COSCA Open Space
Invasive Plant Management Plan

prepared by

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1.0 Introduction

The Conejo Open Space Conservation Agency (COSCA) is a joint powers agency formed in 1977 as a partnership between the City of Thousand Oaks (City) and the Conejo Recreation and Park District (CRPD). This partnership provides for the long-term protection and stewardship of public open space lands and trails. COSCA's core mission is to "acquire, conserve, and manage open space within and surrounding the Conejo Valley for future generations, sustainably balancing public use with ecosystem protection." COSCA currently owns and/or manages approximately 12,700 acres of open space and maintains a 150-mile trail system. The COSCA-owned/managed lands represent approximately 85 percent of the approximately 15,000 acres of open space land existing within Thousand Oaks' city limits and planning area.

California is recognized as one of the world's 36 global biodiversity "hot spots" with over 6,500 species of native plants, 1/3 of which are endemic. However, California's exceptional biodiversity faces serious threats from the growing human population, habitat loss, invasive species, catastrophic wildfires, and climate change (Harrison et al, 2024). These biodiversity threats are related, and responding to them requires consideration of multiple factors. Actions to stem the loss of important habitats often focus on intervening in the spread of invasive non-native plants, as this action can directly influence landscape characteristics.

Invasive non-native plants are:

- Not native to, but can easily spread into wildland ecosystems
- Capable of displacing native species
- Able to hybridize with native species
- Species that do not have natural predators or controls
- Able to alter biological communities; and/or
- Alter ecosystem processes.

Invasive plant species are a problem in natural areas because native wildlife, including mammals, birds, and aquatic species, are adapted to native plant communities and rely on them for shelter and forage. Invasive plants can out-compete native plants because the natural constraints that limit their expansion in their areas of origin are not present in the areas they invade. When native plants are replaced with non-native plants, the support structure for native plant and wildlife species is reduced and the impacts may extend throughout the local ecology. Controlling these species, therefore, is an important part of COSCA's mission to steward biological resources throughout the open space system.

The native vegetation communities within the COSCA-managed lands broadly include chaparral, coastal sage scrub, grasslands, riparian and oak woodlands, and oak savannah. In some areas these primary vegetation types intermix. These native plant communities provide regionally important wildlife habitat and landscape linkages for wildlife species. In addition to the mosaic of native plant communities, large areas comprised of non-native grasslands also occur on the COSCA-managed open space lands. These areas occur in locations previously used for cattle and sheep grazing or in places that were otherwise disturbed and converted from native grassland and shrubland habitats. Overall, however, these lands provide a vital open space resource for people and wildlife regionally, and proper care for these areas can improve habitat value and restore biodiversity over time.

This invasive plant management plan (IPMP) has been prepared to guide and assist COSCA land managers in carrying out invasive plant management activities as part of fulfilling the agency's commitment to protect and enhance natural resources. This IPMP will address the management of invasive plant species on 13,000 acres under COSCA ownership and management. The IPMP "Plan Area" is comprised of three regional units, as described in detail in subsequent sections. Guidance presented in this IPMP will facilitate strategic control of invasive plants and ensure that available financial resources are utilized when and where they will yield optimal value for the recovery and enhancement of native habitats.

The IPMP describes existing conditions in the Plan Area, identifies target invasive non-native plant species to be controlled, and establishes treatment priorities. It also describes management goals and methods, infestation prevention and management strategies, monitoring and reporting protocols, adaptive management techniques, and best management practices to avoid environmental impacts.

1.1 Purpose and Goals

The goals the IPMP is intended to achieve are as follows:

1. Present management measures and protocols that will:
    a. Prevent or substantially deter introduction of invasive plant seeds/propagules
    b. Prevent or substantially deter the spread of invasive species
    c. Identify and provide options to address physical site conditions (such as erosion or repeated disturbance) that promote establishment and persistence of invasive plants
2. Establish a treatment schedule based on budget and labor capacities that:
    a. Control and remove Priority 1 invasive species within identified treatment areas, with the immediate goal of halting propagation and spread as well as reducing cover, and with the eventual goal of eradication to the extent practical.

b. Target and treat Priority 2 invasive species within the treatment areas to control existing populations and prevent further spread.

c. Identify opportunities for restoration/enhancement projects within treatment areas where invasive species can be removed and replaced with native plant and/or seed material.

d. Establish a long-term management program that regularly reevaluates progress and priorities identified in this IPMP.

1.2 Plan Area Setting

1.2.1 Geographic Location and Description

The Plan Area for this IPMP lies within the Conejo Valley, which is located in Ventura County, California. The extent of the Plan Area consists of COSCA's jurisdictional boundary, which is a combination of City and CRPD jurisdictional boundaries owing to COSCA's status as a joint powers agency. Most of the protected natural open space within the Plan Area is owned and managed by COSCA and comprises approximately 13,000 acres. A small amount of open space owned and managed by other entities also occurs within the boundary and will not be included in this IPMP. Open space areas generally form a ring around the perimeter of the City, and in some cases extend into developed areas within the City as well. COSCA open space is bordered by undeveloped land in the Simi Hills in the east, the Santa Monica Mountains to the south, Conejo Mountain to the west, and Mountclef Ridge to the north (Figure 1).

Staff have established specific priority areas for invasive plant management within the Plan Area. These areas were selected based on the number of invasive species present in a particular open space area, the extent of each species, and these species' potential impacts on native plant communities. The priority areas are located in the Conejo Canyons, Arroyo Conejo, Wildwood, Labisco Hill, Sunset Hills, Lang Ranch - Woodridge, Oakbrook, North Ranch, Vallecito, Old Conejo, Dos Vientos, Vista Del Mar, Rancho Potrero, Los Robles, and Los Padres open space areas. As the Plan Area is roughly bisected north to south by California State Route 23 (CA-23) and west to east by Highway 101, the Plan Area has been divided into three regional project areas for planning purposes. These consist of the Northwest Region (North of Hwy 101 / West of Hwy 23), the Northeast Region (North of Hwy 101 / East of Hwy 23), and the South Region (areas south of Hwy 101) (Figure 2).

