San Mateo County Parks Department

Wildfire Mitigation Program

San Mateo County Parks Department
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Background & Purpose

The San Mateo County Parks Department ("Department") manages 24 parks, recreation areas, and regional trails that comprise approximately 16,000 acres of land and almost 200 miles of trail/service road. County parks are located throughout the county and contain many different environments including forest, grasslands, coastal scrub, and chaparral. Core to its mission – *through stewardship, the San Mateo County Parks Department preserves the County's natural and cultural treasures, and provides safe, accessible parks, recreation, and learning opportunities to enhance the community's quality of life* – key Department priorities include providing safe and accessible recreation opportunities, stewarding park natural resources, and managing park facilities and infrastructure. In relation to wildfire mitigation, this specifically means: (i) strategically managing fire fuels throughout the County park system to limit the intensity, rate of spread, and severity of potential future wildfires and (ii) operating and maintaining fire roads, trails, and water infrastructure that support first responders in accessing the interior of parks to conduct fire containment and suppression activities. It is important to note that fire fuel management projects are not capable of preventing or stopping wildfires, rather, they can assist fire agencies in containing and suppressing wildfires.

Because of factors that have resulted in increased fire risk in park environments today, projects that manage fire fuels, restore and improve forest health, and enhance first responder capabilities are necessary to improve public safety. These factors include historic land use practices (i.e., logging and non-native plant introduction), cessation of indigenous stewardship practices, suppression of natural disturbance regimes (i.e. fire, flooding, herbivory, etc.), lack of active stewardship and land management, and increased climatic variability leading to more intense winter storms and prolonged drought periods that contribute to catastrophic wildfires. Moreover, ecosystems in San Mateo County have evolved with the existence of fire on the landscape, largely through the intentional ignition of fire by the indigenous Ohlone people, as well as occasional lightning ignitions. Wildland fires in San Mateo County, and California at large, are now burning less frequently and at a much higher severity than they did prior to the onset of modern fire suppression practices in the early 1900's. Fire will and must continue to burn on these landscapes, but the timing and severity of those fires can be shaped in part by land management decisions.

Fire behavior is driven by three key factors – fuel, weather, and topography. Of those, fuel in the form of live and dead vegetation is the only factor that can be altered to lessen the intensity and subsequent effects of fire. Wildfire mitigation projects are necessary to reduce the total fuel load within parklands, alter the vertical and horizontal continuity of fuels, manage vegetation near ignition sources (i.e., park facilities, roadways, WUI areas), and maintain vegetation clearances for safe access along critical ingress and egress routes. Collectively, these efforts can limit fire behavior (i.e., flame length, rate of spread, torching and crowning, etc.), facilitate safe evacuation and fire suppression efforts, and allow fire to produce beneficial fire effect by burning within its historic fire regime. When scoped to also improve long-term forest health, projects can be designed to be ecologically beneficial and promote adaptability and resilience in the face of extreme wildfire and climate change.

Pursuant to conversations with local fire agencies, in addition to fuel reduction projects, maintaining and improving access to the interior of parks and enhancing reliable water supply in remote areas for first responders must also be prioritized. Projects that enable fire agencies to quickly respond to small fires

and conduct containment and suppression efforts are prioritized in this wildfire mitigation plan. Fire agencies report that approximately 99 percent of fires that occur can be contained and extinguished before becoming uncontrollable. The goal for the Program is to identify and conduct fire mitigation projects that limit the intensity, rate of spread, and severity of potential future wildfires and support first responders in conducting fire containment and suppression activities.

By performing the various fuel reduction and infrastructure improvement projects identified in the Program, the Department will:

- Reduce or modify live and dead fuels to limit fire behavior including flame length, rate of spread, fire intensity, and post-fire effects including tree mortality, smoke production, and soil heating.
- Reduce horizontal and vertical continuity of fuels, especially ladder fuels that can enable ground fires to become canopy fires (i.e. torching and crowning).
- Reduce the number of live or dead trees, thereby reducing forest stand density and potential fire intensity in the parks.
- Improve firefighters' ability to respond to an incident in a park and conduct critical fire containment and suppression activities.
- Protect and improve ingress and egress routes for first responders, local residents, park users, and the general public.
- Improve forest health and ecosystem function and resiliency, including reduction of impacts by invasive species, competition for resources, disease, drought, and wildfire.

Equally important to conducting fuel reduction projects is the on-going effort to maintain these project areas. As vegetation will regrow within the project footprint, in order to preserve the effectiveness of fuel breaks and other fuel reduction projects, the Department must retreat these areas on a regular interval. Failure to do so will result in dense vegetation regrowth which will return a severe fire threat to nearby communities. The devastating effect that can occur when maintenance of treatment areas is not prioritized has been observed during several fires throughout California.

It is important to note that fuel treatments (methods to manage vegetation for a wildfire mitigation benefits) are intended to lower the risk of catastrophic wildfires, however, they cannot eliminate all risk, especially under extreme weather conditions, nor can they prevent or stop a wildfire.

Introduction to the Wildfire Mitigation Program

This Wildfire Mitigation Program ("Program") is a guidance document that outlines the Department's approach to:

- identifying project areas throughout the County park system based on fire hazard and risk criteria, terrain, vegetation type, and wildfire mitigation benefit(s),
- using data-driven decision-making on project implementation,
- effectively scoping fuel reduction projects,
- assessing, monitoring, and maintaining projects to maximize effectiveness, and
- describing the purpose and rationale for conducting these activities.

This Program—updated from the Department's Wildfire Fuel Management Program which was accepted by the Board of Supervisors in 2021—reflects improvements and modifications to the Department's methodology based on lessons learned through implementation of previous projects, new data that has become available, process improvements since the previous program was prepared, and conversations with local fire agencies. More information on methodology for project identification is included in the following section.

It is of note, the Department has other active programs and plans that describe and guide vegetation management activities and which intersect with the Wildfire Mitigation Program as they also describe vegetation management activities including fuel reduction or wildfire risk reduction. These other plans include the County of San Mateo Routine Maintenance Program (2020), the Climate and Habitat Resiliency Plan for Pescadero Creek County Park (2022), the San Bruno Mountain Habitat Conservation Plan (1982), and various park master plans. This Program is consistent with these other programs and plans, and is the Department's primary guidance document for implementation of park-wide fuel reduction, forest health, and fire access improvement projects (e.g. road and water infrastructure repairs).

The pace and scale at which projects will be implemented on an annual basis will be dependent upon numerous factors, including permitting, funding availability, partnerships, and other resource availability (i.e. workforce capacity within seasonal work windows).

This Program is intended to be periodically updated based on monitoring, recommendations reflecting lessons learned, reprioritization of management actions, and any adjustment of tools and techniques. Conditions will change over time and new information will become available through the implementation of this work and research completed elsewhere. As condition changes occur, this Program will be revised accordingly. The Department will follow adaptive management practices, which emphasizes a "learn by doing" approach that incorporates the results of monitoring and scientific information to inform future management decisions. Adaptive management means that the Department seeks to improve and adjust its approach to completing and maintaining projects as new information becomes available, and observations are made on the ground. For example, through on the ground observation of vegetation regrowth, the Department has been able to observe that oak woodland understory vegetation regrowth after initial treatment is slower than other vegetation types, and maintenance of prior fuel reduction work in oak woodlands can occur less frequently while still maintaining wildfire risk reduction benefits. Additionally, new spatial data had become available since the Department's 2021 Fuel Management Program was adopted, which provides new resources to aid in decision making. This is discussed in more detail in the next section.

Project Identification Methodology

Identification of fuel reduction, forest health, and first responder access improvement projects occured as a collaborative process between parks staff, including natural resource management staff and park rangers, as well as professional consultants and partners including local fire agencies. Project identification was also aided by a combination of spatial data, best available research, knowledge of the strategic wildfire mitigation benefits of a treatment type, and field reconnaissance to confirm on-the-ground conditions.

In developing this Program, the Department overlayed three (3) key spatial data sets on wildfire risk or hazard in the region to determine at a county-wide level what areas may have an increased exposure to wildfire risks or would benefit from regional efforts for fuel reduction and wildfire resiliency. Appendix A includes the maps of the County that display the output of this spatial analysis. The three data layers included in the analysis are as follows:

- Wildfire Risk to Structures: utilizing a LiDar-derived geospatial dataset created as a component of a regional fine-scale vegetation mapping effort, this layer was created to support fuels reduction and fire suppression planning activities. The layer combines wildfire hazard values (calculated based on fuel volume and arrangement, topography, weather, and distribution of ignitions across the landscape) with density of structures in a given area to generate a spatially explicit county-wide model for wildfire risk to structures and residential communities. This models the risk that wildfires pose to structures across the county given the best available data. Additional detail on this dataset for San Mateo County can be found here: https://pacificvegmap.org/
- Wildfire Hazard Severity Zones: CAL FIRE maintains a map of fire hazards within State Responsibility Areas (SRA) and Local Responsibility Areas (LRA) based on fuel loads, slope, fire weather, and other relevant factors present, including areas where winds have been identified by the state as a major cause of wildfire spread. These zones, referred to as Fire Hazard Severity Zones (FHSZ), classify a wildland zone as Moderate, High, or Very High fire hazard based on the average hazard across the area included in the zone. "Hazard" is based on the physical conditions that create a likelihood and expected fire behavior over a 30 to 50-year period without considering mitigation measures such as home hardening, recent wildfire, or fuel reduction efforts. More information on this dataset is available here: https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones
- Key Access or Evacuation Routes: This dataset includes a 0.5-mile buffer around various key access or evacuation routes throughout the County, including fire and service roads within county parks. Several county parks are directly adjacent to key evacuation routes for residents, and routes used for access by responding fire personnel.

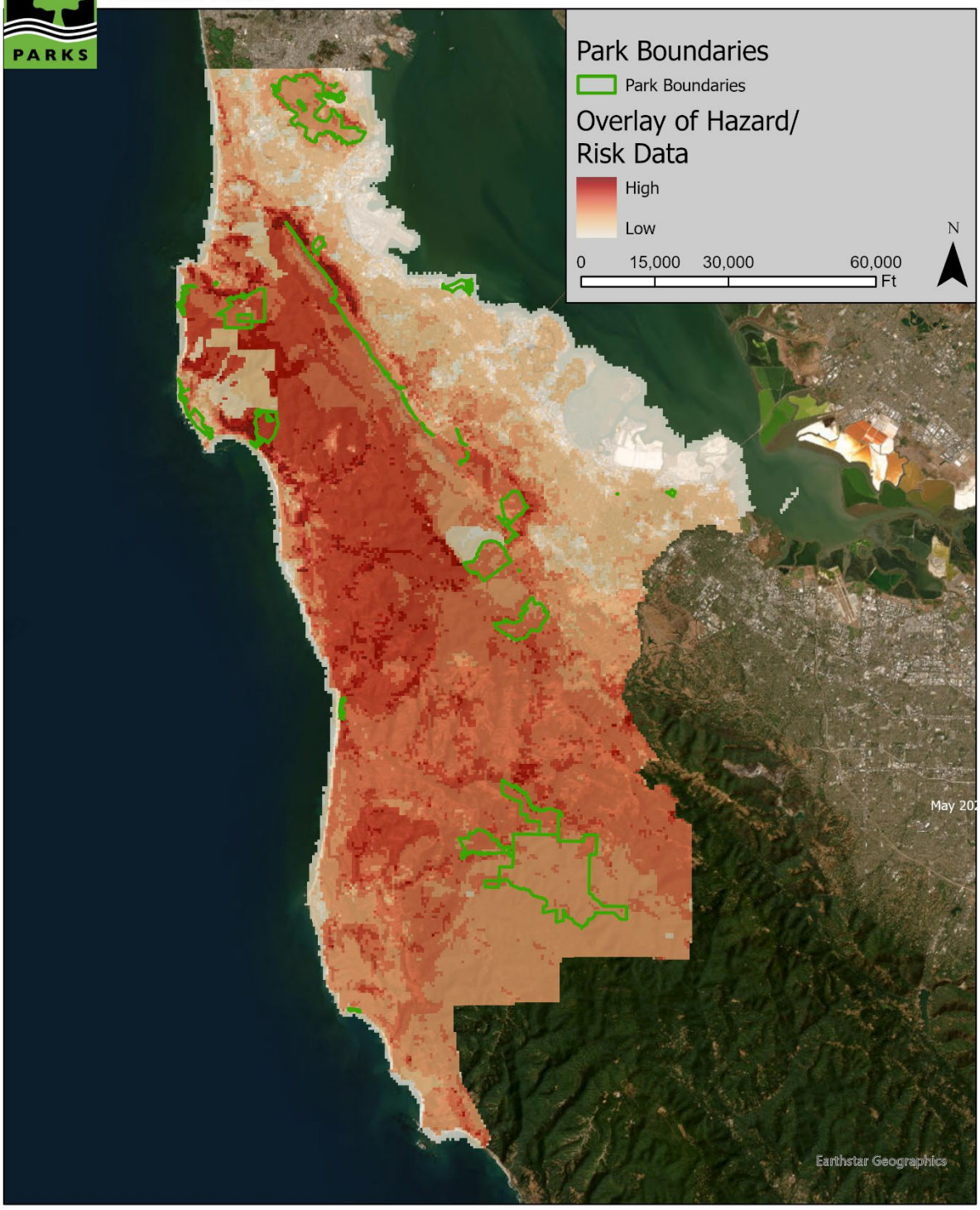
The Department also met with local fire agencies during the development of this Program document. Local fire agencies provided input on priority fuel treatment efforts in County Parks within their jurisdictions, and other priorities for access and infrastructure. Through these conversations, both fuel treatments and efforts to improve access and infrastructure were identified as top priorities for the fire agencies. This input has been incorporated into the project identification process.

Understanding the strategic benefit of fuel treatments and their ability to enhance first responder's wildfire suppression and/or containment capabilities is a new focus of the Program. As further outlined in the next section on fuel management approaches, the placement of fuel breaks should be in areas where they can support or enable fire suppression efforts and provide areas where fire personnel can access the front of a fire or use the area to safely stage fire suppression equipment and personnel.

Field reconnaissance and site assessment procedures are further outlined below, but help verify fuel load conditions, identify environmentally sensitive habitat areas, assess access and terrain constraints that could affect the scope of work, and survey for targeted vegetation to be managed.

San Mateo County Parks

Wildfire Mitigation Program: Overlay of Wildfire Hazard Severity, Risk to Structures, and Evacuation Routes



Other factors that are taken into consideration for project identification include:

- Professional opinion - Department staff's expertise has contributed to the development of this Program.
- Permitting (i.e., existing programmatic permits, CEQA review, coastal development permits, other regulatory approvals),
- Proximity to infrastructure or assets at risk
- Proximity or connectivity to other fuel management or forest health projects

Fuel Management, Forest Health, and Infrastructure Improvement Approaches

Proposed vegetation management approaches (or "treatments") are meant to reduce hazardous fuel loads in order to minimize fire intensity and spread and improve first responders' ability to effectively respond to wildfires through strategically located fuel breaks, forest density reduction areas, road improvements, water supply improvements, and defensible space measures. These treatments are implemented in a variety of forest, woodland, and shrubland vegetation communities throughout San Mateo County parks, all of which have evolved with natural processes such as fire, flooding, and pests, as well as cultural stewardship practices by native Ohlone people.

Some common vegetation communities in County parks include Coast redwood forest, Douglas fir forest, oak woodland, coastal scrub and chapparal, willow thickets, and much more. Some regions of parks are also dominated by non-native, invasive, and highly combustible vegetation such as eucalyptus, acacia, pampas grass, various broom species, Himalayan blackberry, cypress, pines, and many more. In many cases, these invasive species can exacerbate wildfire hazards. Fuel management and forest health treatments are designed and implemented to mimic the natural and anthropogenic processes that historically created and maintained a complex mosaic of ecosystems, as well as the structural and compositional characteristics that make the land more resilient to disturbances that are anticipated to intensify due to climate change (i.e. fire, flooding, pests, etc.). Fire is an inevitability in these vegetation communities, but by reducing fuel loads and densities, and thereby reducing anticipated fire intensity, these treatments can provide safety benefits to surrounding communities and set the stage for wildfires to provide ecological benefits to parklands; solely relying on fire suppression only exacerbates the hazardous fuel conditions over time.

Studies have shown that landscape-level fuel treatments, including fuel breaks and the other treatment approaches outlined below, can aid in wildfire containment and reduce fire behavior to help achieve more broad-based ecosystem management goals. Landscape-level treatments are characterized by their ability to mitigate fire spread and intensity both within and outside of the treatment areas. In other words, "landscape-level" benefits for fire mitigation occur across a larger landscape scale than just the immediate project area. As a result, one of the priorities of this Program is landscape-level treatments.

Wildfire mitigation treatment locations and specifications are typically determined based on the intent of the treatment (e.g., ingress/egress, defensible space, forest health), dominant vegetation type (e.g., forest, woodland, or shrubland), geographic and topographic location (e.g., roads, structures, etc.), fuels conditions, regional wildfire hazard severity, and site history (e.g., prior management, wildfires, etc). Fuels and forest treatment described below are grouped into the following categories: Fuel Breaks (Shaded and Non-shaded), Ingress/Egress Fuel Breaks, Fire Road and Infrastructure Improvements, Defensible Space, Forest Health, and Forest Density Reduction.

Fuel Breaks

Fuel breaks serve various functions in mitigating the spread and intensity of wildfires. By reducing and altering fuel loading and continuity, fuel breaks can lessen fire behavior and provide fire agencies the opportunity to more safely and effectively suppress and contain wildfires before they grow beyond initial attack efforts. Fuel breaks are primarily used to allow first responders to access the advancing edge of a fire and stage materials and supplies to conduct containment and suppression activities. Fuel breaks can also increase protection for nearby communities by reducing or slowing the vertical and horizonal spread of fires. While fuel breaks assist active suppression efforts and can modify fire behavior, they are not designed to passively prevent or stop wildfires, especially when extreme wind and weather conditions drive a wildfire's spread.

For purposes of project scoping, this Program differentiates between non-shaded fuel breaks and shaded fuel breaks.

