San Rafael-San Anselmo Fuel Reduction Zone Project FAQs

What is a Wildfire-Urban Interface Fuel Reduction Zone?

Located in areas along the transition between open lands and land developed by human activity, or "wildland urban interface" (WUI), the WUI fuel reduction will generally consist of strategic removal of vegetation to prevent or slow the spread of non-wind driven wildfire between structures and wildlands, and vice versa.

What is the purpose of the project?

The purpose of the fuel reduction zone is to create and maintain a reduced-fuel and forest-health-restoration zone between San Rafael and San Anselmo to minimize wildfire hazards. The San Rafael-San Anselmo Fuel Reduction Zone (SRSAFRZ) project will reduce wildfire risk in the area and to neighboring communities by removing non-native eucalyptus trees, reducing the overall acreage of the eucalyptus stands, and reducing the density of the remaining eucalyptus trees. It will also restore native habitat by retaining a mosaic of retained oak, grassland, and other common native tree and shrub species.

After years of drought stress the eucalyptus stands that span lands owned primarily by the Marin County Open Space District (MCOSD), Tamalpais Cemetery, Cedars of Marin, and Town of San Anselmo have experienced:

- Declining forest health
- Increased tree mortality
- Multiple fires
- Heavy accumulation of biomass
- Increasingly high tree density
- Heavy surface fuel loading and ladder fuels
- Increase in dead and dying standing trees

The high-density eucalyptus stands pose a high fire risk and could compromise emergency response in this area. This is because eucalyptus species, including the most common blue gum eucalyptus, are highly flammable and promote fire spread, including through their heavy litter fall, flammable oils in the foliage, and open crowns bearing pendulous branches. Due to the size and shape of the bark and leaves, eucalyptus forests are particularly good at spreading embers during wildfire events because leaves and bark can be lofted into the air and move embers over

long distances[1]. This high fire risk area is situated between multiple at-risk communities listed above.

Why is fuel reduction proposed at this location?

The majority of the project site is heavily vegetated and located in the WUI between the communities of San Anselmo and San Rafael. The area has experienced wildfires previously, including in 1976, during which the Sorich Park fire burned 153 acres, and in 2005 when a 15-acre wildfire ignited adjacent to the Mt. Tamalpais Cemetery. Since the past wildfires, the project area has continued to experience growth of non-native eucalyptus increasing the density of smaller diameter trees especially and duff layers. Active management of the eucalyptus stands has not occurred. Large stands of invasive, non-native eucalyptus (*Eucalyptus globulus, Eucalyptus sp.*) occur throughout Marin County, notably around or within communities in the WUI area including on the project site. The California Invasive Plant Council (Cal-IPC) designates blue gum eucalyptus as having an overall negative ecological impact rating of "moderate" due to its ability to displace native plant communities, and alter fire regimes, groundwater availability, and habitat for birds[2]. Eucalyptus species regenerate and grow well in coastal California and have been found to spread easily in these areas. Eucalyptus species, including the most common blue gum eucalyptus, are highly flammable and promote fire spread, including through their heavy litter fall, flammable oils in the foliage, and open crowns bearing pendulous branches[3,4,5,6]. These species generate larger quantities of biomass from leaf and bark litter than native Californian forests, and they remain on the landscape for far longer as well[7]. The flammable oils are more ignitable and burn at higher intensities than California

