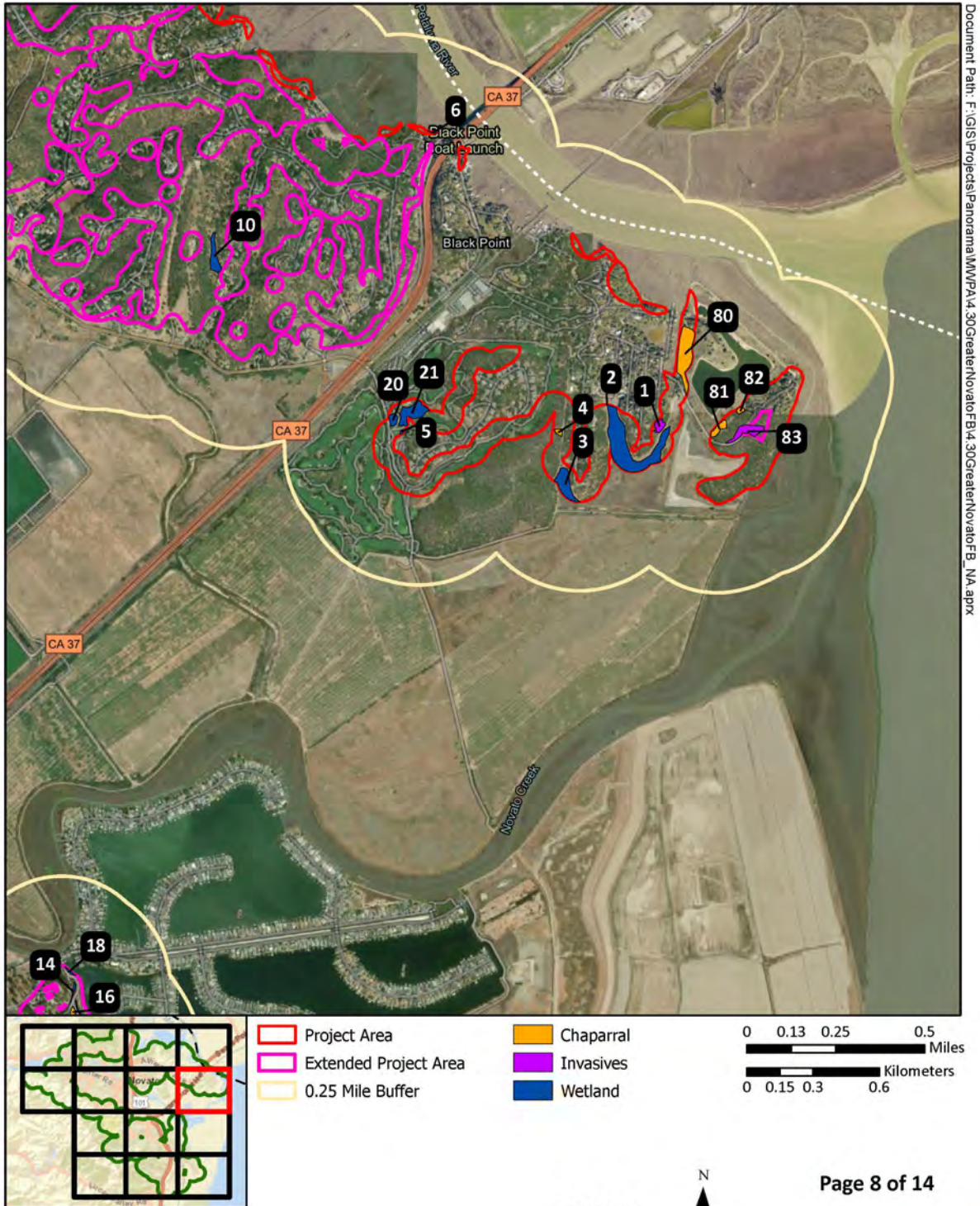


Figure 4h. Habitats identified in the field within the project boundary Central Quadrant 8.

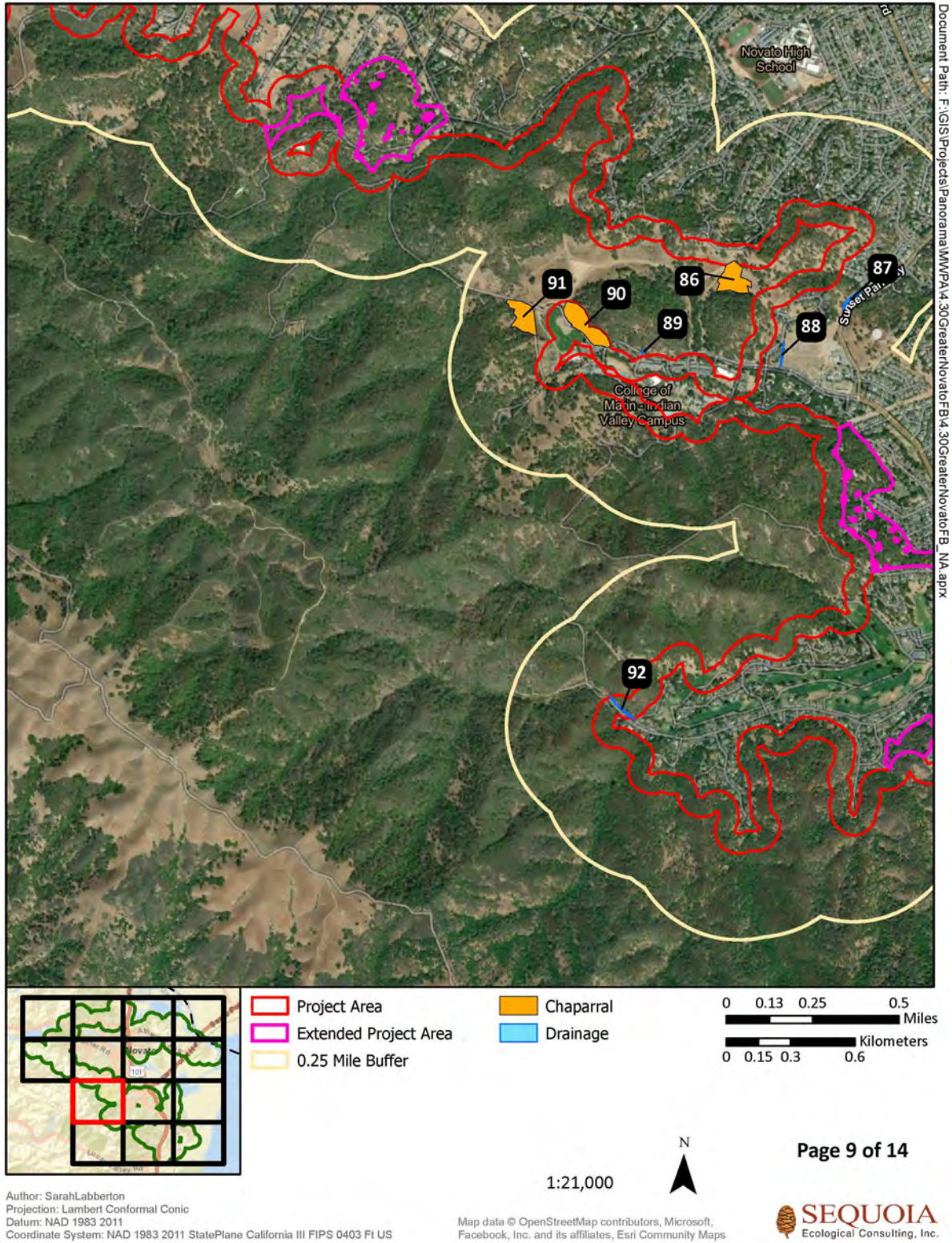


Figure 4i. Habitats identified in the field within the project boundary Central Quadrant 9.

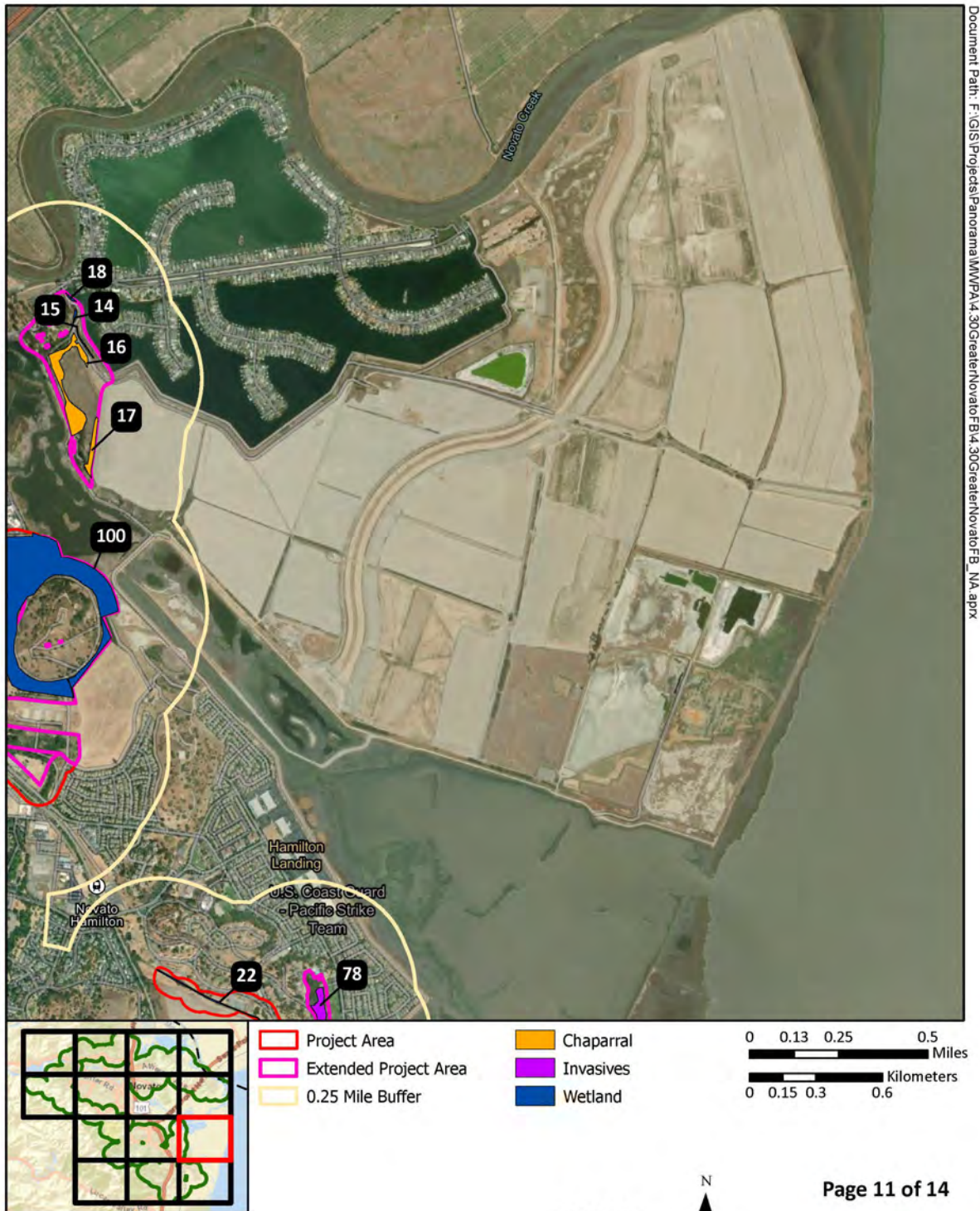


Figure 4k. Habitats identified in the field within the project boundary Central Quadrant 11.

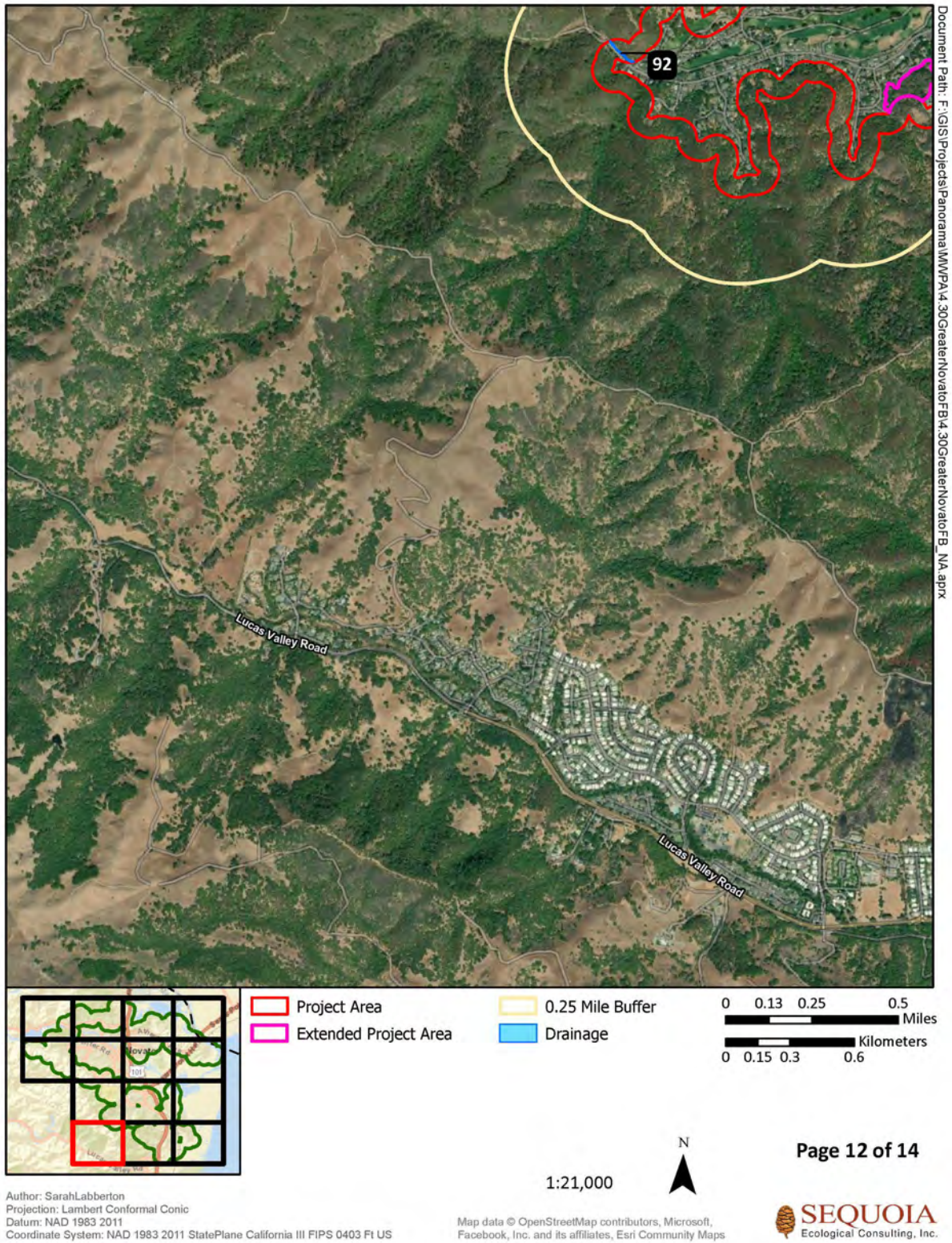


Figure 4I. Habitats identified in the field within the project boundary South Quadrant 12.

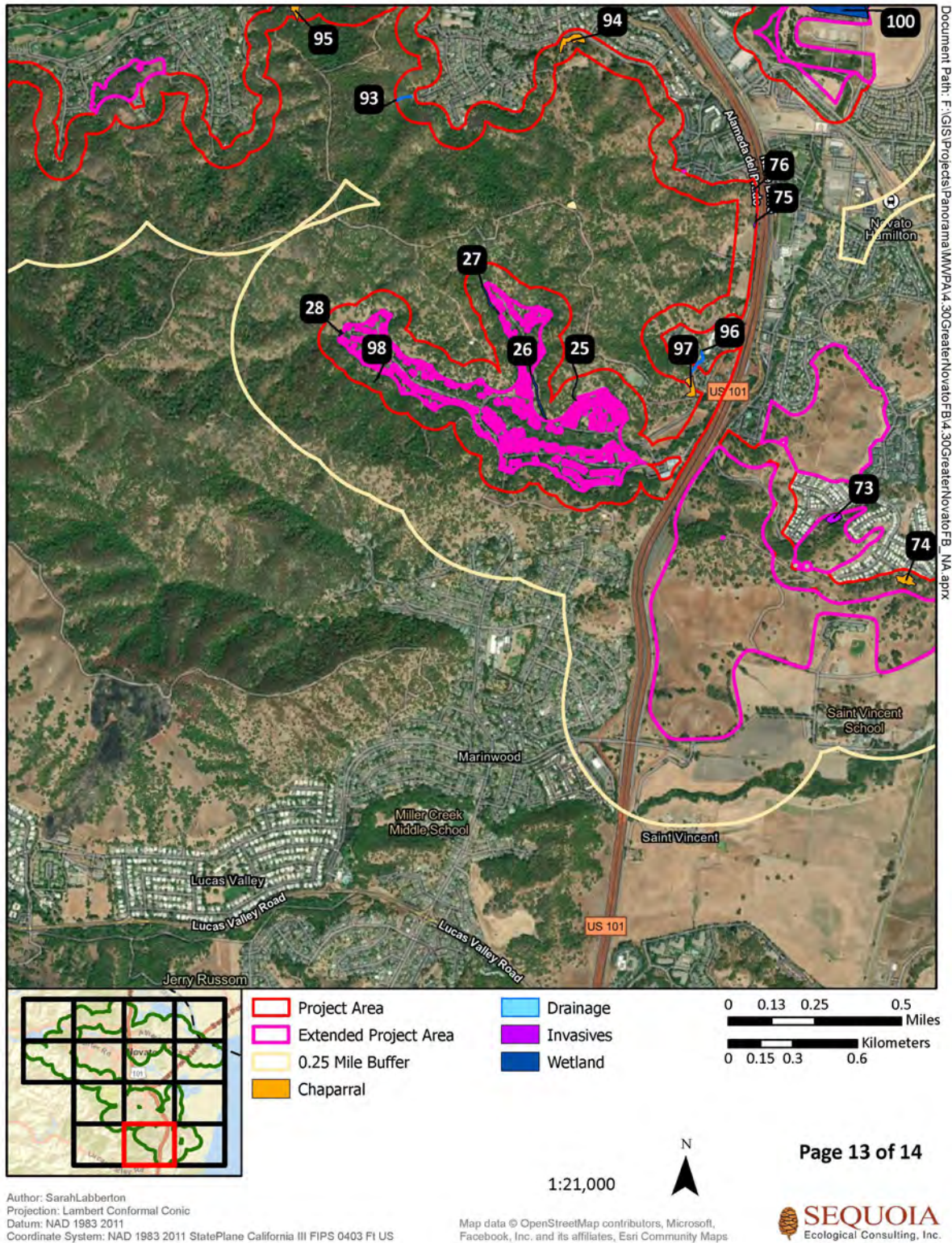


Figure 4m. Habitats identified in the field within the project boundary South Quadrant 13.

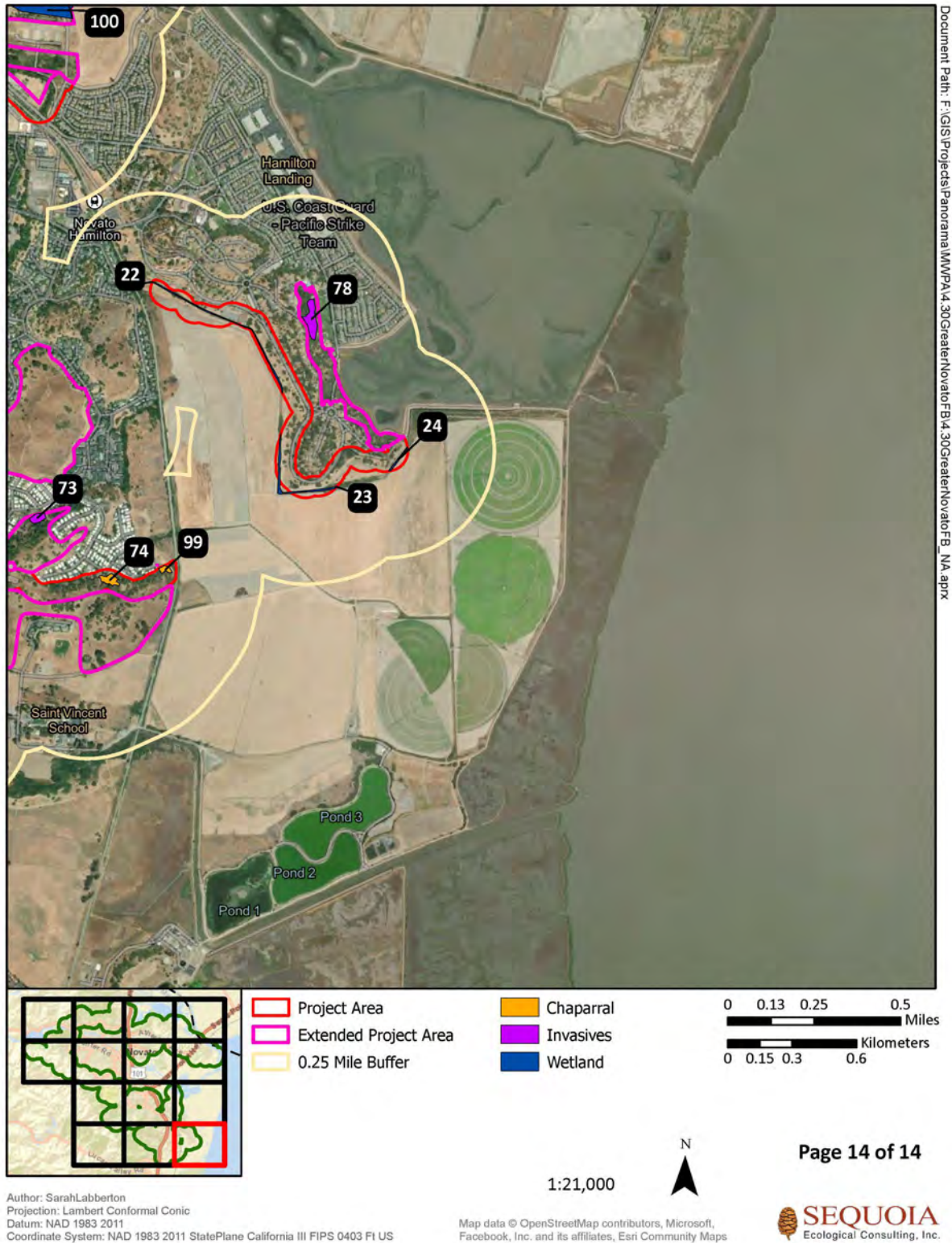
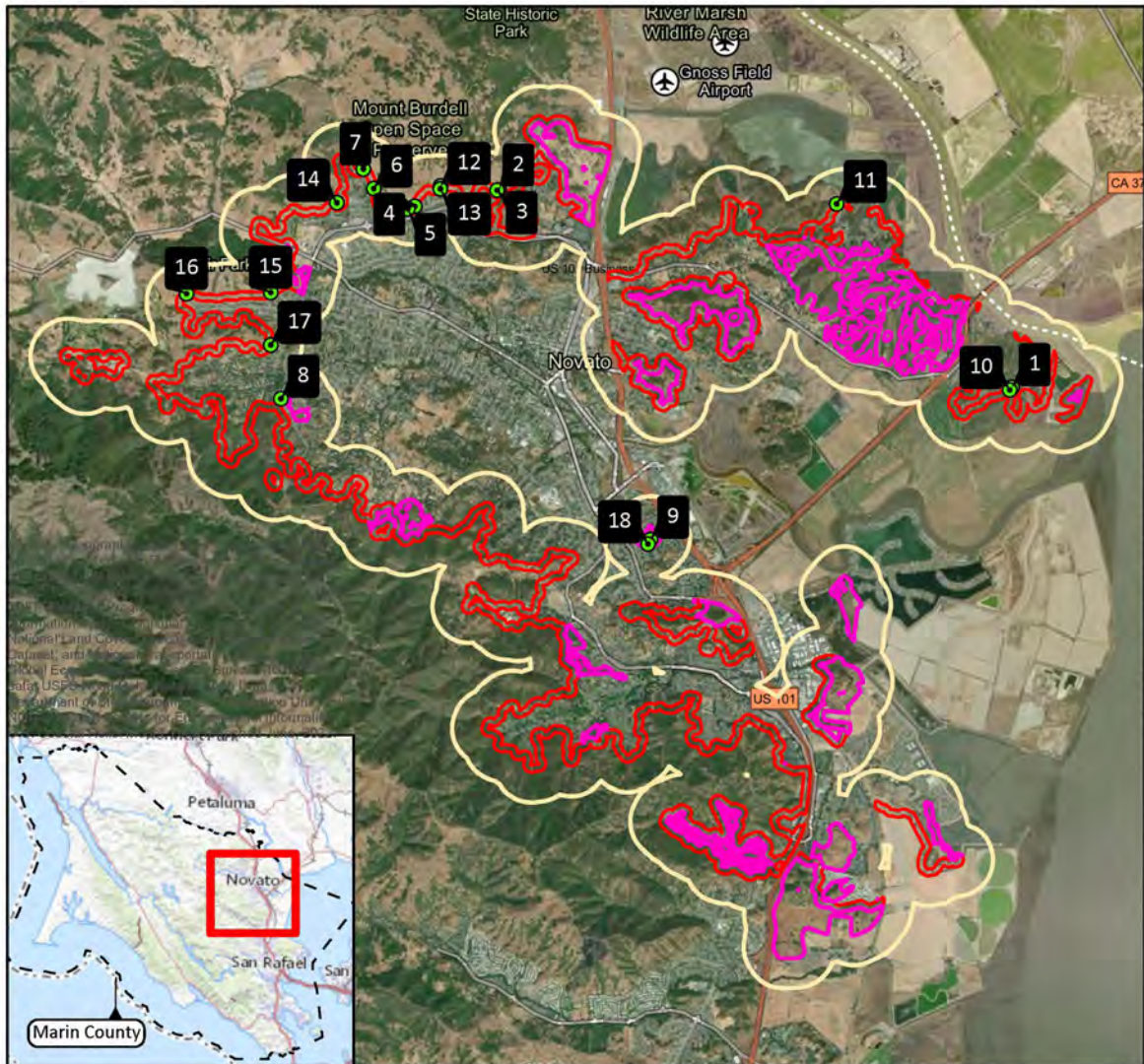


Figure 4n. Habitats identified in the field within the project boundary South Quadrant 14.



