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Project Overview

Description and Timeline

In 2020 the City of Albany (City) started to notice a decline in the health of eucalyptus trees growing on Albany Hill (Hill). The Albany Hill Eucalyptus Project was established in the fall of 2021 in response to the visibly declining health of the forest. Over the following two years, numerous studies were conducted as part of the project to determine the cause of the decline, as well as identify and characterize other factors at play on the hill. This research included studies on the monarch butterfly overwintering habitat, fire risk, and community use. The assessments determined a need to mitigate the associated risks of unhealthy trees as well as to plan for the future of this iconic open space. This implementation plan is intended to serve as a guiding document for the proposed design that has emerged in response to these needs. It outlines past assessment work, describes the community engagement efforts, and provides detailed descriptions of the design process, implementation strategies, and long-term management recommendations. This document is part of the City’s larger stewardship efforts that define the work and care of this public open space.

Project timeline graphic (update and simplify)



(PULL QUOTE) PURPOSE STATEMENT: The City seeks a comprehensive plan for the phased removal of dead and dying eucalyptus trees on Albany Hill and the restoration of habitat for monarchs and native plants and wildlife in a way that creates self-sustaining ecosystems with low fire hazards and minimal maintenance requirements.

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Background

As the only significant topographical feature in the East Bay that sits immediately adjacent to the water, Albany Hill, located on the western side of the City of Albany, is an ecological island and regional landmark. It sits directly across from the Golden Gate strait, where it receives fog and cool winds. Locally the climate of the study area is characterized as Mediterranean with cool wet, winters and warm to hot, dry summers moderated by a strong marine influence including summer fog (USDA 1997). Annual average rainfall for the study area is approximately 24 inches (NOAA 2024) and all of the precipitation is rainfall. The average annual temperature is 60.5 °F. and currently supports a coast live oak woodland, eucalyptus forest, grassland openings, and the riparian zones of Cerrito and Middle Creeks (Nomad, Public Education Session, 2023).

Geologically, Albany hill is an isolated body of Franciscan sandstone surrounded by Quaternary sediment shed from the Berkeley Hills (Alden, 2011). The formation dates from late in the Cretaceous Period, about 70 to 83 million year old (Graymer, 1994). There is one soil mapping unit in the project area: Millsholm silt loam, 50 to 75 percent slopes (USDA 1966). The Millsholm series consists of well-drained to somewhat excessively drained, shallow silt loam soils on steep and very steep uplands. These soils formed from interbedded fine-grained sandstone and shale. Millsholm silt loam ranges from loam or silt loam to light clay loam. Runoff is very rapid, and the erosion hazard is very severe.

Historically, the hill sat adjacent to marshland to the north and west and was predominately open grasslands with oak woodland on the sheltered north and east slopes. It is thought that the forests and grasslands were actively managed by the Ohlone, who had a village near Cerrito creek. The widespread conversion of the region's landscape to grazing lands during the Spanish and Mexican Rancho period in the early 19th century and industrialization of the Gold Rush contributed to marsh infill and urbanization that now characterize the surrounding area. Eucalyptus trees were planted in the late 1800s by Giant Powder Company as blast protection from their gunpowder testing operations (City of Albany, 2012). [Site map or context diagram.](#)

In the 1970s, the City created Creekside Park at the base and north slope of the hill, while the hilltop was designated as public open space. Developers constructed several condominium towers on private land on the west side of the hill in 1977, with the agreement not to develop the remaining acreage. Today these 11 acres, which consist of steep wooded slopes on the bay side of the hill, remain undeveloped. The elevation of Albany Hill ranges from 20 feet above mean sea level near Cerrito Creek at the north to 338 feet at the top. The project area is confined to the top of the hill which ranges in elevation from 180 feet to 338 feet.

The top of the hill, now known as Albany Hill Park, continues to be open space featuring a rustic trail and a stand of mature Eucalyptus trees (City of Albany, 2024).



One outcome of planting eucalyptus was to create monarch overwintering habitat that had not historically been present on Albany Hill. With the vast majority of their historic habitat areas gone due to coastal development, Albany Hill now provides the ideal sunny, wind-sheltered microclimate that monarchs prefer for winter refuge. While their most preferred habitat is located on private property on the western slope, monarchs use the top of the hill more generally for transient cluster sites. (Weiss, Site Walk, 2024). In addition to monarchs, 117 bird species, 30 butterfly species, and numerous other native

insect and plant species have been identified on Albany Hill (Nomad, Public Education Session, 2023).

Despite the dominance of the Eucalyptus stands on the hill, there are stands of native vegetation that persist. Current vegetation communities include Eucalyptus forest, coast live oak woodland, and non-native grassland with patches of native grassland intermixed. This section describes vegetation on-site utilizing a Manual of California Vegetation, Second edition (MCV; Sawyer et al. 2009). Non-native grassland is described using Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986).

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

Eucalyptus forest is the most dominant plant community present on Albany Hill. It is dominated by blue gum (*Eucalyptus globulus**) trees which were planted in the late 1800s by industrialists. Eucalyptus forest on Albany Hill conforms to the MCV association *Eucalyptus (globulus, camaldulensis) Semi-Natural Association*. Eucalyptus forest is characterized by eucalyptus trees dominant in the tree canopy (Sawyer et al. 2009). The canopy ranges from continuous to open and the shrub layer and herbaceous layer is generally sparse to intermittent. Eucalyptus has been planted as trees, groves, and windbreaks; and is naturalized on uplands and stream courses (Sawyer et al. 2009). Blue gum is considered an invasive weed and has a Cal-IPC rank of Moderate (Cal-IPC 2024). Seedlings aggressively invade neighboring areas from original planted locations if adequate moisture is available. Understories in groves of these fast-growing long-lived trees are usually depauperate or consist of thick leaf and bark litter. Seeds of eucalyptus germinate when tree crowns and built-up debris are removed by fire or in other ways. Trees stumps sprout readily.

On Albany Hill, the eucalyptus forest is composed of blue gum overstory with an understory that ranges from areas dominated by non-native grasses and herbs, areas dominated by dense poison oak (*Toxicodendron diversilobum*), and areas with diverse native plants present. Native trees and shrubs present include coast live oak (*Quercus agrifolia* var. *agrifolia*), toyon (*Heteromeles arbutifolia*), poison oak, California rose (*Rosa californica*), bush monkey flower (*Diplacus aurantiacus*), chaparral gooseberry (*Ribes malvaceum* var. *malvaceum*), and California blackberry (*Rubus ursinus*). Native herbs and grasses observed in the understory of Eucalyptus forest include Torrey's melic (*Melica torreyana*), blue wildrye (*Elymus glaucus* subsp. *glaucus*), roughleaf aster (*Eurybia radulina*), Pacific sanicle (*Sanicula crassicaulis*), yarrow (*Achillea millefolium*), soaproot (*Chlorogalum pomeridianum* var. *pomeridianum*), and California goldenrod (*Solidago velutina* subsp. *californica*) among others.

* Denotes a species not native to California.

There are stands of invasive weeds present including Bermuda buttercup (*Oxalis pes-caprae**) and French broom (*Genista monspessulana**).

Coast Live Oak Woodland

Coast live oak woodland within the study area conforms to the MCV alliance *Quercus agrifolia* Woodland and Forest Alliance. In this alliance in California, coast live oak is dominant or co-dominant in the tree canopy with other native trees species including big leaf maple (*Acer macrophyllum*), boxelder (*Acer negundo*), California buckeye (*Aesculus californica*), and California bay (*Umbellularia californica*), among others. Trees are less than 100 feet (30 meters) tall in height and the canopy is open to continuous. Shrub layer is sparse to intermittent. The herbaceous layer is sparse or grassy. Within California, coast live oak woodland inhabits alluvial terraces, canyon bottoms, stream banks, slopes, and flats (Sawyer et al. 2009).

Coast live oak woodland is present at the northern end of Albany Hill where there are dense stands of oaks and along the margins of the Eucalyptus forest, where oaks have higher total cover than the Eucalyptus trees. Coast live oak woodland is mostly outside of the project area, however the intact stands will provide a reference site for restoration in the project area where Eucalyptus forest will be converted to coast live oak woodland. On Albany Hill, coast live oak woodland is dominated by coast live oak in the tree canopy with scattered California buckeye and blue elderberry (*Sambucus mexicana*). The understory includes native species such as poison oak, California blackberry, red flowering currant (*Ribes sanguineum* var. *glutinosum*), hedge nettle (*Stachys rigida* var. *quercetorum*), goldenback fern (*Pentagramma triangularis*), wood fern (*Dryopteris arguta*), and snowberry (*Symphoricarpos albus* var. *laevigatus*), among others. Areas dominated by stands of Bermuda buttercup* and upright veldt grass (*Ehrharta erecta**) are also present.

Grassland

Grassland is present on site in the openings of Eucalyptus forest and adjacent to the trail. The majority of the grassland on site is dominated by non-native grasses, but contains areas of high diversity of native grasses and forbs. As described by Holland (1986) non-native grassland is dominated by a sparse to dense cover of non-native annual grasses and weedy annual and perennial forbs, primarily of Mediterranean origin, that have replaced native perennial grasslands as a result of human disturbance. However, where not completely out-competed by weedy non-native plant species, scattered native wildflower species and native perennial grass species considered remnants of the original vegetation, may also be common. Germination occurs with the onset of the late fall rains while growth, flowering, and seed-set generally occur from winter through spring.