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[1] Boyd, David. 1997. Eucalyptus Removal on Angel Island. 1997 Symposium Proceedings. California Exotic Pest Plant Council.
[2] Cal-IPC. (2015). Plant Assessment Form - Eucalyptus globulus: https://www.cal-ipc.org/plants/paf/eucalyptus-globulus-plant-assessment-form/
[3] Colwell, R. N. (1973). ERTS-1 imagery and high flight photographs as aids to fire hazard appraisal at NASA San Pablo Reservoir Test Site. Symposium on significant results obtained from the Earth Resources Technology Satellite (pp. 145-156).
[4] Skolman, R. G., & Ledig, T. F. (1990). Eucalyptus *globulus labill* bluegum eucalyptus. In R. M. Burns, & B. H. Honkala, Silvics of North America Vol. 2 Hardwoods Agricultural Handbook (pp. 299-304). Washington DC: U.S. Department of Agriculture, Forest Service.
[5] Gill, A. M., Groves, R. H., & Noble, I. R. (1981). Fire in tall open forests (wet sclerophyll forests). In A. M. Gill, R. H. Groves, & I. R. Noble, Fire and the Australian Biota (pp. 339-366). Canberra City: ACT: The Australian Academy of Sciences.
[6] Gill, M. A. (1977). Plant traits adaptive to fires in Mediterranean land ecosystems. In H. A. Mooney, & E. C. Conrad, Proceedings of the symposium on the environmental consequences of fire and fuel management in Mediterranean ecosystems (pp. 17-26). Washington DC: U.S. Department of Agriculture, Forest Service.
[7] Cal-IPC, 2015.

native species[8]. Due to the size and shape of the bark and leaves, eucalyptus forests are the "worst in the world" for spreading embers during wildfire events because leaves and bark can be lofted into the air and move embers over long distances[9]. One study found that the spotting distance was 18 to 22 miles in Australia's eucalyptus-dominated forest[10].

The entire project site was modeled to have a high or very high fire risk[11]. A large portion of the project site, inclusive of the pilot project area, was modeled as a Category 3 fire hazard per the Marin County parcel-level fire hazard assessment that was conducted as part of the Marin Community Wildfire Protection Plan (CWPP) 2020 Update. Category 3 hazards are areas where modeling determined a wildfire would be the most intense with flame lengths greater than 11 feet and the rate of wildfire spread in excess of 60 feet per minute.

In the context of wildfire hazard, the term "hazard" refers to the presence, structure, and makeup of vegetation fuels and the amount of potential energy that may be released in a given environment or weather condition. The term "risk" is the chance, high or low, that any hazard will cause harm to an asset. The CWPP 2020 Update storymap provides an overview of the fire hazard assessment that was conducted including the methodology and an interactive map[12].

What will treatment entail?

Healthy, mature native trees will typically be left intact and in place unless removal were required due to structural or health defects that place infrastructure or lives at risk or should tree densities pose a fire hazard risk. Initial treatments will focus primarily on the removal of invasive and non-native, fire hazardous vegetation, comprised of smaller eucalyptus trees, typically 10 inches diameter breast height (dbh) or less. Select eucalyptus or other non-native, fire hazardous trees greater than 10 inches dbh will be assessed and potentially removed. Most eucalyptus trees greater than 15 dbh will be retained. The project will also remove non-native

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[8] K. J. M. Dickinson and J. B. Kirkpatrick. 1985. The Flammability and Energy Content of Some Important Plant Species and Fuel Components in the Forests of Southeastern Tasmania. Journal of Biogeography. Vol. 12, No. 2, pp. 121-134.

[9] K. J. M. Dickinson and J. B. Kirkpatrick. 1985. The Flammability and Energy Content of Some Important Plant Species and Fuel Components in the Forests of Southeastern Tasmania. Journal of Biogeography. Vol. 12, No. 2, pp. 121-134.

[10] Michael A. Story, Owen F. Price, Jason J. Sharples, Ross A. Bradstock. 2020. Drivers of long-distance spotting during wildfires in south-eastern Australia. March 2. International Journal of Wildland Fire.

[11] The fire risk can be accessed via the MarinMap Map Viewer by selecting "Hazards and Geology", then selecting "Fire Risk".

[12] The parcel-level fire hazard assessment can also be accessed via the MarinMap Map Viewer by selecting "Other Administrative Districts", then selecting the "Marin Wildfire Authority" and ensuring that the "Marin Parcel-level fire hazard assessment" data is checked.

understory (e.g., broom, Himalayan blackberry) and other fire-hazardous understory vegetation, where applicable.

Where will the fuel reduction zone treatments be implemented?

The SRSAFRZ treatments are anticipated to occur within a 145-acre area in western San Rafael and San Anselmo, see Figure 1. The largest landowners include MCOSD (47 acres), Mt. Tamalpais Cemetery (43 acres), Cedars of Marin (21 acres), and the Town of San Anselmo (19 acres). The project may use existing disturbed, graded, or paved areas outside the vegetation treatment area for staging vegetation removal or biomass disposal equipment.