Non-Shaded Fuel Breaks

Non-shaded fuel breaks are treatments used in shrublands or where there are significant densities of non-native plants and are strategically placed along a ridge, valley bottom, access road, around a residential community, or where there is a natural transition in vegetation type, such as from forest or shrubland to grassland. They are typically 100 feet in width, but total width may vary depending on terrain. During installation of the fuel break, most of the vegetation, including mature trees and shrubs, is removed to bare soil, and while natural regeneration of vegetation will occur, long-term maintenance of a non-shaded fuel break will prioritize low levels of vegetation cover. The long-term goal is to maintain no overstory tree canopy in these non-shaded fuel break areas and periodically reduce understory or ground cover vegetation density. Non-shaded fuel breaks are typically limited in size and scale (i.e. placement could be along a ridgeline, but would not include vegetation clearance that would extend down the entire slope), and strategically located in specific locations to accomplish the associated wildfire risk reduction benefits, particularly by supporting or enabling fire suppression efforts. By minimizing the amount of live and dead vegetation within the footprint of the non-shaded fuel break, these treatments help limit fire intensity and rate of spread. It is important to note that non-shaded fuel breaks are not suitable for all scenarios, and can result in a transition from one flammable vegetation type to another flammable vegetation type (i.e. forest to shrubland).

Non-shaded fuel break along a ridgeline in southern Monterey County (photo courtesy of CAL FIRE BEU unit)

Shaded Fuel Breaks

Shaded fuel breaks are fuels treatments used in forest or woodland settings, often along ridgelines, fire roads, or forest edges. They are typically 100 feet in width, but total width may vary depending on terrain. Typically, the forest is thinned by removing understory and mid-story trees; large mature trees are preserved. Lower limbs on larger retained trees are pruned and understory vegetation, including ladder fuels, are also thinned or removed. The overall forest structure is maintained while reducing canopy and understory density, thereby reducing the likelihood of a fire entering the tree canopy. The shade of the retained canopy also helps reduce the potential for rapid regrowth of shrubs and sprouting hardwoods and can reduce erosion, as well as maintain cooler, moister conditions in the understory. The long-term goal is to maintain overstory tree canopy and suitable forest species composition, increase tree size and spacing, and periodically reduce understory vegetation density and ladder fuels. This form of fuel reduction generally consists of strategic removal of vegetation to prevent or slow the spread of wildfire between structures and wildlands, and vice versa, as well as to preserve the effectiveness of ingress and egress routes for first responders.

Shaded fuel break along Bear Gulch Road in Wunderlich County Park

Ingress/Egress Route Fuel Breaks

Due to challenging terrain, vegetation type, and/or other constraints it is not always feasible to maintain larger fuel breaks at an optimal width along all fire roads within parks. An ingress/egress fuel break is a buffer located on both sides of roads identified as critical for emergency vehicle passage, and vegetation would be managed with enough width for the route to be passable by emergency vehicles. To accommodate most common wildland fire engines (Type 3), access roads need a minimum of 20 feet of total clearance width and a vertical clearance of 13.5 feet.

Fire Road and Infrastructure Improvements

This category of work includes access road improvement projects, such as grading or drainage improvements for critical access roads, establishment of turnouts or turn arounds for emergency vehicle access and staging, establishment of new fire roads or connections for access, and other road infrastructure improvements like bridge repairs. This category also includes projects that provide water supply with the intention of aiding fire suppression efforts, such as the installation of non-potable water tanks in the interior of rural parks.

While the Department conducts annual routine maintenance of roads and trails, if the primary goal is to improve access for fire personnel or for fire suppression efforts, it may be included as a project in this

Program. The Department acknowledges that the vast majority of wildfires (up to 99%) that occur have the ability to be contained and/or suppressed quickly by fire response personnel. It is therefore critical to provide and maintain access and fire suppression infrastructure that fire personnel can use in their response efforts to access county parks.

Water infrastructure within the parks serve as important resources for day-to-day operations and recreational needs as well as in the event of wildfires and prescribed fire operations. These include springs, water storage tanks, standpipes, and other infrastructure that can be utilized by firefighting personnel. This water infrastructure is in varying conditions, ranging from fully operable to dilapidated and in need of rebuilding. County Parks will continue working with partner fire agencies to identify critical water resources in need of repair to facilitate safe fire suppression and prescribed fire efforts.

As site conditions change and fire agency partnerships continue to develop, County Parks may identify and implement road and water infrastructure improvement projects beyond those described in this plan that are deemed critical to wildfire hazard reduction.

Defensible Space

Defensible space is the area immediately surrounding a park structure or facility where vegetation management measures to reduce fuels are implemented, providing a key point of defense from an approaching wildland fire, or defense against structure fires spreading into nearby vegetation. Fuel loads are typically reduced within 100 feet of the park structures or boundary. According to PRC 4291, all structures located in high fire hazard zones (in State Responsibility Areas) are required to maintain 100 feet of defensible space. Vegetation clearance specifications are defined by CAL FIRE. Other local fire ordinances may have additional requirements and would be adhered to accordingly.

Forest Health

Forest health treatments are utilized to increase ecosystem health and resilience to disturbances such as fire and drought, allowing these ecosystems to persist and thrive into the future. Such resilience is accomplished by restoring vegetation composition, structure, pattern, integrity, and ecological processes. The Department may implement vegetation treatments that seek to create conditions where historic fire regimes can be reestablished (i.e. prescribed burns), so as to maintain low fuel loading and improve the quality and quantity of habitat, and plant and wildlife species. Treatments include controlling introduced non-native, invasive plants; reducing vegetation density that creates over-competition for resources such as light, water, and soil nutrients; or minimizing the impacts of introduced pests and pathogens. Treatment approaches for forest health improvement efforts may overlap with shaded fuel break areas, where tree canopy and understory vegetation is thinned. Like shaded fuel breaks, forest health treatments also reduce the vertical and horizontal continuity of fuels to reduce the rate of spread and intensity of a fire, reduce dead, dying, or diseased vegetation that increase fire risk, and increase spacing between trees in an overly dense forest stand.

For forest health projects, in addition to most fuel reduction efforts, promoting native vegetation regeneration is a desired end-goal for the project area. Typically, the approach for promoting native vegetation establishment will focus on allowing natural recruitment of native species that are present and existing within the park. Another aspect of native species restoration includes removal and control of non-native invasive species that can outcompete native species. On a site-by-site basis, however, and as conditions and monitoring efforts dictate, active revegetation with native species may be deemed appropriate.

Forest Density Reduction

Forest density reduction treatments refer to a forestry practice whereby the Department would selectively thin a forest stand with the goal of restoring forest stand heterogeneity, reducing stand density, and increasing the growth rate and vigor of retained trees. By creating and encouraging mature forest characteristics, forest density reduction projects improve the health of remaining trees, making them more resilient to fire and drought and increasing their capacity to sequester atmospheric carbon. This treatment approach is discussed in greater detail in the Climate and Habitat Resiliency Plan for Pescadero Creek County Park, where there are forest density reduction treatment areas specifically planned.

Vegetation Treatment Methods

Fuel reduction activities would be performed by Department staff, contractors, and/or CAL FIRE or other fire agency crews using treatment methods described in Table 1 below.

Table 1. Vegetation Treatment Activities and Methods

Treatment Activity Definitions	Description / Method of Application
Mechanical Treatment	Description: Use of motorized mechanical equipment (i.e. heavy equipment) to remove and/or modify vegetation. Mechanical treatment typically targets trees that are less than 8-10 inches in diameter and shrubs or other vegetation in the understory. Treatment is generally applied throughout the project area and can significantly reduce dense understory vegetation and ladder fuels. This can decrease a fire's rate of spread and the potential for a ground fire to spread into the tree canopy and become a crown fire. In shaded fuel break treatments, overstory woody vegetation is generally retained, with the focus on removing understory woody vegetation. Chipped or masticated material is left on site for soil nutrients, erosion control, and weed suppression. Method: Mastication, chipping, brush raking, tilling, mowing, roller chopping, chaining, skidding and removal, piling (often combined with pile burning).
Manual Treatment or Hand Thinning	Description: Use of hand tools and hand-operated power tools to cut, clear, or prune trees, shrubs, or other vegetation. Manual treatment is used across a project area to reduce live and dead fuel loads where mechanical treatment is not feasible (i.e. limited access, steep terrain). Treatment will include chipping, lop and scattering, or pile burning of cut material. Manual treatments can be used to create or expand fuel breaks or ensure clearance standards along fire roads, and is often a preferred method for maintenance of previously treated areas. Method: Hand pull and grub, thin, prune, hand pile, lop and scatter, hand plant, piling (often combined with pile burning).
Large tree removal/	Description: Use of motorized mechanical equipment and/or hand operated power tools to remove larger trees. Large tree removal can be

overstory removal	variable and can include removal of only dead or hazardous trees, selective thinning within a forest stand, or full removal of overstory tree canopy (i.e. in a non-shaded fuel break). Treatment is typically focused on trees greater than 8-10 inches in diameter. Method: Felling, chipping, roller chopping, skidding and removal, bucking, pruning.
Herbicides	Description: Chemical application is designed to inhibit growth of target plant species, largely eucalyptus, broom, cotoneaster, ivy, or jubata grass. Treatment is typically focused on non-native invasive species. Method: Ground-level application only, such as paint-on stumps, backpack hand-applicator, hypo-hatchet tree injection, or hand placement of pellets. Pursuant to County requirements, no broadcast application of herbicide is authorized.
Prescribed burning	Description: Use of fire via pile and broadcast burning to reduce surface fuels, reduce shrub and forest stand density, reduce invasive plant species, and promote regeneration of native species. Treatments are conducted under specific weather and fuels conditions to ensure personnel and public safety. Applicable across many vegetation types (grassland, shrubland, woodlands, and forests), the timing, intensity, and frequency of prescribed fire treatments may vary. All burning is conducted with necessary air quality and burn permits, based on seasonality, and prior approval of Bay Area Air Quality Management District (BAAQMD) and CAL FIRE. The San Mateo County Parks Department has yet to conduct a broadcast burn, however, many of the projects underway are creating the opportunities to introduce this treatment method in the future. Method: Broadcast burning and pile burning. The primary ignition method is drip torches, though other methods may be used based on burn objectives, site access, and safety considerations.
Targeted grazing	Description: Use of herbivores such as sheep, goats, or cattle to reduce live grasses, forbs, and shrubs as well as grass thatch. Primarily used in grassland, woodlands, and shrublands, the timing, intensity, duration, location, and type of animal used is predetermined based on fuel reduction and other natural resource goals.

Project Site Assessment

This Program provides details on the locations and treatment types for the various fire mitigation projects throughout the County park system. However, prior to implementation of the projects outlined in this Program, further site assessment on the ground is required to refine the project specifications and approach.

Site assessments for fuel treatments and access improvements will involve qualified personnel assessing site conditions before finalizing prescriptions for specific implementation details for a project. Site assessments may involve desktop assessments of existing datasets (i.e. GIS data, California Natural

Diversity Database queries, other databases, prior biological resource assessments, other relevant plans or reports), and field reconnaissance and surveying. Field verification of vegetation, habitat, and fuel conditions are required in order to prescribe the appropriate treatments and determine appropriate best management practices and protective measures for natural resources. Additionally, field verification is necessary as online databases or reports may not be entirely representative of current site conditions or changes over time.

The following factors should be considered and noted during the site assessment

- Fuel characteristics
- Plant species composition, including cover estimates of dominant, sub-dominant, invasive, and any special-status plant species
- General size class of trees
- Tree density (i.e. trees per acre) and/or vegetation density
- Presence of tree mortality due to disease such as Sudden Oak Death (SOD)
- Observed encroachment of vegetation that is converting vegetation types
- Slope and topography
- Fire history
- Wildlife habitat features and any wildlife observations, including evidence of bird nesting
- Soil conditions
- Hydrologic features
- Environmentally sensitive habitat areas
- Existing access routes and/or opportunities to create temporary access routes
- Existing roads, trails, or natural barriers that can be utilized as control lines for prescribed fire
- Presence of structures or park facilities, and adjacent homes or properties within 100 feet
- Presence of archaeological, cultural, scenic, and recreational resources
- Logistics for access for equipment
- Slope stability and erosion concerns
- Regulatory or permitting considerations

The treatment approach can also be further defined during the treatment site assessment process. Preliminary project plans within this Program document define the overarching goals and priorities for fuel reduction or infrastructure improvement in certain locations, however the specifics on how to implement this work will be determined through detailed site assessments for each project. The factors listed above will need to be considered when defining the appropriate treatment approach and what methods of treatment are suitable. Onsite observations may confirm the preliminary treatment recommendations for a specific area or may indicate that different treatments should be implemented to best meet current fuel reduction, public safety, and resource management objectives. Slope steepness or obvious signs of significant erosion may dictate additional changes to the treatment approach (such as using smaller ground-based equipment, manual removal, or different equipment, or installation of post-treatment soil coverings) to protect onsite soil resources, water quality, and roads, trails, and other improvements.

Biological surveys may be recommended to determine if the potential habitat is occupied by special-status species. If this is the case, best management practices and treatment guidelines or avoidance and protection measures should be prescribed and implemented.

Project Maintenance & Monitoring

Ongoing monitoring and maintenance of fuel reduction and forest health project areas is paramount. As has been seen many times throughout the state, agencies will conduct fuel reduction work to establish a fuel break, but no effort will be made to maintain this area; within just a couple of years, the fuel break has become obsolete, communities are at risk once again, and fire agencies' ability to respond to an incident is hindered. Maintenance of fuel reduction and forest health project areas is necessary to ensure that these areas are continuing to provide benefits as intended. If project areas are not regularly maintained, threats to public safety elevate and it is expected that a higher level of effort will be needed to re-establish project benefits. The time interval for when maintenance needs to occur will be informed by monitoring of project areas, and the rate of vegetation regrowth. Project areas surrounding facilities or along roadside may need more frequent maintenance. Invasive species that have potential to rapidly expand into project areas are prioritized for regular maintenance treatments until control or containment can be achieved. Other woody shrub or tree species that are slower growing may not require maintenance for several years. Maintenance is conducted using a variety of treatment methods, but is typically considered a lower level of effort and less intensive than initial treatment.

Monitoring following project implementation requires periodic site visits to project areas to make observations primarily on vegetation regrowth, including woody vegetation that can contribute to fuel load, invasive species, and desired native vegetation. Other observations that may be made during regular monitoring include, but are not limited to, erosion and ground disturbance, road and trail condition, wildlife, forest stand composition and density, and tree condition. Monitoring includes taking photo points before and during projects and re-visiting those photo points at future visits to capture regrowth in photos. Mapping tools are used to map the treatment extent and maintenance frequency. Individual maintenance plans for treatment areas are developed for 5-year time frames following initial implementation to guide decision making and resource allocation for maintenance. Through periodic monitoring, the Department is able to effectively budget resources and prioritize maintenance projects.

Best Management Practices

General Best Practices

See Appendix C for a summary of common Best Management Practices (BMPs) that apply to most fuel reduction projects. Some projects may require additional BMPs depending on what sensitive resources are present of have the potential to occur in the area.

Cultural Resources

A qualified archaeologist may need to survey for sensitive cultural resources to be flagged in the field for avoidance. The presence of any such resources must be communicated clearly to the project crews, which must also undergo a mandatory cultural resources training. Tribal consultation may be necessary in order to confirm potential presence of sensitive cultural resources. This is often a requirement of CEQA review and mitigation for projects.

Habitat Features and Refugia

In addition to the targeted retention areas identified for the purposes of forest health and resiliency, a qualified biologist may be required to survey for sensitive species and habitat features for avoidance.

Sensitive habitat features to be avoided may include woodrat middens, potential bat roosts, trees harboring active or inactive raptor nests, rodent burrows, etc. Where feasible, valuable habitat features such as snags and logs are retained on-site, provided they do not pose safety hazards or unreasonably exacerbate fuel risks. Depending upon the species potentially occurring for each discrete fuels reduction area, a qualified biologist may be required to conduct targeted preconstruction surveys in coordination with the sequencing of the project.

Stream channels and other water bodies, as well as associated riparian areas, should be mapped and flagged in the field for avoidance. These features are often demarcated with unique flagging (e.g., blue tape) to distinguish from other flagged resources or avoidance areas. Equipment should remain above top of bank, and no debris or fill should be allowed to enter a channel. If debris does enter a channel incidental to work activities, it should be promptly removed without disturbance to the channel features.

In the Coastal Zone, Environmentally Sensitive Habitat Areas (ESHAs) should be mapped and flagged in the field for avoidance. Coastal Act Section 30107.5 labels an ESHA as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments." Work activities and vehicular/equipment access may be limited in ESHAs.

Integrated Pest Management

The San Mateo County Parks Department utilizes science-based integrated pest management (IPM) as a vital part of improving habitat and protecting biodiversity within our parks. Common non-native, invasive plant species that are targeted as part of IPM include eucalyptus, acacia, cypress, pines, various broom species, pampas grass, and various forbs and grasses.

IPM is an ecosystem and science-based strategy that focuses on efficient and long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Chemical methods (i.e. pesticides, herbicides, insecticides) shall be used only if the above techniques are found to be either ineffective or infeasible. Chemical use shall be in accordance with established guidelines, and treatments shall be made with the goal of removing only target organisms. Pest control materials shall be selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment. Herbicide use is limited to spot spraying in certain areas for invasive weed control purposes.

Project Details

County Park*	Shaded Fuel Breaks	Non-shaded Fuel Breaks	Forest Health	Forest Density Reduction	Targeted Grazing	Defensible Space Areas	Ingress/Egress Route	Road or Infrastructure improvement	Total (acres)
Crystal Springs Regional Trail	-	-	-	-	-	-	12	-	12
Edgewood	29	-	-	-	24	5	-	-	58
Huddart	-	-	296	-	-	20	45	-	361
Junipero Serra	16	-	9	-	-	13	-	-	38
Memorial	38	-	-	-	-	-	-	-	38
Pescadero Creek	328	167	-	511	-	9	-	2	1,017
Pillar Point Bluff	-	-	18	-	-	-	-	-	18
Quarry	185	23	-	-	-	1	-	1	210
Sam McDonald	81	-	-	-	-	12	-	-	93
San Bruno Mountain	26	396	-	-	130	6	-	-	558
San Pedro Valley	21	23	-	-	2	7	3	-	56
Wunderlich	20	-	195	-	-	6	71	-	292
TOTAL	744	609	518	511	156	79	131	3	

*Note that not all County Parks are included in the above table for treatment areas, as many parks do not require extensive fuel reduction due to their landscaping & vegetation present, urban setting, or size. Vegetation management that does occur in other parks not listed may include mowing, hazard tree removal, and invasive plant management.