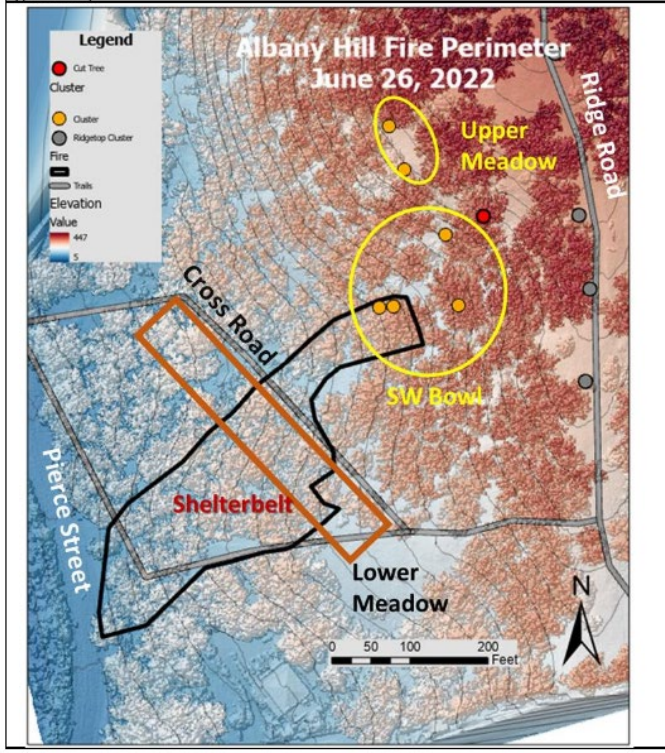
Grassland on site is dominated by wild oats (*Avena fatua**), slender oats (*Avena barbata**), soft chess (*Bromus hordeaceus**), and rigput brome (*Bromus diandrus**). Within this matrix of non-native grasses, stands of native grasses and forbs are present

including blue wildrye, soaproot, yarrow, California goldenrod, California brome (*Bromus sitchensis* var. *carinatus*), California oat grass (*Danthonia californica*), big squirreltail (*Elymus multisetus*), june grass (*Koeleria macrantha*), California melic (*Melica californica*), purple needlegrass (*Stipa pulchra*), Bolander's goldenaster (*Heterotheca sessiliflora* subsp. *bolanderi*), blue-eyed grass (*Sisyrinchium bellum*), purple needlegrass (*Stipa pulchra*), narrowleaf mule ears (*Wyethia angustifolia*), and Pacific aster (*Symphyotrichum chilense*). In some areas, these stands of native species have high cover and are dominant.

Forest Decline

Tasmanian blue gum (*Eucalyptus globulus*), the species of eucalyptus planted on Albany Hill and throughout the Bay Area, has shown widespread decline since 2020. A report studying this regional dieback by U.C. Berkeley cited environmental stressors such as drought, increasing temperature, and fewer fog days, as well as disease from latent pathogens or opportunistic fungi, as strong drivers of the decline (Garbelotto, 2021). Compounding the fire risk, Tasmanian blue gum trees have a low branching and heavy limbed structure with shaggy bark, and they produce considerable ground litter and suckers. (Source). These conditions were spotlighted in the fire that burned on the west side of the hill on June 26th, 2022. While the fire burned important windbreak and cluster habitat for the monarchs (Weiss, 2022), no people or property were damaged, but the imminent need to address the current high-risk fire conditions was strongly highlighted.

Map 1. Fire perimeter, cluster sites, and canopy elevation (blue to red gradient)



CONTRIBUTING STUDIES REVIEW

While not a comprehensive list of documents pertaining to Albany Hill, the following were commissioned as part of the Albany Hill Eucalyptus Project or particularly informative for developing this management plan. They represent the extensive consultations the City has done to address the issues with an informed foundation of expertise and sound science. The complete reports can be found in the appendices.

- a. 2008 City of Albany IPM Policy
- b. 2012 Albany Hill Creekside Park Master Plan
- c. 2018 Albany Hill Monarch Habitat Assessment
- d. 2020 Vegetation and Fuels Management at Albany Hill (*Compatibility with Conservation of Monarch Over-wintering Habitat*)
- e. 2021 Albany Parks, Recreation, and Open Space Master Plan
- f. 2021 Eucalyptus Dieback Report
- g. 2021 Eucalyptus Water Stress Reading Report
- h. 2021 Arborist Report, Tree Risk Assessment Qualification (TRAQ) Level 2 Assessment
- i. 2022 TRAQ Level 3 Assessment of Trees in Monarch Habitat

- j. 2022 Forest Structure Analysis for Monarch Habitat (Draft)
- k. 2022 Fuel Loads Assessment (Draft)

COMMUNITY ENGAGEMENT PROCESS

This section describes the methods and key take-aways from the public engagement process. The priorities revealed through these meetings and surveys have directly informed the design explorations and decision-making processes. Content and recordings from these meetings are available on the city’s project website and print material is available in the appendices.

Placeholder flowchart – refine and update.



Initial Public Survey.

The initial public survey was live on the City’s Albany Hill Project website from July 26th to November 6th, 2023. 745 people responded to questions about general usage, opinions of the hill, and opinions of the Albany Hill Eucalyptus Project. Questions included:

1. How often do you visit the natural areas on Albany Hill?
2. Why do you come to the natural areas on Albany Hill?
3. What aspects do you appreciate?
4. What aspects do you feel could be improved?
5. What is your opinion of the Albany Hill Eucalyptus Project?

Summary paragraph on results

Public Education Session

On November 8, 2023, the City of Albany and project consultants held a community workshop at the Albany Senior Center. The early stages of the project were presented and discussed with the community. Major themes that emerged from this working session included fire safety, failing trees and eroding slopes, a desire for high-quality wildlife habitat, and improvements to the visitor experience.

Site Walk

On December 3, 2023, a site walk was held on Albany Hill with the City, project consultant team, and public to discuss and observe the major considerations of the project.

Summary paragraph on value of experience and input

Parks, Recreation, and Open Space Commission (PROSC) meeting

On March 14, 2024, the design team presented to the Parks, Recreation, and Open Space Commission the three priority area explorations which are described in detail below.

Summary paragraph of primary comments and/or refer to staff report/meeting notes in appendices

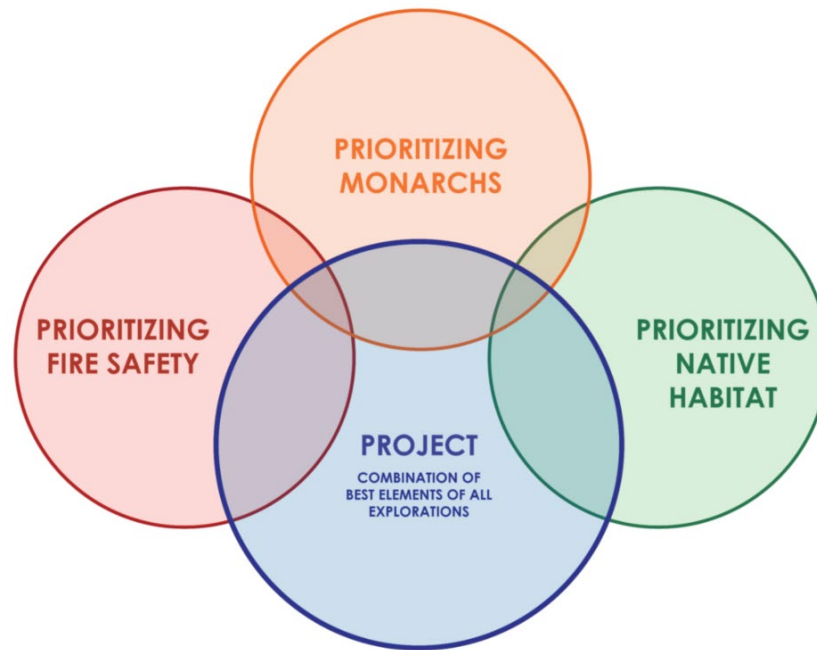
Design Exploration Survey

The second survey was live on the City website from March 14th to April 29th, 2024. The survey asked participants to rank five elements of each Design Exploration (Fire Safety, Native Habitat, Monarch). Or if all elements are equally important, to rank them as all high (priority 1) or all low (priority 5). Key takeaways from the Design Explorations are listed at the end of the next section.

Design Process

PRIORITY AREA EXPLORATIONS

The purpose statement identified three themes as top priorities for the plan: Fire Safety, Monarch Overwintering, and Native Habitat. During the spring of 2024, a visioning exercise was done that took each priority area to its fullest expression. This question was asked for each: “If there were no other factors at play, what would be the ideal configuration and action plan for Albany Hill?” Experts were consulted to develop strategies and outcomes to maximize benefit for each priority area while addressing the real risks associated with the failing forest. The exercise assumed no constraints other than existing site conditions, however the benefits and drawbacks of each exploration were considered with the overall project in mind. The final plan integrates elements of all three Priority Area Explorations (PAE) which are presented below.



Fire Safety

The design team worked with the Albany Fire Department to explore what Albany Hill would look like in its most fire-safe state. The following priorities were identified:

- a. Good access for equipment and personnel.
- b. A disconnected canopy and understory to prevent fire ladders.
- c. A park that models the integration of fire safety and beautiful public space.
- d. Eucalyptus removal and replacement with more appropriate canopy species.

In addition to these priorities, the Fire Department identified the pressing need for eucalyptus removal prior to the plan being implemented. The team reviewed arborist reports (SBCA Tree Consulting, 2021 and McNeil Arboriculture Consultants, 2022) and life/property safety criteria to generate a list of 100-150 trees for which removal is critical. Trees within essential monarch overwintering habitat were excluded from this part of the exercise. These priority tree removals were split into two categories, each with associated criteria for inclusion.

Fire Spread Risk. Trees in this category were selected from three fuel models identified as having “High” or “Very High” fuel loads or “High” fire spread rate. These fuel models represent areas with considerable understory or areas with a thick layer of debris (Rice & Miller, 2022).