Phase I treatment began within a 10.3-acre area in early 2024 comprised of three treatment units (refer to the blue units in Figure 1). This initial treatment area was selected because the area is relatively flat with few erosion and destabilization risks compared to other portions of the overall site. Additionally, treatment areas are more easily accessible from existing roads and trails and showcase two different eucalyptus forest densities; very dense and moderately dense.

Defensible space treatments on 3.7 acres were conducted in summer 2024 along the eastern boundary of the project site.

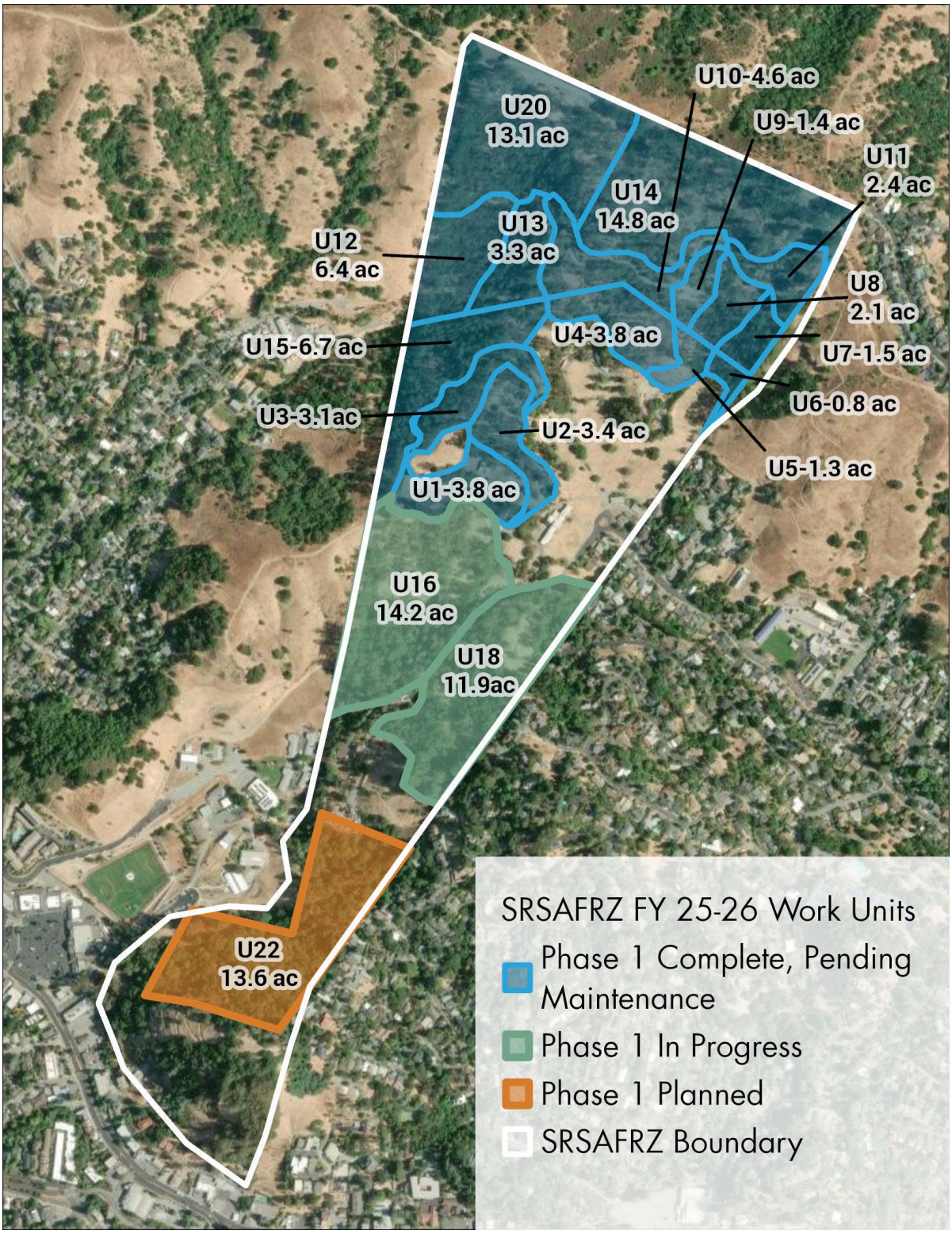
San Rafael Fire began eucalyptus thinning in additional areas (refer to the orange units in Figure 1) within 17.9 acres on the hillside to the east of the cemetery in late summer and fall 2024. The first units to be treated were portions of the cemetery property outside of MCOSD lands then extending into the units on MCOSD land. Treatment within the purple areas on the figure will continue throughout 2025. New areas of initial treatments will likely occur in the northwest and southeastern corners of the project site in 2026 and beyond.