1.2.2 Mediterranean Climate

The Plan Area is characterized as having a Mediterranean climate. A Mediterranean climate supports a unique and diverse ecology adapted to its hot, dry summers and mild, wet winters. Native vegetation typically includes drought-resistant plants like evergreen shrubs, herbs, and deep-rooted trees such as oaks, forming ecosystems known as chaparral, scrub, woodlands and grasslands depending on the region. Locally, shrublands include chaparral

and coastal sage scrub and woodland areas feature dominant trees including coast live oak and valley oaks. In natural drainage areas, local riparian habitats are dominated by two species of willow, CA sycamore, and coast live oaks among many herbaceous and shrub species. These areas are havens of biodiversity and home to many native species that have evolved to survive seasonal drought, fire, and nutrient-poor soils. The climate's variability and distinct wet-dry cycle also influence animal life and ecological interactions, making Mediterranean regions ecologically rich but sensitive to disturbance.

1.2.3 Drought and Fire Regime

As is common in southern California, frequent drought cycles and high-frequency wildfire events contribute to the spread and establishment of non-native invasive plant species. COSCA-managed lands are vulnerable to these forces and have been significantly impacted by two recent long periods of drought. The initial period persisted from approximately 2011 through 2017 and is considered one of the most severe droughts on record in California and the western states. After a brief reprieve, the drought conditions returned in 2020 and deepened in 2021. Wet years in 2023 and 2024 were then followed by a drier 2025. These patterns are emblematic of the climatic variability that must be considered in managing vegetation conditions on open space lands. Exceptional drought conditions can increase the risk for severe wildfires, and result in high native woodland mortality and extremely low rates of plant germination and blooming. These factors contribute to slow recovery rates of native vegetation following fires.

Since 1940, a total of 26 fires have burned in the Plan Area. The fires ranged in size from less than one acre to 3,500 acres. The area with the highest frequency of fire is North Ranch, which has had nine fires, and 5,307 cumulative acres burned, followed by Conejo Canyons, with eight fires that burned 3,199 cumulative acres. The cause of most of these are unknown/unidentified, except for two fires that were identified as vehicle fires, and the Woolsey Fire, which resulted from utility equipment failure.

The most recent Hill and Woolsey Fires started on November 8, 2018, and burned approximately 1,306 acres and 3,500 acres within the Plan Area, respectively. Recovery of native plant communities in recently burned areas varies throughout the Plan Area. Some communities are exhibiting remarkable recovery considering the continuing drought conditions. Other areas are showing signs of only partial recovery while non-native species expand their coverage. With frequent drought and fires, native species within the burn zones face certain challenges in recovery.

Fire is a natural feature of southern California vegetation types, but in pre-modern times the fire frequency interval was long, ranging from 30-100 years. With infrequent fire, vegetation communities had long periods to generate significant seed banks in the soil (grasslands and coastal sage scrub) and extensive root systems (chaparral) to promote rapid recovery. When fires become more frequent, these plant communities do not have adequate time to

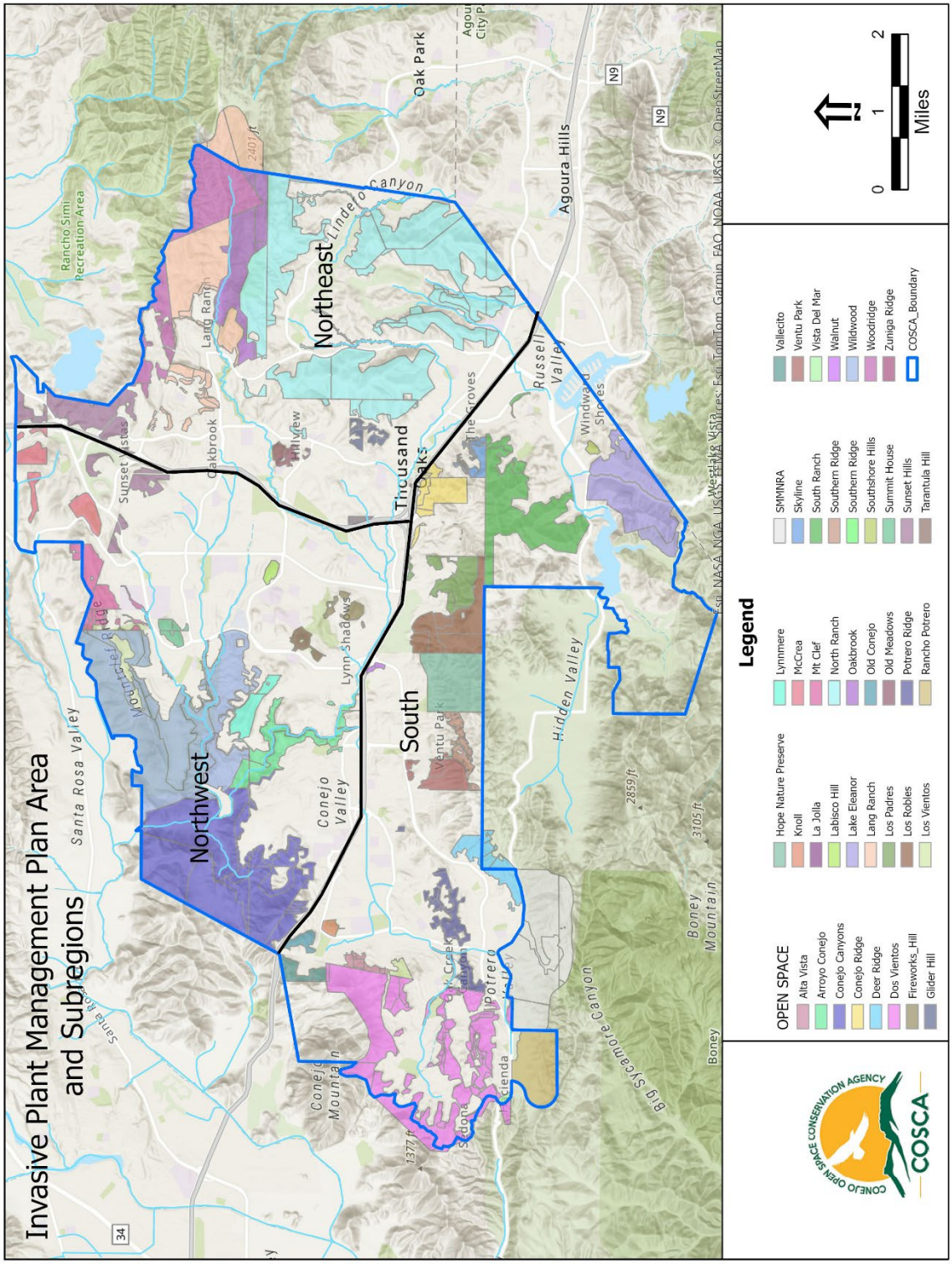
reestablish the resources for recovery. When this occurs, non-native species are often able to outcompete native species. The result is expansion of non-native plant species and reduction in native plant communities in a process called type conversion; wherein native plant communities are converted to non-native communities.