Residential Target. Trees in this category are within 100-ft of a private residence, are listed as dead, or listed as a residential target in the TRAQ2 Arborist Report (SBCA Tree Consulting, 2021).

After the priority tree list was created, the team developed a three phased vision plan for the Fire Safety PAE. Phase 1 involves creating a fire break between private and city owned land and removing trees from the priority tree list. Removals would happen as soon as the ground is dry enough to prevent erosion and before the fire season begins at the end of June. Existing oaks would be protected, and the removed eucalyptus would be chipped and used as mulch on site. Phase 2 work would happen on the slopes between the newly created fire break and the top of the hill. It includes selective eucalyptus removal with new oak trees and native understory planted to fire safe specifications. Phase 3 involves as-needed eucalyptus removal with subsequent mulching along the fire road at the top of the hill. It is important to note that at the time this exploration was done, fire regulations were anticipated to change, and any vegetation management strategies will need to comply with the new code requirements.

Phase diagram (pending edits and figure text).



The pros to this PAE include reducing fire risk and thereby reducing the City's liability by removing all eucalyptus from the hill over time. It would provide a working model for how defensible space can look and feel and serve as a tool for the fire department to showcase a beautiful neighborhood park that is also fire safe. An important downside to this PAE is that monarch habitat would likely move to adjacent, privately-owned land which would reduce public visibility of the overwintering site. This was the simplest and least expensive exploration.

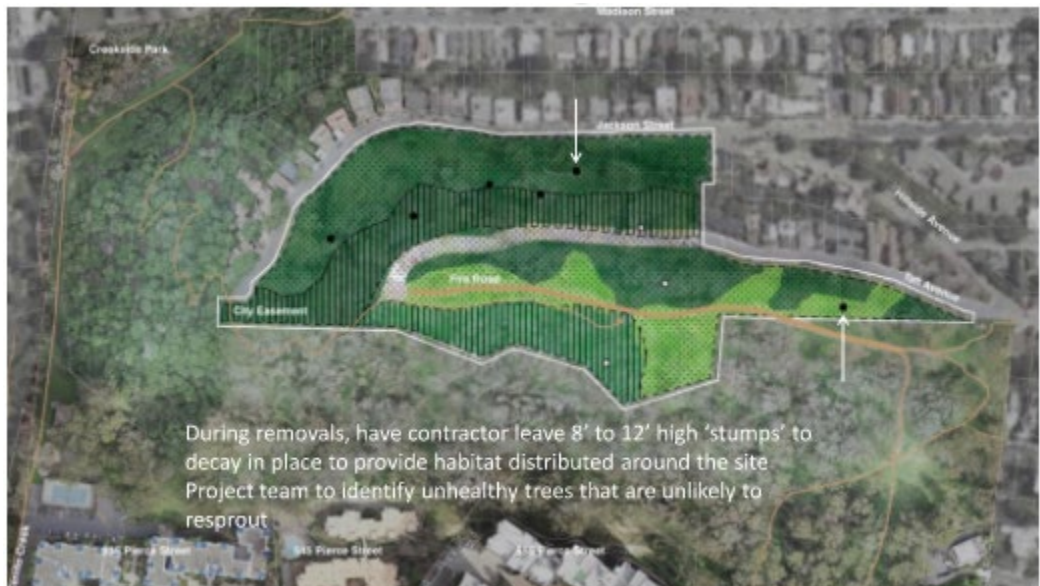
Native Habitat

The design team worked with Nomad Ecology to envision an outcome for Albany Hill that would maximize native habitat. This PAE assumes general eucalyptus removal, protection of existing native vegetation wherever possible, and active restoration and maintenance to achieve intact native habitats. The north and east facing slopes are suited to scattered oak woodland with a grassland understory. The west facing slope can support denser oak woodland with mixed shrub understory, and the top of the hill is well suited to support a native grassland.

Strategies to achieve these habitats include:

1. Collect seed from existing native plants to generate well adapted restoration material.
2. Conduct surveys prior to tree removals to protect existing native plants.
3. Minimize ground disturbance by using delineated haul routes.
4. Mulch extensively with chipped eucalyptus from removals.
5. Reuse eucalyptus logs to create planting opportunities.
6. Leave snags for habitat diversification.

One component of this plan is the distinction between selective and general eucalyptus removals. Selective removal areas have existing native understories that would be delineated and protected during eucalyptus removal. This creates the need for a more nuanced removal process. General removal areas have little to no existing native understory and therefore less need for pre-removal work and less restricted removal processes. [Snag diagram](#)



The benefits of this PAE include creating a complex native habitat mosaic with multi-species benefits, creating a resource for future nearby restoration projects, and maximizing opportunities for cultural use and community and tribal participation. The drawbacks include the need for a more complex maintenance regime than is currently in place, a more deliberate tree removal process to protect existing native species, more competency requirements for the contractor, and, like the Fire Safety PAE, monarch habitat would likely move to adjacent, privately-owned land which would reduce public visibility of the overwintering site. This was estimated to be the most expensive exploration.

Monarch Habitat

The design team worked with Creekside Science to explore what eucalyptus removal processes and outcomes would most likely benefit monarch butterfly use. Currently, monarchs use the ridgetop for transient cluster sites and move lower down the west facing slope to more sheltered, refuge sites during winter storms. These refuge sites exhibit solar access and wind protection characteristics that are favorable to the butterflies and were determined to be critical elements to protect in this PAE.

Because the monarch use areas are concentrated in the southwestern part of the hill, large areas of eucalyptus can be removed without impacting the overwintering habitat (shown in light purple). Within the monarch use areas (shown in pink), eucalyptus would be protected to maintain favorable habitat conditions and replacement eucalyptus and groundcover nectar sources would be planted to fill gaps and provide future continuity of these important resources. Along the rest of the ridge and west facing slopes (shown in dark purple), the failing eucalyptus would be removed and replanted. [Support area diagram \(pending edits and figure text\)](#)



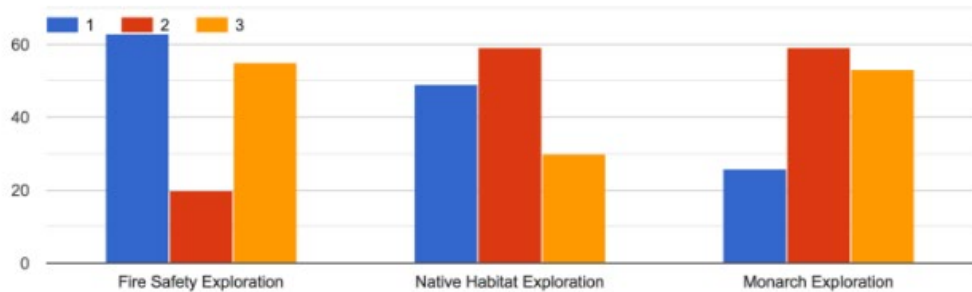
This PAE explored what tree species might be appropriate replacements for the failing trees that currently provide the structure for monarch habitat. Replacement species candidates were selected that have a better fire profile, are better adapted to climate conditions on the hill and provide a comparable morphology to the Tasmanian blue gum. This PAE recommended planting field test trees in order to evaluate several species for suitability directly on the site.

This PAE included the maintenance of the structures and resources currently used by monarchs and preserving public access to the overwintering sites, and retaining significant portions of the failing eucalyptus forest. Drawbacks include the preservation of eucalyptus in the near term within high fire risk and public access areas (and the associated maintenance and liability considerations), and the introduction of new exotic species to the hill.

PUBLIC SURVEY RESPONSES TO PRIORITY AREA EXPLORATIONS

Overall, the Fire Safety Exploration had the most Priority 1 rankings with approximately 61, followed by the Native Habitat Exploration with 49, and the Monarch Exploration with 26. [\(add raw numbers\)](#)

11. Overall, please rank the Priority Explorations in order of your personal priorities (1 = most important, 2 = middle, 3 = lowest)



When the respondents were asked if there were any elements that they strongly opposed, “retention of existing eucalyptus” and “planting *Eucalyptus diversicolor*” received the highest percentage of votes with 55.3% and 49.4%, respectively. “Starting removals of the priority list before starting the larger project” received the next highest percentage with 12.9% strongly opposing. It is worth noting that the majority of respondents did not attend any of the prior three meetings.

Some additional key takeaways from the response to the second online survey comparing the three PAE’s were:

1. 86.5% of respondents said that all elements of the Fire Safety Exploration rank as high priority.
2. Of those that ranked each element of the Fire Safety Exploration, “creating a fire break” received the greatest number of priority 1 rankings.
3. Responses from the Native Habitat Exploration showed that “protection measures for existing native plants” and “active restoration planting” received the greatest number of priority 1 rankings.
4. The Monarch Exploration responses had clear priority rankings for the five elements:
 - a. Priority 1 (highest): Plant non eucalyptus species replacement trees;
 - b. Priority 2: Plant new nectar sources;
 - c. Priority 3: Plant a new windbreak;
 - d. Priority 4: Plant replacement trees – *Eucalyptus diversicolor*;
 - e. Priority 5 (lowest): Retain existing eucalyptus.

Proposed Implementation Plan

Taking into consideration the extensive field observations, analysis, expert studies, and public discussion of a defensible and responsible path forward for the City of Albany’s property, the project team has developed an Implementation Plan that maximizes the benefits of each Priority Area, while accommodating the critical safety issues and long-term sustainability of the Albany Hill landscape post-project.



Project Vision

Chapter in progress

Chapter will focus on the overall vision. Information regarding strategies to achieve the vision will be moved elsewhere in the plan.