Follow-up stump treatment activities occurred in late summer 2024 in Phase I areas and will continue to be conducted as needed. San Rafael Fire and MCOSD are coordinating regarding work on MCOSD lands and a portion of that effort is and will continue to be funded through Measure A.

When will the fuel reduction zone treatments be implemented?

Initial implementation of this project will be phased and take place over several years. The Phase I eucalyptus removal began in the spring 2024 within an approximately 10-acre area, and eucalyptus removal continued in late summer and fall 2024 within an approximately 17.9-acre area (refer to Figure 1). Treatments will continue annually and could occur throughout the year, dependent upon weather (e.g., temperature, precipitation, fire weather/red flag days), as well as the availability of funds for that year. Depending on the season of treatment, the Project will implement appropriate measures to address any potential effects on resources, including nesting birds, risk of fire, risk of erosion/landslide, among others. Initial treatments throughout the SRSAFRZ project site are anticipated to occur over the next 2 to 3 years, with initial treatment completed in 2027 or 2028.

Figure 1 San Rafael – San Anselmo Fuel Reduction Project Eucalyptus Unit Status (June 2026)



Maintenance will be ongoing, depending on the type of vegetation maintenance that is needed. Cut eucalyptus and seedlings, broom, or other fast-growing invasive species are anticipated to be inspected annually and treated every 1 to 3 years, depending upon the condition of the sites.

Will the treatments remove native shrubs or trees?

Healthy, mature native trees will typically be left intact and in place unless removal is required due to structural or health defects that place infrastructure or lives at risk or should tree densities pose a fire hazard risk.

Treatments will focus primarily on the removal of invasive and non-native, fire hazardous vegetation, comprised of smaller eucalyptus trees, typically 10 inches diameter breast height (dbh) or less. Select eucalyptus or other non-native, fire hazardous trees greater than 10 inches dbh will be assessed and potentially removed in subsequent phases. The project will also remove non-native understory (e.g., broom, Himalayan blackberry) and other fire-hazardous understory vegetation.

Will the project remove all eucalyptus?

Smaller stand eucalyptus removal will occur throughout the approximately 145-acre area during Phase 1, depending on access and ease of removal. Some eucalyptus trees between 11 and 15 dbh may be removed.

Will the project create new access roads?

No new access roads will be created as part of the project. Most of the treatment area can be accessed using existing roads and trails. Haul routes to remove the vegetation will be identified prior to implementation of the project.

Will the fuel reduction zone treatments occur during nesting bird season?

Yes, the eucalyptus removal could occur throughout the entire year, including during the nesting bird season. Regarding nesting birds, the Marin Wildfire Prevention Authority (Marin Wildfire) and the San Rafael Fire Department are committed to protecting nesting birds and have incorporated standard Project Design and Implementation Features (PDIFs) related to nesting birds into all core vegetation management projects, including the SRSAFRZ project. Migratory birds and birds of prey are protected under the Migratory Bird Treaty Act and sections 3503 and 3503.5 of the California Fish and Game Code. Natural resources, including

nesting birds, are addressed in the Project-Specific Analysis (PSA)[13] and Addendum for the SRSAFRZ project as this project was determined to be a later activity covered by the California Vegetation Treatment Program (CalVTP) Program Environmental Impact Report (PEIR).