New Work Areas (As of Program Publication)			
County Park	**Treatment Type**	**Work Area/Descriptor**	**Acreage**
Crystal Springs Regional Trail	Ingress/Egress Fuel Break	Vegetation management and tree management along trail	12
Edgewood	Shaded Fuel Break	Old Stage Road	8
Edgewood	Shaded Fuel Break	South and Southeastern Boundary	14
Edgewood	Targeted Grazing	Goat Grazing	24

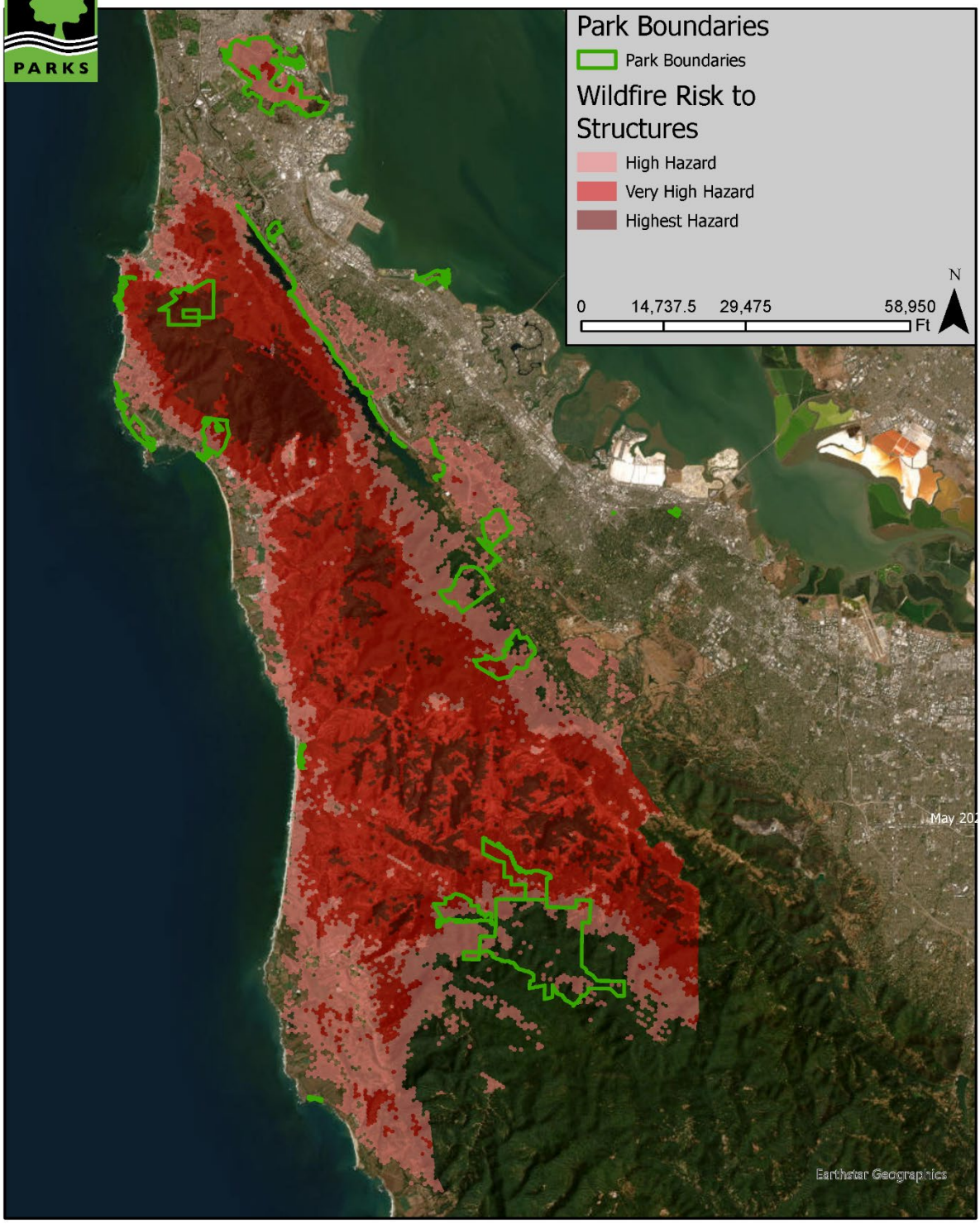
Huddart	Road Improvement	Richard's Road	2
Junipero Serra	Shaded Fuel Break	Park Boundary areas	12
Pescadero Creek	Forest Density Reduction	Forest Density Reduction (CHRP)	511
Pescadero Creek	Shaded Fuel Break	Fire Road shaded fuel breaks	328
Pescadero Creek	Non-Shaded Fuel Break	Tarwater coyote brush and Douglas fir removal	167
Pescadero Creek	Road Improvements	Baker Bridge Replacement	1
Pescadero Creek	Road Improvements	Old Haul Road Stream Crossing Repairs – Schenley Creek and Rhododendron Creek	1
Pescadero Creek	Water Infrastructure	Improve springbox and water tank connection at Keyston Creek	
Quarry	Shaded Fuel Break	Southwest Eucalyptus	14
Quarry	Non-shaded fuel break	Southwestern boundary 200-foot fuel break	8
Quarry	Non-shaded fuel break	El Granada Blvd Swath	11
Quarry	Road Improvement	South Ridge Fire Road	2
Sam McDonald	Shaded Fuel Break	Old Stage Road and Uncle Man Road	25
Sam McDonald	Water Infrastructure	Water tank improvement on Towne Fire Road	
San Bruno Mountain	Shaded Fuel Break	Alta Vista	7
San Bruno Mountain	Shaded Fuel Break	Crocker	18
San Bruno Mountain	Non-Shaded Fuel Break	Coastal scrub management	394
San Bruno Mountain	Targeted Grazing	Livestock grazing on Saddle Loop and Ridge Crest Trail	130
San Pedro Valley	Shaded Fuel Break	Montara Mountain Trail Eucalyptus	12
San Pedro Valley	Non-shaded Fuel Break	Valley View Trail Ridge	23
San Pedro Valley	Ingress/Egress Fuel Break	North Peak Access Road	3
Wunderlich	Ingress/Egress Route	Roadside fuel management on Bear Gulch Road	8
Wunderlich	Forest Health	Loop Fire Road acacia and eucalyptus removal	20
Maintenance Work (As of Program Publication)			
County Park	**Treatment Type**	**Work Area/Descriptor**	**Acreage**
All		Defensible Space around structures and facilities	119
Edgewood	Shaded Fuel Break	Northeastern boundary shaded fuel break	7
Huddart	Forest Health	Governors' Kings Mountain Road project area	82

Huddart	Forest Health	Cal FIRE forest health grant project areas	214
Huddart	Ingress/Egress Fuel Break	Vegetation management along fire roads	45
Junipero Serra	Forest Health	Iris point	9
Junipero Serra	Shaded Fuel Break	Crystal Springs Rd.	4
Memorial	Shaded Fuel Break	Pescadero Creek Road/Wurr Road SFB	38
Pillar Point Bluff	Forest Health	Invasive pine removal along Pillar Ridge	18
Quarry	Shaded Fuel Break	Governor's and State Coastal Conservancy Grant fuel reduction project areas	163
Sam McDonald	Shaded Fuel Break	Ridge & Towne Fire Road Shaded Fuel Breaks (La Honda Fuel Break Project)	56
San Bruno Mountain	Non-Shaded Fuel Break	Saddle Gorse	13
San Bruno Mountain	Shaded Fuel Break	Old Guadalupe Trail	2
San Bruno Mountain	Shaded Fuel Break	Pointe Pacific	1
San Bruno Mountain	Non-Shaded Fuel Break	Coast scrub management	39
San Pedro Valley	Shaded Fuel Break	Point Pacifica	9
San Pedro Valley	Targeted Grazing	Goat Grazing	2
Wunderlich	Forest Health	Cal FIRE forest health grant project areas	183

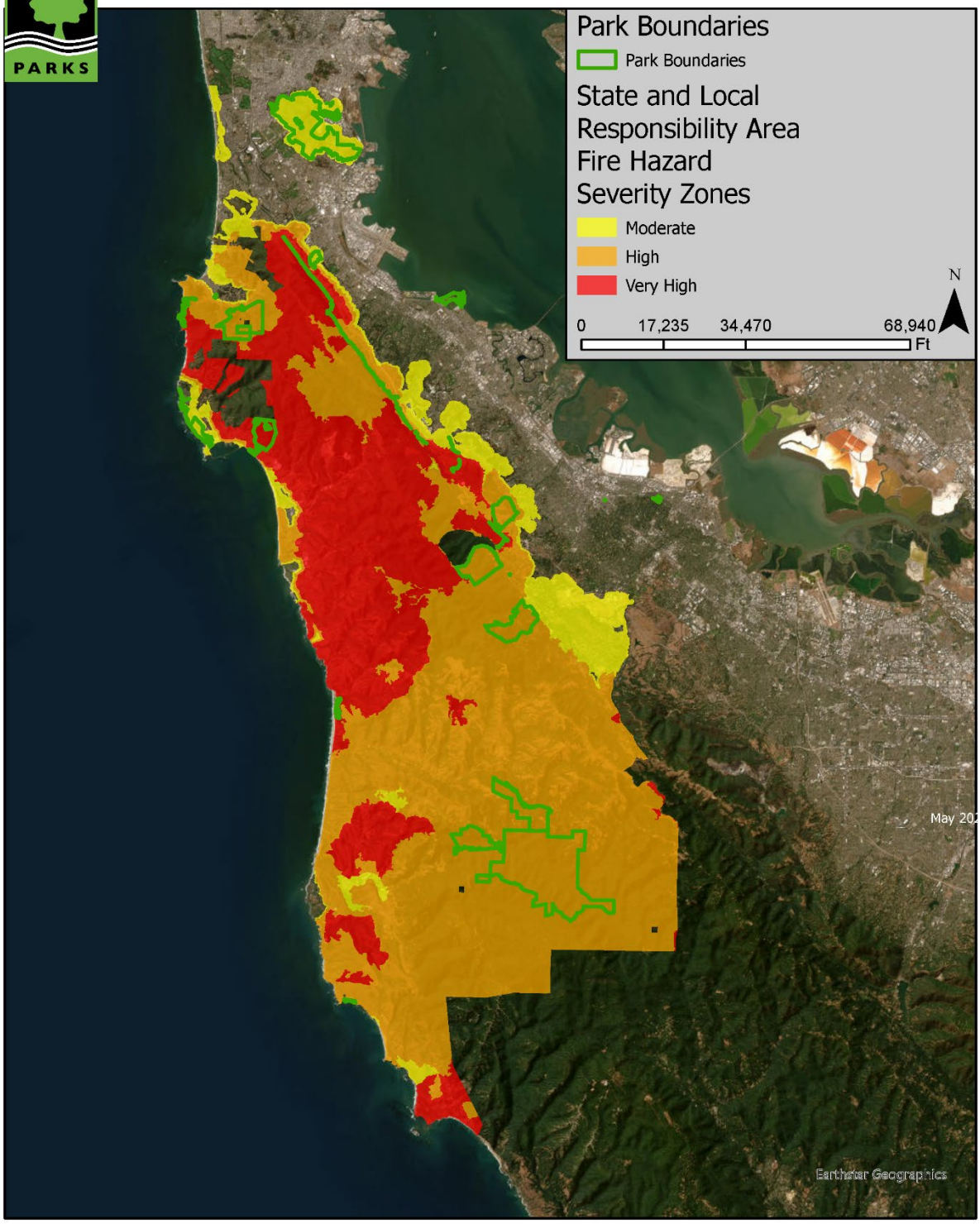
APPENDIX A

Spatial Data

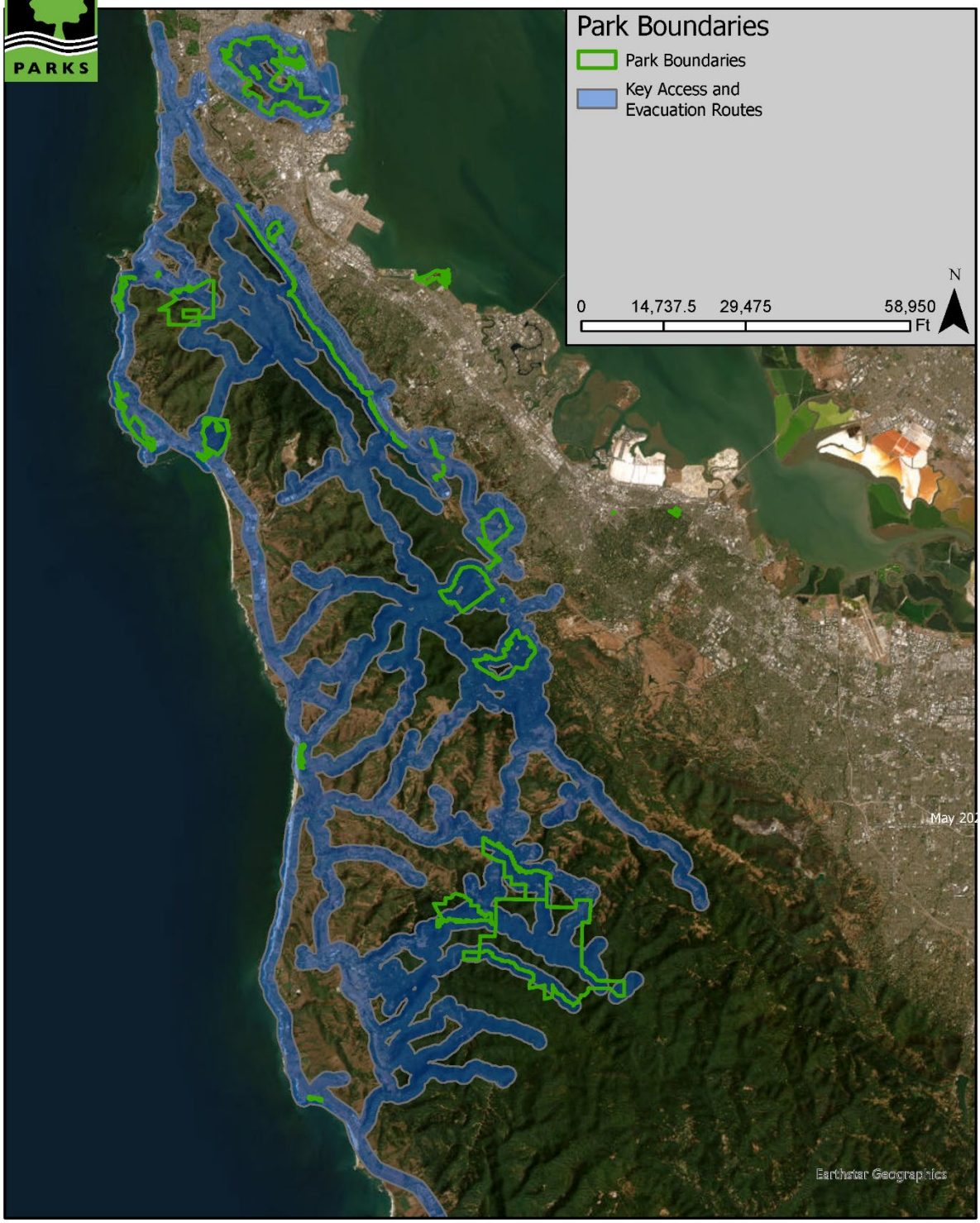
San Mateo County Parks
Wildfire Mitigation Program: Wildfire Risk to Structures



San Mateo County Parks
Wildfire Mitigation Program: Fire Hazard Severity Zones



San Mateo County Parks
Wildfire Mitigation Program: Key Access and Evacuation Routes