1.3.3 Historic Land Uses

In addition to the drought conditions and frequent wildfires, some COSCA open space areas have been impacted by historic land uses that have facilitated colonization by invasive species. In particular, grazing and/or grain production have impacted portions of the Conejo Canyons, Wildwood, Labisco Hill, Lang Ranch, Woodridge, North Ranch, and Rancho Potrero open space areas. Generally, grazing can have long-term impacts on vegetation communities due to soil compaction and damage to native plant communities. Grazing and tillage associated with grain production also impede the persistence of native plant species which results in diminishment of associated soil seed banks. Areas where these activities historically occurred have become dominated by non-native grasslands and herbaceous annual forbs.

Much of COSCA's open space land contains unpaved roads. Many of these were created as access routes on historic ranches, while others were created later by utility companies managing extensive electrical transmission lines and water infrastructure. Disturbance of formerly natural areas, coupled with importation of invasive plant seeds that may be transported by ranch or utility vehicles that have been used in weedy areas elsewhere, allow such species to gain a foothold in disturbed areas and spread to other disturbed areas. Likewise, public trails accessed by hikers, mountain bikers, and equestrians are also vulnerable to seed introduction.

FIGURE 1 – PLAN AREA



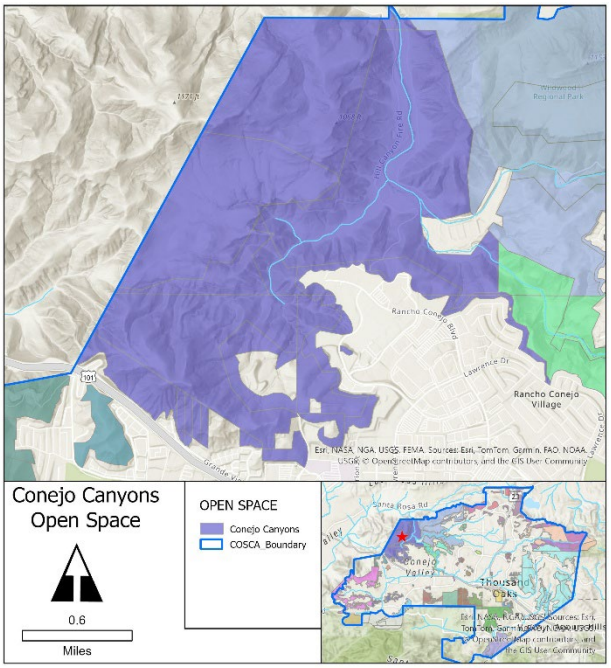
2.0 Existing Conditions

2.1 Open Space Area Descriptions

Northwest Region

The Northwestern Region includes the Conejo Canyons, Arroyo Conejo, Wildwood, and Labisco Hill open space areas.

Conejo Canyons



The Conejo Canyons open space area occupies approximately 1,242 acres. This is COSCA's second-largest open space area and is located in the western portion of the Northwest Region. Notable sub-sections of this area include the flat floodplain of Conejo Creek in Hill Canyon, riparian woodlands in Hawk Canyon, the elevated Western Plateau, and Elliot Peak. This area is bordered by mountainous privately-owned undeveloped land to the west and north, commercial development to the south, and Wildwood Regional Park to the east.

This is a large open space area with a highly varied set of vegetation communities owing to the complex topography and geology. Dominant plant communities include mixed chaparral, coastal sage scrub, non-native grasslands, and riparian scrub and woodland. This area is also characterized by large rocky outcrops which support succulent species including species of *Opuntia* and *Dudleya*.

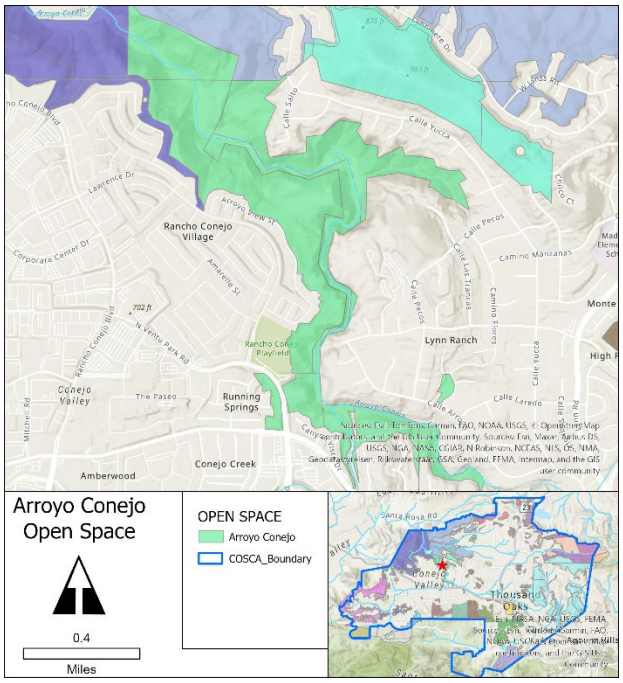
The Conejo Canyons open space has a history of wildfires, the most recent being the Hill Fire (2018), the Hill Canyon Fire (1980), and the Arroyo Fire (1976). The Hill Fire caused significant loss of riparian habitat, particularly the tree canopy, in both Hill Canyon and Hawk Canyon. Riparian tree species in both canyons are comprised of arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), western sycamore (*Platanus racemosa*), and coast live oak (*Quercus agrifolia*). While recovery is underway in both areas, it is occurring more quickly in Hawk Canyon due to a larger percentage of coast live oak trees, which the fire did not impact as significantly as willows and sycamore. Fire impacts in Hill Canyon were more significant due to the greater prevalence of willows and sycamore, and also due to the presence of giant reed *(Arundo donax)* as thatch from these species is very effective in carrying fire into riparian areas. Areas supporting coastal sage scrub and chaparral plant

communities are showing more complete recovery, although some sections show evidence of type conversion toward non-native annual grasses.