For most Marin Wildfire-funded projects, the majority of vegetation management activities that include the potential for disturbing nesting birds are scheduled late in the nesting season to avoid the bulk of nesting activity. Note that the general nesting season is between February 1 and July 31, but these dates are used as a guideline, as birds may begin nesting beforehand and complete nesting after these dates, and active nests are legally protected year-round. However, the SRSAFRZ project area includes an extreme fire risk and requires work over a longer time frame. Therefore, the San Rafael Fire Department staff determined that limiting project work to one specific time of year is not feasible and the project warrants a more aggressive timeline to ensure work is conducted throughout the year and potentially reduce the number of work days to occur during hotter, drier weather. In order to implement PDIF HAZ-2 "Wildfire Risk Reduction: Avoid use of spark- and/or heat-generating equipment during high fire danger days (e.g., Red Flag Days and Fire Weather Watch)", the San Rafael Fire Department staff recommended work during the spring. Work during the nesting bird season requires surveys by qualified biologists and training for crews but does not require additional permitting.

It is consistent with the SRSAFRZ PSA and Addendum that allows work during the nesting season notably in accordance with SPR BIO-12 and Mitigation Measure BIO-2b. SPR BIO-12 allows for work during nesting bird season after a qualified registered professional forester (RPF) or biologist conducts a survey for nesting birds, including raptors. SPR BIO-12 provides additional parameters regarding the surveys, including survey access, locations, timing, duration, and time of day. SPR BIO-12 also lists requirements for work if active nests are found, including establishing buffers, modifying treatment, or deferring treatment if it would disturb active nests. Mitigation Measure BIO-2b requires that a project avoid mortality, injury, or disturbance of individuals by establishing a no-disturbance buffer around occupied sites (e.g. nests). Buffer size around any identified nest will be determined by a qualified RPF or biologists and will generally be a minimum of 100 feet, and larger for raptors. No activity is allowed to occur within the buffer areas until the young have fledged or dispersed; the nest is no longer active, or reducing the buffer would not result in disturbance, mortality, or injury. Monitoring by qualified biologists of any treatments around an active nest is also permitted to ensure that

[13] A Project Specific Analysis or PSA is a tool that project proponents can use under California Department of Forestry and Fire Prevention's (CAL FIRE) CalVTP to comply with California Environmental Quality Act (CEQA) if they are proposing vegetation treatments consistent with the CalVTP PEIR. A project proponent is any local or state agency providing funding or having land ownership and/or management or other regulatory responsibility in the treatable landscape. The PSA is a site-specific analysis of whether the activities and impacts of a proposed vegetation treatment project are within the scope of those analyzed in the Program EIR.

activities do not result in nest failure. This approach is taken by many agencies in the region and is consistent with regulatory requirements.

What methods are used for bird nesting surveys?

Consistent with regulatory requirements and established best practices in the region, the Marin Wildfire and member agencies, including the San Rafael Fire Department, contracts with qualified biologists to conduct nesting bird surveys ahead of vegetation management activities that have a potential to disturb nesting birds and are planned to occur during the nesting bird season, mark buffers around active nests, inform contractors to avoid nest buffers, and monitor nests until the fledglings leave the nest and are mobile.

Nesting bird surveys in general and for the SRSAFRZ project occur no more than 2 days before the onset of treatment to accurately assess avian nesting activity and are conducted every 7 days. These surveys are performed in the early morning to capture peak nesting bird activity and are conducted routinely during nesting bird season. This ensures that species that can construct a nest quickly are detected and protected. Surveys are conducted within the project area footprint and the search radius includes a buffer area of 100 feet for nesting passerines and near-passerine species, and a buffer of a minimum of 250 feet, up to 300 feet for raptors.