Overall Project Goals

At the conclusion of the project, the City aims to achieve the following:

- Reduce fire risk and hazard tree exposure from Eucalyptus on City property.
- Transition Monarch over-wintering habitat at the top of the hill to a more resilient forest stand that is less dependent on *E. globulus*.
- Increase cover of California native oak species.
- Increase cover of herbaceous California native plant species, including monarch nectar plants and species for Tribal use.
- Improve and continue control of invasive plant species.
- Improve and continue to foster suitable habitat for a wide range of fauna currently making Albany Hill their home.
- Expand the variety of native habitat types on Albany Hill.

Long-Term Vision

FIRE SAFETY

Due to the rapid decline in the health of Eucalyptus trees on Albany Hill, this project will help the City reduce fire hazards by removing most of these trees from City-owned parcels. This will also lower the risk of fires spreading to nearby private properties and the larger Albany community

Sequencing strategies

Eucalyptus removals are distributed across three distinct removal phases, with the trees identified by the team as Priority Removals in the first phase, and selective removals adjacent to Monarch areas being left for the last phase.

The removals are also happening around the perimeter of the City property first, both to help with creating a fuel break from the Eucalyptus stands on adjacent private property, and to provide space between remaining City-owned Eucalyptus and private homes. The removal of portions of the current Eucalyptus forest will have impacts on those trees remaining – more wind and sun exposure, and a different water regime. Should trees in Phase 2 removal areas fail between Removal Phase 1 and Removal Phase 2, they will land on previously cleared areas or City property, rather than on private parcels.

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Attractive and Fire Safe

One of the Albany Fire Department (AFD) goals for this project is to demonstrate that fire safe public spaces can also be ecologically diverse, healthy, and attractive places for people. The planting palettes, plans, and shrub and tree spacing for the restoration phases of the project will work with fuel ladder spacing as well ecological community composition guidelines to create an open space that is beautiful, enjoyable, and fire safe.

HABITAT RECOVERY

Albany Hill is the only significant topographical feature in the East Bay that is immediately adjacent to the Bay, directly across from the Golden Gate where it receives fog and cool winds. The hill has been an important place for humans to gather, recreate, and live for millennia.

As a key steward of this land, the City of Albany is committed to restoring as much of the land to native plant communities as possible. Three target habitat types have been identified for restoration planning to achieve this goal: Open Oak Woodland with Herbaceous Understory, Oak Woodland with Shrub Understory and Native Grassland. All of the habitat types identified are similar in composition but vary based on the density of oak trees and the relative density (or absence) of shrubs.

Open Oak Grassland

A high diversity of native herbaceous perennial species were observed in openings between oak trees, particularly on the north facing slope just south of Jackson St. Throughout the Bay Area, patches of native herbaceous species are often found in grassland openings on the margins of oaks. The target vegetation community in this area is scattered oak trees with openings that contain islands of native herbaceous species, and low cover of scattered native shrubs. This area currently has a high number of young oak seedlings that may need to be managed to maintain oaks at the correct density to support grassland openings in between, instead of dense oak woodland.

Restoration activities in this target habitat type include Eucalyptus removal, protection of stands of existing native herbaceous grasses and herbs, planting of native herbaceous grasses and herbs in habitat islands (patches), invasive weed control, and management of oaks to maintain appropriate densities. Many of the young oak seedlings currently on site may be impacted during Eucalyptus removal which will help with optimizing oak spacing both for herbaceous understory establishment and fire safe spacing.

This habitat type occurs on slopes of varying steepness. There are opportunities to reuse log and cutting materials from the Eucalyptus removal process to create wattles to slow surface flows and create horizontal space for new native planting patches while aiding with erosion control. In areas where a general removal strategy has been followed (Areas A and E) more intensive active restoration will be employed compared to areas where

the selective removal strategy has been followed (Areas B, C, D and F) and existing native understory can be protected to remain. Species proposed for planting patches in Open Oak Grassland areas can be found in [\[spreadsheet location\]](#)

Oak Woodland with Shrub understory

Dense Eucalyptus forest is present on the south side of Albany Hill on the south facing slope. The understory in these areas consists of dense Eucalyptus debris with native trees including coast live oaks and native shrubs including toyon and poison oak. Few native perennial species were observed. The dense Eucalyptus in this area will make it difficult to protect any native plant patches during Eucalyptus removal. After Eucalyptus removal we anticipate that there will be high cover of Eucalyptus chips and slash due the amount already present and the amount generated by removal of the dense Eucalyptus overstory. We anticipate that after Eucalyptus removal, the poison oak and toyon on site will resprout and colonize the slope. The area will be less suitable for planting of native herbaceous species due to the shrubs that will recolonize and the depth of the Eucalyptus mulch.

Restoration activities for this target habitat type will be more passive in nature, although where possible, native oaks will be planted within a companion plant island to start establishing higher canopy cover for the future. Native herbaceous species may be planted in openings between the oaks if habitat conditions appear suitable after eucalyptus removal is complete. This target habitat type is found in Area G, just downslope from the Hill Trail. Species proposed for planting patches in Oak Woodland with shrub understory areas can be found in [\[spreadsheet location\]](#)

Native Grassland

At the top of the Hill, there are grassland openings adjacent to the fire road. These areas currently have some native species present but are dominated by non-native annual grasses. Restoration activities would focus on increasing vegetative cover of native perennial grasses and herbs, and decreasing cover of non-native grasses and forbs. Restoration in these areas would include timed mowing of annual grasses, patch planting of native species, and invasive weed control.

The Grassland areas are sequenced for active restoration in later phases to allow for greater sun exposure and reduced leaf litter facilitated by the earlier phase Eucalyptus removals. Grassland planting patches and mowing activities are planned for Areas F2, D4 and J2. Species proposed for planting patches in Grassland areas can be found in [\[spreadsheet location\]](#)

Fauna

While this project is largely focused on addressing the future of the Eucalyptus forest currently dominating the City's parcel on Albany Hill, there are a wide variety of fauna that make the Hill their home, or utilize it as visitors. [bird species utilizing, count summary from Nomad] Over 30 species of butterflies have been recorded on the hill in addition to the charismatic Monarchs (citation).

Removing the Eucalyptus from areas which have native understory and oaks already present will allow those native trees and shrubs to receive better light and water, and provide higher quality native habitat moving forward. Several Eucalyptus trunks will be left to serve as snags, and monitored to ensure they do not resprout and spread.

The project has incorporated protections and strategies to limit disturbance to the fauna of the Hill, while improving future habitat, soil health, food and nectar sources to encourage even more diversity and stability for those creatures that visit or live on the Hill.

MONARCH OVER-WINTERING

Most Eucalyptus trees on City property are not utilized by or beneficial to Monarchs. (pending edits and figure text).



The forest and habitat management implications of providing for continued use of Albany Hill by Monarchs are restricted to a select area on City Property.

The key components in this project that will address the anticipated failure of the current Eucalyptus in the seasonal Monarch use areas are:

- RETAIN existing Eucalyptus in use areas for clustering and to provide wind protection (until existing trees fail/become imminent hazards)
- PLANT replacement trees (more appropriate species) selected from field trial candidates to allow them to gain stature prior to the failure of current host trees
- PLANT groundcover nectar sources in open areas adjacent potential cluster sites on City property (native grassland target habitat)

diagram (pending edits and figure text).

Replacement Trees

The blue gum Eucalyptus on Albany Hill are currently providing amenities to the Monarch populations that were previously provided by native habits along the California coast which are no longer extant. There are compelling benefits to ensuring that Monarchs are still able to find refuge and fodder on Albany Hill moving forward. The City is looking to ensure that the Monarchs will continue to have the necessary habitat amenities on City Property for seasonal overwinter clustering moving into the future. The Eucalyptus stands on City property are in rapid decline, and the need to replace the highly invasive, and high fire risk Eucalyptus stands with a more appropriate species that still meets their needs is urgent.

Description of the vision of the monarch management area (Weiss meo)

REPLACEMENT TREE CANDIDATES

Eucalyptus diversicolor (Karri)

Recommended by Stuart Weiss. Unlike the Tasmanian Blue Gum, *E. diversicolor* is killed outright by severe fires and does not regenerate from a lignotuber or from epicormic shoots under the bark. It poses a much lower risk profile in terms of invasive spread outside of the zones where it may be planted. It has been introduced onto CA state lands for the express purpose of providing Monarch habitat in areas where they have been utilizing *E. globulus* stands (citation).

While non-native, the Karri tree is from the southwestern Australian coastal environment – rather than the much damper Tasmania - and has a much lower water use profile. The wood is also highly valued for lumber, and the blooms are a source of nectar for bees and other pollinators. While not a native plant, the replacement trees would remain on the Hill and serve as a living reminder of past human decisions, and consequences both positive and negative, providing a very tangible discussion point and educational opportunity for future generations. Field tests of their suitability will be critical in determining if their selection is appropriate.

Height, canopy, hort criteria

Additional replacement tree species options are discussed in the next section of this report. A total of four species will be planted as part of the Field Test.

Field trial replacement trees

In addition to the *Eucalyptus diversicolor* recommended as a replacement species during the Priority Area Exploration phase of the project, the consultant team recommends including some California native species and non-eucalyptus alternatives for future Monarch habitat. This project is an opportunity to field test several species for their capacities and appropriateness as replacement trees. An advantage of the multi-phase approach is that it allows the City and Public to participate in both the study and selection process which will help shape the future of the vegetation and character of Albany Hill.

Other replacement candidates for field testing include:

Lyonothamnus floribundus ssp aspleniifolius (Santa Cruz Island Ironwood)

A California native tree, albeit from the Channel Islands and southern California, the Ironwood has very similar structural features as the Tasmanian Blue Gum – narrow tall form, drooping long leaves, and nectar producing blooms. It does, however, also share the issue of shedding bark and high leaf litter production. Unlike the Eucalyptus, however, the leaf and bark products decompose more readily. It has strong branches, but grows at a slower rate than the potential pine candidates (~24”/year).