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- ▭ Project Area
- ▭ Extended Project Area
- 0.25 Mile Buffer
- Observation Point

OBJECTID	Observation	Notes
1	Arctostaphylos	2 individuals observed, not the rare species
2	Fritillaria liliacea	Known recent occurrences protected by large fencing. Could not identify individuals during the survey due to species blooming period.
3	Fritillaria liliacea	Known recent occurrence. Could not identify during survey due to species blooming period
4	Serpentine grassland	Large area of serpentine grassland, full of native grasses and rocky outcrops. Good quality habitat for serpentine species
5	Serpentine grassland	Large area of serpentine grassland, full of native grasses and rocky outcrops. Good quality habitat for serpentine species
6	Serpentine grassland	Good quality serpentine grassland, Tiburon buckwheat observed
7	Serpentine grassland	Good quality serpentine grassland, Tiburon buckwheat observed
8	Rocky outcrop	Exposed rock on steep southwest-facing slope
9	Rocky outcrop	Large rocky outcrop
10	Arctostaphylos	One individual
11	Arctostaphylos	One individual
12	Rocky outcrop	Rocky outcrop
13	Rocky outcrop	Rocky outcrop
14	Rocky outcrop	Rocky outcrop
15	Rocky outcrop	Rocky outcrop
16	Rocky outcrop	Rocky outcrop
17	Good bat tree and granary	Possible bat roosting habitat
18	Rocky outcrop	Large rocky outcrop

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Author: Sarah Labberton
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 Coordinate System: NAD 1983 2011 StatePlane California III FIPS 0403 F1 US

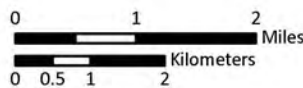


Figure 5. Environmental observations during reconnaissance surveys (8/4-10/26/2022).

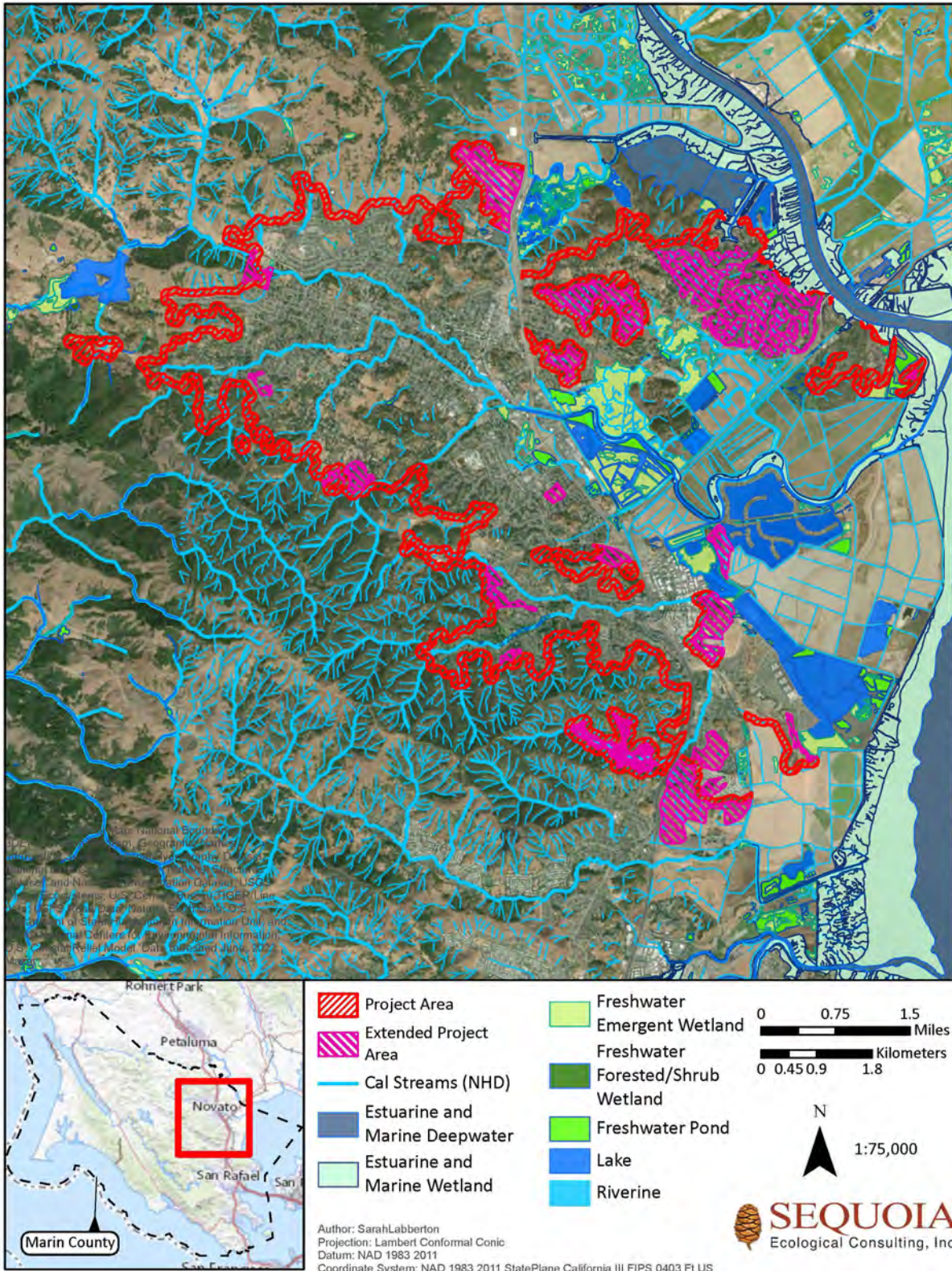


Figure 6. Wetlands and waterways documented within the vicinity of the project boundary.

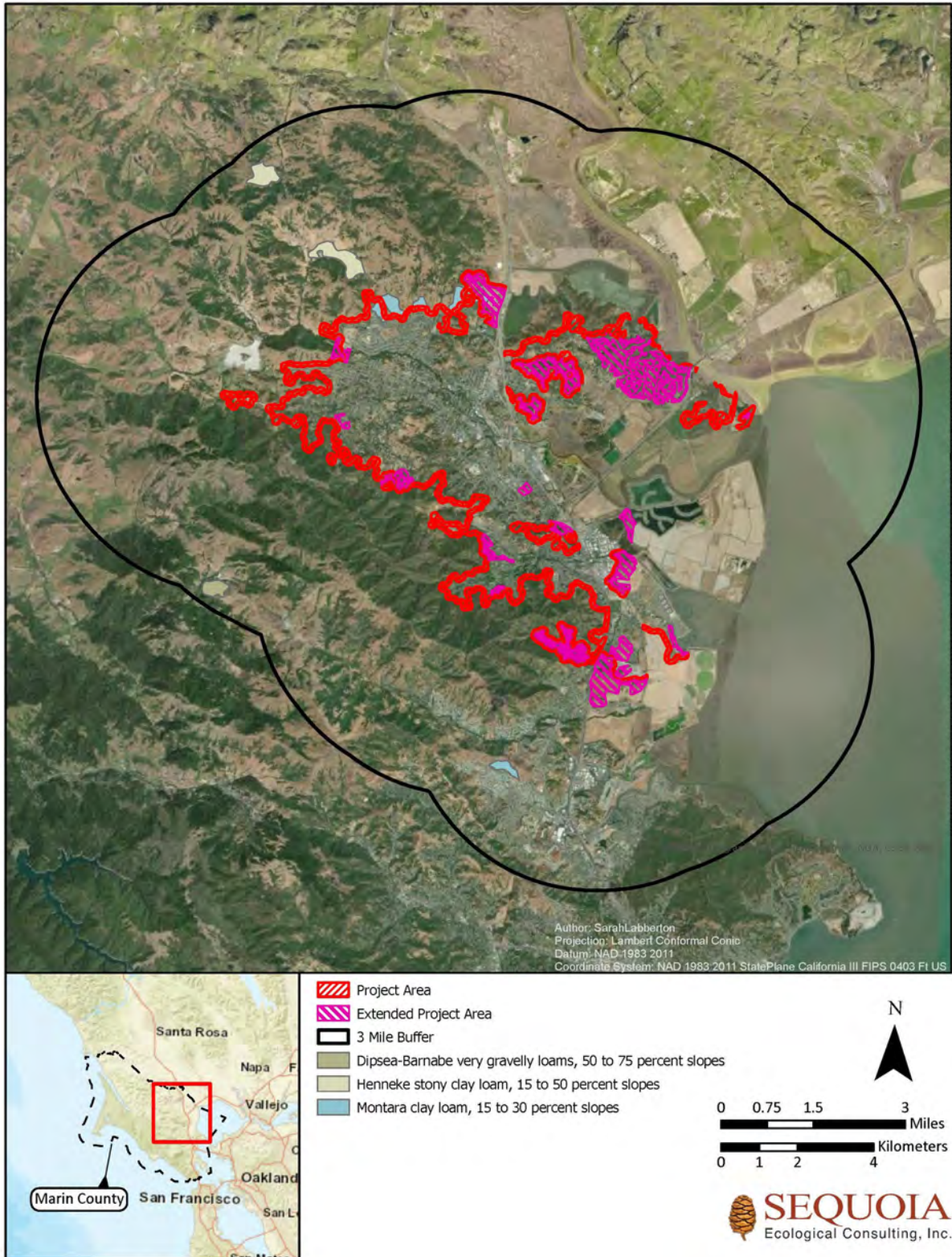


Figure 7. Serpentine soils documented within the vicinity of the project boundary.



Attachment D.3 Summary of Survey Results

Sequoia Ecological Consulting, Inc. (Sequoia) biologists and botanists conducted reconnaissance survey visits in accordance with SPR BIO-1. Seven surveys were conducted between August 4 and October 26, 2022, throughout the project area. Surveys were conducted during favorable conditions, when weather did not impair visibility or access to the site. Survey conditions occurred when temperatures were between 54-79°F, with 0-12 mph wind, variable cloud cover, and no greater than 25% chance of precipitation. An additional survey was conducted January 18, 2023. Survey conditions occurred when temperatures were between 39-50°F, with 0-5 mph wind, 100-50% cloud cover, and no greater than 25% chance of precipitation. The overall results of these surveys are summarized below and included in Figures 3 and 4 (Section D.2). Habitat types were ground-truthed, with focus on sensitive habitats such as waterways, wetlands, avian nesting and bat roosting habitat, terrestrial riparian wildlife habitat, aquatic habitat, chaparral, serpentine, and other potential sensitive plant habitat.

Sensitive Resources Observed

- Wetland Habitat was observed on site and adjacent to the site, especially along the eastern portion. Wetland habitat on site was generally assessed as low-quality wetland habitat for salt marsh harvest mouse, *Reithrodontomys raviventris*, due to the small size and isolated nature of wetlands. Brackish marsh habitat just outside of the mapped project site along the eastern edges of the project area, particularly the marsh areas near Black Point and Bel Marin Keys, are potentially suitable for special-status avian species, including California black rail (*Laterallus jamaicensis coturniculus*), California Ridgway's rail (*Rallus obsoletus obsoletus*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), and San Pablo song sparrow (*Melospiza melodia samuelis*). In addition, wetlands observed on site were generally not suitable for wetland-adapted sensitive plants such as Napa false indigo (*Amorpha californica* var. *napensis*) due to the density of willow, broom, and ivy vegetation.
- Riparian Corridors were observed and mapped throughout the site.
- Suitable Avian Nesting and Bat Roosting Habitat was common throughout the site and included large stands of blue oak (*Quercus douglassii*) with potential cavities suitable for bats. Eucalyptus and tall pine trees were also observed throughout the site, which is preferred nesting habitat for raptors and are utilized by bats as well.
- Terrestrial Riparian Wildlife Habitat (habitat for western pond turtle, foothill yellow-legged frog, California red-legged frog, and California giant salamander) was present and varied in quality throughout site. Terrestrial riparian habitat was identified at several riparian areas throughout the project.
 - Western pond turtle was observed in the Arroyo San Jose near the Marin Humane Society, west of the proposed project area. Pond turtles are able to move freely downstream and may be encountered in the project site during work.
 - One small, unnamed stream near the Pacheco Valle neighborhood provides good quality habitat for foothill yellow-legged frog in the forested areas near a waterway. Good basking spots and ponds were observed within the project site.



- Northern Spotted Owl Nesting Habitat was present in small portions along the western portion of the project site, west of the Indian Valley Preserve and east of the Indian Tree Open Space Preserve, and two historical nest sites are present within ½ mile of the project area. Habitat quality was low or generally unsuitable in most areas of the project site.

Forested areas were dominated by oak woodlands, primarily blue oak (*Quercus douglasii*) and coast live oak (*Quercus agrifolia*), with a mixed to open canopy and an understory of annual grasses. On a few occasions, coyote brush (*Baccharis pilularis*) or common manzanita (*Arctostaphylos manzanita* ssp. *manzanita*) were observed in the understory. Northern spotted owls are known to prefer old-growth forests with large trees and closed canopy. Although they are commonly found in old-growth redwood forests, northern spotted owls have been observed in old-growth oaks as well. Sign of dusky-footed woodrats (*Neotoma fuscipes*), which are not protected in Marin County, but which do provide important prey base for northern spotted owls, was not observed in the project area. Designated critical habitat for northern spotted owl is over 3 miles southwest of the project boundaries.

- Sensitive Plant Habitat: Sensitive plants that arose in the desktop review were categorized by habitat type. The following habitats that have potential to support at least one species of sensitive plant in the project area were observed and assessed for habitat suitability:
 - *Annual Grassland:* Habitat quality was variable throughout site. Most grassland areas were heavily invaded by non-native grass species. Less frequently, high-quality grassland with nearly 50% native herb cover were observed. Both the lower-quality and high-quality grassland areas have the potential to provide suitable habitat for native plants and ground-nesting wildlife, but the areas with greater native plant coverage provide relatively higher quality habitat than those which were dominated by non-native species.
 - *Wetland:* Habitat quality was variable throughout project site. Most freshwater wetland habitats were identified as ephemeral drainages with non-wetted channels and low vegetation diversity on the banks of the channels. The drainages were observed in oak woodland or grassland habitats. In Marin County Open Space where cattle grazing was practiced, drainages were noticeably degraded. Habitat quality was generally poor for Napa false indigo within *Quercus agrifolia* habitat where the soil was wet or wetland-like. Habitat for Baker's navarretia and Koch's cord moss was poor due to insufficient soil moisture and large infestations of invasive species such as nonnative annuals, ivy, and blackberry.
 - *Serpentine Grassland* was identified in the project. High-quality serpentine habitat was observed at Mt. Burdell Preserve, which provides habitat for several species of sensitive plants. Tiburon buckwheat (*Eriogonum luteolum* var. *canium*) was observed during the reconnaissance surveys at Mt. Burdell. Despite the presence of non-native plant cover, these areas provide suitable serpentine grassland to support serpentine-endemic species. Sensitive plants in these areas may benefit from some targeted invasive plant removal.



- *Forests*: Habitat quality of forested area is fair. Much of the forested area included oak woodland habitat with a mixed canopy and open understory. The understory of included nonnative annual grasses and occasional shrubs, including coyote brush (*Baccharis pilularis*), young oak species (*Quercus* spp.), young madrone (*Arbutus menziesii*), and poison oak (*Toxicodendron diversilobum*). Common manzanita was also observed in the understory of the oaks in the Black Point neighborhood.
- *Blue Oak Woodland*: Habitat quality was variable within the project site. In general, the oaks were scattered with annual grassland creating a savannah habitat. Blue oak woodland and savannah habitats host a variety of wildlife species including bats, nesting birds, and various amphibians and reptiles. Marin County Open Space District recognizes large populations of blue oak woodland in Mount Burdell and Rush Creek Open Space Preserves. In both preserves, the blue oaks hybridize with white oaks, *Quercus lobata* and *Quercus garryana*. This was confirmed during the reconnaissance-level surveys. Identification of the oaks can be very difficult in highly hybridized populations.
- *Chaparral*: Habitat quality of observed chaparral was variable, and some was very good for sensitive species habitat. Most consisted of manzanita dominated stands. These were areas where treatment had occurred previously and often and have artificially created these stands. One common manzanita (*Arctostaphylos manzanita* ssp. *manzanita*) stand was observed in the extended project area. The chaparral habitat was open and disjointed. The biologists observed a variable percentage of native versus invasive species in chaparral. Chaparral habitat was mapped to Alliance group to determine sensitivity status.
- Chaparral Alliances: Chaparral stands observed during site surveys were mapped and characterized to Alliance group by dominant species. Alliance groups were identified based on individual stands, or contiguous patches of scrub habitat. Coyote bush (*Baccharis pilularis*) stands were most common and were also the most likely to have a high density of invasive species presence. Some stands were identified by the Alliance group of the dominant genus, because suitable flowering parts of the individual plant were not sufficient to identify the dominant individuals to species (this is the case for stands of *Arctostaphylos* and *Adenostoma* stands). In total, the following were observed and mapped during surveys:
 - Twenty-eight (28) stands of *Baccharis pilularis*
 - Four (4) stands of *Arctostaphylos* spp. Alliance

Resource Impact Avoidance

A limited list of resource avoidance measures is presented below. The PSA, Section 3.7 provides an extensive analysis, including the necessary Standard Project Requirements and mitigation measures from the California Vegetation Treatment Program Environmental Impact Report.

- Wetland and Riparian Habitat: Potential impacts to these habitats will be avoided by excluding work from these areas during wet periods, per measures SH-1, SH-2, and SH-3.
- Nesting Bird Habitat: Potential impact is low if work occurs outside of nesting season. If work which could disturb active nests will be conducted (tree or brush removal during the nesting



season), a nesting bird survey would be performed prior to any project activities, per measures NB-1, NB-2, NB-3, and NB-4.

- Roosting Bat Habitat: Roosting bats could be impacted if roosting habitat is disturbed by project activities (branch or tree removal). A bat roosting survey is recommended prior to project activities, per measures RB-1, RB-2, RB-3, and RB-4.
- Riparian Species Habitat: Potential impact is low if work activity implements standard riparian avoidance measures and environmental training. Because California giant salamanders and other amphibians travel during and right after rain events, project activities should not continue during or directly after rain events. Measure SH-1 would apply if work occurs in riparian areas.
- Serpentine Grasslands: Potential impact is low with full avoidance of serpentine habitat. Environmental training will cover how to identify serpentine habitat, and it will be flagged for avoidance prior to the start of work. Measures ET-1 would require environmental training for all crew members, and ES-1 would require a survey for rare plants within suitable habitat in the project area.

Full Species List:

The following species were observed during surveys of the project area: oak titmouse, red-tailed hawk, chestnut-backed chickadee, California scrub-jay, turkey vulture, snowy egret, great egret, spotted towhee, European starling, lesser goldfinch, house finch, northern mockingbird, western meadowlark, lark sparrow, American white pelican, double-crested cormorant, house sparrow, Bewick's wren, house wren, white-breasted nuthatch, wren, California towhee, American crow, acorn woodpecker, Anna's hummingbird, Eurasian collared dove, lesser goldfinch, Nuttall's woodpecker, warbling vireo, American goldfinch, dark-eyed junco, purple finch, red-shouldered hawk, hooded oriole, tundra swan, American bittern, tree swallow, downy woodpecker, American kestrel, northern flicker, white-crowned sparrow, golden-crowned sparrow, ruby-crowned kinglet, mourning dove, Steller's jay, black-necked stilt, American robin, American avocet, yellow warbler, osprey, common raven, California quail, song sparrow, brown creeper, California ground squirrel, western gray squirrel, fox squirrel, raccoon tracks, black-tailed deer, northern pocket gopher, otter tracks, skunk tracks, coyote, black-tailed jackrabbit, brush rabbit.

Invasive Species Infestations: Large infestations of invasive plant species were identified and mapped during the reconnaissance surveys. Species mapped included: rock rose (*Cistus* sp.), French broom (*Genista monspessulana*), milk thistle (*Silybum marianum*), and Himalayan blackberry (*Rubus armeniacus*).



Select site photos - Reconnaissance Survey 2022



Photo 1. Example of coyote brush (*Baccharis pilularis*) chaparral surrounded by annual grassland. (Day 7 Reconnaissance Survey, 10/26/2022).



Photo 2. Example of coyote brush (*Baccharis pilularis*) chaparral with dead or mature individuals and young sprouts. (Day 7 Reconnaissance Survey, 10/26/2022).

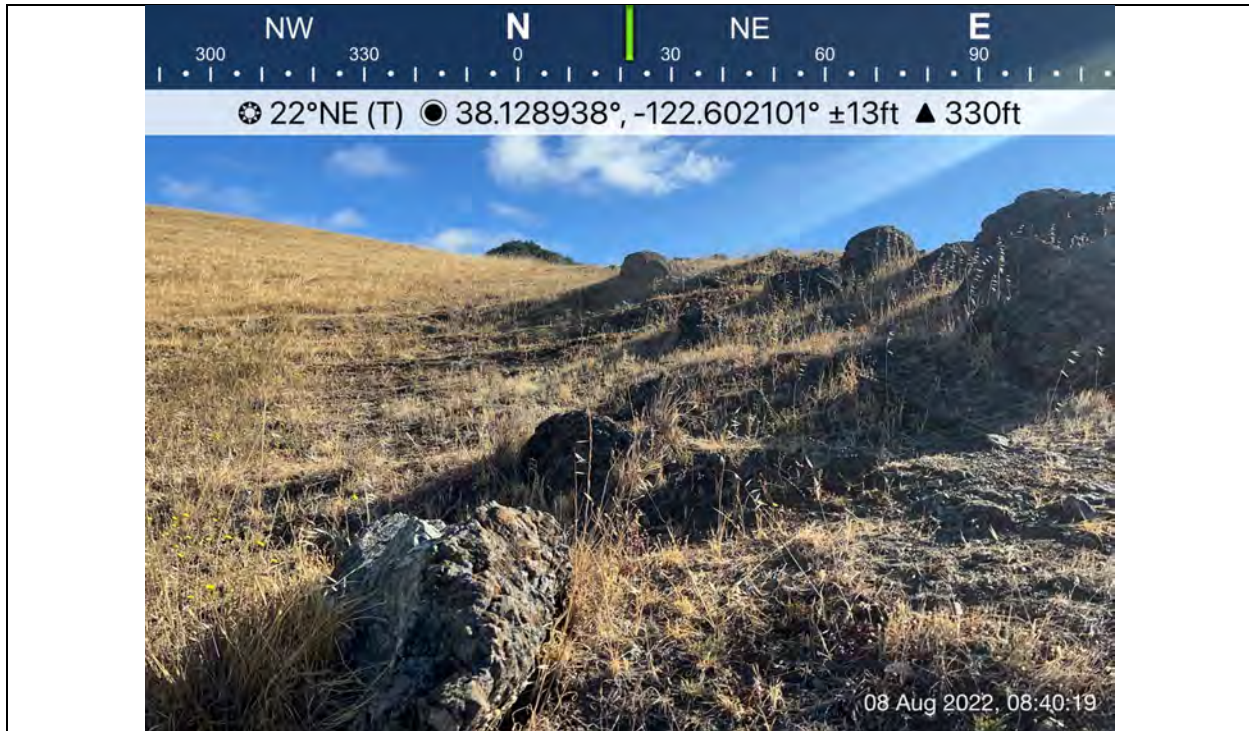


Photo 3. Serpentine grassland habitat was found in the Mt. Burdell Preserve, which provides habitat for several special-status plant species (Day 3 Reconnaissance survey, 8/8/2022).

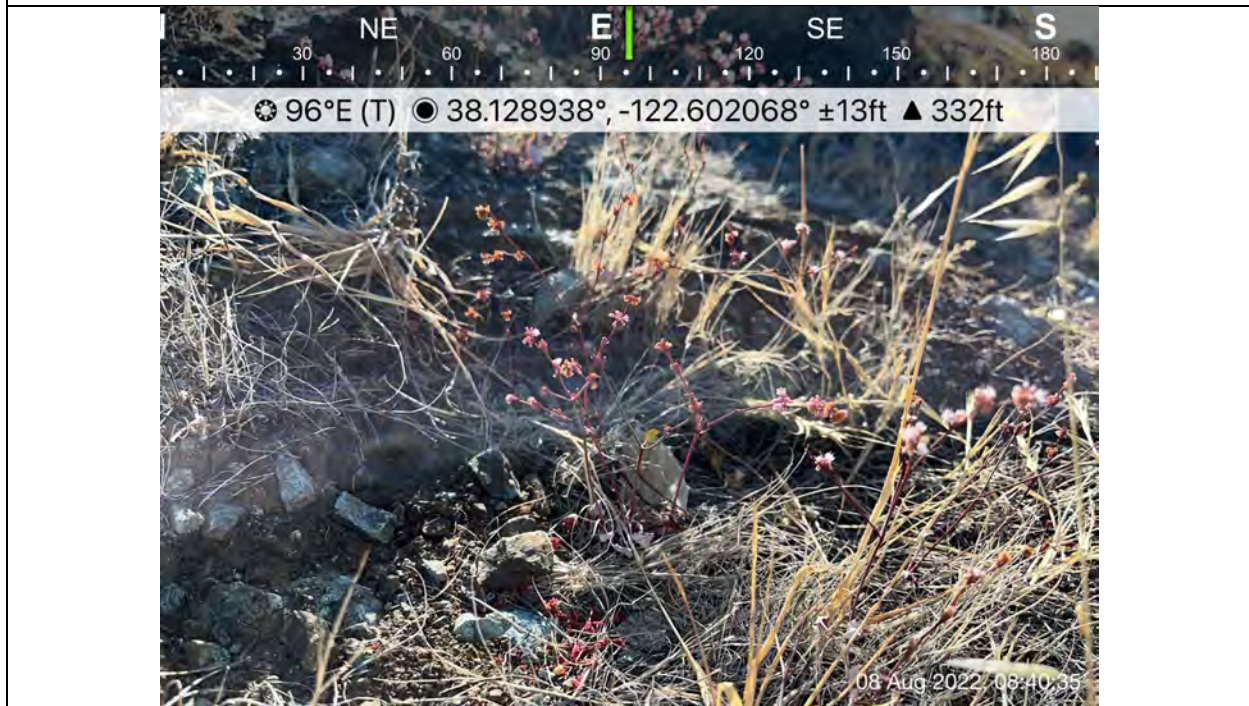


Photo 4. Serpentine grassland habitat was found in the Mt. Burdell Preserve, where Tiburon buckwheat (pictured) was observed growing along rocky outcrops. (Day 3 Reconnaissance survey, 8/8/2022).