Arroyo Conejo

The Arroyo Conejo open space area consists of 293 acres and contains Arroyo Conejo Creek, which becomes Conejo Creek further downstream, and associated upland areas. It is located in the south central area of the Northwest Region. The primary feature of this area is the deeply incised channel of the Arroyo and resulting steep-walled canyon. The area is bordered by residential areas to the South, East and West, and the Conejo Canyons open space to the North.

This portion of Arroyo Conejo is among the remaining few non-channelized areas in the City and supports valuable riparian resources. Infrastructure is present within the area but is limited to municipal wastewater pipelines and a maintenance access road. While some stream bank stabilization structures for infrastructure protection also occur, most of the stream is still in a natural condition.

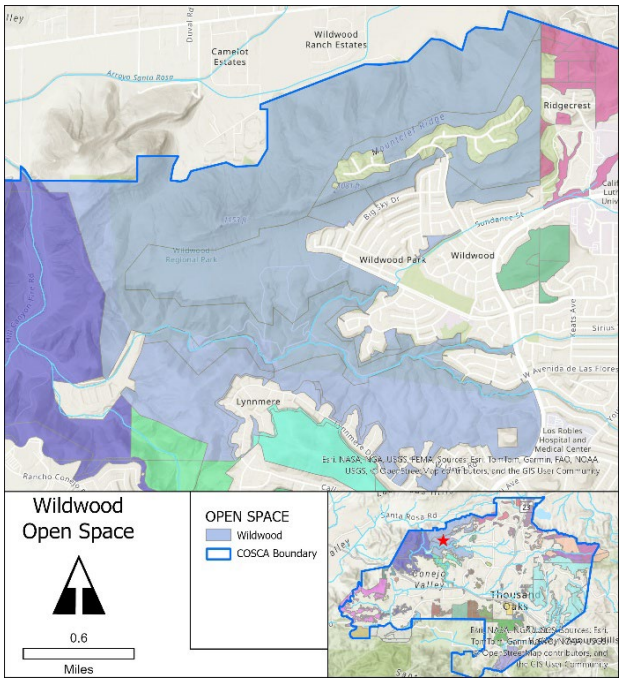


The primary vegetation types in this area are riparian woodland, which occurs along the floor of the Arroyo. The upland areas support healthy populations of coastal sage scrub species among a series of rock outcroppings, as well as areas of coast live oak/black walnut woodlands.

In contrast with other open space areas, Arroyo Conejo does not have a history of wildfires. However, as the climate becomes more variable, fire risk may increase. In relation to this concern, a project to remove giant reed and Mexican fan palm (*Washingtonia robusta*) from a 1-mile section of the Arroyo starting at W. Hillcrest Drive and continuing downstream was initiated in 2021. Currently, giant reed as well as palms shorter than 10-feet in height have been successfully removed from this reach. Regular monitoring and maintenance of this area will occur to ensure that neither species is reestablished. Palms taller than 10 feet will be removed as part of a subsequent project. As a result of the current project, native species in the riparian corridor such as arroyo willow and poison oak (*Toxicodendron diversilobum*) have rebounded.

Wildwood

Wildwood Regional Park occupies approximately 825 acres and is located along the northwestern boundary of the Northwest Region. This area is bordered by low density rural development to the north and east, suburban development to the south and abuts the Conejo Canyons open space area to the west.



Wildwood hosts a wide variety of vegetation types due to its complex topography and geology. Notable features include Mountclef Ridge, Wildwood Mesa, and Wildwood Canyon through which the North Fork of Arroyo Conejo flows.

The vegetation on Mountclef Ridge consists of mixed chaparral and coastal sage scrub, along with scattered populations of coast prickly pear (*Opuntia littoralis*) and small annual grasslands. Invasive species in this area are primarily non-native annual grasses, mustards, and fennel (*Foeniculum vulgare*). There are also growing infestations of fountain grass (*Pennisetum setaceum*) in the eastern portion of this area.

Wildwood Mesa is a broad and gently sloping expanse of annual grassland. A few small seasonal wetlands occur in its central area where surface runoff from the northern and southern slopes collect. Non-native species in this area include non-native annual grasses, mustards, and Russian thistle (*Salsola tragus*). Much of the mesa area was historically used for ranching including hay production and livestock. The wildfires of significance that have impacted large portions of this area are the Wildwood-1 Fire (1995) and the Hill Canyon Fire (1980).

Labisco Hill

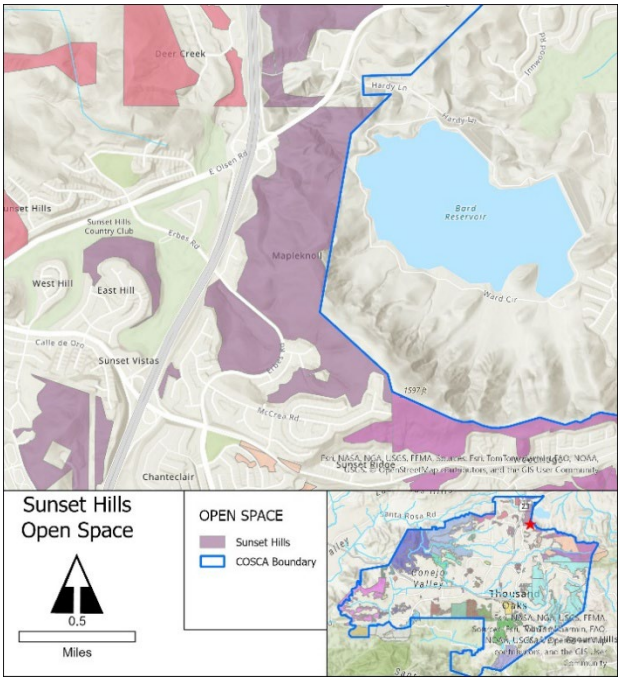
The Labisco Hill open space area is a prominent 24-acre knoll surrounded by residential development in the eastern portion of the Northwest Region. The dominant vegetation consists of coastal sage scrub species that are intermixed with non-native shrub and grass species, including non-native annual grasses, mustards, and Russian thistle. Shrub density is higher on the north-facing slope. As this area is completely surrounded by suburban development, its entire perimeter is managed as a fuel reduction area. Labisco Hill does not have documented fire history, and the presence of invasive species in this area is likely a result of historic livestock grazing.

Northeast Region

The Northeast Region consists of the Sunset Hills, Lang Ranch, Woodridge, Oakbrook, and North Ranch open space areas.