APPENDIX B

Project Maps


Donner Ave
Crystal Springs Rd
Crystal Springs Rd
280
Courtland Dr
Crystal Springs Rd
280
Junipero Serra
Junipero Serra
County Park
Junipero Serra
Lomita Ave
Crystal Springs Rd
Circle Ct
Terrace Dr
Ridgewoo
Robi
Brooks
Helen Dr
Junipero Serra County Park
Wildfire Mitigation Projects
May 2025
Fire Road
Trail
Planned
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
Completed
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
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Non-Shaded Fuel Break
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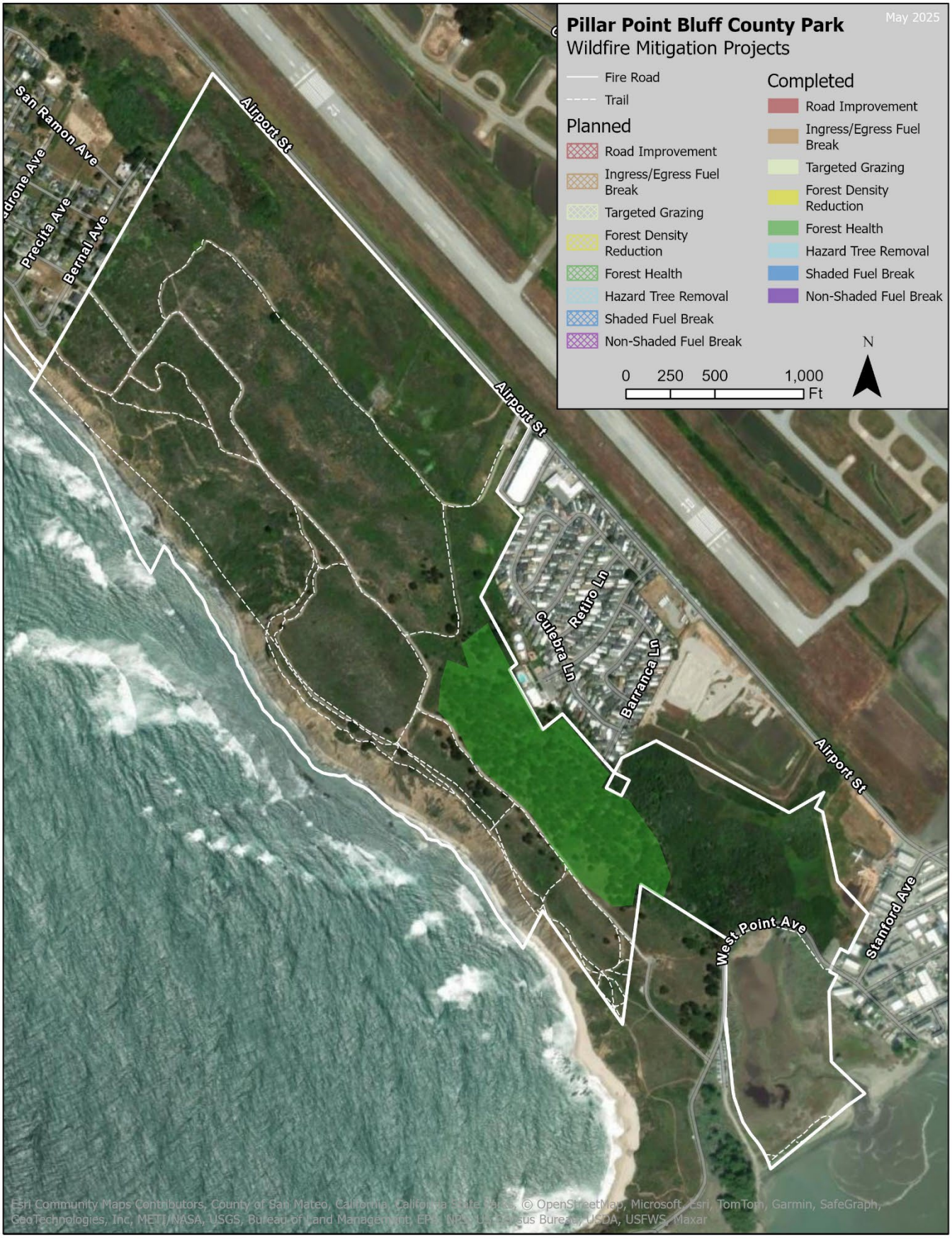
Pillar Point Bluff County Park
Wildfire Mitigation Projects
May 2025
Fire Road
Trail
Planned
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
Completed
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
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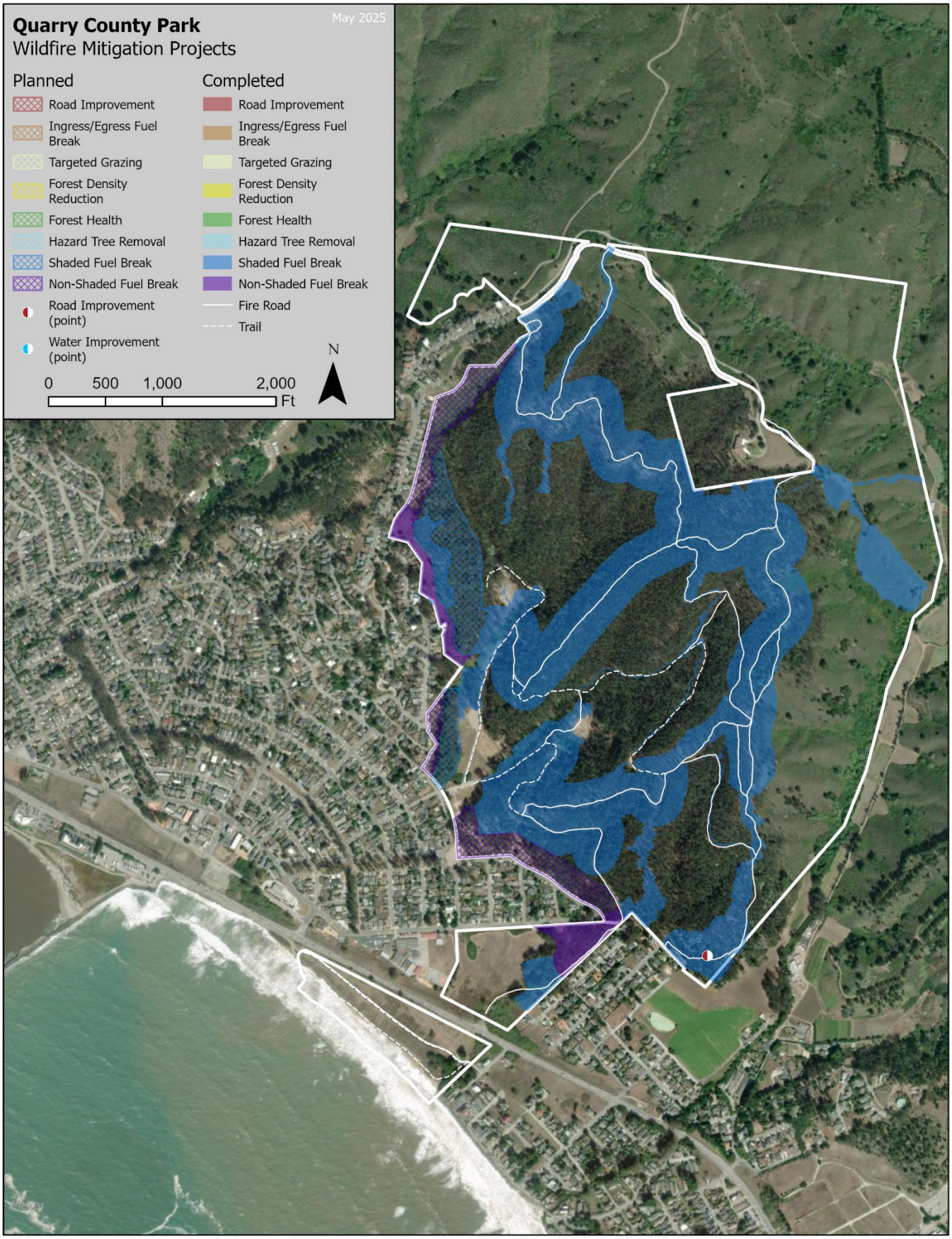
0 250 500 1,000
Ft
San Ramon Ave
Precita Ave
Bernal Ave
Airport St
Airport St
Retiro Ln
Culebra Ln
Barranca Ln
Airport St
West Point Ave
Stanford Ave
Esri Community Maps Contributors, County of San Mateo, California, California State Parks, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS, Maxar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Wildfire Mitigation Projects
May 2025
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Road Improvement
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Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
Road Improvement (point)
Water Improvement (point)
Completed
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
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Non-Shaded Fuel Break
Fire Road
Trail
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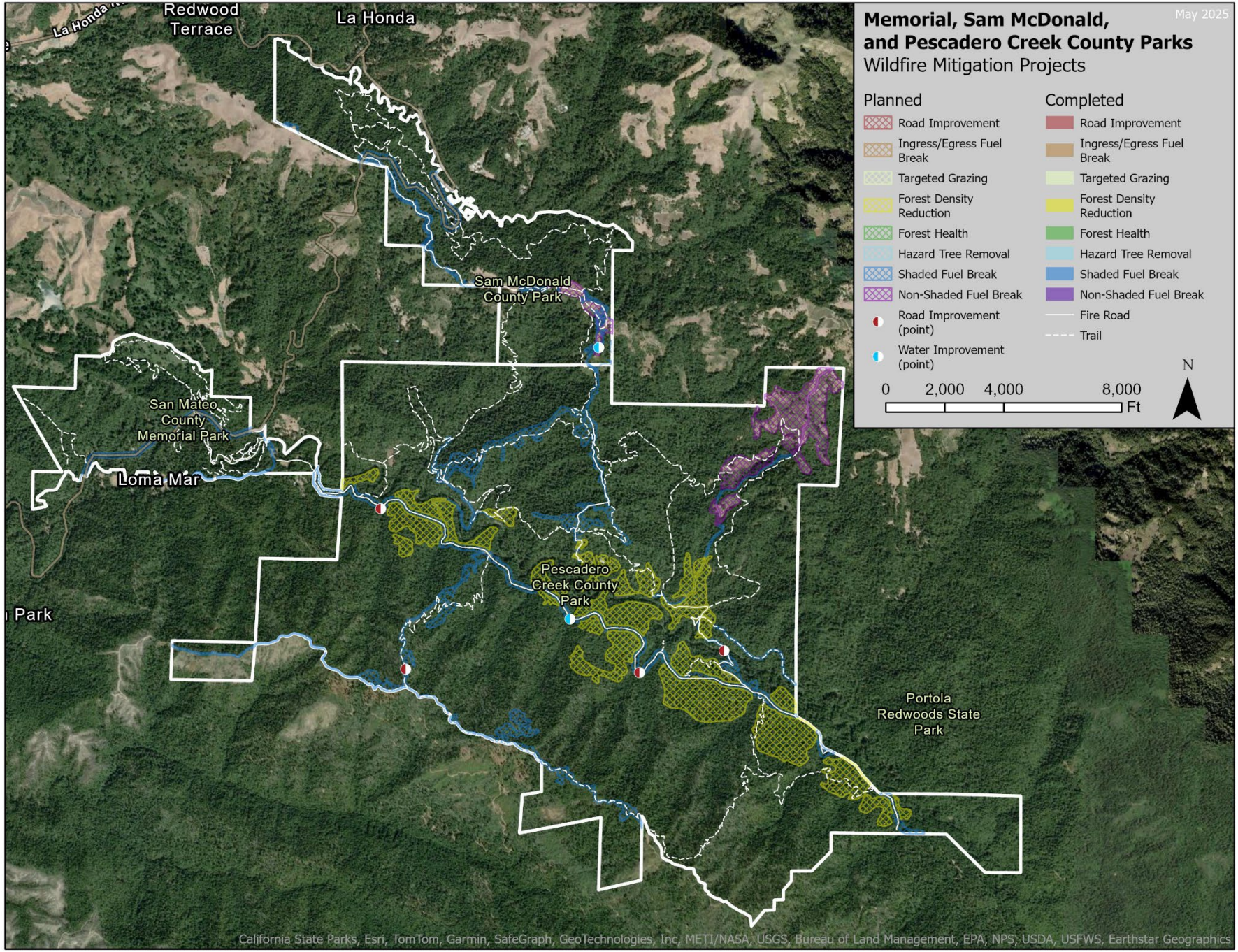
Memorial, Sam McDonald, and Pescadero Creek County Parks
Wildfire Mitigation Projects
May 2025
Planned
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
Road Improvement (point)
Water Improvement (point)
Completed
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
Fire Road
Trail
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0 2,000 4,000 8,000
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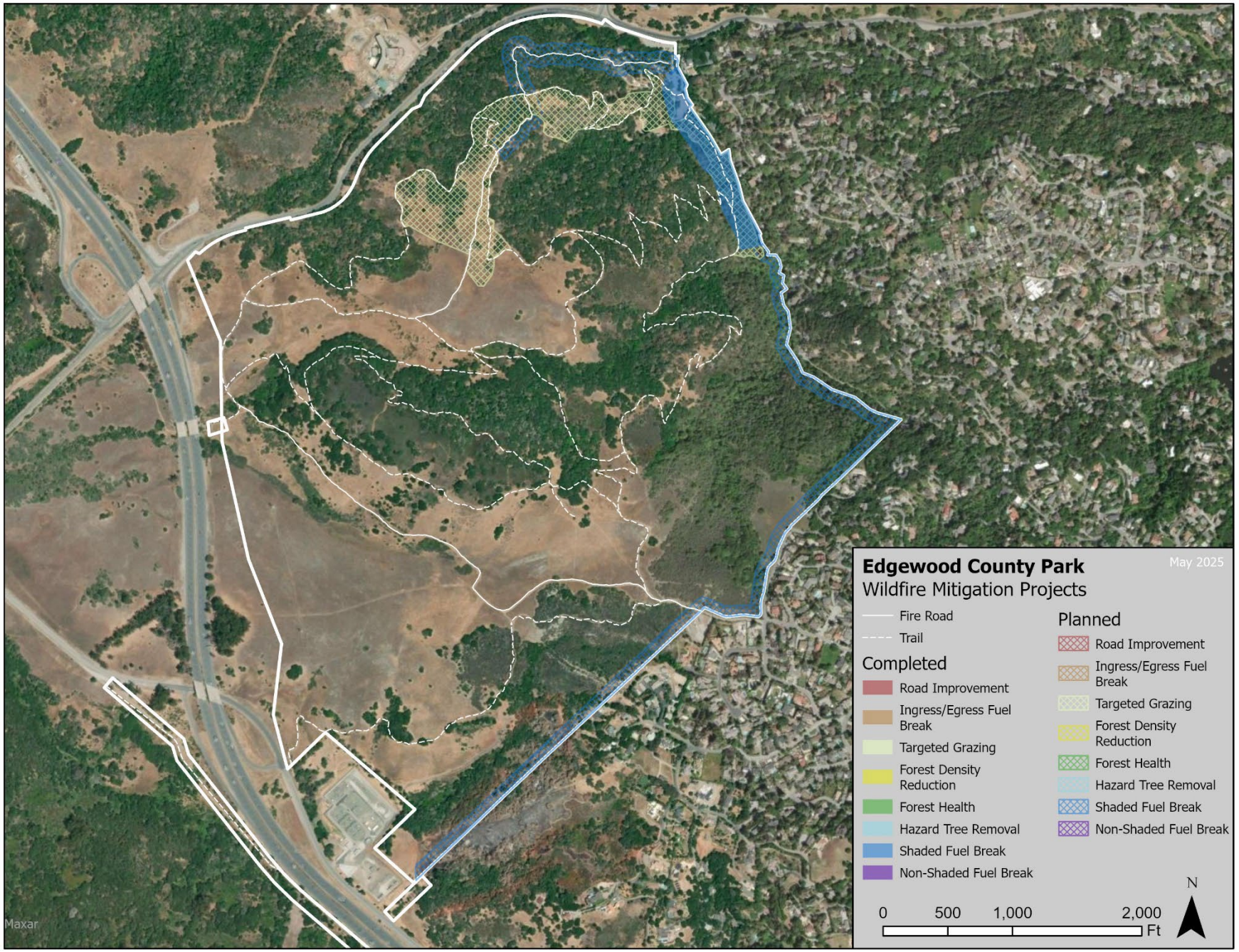
Redwood Terrace
La Honda
Sam McDonald County Park
San Mateo County Memorial Park
Loma Mar
Pescadero Creek County Park
Portola Redwoods State Park
California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, USFWS, Earthstar Geographics


Edgewood County Park
May 2025
Wildfire Mitigation Projects
Fire Road
Trail
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Road Improvement
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Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
Planned
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
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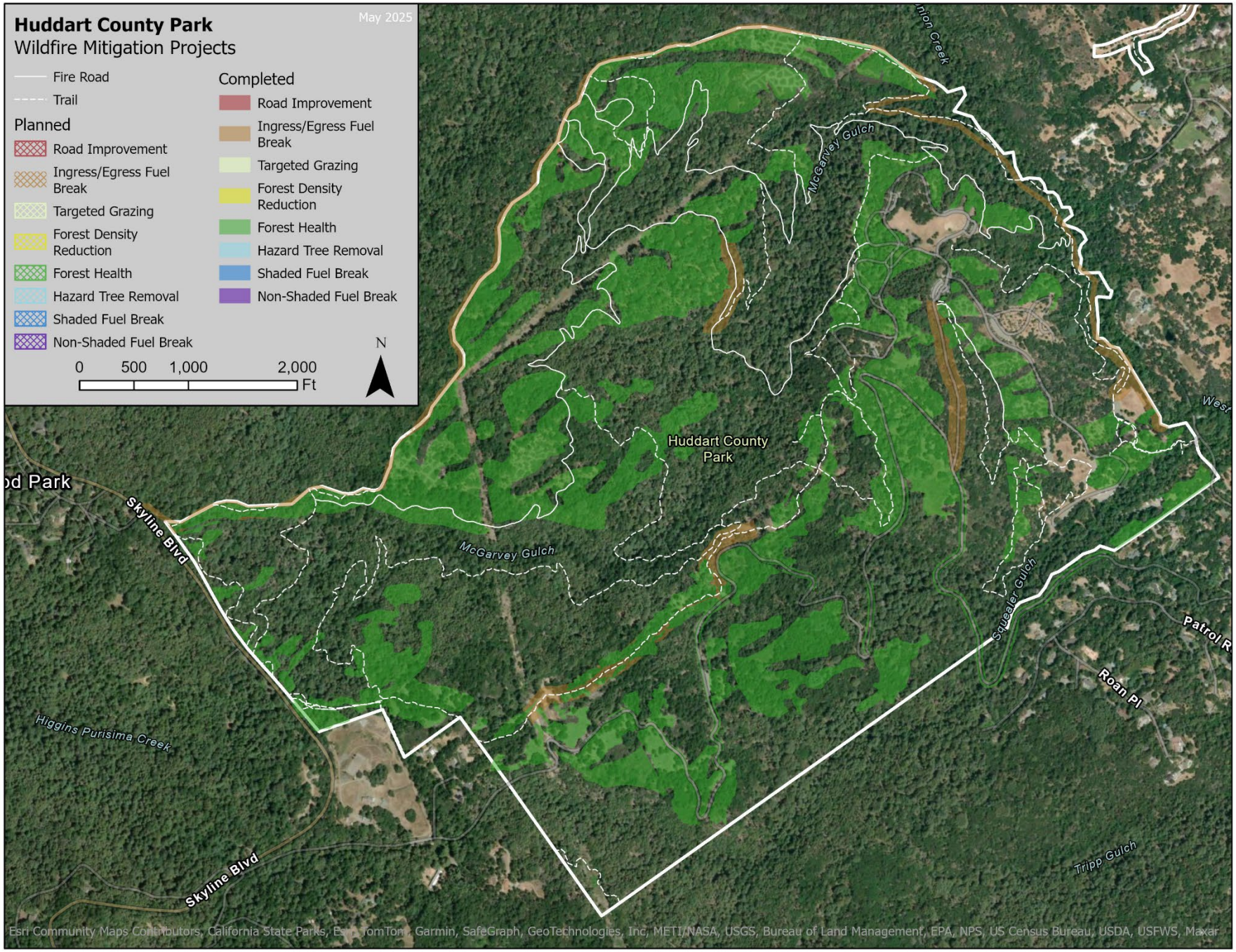
Huddart County Park
Wildfire Mitigation Projects
May 2025
Fire Road
Trail
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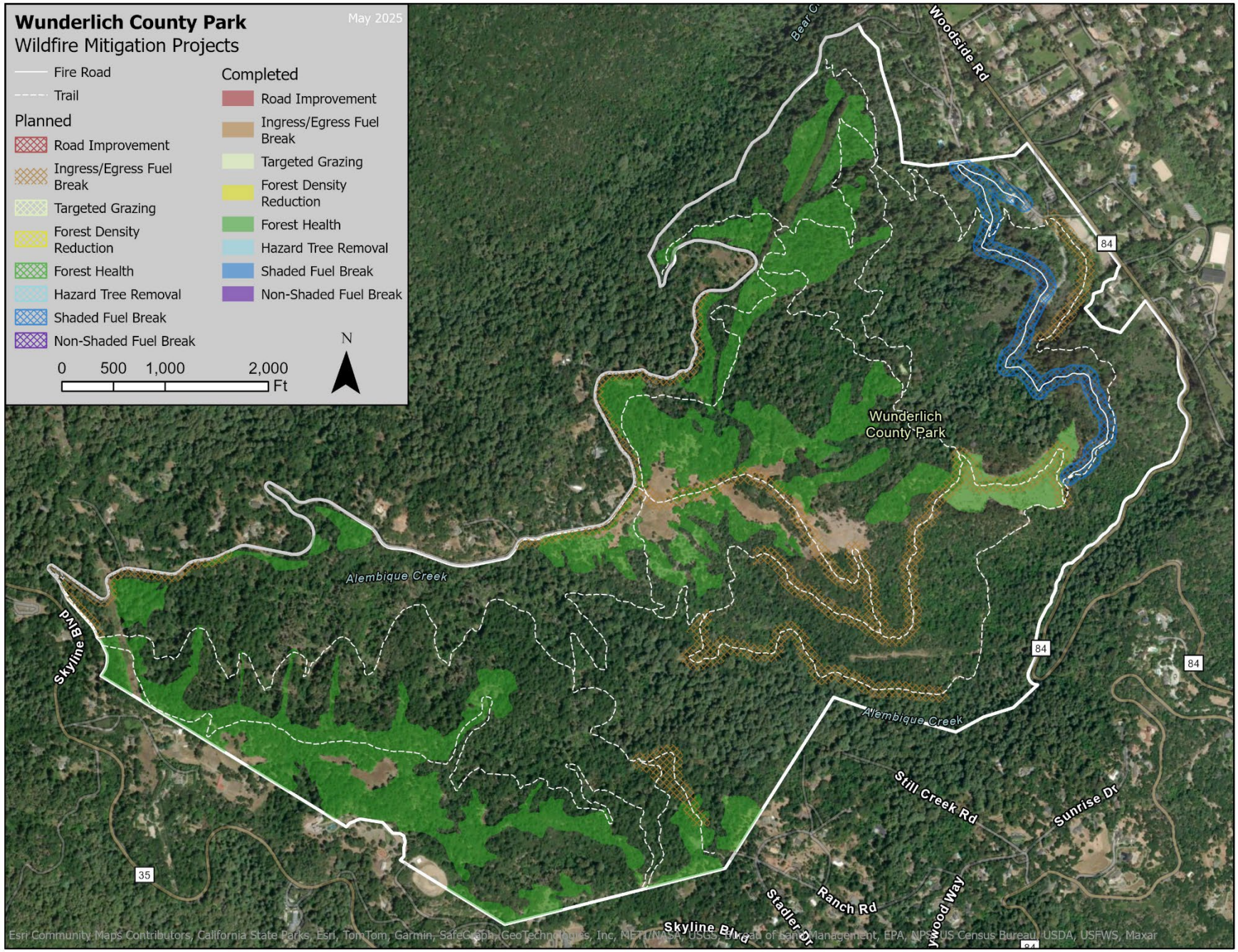
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
Completed
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
0 500 1,000 2,000 Ft
N
Huddart County Park
McGarvey Gulch
Skyline Blvd
Squealer Gulch
Roan Pl
Tripp Gulch
Higgins Purisima Creek
Esri Community Maps Contributors, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS, Maxar