Photo 5. Oak woodlands with a mixed canopy and open understory were observed throughout the project footprint. (Day 2 Reconnaissance Survey, 8/5/2022).



Photo 6. Example of blue oak woodland along the edge of a maintained golf course in the Black Point area of the project site. Private residences are observed behind the woodland (Day 1 of Reconnaissance Survey, 8/4/2022).



Photo 7. Wetland identified near Bel Marin Keys, pickleweed (*Salicornia* sp.) and prickly Russian thistle (*Salsola tragus*) observed in wetland. (Day 2 Reconnaissance Survey, 8/5/2022).



Photo 8. Example of riparian habitat near Arroyo San Jose. Low water levels created ponds and dry benches along the channel. (Day 4 Reconnaissance Survey, 8/11/2022).





Attachment D.4 Relevant MWPA PDIFs

The MWPA implements the following Project Design and Implementation Features (PDIFs) on all projects in order to avoid and minimize potential impacts on sensitive plant species, wildlife species, and natural communities. As projects are processed, language may evolve and improve. Projects are reviewed on a case-by-case basis and measures are incorporated as they are determined to be relevant. Measures relevant to the Greater Novato Shaded Fuel Break Project are provided below.

ET-1: Environmental Training for Biological Resources

All crew members and contractors will receive training from a qualified registered professional forester (RPF) or biologist prior to beginning a treatment project where sensitive biological resources could occur in the work areas. The training will describe the appropriate work practices necessary to effectively implement the appropriate project design and implementation features and to comply with the applicable environmental laws and regulations. The training will include the identification, relevant life history information, and avoidance of potentially present special-status species with potential to occur; identification and avoidance of sensitive natural communities and habitats with the potential to occur in the treatment area; best management practices; and reporting requirements. As appropriate, the training will include protocols for work, such as specific trimming methods, where applicable. The training will instruct workers when it is appropriate to stop work and allow wildlife encountered during treatment activities to leave the area unharmed, and when it is necessary to report encounters to a qualified RPF or biologist. The qualified RPF or biologist will immediately contact the California Department of Fish and Wildlife (CDFW) or United States Fish and Wildlife Service (USFWS), as appropriate, if any wildlife protected by the California Endangered Species Act (CESA) or Federal Endangered Species Act (ESA) is encountered and cannot leave the site on its own (without being handled).

ES-1: Environmental Surveys for Rare Plants:

Within areas where rare and special-status plants have a moderate to high potential to occur, based on desktop data of habitat types, known site-specific information, and the professional judgement of qualified biologists, surveys will be conducted prior to any activity that has either (a) the potential to damage sensitive perennial plants, or (b) is proposed to occur during the flowering season for the specific annual plant species and has the potential to damage the flowering body and/or seeds. Activities that have the potential to damage the flowering body may include but may not be limited to prescribed grazing, mowing, weed whacking, off-road vehicle and heavy equipment use, discing, and prescribed burning.

Surveys for rare plants will occur for these species within suitable habitat within the project footprint. Surveys will occur during the blooming period, if feasible, and will occur prior to work for the specified special-status plant. If blooming period surveys are not feasible and the



sensitive plant in question can be keyed to genus outside of the blooming period, surveys will be conducted for all members of the genus. Individuals will be flagged for avoidance or modified methods. Physical avoidance will include flagging, fencing, stakes, or clear, existing landscape demarcations (e.g., edge of a roadway) to delineate the boundary of the avoidance area around the suitable habitat and removal after completion. For physical avoidance, a buffer may be implemented as determined necessary by the biologist. Sensitive species damage or loss avoidance may include implementation of appropriate species-specific no-activity buffers around sensitive resources. Temporary fencing will also be implemented, as and where determined necessary based on the species tolerance, if grazing is prescribed in the area of flagged individuals for avoidance or modified methods (WILD-1).

IP-1: Clean Equipment

All crew members, surveyors, and other personnel on site related to project activities will clean clothing, footwear, and equipment used during treatments of soil, seeds, vegetative matter, other debris or seed-bearing material, or water (e.g., rivers, streams, creeks, lakes) before entering the treatment area or when leaving an area with infestations of invasive plants, noxious weeds, known plant pathogens, or invasive wildlife.

IP-2: Prevent the Spread of Invasive Species and Plant Pathogens

Segregate and treat soils and vegetation contaminated with invasive plant seeds and propagules. Treat, as appropriate, to prevent the spread of invasive plants. Treatment may include disposal on site within already infested areas, chipping or pile burning and mulching to eliminate viable seeds, or disposal at an approved cogeneration plant or green waste facility.

Minimize soil disturbance to the greatest extent possible to reduce the potential for introducing or spreading invasive plants or plant pathogens, to protect topsoil resources, and to reduce available habitat for the establishment of new invasive plants.

IP-3: Treat Invasive Plants Prior to Seeding

Schedule activities to maximize the effectiveness of control efforts and minimize introduction and spread of invasive plants as feasible, with consideration for project objectives and location (e.g., install and maintain fuel breaks, disc lines, and other work before non-native plants set seeds).

IP-4: Retain Native Plants

When removing vegetation, focus first on removing invasive and highly flammable species, and dead or diseased vegetation. Retain beneficial, low-fire risk native plant species whenever possible.



GEO-1: Erosion and Soils Loss Stabilization Measures

Soils will be stabilized if a vegetation management activity may leave less than 70 percent groundcover or native mulch/organic material.

For areas between 50 percent and 70 percent ground cover left:

- Sow native grasses and other suitable native vegetation on denuded areas where natural colonization or other replanting will not occur rapidly; use slash or chips to prevent erosion on such areas.
- Use surface mounds, depressions, logs, rocks, trees and stumps, slash and brush, the litter layer, and native herbaceous vegetation downslope of denuded areas to reduce sedimentation and erosion, as necessary to prevent erosion or slope destabilization.
- Install approved, biodegradable erosion-control measures and non-filament-based geotextiles (e.g., coir, jute) when:
 - conducting substantial ground-disturbing work (e.g., use of heavy equipment, pulling large vegetation) within 100 feet and upslope of currently flowing or wet wetlands, streams, lakes, and riparian areas;
 - causing soil disturbance on moderate to steep (10 percent slope and greater) slopes; and
 - removing invasive plants from stream banks to prevent sediment movement into watercourses and to protect bank stability.
- Sediment-control devices, if installed, will be certified weed-free. Sediment control devices will be inspected daily during active work to ensure that they are repaired and working as needed to prevent sediment transport into the waterbodies.

For areas with less than 50 percent ground cover:

- Any of the above measures will be implemented.
- Stabilize with mulch or equivalent immediately after project activities to the maximum extent practicable.
- If project activities could result in substantial sediment discharge from soil disturbance, as determined by the qualified personnel (e.g., RPF), organic material from mastication or mulch will be incorporated onto at least 75 percent of the disturbed soil surface where the soil erosion hazard is moderate or high, and 50 percent of the disturbed soil surface where soil erosion hazard is low to help prevent erosion.
- Where slash mulch is used, it will be packed into the ground surface with heavy equipment so that it is sufficiently in contact with the soil surface.
- Once work is completed, the areas will be inspected at least annually if accessible, until groundcover exceeds 70 percent or slopes have stabilized, as determined by a qualified professional. At that time, erosion-control and slope-stability devices may be removed.



GEO-2 Prescribed Herbivory Erosion and Trail Control Measures

Methods will be implemented to reduce the potential creation of prescribed herbivory trails and erosional features, including the following:

- Implement methods, which could include rotating or providing multiple feeding areas to minimize excessive congregation of animals in any one location for too long, as determined by a qualified professional.
- If prescribed herbivory trails or damaged areas form, the bare area will be remediated by decompacting the soil and discontinuing prescribed herbivory in the area until the trails are revegetated, as determined by a qualified professional.
- Manage livestock grazing on steep slopes (generally slopes with more than 35 percent grade) to reduce potential for erosion. Management can include (but is not limited to) reducing or limiting the number of animals or duration on slopes above 35% (using stocking equation) to avoid erosion and avoid placing water and feeding troughs on steep slopes.
- Grazing will not occur during a storm event or under muddy conditions, when hooves may sink into the ground.

HAZ-1 Leak Prevention and Spill Cleanup

The project proponent will, at a minimum, implement measures that address the following procedures related to the use of hazardous materials during work:

- Proper disposal or management of contaminated soils and materials (i.e., clean up materials)
- Daily inspection of vehicles and equipment for leaks and spill containment procedures
- Emergency response and reporting procedures to address hazardous material releases
- Emergency spill supplies and equipment will be available to respond in a timely manner if an incident should occur.
- Response materials such as oil-absorbent material, tarps, and storage drums will be available in the plan area at all times during management activities and will be used as needed to contain and control any minor releases.
- The absorbent material will be removed promptly and disposed of properly.
- Use of secondary containment and spill rags when fueling
- Discourage “topping-off” fuel tanks



- Workers using fuels or other hazardous materials must be knowledgeable of the specific procedures necessary for hazardous materials cleanup and emergency response.
- All diesel and gasoline powered equipment will be maintained per manufacturer's specification, and in compliance with all state and federal emission requirements.

HAZ-2 Wildfire Risk Reduction

The following measures will be implemented during activities that involve the use of equipment that can generate sparks or heat:

- Maintain fire suppression equipment (e.g., shovel, extinguisher) in work vehicles and ensure workers are trained in use
- Closely monitor for ignited vegetation from equipment and tool use
- Train workers to properly handle and store flammable materials to minimize potential ignition sources
- Prohibit smoking in vegetated areas
- Avoid use of spark- and/or heat-generating equipment during high fire danger days (e.g., Red Flag Days and Fire Weather Watch)
- Outfit off-road diesel vehicles and equipment with spark arrestors
- Avoid metal string or blade weed trimmers
- Maintain one fire extinguisher for each chainsaw

HYD-1 Prescribed Herbivory Treatments

The following water quality protections will apply for all prescribed herbivory treatments:

- Limit the duration of prescribed herbivory within 50 feet of lakes/reservoirs, creeks, streams, riparian corridors, and wetlands to prevent soil erosion that could affect water quality (see SH-1)
- Water will be provided for grazing animals in the form of an on-site stock pond, or a portable water source located outside of environmentally sensitive areas.
- Treatment prescriptions will be designed to protect soil stability. Grazing animals will be herded out of an area if accelerated soil erosion is observed.



NSO-1 Northern Spotted Owl Nesting Season Avoidance

Each project will be reviewed by a qualified biologist to determine if northern spotted owls have potential to occur near proposed project activities. Within areas where northern spotted owl has the potential to occur, work, including mowing with heavy equipment, the mechanical removal of vegetation, or prescribed burning, including pile and broadcast burning, will occur outside of the northern spotted owl nesting season to the extent feasible (February 1 to July 31).

If work must occur during the northern spotted owl nesting season, either NSO-2 or NSO-3 will apply.

NSO-2 Work During Northern Spotted Owl Nesting Season – Surveys

Within an area where northern spotted owl has the potential to occur, when work will occur during the northern spotted owl nesting season (February 1 through July 31), and work is not considered low-impact by a qualified biologist the following measure will apply. Low impact type activities include, but are not limited to, goat grazing, hand pulling of weeds, hand trimming of trees and vegetation with non-mechanized equipment, chipping from existing roadways in residential areas, and use of mechanized equipment adjacent to roads or in residential areas that is a typical noise for the environment. In contrast, high-impact activities may include operation of heavy machinery in wildlands with lower baseline environmental noise, or work which produces noise disturbance for a longer duration than is typical in the environment.

The biologists will determine if a known breeding pair is found within 0.25 mile of the proposed activity (i.e., from existing surveys that season or historic data) and perform a nest check to confirm presence. If no survey data for the season has been completed for the areas, two surveys will be conducted by a qualified biologist (whose qualifications have been approved by the MWPA or lead public agency) for nesting northern spotted owls during the months of April and May preceding the commencement of these activities. At a minimum, the survey area will include all suitable nesting habitats within 0.25 mile of any planned activity sites, and then one of the two options listed below will be implemented. If access cannot be secured for surveys, then work should be delayed until after the nesting season, unless it can be shown that noise generation from the activities and the activities proposed would be below noise and visual disturbance levels for northern spotted owls (refer to USFWS Revised Transmittal of Guidance: Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California) at the nest site, if known.

1. If it is conclusively determined that there are nesting northern spotted owls, planned activities that generate noise (e.g., mowing, heavy equipment usage, crews with hand tools that generate noise) in areas without regular human disturbances from human residency (e.g., leaf blowers, home construction and remodeling, roadways), that are within 0.25-mile of an identified active nest will not begin prior to August 1 unless the young have fledged, at which time work may begin no earlier than July 10. Prescribed burns may only occur within suitable northern spotted owl habitat (as determined by a qualified biologist) during the



nesting season if protocol surveys have determined that northern spotted owl nesting is not occurring in the area of planned activity.

2. If work must occur within 0.25 mile, and work has been determined to have the potential to impact an active northern spotted owl nest, CDFW and USFWS would be consulted to determine if take could occur and whether further permits are required.

NSO-3 Northern Spotted Owl Habitat Alteration

For projects involving removal of large trees (10-inches DBH or greater) in potential northern spotted owl roosting, or nesting habitat (as identified during the desktop review) in areas without regular human disturbances from human residency, habitat alteration within core use areas (nesting and roosting habitat) will be planned in consultation with a qualified biologist.

NSO-4 Retain Dusky-footed Woodrat Nests

Dusky-footed woodrats are important prey for northern spotted owls. Wherever feasible, project activities will leave dusky-footed wood rat nests intact. If possible, maintain a 3-foot buffer of vegetation around dusky-footed woodrat middens.

NB-1 Nesting Bird Season Avoidance

Whenever possible, schedule work outside of the bird nesting season, which is generally from February 1 through July 31st [8]. Not all species nest between the regulatory season, and active nests that are encountered year-round are protected.

NB-2 Nesting Bird Surveys

If work that has the potential to impact nesting birds commences between February 1 and July 31 (during the nesting season), a qualified biologist (whose qualifications have been approved by the MWPA or lead public agency) will conduct a pre-activity survey for nesting birds.

Nesting bird surveys are recommended during the nesting season for work involving mowing with heavy equipment, other vegetation (including tree) removal or limbing and trimming activities, and prescribed (broadcast and pile) burning. Low-impact activities including goat grazing, hand-pulling weeds, and herbicide application do not generally require nesting bird surveys. Determination of need for surveys for low-impact activities should be evaluated on a case-by-case basis in consultation with a qualified biologist or RPF.

Nesting bird surveys will occur within no more than 7 days prior to work to ensure that no nests will be disturbed during vegetation management work. If work pauses for more than 7 days, a follow-up survey will be conducted prior to the restarting of work. Appropriate survey areas will be determined by the qualified biologist depending on the project footprint, type of activity proposed, and suitable habitat for nesting birds. Surveys will be conducted during periods of high bird activity (i.e., 1-3 hours after sunrise and 1-3 hours before sunset). If the qualified



biologist determines that visibility is significantly obstructed due to on-site conditions (such as access issues, rain, fog, smoke, or sound disturbance [including high wind]), surveys will be deferred until conditions are suitable for nest detection.

NB-3 Nesting Birds: Active Nest Avoidance

If active nests (i.e., presence of eggs and/or chicks) are observed in areas that could be directly or indirectly disturbed (including noise disturbance), a temporary, species-appropriate no-disturbance buffer zone will be created around the nest sufficient to reasonably expect that breeding would not be disrupted. No work will occur inside the buffer zone.

The size of the buffer zone will be determined by the biologist, by taking into account factors including but not limited to the following:

- Noise and human disturbance levels at the site at the time of the survey and the noise and disturbance expected during the work;
- Distance and amount of vegetation or other screening between the site and the nest; and
- Sensitivity of individual nesting species and behaviors of the nesting birds, taking into account factors such as topography, visibility to source of disturbance, noise/vibration, nesting phase, and other case-by-case specifics.

Buffer sizes may be altered during the course of work at the recommendation of the biologist. Raptor nests are subject to additional protections, including during the “branching” phase, when fledglings begin to fly but do not fully leave the nest. Buffers will be maintained until young fledge or the nest becomes inactive, as determined by the qualified biologist.

If work must occur within the buffer, proceed to NB-4.

NB-4 Nesting Birds - Active Nest Monitoring

If an avoidance buffer is not achievable, a qualified biologist may monitor the nest(s) during work activities within the recommended nest buffer to document that no take of the nest (nest failure) has occurred related to work activities. If it is determined that work activity is resulting in nest disturbance, work should cease immediately.

WILD-1 Temporary Fencing

If temporary fencing is required for prescribed herbivory treatment, a wildlife-friendly recyclable fencing design will be used. The design should consider the following:

- Minimize the chance of wildlife entanglement by minimizing barbed wire, loose or broken wires.



- If feasible, keep electric netting-type fencing electrified at all times or laid down while not in use.
- Charge temporary electric fencing with intermittent pulse energizers.
- Allow wildlife to jump over easily without injury by installing fencing that can flex as non-target animals pass over it and installing the top wire low enough (no more than approximately 40 inches high on flat ground) to allow adult ungulates to jump over it, while keeping grazing animals safely within the fence. The determination of appropriate fence height will consider slope, as steep slopes are more difficult for wildlife to pass.
- Fences should be highly visible to birds and mammals by using high-visibility tape or wire, flagging, or other markers.

RB-1 Pework Survey

If vegetation management activities would (1) occur in trees with potential for roosting bat species, (2) would include removal or trimming of trees where a bat could be roosting, or (3) would involve removal or trimming of a tree with mechanized equipment adjacent to trees or structures that could have roosting bats and (4) the work would commence between March 1 and July 31, during the bat maternity period, a pre-activity survey will be conducted for roosting bats within 2 weeks prior to work to ensure that no roosting bats will be disturbed during work. This survey can be conducted concurrent with other surveys for other sensitive species. Trees and shrubs within the work footprint that have been determined to be unoccupied by roosting bats, or that are located outside the avoidance buffer for active roosting sites may be removed. Roosting initiated during work is presumed to be unaffected, and no buffer would be necessary.

RB-2 Avoidance of Maternity Roosts and Day Roosts

If active maternity roosts or day roosts are found within the project site, or in areas subject to disturbance from work activities, avoidance buffers will be implemented. The buffer size will be determined in consultation with the qualified biologist or RPF.

RB-3 Bat Roosting Tree Removal – Seasonal Restrictions

If it is determined that a colonial maternity roost is potentially present, the roost will be avoided and will not be removed during the breeding season (March 1 through July 31) unless removal is necessary to address a safety hazard.

Operation of mechanical equipment producing high noise levels (e.g., chainsaws, heavy equipment) in proximity to buildings/structures supporting or potentially supporting a colonial bat roost will be restricted to periods of seasonal bat activity (as defined above), when possible.



RB-4 Bat Roosting Tree Removal – Emergency Removals

Potential non-colonial roosts that must be removed in order to address an imminent safety hazard can be removed after consultation with a biologist. Removal will occur on warm days in late morning to afternoon when any bats present are likely to be warm and able to fly. Appropriate methods will be used to minimize the potential of harm to bats during tree removal. Such methods may include using a two-step tree removal process. This method is conducted over two consecutive days, and works by creating noise and vibration by cutting non-habitat branches and limbs from habitat trees using chainsaws only (no excavators or other heavy machinery) on Day 1. The noise and vibration disturbance, together with the visible alteration of the tree, is very effective in causing bats that emerge nightly to feed, to not return to the roost that night. The remainder of the tree is removed on Day 2.

SH-1 Riparian Resources – Project Design

Work will be avoided in riparian and wetland areas. Some treatment may be approved on a case-by-case basis. Treatments will be limited to removal of uncharacteristic fuel loads (e.g., removing dead or dying vegetation), trimming/limbing of woody species as necessary to reduce ladder fuels, and select thinning of vegetation to restore densities that are representative of healthy stands of the riparian vegetation types that are characteristic of the region. Work will only be permitted in dry conditions, where soil is not saturated and no rain (precipitation of 0.5 inches or greater) has occurred in the past 24 hours. Allowable activities include hand removal of dead or dying riparian trees and shrubs, invasive plant removal, selective thinning, and removal of encroaching upland species. Mature, healthy trees will not be removed from a riparian corridor. No foot traffic or equipment will be permitted to enter a wetted channel at any time. Any activities conducted within a riparian corridor will be conducted so as to avoid alteration to a bed, channel, or bank of a waterway and all debris, including sawdust, chips, or other vegetative material, will be prevented from entering the bed, channel, or bank of a waterway, unless a permit from the California Department of Fish and Game under Section 1600 is obtained.

SH-2 Grazing and Sensitive Habitats

Avoid grazing in sensitive habitats including serpentine-associated communities, chaparral, and across waterways and within a 50-foot buffer of waterways if there is a need for protection of riparian vegetation from grazing. Limited grazing may be allowed if it would be beneficial to plant and wetland communities, including serpentine-associated communities, without causing harm (e.g., removal of invasive species) and would not result in erosion.

SH-3 Minimization of Pile Burning Disturbance

Pile burning will not be performed in sensitive habitats, such as serpentine-associated communities, wetlands, or riparian areas. If piles are burned on a different day than piled, the piles should be moved prior to burning to ensure wildlife is not present, such as by re-piling by hand, or a qualified biologist will inspect the pile prior to burning to ensure wildlife are not



present. If moving or inspection of the piles is not feasible, the pile will be lit from one side and allowed to burn slowly to the other side, in order to allow any wildlife to relocate, rather than lighting the entire pile at once.



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APPENDIX

Appendix E: Soil and Slope Stability Report

APPENDIX

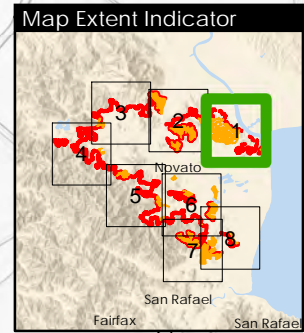
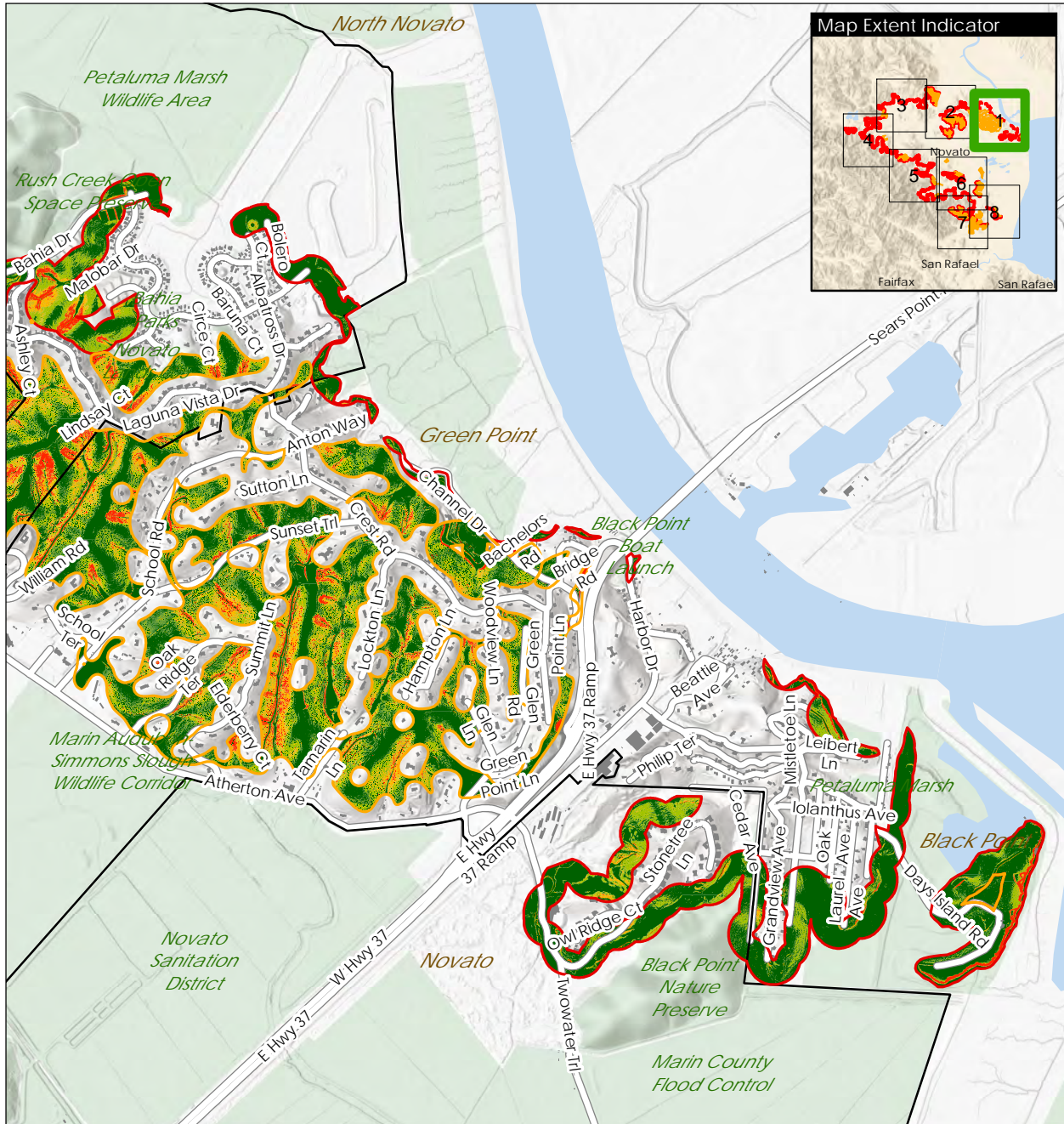
Appendix F: Project-Specific CEQA Findings and Statement of Overriding Considerations

Attachment E– Soil and Slope Stability Report

Soil Report and Slope Stability Analysis

A significant portion of the project area is located on steep terrain. Treatment activities could result in the exposure of soils, which would increase the potential for erosion and loss of topsoil. A slope stability analysis was conducted to identify project areas with different slopes. A soil report was produced for the fuel break and WUI fuel reduction area using the Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA, 2022). Thirty one soil types were identified within the project area. The dominant soil types within the project site are the Tocaloma-McMullin complex and Bressa variant-McMullin variant complex, that comprise of 17 percent and 16 percent of the project area, respectively. Soils that occur on slopes greater than 50 percent include the Bonnydoon-Gilroy-Typic Argixerolls, Saurin-Bonnydoon complex, Tocaloma-McMullin complex, and Tocaloma-Saurin association.