During these surveys, the biologist will methodically walk through and observe all areas within the work zone, observing tall and densely wooded areas, thick brush and understory, cavities in live and dead trees, stream banks, the ground, and manmade structures such as buildings, telephone poles, and bridges. Biologists also scan large, prominent trees for presence of raptor nests, as many raptor species prefer dominant trees to build the nests (such as red-tailed hawks or red-shouldered hawks). When a bird is observed, the biologist studies its behavior intently to understand its activities (e.g., to determine if it is exhibiting nesting behavior, non-nesting, etc.). Biologists also listen for different calls/songs to determine if nesting is likely. Calls and songs can be determined to be territorial (such as for nesting Anna's hummingbirds); alarm calls and vocalizations, indicating a potential nest location nearby, or part of a display, such as a male songbird attempting to attract females to become potential mates. By using a combination of methods to search for active nesting birds, the likelihood of nest detection is increased greatly.

The location of any active nest is documented via global position system (GPS) points that can be incorporated into project spatial data. The information is relayed to the crew leader directly to ensure avoidance. The nest and nest buffer are also flagged with appropriately colored flagging that includes the date, species, and nest direction. Survey findings are documented in a nesting bird survey form for each day of survey for each project.

How is resprouting of eucalyptus managed and will herbicides be used?

Eucalyptus Management: Herbicides are a critical treatment method in controlling regrowth of certain non-native species including eucalyptus. Marin Wildfire projects use targeted herbicide

treatment for effective management of eucalyptus due to the extensive resprouting that occurs otherwise and the limited, effective treatments to stop eucalyptus resprouting. Herbicides are also used for broom management as part of this project and are applied to broom plants via basal bark or cut stump application.

The process begins with cutting the eucalyptus trees. Tree crews will leave a high stump (refer to photos below) when cutting down the eucalyptus tree to facilitate relocating the stump later and to leave enough space for a second cut before applying herbicide to the fresh stump surface. According to the California Native Plant Society (CNPS), cutting and applying herbicide to the outer portion of the cut stump is the most effective method of controlling eucalyptus[14]. The timing of follow up herbicide treatment is correlated to the effectiveness of the treatment. The San Rafael Fire Department has found that applying herbicide to cut stumps in the fall has proven to be most successful. Due to the relatively short window during which herbicide application is generally most effective, it is not feasible to only cut eucalyptus trees during this time of year. Therefore, the eucalyptus trees are cut throughout the year, as appropriate. Crews then return to cut the stumps a second time in fall and paint herbicides onto the freshly cut eucalyptus stump to help stop regrowth as shown below. No broadcast or aerial spraying is allowed and for eucalyptus would not be the most effective method.

Tall eucalyptus stumps after first cut and prior to herbicide treatment

[14] CNPS. 1995. Eucalyptus spp. - *Ailanthus altissima - Robinia pseudoacacia* Woodland Semi-Natural Alliance. https://vegetation.cnps.org/alliance/31

Cut stump herbicide application

Compliance: Only herbicides allowable under the CalVTP and per local regulations are being used. While the CalVTP PEIR and Marin Wildfire-funded projects are permitted to use several different types of herbicides, those with the active ingredient triclopyr have been used more often than the other allowable types. Refer below for more information on triclopyr.

Herbicide application will be conducted in accordance with regulations and the CalVTP must comply with the U.S. Environmental Protection Agency (EPA) label directions, as well as California Environmental Protection Agency and Department of Pesticide Regulation (DPR) label standards. The application method chosen will depend on the written recommendations of an independent Pest Control Advisor (PCA) licensed by DPR for the targeted weed species and characteristics of the site to which the treatment is proposed.

Implementation of herbicide application as part of projects approved under the CalVTP EIR will not result in substantial exposure of the public or environment to herbicides. Adherence to relevant regulations, CalVTP PEIR Standard Project Requirements, and/or PDIFs will limit the potential for acute or chronic exposure, over-spray, drift, and impacts to non-target species and areas, such as waterways or rare plants, from herbicide application. Any local restrictions regarding herbicides will be followed.

Herbicide Information and Safety: Garlon 4 Ultra, with the active ingredient of triclopyr, will be used for most treatments due to the success this herbicide has with preventing resprouting of

eucalyptus. Triclopyr is used to control woody plants and broadleaf woods and is specifically recommended for treatment of broom and eucalyptus[15].