Sunset Hills

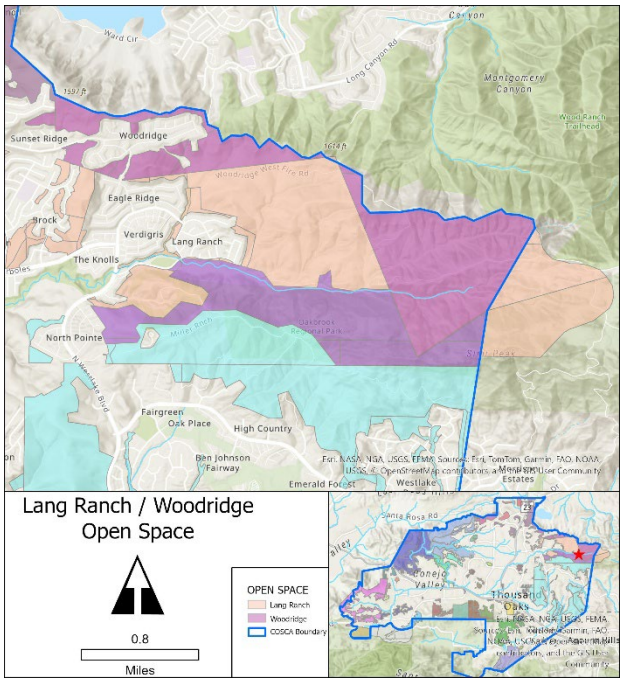
The Sunset Hills open space area comprises 410 acres, with portions located on each side of the 23 Freeway. The bulk of the area lies on the east side of the freeway, in the northwest corner of the Northeast Region. It is bordered by undeveloped private land to the north, open space (non-COSCA) associated with Bard Reservoir to the east, suburban development to the south, and the 23 Freeway to the west. Coastal sage scrub comprises the majority of the vegetation in this area, which is accompanied by scattered areas of non-native annual grasslands, and pockets of oak woodland on short north facing slopes and shallow draws.



Wildfire in this area is uncommon, with fire history being limited to the 28-acre Erbes Fire (2021). However, grassland areas have been impacted by ongoing drought cycles which have enabled the establishment of a significant area of Russian thistle. Italian thistle (*Carduus pycnocephalus*), milk thistle (*Silybum marianum*), and tocalote (*Centaurea melitensis*) also occur, with Italian thistle favoring oak woodland areas and milk thistle and tocalote favoring trail margins.

Lang Ranch - Woodridge

The Lang Ranch and Woodridge open space areas occupy 1,035 acres. They are discussed together for the purposes of this plan because they are interrelated geographically and share a similar mix of habitat types. The area, located in the northeast portion of the Northeast Region, is bordered by open space to the north, east, and south, and residential development to the west. Comon vegetation types in this area include non-native annual grasslands on south facing slopes and mixed coastal sage scrub and chaparral on north facing slopes. The Lang Ranch and Woodridge areas make up the headwaters of Lang Creek. The creek is ephemeral and supports oak woodland and limited riparian vegetation.

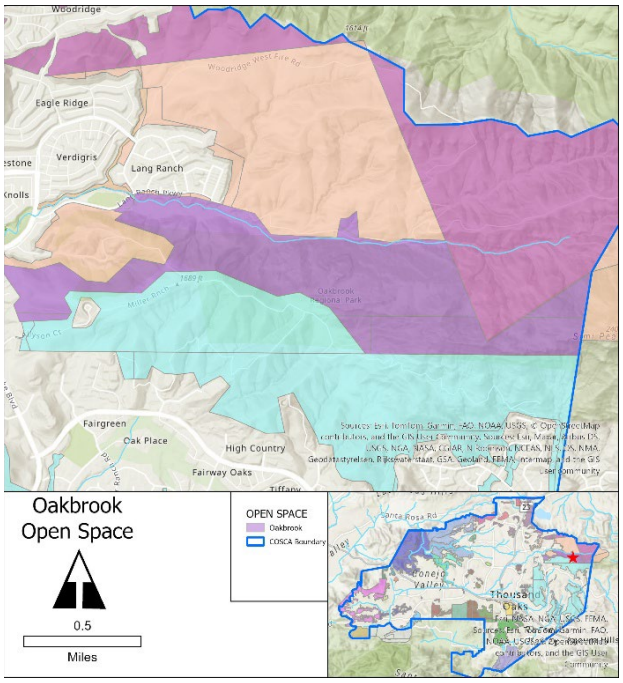


This region has a long history of large wildfires. There have been three incidents that burned large portions of the area, including the Woolsey Fire (2018), the Devonshire-Parker Fire (1967), and the Simi Hills Fire (1947). Several smaller fires have burned limited portions of this area, and all add up to a high fire frequency. The location of this area at the northeast corner of the Conejo Valley also makes it the first area to be impacted by fires ignited to the northeast and driven southwest by Santa Ana winds.

The vegetation at Lang Ranch is recovering from the Woolsey Fire (2018), though slightly hampered by the drought. Most areas of scrub vegetation communities have recovered, although it appears that some type-conversion to non-native annual grasses has occurred on the margins between former grasslands and scrub communities. The primary invasive species in this area are non-native annual grasses, black mustard (*Brassica nigra*), and tree tobacco (*Nicotiana glauca*).

Oakbrook

The Oakbrook open space area covers approximately 433 acres in the eastern portion of the northeast region, south of the Lang Ranch and Woodridge open space areas and north of the North Ranch open space area. The Oakbrook area is distinctive for its rocky outcrops and prominent north-facing slope. The dominant vegetation is a mixture of chaparral and coastal sage scrub.