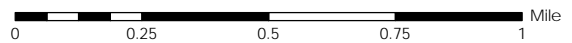
A steep slope analysis was performed to evaluate areas of the fuel break and WUI fuel reduction area over 50 percent in slope, where several of the Standard Project Requirements (SPRs) would apply. Approximately, 635 acres of the fuel break and WUI fuel reduction area are located on slopes greater than 50 percent (as shown in Figure 1 through Figure 8)

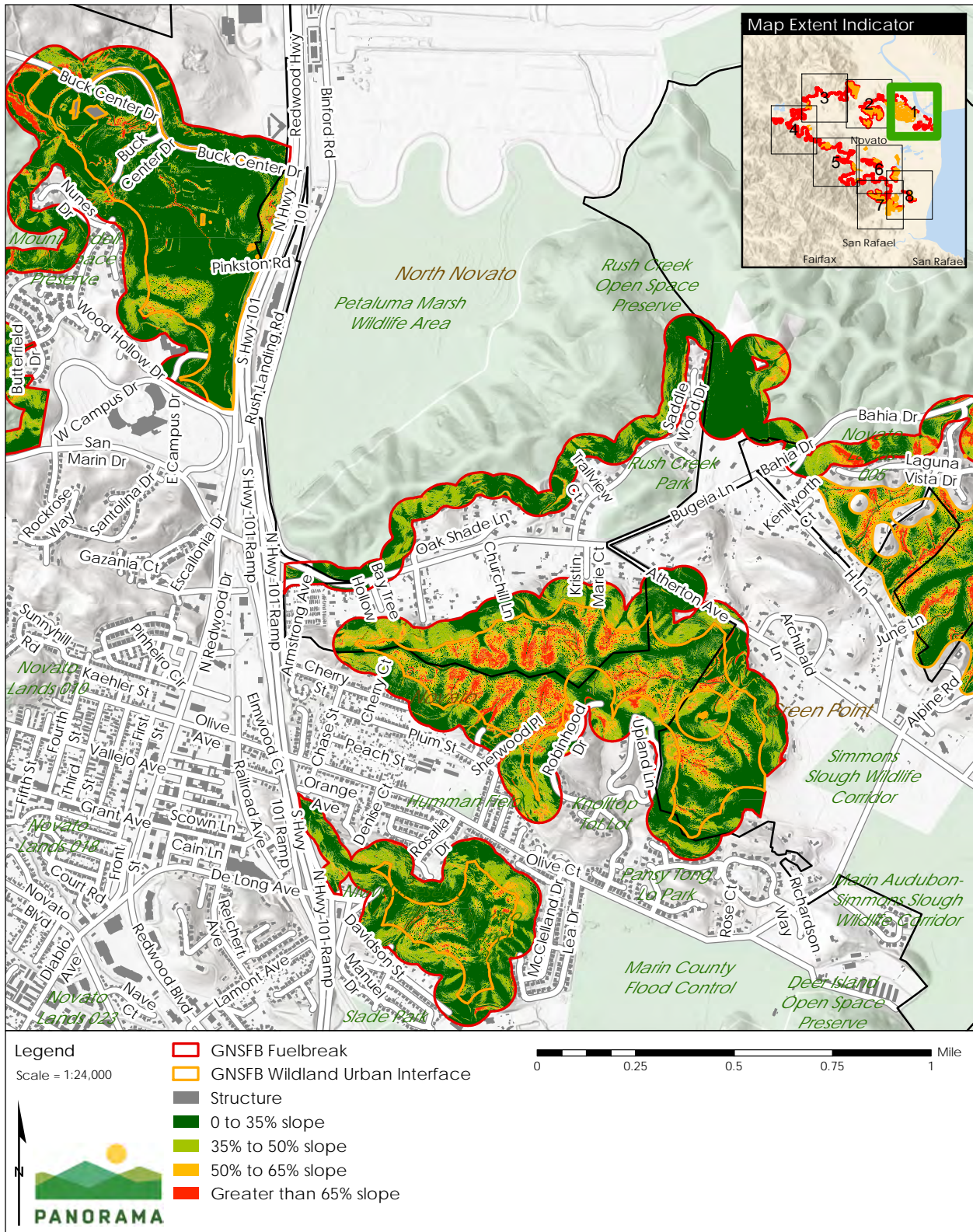


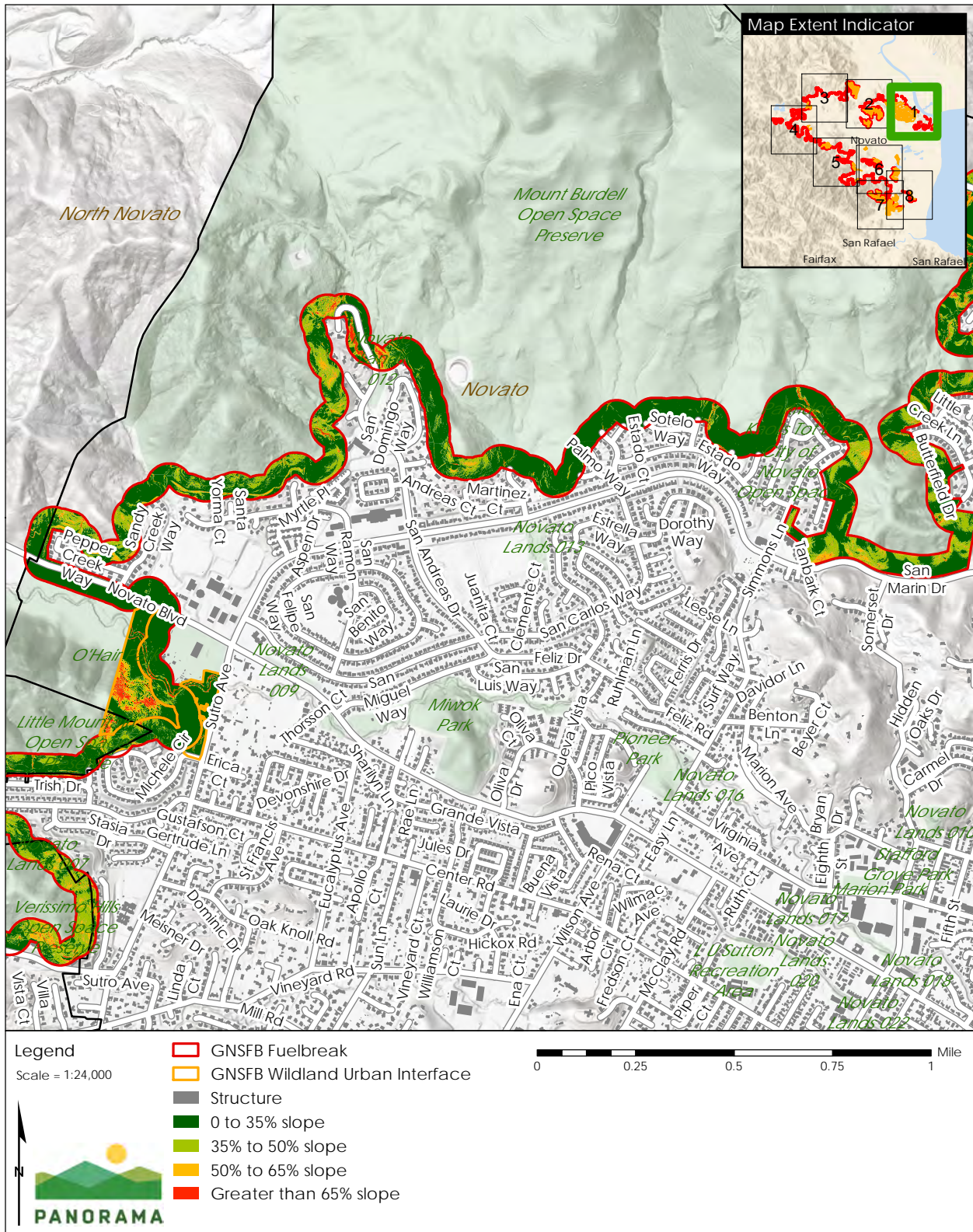
Legend

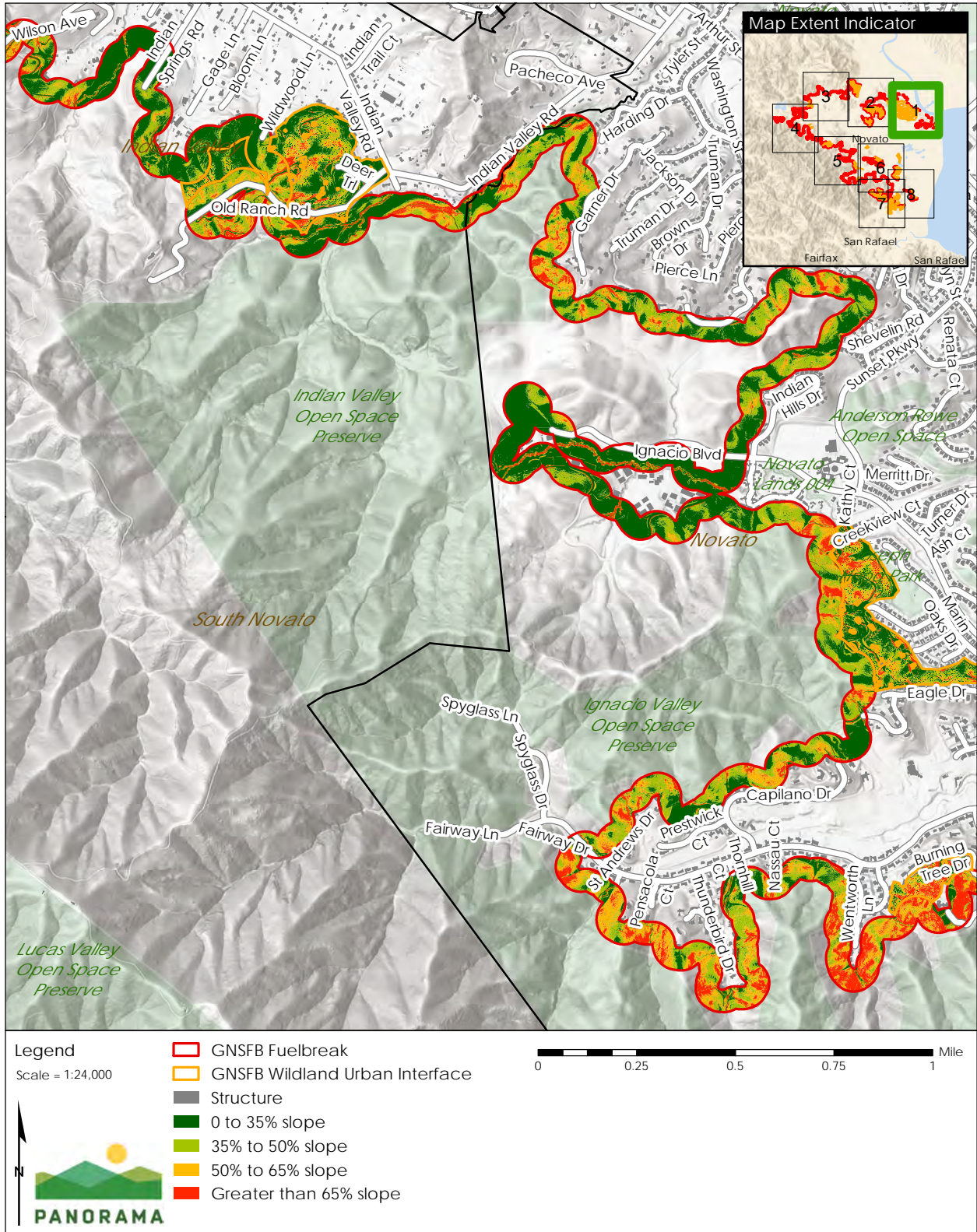
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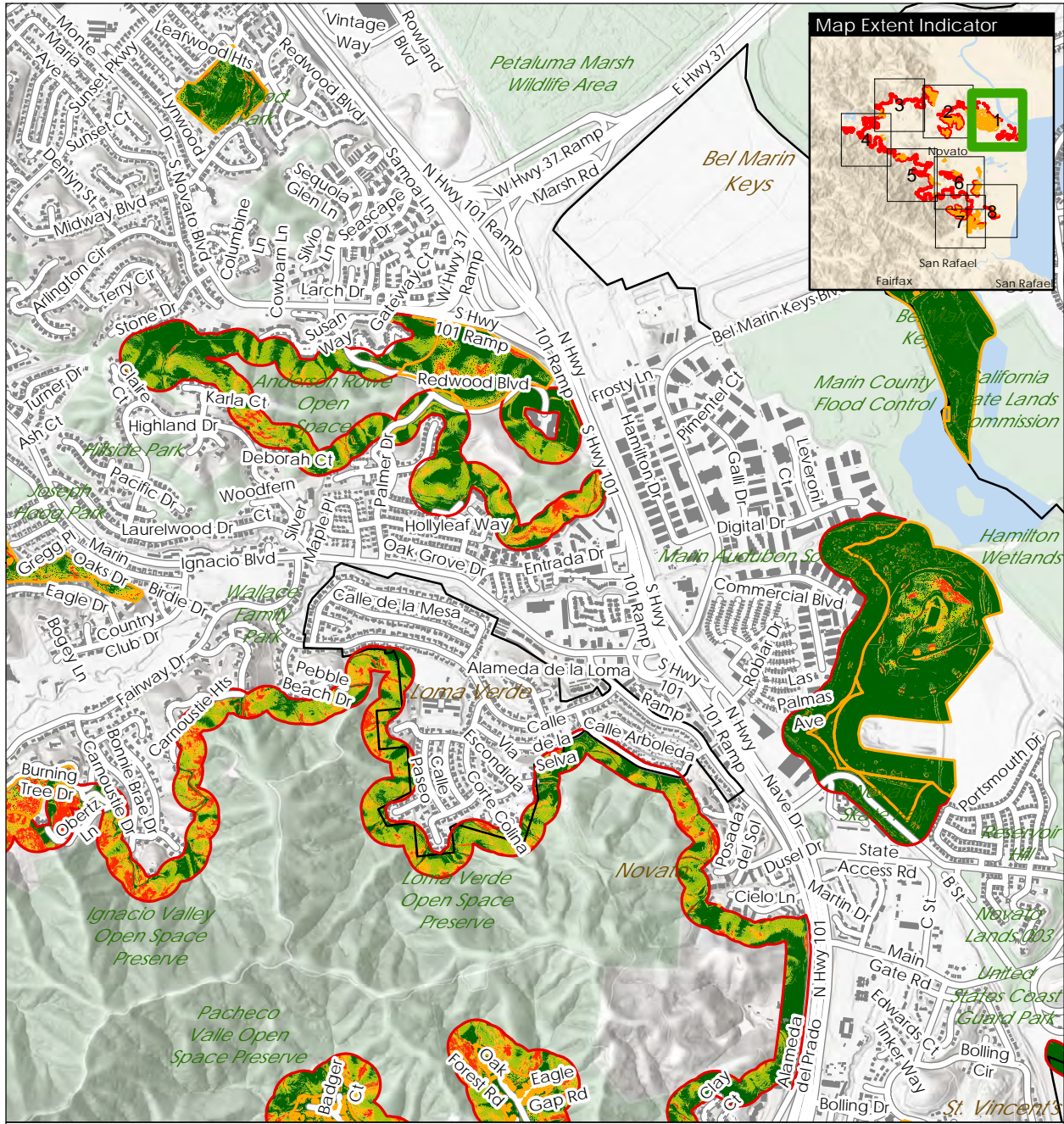
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- GNSFB Wildland Urban Interface
- Structure
- 0 to 35% slope
- 35% to 50% slope
- 50% to 65% slope
- Greater than 65% slope











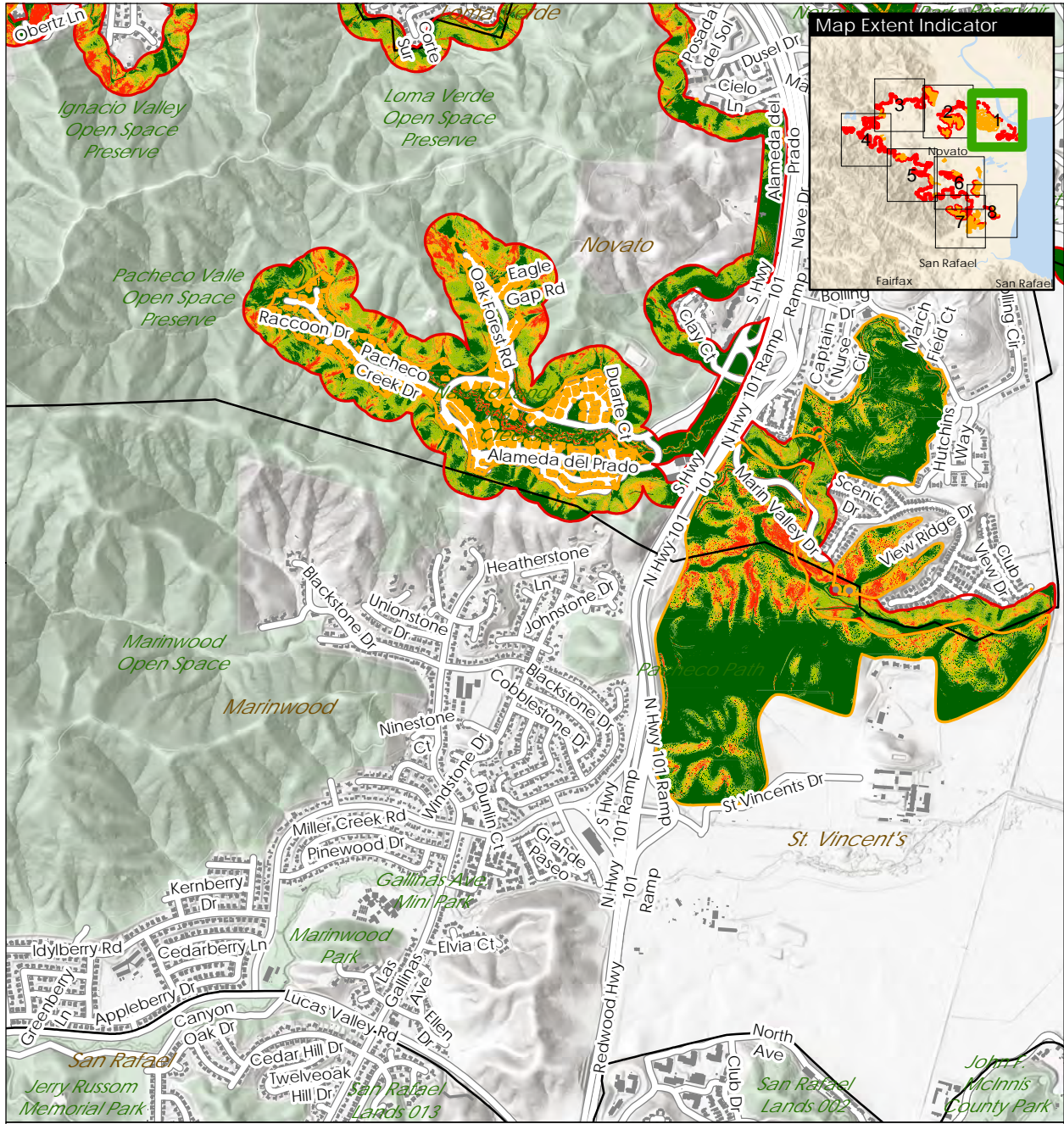
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- GNSFB Fuelbreak
- GNSFB Wildland Urban Interface
- Structure
- 0 to 35% slope
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- 50% to 65% slope
- Greater than 65% slope

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0 0.25 0.5 0.75 1 Mile

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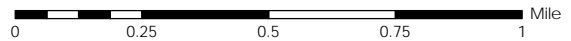


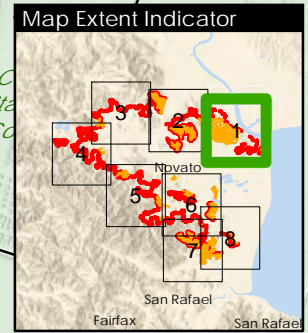
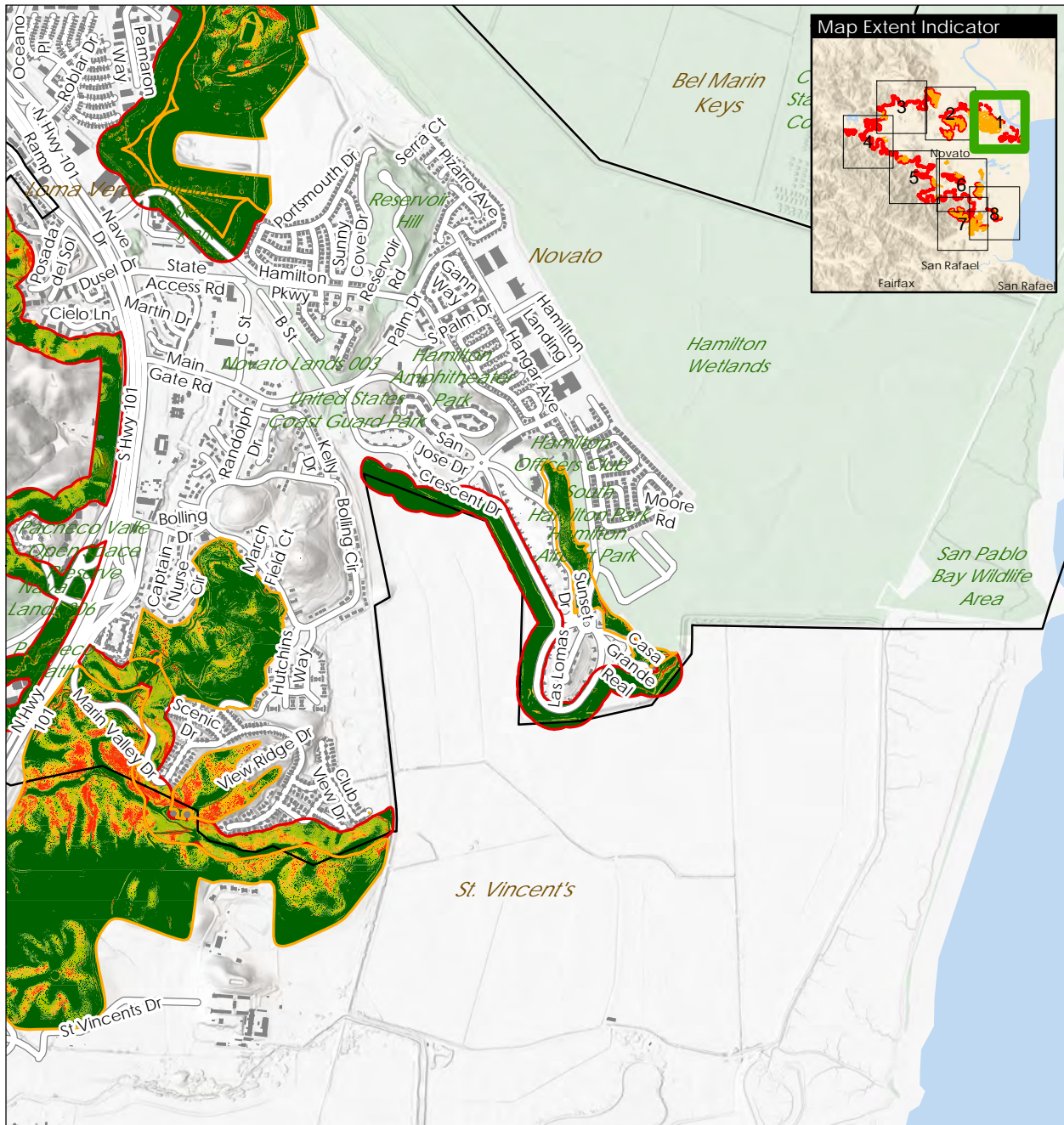
Legend

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- GNSFB Fuelbreak
- GNSFB Wildland Urban Interface
- Structure
- 0 to 35% slope
- 35% to 50% slope
- 50% to 65% slope
- Greater than 65% slope





Legend

- GNSFB Fuelbreak
- GNSFB Wildland Urban Interface
- Structure
- 0 to 35% slope
- 35% to 50% slope
- 50% to 65% slope
- Greater than 65% slope