Wunderlich County Park
May 2025
Wildfire Mitigation Projects
Fire Road
Trail
Planned
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
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Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
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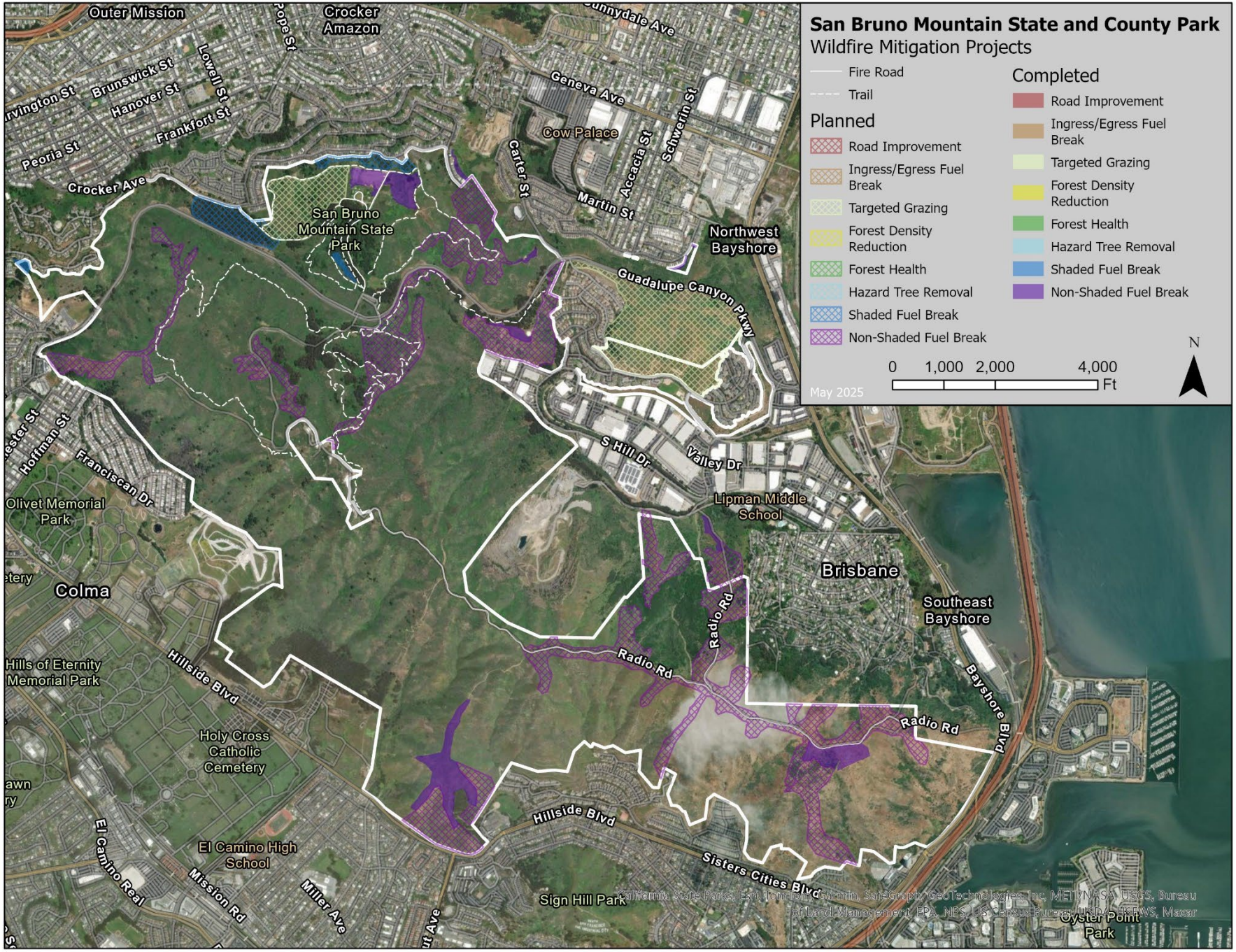
0 500 1,000 2,000
Ft
Woodside Rd
Wunderlich County Park
Alembique Creek
Skyline Blvd
Still Creek Rd
Sunrise Dr
Ranch Rd
Skyline Blvd
84
35
Esri Community Maps Contributors, California State Parks, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, US Census Bureau, USDA, USFWS, Maxar


San Bruno Mountain State and County Park
Wildfire Mitigation Projects
Fire Road
Trail
Planned
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
Completed
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
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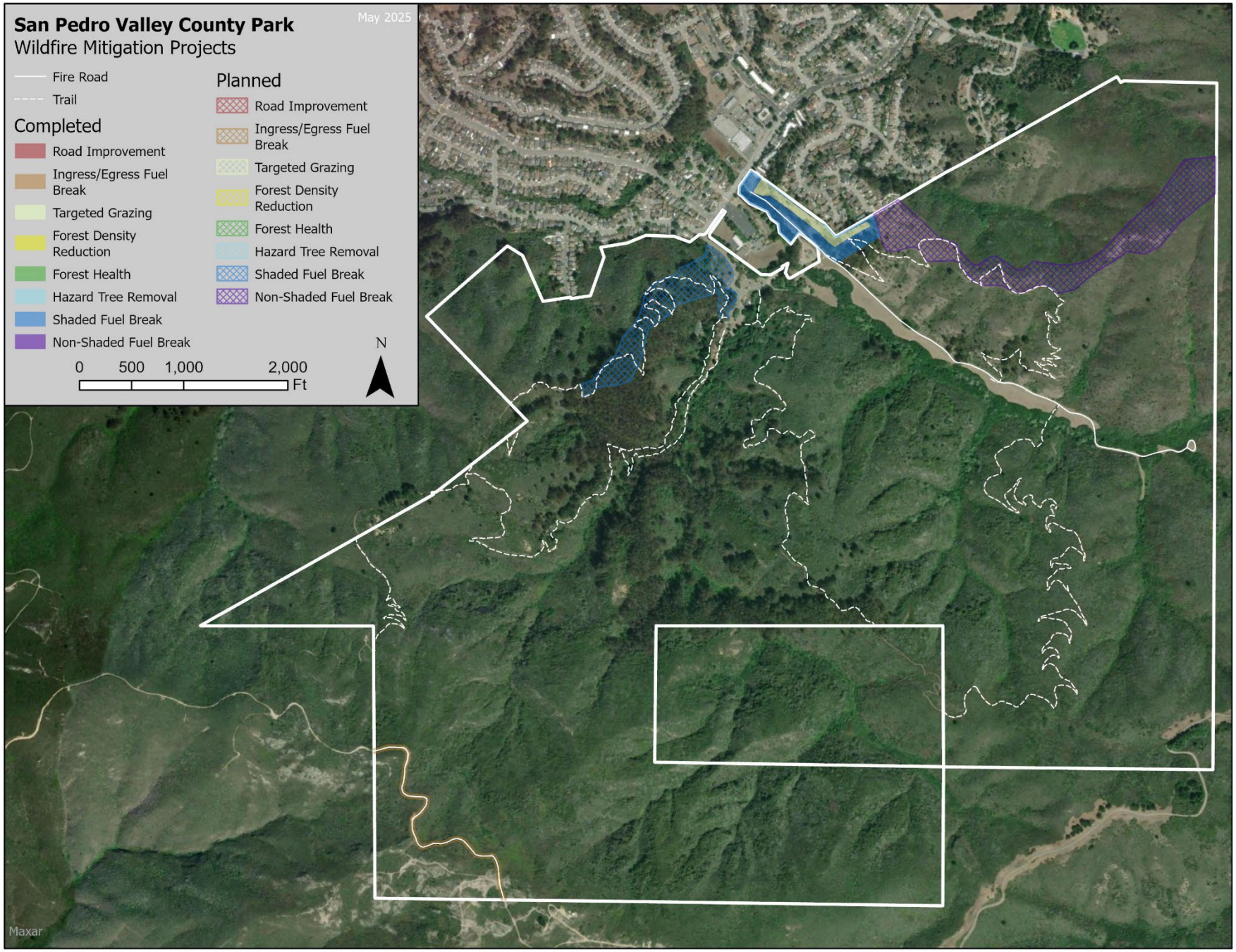
May 2025
Outer Mission
Crocker Amazon
Geneva Ave
Cow Palace
Carter St
Martin St
Accacia St
Schwerin St
Northwest Bayshore
Guadalupe Canyon Pkwy
San Bruno Mountain State Park
Crocker Ave
Peoria St
Frankfort St
Hanover St
Brunswick St
Lowell St
Irvington St
Hoffman St
Franciscan Dr
Olivet Memorial Park
Colma
S Hill Dr
Valley Dr
Lipman Middle School
Brisbane
Southeast Bayshore
Radio Rd
Bayshore Blvd
Hills of Eternity Memorial Park
Hillside Blvd
Holy Cross Catholic Cemetery
El Camino High School
El Camino Real
Mission Rd
Miller Ave
Sign Hill Park
Sisters Cities Blvd
Oyster Point Park


San Pedro Valley County Park
Wildfire Mitigation Projects
May 2025
Fire Road
Trail
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Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
Planned
Road Improvement
Ingress/Egress Fuel Break
Targeted Grazing
Forest Density Reduction
Forest Health
Hazard Tree Removal
Shaded Fuel Break
Non-Shaded Fuel Break
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Maxar

Standard Best Management Practices

BMP Number	BMP Title	BMP Description
General Avoidance and Minimization Measures		
GEN-1	Staging and Access	▪ Staging, access, and parking areas will be located outside of sensitive habitats to the extent feasible. ▪ Staging areas will be located 30 feet from the top of bank (or as far as feasibly possible) or on the outboard side of levees. ▪ Vegetation removal shall be limited to the minimum amount necessary to provide access.
GEN-2	Minimize Area of Disturbance and Site Maintenance	▪ Areas of disturbance will be limited to the smallest footprint necessary and a single access pathway, where feasible. For maintenance activities near waterways or other sensitive habitat, the designated work area shall be clearly identified in the field using highly visible material, and work will not be conducted outside this area. ▪ Keep excavated soil and materials on the site where they will not collect into the street or get transported to storm drains or nearby water bodies by rainfall or runoff in order to avoid deleterious effects to fish, wildlife, and beneficial uses. ▪ Transfer excavated materials to dump trucks on the site, not in the street.
GEN-3	Project Entrances and Perimeter	▪ Establish and maintain effective perimeter controls and stabilize all project entrances and exits to sufficiently control erosion and sediment discharges from site and tracking off site. ▪ Use dust control measures or sweeping as needed on any access routes
GEN-6	Hazardous Materials Storage/ Disposal	▪ Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state, and federal regulations. ▪ Store hazardous materials and wastes in watertight containers, store in appropriate secondary containment, and cover them at the end of every workday or during wet weather or when rain is forecast. ▪ Follow manufacturer's application instructions for hazardous materials and be careful not to use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours. ▪ Arrange for appropriate disposal of all hazardous wastes.
GEN-7	Spill Prevention and Control	• Keep spill cleanup materials (rags, absorbents, etc.) available at the construction site at all times. • Inspect vehicles and equipment frequently for and repair leaks promptly. On-site monitor should insect beneath all vehicles that have been parked more than 15 minutes before they leave the work area. Use drip pans to catch leaks until repairs are made. • Clean up spills or leaks immediately and dispose of cleanup materials properly. • Do not hose down surfaces where fluids have spilled. Use dry cleanup methods (absorbent materials, cat litter, and/or rags). • Sweep up spilled dry materials immediately. Do not try to wash them away with water or bury them. If water must be used, the Contractor shall collect the water and spilled fluids and dispose of it as hazardous waste. • Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.

BMP Number	BMP Title	BMP Description
GEN-7	Spill Prevention and Control (continued)	• Small spills (less than 18 inches in diameter) including small quantities of oil, gasoline, paint or other materials should be controlled by the first responder (maintenance staff) and do not necessarily require an emergency response team. Medium spills (greater than 18 inches but less than 6 feet in diameter) are typically controlled by the first responder (maintenance staff) but police or fire department HAZMAT teams may be called based on conditions. Report significant spills (larger than 6 feet in diameter and any "running" spill) immediately. You are required by law to report all significant releases of hazardous materials, including oil. To report a spill, contact the San Mateo County Environmental Health Services Division, or other emergency office (e.g., local fire or police department) as warranted, immediately and document the spill using the spill documentation form . Alternatively, 1) dial 911, the local emergency response number, the National Response Center at (800) 424-8802; or 2) call the Governor's Office of Emergency Services Warning Center, (800) 852-7550 (24 hours). As appropriate, contact other agencies including California Occupational Safety and Health Administration or the Regional Water Quality Control Board. All chemical spills shall be reported as soon as possible to the emergency site contact.
GEN-8	Waste Management	Cover waste disposal containers securely at the end of every workday and during wet weather. ▪ Check waste disposal containers frequently for leaks and to make sure they are not overfilled. Never hose down a dumpster on the construction site. ▪ Ensure that portable toilets have a secondary containment plan (e.g., a containment pan). ▪ Clean or replace portable toilets and inspect them frequently for leaks and spills. ▪ Dispose of all wastes and debris properly. Recycle materials and wastes that can be recycled (such as asphalt, concrete, aggregate base materials, wood, gyp board, pipe, etc.) ▪ Dispose of liquid residues from paints, thinners, solvents, glues, and cleaning fluids as hazardous waste.
GEN-9	Vehicle Maintenance and Parking	▪ Designate an area, fitted with appropriate BMPs, for vehicle and equipment parking and storage. ▪ Perform major maintenance, repair jobs, and vehicle and equipment washing off site. ▪ Conduct vehicle and equipment cleaning at County corporation yards and ensure that rinse water does not run into gutters, streets, storm drains, or surface waters. ▪ If refueling or vehicle maintenance must be done on-site, work in a bermed area (e.g., sandbags, gravel bags, compost socks, or other barrier material) at least 150 feet away from creek channels, away from storm drains and over a drip pan big enough to collect fluids. ▪ Refuel vehicles at least 150 feet away from the active stream channel. ▪ Keep an ample supply of spill clean-up materials near fueling, vehicle maintenance and hazardous materials/hazardous waste storage areas. Inventory clean-up materials monthly and restock as needed. ▪ Post proper fueling and spill clean-up instructions at fueling areas. Never leave the area while equipment is being filled. ▪ Recycle or dispose of fluids as hazardous waste. ▪ Do not clean vehicle or equipment on-site using soaps, solvents, degreasers, steam cleaning equipment, etc. ▪ Perform vehicle and mobile equipment steam cleaning, pressure washing or degreasing only over a containment designed to collect any generated wash water. Collect wash water and discharge to sewer via an oil water separator. Do not pour wash water down storm drains or sewers connected to septic systems.