Height, canopy, hort criteria

Pinus canariensis

A non-native pine tree that hails from the Canary Islands, this tree is readily available in the nursery trade, is non-invasive, a rapid grower with the structural features needed for potential utilization by Monarchs (solar gain and wind protection). It is frequently planted for screening adjacent parking garages, highways, and other high wind areas with challenging soil or pollution profiles. There are vigorous and healthy examples planted in West Berkeley and Albany that led credence to their ability to thrive in the project area. *P. canariensis* is also considered one of the most fire-resistant pines available, and is highly drought resistant, which improves its ability to provide habitat amenities under a wide range of potential future conditions.

Height, canopy, hort criteria

Pinus sabiniana (Gray or Foothill Pine)

Unlike *P. canariensis*, the Gray Pine is native to California and was historically found in the East Bay (citation-Calflora has specimens on UC campus in the 1800's and others in Tilden) It too has a very vertical profile, with a growth rate of approximately 3' a year, allowing it the potential to replace the failing *E. globulus* stands in a shorter time period. It is utilized by a wide range of wildlife, and has medium branch strength (selectree.calpoly.edu)

Height, canopy, hort criteria

SLOPE STABILITY AND SOIL HEALTH

The removal of the majority of *E. globulus* will reduce the slope instability currently seen on City property. Eucalyptus roots force themselves between sandstone cracks looking for water, and to stabilize the tall tree from wind forces, loosening the soil. The slow rate of decomposition of Eucalyptus duff also retards the formation of a healthy soil profile and reduces available nutrients and habitat for soil microfauna. The project aims to retain and improve soils on the project site through a variety of methods, including the use of nurse logs on steep slopes to retain grade and provide planting areas for native bunchgrasses and other slope stabilizing species.

Adjacent eucalyptus forest

Describe goal of modeling removals and habitat restoration opportunities for adjacent property owners to adopt similar removal and rehabilitation efforts.

LONG-TERM MAINTENANCE AND ADAPTIVE MANAGEMENT

[will be moved to Chapter 4]

Adaptive management – advantage of spreading removals and restoration phases out temporally is the ability to observe how the change in physical structure to the habitat plays out with new plantings – and what emerges from the seed bank and soil on the hill. Close observation and documentation of can inform future planting strategies and activities.

- Preventing spread of *E. globulus* onto City property from adjacent parcels containing stands
- Invasive weed control between active restoration plant patches
- Seed (and vegetative) amplification from site sources (existing and project patches)
- Community involvement / outside stewardship partners crucial to the success of the project

- Citizen science and observations
- Ensuring that future management decisions are in-line with project objectives and goals.



Implementation Plan

Strategy Overview

When designing the implementation sequencing, along with the priority area goals many factors were taken into consideration that led to the following strategies:

- Separating the project implementation by areas of contractor expertise (tree removals and site stewardship)
- Distribution of costs and tasks to maximize grant opportunities and fiscal efficiency
- Front loading high-risk removals
- Minimizing disturbance of ecological assets already present on Albany Hill
- Allowing time for high quality native plant contract growing
- Limiting disturbance within the Monarch Management Area by addressing tree removals on a case by case basis, selectively managing understory vegetation, and allowing time for wind break plantings and field trial trees to gain stature
- Staggering removal and restoration phases to allow for adaptive management based on results of previous phases
- Sequencing removal phases to reduce potential risks of failure on remaining *E. globulus* trees due to changes in stand dynamics (impacts from changes to wind and solar exposure)

TWO CONTRACTORS; TWO BID DOCUMENTS

One of the challenges of creating an implementation plan for this project is the scope of tasks needed to achieve the primary goals. Eucalyptus removal is a specialized skill, and contractors who can tackle a site with slopes, tight access and adjacent residences will almost certainly not possess the equally specialized skills of native plant identification and environmental restoration experience. By separating the project into two distinct contracts, and allowing them to stagger in sequence, the City has a greater chance of receiving competent and competitive bids for the project.

Bid documentation for the removals contractor and restoration contractor will be connected by a single set of technical specifications for the project, ensuring that all parties involved are working off the same information, requirements, and criteria. The intent is to make each scope of work as transparent as possible, and more easily coordinated. The project kick-off will involve site walks and meetings with both contractors present, for the same reason – to insure each scope of work is receiving the same information, and each area of expertise can help inform and guide the other.

REPLACEMENT TREE FIELD TRIAL ASSESSMENT

One of the pressing questions for this project is how to handle the opportunistic utilization of a Cal-IPC rated invasive species (*E. globulus*) by a potentially endangered species (Monarch butterflies). Human development is responsible for the loss of their original habitat along the California coast, and human industry is responsible for the

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presence of the Eucalyptus on Albany Hill. What is the responsible path forward for both the hill and the butterfly? How do we keep the educational benefits (and sheer delights) of having Monarch clusters on the publicly accessible parts of the hill without compromising its overall habitat health and fire profile?

A key component of the solution presented by the implementation plan is experimentation. The trees the Monarchs use seasonally on City Property are ill and failing. To provide continuity, we need to replace them with less problematic trees that will still provide the same services. This is not a unique problem to Albany Hill. Other land managers are taking different approaches, and various research is ongoing (Fisher 2023).

This project provides an opportunity to field test several different species to see how well they adapt and thrive on Albany Hill, and what their physical properties actually are in this environment as well. The project as proposed has seven phases – four restoration and three removals. The first restoration phase calls for the planting of the field trial trees, which remain in place for evaluation and monitoring through phases 1-6. This allows time for assessment, observation, public and expert comment, and an opportunity to see how the Monarchs react to them in place. By Phase 7, the selected replacement species can be planted in larger numbers at the appropriate layout and spacing to provide ideal solar access and wind protection for the Monarchs.

PROJECT PHASING OVERVIEW

The project site was divided into lettered areas to simplify communication prior to implementation regardless of phase (removal or restoration) and to make coordination between contractors more efficient.

[insert phasing diagram overviews from restoration and removals bid set with all areas labelled]



Implementation Plan

BMPs and Protective Measures/Conditions

CULTURAL RESOURCES

Native American habitation and use of the hills resources date back millennia. However, villages and resources were concentrated near the two creeks that run on both the north and south ends of the hill; not on the ridgeline. The City will consult with the Tribe to confirm areas of cultural significance or sensitivity prior to the start of project work, and where indicated, tribal monitors will be on site for any ground disturbing activities.

Tribal input will also be solicited for the composition of planting palettes to ensure culturally important plants are included for stewardship and propagation. Tribal members will be invited to collaborate and inform the priority rankings for species designated for salvage and transplant.

BOTANICAL RESOURCES

General Vegetation/Existing Native and Eucalyptus Removal

Oak trees and native vegetation in the project area will be protected and avoided during tree removal to the maximum extent feasible. Within the selective removal zones, areas of native trees and other native vegetation will be flagged or marked prior to the start of tree removals for that area. The tree removal contractor will be shown the flagged and marked locations of native trees and native vegetation, and strategies for avoidance will be planned and coordinated prior to the commencement of any tree removal activities.

Some native trees and native vegetation are in close proximity to Eucalyptus slated for removal – species that are good candidates for salvage and subsequent replanting will be assessed and dug to the extent possible. This work will be conducted by the restoration contractor rather than the removals contractor.

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Invasive Weed Prevention Measures

Invasion of the restoration areas by invasive weeds can significantly impede the development of the restoration site and will need to be monitored and controlled. Non-native invasive weeds will be controlled through a combination of manual or mechanical means, as appropriate. The California Invasive Plant Council assigns ratings to invasive weeds based on criteria such as ecological impacts, treatment or eradication priority, and threats they pose to agricultural economics (Cal-IPC 2024). Invasive weeds observed on site include Bermuda buttercup (*Oxalis pes-caprae**, Cal-IPC rated Moderate), French broom (*Genista monspessulana**, High), English ivy (*Hedera helix**, High), Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus**, Moderate), bull thistle (*Cirsium vulgare**, Moderate), fennel (*Foeniculum vulgare**, Moderate), eggleaf spurge (*Euphorbia oblongata**, Limited), milkflower cotoneaster (*Cotoneaster lacteus**, Moderate), woolly cotoneaster (*Cotoneaster pannosus**, Moderate) and poison hemlock (*Conium*

maculatum*, Moderate), among others. Invasive weeds on Albany Hill will be treated if they are negatively impacting restoration progress, regardless of their Cal-IPC ranking

1. Prevention training will be provided to staff and tree removal contractors prior to starting work. Invasive weed identification and avoidance measures will be included in the preconstruction environmental tailboard meeting. The training will include field identification of invasive plants in the project area, reproductive biology of invasive plants, and invasive plant prevention Best Management Practices. The training will also include a summary of Phytophthora, its issues, spread, and Best Management Practices. The biological monitor will ensure that contractors understand provisions for invasive weed prevention and soil borne pathogen spread prevention throughout the project. Invasive and non-native plant and soil borne pathogen considerations will be routinely addressed during regular tailboard meetings.
2. Cleaning BMPs will be integrated into the project. All equipment and material arriving on site will be clean and free of soil and plant material. Contractor vehicles and equipment will be cleaned prior to arriving at the work site, to minimize bringing invasive weed propagules, plant pathogens, insects, and soil from elsewhere onto the project.
3. The soil surface will be disturbed the minimum amount necessary to complete tree removal and replanting activities, which will reduce ground disturbance and consequently will help minimize the proliferation of invasive weeds.