Scale = 1:24,000

PANORAMA

0 0.25 0.5 0.75 1 Mile



United States
Department of
Agriculture

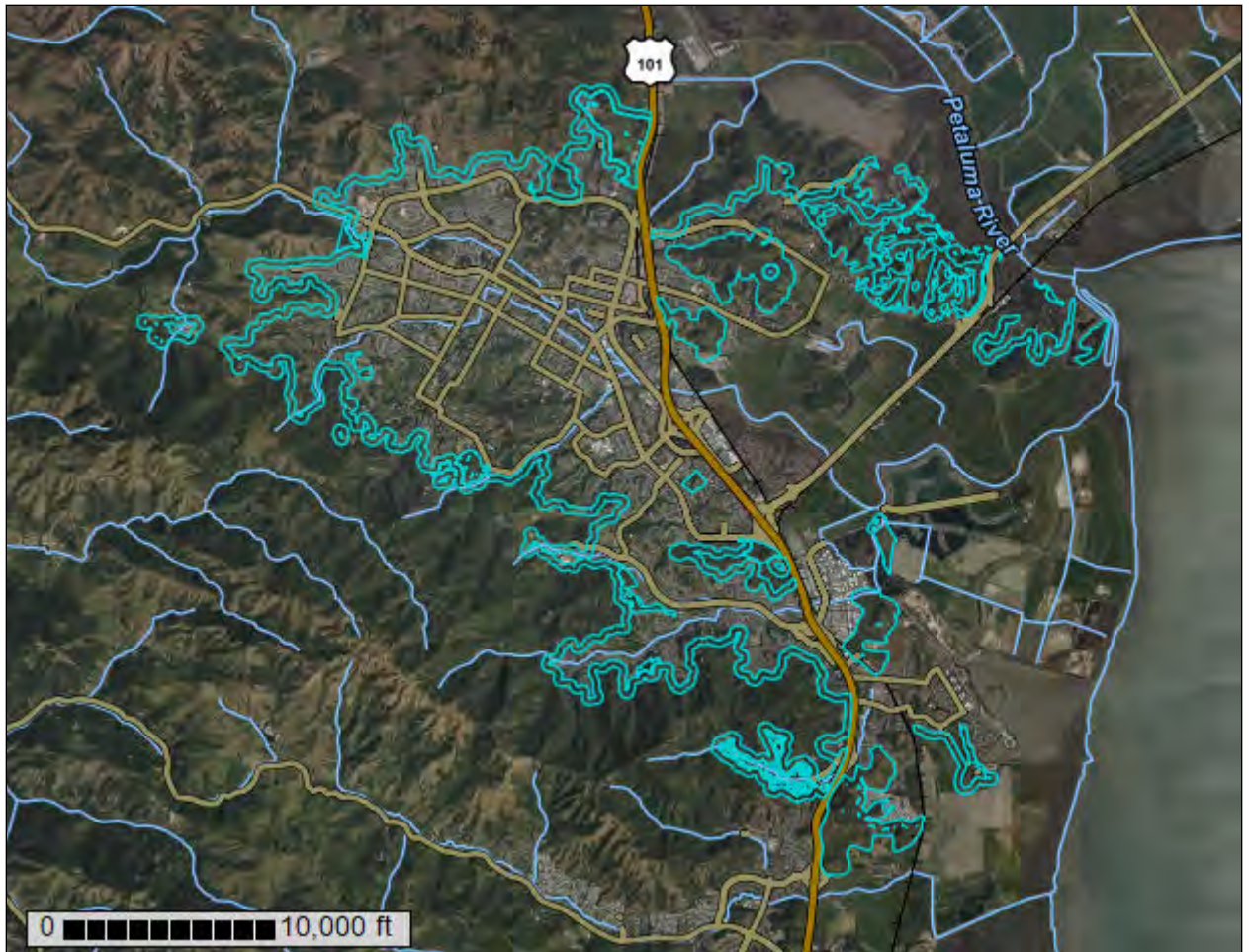
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Marin County, California

GNSFB Project Area



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

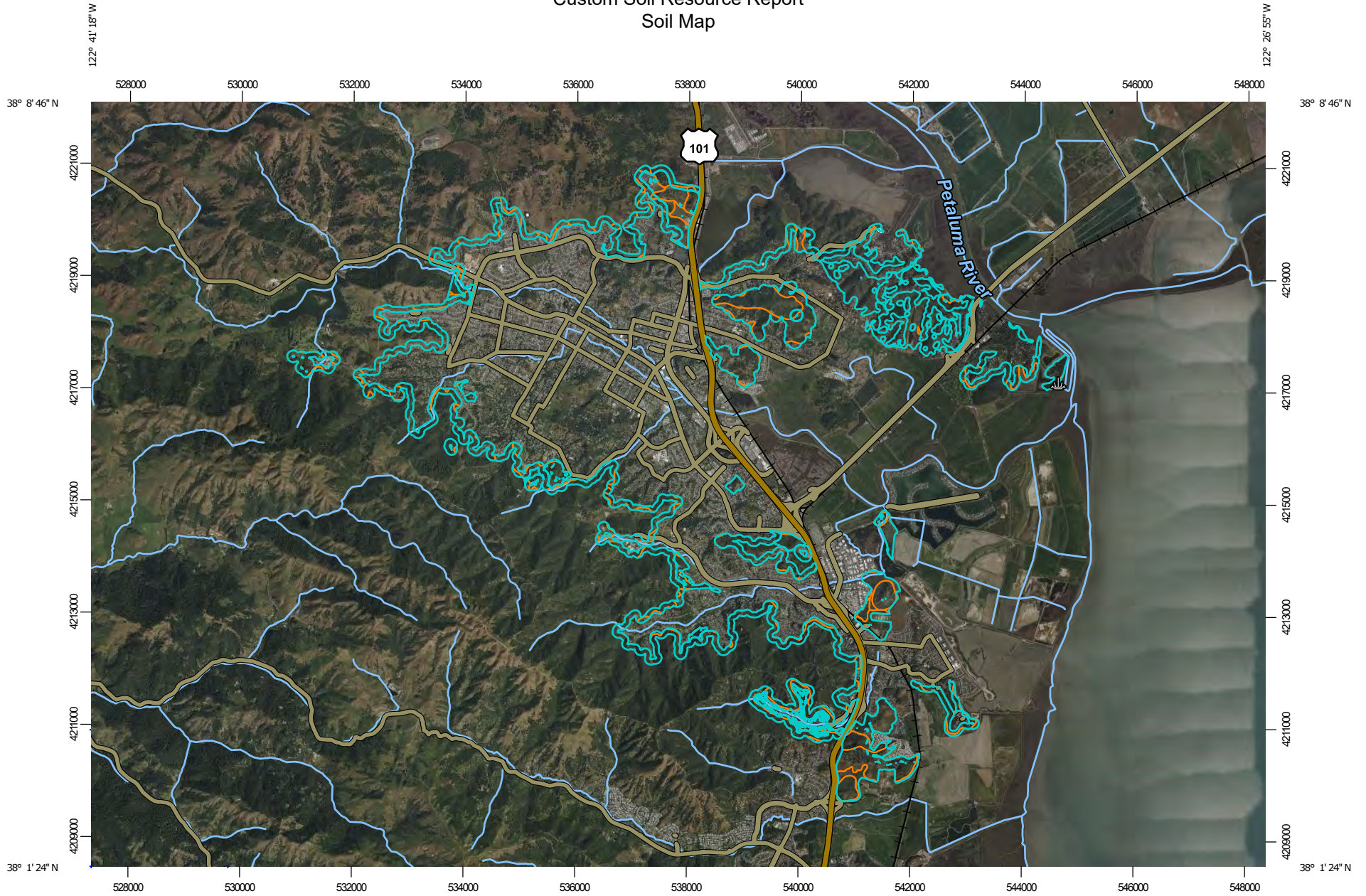
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

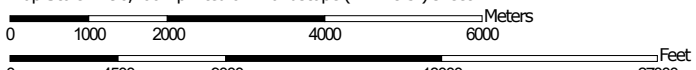
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:96,100 if printed on A landscape (11" x 8.5") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Marin County, California
 Survey Area Data: Version 16, Sep 13, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 26, 2022—Apr 25, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Ballard gravelly, loam 2 to 9 percent slopes	18.2	0.5%
102	Ballard-Urban land complex, 0 to 9 percent slopes	17.3	0.5%
105	Blucher-Cole complex, 2 to 5 percent slopes	44.6	1.3%
108	Bonnydoon-Gilroy-Typic Argixerolls, 50 to 75 percent slopes	81.1	2.3%
109	Bressa variant-McMullin variant complex, 30 to 50 percent slopes	549.6	15.9%
113	Clear Lake clay, 0 to 2 percent slopes, MLRA 15	1.5	0.0%
114	Cortina gravelly sandy loam, 0 to 6 percent slopes, cool, MLRA 15	24.9	0.7%
128	Gilroy-Typic Argixerolls-Bonnydoon, 30 to 50 percent slopes	52.0	1.5%
140	Los Osos-Bonnydoon complex, 5 to 15 percent slopes	14.4	0.4%
141	Los Osos-Bonnydoon complex, 15 to 30 percent slopes	133.4	3.9%
142	Los Osos-Bonnydoon complex, 30 to 50 percent slopes	278.0	8.0%
143	Los Osos-Urban land-Bonnydoon complex, 15 to 30 percent slopes	7.0	0.2%
146	Montara clay loam, 15 to 30 percent slopes	58.5	1.7%
147	Novato clay, 0 to 1 percent slopes	16.5	0.5%
157	Pits, quarries	38.5	1.1%
161	Saurin-Bonnydoon complex, 2 to 15 percent slopes	9.1	0.3%
162	Saurin-Bonnydoon complex, 15 to 30 percent slopes	43.0	1.2%
163	Saurin-Bonnydoon complex, 30 to 50 percent slopes	179.2	5.2%
164	Saurin-Bonnydoon complex, 50 to 75 percent slopes	27.6	0.8%
166	Saurin-Urban land-Bonnydoon complex, 30 to 50 percent slopes	118.3	3.4%

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Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
179	Tocaloma-McMullin complex, 30 to 50 percent slopes	133.9	3.9%
180	Tocaloma-McMullin complex, 50 to 75 slopes	594.3	17.2%
184	Tocaloma-Saurin association, very steep	516.0	14.9%
185	Tocaloma-Saurin association, extremely steep	58.1	1.7%
201	Urban land-Ballard complex, 0 to 9 percent slopes	2.0	0.1%
202	Urban land-Xerorthents complex, 0 to 9 percent slopes	3.3	0.1%
203	Xerorthents, fill	13.1	0.4%
204	Xerorthents-Urban land complex, 0 to 9 percent slopes	289.9	8.4%
206	Yorkville clay loam, 15 to 30 percent slopes	31.5	0.9%
210	Water	1.2	0.0%
301	Reyes clay, 0 to 2 percent slopes	107.2	3.1%
Totals for Area of Interest		3,463.6	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the

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scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Marin County, California

101—Ballard gravelly, loam 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hf14
Elevation: 10 to 300 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 230 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ballard and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ballard

Setting

Landform: Fan terraces, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from shale, sandstone and/or granite

Typical profile

H1 - 0 to 19 inches: gravelly loam
H2 - 19 to 65 inches: gravelly clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R014XC008CA - LOAMY BOTTOMLAND
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 5 percent
Hydric soil rating: No

Cortina

Percent of map unit: 5 percent
Hydric soil rating: No

Clear lake

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

102—Ballard-Urban land complex, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: hf15
Elevation: 10 to 300 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 230 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ballard and similar soils: 55 percent
Urban land: 25 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ballard

Setting

Landform: Fan terraces, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from shale, sandstone and/or granite

Typical profile

H1 - 0 to 19 inches: gravelly loam
H2 - 19 to 65 inches: gravelly clay loam

Properties and qualities

Slope: 0 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

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Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: R014XG912CA - Loamy Terrace

Hydric soil rating: No

Description of Urban Land

Setting

Landform: Fan terraces, alluvial fans

Landform position (two-dimensional): Backslope

Down-slope shape: Linear

Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): 8

Land capability classification (nonirrigated): 8

Hydric soil rating: No

Minor Components

Blucher

Percent of map unit: 6 percent

Landform: Drainageways

Landform position (two-dimensional): Backslope

Hydric soil rating: Yes

Hydraquents

Percent of map unit: 5 percent

Landform: Depressions

Landform position (two-dimensional): Backslope

Hydric soil rating: Yes

Cole

Percent of map unit: 4 percent

Hydric soil rating: No

Reyes

Percent of map unit: 3 percent

Landform: Depressions

Landform position (two-dimensional): Backslope

Hydric soil rating: Yes

Unnamed, clayey subsoil

Percent of map unit: 2 percent

Hydric soil rating: No

105—Blucher-Cole complex, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: hf18

Elevation: 0 to 500 feet

Mean annual precipitation: 25 to 35 inches

Mean annual air temperature: 57 to 61 degrees F

Frost-free period: 210 to 290 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Blucher and similar soils: 40 percent

Cole and similar soils: 30 percent

Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blucher

Setting

Landform: Basin floors, alluvial fans

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Tread, talf

Down-slope shape: Concave, linear

Across-slope shape: Linear

Parent material: Alluvium derived from sandstone, granite, or shale

Typical profile

H1 - 0 to 7 inches: silt loam

H2 - 7 to 23 inches: silt loam

H3 - 23 to 60 inches: clay loam

Properties and qualities

Slope: 2 to 5 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: OccasionalNone

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): 2w

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Ecological site: R015XC025CA - CLAYEY BOTTOMLAND

Custom Soil Resource Report

Hydric soil rating: Yes

Description of Cole

Setting

Landform: Basin floors, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Alluvium derived from shale, sandstone, or granite

Typical profile

H1 - 0 to 5 inches: clay loam
H2 - 5 to 14 inches: silty clay loam
H3 - 14 to 60 inches: silty clay

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R015XC025CA - CLAYEY BOTTOMLAND
Hydric soil rating: Yes

Minor Components

Cortina

Percent of map unit: 10 percent
Hydric soil rating: No

Unnamed, slopes less than 2 percent

Percent of map unit: 10 percent
Hydric soil rating: No

Clear lake

Percent of map unit: 10 percent
Landform: Depressions
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

108—Bonnydoon-Gilroy-Typic Argixerolls, 50 to 75 percent slopes

Map Unit Setting

National map unit symbol: 2yrg6
Elevation: 250 to 1,210 feet
Mean annual precipitation: 38 to 56 inches
Mean annual air temperature: 58 to 59 degrees F
Frost-free period: 346 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Bonnydoon, lithic, and similar soils: 30 percent
Gilroy and similar soils: 25 percent
Typic argixerolls and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bonnydoon, Lithic

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from igneous and metamorphic rock

Typical profile

A - 0 to 19 inches: sandy loam
R - 19 to 29 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.13 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R015XC038CA - SHALLOW LOAMY

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Hydric soil rating: No

Description of Gilroy

Setting

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Convex

Parent material: Residuum weathered from igneous and metamorphic rock

Typical profile

A - 0 to 7 inches: gravelly sandy loam

Bt1 - 7 to 22 inches: gravelly loam

Bt2 - 22 to 28 inches: gravelly clay loam

R - 28 to 38 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.13 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 2.0

Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: C

Ecological site: R015XC010CA - FINE LOAMY

Hydric soil rating: No

Description of Typic Argixerolls

Setting

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Concave

Parent material: Residuum weathered from igneous and metamorphic rock

Typical profile

A - 0 to 8 inches: loam

Bt - 8 to 48 inches: gravelly clay loam

R - 48 to 58 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent

Depth to restrictive feature: 40 to 60 inches to lithic bedrock

Drainage class: Well drained

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Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.13 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 2.0

Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: C

Ecological site: R015XC010CA - FINE LOAMY

Hydric soil rating: No

Minor Components

Tocaloma

Percent of map unit: 5 percent

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: No

Saurin

Percent of map unit: 5 percent

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: No

Mcmullin

Percent of map unit: 5 percent

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Convex

Hydric soil rating: No

Bonnydoon

Percent of map unit: 5 percent

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: No

Montara

Percent of map unit: 5 percent

Landform: Hillslopes

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Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

109—Bressa variant-McMullin variant complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hf1d
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 30 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 270 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Bressa variant and similar soils: 45 percent
McMullin variant and similar soils: 25 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bressa Variant

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from conglomerate

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 25 inches: gravelly sandy clay loam
H3 - 25 to 30 inches: sandy clay loam
H4 - 30 to 34 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

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Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Description of McMullin Variant

Setting

Landform: Hills, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave, convex
Parent material: Residuum weathered from conglomerate

Typical profile

H1 - 0 to 14 inches: gravelly sandy clay loam
H2 - 14 to 18 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Minor Components

Unnamed, clayey subsoil

Percent of map unit: 10 percent
Hydric soil rating: No

Unnamed, slopes less than 30 percent

Percent of map unit: 10 percent
Hydric soil rating: No

Bonnydoon

Percent of map unit: 5 percent
Hydric soil rating: No

Los osos

Percent of map unit: 5 percent

Hydric soil rating: No

113—Clear Lake clay, 0 to 2 percent slopes, MLRA 15

Map Unit Setting

National map unit symbol: 2vbsx

Elevation: 0 to 1,000 feet

Mean annual precipitation: 29 to 41 inches

Mean annual air temperature: 57 to 59 degrees F

Frost-free period: 200 to 300 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Clear lake and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clear Lake

Setting

Landform: Basin floors

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Basin alluvium derived from metamorphic and sedimentary rock

Typical profile

Ap - 0 to 8 inches: clay

Bss1 - 8 to 28 inches: clay

Bss2 - 28 to 42 inches: clay

C - 42 to 65 inches: clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 36 to 72 inches

Frequency of flooding: Rare

Frequency of ponding: Frequent

Calcium carbonate, maximum content: 4 percent

Maximum salinity: Nonsaline to very slightly saline (0.5 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 2.0

Available water supply, 0 to 60 inches: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): 3w

Land capability classification (nonirrigated): 3w

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Hydrologic Soil Group: D

Ecological site: R015XC025CA - CLAYEY BOTTOMLAND

Hydric soil rating: Yes

Minor Components

Unnamed, overwash

Percent of map unit: 3 percent

Landform: Basin floors

Landform position (two-dimensional): Backslope

Hydric soil rating: Yes

Slopes more than 2 percent

Percent of map unit: 3 percent

Hydric soil rating: No

Cole

Percent of map unit: 2 percent

Hydric soil rating: No

Blucher

Percent of map unit: 2 percent

Landform: Drainageways

Landform position (two-dimensional): Backslope

Hydric soil rating: Yes

114—Cortina gravelly sandy loam, 0 to 6 percent slopes, cool, MLRA 15

Map Unit Setting

National map unit symbol: 2w8cs

Elevation: 20 to 400 feet

Mean annual precipitation: 29 to 45 inches

Mean annual air temperature: 55 to 59 degrees F

Frost-free period: 326 to 346 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Cortina and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cortina

Setting

Landform: Flood-plain steps

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Convex

Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

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Typical profile

A - 0 to 10 inches: gravelly sandy loam
C1 - 10 to 44 inches: very gravelly sandy loam
C2 - 44 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.60 to 2.83 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Maximum salinity: Nonsaline (0.2 to 0.5 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: R015XC033CA - GRAVELLY SANDY LOAM
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 7 percent
Hydric soil rating: No

Ballard

Percent of map unit: 5 percent
Hydric soil rating: No

Clear lake

Percent of map unit: 2 percent
Landform: Depressions
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

Unnamed

Percent of map unit: 1 percent
Hydric soil rating: No

128—Gilroy-Typic Argixerolls-Bonnydoon, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: 2yrg5
Elevation: 130 to 1,340 feet
Mean annual precipitation: 32 to 51 inches

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Mean annual air temperature: 58 to 59 degrees F
Frost-free period: 325 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Gilroy and similar soils: 35 percent
Typic argixerolls and similar soils: 25 percent
Bonnydoon, lithic, and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gilroy

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from igneous and metamorphic rock

Typical profile

A - 0 to 12 inches: loam
Bt1 - 12 to 21 inches: clay loam
Bt2 - 21 to 30 inches: gravelly clay loam
R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.13 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R015XC010CA - FINE LOAMY
Hydric soil rating: No

Description of Typic Argixerolls

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from igneous and metamorphic rock

Custom Soil Resource Report

Typical profile

A - 0 to 21 inches: loam
Bt - 21 to 45 inches: gravelly clay loam
R - 45 to 55 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.13 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R015XC010CA - FINE LOAMY
Hydric soil rating: No

Description of Bonnydoon, Lithic

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from igneous and metamorphic rock

Typical profile

A - 0 to 18 inches: loam
R - 18 to 28 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.13 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F015XY010CA - Hills >40"ppt

Custom Soil Resource Report

Hydric soil rating: No

Minor Components

Tocaloma

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Montara

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Mcmullin

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

140—Los Osos-Bonnydoon complex, 5 to 15 percent slopes

Map Unit Setting

National map unit symbol: hf2d
Elevation: 200 to 1,200 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 270 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Los osos and similar soils: 60 percent
Bonnydoon and similar soils: 25 percent

Custom Soil Resource Report

Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Los Osos

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 18 inches: loam
H2 - 18 to 38 inches: clay
H3 - 38 to 42 inches: bedrock

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: R015XC032CA - FINE LOAMY CLAYPAN
Hydric soil rating: No

Description of Bonnydoon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from shale, or sandstone

Typical profile

H1 - 0 to 15 inches: gravelly loam
H2 - 15 to 19 inches: bedrock

Properties and qualities

Slope: 5 to 15 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Custom Soil Resource Report

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XC037CA - SHALLOW GRAVELLY LOAM
Hydric soil rating: No

Minor Components

Slumps

Percent of map unit: 2 percent
Hydric soil rating: No

Tocaloma

Percent of map unit: 2 percent
Hydric soil rating: No

Yorkville

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, shallow

Percent of map unit: 2 percent
Hydric soil rating: No

Saurin

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, deep

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

141—Los Osos-Bonnydoon complex, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hf2f
Elevation: 50 to 1,500 feet

Custom Soil Resource Report

Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 270 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Los osos and similar soils: 60 percent
Bonnydoon and similar soils: 20 percent
Minor components: 17 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Los Osos

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 18 inches: loam
H2 - 18 to 38 inches: clay
H3 - 38 to 42 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: R015XC032CA - FINE LOAMY CLAYPAN
Hydric soil rating: No

Description of Bonnydoon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from shale, or sandstone

Typical profile

H1 - 0 to 15 inches: gravelly loam

Custom Soil Resource Report

H2 - 15 to 19 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent

Depth to restrictive feature: 10 to 20 inches to paralithic bedrock

Drainage class: Somewhat excessively drained

Runoff class: High

*Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)*

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 6e

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: R015XC037CA - SHALLOW GRAVELLY LOAM

Hydric soil rating: No

Minor Components

Tocaloma

Percent of map unit: 2 percent

Hydric soil rating: No

Slopes less than 15 percent

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed, deep

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed, shallow

Percent of map unit: 2 percent

Hydric soil rating: No

Slumps

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed, gravelly

Percent of map unit: 2 percent

Hydric soil rating: No

Saurin

Percent of map unit: 2 percent

Hydric soil rating: No

Yorkville

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes

142—Los Osos-Bonnydoon complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hf2g
Elevation: 200 to 1,200 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 270 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Los osos and similar soils: 60 percent
Bonnydoon and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Los Osos

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 30 inches: clay
H3 - 30 to 34 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XC032CA - FINE LOAMY CLAYPAN
Hydric soil rating: No

Description of Bonnydoon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from shale, or sandstone

Typical profile

H1 - 0 to 11 inches: gravelly loam
H2 - 11 to 15 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XC037CA - SHALLOW GRAVELLY LOAM
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 5 percent
Hydric soil rating: No

Tocaloma

Percent of map unit: 3 percent
Hydric soil rating: No

Slumps

Percent of map unit: 3 percent
Hydric soil rating: No

Yorkville

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, deep

Percent of map unit: 3 percent
Hydric soil rating: No

Slopes more than 50 percent

Percent of map unit: 3 percent
Hydric soil rating: No

143—Los Osos-Urban land-Bonnydoon complex, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hf2h
Elevation: 200 to 1,200 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 270 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Los osos and similar soils: 40 percent
Urban land: 35 percent
Bonnydoon and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Los Osos

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 18 inches: loam
H2 - 18 to 38 inches: clay
H3 - 38 to 42 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e

Custom Soil Resource Report

Hydrologic Soil Group: D
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Description of Bonnydoon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from shale, or sandstone

Typical profile

H1 - 0 to 15 inches: gravelly loam
H2 - 15 to 19 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Minor Components

Saurin

Percent of map unit: 2 percent
Hydric soil rating: No

Henneke

Percent of map unit: 2 percent
Hydric soil rating: No

Slumps

Percent of map unit: 1 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

Slopes less than 15 percent

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, deep

Percent of map unit: 1 percent
Hydric soil rating: No

Tocaloma

Percent of map unit: 1 percent
Hydric soil rating: No

Xerorthents

Percent of map unit: 1 percent
Hydric soil rating: No

146—Montara clay loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hf2l
Elevation: 100 to 1,500 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 290 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Montara and similar soils: 85 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Montara

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope

Custom Soil Resource Report

Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from serpentinite

Typical profile

H1 - 0 to 13 inches: clay loam
H2 - 13 to 17 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 10 to 15 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.2 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XC036CA - SHALLOW FINE LOAMY SERPENTINE
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, shallow

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, stony

Percent of map unit: 2 percent
Hydric soil rating: No

Yorkville

Percent of map unit: 2 percent
Hydric soil rating: No

Henneke

Percent of map unit: 2 percent
Hydric soil rating: No

147—Novato clay, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2xm5v
Elevation: 0 to 10 feet
Mean annual precipitation: 27 to 35 inches
Mean annual air temperature: 56 to 58 degrees F
Frost-free period: 320 to 360 days
Farmland classification: Not prime farmland

Map Unit Composition

Novato and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Novato

Setting

Landform: Salt marshes
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

Ag - 0 to 11 inches: clay
Cg - 11 to 79 inches: clay

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 0 to 12 inches to salic
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Maximum salinity: Strongly saline (24.0 to 60.0 mmhos/cm)
Sodium adsorption ratio, maximum: 90.0
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): 8w
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: C/D
Ecological site: R014XG903CA - Salt Marsh
Hydric soil rating: Yes

Minor Components

Reyes

Percent of map unit: 5 percent
Landform: Tidal marshes, tidal flats
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Typic hydraquents, overwash