Triclopyr has little if any potential to bioaccumulate due to the tendency for triclopyr to dissipate quickly[16,17]. Triclopyr is not classified as a pesticide linked to cancer by the USEPA (triclopyr is a Group D chemical, versus Classes A, B, and C, which are carcinogens) nor listed as carcinogens known to the State of California to cause cancer under Proposition 65. The USEPA classified triclopyr as slightly toxic or non-toxic (Toxicity Categories III and IV)[18].

Due to the manner in which triclopyr is applied, the herbicide is primarily going to be present in the targeted vegetation, whether foliage or cut stumps, rather than the soil. The primary methods by which triclopyr degrades are via microbial metabolism in the soil, photolysis (also referred to as photodegradation), and hydrolysis (exposure to water). The half-life of triclopyr has been observed to be approximately 2 to 5.6 hours due to photodegradation[19,20]. Triclopyr is a systemic herbicide that is absorbed through plant leaves. The half-life of triclopyr in plant vegetation varies significantly from 3 to 24 days[21]. As the foliage dies and falls to the ground, some herbicide residue may interface with soils. Triclopyr binds well to organic material, notably plant roots, and with the organics in soils. While the half-life of triclopyr in soils exposed to sunny conditions has been observed to be 2 hours and, on average under all conditions, the half-life in soils has been observed to be 30 days[22], the quantity of herbicide in soils due to the targeted application methods used in the project will be low. One study found little indication of leaching either horizontally or vertically in loamy soils[23]. Another study found that neither leaching nor long-distance overland water flow contributed significant amounts of the herbicide into a nearby stream and concluded that the use of triclopyr posed little risk for non-target organisms or downstream water users[24].

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[15] DiTomaso, J.M. Kyser et al. 2013. Weed Control in Natural Areas in the Western United States. Weed Research and Information Center, University of California. 544 pp.
[16] Strid, A.; Hanson, W.; Hallman, A.; Jenkins, J. 2018. Triclopyr General Fact Sheet; National Pesticide Information Center, Oregon State University Extension Services. npic.orst.edu/factsheets/triclopyrgen.html.
[17] The Nature Conservancy. April 2001. Weed Control Methods Handbook: Tools & Techniques for Use in Natural Areas.
[18] USEPA. https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_G-82_1-Oct-98.pdf
[19] The Nature Conservancy. 2001.
[20] Garlon 4 Ultra. Safety Data Sheet. March 2022.
[21] Strid et al. 2018
[22] Newton, et al. 1990. Deposition and Dissipation of Three Herbicides in Foliage, Litter, and Soil of Brushfields of Southwest Oregon. Journal of Agricultural Food Chemicals. Vol. 38, pp. 574-583.
[23] USFS. 1996. Triclopyr Herbicide Information Profile. November.
[24] The Nature Conservancy. 2001.

How will cut vegetative material from the proposed treatments be processed?

Project debris will generally be processed through hauling, chipping and hauling, chipping and broadcasting, mulching, and/or burning. Burning may include pile burning, air curtain burning, burning via a carbonator, or kiln burning. The cut vegetation materials may be processed in a variety of ways if off-hauled, including but not limited to use in pyrolysis-biomass conversion or enhanced composting. Marin Wildfire is participating in a biomass recovery study to identify long-term, high-value solutions for managing domestic green waste and biomass produced by wildfire hazard reduction activities throughout the County over the next 10 to 20 years. Once complete, the study may lead to the use of additional biomass processing techniques.

Where is the environmental document available for public review?

Marin Wildfire, Central Marin Fire, San Rafael Fire, and MCOSD, for the portions of the project on their lands, evaluated the proposed treatments for California Environmental Quality Act (CEQA) compliance as later activities covered by CalVTP PEIR using the PSA checklist. The PSA process does not require a public review period per the CalVTP PEIR. CAL FIRE includes information about proposed projects on an online viewer at least 15 days prior to filing the Notice of Determination for a project. The PSA is then uploaded to the CalVTP website after it has been approved. Marin Wildfire made the PSA and Addendum available to the public at this link the Friday prior to the Marin Wildfire's approval of the project at the MWPA Board of Director's meeting.