FAUNA

Western Monarch Protection Measures

The project will leave the Monarch Management areas largely undisturbed until Phase 6, which will leave the host trees in place for as long as safety allows. The Critical Monarch Zone (see Phasing Diagrams) will be excluded from the Removals Contract, and be managed entirely by the City of Albany. Work within the Monarch Buffer Zone will be determined in Phase 5.

[[phase diagram showing Monarch Areas](#)]

1. Dead branches and dead trees do not provide monarch habitat or wind shelter because of the lack of foliage. Dead standing trees are hazards to people and other trees, and removals in the monarch area during the non-overwintering season (April –September) should be prioritized to avoid removal during the October-March overwintering season if possible.
2. If dead trees are deemed immediate hazards, then removal during the overwintering season can be considered. A monarch specialist or biologist should survey the area

and confirm monarch cluster absence if work within the overwintering areas is absolutely necessary during the overwintering season.

3. Use of heavy machinery, construction activities, and tree management activities should be avoided within the overwintering areas when clustering monarchs are present (October 1- March 15). A monarch specialist or biologist should survey the area and confirm monarch cluster absence if work within the overwintering areas is absolutely necessary during the overwintering season.
4. Avoid wholesale clearing of understory vegetation in the monarch area. Removal of non-native understory (i.e. acacias, cotoneaster, and other shrubs) should proceed deliberately over many years. A good rule of thumb is that removal of a shrub or small tree should not increase wind exposure; i.e. there should be another shrub or small tree already in place so that wind shelter is maintained.
5. If a non-native shrub is eventually to be removed, then a native shrub should be planted prior to removal to maintain wind shelter provided by the non-native
6. Weed treatments and plantings in the groundcover can be done during the overwintering season with appropriate precautions to not disturb monarchs.

Bird Protection Measures

1. If possible, tree and vegetation removal activities should be conducted between September 1 and January 31, outside of the nesting season.
2. If tree and vegetation removal begin during the nesting season (February 1 – August 31), pre-construction surveys for nesting birds will be conducted by a qualified biologist no more than one week prior to the start of project work. The surveys will cover the project area and adjacent habitats up to 300 feet from the project boundary if possible. The surveys will entail a variety of techniques, such as systematically searching nesting substrates, watching adult birds for parental behavior (e.g., carrying nest material or food), incidental flushing of an adult from a concealed nest, and auditory detection of begging calls from nestlings. If no active nests are found within the survey area, no further action is necessary.
3. If active nests, i.e. nests with eggs or young present, are found within the survey area, non-disturbance buffers will be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover, the nesting pair's tolerance to disturbance and the type/duration of potential disturbance. No work will occur within the non-disturbance buffers until the young have fledged as determined by a qualified biologist. If buffers are established and it is determined that project activities are resulting in nest disturbance, work in the nearby vicinity of the nest will cease immediately.

Bat Protection Measures

1. If possible, tree and vegetation removal activities should be conducted between September 1 and January 31, outside of the bat roosting season.

2. If tree and vegetation removal begin during the bat roosting season (February 1 – August 31), pre-construction surveys for roosting bats will be conducted by a qualified biologist no more than one week prior to the start of project work. The survey shall include a visual inspection of features within 50 feet of the work area for potential roosting features and sign of roosting bats no more than one week prior to disturbance of such features. If bats (individuals or colonies) or recent bat sign (guano, urine staining) are detected during the survey or during work activities, no work will occur and no materials will be staged within 50 feet of the roost. If any occupied roosts identified during the survey will be altered or disturbed by project activities, CDFW will be contacted for further instructions on how to proceed.

EROSION CONTROL/SOIL MANAGEMENT

1. Trees will be cut as close to the ground as feasible, and stumps will remain on site to prevent ground disturbance
2. Eucalyptus mulch will be retained on site in areas where it is desirable to provide the well-documented benefits of mulch. The mulch will help stabilize the soil following tree removal and minimize erosion and weed growth. The mulch will be comprised mainly of chipped Eucalyptus wood. Care will be taken to ensure mulch is not spread thickly on areas of native grassland vegetation – Priority Native Plant Stands will not receive project mulch. Retaining Eucalyptus mulch on site has been identified as a crucial component in multiple successful restoration projects.
3. Designated drag and equipment access routes to reduce site disturbance and soil compaction.
4. Removals contractor will be in charge of SWPPP and sediment controls, as conditions of the project.

PATHOGEN MANAGEMENT

Eucalyptus pathogen

The following section is from “Investigating the fungi responsible for the recent large-scale dieback of Blue Gum Eucalyptus (*Eucalyptus globulus*) in the San Francisco Bay Area,” a 2021 report prepared by Matteo Garbelotto, U.C. Berkeley, for the SFPUC, USFS, and EBRPD. Albany Hill was one of the study sites and the report provides specific information about the pathogens found on site. The Eucalyptus dieback “appears to be driven mostly by environmental stressors” (p. 14) and no infectious pathogen with a broad host range was identified as the driver of the decline (Garbelotto, 2021). Because little is known about the biology of *P. eucalypti*, the most widespread pathogen in their study, the Garbelotto report did not make explicit recommendations, although thinning to reduce tree density is expected to help mitigate environmental stressors that make the trees more vulnerable.

One fungus found on A Hill has a broad host range – including ericaceous and myrtaceous hosts.

“Not much is known about the biology of *P. eucalypti*, so it is difficult to formulate recommendations, nonetheless this pathogen can be classified as an endophytic latent pathogen, capable of causing disease when plant stress becomes significant. Density may be in part an issue, but not as clearly as for the acacia dieback, given it is likely most *Eucalyptus* are already endophytically infected by *P. eucalypti* and other latent pathogens. Nonetheless, most infectious tree diseases show a positive density dependence, so its importance cannot be excluded. Tree density may be an issue particularly if the size of tree populations is above the site carrying capacity -- especially since carrying capacity is likely to have been lowered due to reduced water availability. Many of the other latent pathogens are known to sporulate on dead plant tissue, and even if none are widespread, each site has its site-specific array of such pathogens.” (Garbelotto, 2021)

Phytophthora

Euc dieback report says “Note: Soil baiting for *Phytophthoras* has not been completed yet. Report will be amended when results are available.” updated report online not found.

The following section is from “Best Management Practices for Preventing *Phytophthora* Introduction and Spread,” a 2018 report prepared by Phytosphere Research for the Golden Gate National Parks Conservancy (Swiecki & Bernhardt, 2018). It is a useful starting point but does not preclude the need to follow specific BMP’s or protocols presented in permit requirements, construction specifications, or other relevant material.

Phytophthora is a genus of microorganisms, most of which are plant pathogens. They cause diseases such as root rot, stem cankers, and fruit and leaf blights. The diseases can “pose a threat to the health, functioning, and sustainability of both natural plant communities and urban landscapes” (p. 1-2). Sudden oak death, caused by *Phytophthora ramorum*, is a notable example in the Bay Area of the devastating effect these pathogens can have on native ecosystems.

The following BMPs are focused on preventing the introduction of *Phytophthora* to a site, spread within one site, and movement of contamination to another site. They apply even if already present, as infestation of more than one *Phytophthora* can further degrade an area and make management more complicated. The general strategies below apply to trail work, construction, and soil import and management. Specific BMPs for each strategy can be found in the report in the appendices.

1. Worker training and preparation
2. Cleaning and sanitation required before entering work sites
3. Minimize risk generating activities:
 - a. Keep high risk activities to a minimum, these include general site disturbance, earth moving activities, and plant root disturbance.
4. Segment operations spatially across the site:

- a. Separate project activities into smaller areas, may include directional controls such as working from more sensitive areas towards less sensitive areas.
5. Segment operations temporally across the site:
 - a. Separate project activities into phases or respond to site specific conditions, e.g. avoid high-risk areas in wet weather.
6. Use clean materials
 - a. Use construction equipment and plant material (mulch, plants for revegetation) that is free from contamination.
7. Use clean water
8. Decontaminate more frequently

FIRE AND HUMAN SAFETY DURING REMOVALS

[in progress pending review with CoAFD]



Implementation

Project Phase Descriptions

PHASE 1 – RESTORATION (PILOT PHASE)

The first phase of the project is designed to lay the groundwork for protecting and amplifying the natural resources already present on the Hill, and to initiate activities which require longer timelines for completion. While the need to remove many of the Eucalyptus trees is urgent, properly preparing for the removals phases of the project will greatly reduce damage to existing resources, protect Monarch habitat and increase the City's ability to accelerate ecological recovery.

[insert phase diagram]

Initiate Contract Grow of Native Plants

Prior to any Eucalyptus removals, the restoration contractor's selected native plant nursery (The Watershed Nursery, for example) can collect seed and cuttings from the Hill as candidates to start a dedicated contract grow for Restoration Phases 1, 5 and 7-. While the seed sources and cuttings from the site will likely not be enough to provide material for the full extents of planting needs, using seed from local populations has many ecological advantages. Many desirable species are also difficult to grow from seed, and cuttings may be used to supplement what is available.

Pre-removal Salvage of Transplant Candidates

Many of the plants that are desirable in the target habitat types are good candidates for transplanting/relocation (see "name" spreadsheet). Within the selective removal zones (B1&2, C1&2, D) there are native plants adjacent to Eucalyptus trees that are both highly valuable habitat plants and very likely to be damaged in the removals process. Prior to Phase 2 -Removals (exterior), Nomad Ecology and City staff would walk the site and flag plants suitable for salvage, storage and transplanting back onto the site after the initial tree removal phase.

Ideally, salvage work would be done from early winter to early spring when the ground is still moist. For plants that may be dormant at that time, flagging the plants in the prior spring/summer when they are still visible is recommended. Plants would be salvaged and stored on site, kept moist and re-planted after tree removal in their designated zone is complete.