Percent of map unit: 4 percent
Landform: Salt marshes
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Water

Percent of map unit: 1 percent

157—Pits, quarries

Map Unit Composition

Pits: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting

Landform: Hills, flood plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, tread
Down-slope shape: Concave
Across-slope shape: Concave

Interpretive groups

Land capability classification (irrigated): 8e
Land capability classification (nonirrigated): 8e
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (two-dimensional): Backslope
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

161—Saurin-Bonnydoon complex, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: hf32
Elevation: 50 to 1,500 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 270 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Saurin and similar soils: 50 percent
Bonnydoon and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saurin

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 10 inches: clay loam
H2 - 10 to 33 inches: clay loam
H3 - 33 to 37 inches: bedrock

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R015XC034CA - LOAMY
Hydric soil rating: No

Description of Bonnydoon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 15 inches: gravelly loam
H2 - 15 to 19 inches: bedrock

Properties and qualities

Slope: 2 to 15 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XC037CA - SHALLOW GRAVELLY LOAM
Hydric soil rating: No

Minor Components

Unnamed, shallow

Percent of map unit: 5 percent
Hydric soil rating: No

Tocaloma

Percent of map unit: 5 percent
Hydric soil rating: No

Los osos

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, deep

Percent of map unit: 5 percent
Hydric soil rating: No

162—Saurin-Bonnydoon complex, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hf33
Elevation: 50 to 1,500 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 270 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Saurin and similar soils: 40 percent
Bonnydoon and similar soils: 30 percent
Minor components: 24 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saurin

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 10 inches: clay loam
H2 - 10 to 33 inches: clay loam
H3 - 33 to 37 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R015XC034CA - LOAMY
Hydric soil rating: No

Description of Bonnydoon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 15 inches: gravelly loam
H2 - 15 to 19 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XC037CA - SHALLOW GRAVELLY LOAM
Hydric soil rating: No

Minor Components

Tocaloma

Percent of map unit: 8 percent
Hydric soil rating: No

Los osos

Percent of map unit: 8 percent
Hydric soil rating: No

Unnamed, dark surface

Percent of map unit: 8 percent
Hydric soil rating: No

163—Saurin-Bonnydoon complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hf34
Elevation: 50 to 1,500 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 270 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Saurin and similar soils: 50 percent
Bonnydoon and similar soils: 40 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saurin

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 10 inches: clay loam
H2 - 10 to 33 inches: clay loam
H3 - 33 to 37 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R015XC034CA - LOAMY
Hydric soil rating: No

Description of Bonnydoon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 11 inches: gravelly loam
H2 - 11 to 15 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XC037CA - SHALLOW GRAVELLY LOAM
Hydric soil rating: No

Minor Components

Tocaloma

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, shallow

Percent of map unit: 2 percent
Hydric soil rating: No

Los osos

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, dark surface

Percent of map unit: 2 percent
Hydric soil rating: No

164—Saurin-Bonnydoon complex, 50 to 75 percent slopes

Map Unit Setting

National map unit symbol: hf35
Elevation: 50 to 1,500 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 270 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Saurin and similar soils: 50 percent
Bonnydoon and similar soils: 40 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saurin

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 10 inches: clay loam
H2 - 10 to 33 inches: clay loam
H3 - 33 to 37 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: R015XC034CA - LOAMY
Hydric soil rating: No

Description of Bonnydoon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 11 inches: gravelly loam
H2 - 11 to 15 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R015XC037CA - SHALLOW GRAVELLY LOAM
Hydric soil rating: No

Minor Components

Tocaloma

Percent of map unit: 2 percent
Hydric soil rating: No

Los osos

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, shallow

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, dark surface

Percent of map unit: 2 percent
Hydric soil rating: No

166—Saurin-Urban land-Bonnydoon complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hf37
Elevation: 50 to 1,500 feet
Mean annual precipitation: 25 to 40 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 270 to 320 days
Farmland classification: Not prime farmland

Map Unit Composition

Saurin and similar soils: 30 percent
Urban land: 25 percent
Bonnydoon and similar soils: 20 percent
Minor components: 21 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Saurin

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 10 inches: clay loam
H2 - 10 to 33 inches: clay loam
H3 - 33 to 37 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R015XY009CA - Hills 20-40"ppt

Custom Soil Resource Report

Hydric soil rating: No

Description of Urban Land

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Description of Bonnydoon

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 11 inches: gravelly loam
H2 - 11 to 15 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Minor Components

Tocaloma

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, shallow

Percent of map unit: 5 percent

Hydric soil rating: No

Xerorthents

Percent of map unit: 5 percent

Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent

Hydric soil rating: No

Los osos

Percent of map unit: 2 percent

Hydric soil rating: No

Slumps

Percent of map unit: 2 percent

Hydric soil rating: No

179—Tocaloma-McMullin complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hf3n

Elevation: 50 to 1,500 feet

Mean annual precipitation: 30 to 40 inches

Mean annual air temperature: 55 to 61 degrees F

Frost-free period: 290 to 330 days

Farmland classification: Not prime farmland

Map Unit Composition

Tocaloma and similar soils: 40 percent

McMullin and similar soils: 35 percent

Minor components: 19 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tocaloma

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 19 inches: loam

H2 - 19 to 39 inches: very gravelly loam

H3 - 39 to 43 inches: bedrock

Custom Soil Resource Report

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Description of McMullin

Setting

Landform: Hills, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from conglomerate

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 18 inches: gravelly loam
H3 - 18 to 22 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 12 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Minor Components

Unnamed, shallow

Percent of map unit: 5 percent

Hydric soil rating: No

Unnamed, dark surface

Percent of map unit: 5 percent

Hydric soil rating: No

Saurin

Percent of map unit: 5 percent

Hydric soil rating: No

Los osos

Percent of map unit: 2 percent

Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent

Hydric soil rating: No

180—Tocaloma-McMullin complex, 50 to 75 slopes

Map Unit Setting

National map unit symbol: hf3p

Elevation: 50 to 1,500 feet

Mean annual precipitation: 30 to 40 inches

Mean annual air temperature: 55 to 61 degrees F

Frost-free period: 290 to 330 days

Farmland classification: Not prime farmland

Map Unit Composition

Tocaloma and similar soils: 40 percent

McMullin and similar soils: 35 percent

Minor components: 18 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tocaloma

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 19 inches: loam

H2 - 19 to 39 inches: very gravelly loam

H3 - 39 to 43 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent

Custom Soil Resource Report

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Description of McMullin

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from conglomerate

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 18 inches: gravelly loam
H3 - 18 to 22 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 12 to 20 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Minor Components

Saurin

Percent of map unit: 5 percent
Hydric soil rating: No

Bonnydoon

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, deep

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, shallow

Percent of map unit: 2 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

Maymen

Percent of map unit: 2 percent
Hydric soil rating: No

184—Tocaloma-Saurin association, very steep

Map Unit Setting

National map unit symbol: hf3t
Elevation: 50 to 1,500 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 55 to 63 degrees F
Frost-free period: 290 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Tocaloma and similar soils: 40 percent
Saurin and similar soils: 30 percent
Minor components: 26 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tocaloma

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 19 inches: loam
H2 - 19 to 39 inches: very gravelly loam
H3 - 39 to 43 inches: bedrock

Custom Soil Resource Report

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: R015XY009CA - Hills 20-40"ppt
Hydric soil rating: No

Description of Saurin

Setting

Landform: Hills, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave, convex
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 10 inches: clay loam
H2 - 10 to 33 inches: clay loam
H3 - 33 to 37 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: R015XC034CA - LOAMY
Hydric soil rating: No

Minor Components

Mcmullin

Percent of map unit: 5 percent

Custom Soil Resource Report

Hydric soil rating: No

Montara

Percent of map unit: 5 percent

Hydric soil rating: No

Bonnydoon

Percent of map unit: 5 percent

Hydric soil rating: No

Los osos

Percent of map unit: 5 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 2 percent

Landform: Depressions

Hydric soil rating: Yes

Unnamed, gravelly soils

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed, light colored soils

Percent of map unit: 2 percent

Hydric soil rating: No

185—Tocaloma-Saurin association, extremely steep

Map Unit Setting

National map unit symbol: hf3v

Elevation: 50 to 1,500 feet

Mean annual precipitation: 30 to 40 inches

Mean annual air temperature: 55 to 63 degrees F

Frost-free period: 290 to 330 days

Farmland classification: Not prime farmland

Map Unit Composition

Tocaloma and similar soils: 40 percent

Saurin and similar soils: 30 percent

Minor components: 23 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tocaloma

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Concave

Custom Soil Resource Report

Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 19 inches: loam

H2 - 19 to 39 inches: very gravelly loam

H3 - 39 to 43 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): 7e

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: B

Ecological site: R015XY009CA - Hills 20-40"ppt

Hydric soil rating: No

Description of Saurin

Setting

Landform: Hills

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Convex

Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 10 inches: clay loam

H2 - 10 to 33 inches: clay loam

H3 - 33 to 37 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent

Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 7e

Land capability classification (nonirrigated): 7e

Hydrologic Soil Group: C

Ecological site: R015XC034CA - LOAMY

Custom Soil Resource Report

Hydric soil rating: No

Minor Components

Mcmullin

Percent of map unit: 5 percent

Hydric soil rating: No

Unnamed, gravelly soils

Percent of map unit: 5 percent

Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

Hydric soil rating: No

Bonnydoon

Percent of map unit: 5 percent

Hydric soil rating: No

Unnamed, shallow

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent

Landform: Depressions

Hydric soil rating: Yes

201—Urban land-Ballard complex, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: hf4c

Elevation: 10 to 300 feet

Mean annual precipitation: 25 to 35 inches

Mean annual air temperature: 61 to 64 degrees F

Frost-free period: 230 to 300 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Urban land: 55 percent

Ballard and similar soils: 25 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Alluvial fans

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Tread

Custom Soil Resource Report

Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Ballard

Setting

Landform: Fan terraces, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Convex, concave
Across-slope shape: Convex, linear
Parent material: Alluvium derived from shale, sandstone and/or granite

Typical profile

H1 - 0 to 19 inches: gravelly loam
H2 - 19 to 65 inches: gravelly loam

Properties and qualities

Slope: 0 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R014XG912CA - Loamy Terrace
Hydric soil rating: No

Minor Components

Cole

Percent of map unit: 4 percent
Hydric soil rating: No

Unnamed, clayey soils

Percent of map unit: 4 percent
Hydric soil rating: No

Reyes

Percent of map unit: 4 percent
Landform: Salt marshes
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

Hydraquents

Percent of map unit: 4 percent

Custom Soil Resource Report

Landform: Tidal flats
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

Blucher

Percent of map unit: 4 percent
Hydric soil rating: No

202—Urban land-Xerorthents complex, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: hf4d
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 30 inches
Mean annual air temperature: 55 to 63 degrees F
Frost-free period: 270 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 70 percent
Xerorthents and similar soils: 20 percent
Minor components: 9 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Landform: Valley floors
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Ecological site: R015XY003CA - Loamy Bottom
Hydric soil rating: No

Description of Xerorthents

Setting

Landform: Valley floors, tidal flats
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Earth spread deposits derived from igneous, metamorphic and sedimentary rock

Custom Soil Resource Report

Properties and qualities

Slope: 0 to 9 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): 8s
Land capability classification (nonirrigated): 8s
Ecological site: R015XY003CA - Loamy Bottom
Hydric soil rating: No

Minor Components

Hydraquents

Percent of map unit: 2 percent
Landform: Tidal flats
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

Cole

Percent of map unit: 1 percent
Hydric soil rating: No

Slopes more than 9 percent

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, briefly flooded soils

Percent of map unit: 1 percent
Hydric soil rating: No

Novato

Percent of map unit: 1 percent
Landform: Salt marshes
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

Ballard

Percent of map unit: 1 percent
Hydric soil rating: No

Reyes

Percent of map unit: 1 percent
Landform: Salt marshes
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

Blucher

Percent of map unit: 1 percent
Hydric soil rating: No

203—Xerorthents, fill

Map Unit Setting

National map unit symbol: hf4f
Elevation: 0 to 480 feet
Mean annual precipitation: 29 to 35 inches
Mean annual air temperature: 57 to 59 degrees F
Frost-free period: 345 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Xerorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Xerorthents

Setting

Landform: Valley floors, tidal flats
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Earth spread deposits derived from igneous, metamorphic and sedimentary rock

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): 8s
Land capability classification (nonirrigated): 8s
Ecological site: R015XY003CA - Loamy Bottom
Hydric soil rating: No

204—Xerorthents-Urban land complex, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: hf4g
Elevation: 0 to 500 feet
Mean annual precipitation: 20 to 30 inches

Custom Soil Resource Report

Mean annual air temperature: 55 to 63 degrees F
Frost-free period: 270 to 350 days
Farmland classification: Not prime farmland

Map Unit Composition

Xerorthents and similar soils: 45 percent
Urban land: 40 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Xerorthents

Setting

Landform: Tidal flats, valley floors
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Earth spread deposits

Properties and qualities

Slope: 0 to 9 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): 8s
Land capability classification (nonirrigated): 8s
Ecological site: R015XY003CA - Loamy Bottom
Hydric soil rating: No

Description of Urban Land

Setting

Landform: Valley floors, tidal flats
Landform position (two-dimensional): Backslope

Interpretive groups

Land capability classification (irrigated): 8
Land capability classification (nonirrigated): 8
Ecological site: R015XY003CA - Loamy Bottom
Hydric soil rating: No

Minor Components

Ballard

Percent of map unit: 2 percent
Hydric soil rating: No

Blucher

Percent of map unit: 2 percent
Hydric soil rating: No

Cole

Percent of map unit: 2 percent
Hydric soil rating: No

Slopes more than 9 percent

Percent of map unit: 2 percent
Hydric soil rating: No

Hydraquents

Percent of map unit: 2 percent
Landform: Tidal flats
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

Unnamed, briefly flooded soils

Percent of map unit: 2 percent
Hydric soil rating: No

Reyes

Percent of map unit: 1 percent
Landform: Salt marshes
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

Novato

Percent of map unit: 1 percent
Landform: Salt marshes
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

206—Yorkville clay loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hf4j
Elevation: 50 to 1,500 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 55 to 59 degrees F
Frost-free period: 240 to 270 days
Farmland classification: Not prime farmland

Map Unit Composition

Yorkville and similar soils: 85 percent
Minor components: 12 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yorkville

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from shale

Custom Soil Resource Report

Typical profile

H1 - 0 to 14 inches: clay loam

H2 - 14 to 51 inches: clay

H3 - 51 to 55 inches: bedrock

Properties and qualities

Slope: 15 to 30 percent

Depth to restrictive feature: 40 to 60 inches to paralithic bedrock

Drainage class: Moderately well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: D

Ecological site: R015XC032CA - FINE LOAMY CLAYPAN

Hydric soil rating: No

Minor Components

Unnamed, shallow

Percent of map unit: 2 percent

Hydric soil rating: No

Slopes less than 15 percent

Percent of map unit: 2 percent

Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent

Hydric soil rating: No

Slumps

Percent of map unit: 2 percent

Hydric soil rating: No

Unnamed, shallower

Percent of map unit: 2 percent

Hydric soil rating: No

Los osos

Percent of map unit: 2 percent

Hydric soil rating: No

210—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

301—Reyes clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2yrgm

Elevation: 0 to 20 feet

Mean annual precipitation: 23 to 31 inches

Mean annual air temperature: 58 to 58 degrees F

Frost-free period: 319 to 365 days

Farmland classification: Not prime farmland

Map Unit Composition

Reyes and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Reyes

Setting

Landform: Tidal marshes, tidal flats

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Estuarine deposits

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

Ag - 1 to 15 inches: clay

Bjg - 15 to 55 inches: clay

2Cg - 55 to 79 inches: clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: 6 to 20 inches to sulfuric

Drainage class: Somewhat poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high
(0.01 to 0.20 in/hr)

Depth to water table: About 48 to 60 inches

Frequency of flooding: Rare

Frequency of ponding: None

Maximum salinity: Moderately saline to strongly saline (8.0 to 24.0 mmhos/cm)

Sodium adsorption ratio, maximum: 22.0

Custom Soil Resource Report

Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: C

Ecological site: R014XC007CA - ACID SUBIRRIGATED

Hydric soil rating: Yes

Minor Components

Novato

Percent of map unit: 5 percent

Landform: Tidal marshes

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

Reyes, overwashed

Percent of map unit: 2 percent

Landform: Tidal marshes, tidal flats

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

Clear lake

Percent of map unit: 1 percent

Landform: Drainageways

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: Yes

Water

Percent of map unit: 1 percent

Typic xerorthents, levees

Percent of map unit: 1 percent

Landform: Tidal marshes

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Soil Erosion

This folder contains a collection of tabular reports that present soil erosion factors and groupings. The reports (tables) include all selected map units and components for each map unit. Soil erosion factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

RUSLE2 Related Attributes

This report summarizes those soil attributes used by the Revised Universal Soil Loss Equation Version 2 (RUSLE2) for the map units in the selected area. The report includes the map unit symbol, the component name, and the percent of the component in the map unit. Soil property data for each map unit component include the hydrologic soil group, erosion factor Kf for the surface horizon, erosion factor T, and the representative percentage of sand, silt, and clay in the mineral surface horizon. Missing surface data may indicate the presence of an organic layer.

Report—RUSLE2 Related Attributes

Soil properties and interpretations for erosion runoff calculations. The surface mineral horizon properties are displayed or the first mineral horizon below an organic surface horizon. Organic horizons are not displayed.

Custom Soil Resource Report

RUSLE2 Related Attributes—Marin County, California								
Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
101—Ballard gravelly, loam 2 to 9 percent slopes								
Ballard	85	—	B	.37	5	44.3	40.7	15.0
102—Ballard-Urban land complex, 0 to 9 percent slopes								
Ballard	55	—	B	.37	5	44.3	40.7	15.0
105—Blucher-Cole complex, 2 to 5 percent slopes								
Blucher	40	—	C/D	.37	5	26.5	53.5	20.0
Cole	30	—	C/D	.32	5	35.4	33.6	31.0
108—Bonnydoon-Gilroy-Typic Argixerolls, 50 to 75 percent slopes								
Bonnydoon, lithic	30	—	D	.28	1	60.0	22.0	18.0
Gilroy	25	—	C	.28	2	55.0	30.0	15.0
Typic Argixerolls	20	—	C	.32	3	40.0	35.0	25.0
109—Bressa variant-McMullin variant complex, 30 to 50 percent slopes								
Bressa variant	45	—	C	.37	3	39.8	37.7	22.5
McMullin variant	25	—	D	.28	2	57.0	18.0	25.0
113—Clear Lake clay, 0 to 2 percent slopes, MLRA 15								
Clear Lake	90	200	D	.24	5	26.0	29.0	45.0
114—Cortina gravelly sandy loam, 0 to 6 percent slopes, cool, MLRA 15								
Cortina	85	151	A	.24	4	65.9	19.1	15.0
128—Gilroy-Typic Argixerolls-Bonnydoon, 30 to 50 percent slopes								
Gilroy	35	—	C	.28	2	38.0	37.0	25.0
Typic Argixerolls	25	—	C	.32	3	41.0	37.0	22.0
Bonnydoon, lithic	20	—	D	.37	1	41.0	37.5	21.5
140—Los Osos-Bonnydoon complex, 5 to 15 percent slopes								
Los Osos	60	—	D	.32	3	39.2	37.3	23.5
Bonnydoon	25	—	D	.28	2	39.1	36.9	24.0

Custom Soil Resource Report

RUSLE2 Related Attributes—Marin County, California								
Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
141—Los Osos-Bonnydoon complex, 15 to 30 percent slopes								
Los Osos	60	—	D	.32	3	39.2	37.3	23.5
Bonnydoon	20	—	D	.28	2	39.1	36.9	24.0
142—Los Osos-Bonnydoon complex, 30 to 50 percent slopes								
Los Osos	60	—	D	.32	3	39.2	37.3	23.5
Bonnydoon	20	—	D	.28	2	39.1	36.9	24.0
143—Los Osos-Urban land-Bonnydoon complex, 15 to 30 percent slopes								
Los Osos	40	—	D	.32	3	39.2	37.3	23.5
Bonnydoon	15	—	D	.28	2	39.1	36.9	24.0
146—Montara clay loam, 15 to 30 percent slopes								
Montara	85	—	D	.32	1	35.4	33.6	31.0
147—Novato clay, 0 to 1 percent slopes								
Novato	90	98	C/D	.17	3	1.0	34.0	65.0
161—Saurin-Bonnydoon complex, 2 to 15 percent slopes								
Saurin	50	—	C	.28	3	33.5	36.5	30.0
Bonnydoon	30	—	D	.28	2	39.1	36.9	24.0
162—Saurin-Bonnydoon complex, 15 to 30 percent slopes								
Saurin	40	—	C	.28	3	33.5	36.5	30.0
Bonnydoon	30	—	D	.28	2	39.1	36.9	24.0
163—Saurin-Bonnydoon complex, 30 to 50 percent slopes								
Saurin	50	—	C	.28	3	33.5	36.5	30.0
Bonnydoon	40	—	D	.28	2	39.1	36.9	24.0
164—Saurin-Bonnydoon complex, 50 to 75 percent slopes								
Saurin	50	—	C	.28	3	33.5	36.5	30.0
Bonnydoon	40	—	D	.28	2	39.1	36.9	24.0

Custom Soil Resource Report

RUSLE2 Related Attributes—Marin County, California								
Map symbol and soil name	Pct. of map unit	Slope length (ft)	Hydrologic group	Kf	T factor	Representative value		
						% Sand	% Silt	% Clay
166—Saurin-Urban land-Bonnydoon complex, 30 to 50 percent slopes								
Saurin	30	—	C	.28	3	33.5	36.5	30.0
Bonnydoon	20	—	D	.28	2	39.1	36.9	24.0
179—Tocaloma-McMullin complex, 30 to 50 percent slopes								
Tocaloma	40	—	B	.32	3	41.4	37.1	21.5
McMullin	35	—	D	.32	1	42.1	37.9	20.0
180—Tocaloma-McMullin complex, 50 to 75 slopes								
Tocaloma	40	—	B	.32	3	41.4	37.1	21.5
McMullin	35	—	D	.32	1	41.6	37.4	21.0
184—Tocaloma-Saurin association, very steep								
Tocaloma	40	—	B	.32	3	41.4	37.1	21.5
Saurin	30	—	C	.28	3	33.5	36.5	30.0
185—Tocaloma-Saurin association, extremely steep								
Tocaloma	40	—	B	.32	3	41.4	37.1	21.5
Saurin	30	—	C	.28	3	33.5	36.5	30.0
201—Urban land-Ballard complex, 0 to 9 percent slopes								
Ballard	25	—	B	.37	5	44.3	40.7	15.0
206—Yorkville clay loam, 15 to 30 percent slopes								
Yorkville	85	—	D	.32	4	33.6	36.9	29.5
301—Reyes clay, 0 to 2 percent slopes								
Reyes	90	98	C	.17	3	3.0	39.0	58.0

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APPENDIX

Appendix F: Project-Specific CEQA Findings and Statement of Overriding Considerations

Project-Specific CEQA Findings and Statement of Overriding Considerations

1.1 Introduction

The Marin Wildfire Prevention Authority (MWPA), referred to herein as the "Project Proponent,"¹ in the exercise of its independent judgment, makes and adopts the following findings regarding its decision to approve the Greater Novato Shaded Fuel Break (GNSFB) Project (Project ID 2023-06), referred to herein as "vegetation treatment project" or "proposed project" within the scope of the California Vegetation Treatment Program (CalVTP). The MWPA is serving as the Project Proponent due to its role as the agency providing initial planning and implementation funding for this vegetation treatment project. Implementation of the vegetation treatment project will be managed by the Novato Fire District. The MWPA is a joint powers authority created for the purpose of funding, planning, and implementing wildfire risk reduction activities in cooperation with its 17 member agencies; Novato Fire is one such member agency. This document has been prepared in accordance with the California Environmental Quality Act (Pub. Resources Code, Sections 21000 et seq.) (CEQA) and the CEQA Guidelines (Cal. Code Regs., Tit. 14, Sections 15000 et seq.).

1.2 Statutory Requirements for Findings

Public Resources Code section 21002 provides that "public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects[.]" The same section provides that the procedures required by CEQA "are intended to assist public agencies in systematically identifying both the significant effects of projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects" (Pub. Resources Code, Section 21002.). Section 21002 goes on to provide that "in the event [that] specific economic, social, or other conditions make infeasible such project alternatives or such

¹ For the purposes of implementing the CalVTP, a project proponent is a public agency that provides funding for vegetation treatment or has land ownership, land management, or other regulatory responsibility in the treatable landscape and is seeking to fund, authorize, or implement vegetation treatments consistent with the CalVTP. If through the Project Specific Analysis (PSA) a project proponent determines that a proposed project is within the scope of the CalVTP PEIR, then the project proponent would act as a responsible agency pursuant to CEQA. A regulatory agency seeking to use the CalVTP PEIR to issue any secondary approval or permit for vegetation treatments would also be a responsible agency.

ATTACHMENT F

mitigation measures, individual projects may be approved in spite of one or more significant effects thereof.”

The mandate and principles announced in Public Resources Code section 21002 are implemented, in part, through the requirement that agencies must adopt findings before approving projects for which EIRs are required (See Pub. Resources Code, Section 21081, subd. (a); CEQA Guidelines, Section 15091, subd. (a)). For each significant environmental effect identified in an EIR for a project, the approving agency must issue a written finding reaching one or more of three permissible conclusions:

1. Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the final EIR.
2. Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
3. Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the final EIR.

(CEQA Guidelines, Section 15091, subd. (a); Pub. Resources Code, Section 21081, subd. (a).) Public Resources Code section 21061.1 defines “feasible” to mean “capable of being accomplished in a successful manner within a reasonable period, taking into account economic, environmental, social, legal, and technological factors.” (See also *Citizens of Goleta Valley v. Bd. of Supervisors* (1990) 52 Cal.3d 553, 565.)