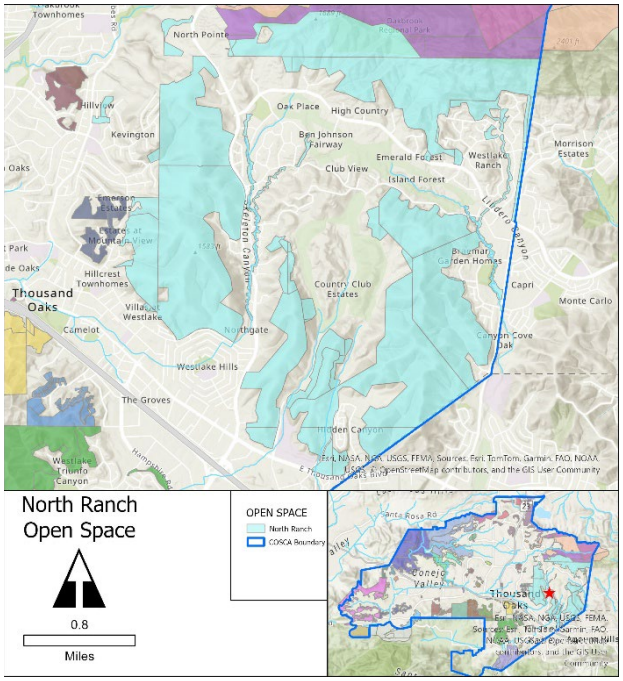


The Oakbrook open space has been affected by fire and most of the area has been burned five times since 1949. The most recent fire was the Woolsey Fire (2018), which burned the entire area. The Topanga Fire (2005) and Dayton Canyon Fire (1982) each burned approximately half of the area.

Following the Woolsey Fire, this area experienced two to three years of exceptional growth of Braunton's milkvetch (*Astragalus brauntonii*), a rare species that relies on disturbance such as wildfire to germinate from long dormant seed banks. With the broader recovery of larger perennial chaparral shrub species, the prevalence of this species has subsided.

North Ranch

The North Ranch open space consists of approximately 2,183 acres located in the southeastern portion of the Northeast Region. It is comprised of three main areas including the northern section bordering the Oakbrook open space (north section), the southeast area containing three subsections (east section), and the area west of Westlake Blvd. commonly called the Hillcrest open space. This open space area is surrounded by suburban development to the east, south, and west, while the northern section borders the open space areas discussed above.



The dominant vegetation types in the North Ranch open space are coastal sage scrub and non-native annual grassland. Invasive species are prevalent on ridgetops where historic fuel breaks were created and along a series of unpaves utility roads used to access electrical transmission towers.

The North Ranch open space has been affected by numerous small, localized fires in the past few decades. Large fires burning much of the area include the Woolsey Fire (2018) and the Dayton Canyon Fire (1982). The most recent fire is the County Fire (2021), which burned 26.5 acres between Country Valley Rd. and Via Merida.

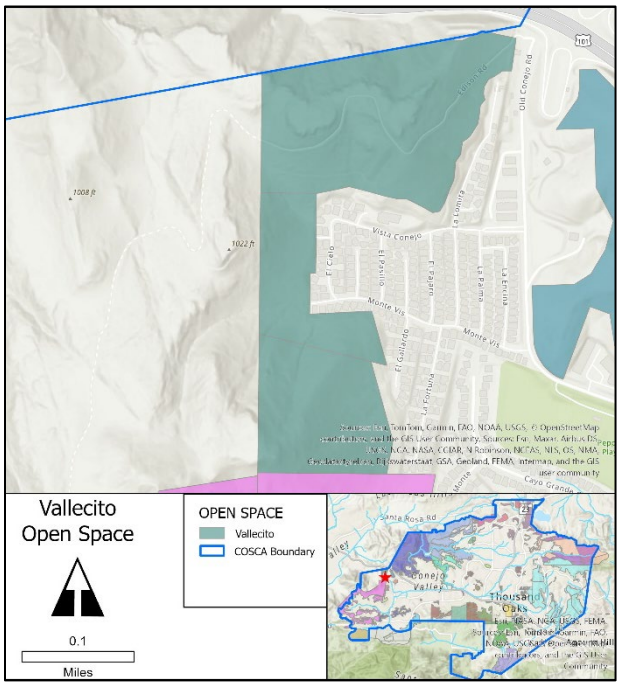
Native vegetation has recovered in most areas where it was present prior to the Woolsey Fire as well as the County Fire. In isolated regions, non-native grasslands that were dominant prior to these fires have expanded at the expense of native species. Native vegetation remains dominant in areas that did not burn.

South Region

The South Region consists of the Vallecito, Old Conejo, Dos Vientos, Vista Del Mar, Rancho Potrero, Los Robles, and Los Padres open space areas.

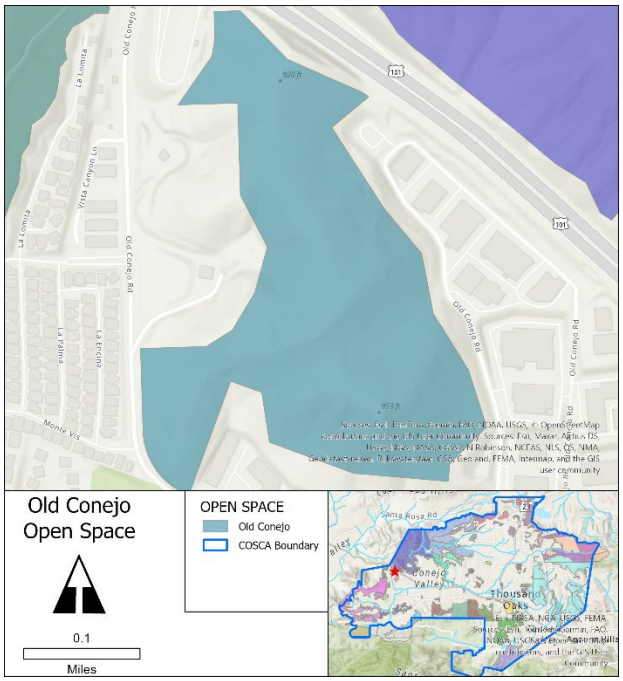
Vallecito

The Vallecito open space area covers approximately 66 acres. It is situated in the western portion of the South Region. Residential development occurs along the eastern boundary, privately-owned undeveloped land occurs along the northern and western boundaries, and the Dos Vientos open space abuts the southern boundary.