BMP Number	BMP Title	BMP Description
GEN -10	Equipment Maintenance & Fueling	▪ A separate area should be designated for equipment maintenance and fueling, away from any slopes, watercourses, or drainage facilities. ▪ Equipment should not be stored in areas that will potentially drain to watercourses or drainage facilities. If equipment must be stored in areas with the potential to generate runoff, drip pans, berms, gravel bags, or absorbent booms should be employed to contain any leaks or spills. ▪ Equipment should be inspected daily for leaks or damage and promptly repaired. ▪ Fueling and maintenance of vehicles should take place at least 65 feet away from waterways. ▪ In the event of a spill, follow procedures outlined in BMP GEN-7.
GEN-16	Timing of Work	▪ In general, routine maintenance and construction activities that take place in sensitive habitat and/or in channels below ordinary high water will be conducted during the dry season (June 15 through October 15). Maintenance activities that are in upland areas and that would not affect streams may occur during low rainfall years at times when there is no predicted rainfall (chance of precipitation is less than 30 percent chance of rain). Activities that are subject to permit requirements will be conducted during the period authorized by the permits.
GEN-17	Maintain Traffic Flow	▪ To the extent feasible, work shall be staged and conducted in a manner that maintains two-way traffic flow on roadways in the vicinity of the work site. ▪ Heavy equipment and haul traffic shall be prohibited in residential areas to the greatest extent feasible. When no other route to and from the site is available, heavy equipment and haul traffic through residential areas shall be restricted to the hours of 8 a.m. to 5:30 p.m., Monday through Friday. ▪ If heavy equipment or hauling is required beyond the hours above, the County or their contractor would provide notice to adjacent property owners 48 hours in advance of such activities.
GEN-18	Traffic Control and Public Safety	▪ In the event that work activities require the temporary closure of any traffic lanes, the County shall implement measures to guide traffic (such as signage and flaggers), safeguard construction workers, provide safe passage of vehicles, and minimize traffic impacts through the duration of work activities. The County also shall notify local emergency service providers regarding any planned lane closures. ▪ For any other work within or near the roadway that could pose a hazard to the public, the County shall install/implement appropriate measures, such as fences, barriers, flagging, guards, and/or signs, to give adequate warning and provide protection from the potentially dangerous condition. ▪ For work activities along or near roadways with sidewalks and bike lanes, the County shall implement measures to ensure the safe passage of pedestrians and bicyclists around the work site. ▪ Where work is proposed at a recreational park or trail, warning signs will be posted several feet beyond the limits of work. Signs will also be posted if trails will be temporarily closed.

BMP Number	BMP Title	BMP Description
GEN-19	Dust Management Controls	The County will implement the Bay Area Air Quality Management District (BAAQMD) Basic Dust Control Measures. Current measures stipulated by the BAAQMD Guidelines include the following: • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off-site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
GEN-20	Firearms	No firearms (except for federal, State, or local law enforcement officers and security personnel) will be permitted at the project site to avoid harassment, killing or injuring of wildlife.
GEN-21	Domestic Animals	No animals (e.g., dogs or cats) can be brought to the project site to avoid harassment, killing or injuring of wildlife.
GEN-23	Fire Prevention	1. All earthmoving and portable equipment with internal combustion engines will be equipped with spark arrestors. 2. During the high fire danger period (April 1–December 1), work crews will: ▪ Have appropriate fire suppression equipment available at the work site. ▪ Keep flammable materials, including flammable vegetation slash, at least 10 feet away from any equipment that could produce a spark, fire, or flame. ▪ Not use portable tools powered by gasoline-fueled internal combustion engines within 25 feet of any flammable materials unless a round-point shovel or fire extinguisher is within immediate reach of the work crew (no more 25 feet away from the work area).
GEN-28	Herbicide Application	▪ Herbicide application shall only be conducted when the climate is dry and when wind speeds do not exceed 7 miles per hour. Herbicides shall not be used in or adjacent to any fish-bearing stream, lake, pond or other water bodies 3. supporting suitable habitat for California red-legged frog or other listed species.

Cultural Resources Best Management Practices

BMP Number	BMP Title	BMP Description
CUL-1	Review Cultural Resources Sensitivity Map Data and County Baseline Maps to Determine if the Work Area Has Been Subject to a Previous Cultural Resource Study	During the early phases of Annual Work Plan development, the County will review the Cultural Sensitivity Map Data and County Baseline Maps (Appendix I) for all locations where ground-disturbing activities are proposed where excavation would be required beyond the facility's as-built design or otherwise reach previously undisturbed soils beyond existing engineered depths or extent. If the foregoing conditions are not applicable to the maintenance activity being performed, only BMPs CUL-4 and CUL-5 will be required. Based on the location of projects, and whether or not excavation or ground disturbance will occur beyond existing engineered depths or extent, BMPs CUL-2 through CUL-4 shall be implemented as follows: ▪ High Sensitivity: BMPs CUL-2, CUL-3, and CUL-4 ▪ Moderate Sensitivity: BMP CUL-2 and CUL-3 ▪ Low Sensitivity: BMPs CUL-2 through CUL-4 not required ▪ Unknown Sensitivity: BMP CUL-2 and CUL-3 ▪ BMPs CUL-5 and CUL-6 are applicable to all ground-disturbing activities in natural channels or native soils, regardless of the sensitivity level of the work area.
CUL-2	Record Search and Field Inventory for Highly or Moderately Sensitive Areas (Sensitivity Ratings 3-5), and Areas of Unknown Sensitivity	▪ The County will retain a qualified cultural resources specialist to conduct a review and evaluation of locations that involve soil disturbance/excavation in natural channels or native soils identified as Highly to Moderately Sensitive to determine the potential for these activities to affect significant cultural resources. ▪ The initial evaluation will be based on a review of archival information provided by the Northwest Information Center (NWIC) of the California Historical Resources Information System in regard to the project area based on a 0.25-mile search radius. This initial archival review will be completed by the professional archaeologist who will be able to view confidential site location data and literature to arrive at a preliminary sensitivity determination. ▪ It is recommended that the County conduct a review of the Sacred Lands Inventory of the Native American Heritage Commission (NAHC) and due diligence outreach with individuals identified by the NAHC and/or local historical societies or groups. This outreach would involve sending a letter with a request for pertinent information about cultural resources within the project area and to identify any concerns. This outreach is in addition to notification under PRC 21080.3.1 (i.e., CUL-3), and may be appropriate for projects that would not otherwise require Assembly Bill 52 notification. Such outreach is also encouraged under Section 106 implementing regulations at 36 CFR 800.4(a)(3) for identification of historic properties. ▪ The qualified archaeologist will conduct field inventory of the project area to determine the presence/absence of surface cultural materials. The results, along with any mitigation and/or management recommendations, will be presented to the County in an appropriate report format that includes any necessary maps, figures, and correspondence with interested parties. The report will also include a summary of the records search and archival research data, and pertinent geoarchaeological overviews and studies, and regional research designs, as appropriate. ▪ A summary table indicating appropriate management actions (e.g., monitoring during construction, presence/absence testing for subsurface resources, and data recovery) will be developed for each project work area reviewed.

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		▪ The maintenance activities will be implemented to avoid significant impacts to cultural resources, if possible. **EXCEPTIONS**: After the NWIC record search and NAHC sacred lands search have been conducted, the qualified archaeologist may determine that a field review is not necessary under the following circumstances: ▪ Locales that have previously been subject to cultural resource studies where no previously identified cultural resources or historical resources were documented. ▪ Locales that have previously been subject to cultural resources studies, but identified cultural resources have been determined by a qualified archaeologist/resource specialist as not eligible for listing in the California Register of Historical Resources (CRHR) or the National Register of Historic Places (NRHP). ▪ A short report would be required to document the decision not to conduct a field study.
CUL-3	Consult with Native American Tribes	▪ The County, as the lead CEQA agency, has notified Native American tribes about the Maintenance Program according to PRC 21080.3.1 (also referred to as Assembly Bill 52); *only Native American tribes that have previously requested notification from the County pursuant to PRC 21080.3.1(b) require notification*. For tribes that request consultation under PRC 21080.3.1(b)(2), the County will consult with those tribes pursuant to PRC 21080.3.2 for projects in areas of high, moderate, and unknown sensitivity.
CUL-4	Construction Monitoring	▪ The County will retain a qualified archaeologist to be present on-site during ground-disturbing activities within areas identified as highly sensitive for cultural areas, unless the qualified archaeologist determines otherwise after the field inventory conducted under CUL-2. Similarly, after conducting the field study under CUL-2, the qualified archaeologist may determine that areas originally identified as moderately sensitive for cultural resources warrant monitoring during construction. The reasons for conducting monitoring in areas initially considered of moderate sensitivity would be discussed in the inventory report. ▪ The qualified archaeologist will have the authority to stop work if cultural resources are discovered. ▪ If any cultural resources are discovered during construction monitoring, BMP CUL-6 would be implemented as appropriate.
CUL-5	Conduct Pre-Maintenance Educational Training	At the beginning of each maintenance season, and in concert with implementing BMP BIO-1, as well as before conducting activities subject to BMP CUL-2 through CUL-4, all maintenance personnel will participate in an educational training session conducted by a qualified cultural resources specialist. This training will include instruction on how to identify historic and prehistoric resources that may be encountered, and will describe the appropriate protocol to be followed if resources are discovered during maintenance work.
CUL-6	Address Discovery of Cultural Remains or Historic or Paleontological Artifacts Appropriately	Unanticipated discoveries of cultural and paleontological resources may occur during maintenance construction activities. Examples of cultural remains are obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or significant areas of tool-making debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period artifacts may include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. Paleontological artifacts are fossilized remains of plants and animals. Work will be restricted or stopped in areas where remains or artifacts are found until proper protocols are met.

		Protocol for treatment of prehistoric or historic cultural resources: 1. Work at the location of the find will halt immediately within 50 feet of the find. A "no work" zone will be established utilizing appropriate flagging to delineate the boundary of this zone, which will measure at least 50 feet in all directions from the find. 2. The County will retain the services of a consulting archaeologist, who will visit the discovery site as soon as practicable and perform minor hand excavation to describe the archaeological or paleontological resources present and assess the amount of disturbance. 3. The consulting archaeologist will provide to the County and USACE, at a minimum, written and digital-photographic documentation of all observed materials, utilizing the CRHR and NRHP guidelines for evaluating archaeological resources. Based on the assessment, the County and USACE will identify the CEQA and Section 106 cultural resources compliance procedures to be implemented. 4. If the consulting archaeologist determines that the find appears not to meet the CRHR or NRHP criteria of significance, and a USACE archaeologist concurs with the consulting archaeologist's conclusions, construction may continue while monitored by the consulting archaeologist. The authorized maintenance work will resume at the discovery site only after the County has retained a consulting archaeologist to monitor and the Maintenance Manager has received notification from USACE allowing work to continue. 5. If the find appears significant, avoidance of additional impacts is the preferred alternative. The consulting archaeologist will determine if adverse impacts to the resources can be avoided. 6. Where avoidance is not practical (e.g., maintenance activities cannot be deferred or must be completed to satisfy the Maintenance Program objective), the County will develop an action plan (also known as a data recovery plan) and submit it to USACE within 48 hours of determining that maintenance activities cannot be deferred. The action plan will be submitted by email to the appropriate archeological/cultural resources contact at the USACE. The action plan is equivalent to a data recovery plan. It will be prepared in accordance with the current professional standards and state guidelines for reporting the results of the work, and will describe the services of a Native American consultant and a proposal for curation of cultural materials recovered from a non-grave context. 7. The recovery effort will be documented in a report prepared by the consulting archaeologist in accordance with current archaeological standards. Any non-grave artifacts will be placed with an appropriate repository. 8. In the event of discovery of human remains (or if a find consists of bones suspected to be human), the field crew supervisor will take immediate steps to secure and protect such remains from vandalism during periods when work crews are absent.) 9. The maintenance crew supervisor will immediately notify the San Mateo County Coroner and provide any information that identifies the remains as Native American. If the remains are determined to be those of a prehistoric Native American or a Native American from the ethnographic period, the Coroner will contact NAHC within 24 hours of being notified about the remains. NAHC will designate and notify a Most Likely Descendant (MLD) within 24 hours. The MLD will have 24 hours to consult and provide recommendations for the treatment or disposition, with proper dignity, of the human remains and grave goods. 10. Preservation in situ is the preferred option for human remains. Human remains will be preserved in situ if continuation of the maintenance work, as determined by the consulting archaeologist and MLD, will not cause further damage to the remains. The remains and artifacts will be documented, the find location carefully backfilled (with protective geo-fabric if desirable), and the information recorded in County Maintenance Program files.

BMP Number	BMP Title	BMP Description
		11. If human remains or cultural items are exposed during maintenance that cannot be protected from further damage, they will be exhumed by the consulting archaeologist at the discretion of the MLD and reburied, with the concurrence of the MLD, in a place mutually agreed upon by all parties. <u>Protocol for treatment of paleontological resources:</u> 1. Work at the location of the find will halt immediately within 50 feet of the find. A "no work" zone will be established utilizing appropriate flagging to delineate the boundary of this zone, which will measure at least 50 feet in all directions from the find. 2. The County shall retain the services of a consulting paleontologist. The consulting paleontologist will meet the Society for Vertebrate Paleontology's criteria for a qualified professional paleontologist (Society of Vertebrate Paleontology 2010). 3. The consulting paleontologist shall visit the discovery site as soon as practicable and perform minor hand-excavation to describe the paleontological resources present and assess the amount of disturbance. The consulting paleontologist will follow the Society for Vertebrate Paleontology's guidelines (2010) for treatment of the artifact. Treatment may include preparation and recovery of fossil materials for an appropriate museum or university collection, and may include preparation of a report describing the finds. The County will be responsible for ensuring that the consulting paleontologist's recommendations for treatment are implemented.

Table 9-3. Biological Resources Best Management Practices

BMP Number	BMP Title	BMP Description
BIO-1	Environmental Awareness Training	Prior to commencing maintenance activities in a given year, all participating maintenance personnel will attend a worker environmental awareness training program. The training will include a brief review of special-status species, sensitive habitats, and other sensitive resources that may exist in the project area, including field identification, habitat requirements, and the legal status and protection of each relevant species, as well as locations of sensitive biological resources. The training will include materials concerning the following topics: sensitive resources, resource avoidance, permit conditions, and possible consequences for violations of State or Federal environmental laws. The training will cover the maintenance activity's conservation measures, environmental permits, and regulatory compliance requirements, as well as the roles and authority of the monitors and biologist(s). It will include printed material and an oral training session by a qualified biologist.
BIO-3	California Red-legged Frog Protection Measures	If suitable habitat for California red-legged frog is determined to exist in or around the work area where maintenance activities are planned to occur, the County will implement applicable protection measures as follows: ▪ No more than twenty-four (24) hours prior to the date of initial ground disturbance or mowing, a pre-activity survey for the California red-legged frog will be conducted by a qualified biologist at the work site. The survey will consist of walking the work area limits to ascertain the possible presence of the species. The qualified biologist will investigate all potential areas that could be used by the California red-legged frog for feeding, breeding, sheltering, movement, and other essential behaviors. This includes an adequate examination of mammal burrows, such as those of California ground squirrels (*Spermophilus beecheyi*) or gophers (*Thomomys bottae*). If any adults, subadults, juveniles, tadpoles, or eggs are found, the qualified biologist will contact the USFWS to determine if moving any of the individuals is appropriate. If the USFWS approves moving animals, the biologist and USFWS will identify a suitable relocation site, and the County will ensure the qualified biologist is given sufficient time to move the animals from the work site before ground disturbance is initiated. Only qualified biologists will capture, handle, and monitor the California red-legged frog. ▪ To minimize harassment, injury, death, and harm to individual California red-legged frogs, one of the following two measures will be implemented. ▪ An approved, qualified biologist(s) will be on-site during all activities that may result in take of the California red-legged frog, as determined by the biologist taking into account all information gathered during the desktop audit of the site as well as the preconstruction survey. Qualified biologists must be approved by the USFWS. ▪ Or: Prior to pre-activity surveys, personnel will enclose the work area with an exclusion fence with a minimum height above grade of 42 inches. The bottom of the fence will either be buried a minimum of six inches below ground or otherwise secured in a manner approved by the USFWS and will remain in place during all maintenance activities in order to prevent California red-legged frogs from entering the work area. Escape ramps, funnels, or other features that allow animals to exit the work area, but which will prohibit the entry of such animals, will be provided in the exclusion fencing. A qualified biologist will conduct a pre-activity survey of the fence installation area immediately prior to (i.e., the day of) the commencement of installation and will be on-hand to monitor fence installation. The exclusion fencing will be inspected daily by maintenance personnel and maintained for the duration of maintenance implementation.