With respect to a project for which significant impacts are not avoided or substantially lessened, a public agency, after adopting proper findings, may nevertheless approve the project if the agency first adopts a Statement of Overriding Considerations setting forth the specific reasons why the agency found that the project’s “benefits” rendered “acceptable” its “unavoidable adverse environmental effects.” (CEQA Guidelines, Sections 15093, 15043, subd. (b); see also Pub. Resources Code, Section 21081, subd. (b).) The California Board of Forestry and Fire Protection (the Board of Forestry) adopted Findings and a Statement of Overriding Considerations on December 30, 2019.

Here, as explained in the Board of Forestry’s Findings and the Draft Program Environmental Impact Report (Draft PEIR) and the Final PEIR (collectively, the “PEIR”), the CalVTP would result in significant and unavoidable environmental effects to the following: Aesthetics; Air Quality; Archaeological, Historical, and Tribal Cultural Resources; Biological Resources; Greenhouse Gas Emissions; Transportation; and Public Services, Utilities, and Service Systems. For reasons set forth in the Board of Forestry’s Statement of Overriding Considerations, however, the Board of Forestry determined that overriding economic, social, and other considerations outweigh the significant, unavoidable effects of the CalVTP.

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As noted in the CalVTP PEIR, when a responsible agency approves a vegetation treatment project within the scope finding for all environmental impacts, it must adopt its own CEQA findings pursuant to Section 15091 of the State CEQA Guidelines, and if needed, a statement of overriding considerations, pursuant to Section 15093 of the State CEQA Guidelines (See CEQA Guidelines section 15096(h)). According to case law, a responsible agency's findings need only address environmental impacts "within the scope of the responsible agency's jurisdiction" (*Riverwatch v. Olivenhain Municipal Water District* (2009) 170 Cal.App.4th 1186, 1202.). Although each responsible agency must adopt its own findings, such agencies have the option of reusing, incorporating, or adapting all or part of the findings adopted by the Board of Forestry for the CalVTP PEIR to meet the agency's own requirements to the extent the findings are applicable to the proposed vegetation treatment project. The following document sets forth the required findings for an agency's project-specific approval that relies on and implements the CalVTP PEIR.

The Project Proponent adopts these findings to document its exercise of its independent judgment regarding the potential environmental effects analyzed in the PEIR and to document its reasoning for approving the vegetation treatment project under the CalVTP PEIR despite these effects.

1.3 Background and Project Description

The Novato Fire District is proposing a MWPA Core Project, referred to as the GNSFB project. The goal of the GNSFB project is to create and maintain a continuous reduced-fuel and forest-health-restoration zone around the communities in the greater Novato area. The proposed project would involve conducting vegetation management activities to create an approximately 60-mile-long continuous shaded fuel break within a 2,123-acre area. Wildland Urban Interface (WUI) fuels reduction areas account for up to 1,340 acres adjacent to the fuel break that may also be treated.

The proposed project would involve reducing fuel loads around the City of Novato, including the neighborhoods of North Novato, Green Point, Black Point, Bel Marin Keys, Loma Verde, St. Vincent's, South Novato, and Indian Valley, bordering open spaces and within the WUI. The proposed GNSFB project passes through land owned and/or managed by local jurisdictions, MCOSED/Marin County Parks, North Marin Water District (NMWD), and private landowners. Existing or approved fuels management areas in Novato approved under separate CEQA processes and programs, are included in the overall proposed project analyzed in the PSA and addendum as these areas tie into the overall effectiveness of the proposed project. These existing or approved fuels management areas may be treated in the future under this proposed project or continue to be treated as part of the already approved projects. Wildfire hazard risk is very high or high in most of the fuel break and WUI (1,984 acres) with moderate risk as the second largest acreage (1,338 acres), as identified by the Fire Hazard Zones. This is a result of both the spread of exotic, invasive, fire-hazardous vegetation and decades of dead vegetation

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accumulation due to over a hundred years of fire suppression and the increased risk of anthropogenic ignition due to the density of urban development.

Of the total 3,463-acre GNSFB project area, 1,228 acres fall within the State Responsibility Area (SRA), with 2,227 acres contained within the Local Responsibility Area (LRA) and 8 acres in the Federal Responsibility Area. The LRA and FRA portions of the project area comprise the same vegetation community types and are often contiguous with the SRA portions. The PSA would provide CEQA coverage for the FRA; however, any work in the FRA would require consideration under the National Environmental Protection Act (NEPA) prior to work, if required. The entire Novato zone, within which the GNSFB project falls, is serviced by the Novato Fire District.

1.3.1 Proposed Treatments

The proposed project is broken up according to prioritized segments and land ownership, which are shown in Table 1. The proposed CalVTP treatments for both initial and maintenance treatments are listed in Table 2.

Table 1 Project Segments by Land Ownership and Size

Project segments (see Section 2.2.3)	Land manager	Acres	Total acres	Estimated schedule for initial treatments ^a
1	Marin County Open Space District	76.4	151.8	Spring/summer 2023
	North Marin Water District	6.7		
	City of Novato	14.7		
	Private/other	54.0		
2	Marin County Open Space District	73.2	148.2	Spring/summer 2023
	City of Novato	17.7		
	Private/other	57.3		
3	Marin County Open Space District	58.4	150.9	Spring 2023 to January 2024
	Marin County Parks Department	0.7		
	Marinwood Community Services District	0.9		
	City of Novato	5.6		

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Project segments (see Section 2.2.3)	Land manager	Acres	Total acres	Estimated schedule for initial treatments ^a
	Private/other	85.3		
4	City of Novato	54.9	114.0	Spring 2023 to January 2024
	Private/other	59.1		
5	Marin County Open Space District	48.3	153.9	Spring 2023 to January 2024
	Private/other	105.6		
6	City of Novato	15.1	170.1	Spring 2023 to January 2024
	Private/other	155.1		
7	Marin County Open Space District	33.9	168.7	Spring 2023 to January 2024
	Private/other	134.8		
8	California Department of Fish and Wildlife	1.5	164.9	Spring 2025 to January 2026
	Marin County Open Space District	38.7		
	City of Novato	22.0		
	Private/other	102.7		
9	North Marin Water District	20.4	61.6	Spring 2024 to January 2025
	Private/other	41.2		
10	Private/other	154.1	154.1	Spring 2025 to January 2026
11	Marin County Open Space District	70.3	149.7	Spring 2025 to January 2026
	Private/other	79.4		
12	Marin County Open Space District	14.1	94.8	Spring 2024 to January 2025
	City of Novato	1.9		
	Private/other	78.8		
13	California Department of Fish and Wildlife	46.5	130.4	Spring 2023 to January 2026

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Project segments (see Section 2.2.3)	Land manager	Acres	Total acres	Estimated schedule for initial treatments ^a
	Marin County Parks Department	7.8		
	Private/other	76.1		
14	Marin County Open Space District	48.3	62.8	Spring 2024 to January 2025
	Private/other	14.5		
15	North Marin Water District	2.7	68.0	Spring 2025 to January 2026
	City of Novato	17.2		
	Private/other	48.1		
16	Private/other	42.1	42.1	Spring 2023 to January 2024
17	Private/other	45.6	45.6	Spring 2024 to January 2025
18	Marin County Open Space District	36.3	44.7	Spring 2024 to January 2025
	Private/other	8.4		
19	City of Novato	1.4	44.3	Spring 2024 to January 2025
	Private/other	42.7		
WUI fuels reduction area	California Department of Fish and Wildlife	2.2	1,340	As needed
	California State Coastal Conservancy	13.3		As needed
	California State Lands Commission	12.6		As needed
	Marin County Open Space District	3.5		As needed
	Marin County Public Works Dept./Flood Control	3.8		As needed
	North Marin Water District	2.8		As needed
	City of Novato	97.8		As needed

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Project segments (see Section 2.2.3)	Land manager	Acres	Total acres	Estimated schedule for initial treatments ^a
	Private/other	1,202.4		As needed
Total GNSFB project	private	2,590	3,463	
	public	872.8		

Notes:

^a Timing may change based on funding sources, resource availability, and changing conditions. More segments may be completed sooner should grant funding be available or if work has already been completed in some areas. Maintenance of earlier segments may overlap initial treatments on later segments.

^b Numbers may not add due to rounding.

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Table 2 Proposed CalVTP Project Initial Treatments

CalVTP treatment type	Treatment description	CalVTP treatment activity	Treatment size (acres) max	Equipment used for treatments	Timing of initial treatments
Shaded fuel break	Creation of a continuous fuel break approximately 200 feet, but up to 300 feet, in width, including thinning of understory and invasive species removal	Manual treatments (all hand thinning and assess on site)	1,332 (up to 1,553) ^a	Chainsaws, pole pruners, loppers, and string trimmers	Phased over 5 years, with work generally occurring outside the nesting season, from August through January each year
		Ground-based mechanical treatments (includes rearrangement, e.g. mowing)	566	Skid steers or tractors with mounted masticators, or mowers; ride mowers	
		Prescribed herbivory	An estimated up to 482 acres may also be treated with prescribed herbivory	Livestock; goats, sheep, cattle, horses	As needed
		Herbicide	Targeted spot treatment before, during, or after other treatments within the entire shaded fuel break area, where allowed per local regulation (very limited locations within up to 2,118 acres)	Herbicide and applicator materials	As needed
		Pile burn	As needed with material removed within the entire fuel break area (up to 2,118 acres)	Drip torch	As needed
		None	6.3	None	None
		<i>Subtotal</i>	<i>2,124</i>		

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CalVTP treatment type	Treatment description	CalVTP treatment activity	Treatment size (acres) max	Equipment used for treatments	Timing of initial treatments
Wildland-urban interface (WUI) fuels reduction area	Fuels reduction in open spaces to reduce wildfire hazards	Manual treatments (all hand thinning and asses of site)	796 (up to 876) ^b	Chainsaws, pole pruners, loppers, and string trimmers	Phased over 5 years, with work generally occurring outside the nesting season, from August through January each year
		Ground-based mechanical treatments (includes rearrangement, i.e. mowing)	461 ^c	Skid steers or tractors with mounted masticators, or mowers; and ride mowers	
		Prescribed herbivory	An estimated up to 353 acres may be treated with prescribed herbivory	Livestock; goats, sheep, cattle, horses	As needed
		Herbicide	Targeted spot treatment before, during, or after other treatments within the entire shaded fuel break area, where allowed per local regulation (very limited locations within up to 1,310 acres)	Herbicide and applicator materials	As needed
		Pile burn	As needed with material removed within the entire fuel break area (up to 1,310 acres)	Drip torch	As needed
		Broadcast burn	92 acres	Drip torch, fire engines, and water truck	Phased over up to 5 years
		None	3.1	None	None
		<i>Subtotal</i>	<i>1,340</i>		

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CalVTP treatment type	Treatment description	CalVTP treatment activity	Treatment size (acres) max	Equipment used for treatments	Timing of initial treatments
Total acres			3,463^d		

Notes:

- ^a Includes 220 acres of areas that were determined through modeling to be too steep, have too low of canopy cover, or are riparian. These areas would be assessed on site, and treatment in these areas is not precluded if the fire agency determines through site inspections that treatment is necessary and possible
- ^b Includes 80 acres of areas that were determined through modeling to be too steep, have too low of canopy cover, or are riparian. These areas would be assessed on site and treatment in these areas is not precluded if the fire agency determines through site inspections that treatment is necessary and possible
- ^c A 1.6-acre portion of the burn unit and a 24-acre portion of invasive tree removal area in the WUI were not included in the modeling. This acreage was included in ground-based mechanical treatment based on conversation with the Novato Fire District.
- ^d Includes approximate 6 acres for the fuel break and 3 acres for the WUI fuels reduction area that were not identified for treatment due to habitats that would not require treatment such as water features

1.3.2 Initial Treatments

Treatment Types

Fuel Break

The proposed project includes development and maintenance of a continuous reduced-fuel and forest-health-restoration zone within a typically 200-foot-wide fuel break around structures in the WUI, at the periphery of communities adjacent to undeveloped open spaces. The goal is to restore treated areas to a more natural, healthy, and fire-adapted condition, reducing accumulated ground and ladder fuels and dead and down woody debris. Portions of the fuel break may extend up to 300 feet from structures or may be less than 200 feet. Width and intensity of treatment within the fuel break would vary based on locations of particular hazards (such as existing dry brush piles or dense stands of dead vegetation up to 300 feet from structures), topography, site conditions, and land management agency preferences (such as MCOSED/Marin County Parks). Within the portion of the fuel break typically 0 to 100 or 150 feet wide, as determined appropriate by fire professionals and based on site conditions, treatments may include higher intensity fuel reduction typical of defensible space, with a focus on vertical and horizontal spacing in addition to removal of invasive species and dead and dying vegetation, if required by local fire codes or ordinances. In forest health zones, generally vegetation treatments would be lower intensity, focused primarily on removal of invasive and non-native, fire hazardous vegetation, removal of dead and dying vegetation, and limbing of native trees to mimic conditions that might exist in an environment where fires were allowed to occur naturally. For the purposes of this analysis, an area up to 300 feet has been evaluated across the entire length of the fuel break.

Wildland-Urban Interface Fuel Reduction

The project area also includes fuels reduction within several extended areas of open space within the WUI that are located between the fuel break and structures. These areas are not part of the fuel break but could be treated to further increase wildland fire protections. Vegetation would be thinned to reduce density and fuel loads in these areas. In one portion of the WUI fuels reduction area, broadcast burning may be implemented. In three smaller portions of the WUI (approximately 24 acres), removal of larger non-native trees is the focus of treatment.

Treatment Methods

Overview

Fuel treatment methods vary depending on cover type, condition of vegetation, topography, costs, and efficiency and in conformance with landowner/manager requirements. The primary treatment methods or activities that may be implemented include manual treatments, ground-based mechanical treatment, prescribed herbivory, targeted herbicide application, and broadcast burning (CalVTP PEIR Section 2.5.2).

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Manual Treatment

Manual treatments, called hand thinning in the modeling, include use of hand tools and hand-operated power tools to cut, clear, girdle, or prune herbaceous woody species and remove dead woody vegetation and low-lying shrubs and brush as well as trees. These treatments are typically used where access for larger equipment is not feasible or not appropriate. Invasive species removal can be performed by hand (or mechanically). Equipment and tools that could be used include chainsaws, pole pruners, loppers, and string trimmers.

Ground-Based Mechanical Treatment

Motorized equipment would be used to cut, uproot, crush/compact, or chop existing vegetation on slopes generally less than 35 percent, or over 35 percent for limited distances or with special equipment. The equipment and tools that could be used include skid steers or tractors with mounted masticators, mowers, and ride mowers.

Prescribed Herbivory

Prescribed herbivory would be used to reduce fuel loads, typically in shrubland and forest understory, but grasslands as well, and may be used as a pretreatment before implementation of other methods. Livestock may include horses, cattle, sheep, or goats. Prescribed herbivory may require the installation of temporary fencing where natural barriers are not present and of temporary water facilities and other infrastructure (e.g., tanks, corrals, fences) as well as the deployment of guard animals and/or a shepherd.

Goats, and sometimes sheep, are used for targeted reduction of fine fuels such as grasses and herbaceous vegetation. Goat grazing would involve transporting a herd of goats to the designated prescribed herbivory sites. Site preparation would involve installation of a portable electric fence to contain the goats, powered by a battery charged by a generator or solar panels and water trough. The herder would determine the area to be grazed based on site conditions; it would typically range from 1 to 2 acres but can be up to 5 acres at one time for goats, or a larger area (larger than 5 acres) for other types of livestock, such as sheep or cattle.

Herbicide Application

Herbicides would be used in a targeted manner as stump and spot spray treatments to kill or prevent regrowth of invasive and non-native species such as broom and eucalyptus. The proposed project would use herbicides, along with other methods of invasive species eradication, as part of an integrated pest management approach. Herbicides would be applied in adherence with all United States Environmental Protection Agency (USEPA) and California Environmental Protection Agency (CalEPA) regulations and in such a way as to prevent over drift. Only target plant species would be affected. Herbicides would only be used as allowable based on local regulations (e.g., City of Novato Municipal Code Division 19.35.060).

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Broadcast Burning²

Broadcast burning would be used in portions of the WUI within the project area in order to reduce fuels efficiently over a larger area and with consideration of specific conditions including weather, fuel type, and other factors, as shown in Figure 2-3. Broadcast burning may include burning the understory in a wooded area, grasslands, or other selected communities.

Prescribed burning is anticipated to require at least 25 crew members. The CalVTP identifies 45 workers as the average number of workers on site for a prescribed burn. Broadcast burning, including site preparation, ignition, mop-up, and post-burn monitoring and rehabilitation. Construction line and pre-burn fuel treatment such as cutting back vegetation near the control lines can take up to two weeks. Broadcast burn for a single burn unit would typically take 1 day and monitoring and rehabilitation would typically last up to a week. Broadcast burning would occur within a 92.8-acre WUI fuels reduction area.

Two onsite water trucks and/or two water tanks, and a nearby fire hydrant would be used for fire suppression. Permission to use the water tanks may be necessary from the Marin Municipal Water District. All burning would occur in accordance with regulations regarding the use of prescribed burning, including in the burn plan. During certain times of the year, a burn permit would be issued by the relevant fire authority. A permit to burn would always be required by the Bay Area Air Quality Management District. A Smoke Management Plan would be submitted to the Bay Area Air Quality Management District within the specified timeframe. The draft burn plan has been written by a qualified burn plan preparer, who is a qualified prescribed fire Burn Boss. The burn plan includes burn unit level information including the burn prescriptions, resource needs, weather parameters for burning, pre-burn prep, burn team communication protocols, and post-burn monitoring. The burn plan describes the general ignition pattern, such as a strip head fire, dot ignition, or other, with discretion given to the burn boss to use the pattern they deem most appropriate given local vegetation and weather conditions.

Broadcast burning would be performed as stated in the CalVTP. Generally speaking, that would entail the following. Prior to burning, the burn unit would be identified. Burn units are typically bounded by existing infrastructure, such as roads and trails, that act as control lines. Existing control lines may be improved, or new control lines may need to be installed within a few weeks or days of a burn event. A new control line may be installed through mowing, mastication, scraping, discing, or wetting. Additional pre-treatment of fuels in a burn unit may be needed for operational safety. A prescribed burn would be ignited using approved ignition devices, which in most cases would be a drip torch, but may include other equipment such as hand-held flares (“fusee”), hand launched devices, or similar methods. Control during the burn would be accomplished by or with hand crews, fire engines, hose lays, portable pumps,

² In the CalVTP PEIR, broadcast burning is one of the two categories of burning under the treatment activity referred to as “prescribed burning.” Throughout the PSA analysis, the term “broadcast burning” is used for clarity. The other category of “prescribed burning” is “pile burning.”

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backpack pumps, and hand tools. Other equipment needed on site could include fire engines and chainsaws as well as equipment for making a fuel containment perimeter (masticators and/or track chippers).

Following the burn, mop up would occur, which is the process by which the prescribed fire is safely put out. Select snags or trees may need to be taken down because of fire inside their trunks. Logs may need to be trenched to prevent rolling after an area has burned. Putting out any flames or stirring up a hot spot that is smoking is also done. The work starts along the back or cooler sides of an active fire as soon as possible. Depending upon multiple factors (e.g., fire behavior, weather forecast), some crew members may remain on site for extended periods (overnight). Mop-up work is generally performed all the way around a fire's edge. Mop up would be conducted using hand crews, equipment, hose lays, or other methods as described in the burn plan. Rehabilitation consists of the decommissioning of control lines as well as follow-up weed control after a prescribed fire. Control line decommissioning is generally limited to the manual re-distribution of duff and brush back into the previously cleared lines. This spreads native seed back into the lines to facilitate natural revegetation.

Biomass Disposal

Overview

Project debris would generally be processed through chipping and hauling, chipping, and broadcasting or by pile burns. The cut vegetation materials may be processed in a variety of ways if off-hauled, including but not limited to use in pyrolysis-biomass conversion or enhanced composting. Approximately 20 to 30 cubic yards of material could be off-hauled from a single treatment area for processing each workday.

Chipping

An All-Terrain Vehicle (ATV) and tracked towable chipper may be used to process cut vegetative materials. The vegetative material would be fed through the chipper and broadcast at treatment areas or hauled away for processing. Chipped material spread on site would be chipped to under 3 inches in size and would be applied no more than 2 to 4 inches in depth to minimize wildfire risk. Vegetative material, if removed, would be hauled to West Marin Compost, Redwood Landfill, or Marin Resource Recovery Center or another appropriate biomass processing facility.

Pile Burning³

Cut material may be pile burned, depending upon access and the conditions of the treatment area. Suitable treatment areas are typically flat or gentle slopes and have open areas away from tree canopies and power lines. Areas selected would be those away from waterways. Piles would generally be 4 feet in diameter and 4 feet in height. Multiple piles may be burned on a

³ In the CalVTP PEIR, pile burning is one of the two categories of burning under the treatment activity referred to as "prescribed burning". Throughout the PSA analysis, the term "pile burning" is used for clarity.

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single day. Pile burning would be conducted in compliance with CAL FIRE and BAAQMD Regulation 5 for open burning and burn day restrictions.

1.3.3 Maintenance Treatments

The condition of the treatment areas after treatment would be monitored annually or as appropriate depending upon the vegetation types and presence of broom. Maintenance in grasslands or areas where initial treatments were less intense could occur annually. Maintenance would typically occur every 3 to 5 years in woodlands and forests. Areas with broom are anticipated to be treated every 1 to 3 years, depending upon the condition of the sites. Subsequent treatments are anticipated to be the same as the proposed project activities but are subject to change depending on the site's condition and response to initial treatment.

Prior to implementing a maintenance treatment, the project proponent would verify that the expected site conditions as described in the PSA are present in the treatment area. As time passes, the continued relevance of the PSA would be considered by the project proponent in light of potentially changed conditions or circumstances. Where the project proponent determines the PSA is no longer sufficiently relevant, the project proponent would determine whether a new PSA or other environmental analysis is warranted. For example, the project proponent may conduct a reconnaissance survey to verify that conditions are substantially similar to those anticipated in the PSA. Updated information would be documented.

1.4 Environmental Review Process

The Project Proponent followed the evaluation and reporting process outlined in the PSA and required under the CalVTP. The proposed project includes areas outside the CalVTP "treatable landscape," that was not directly addressed. Under the CalVTP, areas outside the treatable landscape can be analyzed against the PEIR through an addendum if the types of vegetation are covered already, the types of treatment methods are covered, and no new or substantially greater impacts will occur. Similarly, new methods can be included if they result in no new or substantially greater impacts. The Project Proponent, therefore, also prepared an addendum to the CalVTP PEIR (Addendum) for the inclusion of the additional 2,134 acres outside of the modeled treatable landscape.

On February 6, 2023 the Project Proponent submitted the required information to CAL FIRE regarding this project when it began preparing the PSA and Addendum. The submittal included:

- GIS data that included project location (as a point);
- project size;
- planned treatment types and activities; and
- contact information for a representative of the project proponent.

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Upon adoption of these findings and approval of the project, the Project Proponent will submit this completed PSA and Addendum and associated geospatial data to CAL FIRE at the time a Notice of Determination is filed. The submittal will include the following:

- The completed PSA Environmental Checklist and Addendum;
- The completed Mitigation Monitoring and Reporting Program;
- GIS data that include:
 - a polygon(s) of the project area, showing the extent of each treatment type included in the project (ecological restoration, fuel break, WUI fuel reduction)

As required under the CalVTP, the Project Proponent will submit the following information annually to CAL FIRE after implementation of each phase of treatment:

- GIS data that include a polygon(s) of the treated area, showing the extent of each treatment type implemented (ecological restoration, fuel break, WUI fuel reduction)
- A post-project implementation report for each phase (referred to by CAL FIRE as a Completion Report) that includes
 - Size of treated area (typically acres);
 - Treatment types and activities;
 - Dates of work;
 - A list of the SPRs and mitigation measures that were implemented; and
 - Any explanations regarding implementation, if required by SPRs and mitigation measures (e.g., explanation for feasibility determination required by SPR BIO-12; explanation for reduction of a no-disturbance buffer below the general minimum size described in Mitigation Measures BIO-1a and BIO-2b.)

1.5 Record of Proceedings

In accordance with Public Resources Code Section 21167, subdivision (e), the record of proceedings for the Project Proponent's decision to approve the vegetation treatment project under the CalVTP includes the following documents at a minimum:

- The certified Final PEIR for the CalVTP, including the Draft PEIR, responses to comments on the Draft PEIR, and appendices;
- All recommendations and findings adopted by the Board of Forestry in connection with the CalVTP and all documents cited or referred to therein;
- All reports, studies, memoranda, maps, staff reports, or other planning documents relating to the treatment project prepared by the Project Proponent, consultants to the Project Proponent, or responsible or trustee agencies with respect to the Project Proponent's compliance with the requirements of CEQA and with respect to the Project Proponent's action on the CalVTP;
- Matters of common knowledge to the Project Proponent, including but not limited to federal, state, and local laws and regulations;

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- Any documents expressly cited in these findings, in addition to those cited above; and
- Any other materials required for the record of proceedings by Public Resources Code section 21167.6, subdivision (e).

Pursuant to CEQA Guidelines section 15091, subdivision (e), the documents constituting the record of proceedings are available for review during normal business hours at 1600 Los Gatos Dr., Suite 345, San Rafael, CA 94903. The custodian of these documents is Anne Crealock, MWPA Planning and Program Manager.

1.6 Mitigation Monitoring and Reporting Program

A Mitigation Monitoring and Reporting Program (MMRP) was adopted by the Board of Forestry for the CalVTP, and the applicable mitigation measures for this treatment project have been identified in the PSA and Addendum. The Project Proponent will use the PSA MMRP to track compliance with the CalVTP mitigation measures. The MMRP will remain available for public review during the compliance period. The Final MMRP is attached to and is approved in conjunction with the approval of the treatment project and adoption of these Findings.