For Transplanting protocols, please see the construction documents for the Restoration Contractor and the Project Technical Specifications for further details. In brief, the contractor would do the following:

- Dig plant with a sanitized shovel
- Place dug plants on tarps, moving plants to identified storage area.

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- Dig a very shallow trench, line-up and place all the plants in the trench and cover them in soil.
- Lay burlap over the edges of the pile to help keep it moist (plants stay moist longer in piles of soil vs individual containers).

Flag and Map Priority Native Plant Stands to Protect

Phase 1-Restoration will assess the selective removal areas for patches of valuable existing native habitat, or mature oaks and toyons to be protected in place. Efforts will be made to determine the general extents of these areas prior to the selection of a contractor to allow for a reasonable level of effort estimation in the Bid documents. However, prioritizing the botanical community components should be strongly informed by the City of Albany Natural Lands staff, the project consulting biologists (Nomad) and tribal input. There will necessarily be compromises and not all native vegetation will be able to remain undisturbed, but every effort will be made to protect what is already present on site.

Flag and Identify Removal Access Routes

After the Priority Native Plant Stands (PNPS's) s have been confirmed and flagged, the removals contractor will walk the site to discuss and mark the Phase 2 – Removals access routes, staging areas, and logs for reuse to remain on site.

Plant Field Trial Trees – Replacement Candidates

Three specimens of each of the replacement tree candidates will be planted in locations as shown in the Restoration Bid Set. Locations will be reviewed and confirmed with the Natural Lands Coordinator and Monarch Biology consultant to maximize immediate services which may be provided (improving wind break, etc.).

Pruning and Limbing of Eucalyptus adjacent Hilltop Trail

The Eucalyptus trees along the fire road and trail which are not slated for removal in Phase 2 – Removals will be evaluated for pruning and limbing by the restoration contractor and City Staff to minimize risks to both contractor staff and the public during the course of the project. Our assumption in including these measures in Phase 1-Restoration is that the trail from the Taft Circle to the Monarch area will be able to remain open to the public during the majority of Phase 2 – Removals. Removal phases 4 and 6 will likely necessitate the closure of the public amenities on the Hill.

PHASE 2 – REMOVALS – (EXTERIOR)

The first removals phase of the project prioritizes the removal of Eucalyptus trees that pose the highest fire risks, and the highest risks to adjacent properties. The trees directly uphill from homes on Taft Ave. and Jackson Street, and those trees which present the

greatest potential for torching and ember spread are included in this phase. The Removals contractor will have the advantage of the advance work done during the pilot phase (Phase 1-Restoration), with the risk of damaging important resources greatly reduced. Best Management practices for the protection of faunal resources will also be required (see Section XXX). All removals phases will be included in the initial Bid Package; see Eucalyptus Removals Project Overview sheet (appendices listed).

[insert phase diagram]

Pre-Removal Project Kick-off Walk

Both the Restoration contractor and Removals contractor will walk the site with City staff prior to commencing the first removals phase to ensure timing, routes, storage areas, and zones of responsibility are clearly laid out and agreed upon. Both contractors will be working from the same set of technical specifications.

Selective Removal Areas – B1, B2, C1, C2, D

These areas require more precision removals and will have designated PNSP's to avoid during the removals work. 104 Eucalyptus are estimated to be in these areas based on Lidar data and the arborists reports (citation).

General Removal Areas – A

The general removal area included in Phase 2 – Removals will create a fuel break between the privately held Eucalyptus stands and the homes along Taft Ave. and Jackson St. The area immediately adjacent Taft Circle was included to both open up dramatic views early on in the project, and provide for an easy exit route for loading and equipment. Area A can also receive mulch up to 8" deep, and be used for temporary staging and storage for materials moving out of Taft circle. 45 Eucalyptus are estimated to be in this area based on Lidar data and the arborists reports (citation).

Stump Treatment and Lumber Reuse

Lengths of logs from Phase 2 – Removals will be salvaged for reuse in the restoration phases of the project to help create planting shelves on steeper slopes that have suffered from de-stabilization from Eucalyptus root action, for edging and informal benches along existing trails, and to help block lines of desire trails/informal pathways in the area. There is the potential for the City to negotiate the sale of some Eucalyptus materials to wood brokers such as Bay Area Redwoods, or make in-kind arrangements for milling and processing on site. Wood from tree removals can be reused for stairs at Peggy Thompson Pierce Street Park, which can also be a site for storing and staging reused logs and lumber.

PHASE 3 – RESTORATION (EXTERIOR)

This phase of the restoration efforts is focused on the Open Oak Grassland areas of the Phase 2 – Removals. The first contract grown plants initiated in the pilot phase will be available for installation on the project site.

[insert phase diagram]

Selective Removal Areas – B1, B2, C1, C2, D1, D2, D3

The selective removal areas that contained protected Priority Native Plant Stands (PNPS's) will be assessed, weeded and mulched, and additional planting patches will be installed to augment the existing native vegetation, although in a more minimal fashion than in the general removal areas.

The selective removal areas will have a more 'passive restoration' approach applied to them. Removing the Eucalyptus trees will allow the native vegetation already present to have access to greater resources – water, light, and nutrients. Invasive species management will be the main effort here, along with replanting any salvaged plants after removal disturbance is complete. Area C1 will likely require the least amount of inputs as it currently contains the native plant demonstration garden – removing the Eucalyptus in that zone will go a long way towards the good work already being done having room to expand.

General Removal Area – A

This area will need to be 'inoculated' with native plants – both herbaceous patches and oak plantings with companion plants. The patches planted here will be composed of species from the Open Oak Grassland habitat type.

Pre-removal Salvage of Transplant Candidates

The restoration contractor will walk the Phase 4 Selective Removal Area (F) with the City of Albany Natural Lands staff and project biologist to flag areas to protect, and identify candidates for salvage and replanting.

PHASE 4 – REMOVALS (INTERIOR)

The fourth phase of the project focuses on the removal of Eucalyptus trees at the interior of the site. The contractor can utilize drag and removal routes established in Phase 1 if practical. All areas in Phase 4 have access to Taft Circle and Taft Ave. for removal routes. The vast majority of removals in the phase are in the General Category and require less careful removal preparations.

Pre-Removal Walk

Both Restoration contractor and Removals contractor will walk the site with City staff prior to commencing Phase 4 to ensure timing, routes, storage areas, and zones of responsibility are clearly laid out and agreed up. Both contractors will be working from the same set of technical specifications.

[insert phase diagram]

Area F - Selective Removal

60 Eucalyptus are estimated to be in these areas based on Lidar data and the arborists reports (citation).

Areas E, G -General Removal

The general removal areas included in Phase 4 will continue the fuel break between the privately held Eucalyptus stands and city property (Area G) and complete the removal of the Eucalyptus between Taft Ave. and Jackson St. (Area F). This will further open views both towards the Bay, and towards the Phase 1 and 3 Restoration Areas. 157 Eucalyptus are estimated to be in these areas based on Lidar data and the arborists reports (citation).

PHASE 5 – RESTORATION (INTERIOR)

The fifth project phase involves work to help establish all three target habitat types in both Phase 2 and 4 removal areas.

[insert phase diagram]

Area D4 – Active and Passive Restoration - Native Grassland

This portion of selective removal area D will have received passive restoration (invasives control, mulching, return of any salvaged plants) during Phase 3. The delay in the active restoration efforts allows for time to see whether native plants express themselves from the seed bank in this area with a reduction in canopy cover and a change in water regimes. The delay also allows for additional contract grow plants to mature.

Area E – Active Restoration – Open Oak Grassland

This area, just downhill from Taft Ave., will require active planting of oaks and companion palette plants. Spacing of planting patches will vary based on the topography to ensure adequate vertical spacing for fire safety.

Areas F1 & F2 – Passive Restoration

The area between the fire road and Taft Ave. contains areas of two different habitat types, both within the selective removal area F. The majority of restoration efforts here will be passive, allowing the native understory that exists to express itself in the improved conditions post Eucalyptus removal, but will also include the reinstallation of any plants salvaged and stored during Phase 3.

Area G – Passive Restoration

While this area had general removal protocols in Phase 4 the steepness of the site, the extensive presence of Poison Oak and Toyon, both of which will very likely re-establish themselves with no active planting, makes taking a passive restoration approach in this area both practical and financially efficient.

PHASE 6 – REMOVALS (ASSESSMENT)

The final removals phase of the project focuses on the assessment and potential removal of select Eucalyptus trees from within the Monarch Management Buffer Zone. Prior to initiating removals in Phase 6, the City arborist will flag any trees in the Monarch Management Buffer Zone in need of assessment. If trees from this zone are identified as failing or as hazards, the Removal contractor will remove them at the City’s discretion. Trees which have been identified by the City and the consulting Monarch biologist to maintain existing habitat structures for the Monarchs will be left standing, with the long-term intent to be replacement in kind by trees of the replacement species. No trees will be removed from the Critical Monarch Zone by the Removals contractor; this area is not part of the removals project.

[insert phase diagram]

PHASE 7 – RESTORATION (MONARCH SUPPORT)

The final restoration phase is focused on the Monarch use areas, and providing enhancements adjacent to the Eucalyptus that will remain until failure, or until the replacement trees reach a size that would allow for a gradual reduction of the E. globulus stands with minimal impacts to the amenities available for the butterflies. All three habitat types are present in this phase and will represent the last installation of contract grown plants on the Hill.