BMP Number	BMP Title	BMP Description
		▪ The qualified biologist(s) will be given the authority to freely communicate verbally, by telephone, electronic mail, or in writing at any time with maintenance personnel, any other person(s) at the work area, otherwise associated with the maintenance work, the USFWS, the CDFW, or their designated agents. The qualified biologist will have oversight over implementation of all the conservation measures in this programmatic biological opinion, and will have the authority and responsibility to stop work activities if they determine any of the associated requirements are not being fulfilled. If the qualified biologist(s) exercises this authority, the USFWS will be notified by telephone and electronic mail within twenty-four (24) hours. The USFWS contact is the Coast Bay Foothills Division Chief of the Endangered Species Program at the Sacramento Fish and Wildlife Office at telephone (916) 414-6600. ▪ The County will minimize adverse impacts to the California red-legged frog by limiting, to the maximum extent possible, the number of access routes, ground disturbance area, equipment staging, storage, parking, and stockpile areas. Prior to initiating maintenance work that involve ground-disturbing activities, equipment staging areas, site access routes, sediment removal and transportation equipment and personnel parking areas, debris storage areas, and any other areas that may be disturbed will be identified, surveyed by the qualified biologist, and clearly identified with fencing. The fencing will be inspected by the qualified biologist and maintained daily until the last day that equipment is at the site. ▪ To the extent practicable, ground-disturbing activities will be avoided from October through April because that is the time period when California red-legged frogs are most likely to be moving through upland areas. When ground-disturbing activities must take place between November 1 and March 31, the County will ensure that daily monitoring by the qualified biologist is completed for the California red-legged frog. ▪ If egg masses are present and work cannot be postponed until after hatching, a buffer of vegetation at least 10 feet in diameter shall be left around any egg masses found. Staff will keep a record of any sites where egg masses are found and will conduct vegetation removal at these sites between June 15 and October 15. Staff shall avoid entering the channel to avoid dislodging egg masses. Activities shall be performed from the banks. ▪ To minimize harassment, injury, death, and harm in the form of temporary habitat disturbances, all maintenance-related vehicle traffic will be restricted to established roads, sediment removal and access areas, equipment staging, storage, parking, and stockpile areas. These areas will be included in pre-activity surveys and, to the maximum extent possible, established in locations disturbed by previous activities to prevent further adverse impacts. Maintenance-related vehicles will observe a 20-mile per hour speed limit within work areas, except on County roads, and State and Federal highways. Off-road traffic outside of designated and fenced work areas will be prohibited. ▪ When a California red-legged frog is encountered in the work area, all activities which have the potential to result in the harassment, injury, or death of the individual will be immediately halted. The qualified biologist will then assess the situation in order to select a course of action that will avoid or minimize adverse impacts to the animal. To the maximum extent possible, contact with the frog will be avoided and the individual will be allowed to move out of the potentially hazardous situation to a secure location on its own volition. This procedure applies to situations where a California red-legged frog is encountered while it is moving to another location. It does not apply to animals that are uncovered or otherwise exposed or in areas where there is not sufficient adjacent habitat to support the species should the individual move away from the hazardous location.

BMP Number	BMP Title	BMP Description
		▪ California red-legged frogs that are in danger will be relocated and released by the qualified biologist outside the work area within the same riparian area or watershed. If relocation of the individual outside the work area is not feasible (i.e., there are too many individuals observed per day), the biologist will relocate the animals to a USFWS preapproved location. Prior to the initial ground disturbance, the County will obtain approval of the relocation protocol from the USFWS in the event that a California red-legged frog is encountered and needs to be moved away from the work site. Under no circumstances will a California red-legged frog be released on a site unless the written permission of the landowner has been obtained by the County. The qualified biologist will limit the duration of the handling and captivity of the California red-legged frog to the minimum amount of time necessary to complete the task. If the animal must be held in captivity, it will be kept in a cool, dark, moist, aerated environment, such as a clean and disinfected bucket or plastic container with a damp sponge. ▪ The County will immediately notify the USFWS once the California red-legged frog and the site is secure. The USFWS contact for this situation is the Coast Bay Foothills Division Chief of the Endangered Species Program by email and at telephone (916) 414-6600. ▪ A litter control program will be instituted at each activity site. All workers will ensure their food scraps, paper wrappers, food containers, cans, bottles, and other trash are deposited in covered or closed trash containers. The trash containers will be removed from the site at the end of each working day. ▪ The County will comply with all herbicide application requirements mandated by the USEPA and stipulated injunctions pertaining to California red-legged frog. For example, herbicides will be limited for controlling state-designated invasive species and noxious weeds, will not be used within 15 feet of aquatic breeding critical habitat or non-breeding aquatic critical habitat areas or within 15 feet of aquatic features within non-critical habitat sections subject to the 2006 Court-ordered injunction; precipitation is not occurring or forecast to occur within 24 hours; herbicide is limited to localized spot treatment using hand-held devices; and herbicide will be applied by a certified applicator or person working under the direct supervision of a certified applicator. ▪ For on-site storage of pipes, conduits and other materials that could provide shelter for California red-legged frogs, materials will be securely capped prior to storage or an open-top trailer will be used to elevate the materials above ground. This is intended to reduce the potential for animals to climb into the conduits and other materials. ▪ To the maximum extent practicable, no maintenance activities will occur during rain events or within 24-hours following a rain event. Prior to maintenance activities resuming, a qualified biologist will inspect the work area and all equipment/materials for the presence of California red-legged frogs. The animals will be allowed to move away from the work site of their own volition or moved by the qualified biologist. ▪ To the maximum extent practicable, night-time construction activities will be minimized or avoided by the County. Because dusk and dawn are often the times when the California red-legged frog most actively moving and foraging, to the maximum extent practicable, earthmoving and other project activities will cease no less than 30 minutes before sunset and will not begin again prior to 30 minutes after sunrise. Except when necessary for driver or pedestrian safety, to the maximum extent practicable, artificial lighting at a work site will be prohibited during the hours of darkness. ▪ Plastic monofilament netting (erosion control matting), loosely woven netting, or similar material in any form will not be used at the project site because California red-legged frogs can become entangled and trapped in them. Any such material found on site will be immediately removed by the qualified biologist, maintenance personnel, or County contractors. Materials utilizing fixed weaves (strands cannot move), polypropylene, polymer or other synthetic materials will not be used.

BMP Number	BMP Title	BMP Description
		▪ Trenches or pits one (1) foot or deeper that are going to be left unfilled for more than forty-eight (48) hours will be securely covered with boards or other material to prevent the California red-legged frog from falling into them. If this is not possible, the County will ensure wooden ramps or other structures of suitable surface that provide adequate footing for the California red-legged frog are placed in the trench or pit to allow for their unaided escape. Auger holes or fence post holes that are greater than 0.10 inch in diameter will be immediately filled or securely covered so they do not become pitfall traps for the California red-legged frog. The qualified biologist will inspect the trenches, pits, or holes prior to their being filled to ensure there are no California red-legged frogs in them. The trench, pit, or hole also will be examined by the qualified biologist each workday morning at least one hour prior to initiation of work and in the late afternoon no more than one hour after work has ceased to ascertain whether any individuals have become trapped. If the escape ramps fail to allow the animal to escape, the qualified biologist will remove and transport it to a safe location, or contact the USFWS for guidance.
BIO-4	California Tiger Salamander Protection Measures	In the limited area in which the California tiger salamander might occur (i.e., in the vicinity of Alpine Trail), the measures described for California red-legged frog above will be implemented for California tiger salamander as well. In addition, the CDFW will be included in any agency coordination, as well as the USFWS, for issues involving the salamander.
BIO-5	San Francisco Garter Snake Protection Measures	In areas within one mile of a documented occurrence of the San Francisco garter snake, onsite habitat shall be evaluated by a qualified biologist or biological monitor for the potential to support this species. If suitable habitat for San Francisco garter snake is determined to exist in or around the work area where ground disturbing activities or mowing are planned to occur, the following measures will be followed: ▪ To the extent feasible, maintenance activities should be conducted from April through October during the dry season when these semi-aquatic species are less likely to be found in a work area. ▪ Prior to implementation of maintenance work, the County will submit to the USFWS and CDFW for its review and approval the qualifications of proposed wildlife biologist(s) who will perform pre-activity surveys and on-site monitoring. ▪ To avoid harassment, injury, death, and harm to individual San Francisco garter snakes, immediately prior to (i.e., the day of) the initiation of maintenance activities that have potential for take of the San Francisco garter snake, a USFWS and CDFW-approved biologist will conduct daytime surveys throughout the project site. The approved biologist will be present during initial ground-disturbing activities (i.e., clearing and grubbing) within 250 ft of the work area to monitor for individual garter snakes. The biologist will also be present during any other maintenance activities that could potentially result in take, as determined by the biologist taking into account all information gathered during the desktop audit of the site as well as the preconstruction survey. If a San Francisco garter snake is observed within the maintenance work area, either during the pre-activity survey or at any time, activities that could potentially harm the individual will cease and the USFWS and CDFW will be contacted immediately. Work will not re-commence without written approval from CDFW. The on-site biologist will be the contact for any employee or contractor who might inadvertently kill or injure a garter snake or anyone who finds a dead, injured, or entrapped San Francisco garter snake. The on-site biologist shall possess a working cellular telephone whose number shall be provided to the USFWS and CDFW.

BMP Number	BMP Title	BMP Description
		▪ For vegetation removal on berms or other sites with suitable San Francisco garter snake habitat, vegetation shall be cut down to 3 inches by hand tools (weedwhacker, etc.). Once the ground is visible, a visual survey for San Francisco garter snakes shall be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mowing or mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. ▪ Maintenance-related vehicles will observe a 20 mile per hour speed limit while in the work area. ▪ San Francisco garter snakes may be attracted to structures that provide cavities such as pipes; therefore, all pipes, culverts, or similar structures that are stored at the site for one or more overnight periods will be either securely capped prior to storage or thoroughly inspected by the on-site biologist and/or the maintenance foreman/manager before the pipe is buried, capped, or otherwise used or moved. If a San Francisco garter snake is discovered inside a pipe, the biologist (or a member of the maintenance crew, if the biologist is not on-site) will watch the individual until it has moved out of the maintenance work area. ▪ A litter control program will be instituted at each activity site. All workers will ensure their food scraps, paper wrappers, food containers, cans, bottles, and other trash are deposited in covered or closed trash containers. The trash containers will be removed from the site at the end of each working day.
BIO-6	Measures to Protect the Foothill Yellow-legged Frog, California Giant Salamander, Santa Cruz Black Salamander, and Western Pond Turtle	In areas within one mile of documented foothill yellow-legged frog, California giant salamander, Santa Cruz black salamander, or western pond turtle occurrences, or where suitable habitat for one or more of these species is determined to exist in or around the work area where ground disturbing activities or mowing are planned to occur, the County will implement applicable protection measures as follows: ▪ The qualified biologist will conduct a special-status species survey on each morning of and within 48 hours prior to the scheduled work commencing. 1. If no foothill yellow-legged frog, California giant Salamander, Santa Cruz black salamander, or western pond turtle is found, the work may proceed. 2. If eggs or larvae of the foothill yellow-legged frog, California giant salamander, Santa Cruz black salamander, are found, the qualified biologist will establish a buffer around the location of the eggs/larvae and work may proceed outside of the buffer zone. No work will occur within the buffer zone. Work within the buffer zone will be rescheduled until the time that eggs have hatched and/or larvae have metamorphosed, or the Permittee shall contact CDFW to develop site appropriate avoidance and minimization measures. 3. If an active western pond turtle nest is detected within the activity area, a 10-foot buffer zone around the nest will be established and maintained during the breeding and nesting season (April 1 – August 31). The buffer zone will remain in place until the young have left the nest, as determined by a qualified biologist. 4. If adult or non-larval juvenile foothill yellow-legged frogs, California giant salamanders, Santa Cruz black salamanders, or western pond turtles are found, one of the following two procedures will be implemented: 5. If, in the opinion of the qualified biologist, capture and removal of the individual to a safe place outside of the work area is less likely to result in adverse effects than leaving the individual in place and rescheduling the work (e.g., if the species could potentially hide and be missed during a follow-up survey), the individual will be captured and relocated by a qualified biologist to suitable habitat at least 100 meters away and work may proceed.

BMP Number	BMP Title	BMP Description
BIO-6	Measures to Protect the Foothill Yellow-legged Frog, California Giant Salamander, Santa Cruz Black Salamander, and Western Pond Turtle	6. If, in the opinion of the qualified biologist, the individual is likely to leave the work area on its own, and work can be feasibly rescheduled, a buffer will be established around the location of the individual(s) and work may proceed outside of the buffer zone. No work will occur within the buffer zone until the turtle has left the work area. Work within the buffer zone will be rescheduled if necessary.
BIO-7	Check for Wildlife in Pipes/Construction Materials	For maintenance activities that involve pipes or culverts, the County will visually check all sections of pipe for the presence of wildlife sheltering within them prior to moving any pipe or culvert sections that have been stored on the site overnight, or the pipes will have the ends capped while stored on site so as to prevent wildlife from entering. After attachment of the pipe/culvert sections to one another, the exposed end(s) of the pipe/culvert will be capped at the end of each day during construction to prevent wildlife from entering and being trapped within the pipeline/culvert.
BIO-8	Minimize Impacts on Dusky-footed Woodrat Nests	If suitable habitat for San Francisco dusky-footed woodrat is determined to exist in the work area, the following measure will be followed: ▪ No more than two weeks prior to the beginning of ground disturbance or other routine maintenance activities that could disturb woodrat nests, a qualified biologist will survey the work areas scheduled for maintenance. If any dusky-footed woodrat nests are found, the nests shall be flagged and construction fencing or flagging that will not impede the movement of the SFDW shall be placed around the nest to create a 10-foot buffer (where feasible). If the nest is located adjacent to a road or trail, the nest shall be clearly flagged so equipment/truck drivers accessing sites can see the nest. If a dusky-footed woodrat nest is identified in a work area, the following measure will be implemented by the County. ▪ The County will avoid physical disturbance of the nest if feasible. Ideally, a minimum 10-foot buffer should be maintained between maintenance construction activities and each nest to avoid disturbance. In some situations, a smaller buffer may be allowed if in the opinion of a qualified biologist removing the nest would be a greater impact than that anticipated as a result of maintenance activities. ▪ If a dusky-footed woodrat nest cannot be avoided and the nest is located in urban or bayside areas where woodrat populations are small and isolated from larger populations, the County will consult with CDFW regarding the appropriate measures to minimize impacts.

BMP Number	BMP Title	BMP Description
		▪ If a dusky-footed woodrat nest cannot be avoided and the nest is located in more rural or natural areas and/or where woodrat populations are large and have connectivity to large populations, one of the following two relocation measures will be implemented by the County: 1. If the woodrat nest site and the proposed relocation area are connected by suitable dispersal habitat for the woodrat, as determined by a qualified biologist, the following relocation methodology will be used: Prior to the beginning of construction activities, a qualified biologist will disturb the woodrat nest to the degree that all woodrats leave the nest and seek refuge outside of the maintenance activity area. Relocations efforts will avoid the nesting season (February - July) to the maximum extent feasible. Disturbance of the woodrat nest will be initiated no earlier than one hour before dusk to minimize the exposure of woodrats to diurnal predators. Subsequently, the biologist will dismantle and relocate the nest material by hand. All material from dismantled nests will be placed in a pile, preferably against a log or tree trunk, in suitable habitat located at least 20 feet from, but otherwise as close as possible to, the original nest locations, to provide material for woodrats to construct new nests. During the deconstruction process, the biologist will attempt to assess if there are juveniles in the nest. If immobile juveniles are observed, the deconstruction process will be discontinued until a time when the biologist believes the juveniles will be fully mobile. A 10-foot wide no-disturbance buffer will be established around the nest until the juveniles are mobile. The nest may be dismantled once the biologist has determined that adverse impacts on the juveniles would not occur. All disturbances to woodrat nests will be documented in a construction monitoring report and submitted to CDFW. 2. If a qualified biologist determines that the woodrat relocation area is separated from the nest site by major impediments, or a complete barrier, to woodrat movement, trapping for woodrats will be conducted prior to relocation of nest material. Prior to the start of nest relocation activities, artificial pine box shelters will be placed at each of the sites selected for relocation of nest materials. The dimensions of the artificial shelters will be approximately 8” long x 8” wide x 6” high. Each shelter will include two interior chambers connected by an opening. At the relocation sites, the artificial pine box shelters will provide basement structures for the relocated woodrat nest materials, allowing woodrats to enter, use, and modify the relocated nests. A qualified biologist will set two traps around each of the woodrat nests to be relocated. Traps will be set within one hour prior to sunset, and baited with a mixture of peanut butter, oats, and apples. Traps will also be equipped with cotton bedding and covered with cardboard. The traps will be checked the following morning, within one- and-a-half hours of sunrise. If a woodrat is captured it will be placed in a quiet area while its nest material is relocated; the animal will then be released at the relocated nest. If no woodrats are captured after the first night, the biologist will set the traps for one additional evening to increase the probability of capturing the animal and ensuring a safe relocation. If no woodrats are captured at a given house after two nights, it will be assumed that the house is not currently occupied. 3. Trapping will only be conducted outside the breeding season, which for woodrats is from February through the end of July. If a litter of young is found or suspected while dismantling a nest for relocation, the nest material will be replaced, any trapped woodrats will be returned to the nest, and the nest will be left alone for 2 to 3 weeks,

BMP Number	BMP Title	BMP Description
		after which time the nest would be rechecked to verify that the young are capable of independent survival, as determined by the lead woodrat biologist, before proceeding with nest dismantling.
BIO-9	Measures to Protect Nesting Migratory Birds	▪ To the extent possible, conduct vegetation removal activities prior to nesting bird season (February 1 through August 31). ▪ For maintenance activities or tree removal that are scheduled to occur between February 1 and August 31, a qualified biologist will survey the work area and a minimum of 300 feet surrounding the work area for raptor nests and 100 feet for nests of non-raptors. This survey will occur no more than three days prior to starting work. If a lapse in maintenance-related work of 7 days or longer occurs, another focused survey will be conducted before maintenance work can be reinitiated. ▪ If nesting birds are found, a no-work buffer will be established around the nest and maintained until the young have fledged. A qualified biologist will identify an appropriate buffer based on a site specific-evaluation. Typical appropriate buffers are 300 feet for raptors, herons, and egrets (though larger for bald and golden eagles, as discussed in BIO-14); 100 feet for non-raptors nesting on trees, shrubs and structures, and 25 feet for ground-nesting non-raptors. ▪ The boundary of each buffer zone will be marked with fencing, flagging, or other easily identifiable marking if work will occur immediately outside the buffer zone. ▪ Install physical barriers to nesting where appropriate (e.g., install netting over entryways to cavities, bridge ledges, culverts) and check regularly for any trapped birds. Work will not commence within the buffer until fledglings are fully mobile and no longer reliant upon the nest or parental care for survival. ▪ No trees or shrubs shall be disturbed that contain active bird nests until all eggs have hatched, and young have fully fledged (are no longer being fed by the adults and have completely left the nest site). To avoid potential impacts to tree or shrub-nesting birds, any project-specific trimming or pruning of trees or shrubs shall be conducted during the time period of September 1 to February 14 unless a preconstruction nesting bird survey has been conducted by a qualified biologist. No habitat removal or modification shall occur within the Ecologically Sensitive Area fenced nest zone even if the nest continues to be active beyond the typical nesting season for the species, until the young have fully fledged and will no longer be adversely affected by the project. ▪ Within areas subject to CDFW regulation under Section 1600 of the Fish and Game Code, nesting bird protection measures required as conditions of the Streambed Alteration Agreement will be implemented.
BIO-10	Measures to Protect Nesting Marbled Murrelet	▪ During marbled murrelet breeding/nesting season (March 24 to September 15), if suitable marbled murrelet nesting trees are present within 300 feet of the project area or if a marbled murrelet nest is detected, Permittee shall consult with CDFW before proceeding. If habitat trees are present within ¼- mile of the project site but are greater than 300 feet from the work area, Permittee may proceed with the following conditions: ○ Work within the ¼-mile buffer shall be confined to the period of September 15 to October 15. ○ If activities cannot be performed during this window and would thus occur during the marbled murrelet breeding season (March 25 to September 15), seasonal disturbance minimization buffers as listed the USFWS document, *Estimation of the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California* (2006) shall be followed. Permittee shall measure ambient noise and estimate construction activity noise to calculate seasonal buffer widths using that reference.