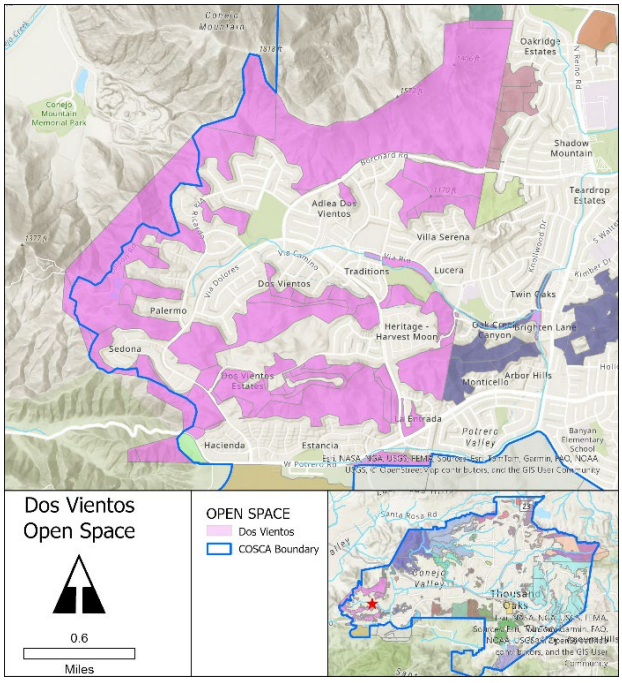
This area is characterized by its steep slopes, rocky outcrops and generally south-facing aspect. The primary vegetation types are non-native grasslands and varying alliances of coastal sage scrub species, including coast prickly pear. The area has been impacted by wildfires including the Hill Fire (2018), the Scales Fire (2017), the Springs Fire (2013), the Conejo Fires (2011/2012) and the Wendy Incident (2004). Bulldozer scars from the Hill Fire are still evident. Fire frequency is a management concern in this area and has impacted native vegetation communities and catalyzed colonization by flammable non-native species such as fountain grass.

Old Conejo



The Old Conejo open space area is approximately 38 acres and lies in the western portion of the South Region, east of the Vallecito area. It is bordered by residential and commercial development to the east, south, and west, and the 101 Freeway to the north. The dominant vegetation type is coastal sage scrub with areas of annual grassland. Fire has been less of a feature in this area, with the most recent occurring in 1980 (Hill Canyon Fire). Prior to COSCA's acquisition of this area, the area had been frequented by off-highway vehicles for many decades and vegetation conditions were highly disturbed. Vegetation conditions have recovered in much of the area while the most disturbed areas have converted to non-native annual grasslands which also contain species such as fennel.

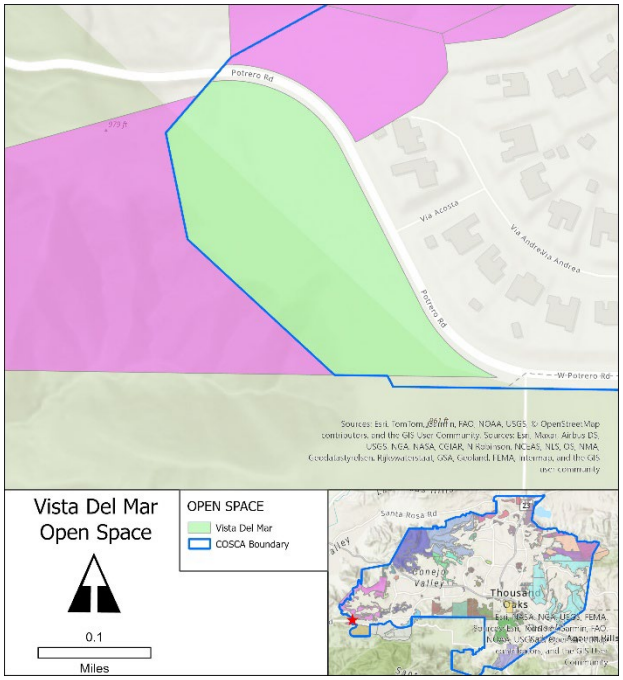
Dos Vientos



The Dos Vientos open space area is located at the western edge of the South Region portion of the Plan Area and comprises 375 acres. The COSCA-owned land is bordered by non-COSCA open space to the west, privately owned undeveloped land to the north and south, and suburban development to the east. This area is notable for its steep slopes, rocky outcrops, and southern exposure. The predominant native vegetation types are coastal sage scrub, mixed chaparral, and non-native annual grasses. While fire is regular feature of this region, this site has experienced fewer fires than areas immediately to the north. The most recent fires are the Hill Fire (2018), the Springs Fire (2013) and the Hill Canyon Fire (1980). Several dry years following the Springs Fire led to a very slow recovery, especially on the steeper upper slopes. Although the Hill Fire only burned 63 acres of this

area, the short time interval between it and the Springs Fire has also hampered recovery as vegetation has not returned to the densities that existed prior to 2013. Fire frequency in this area has also likely played in a role in type conversion and colonization by fountain grass, which is quite prevalent throughout this area. Additionally, bulldozer scars from the Springs Fire have also been quite slow to recover. Other invasive non-native species include Italian thistle, mustards, and Mexican fan palm.

Vista Del Mar

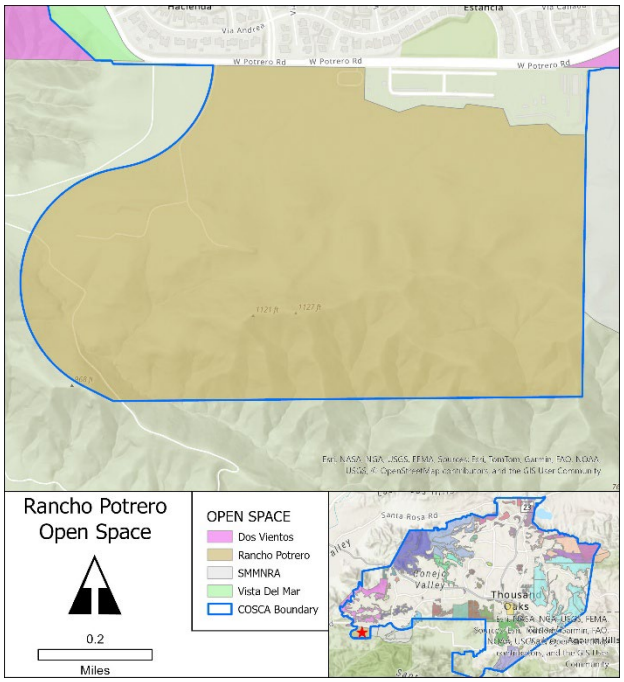


The Vista Del Mar open space area is located in the southwestern corner of the South Region and is 8.7 acres in size. It is bordered by non-COSCA open space to the west, Potrero Road to the north, residential property to the east, and private ranchland to the south. The predominant vegetation in this area is a mixture of coastal sage scrub species and non-native annual grassland. Fire history in this area is limited, with the most recent being the Green Meadows Fire (1993), the Hill Canyon Fire (1980), and the Potrero Fire (1975). This area is notable as it contains the first and only population of yellow star thistle (*Centaurea solstitialis*) within COSCA open space lands. Occasional artichoke thistle (*Cynara cardunculus*) plants have been found in this area as well and both plant species are currently under treatment.