[insert phase diagram]

Area J1 - Active and Passive Restoration – Oak Woodland and Shrubs

Area J2 – Active and Passive Restoration – Native Grasslands

Area H – Active and Passive Restoration – Open Oak Grassland

Replacement Tree Selection and Planting

By the time the project has reached Restoration Phase 7, several growing seasons will have passed, and the City will have enough data and documentation to make a choice regarding a preferred tree species for replacement. Augmenting and ‘backing up’ the *E. globulus* trees currently utilized as cluster sites through new planting will be initiated as part of this phase of work.



Long-Term Management

Long term management of Albany Hill will be required to guide the trajectory of the site towards the long-term vision (see Chapter 2). Albany Hill is a living landscape that will continue to evolve and transition over time; often reacting to conditions out of our control such as drought, pest and invasive species dynamics, and the continued changes to seasonal fog and rainfall intensity.

Funding as it relates to Implementation and Long-term Management

The Implementation Plan provides direction on how best to re-set the site trajectory based on our current understanding of the site and the potential for funding. Within the plan, there are a series of adaptations to the implementation approach that can be made to match the level of effort to the realized funding. Much of this includes how much active restoration is completed. Active restoration includes the collection, propagation, planting, irrigation and maintenance of new plantings. The cost of the active restoration components are roughly half the total costs of the project, or about \$1.5 million dollars. The advantage of including active restoration as component of the approach to the work on Albany Hill has been noted earlier in this document and includes a more robust push of the site towards an ecologically rich and resilient landscape. However, the site can be guided more passively by putting a greater emphasis on protection and stewardship of the existing flora on-site. While you save implementation money with this approach, the trade off is a slower rate of achieving the vision. It is important to emphasize that the City maintains the ability to continuously adjust the degree of active restoration as put forth in this Implementation Plan to match realized funding. Funding will be the biggest driver in how Albany Hill is managed in the short term and the long term.

Invasive Plant Control Measures

EUCALYPTUS RE-SPROUT PREVENTION

In Golden Hours 2022 report, they note that effective eucalyptus management requires a multi-year strategy. The report goes on to recommend that during the mechanical removal of the eucalyptus trees, stumps should be cut as close to the ground as possible. Cover the stumps with thick black polyethylene tarps, secured with staples, and reinforced with chicken wire for added durability. This method, developed by Golden Hour, enhances the success of eucalyptus control without relying on herbicides.

If trees are not tarped they will require frequent (two to three times a year) removal of sprouts. Based on City experience on Albany Hill in the past, this approach has been successful at killing the tree after 4 or 5 years (Cunningham, personal communication 2024).

MULCHING

Eucalyptus mulch offers several benefits. It helps retain soil moisture, suppress weeds, and improve soil health by releasing essential nutrients as it decomposes. Four-inch depth is a suitable minimum for general application, but mulch can be placed

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significantly deeper if the site works generate sufficient material. Selective removal areas, such as in plant patches and existing native plants, require a thinner layer of 2 to 3 inches to avoid inhibiting growth. Larger chips are suitable for this project because larger chips tend to last longer than smaller chips, which tend to break down faster and enrich the soil more quickly. Additionally, eucalyptus mulch can enhance fire safety by reducing the amount of flammable material on the ground.

For long-term maintenance, new mulch generated from maintenance activities can be used to replenish existing mulch. It is recommended to top up the mulch every 6-12 months to maintain a depth of at least three inches, which will help keep weeds down and retain soil moisture. If the mulch is not replenished, it will still functionally persist for about a year, but its effectiveness in moisture retention and weed suppression will gradually diminish over time.

MANUAL REMOVAL

Annual grassland and general weed management on Albany Hill will likely be required in areas with significant exposure. A closed canopy is envisioned for most areas of the hill, creating shaded fuel break conditions that will eventually require less frequent vegetation management than open grasslands.

Even with the transition to shaded fuel breaks over much of the hill, it is anticipated that portions of the hill will require long-term management of annual grasslands and thick herbaceous stands to reduce fuel loads and maintain a more diverse assemblage of grasses and forbs. If well-timed, the removal of annual grassland thatch can be done once a year and can be synchronized with the flowering and seeding of beneficial and pest species. This precise timing should be evaluated annually to match the changing on-site conditions.

There are a few strategies for managing ground cover on Albany Hill that the City may consider. These include line trimming, goats, and hand weeding select areas. Line trimming is an effective way to control moderate-sized stands of weedy grasses. This method is particularly useful in areas that require special protection and is likely the most suitable strategy as long as the scale of the work remains around a few acres or less.

Goats are becoming an increasingly common sight around the Bay Area as land managers have seen the value of these aggressive grazers at efficiently clearing large areas of unwanted vegetation, including invasive species that are difficult to manage with traditional methods. A small industry has emerged to cater to this business, enabling the growth of goats as a management tool. Goats can access the steep or rocky areas of Albany Hill; however, they will require intricate fencing to keep them out of stands of native vegetation and active restoration areas. If properly fenced, goats can manage a larger area of Albany Hill than line trimming.

Hand weeding, though labor-intensive, is a precise and effective way to manage specific areas. This method allows for the targeted removal of invasive plants without disturbing the surrounding vegetation and is suitable for native stands of vegetation as well as actively planted patches. Hand weeding should be combined with either line trimming or goat grazing to manage Albany Hill effectively.

Monarch Management Area

The priority for this area is to protect the over-wintering habitat and use of the monarch butterfly within City property on Albany Hill. As discussed earlier, tree removals within this area are to be managed overtime as trees pose hazards or die. The 2021 SBCA Arborist Report identified a number of hazard trees within the Monarch Management Area that should be evaluated if left in place. The City intends to remove these trees over time following a more defensive approach than the rest of the City owned properties. The goal is to maintain monarch habitat while encouraging the top of the hill to transition to a more healthy and resilient plant community.

Time is of the essence when it comes to transitioning the Monarch Management Area from reliance on the decaying eucalyptus forest. The challenge will be to foster the growth of new roosting and wind break trees within this area before the eucalyptus stand is becomes functionally insufficient as habitat.

The following are management activities prescribed for this area.

- All work in this area is subject to the Monarch BMP's (see Chapter 3)
- Monitor the health of the remaining eucalyptus trees multiple times a year to evaluate hazard trees
- Remove trees identified as posing hazards per BMP's
- Monitor replacement trees and adapt the revegetation approach to continue to plant the most successful species at providing monarch habitat on the top of the hill (see below for additional detail).
- Thin dead wood from trees and from the low and mid-canopy.
- Protect mid-canopy growth for habitat and the wind break benefits.
 - Along the ridgeline, maintain a horizontally discontinuous patchwork of understory and middle story trees and shrubs to provide some wind shelter while reducing fuel continuity (Weiss, 2022).
 - Allow toyons and live oaks to fill in the gaps in the wind shelter area across the fire road.
- Revegetate and steward the Monarch Management area for nectar/pollinator plants.
 - Ensure adequate nectar sources are available in fall and winter.
 - Maintain restoration patches keeping the interplay between wind protection and fuel discontinuity in mind.

- Maintain grassland habitat outside of patch and shrub locations to keep the fuel loads low and minimize the risk of damage from fire spreading into the Monarch zones.

Replacement Tree Monitoring and Assessment

The City is looking to replace the degraded and high fire risk Eucalyptus stands within the Monarch use areas with a replacement species that will meet the following criteria:

- Non-invasive – when planted will remain within original planting areas
- Reduced fire risk profile – tree will be able to remain healthy and vigorous with minimal inputs, and does not create leaf and bark litter which resists decomposition
- Structurally compatible with Monarch needs – sufficient height and canopy/leaf patterns to provide wind protection while allowing light penetration
- Growth rate occurs at a meaningful rate to provide habitat
- Prioritize native species to reduce risk of unintended consequences and maximize habitat value beyond the use of Monarch butterflies

During Phase 1 – Restoration (Pilot phase), field test specimens of four species are to be planted for evaluation as suitable substitutions for *E. globulus* on site. These trial trees will be maintained through the duration of the remaining phases of the Implementation Plan and evaluated by the City as candidates for additional replanting efforts.

The Implementation Plan is the first step in transitioning this Monarch Management Area into a resilient forest. Long-term management will be required to adaptively manage the introduced tree species. It is anticipated that long term management will involve continued active planting of trees and may include species not considered in this plan.

Areas outside of Monarch Management Area

ONGOING FIRE RISK REDUCTION

The following tasks shall continue as part of the long-term management of fire fuel on Albany Hill (Rice, 2022).

- Continue thinning understory shrubs and remove small dead material. Use large dead material to prevent unauthorized trail development.
- Create and maintain defensible space within 100 feet of all structures. Collaborate with landowners to achieve this goal, potentially funded by grants.
- [Pull 2012 goals and actions from the 2012 vegetation management plan.](#)

Patch Planting Expansion & Amplification

[in progress – explanation of patch densities, opportunities for out-planting certain species – Natural Lands or outside stewardship support staff and seed collection across restoration phases]

Long-term Stewardship Opportunities

Long-term stewardship as a collaborative effort between the City of Albany and those in the community who care about the hill is an opportunity to instill stewardship values in future generations, provide work and employment opportunities for community members, as well as providing for consistent and quality care. Consistent and well-trained maintenance efforts will also protect the significant investment being made with public funds.

Public outreach surveys conducted for this project indicate there is significant interest in helping with weeding, planting, and maintenance work to ensure the success of native habitats. For more skilled work, precedent can be found in the creeks and open space maintenance contract that the City awarded to Urban Tilt in 2021. Important to consider is that the habitats on the hill will evolve both rapidly after removal, and over the long term. Initial efforts will be more intense to help the new plants establish themselves and to keep the invasives at bay – including the *E. globulus* stands remaining on adjacent parcels. Stewardship will require attention and effort by City officials, skilled laborers, and the community to both launch and foster the long-term stability of the healthy habitats and public access amenities this project aims to achieve.



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