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		○ Alternatively, if protocol-level surveys are conducted and do not indicate that the habitat is occupied by marbled murrelet, seasonal and distance work restrictions may be lifted with written approval from CDFW. Protocol level survey procedures and information can be found at: http://www.pacificseabirdgroup.org/publications/PSG_TechPub2_MAMU_ISP.pdf
BIO-11	Non-native Aquatic Plant Removal	Any aquatic non-native plants found while performing maintenance activities will be disposed of properly and will not be placed back into the tributaries where work is being conducted or any other drainages, creeks, or streams.
BIO-12	Measures to Protect Special-Status Butterflies	If suitable habitat for Bay checkerspot, Mission blue, San Bruno elfin, or Callippe silverspot butterflies is determined to exist in or around the work area where ground disturbing activities are planned to occur, the County will implement applicable protection measures as follows: ▪ Areas supporting larval host plants for the Bay checkerspot, Mission blue, San Bruno elfin, or Callippe silverspot will be identified by a qualified biologist and protected from disturbance by establishing buffer zones around individual plants or populations. The size of the buffer will be determined by a qualified botanist; the actual distance will depend on the plant species potentially affected and the type of disturbance. If impacts on larval host plants of federally listed butterflies are unavoidable and are within occupied or potentially occupied habitats, then the County will stop work in the vicinity of the host plant(s) and consult with the USFWS. ▪ No herbicide will be applied to the buffer area, and to the extent feasible, maintenance personnel and equipment will not operate within such areas. If, based on a review of current CNDDB records or the latest information available from the Xerces Society (https://xerces.org/state-of-the-monarch-butterfly-overwintering-sites-in-california/) historically or currently occupied overwintering habitat for the monarch butterfly is determined to exist in or adjacent to the work area where ground disturbing activities are planned to occur, the County will implement applicable protection measures as follows: ▪ Areas supporting overwintering habitat for the monarch butterfly will be identified by a qualified biologist and maintenance activities during fall and winter months when monarch butterflies are present will be avoided to the extent practicable. ▪ Historically or currently occupied trees/groves will be protected from disturbance by the establishment of a 100-foot buffer zone around the tree/grove. The buffer will be measured from the outside edge of the dripline of the monarch grove. If maintenance activities within 100 feet of a historically or currently occupied tree/grove are unavoidable, the County will prepare and implement an impact minimization plan in consultation with the USFWS. ▪ No herbicides or pesticides will be applied to the buffer area, and to the extent feasible, maintenance personnel and equipment will not operate within such areas.
BIO-13	Measures to Protect the California Ridgway's Rail	If suitable breeding habitat for California Ridgway's rails is determined to exist in or around the work area where maintenance activities are planned to occur, the County will implement applicable protection measures as follows: ▪ If work will occur during the Ridgway's rail breeding season (February 1 through August 31), the County will conduct

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		pre-activity surveys for the Ridgway's rail in the late winter and early spring of the year maintenance activities are scheduled to occur. Surveys will be conducted per the current USFWS protocol. ▪ If the surveys confirm there are no breeding rails within 700 feet of the project area, or the area where heavy equipment, ground disturbance, or vegetation removal would occur, work activities may proceed during the breeding season. ▪ If surveys identify the presence of breeding rails, no maintenance activities will occur within 700 feet of occupied nesting habitat during the breeding season (February 1 to August 31). For work occurring within 300 feet of potential nonbreeding habitat for California Ridgway's rails which provides habitat that occasional nonbreeding California Ridgway's rails may use for foraging or cover, or other identified suitable California Ridgway's rail habitat locations, the County will implement applicable protection measures as follows: ▪ Prior to the initiation of work each day, if suitable habitat occurs within the immediate work area, a qualified biologist will conduct a preconstruction survey of all suitable habitat that may be directly or indirectly impacted by the day's activities (work area, access routes, staging areas). Specific habitat areas are vegetated areas of cordgrass (*Spartina* spp.), marsh gumplant (*Grindelia* spp.), pickleweed (*Salicornia pacifica*), alkali heath, (*Frankenia* sp.), and other high marsh vegetation, brackish marsh reaches of creek with heavy accumulations of bulrush thatch (old stands), and high water refugia habitat that may include annual grasses, and shrubs immediately adjacent to channels. ▪ If during the initial daily survey or during work activities a Ridgway's rail is observed within or immediately adjacent to the work area (50 feet), initiation of work will be delayed until the Ridgway's rail leaves the work area. ▪ Mowing using heavy equipment (e.g., tractors, boom mowers, or rider mowers) will not be conducted in habitat areas or within 50 feet of habitat areas. If mowing with hand equipment is necessary within 50 feet of habitat areas, an on-site monitor will observe the area in front of the mower from a safe vantage point while it is in operation. If Ridgway's rails are detected within the area to be mown, the mowing will stop until the individual(s) have left the work area. ▪ If visual observation cannot confirm the Ridgway's rail(s) left the work area, then it is assumed that the individual(s) remains in the work area and the work will not resume until the area has been thoroughly surveyed (and absence confirmed) or the USFWS has been contacted for guidance.
BIO-14	Measures to Protect Bat Colonies	▪ If high-quality habitat for roosting bats (i.e., large trees with cavities of sufficient size to support roosting bats, or buildings providing suitable roost sites, as determined by a qualified bat biologist) is present within 100 feet of a maintenance site, a qualified bat biologist will conduct a survey to look for evidence of bat use within two weeks prior to the onset of work activities. If evidence of bat occupancy is observed, or if high-quality roost sites are present in areas where evidence of bat use might not be detectable (such as a tree cavity), an evening survey and/or nocturnal acoustic survey may be necessary to determine if a bat colony is present and to identify the specific location of the bat colony. ▪ If no active maternity colony or non-breeding bat roost is located, project work can continue as planned. ▪ If an active maternity colony or non-breeding bat roost is located, the project work will be redesigned to avoid disturbance of the roosts, if feasible.

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		▪ If an active maternity colony is located, and the project cannot be redesigned to avoid removal or disturbance of the occupied tree or structure, disturbance will not take place during the maternity season (March 15 – July 31), and a disturbance-free buffer zone (determined by a qualified bat biologist) will be observed during this period. ▪ If an active non-breeding bat roost is located, and the project cannot be redesigned to avoid removal or disturbance of the occupied tree or structure, the individuals will be safely evicted between August 1 and October 15 or between February 15 and March 15 (as determined by a Memorandum of Understanding with CDFW). Bats may be evicted through exclusion after notifying CDFW. Trees with roosts that need to be removed will first be disturbed at dusk, just prior to removal that same evening, to allow bats to escape during the darker hours.
BIO-15	Nesting Bald Eagle and Golden Eagle Avoidance	In areas within 0.5 mile of known bald or golden eagle nesting areas, the following measures will be implemented: ▪ To the extent feasible, conduct vegetation removal activities prior to the nesting season (January 15 through August 1). ▪ For maintenance activities or tree removal that are scheduled to occur between January 15 and August 1, a qualified biologist will survey the work area and a minimum 0.5 mile surrounding the work area for eagle nests. This survey will occur no more than seven days prior to starting work. ▪ No maintenance activities will occur within a 0.5-mile viewshed buffer zone (areas that can be seen by an eagle on the nest), around any active eagle nest during the breeding season, unless a qualified biologist determines late in the season that nesting activity has been completed for the year. No breeding-season maintenance activities will occur within 0.25 mile of the nest site a, regardless of whether or not those activities can be seen from the nest, while nesting activity is occurring.
BIO-16	Avoid Special-Status Plant Species	For projects located in areas where special-status plants have been identified as potentially occurring (see Table 4-1), a qualified biologist will assess habitat suitability for the potential occurrence of special-status plant species within the work area. If determined to be warranted, a qualified botanist will conduct appropriately timed surveys for the focal plant species in accordance with CDFW's special-status plant survey methodology. If a special-status species is observed in or near the project site, the County will follow the measures below as well as any additional measures that might be contained in the forthcoming Biological Opinion issued by the USFWS for the Maintenance Program. ▪ If discovered, the population size and occupied area of special-status plant populations identified during the field survey, and with potential to be impacted, will be estimated. A "population" will be defined as the group of individuals of a species present within a 0.10-mile radius. In addition, the population will be photographed and flagged to maximize avoidance, as well as to estimate the percentage of the population affected. If feasible, the project shall be redesigned or modified to avoid direct and indirect impacts on special-status plant species. ▪ Special-status plants to be avoided will be protected from disturbance by installing environmentally sensitive area fencing (orange construction barrier fencing or a suitable alternative). Protective fencing will be installed under the direction of a qualified biologist as necessary to protect the plant and its habitat; where feasible, the environmentally sensitive area fencing will be installed at least 50 ft from the edge of the population. The location of the fencing will be shown on the maintenance design drawings and marked in the field with stakes and/or flagging. The design specifications will contain clear language that prohibits maintenance-relate activities, vehicle operation, material and equipment storage, and other surface disturbing activities within the fenced environmentally sensitive area. For non-ground disturbing vegetation management activities conducted using only hand-held equipment, the non-disturbance

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		buffer may be reduced to a minimum of 3 feet and flagging of the population may be used in place of environmentally sensitive fencing. ▪ Vegetation management activities in sensitive plant areas will be conducted under the guidance of a qualified botanist. These activities will be timed following the blooming periods of potentially occurring listed species. ▪ If any impacts to individual state-listed plants are unavoidable, or if more than 5 percent of a population of a federally listed plant species or species with California Rare Plant Ranks of 1 or 2 would be impacted, then the County will stop work in the vicinity of the plant(s) and consult with the appropriate regulatory agencies. ▪ If impacts to state or federally listed plants are unavoidable and less than 5 percent of a population would be impacted, prior to any ground-disturbing activities the County will preserve the seedbank within the impact area by removing and retaining the topsoil prior to the implementation of maintenance activities. Following completion of the maintenance activity, the County will monitor the impact area for two years. Any non-native invasive plant species occurring within this area during the monitoring period will be removed under the supervision of a qualified biologist. ▪ If appropriately timed focused botanical surveys cannot be conducted prior to maintenance activities in areas identified by a qualified biologist as potentially supporting listed plants, then the County will assume presence of the plant species in question.
BIO-17	Sudden Oak Death Controls	▪ Before entering maintenance sites located in areas infested with *Phytophthora*, field workers will receive training that includes information on *Phytophthora* pathogens and how to prevent the spread of these and other soil-borne organisms by following approved phytosanitary procedures. ▪ The exterior and interior of all vehicles, construction equipment, and tools should be clean and free of debris, soil and mud (including mud on tires, treads, wheel wells and undercarriage) prior to arrival at a new job site, especially during the wet season. ▪ Work shoes should be kept clean by inspecting shoe soles and removing mud, debris and soil off treads before moving to a new job site. ▪ Do not collect or transport host plants from an infested or quarantined area. ▪ Vehicles should stay on established roads whenever possible. ▪ To minimize the potential for spreading potentially contaminated soil and time required for decontamination, if possible, avoid vehicle traffic and field work when soils are wet enough to stick readily to shoes, tools, equipment and tires. ▪ Delivered nursery plants that will be held before planting will be transferred to cleaned and sanitized raised benches and maintained in accordance with the "Guidelines to Minimize *Phytophthora* Pathogens for holding (non-production) nurseries at restoration sites, Section 3." ▪ A portion of purchased nursery plants will be tested for *Phytophthora* using the pear-baiting methodology in which pear baits are placed in soil samples, water samples and root samples of nursery purchased plants. Incubation temperatures with diurnal fluctuations from 21 degrees Celsius to 27 degrees Celsius are generally suitable for detecting *Phytophthora* species using pear baits. If dark lesions appear on pears, the sample likely has *Phytophthora* inoculum. For additional information for the pear-baiting methodology, see: phytosphere.com/BMPsnursery/test3_2bait.htm

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		▪ Nursery plants will be transported on or in vehicles or equipment that have been cleaned before loading the stock. ▪ Nursery stock will not be placed on the soil or other potentially contaminated surfaces until they are placed at their specific planting sites. ▪ Minimize unnecessary movement of soil and plant material within a planting area, especially from higher to lower risk areas. ▪ On-site or off-site collection of plant materials, including seed and cuttings for direct planting, will be conducted in a phytosanitary manner. ▪ Only uncontaminated water or water that has been effectively treated to remove or kill *Phytophthora* should be used for rinsing or irrigating plant material.
BIO-18	Invasive Plant Control	▪ In order to minimize the spread of invasive plants, all equipment (including personal gear) will be cleaned of soil, seeds, and plant material prior to arriving on the project site to prevent introduction of undesirable plant species. ▪ Prior to implementation of Program activities at a given site, the proposed staging area, as well as any areas to be graded, will be surveyed for the presence of invasive weed species. Invasive weed species occurring within locations of construction clearing and grubbing shall be flagged for removal by the biological monitor or qualified biologist. Any invasive weeds with a Cal-IPC rating of "moderate" or "high" found within the survey area will be removed and disposed of in a sanitary landfill, incinerated off-site, or disposed in a high-temperature composting facility that can compost using methods known to kill weed seeds, taking care to prevent any seed dispersal during the process by bagging material or covering trucks transporting such material from the site. ▪ Suitable onsite disposal areas should be identified to prevent the spread of weed seeds. Invasive plant material should be rendered nonviable (partially decomposed, very slimy or brittle) when being treated onsite. Maintenance staff shall desiccate or decompose invasive plant material until it is nonviable. Depending on the type of plant, disposed plant material can be left out in the open as long as roots are not in contact with moist soil, or can be covered with a tarp to prevent material from blowing or washing away. Permittee shall monitor all sites where invasive plant material is disposed onsite and treat any newly emerged invasive plants. Invasive plant material removed during work activities shall be bagged and appropriately incinerated or disposed of in a landfill or permitted composting facility. ▪ No invasive plants shall be planted at maintenance work areas. Prohibited exotic plant species include those identified in the California Invasive Plant Council's Inventory Database, which is accessible at: https://www.cal-ipc.org/plants/inventory/.
BIO-19	Restore Channel Features	▪ Following completion of bank stabilization activities, any temporary modifications to the low-flow channels will be reversed so that the channel is contoured to facilitate fish passage at least as well following the activity as it did prior to the stabilization activity.
BIO-20	Avoidance of Mammal Pupping Sites	▪ Work within 250 feet of an active harbor seal or sea lion haul out will be conducted outside of the pupping season (i.e., June – February).
BIO-21	General Wildlife Protection Measures	▪ If any wildlife is encountered during project activities, said wildlife shall be allowed to leave the area unharmed and on their own volition, except in cases where relocation by a qualified biologist is permitted by conditions below.

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BIO-22	Measures to Protect Nesting Western Snowy Plover	▪ To the extent feasible, maintenance activities within 600 feet of suitable snowy plover breeding habitat will occur outside the plover breeding season of March 1 through September 14. ▪ If maintenance activities are scheduled to occur within 600 feet of suitable snowy plover breeding habitat during the nesting season (March 1 through September 14), a pre-activity survey will be conducted by a qualified biologist within 7 days prior to the start of the activity to determine whether active nests are present. ▪ If an active snowy plover nest is detected within 600 feet of maintenance areas, the qualified biologist, in coordination with USFWS personnel, will determine an appropriate buffer that should remain free from new activities (i.e., those that were not ongoing when the nest was established). The buffer will be determined taking into account visual barriers (such as dunes) between the activities and the nest and the level and proximity of human activity around the nest when it was established. The buffer will remain in place until the nest is no longer active. ▪ If broods of unfledged snowy plover young are present, no maintenance activities will occur within 300 feet (or as otherwise determined by a qualified biologist in coordination with the USFWS) of a brood.
BIO-23	Burn Pile Measures	▪ The County would coordinate burn pile activities with CAL FIRE. ▪ Burning will only occur on days when danger of wildfire is low (e.g., it will not occur on windy days or in very hot, dry conditions). ▪ No burn piles will be located within 200 feet of known occurrences of special-status plants, suitable habitat for special-status butterflies and their hostplants, or high-quality aquatic or wetland habitat for the California red-legged frog, California tiger salamander, or San Francisco garter snake. ▪ Prior to the initiation of burning, the burn pile will be physically disturbed (e.g., with a stick or shovel) to encourage any animals taking refuge within the pile to move out of the pile.
BIO-24	Pathogen Control	▪ In order to minimize the spread of plant and animal pathogens, all equipment (including personal gear such as boots) will be cleaned of soil, seeds, and plant material prior to arriving on a maintenance site. All organic matter will be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water or potentially contaminated sediments. ▪ Equipment, including maintenance equipment and field gear used to capture and relocate special-status species such as frogs, will be disinfected after exiting one aquatic habitat and before entering the next aquatic habitat, unless the waters are hydrologically connected to one another. Cleaning equipment in the immediate vicinity of aquatic habitats will be avoided (e.g., clean in an area at least 100 feet from aquatic features). ▪ Boots, nets, gloves, and any other equipment used to handle amphibians or aquatic organisms will be scrubbed with a bleach solution (0.5 to 1.0 cup per 1.0 gallon of water), Quat-128™ (1:60), or a 3 to 6 percent sodium hypochlorite solution and thoroughly rinsed clean with water between maintenance sites. Care will be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat. ▪ When working at sites with known or suspected disease problems, disposable gloves will be worn and changed between handling each animal. Gloves will be wetted with water from the site or distilled water prior to handling any

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		amphibians. Gloves will be removed by turning inside out with hands cleaned using a hand cleaner and water rinse to minimize cross-contamination.