1.7 Findings for Determinations of Less than Significant

The Project Proponent has reviewed and considered the information in the Final PEIR for the CalVTP addressing potential environmental effects, proposed mitigation measures, and alternatives. The Project Proponent, relying on the facts and analysis in the Final PEIR and the treatment project PSA and Addendum, which were presented to the MWPA Board and reviewed and considered prior to any approvals, concurs with the conclusions of the Final PEIR and the treatment project PSA and Addendum regarding the potential environmental effects of the CalVTP and the treatment project. Additionally, some of the environmental impacts predicted by the CalVTP PEIR to be significant and unavoidable or less than significant after mitigation may be determined in a PSA to be less severe for an individual treatment project than determined in the statewide PEIR. Those impacts found to be less than significant for the GNSFB project have also been included here. The Project Proponent also finds that no new or more severe impacts will occur as a result of performing treatments in areas outside the “treatable landscape” considered in the CalVTP PEIR.

The Project Proponent concurs with the conclusions in the Final PEIR and treatment project PSA that all the following impacts will have a less than significant or no impact:

1.7.1 Aesthetics and Visual Resources

- Impact AES-1: Result in short-term, substantial degradation of a scenic vista or visual character or quality of public views, or damage to scenic resources in a state scenic highway from treatment activities

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- Impact AES-2: Result in long-term, substantial degradation of a scenic vista or visual character or quality of public views, or damage to scenic resources in a State scenic highway from WUI fuel reduction, ecological restoration, or shaded fuel break treatment types
- Impact AES-3: Result in long-term substantial degradation of a scenic vista or visual character or quality of public views, or damage to scenic resources in a state scenic highway from the non-shaded fuel break treatment type

1.7.2 Agricultural and Forestry Resources

- Impact AG-1: Directly result in the loss of forest land or conversion of forest land to a non-forest use or involve other changes in the existing environment which, due to their location or nature, could result in conversion of forest land to non-forest use

1.7.3 Air Quality

- Impact AQ-2: Expose people to diesel particulate matter emissions and related health risk
- Impact AQ-3: Expose people to fugitive dust emissions containing naturally occurring asbestos and related health risk
- Impact AQ-5: Expose people to objectionable odors from diesel exhaust

1.7.4 Archaeological, Historical, and Tribal Cultural Resources

- Impact CUL-1: Cause a substantial adverse change in the significance of built historical resources
- Impact CUL-3: Cause a substantial adverse change in the significance of a tribal cultural resource
- Impact CUL-4: Disturb human remains

1.7.5 Biological Resources

- Impact BIO-6: Substantially reduce habitat or abundance of common wildlife
- Impact BIO-7: Conflict with Local Policies or Ordinances Protecting Biological Resources
- Impact BIO-8: Conflict with the Provisions of an Adopted Natural Community Conservation Plan, Habitat Conservation Plan, or Other Approved Habitat Plan

1.7.6 Geology, Soils, and Mineral Resources

- Impact GEO-1: Result in Substantial Erosion or Loss of Topsoil
- Impact GEO-2: Increase Risk of Landslide

1.7.7 Greenhouse Gas Emissions

- Impact GHG-1: Conflict with applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs

1.7.8 Energy Resources

- Impact ENG-1: result in wasteful, inefficient, or unnecessary consumption of energy

1.7.9 Hazardous Materials, Public Health, and Safety

- Impact HAZ-1: Create a significant health hazard from the use of hazardous materials
- Impact HAZ-2: Create a significant health hazard from the use of herbicides

1.7.10 Hydrology and Water Quality

- Impact HYD-1: Violate water quality standards or waste discharge requirements, substantially degrade surface or ground water quality, or conflict with or obstruct the implementation of a water quality control plan through the implementation of prescribed burning
- Impact HYD-2: Violate water quality standards or waste discharge requirements, substantially degrade surface or ground water quality, or conflict with or obstruct the implementation of a water quality control plan through the implementation of manual or mechanical treatment activities
- Impact HYD-3: Violate water quality standards or waste discharge requirements, substantially degrade surface or ground water quality, or conflict with or obstruct the implementation of a water quality control plan through prescribed herbivory
- Impact HYD-4: Violate water quality standards or waste discharge requirements, substantially degrade surface or ground water quality, or conflict with or obstruct the implementation of a water quality control plan through the ground application of herbicides
- Impact HYD-5: Substantially alter the existing drainage pattern of a treatment site or area

1.7.11 Land Use and Planning, Population and Housing

- Impact LU-1: Cause a significant environmental impact due to a conflict with a land use plan, policy, or regulation
- Impact LU-2: Induce substantial unplanned population growth

1.7.12 Noise

- Impact NOI-1: Result in a substantial short-term increase in exterior ambient noise levels during treatment implementation
- Impact NOI-2: Result in a substantial short-term increase in truck-generated SENLs during treatment activities

1.7.13 Recreation

- Impact REC-1: Directly or indirectly disrupt recreational activities within designated recreation areas

1.7.14 Transportation

- Impact TRAN-1: Result in temporary traffic operations impacts by conflicting with a program, plan, ordinance, or policy addressing roadway facilities or prolonged road closures
- Impact TRAN-2: Substantially increase hazards due to a design feature or incompatible uses

1.7.15 Public Services, Utilities, and Service Systems

- Impact UTIL-1: Result in physical impacts associated with provision of sufficient water supplies, including related infrastructure needs
- Impact UTIL-2: Generate Solid Waste in Excess of State Standards or Exceed Local Infrastructure Capacity
- Impact UTIL-3: Comply with federal, state, and local management and reduction goals, statutes, and regulations related to solid waste

1.7.16 Wildfire

- Impact WIL-1: Substantially exacerbate fire risk and expose people to uncontrolled spread of a wildfire
- Impact WIL-2: Expose people or structures to substantial risks related to post-fire flooding or landslides

1.7.17 Cumulative

- Aesthetics and Visual Resources
- Agriculture and Forestry Resources
- Archaeological, Historical and Tribal Cultural Resources
- Biological Resources
- Geology, Soils, Paleontology, and Mineral Resources
- Greenhouse Gas Emissions
- Energy Resources
- Hazardous Materials, Public Health and Safety
- Hydrology and Water Quality
- Land Use and Planning & Population and Housing
- Noise
- Recreation
- Transportation
- Public Services, Utilities and Service Systems
- Wildfire

1.8 Significant Effects and Mitigation Measures

The PEIR identified several significant and potentially significant environmental effects (or impacts) that the CalVTP will contribute to or cause. The Board of Forestry determined that

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some of these significant effects can be fully avoided through the application of feasible mitigation measures. Other effects, however, cannot be avoided by the adoption of feasible mitigation measures or alternatives and thus will be significant and unavoidable. For reasons set forth in Section 1.11 of the Board of Forestry's Findings and Statement of Overriding Considerations, however, the Board of Forestry determined that overriding economic, social, and other considerations outweigh the significant, unavoidable effects of the CalVTP.

The Board of Forestry adopted the findings required by CEQA for all direct and indirect significant impacts. The findings provided a summary description of each impact, described the applicable mitigation measures identified in the PEIR and adopted by the Board of Forestry, and stated the Board of Forestry's findings on the significance of each impact after imposition of the adopted mitigation measures. A full explanation of these environmental findings and conclusions can be found in the Final PEIR; and the Board of Forestry incorporated by reference into its findings the discussion in those documents supporting the Final PEIR's determinations. In making those findings, the Board of Forestry ratified, adopted, and incorporated into the findings the analyses and explanations in the Draft PEIR and Final PEIR relating to environmental impacts and mitigation measures, except to the extent any such determinations and conclusions were specifically and expressly modified by the findings.

Not every individual treatment project will have all the significant environmental impacts that the CalVTP was determined to contribute to or cause. Additionally, some of the environmental impacts predicted by the CalVTP PEIR to be significant and unavoidable or less than significant after mitigation may be determined in a PSA to be less severe for an individual treatment project than determined in the statewide PEIR. The impacts and mitigation measures identified in Sections 1.9 and 1.10 reflect the conclusions of the PSA and Addendum by indicating which of the CalVTP's impacts that this treatment project will contribute to or cause. By indicating the project-specific effects of this treatment project as follows, the Project Proponent's decisionmaker or decision-making body is hereby making the required findings under CEQA regarding the application or feasibility of mitigation measures to reduce those impacts.

1.9 Finding for Impacts Mitigated to Less than Significant

The Project Proponent finds that changes or alterations have been required in, or incorporated into, the treatment project that avoid or substantially lessen the significant environmental effects indicated below, as identified in the Final PEIR and the PSA and Addendum. Implementation of the mitigation measures indicated below to be applicable to the treatment project, which have been required or incorporated into the project, will reduce these impacts to a less than significant level. The Project Proponent hereby directs that these mitigation measures be adopted.

1.9.1 Archaeological, Historical, and Tribal Cultural Resources

- Impact CUL-2: Cause a substantial adverse change in the significance of unique archaeological resources or subsurface historical resources

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- Mitigation Measure CUL-2: Protect Inadvertent Discoveries of Unique Archaeological Resources or Subsurface Historical Resources

1.9.2 Biological Resources

- Impact BIO-1: Substantially affect special-status plant species either directly or through habitat modifications
 - Mitigation Measure BIO-1a: Avoid Loss of Special-Status Plants Listed under ESA or CESA
 - Mitigation Measure BIO-1b: Avoid Loss of Special-Status Plants Not Listed Under ESA or CESA
- Impact BIO-2: Substantially affect special-status wildlife species either directly or through habitat modifications
 - Mitigation Measure BIO-2a: Avoid Mortality, Injury, or Disturbance and Maintain Habitat Function for Listed Wildlife Species and California Fully Protected Species (All Treatment Activities)
 - Mitigation Measure BIO-2b: Avoid Mortality, Injury, or Disturbance and Maintain Habitat Function for Other Special-Status Wildlife Species (All Treatment Activities)
- Impact BIO-3: Substantially affect riparian habitat or other sensitive natural community through direct loss or degradation that leads to loss of habitat function
 - Mitigation Measure BIO-3a: Design Treatments to Avoid Loss of Sensitive Natural Communities and Oak Woodlands
 - Mitigation Measure BIO-3c:
- Impact BIO-4: Substantially affect state or federally protected wetlands
 - Mitigation Measure BIO-4: Avoid State and Federally Protected Wetlands
- Impact BIO-5: Interfere substantially with wildlife movement corridors or impede use of nurseries
 - Mitigation Measure BIO-5: Retain Nursery Habitat and Implement Buffers to Avoid Nursery Sites

1.9.3 Hazardous Materials, Public Health, and Safety

- Impact HAZ-3: Expose the public or environment to significant hazards from disturbance to known hazardous material sites
 - Mitigation Measure HAZ-3: Identify and Avoid Known Hazardous Waste Sites

1.9.4 Transportation

- Impact TRAN-3: Result in a net increase in VMT for the proposed CALVTP
 - Mitigation Measure AQ-1: Implement On-Road Vehicle and Off-Road Equipment Exhaust Emission Reduction Techniques

1.10 Findings for Significant and Unavoidable Impacts

The CalVTP PEIR determined that some impacts of the program would be significant and unavoidable, even after implementation of all feasible mitigation. The Project Proponent finds that the treatment project will contribute to or be within the scope of the following significant and unavoidable impacts identified in the CalVTP as indicated. Incorporating and implementing the following mitigation measures indicated to be applicable to the treatment project will reduce the severity of these impacts, but not necessarily to a less-than-significant level. The Project Proponent hereby directs that these mitigation measures be adopted. The Project Proponent therefore finds that changes or alterations have been required in, or incorporated into, the treatment project that will substantially lessen, but not avoid, the potentially significant environmental effect as identified in the PEIR and PSA.

The Project Proponent finds that there are no feasible mitigation measures beyond the mitigation measures indicated below to reduce these impacts. These impacts could remain significant and unavoidable for the proposed project, within the scope of the analysis of the CalVTP PEIR, but some or all the impacts identified for the CalVTP might also be fully mitigated by the required mitigation measures due to the reduced scale of the proposed project as compared to the statewide scale of the CalVTP. The Project Proponent concludes, however, that even though the proposed project may have some or all the same significant and unavoidable impacts of the CalVTP, the benefits of the CalVTP and this vegetation treatment project outweigh the potentially significant unavoidable impacts of the Program and treatment project, as set forth in the Board of Forestry’s Statement of Overriding Considerations and the Project Proponent’s own Statement of Overriding Considerations.

1.10.1 Air Quality

- Impact AQ-1: Generate emissions of criteria air pollutants and precursors during treatment activities that would exceed CAAQS or NAAQS
 - Mitigation Measure AQ-1: Implement On-Road Vehicle and Off-Road Equipment Exhaust Emission Reduction Techniques

Implementation of Mitigation Measure AQ-1 was required or incorporated into the CalVTP by the Board of Forestry to reduce the severity of this impact but may not reduce it to a less-than-significant level. Emission reduction techniques included Mitigation Measure AQ-1 will be included for the Project Proponent to the extent feasible, however, for the same reasons explained in the PEIR, this impact will remain within the scope of the PEIR’s determination that the impact is potentially significant and unavoidable given the uncertainty of whether renewable diesel fuel or electric and gas-powered equipment would be available at any specific time during the implementation of the proposed project, as well as uncertainties with the associated emission reductions. The 92-acre broadcast burn is anticipated to generate the largest amount of emissions per acre and based on the CalVTP estimated emissions per acre for different types of vegetation treatments and fuel types, it is assumed that the GNSFB project would exceed Bay Area Air Quality Management District annual significance thresholds,

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primarily due to broadcast burning, and would therefore likely contribute to a significant impact.

The Project Proponent incorporated all feasible and applicable measures to prevent and minimize this potential impact, pursuant to SPRs AD-4, SPR AQ-1 through AQ-6, and Mitigation Measure AQ-1. The Project Proponent finds that fully mitigating this impact is potentially not feasible due to the size and scope of the proposed project and the uncertainty about the availability of reduced emission equipment for use during the entire project implementation; there are no feasible mitigation measures to further reduce this impact. This impact will remain within the scope of the PEIR's determination that the impact is potentially significant and unavoidable. The Project Proponent concludes, however, that the benefits of the CalVTP and vegetation treatment project outweigh the significant unavoidable impacts of the Program and treatment project, as set forth in the Statement of Overriding Considerations. The Project Proponent therefore finds that changes or alterations have been required in, or incorporated into, the proposed project that will substantially lessen, but not avoid, the significant environmental effect as identified in the PEIR.

- Impact AQ-4: Expose people to toxic air contaminants emitted by prescribed burns and related health risk
 - No feasible mitigation is available.

The Project Proponent incorporated all feasible measures to prevent and minimize this potential impact pursuant to SPR AD-4, SPR AQ-1, SPR AQ-2, SPR AQ-3 and SPR AQ-6. The Project Proponent found that fully mitigating this impact is not feasible; there are no feasible mitigation measures to reduce this impact. This impact will remain within the scope of the PEIR's determination that the impact is potentially significant and unavoidable. The Project Proponent concludes, however, that the benefits of the CalVTP and vegetation treatment project outweigh the significant unavoidable impacts of the Program and vegetation treatment project, as set forth in the Statement of Overriding Considerations. The Project Proponent therefore finds that changes or alterations have been required in, or incorporated into, the proposed project that will substantially lessen, but not avoid, the significant environmental effect as identified in the PEIR.

- Impact AQ-6: Expose people to objectionable odors from smoke during prescribed burning
 - No feasible mitigation is available.

The Project Proponent has incorporated all feasible measures to prevent and minimize this potential impact pursuant to SPR AD-4, SPR AQ-2, SPR AQ-3 and SPR AQ-6. The Project Proponent finds that fully mitigating this impact is not feasible; there are no feasible mitigation measures to reduce this impact. This impact will remain within the scope of the PEIR's determination that the impact is potentially significant and unavoidable. The Project Proponent concludes, however, that the benefits of the CalVTP and vegetation treatment project outweigh the significant and unavoidable impacts of the Program and vegetation treatment, as set forth in the Statement of Overriding Considerations. The Project Proponent therefore finds that changes

or alterations have been required in, or incorporated into, the proposed project that will substantially lessen, but not avoid, the significant environmental effect as identified in the PEIR.

1.10.2 Greenhouse Gas Emissions

- Impact GHG-2: Generate GHG emissions through treatment activities
 - Mitigation Measure GHG-2: Implement GHG Emission Reduction Techniques During Prescribed Burns

Implementation of Mitigation Measure GHG-2 was required or incorporated into the CalVTP by the Board of Forestry to reduce the severity of this impact, but not to a less-than-significant level. MM GHG-2 will be implemented for the GNSFB and will reduce GHG emissions associated with prescribed burning by burning when fuels have a higher fuel moisture content, reducing the total area burned by mosaic burning and isolating and leaving large fuels unburned and by scheduling burns before new fuels appear. Treatment activities will contribute to annual GHG emissions generated under the CalVTP, and this impact will fall within the finding of the PEIR of potentially significant and unavoidable. Methods for reducing GHG emissions from pile burning and broadcast burning will be integrated into SPR AQ-3 (Burn Plan) as described in MM GHG-2. Other measures could include the purchase and retirement of carbon credits to offset the one-time GHG emissions directly associated with the proposed project; however, this approach would consume financial resources needed to achieve wildfire risk reduction objectives. No other feasible and effective mitigation exists that would reduce this impact to a less-than-significant level without compromising the effectiveness of the proposed project.

The Project Proponent finds that mitigating this impact is not feasible; there are no feasible mitigation measures to reduce this impact. This impact will remain within the scope of the PEIR's determination that the impact is significant and unavoidable. The Project Proponent concludes, however, that the benefits of the CalVTP and vegetation treatment project outweigh the significant unavoidable impacts of the Program and treatment project, as set forth in the Statement of Overriding Considerations, below. The Project Proponent therefore find that changes or alterations have been required in, or incorporated into, the proposed project that will substantially lessen, but not avoid, the significant environmental effect as identified in the PEIR.

1.10.3 Cumulative

- Air Quality
 - Impact AQ-1: Generate emissions of criteria air pollutants and precursors during treatment activities that would exceed CAAQS or NAAQS
 - Impact AQ-4: Expose people to toxic air contaminants emitted by prescribed burns and related health risk
 - Impact AQ-6: Expose people to objectionable odors from smoke during prescribed burning

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The Project Proponent has incorporated all feasible measures to prevent and minimize the potential contribution to a cumulative impact pursuant to SPRs and mitigation measures. The Project Proponent finds that fully mitigating the project's contribution to the cumulative impact is not feasible; there are no feasible mitigation measures to reduce this impact. The impacts will remain potentially significant and unavoidable. The Project Proponent concludes, however, that the benefits of the CalVTP and vegetation treatment project outweigh the significant and unavoidable impacts of the Program and vegetation treatment, as set forth in the Statement of Overriding Considerations. The Project Proponent therefore finds that changes or alterations have been required in, or incorporated into, the proposed project that will substantially lessen, but not avoid, the significant environmental effect as identified in the PEIR.

1.11 Statement of Overriding Considerations

As set forth in the Board of Forestry's adopted Findings, the Board of Forestry determined that the CalVTP will result in significant adverse environmental effects that cannot be avoided even with the adoption of all feasible mitigation measures, and there are no feasible project alternatives that would mitigate or substantially lessen the impacts. Despite these effects, however, the Board of Forestry, in accordance with CEQA Guidelines Section 15093, chose to approve the CalVTP because, in its view, the benefits to life, property, and other resources, and the other benefits of the CalVTP, will render the significant effects acceptable.

In the Board of Forestry's judgment, the CalVTP and its benefits outweigh its unavoidable significant effects. The Board of Forestry's Findings were based on substantial evidence in the record. The Board of Forestry's Statement of Overriding Considerations identified the specific reasons why, in the Board of Forestry's judgment, the benefits of the CalVTP as approved outweigh its unavoidable significant effects.

Exercising its independent judgment and review, the Project Proponent (the MWPA) concurs that the benefits of the CalVTP and the treatment project outweigh the significant environmental effects and hereby incorporates by reference and adopts the Board of Forestry's Statement of Overriding Considerations for the CalVTP.

Any one of the reasons listed in the Statement of Overriding Considerations is sufficient to justify approval of the treatment project. Thus, even if a court were to conclude that not every reason is supported by substantial evidence, the Project Proponent will stand by its determination that each individual reason is sufficient. The substantial evidence supporting the various benefits can be found in the preceding findings, which are incorporated by reference into this section, and the documents found in the Record of Proceedings, which are described and defined in Section 5, above.

- The CalVTP will reduce dire risks to life, property, and natural resources in California.

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- The CalVTP reflects the most current and commonly accepted science and conditions in California and allows for adaptation in response to potential evolution and changes in science and conditions.
- The CalVTP reflects the Board of Forestry's and CAL FIRE's goals. The CalVTP will help the Board of Forestry and CAL FIRE achieve their central goals for reducing and preventing the impacts of fire in the state, as outlined in the *2018 Strategic Fire Plan for California*. The CalVTP will help to establish a natural environment that is more resilient and built assets that are more resistant to the occurrence and effects of wildland fire.
- The CalVTP will help implement Executive Orders, including:
 - EO B-42-17: Governor Brown's order issued to bolster the state's response to unprecedented tree die-off through further expediting removal of millions of dead and dying trees across the state;
 - EO B-52-18: Governor Brown's order to improve forest management and restoration, provide regulatory relief, and reduce barriers for prescribed fire; and
 - EO N-05-19: Governor Newsom's order directing CAL FIRE to recommend immediate-, medium-, and long-term actions to help prevent destructive wildfires.
- The Board of Forestry is required by law to comply with SB 1260, signed into law by Governor Brown in February 2018, which improves California forest management practices to reduce the risk of wildfire in light of the changing climate and includes provisions for the CalVTP PEIR to serve as the programmatic CEQA coverage for prescribed burns within the SRA. The CalVTP will bring the Board of Forestry into compliance with these requirements.
- The Board of Forestry is required by law to comply with SB 632, signed into law by Governor Newsom in October 2019, which requires the Board of Forestry to certify a Final PEIR, pursuant to CEQA, for the vegetation treatment program filed with the State Clearinghouse under Number 2019012052 in January 2019. The CalVTP will bring the Board of Forestry into compliance with this requirement.
- The CalVTP will help to meet California's GHG emission goals consistent with the California Forest Carbon Plan, California's 2017 Climate Change Scoping Plan, *Fire on the Mountain: Rethinking Forest Management in the Sierra Nevada*, and California 2030 Natural and Working Lands Climate Change Implementation Plan.

Mitigation Monitoring and Reporting Program

Introduction

The California Environmental Quality Act (CEQA) and the State CEQA Guidelines (PRC Section 21081.6 and State CEQA Guidelines Sections 15091[d] and 15097) require public agencies “to adopt a reporting and monitoring program for changes to the project which it has adopted or made a condition of project approval to mitigate or avoid significant effects on the environment.” A Mitigation Monitoring and Reporting Program (MMRP) is required for approval of the proposed project because the PSA/Addendum identifies potential significant adverse impacts, Standard Project Requirements (SPRs) that are incorporated into the program description to avoid and minimize adverse effects, and all feasible mitigation measures (MMs) that have been adopted. Where potentially significant impacts remain after application of SPRs, MMs have been identified to further reduce and/or compensate for those impacts. While only mitigation measures are required to be covered in an MMRP, both SPRs and MMs are included in the CalVTP MMRP to assist in implementation of all environmental protection features of later activities consistent with the CalVTP PEIR. In addition to the SPRs and MMs, MWPA has developed specific Project Design and Implementation Features (PDIFs) adapted from several source documents that will be incorporated as applicable into the project design and implementation for each of its projects.

Purpose of Mitigation Monitoring and Reporting Program

This MMRP has been prepared to monitor the implementation of SPRs and mitigation measures in connection with the approval of the CalVTP PEIR and its use by project proponents. The attached tables present the text of each SPR and MM, the timing of its planned implementation, the implementing entity, and the entity with monitoring responsibility. The numbering of SPRs and MMs follows the numbering used in the CalVTP PEIR. SPRs and mitigation measures that are referenced more than once in the PSA/Addendum are not duplicated in the MMRP.

Roles and Responsibilities

Unless otherwise specified herein, the Project Proponent (Marin Wildfire Prevention Authority [MWPA]) is responsible for verifying and monitoring implementation of the mitigation measures within its jurisdiction according to the specifications provided for each measure and for demonstrating that the action has been successfully completed, pursuant to Section 15097 of the State CEQA Guidelines. Implementation of the vegetation treatment project will be

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managed by Central Marin Fire Department (Central Marin Fire) and associated fire agencies. Central Marin Fire and their contractors will implement the mitigation measures.

The Project Proponent is responsible for overall administration of the project-specific MMRP and for verifying that staff members, associated fire agencies, or contractors have completed the necessary actions for each measure (i.e., appropriate amendments to the proposed ordinance).

Reporting

The Project Proponent will document and describe the compliance of the proposed project with the required SPRs and mitigation measures either by adapting the project-specific MMRP table or preparing a separate post-project implementation report.

Mitigation Monitoring and Reporting Program Table

The categories identified in the MMRP table provided in Attachment B, Standard Project Requirements Checklist and Mitigation Measures Checklist, are described below and in Attachment B.

Applicable. The SPRs or MMs from the CalVTP PEIR, listed in Table 1 and Table 2 in Attachment B, are applicable to the initial treatment and/or maintenance of the proposed project. The PDIFs that meet an SPR are shown as replacing the SPR. Where an SPR is identified as more stringent than the PDIFs, this is noted next to the SPR. A yes/no (Y/N) is placed next to the initial treatment and treatment maintenance to indicate if it is applicable to that stage of treatment. MMs and SPRs not applicable to initial or maintenance treatments for the proposed project were removed from the tables.

Timing. This column identifies the time frame in which the SPR or mitigation measure will be implemented (e.g., prior to treatment, during treatment, etc.) (Table 1 and Table 2).

Implementing Entity. The implementing entity is the agency or organization responsible for carrying out the requirement. Fire Agency, Contractor, Fire Agency & Contractor, or MWPA is indicated in this column to identify which entity will be the responsible party (Table 1 and Table 2).

Verifying/Monitoring Entity. The verifying/monitoring entity is the agency or organization responsible for ensuring that the requirement is implemented. The verifying/monitoring entity may be different from the implementing entity. See Table 1 and Table 2.