Rancho Potrero

The Rancho Potrero open space area is located in the southwestern corner of the South Region and is 295 acres in size. It is bordered by residential property and an equestrian center to the north, private ranchland to the west and National Park Service property to the south and east. The northern portion of this area is a gently sloped non-native annual grassland punctuated by occasional low knolls that support various coastal sage scrub species. Two south-to-north oriented ephemeral drainage swales contain native and non-native wetland-associated species. A larger swale that parallels the equestrian center hosts riparian tree and shrub species that were installed as compensatory mitigation for a nearby

development. The southern portion of this area consists of a rocky ridgeline dominated by mixed chaparral and coastal sage scrub plant communities, with some areas of exposed rock and non-native annual grasses.

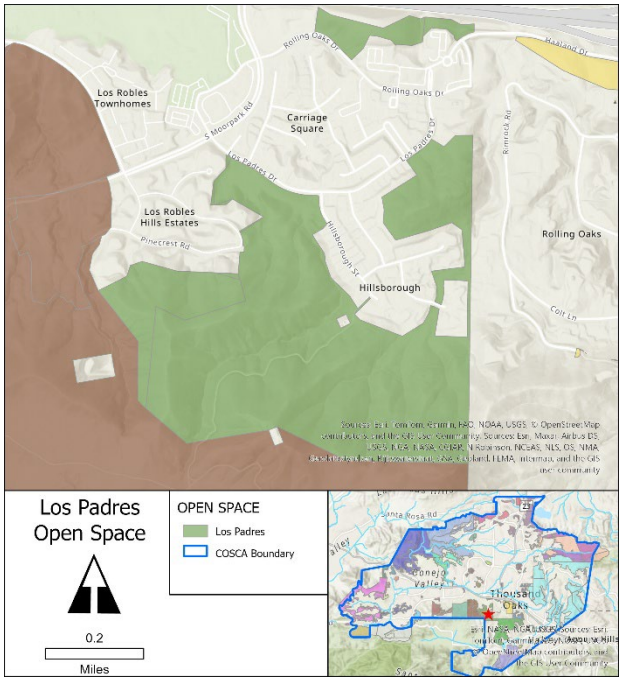


Fire is a feature of this area, with the most recent large fires being the Green Meadows Fire (1993) and Springs Fire (2013), neither of which burned the full extent of the area. The Springs Fire left several east-facing hillsides unburned, so damage was not universal. Although the region experienced drought immediately after the Springs Fire, recovery of the shrublands has been good.

Invasive species in the northern section include Italian ryegrass (*Festuca perennis*), fennel, bristly ox tongue (*Helminthotheca echioides*), artichoke thistle, redstem filaree (*Erodium cicutarium*), and Russian knapweed (*Rhaponticum repens*). Russian thistle, tocalote, and various non-native annual grasses are scattered throughout the southern section.

Los Robles

The Los Robles open space area is 358 acres in size and lies in the central portion of the South Region. The area is bordered by the Los Robles Golf Course to the north, residential development and open space to the east, and open space to the south and west. This area is densely vegetated with chaparral plant communities. Three prominent ephemeral drainage areas support dense oak woodlands. The area contains two historic fire fuel breaks dominated by invasive annual grasses. Despite decades since their creation, native vegetation is sparse in the disturbed areas indicating that type conversion is likely permanent. A small restoration project has been implemented on the southern fuel break with the installation of coast live oaks (*Quercus agrifolia*) and chaparral

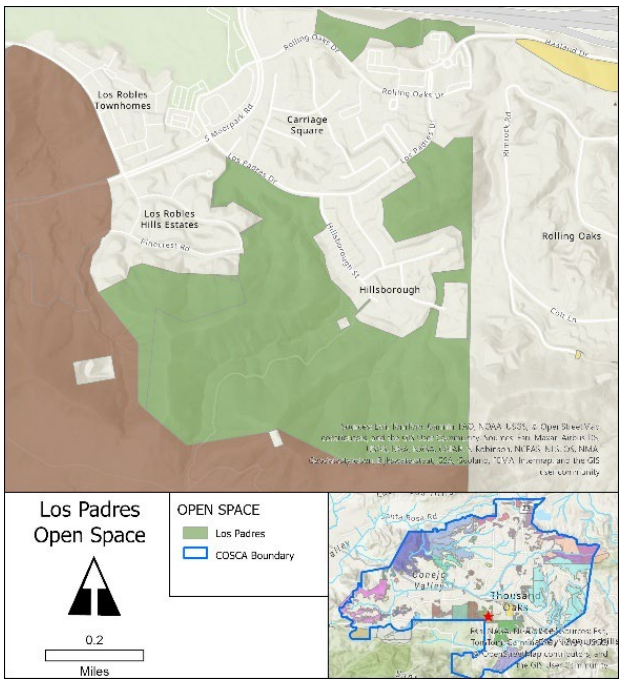


shrub species. Further planting and a substantial weed management effort would be necessary to restore the chaparral shrub cover in these areas.

Like other portions of the Plan Area, fire is a regular feature of this landscape. The most recent fires here were the Green Meadows Fire (1993) and the Los Robles Fire (1976). Recovery time between these fires has been relatively long and recovery has been robust in areas not being maintained as fuel breaks. Common invasive species in this area include fountain grass, Italian thistle, tocalote, and non-native annual grasses.

Los Padres

The Los Padres open space area is 186 acres in size and is located in the central portion of the South Region, adjacent to the Los Robles open space area. It is bordered by residential development to the north, and open space to the east, south, and west, and also includes an 18.5-acre common area associated with a neighboring HOA . The area hosts dense chaparral vegetation on its primarily north-facing slopes. An ephemeral stream emanates from the central portion of this area and supports a coast live oak woodland in its northern portion.



Unlike many other portions of the Plan Area, fire is not a regular occurrence in the Los Padres open space area, with the most recent event being the Los Robles Fire (1976). The presence of invasive non-native species is limited, with instances typically occurring along trail or access road margins. Invasive species include smilo grass (*Stipa miliacea*), Italian thistle, and tocalote.

3.0 Invasive Plant Species

3.1 Invasive Plant Management History

Current vegetation management activities within COSCA open space areas consist of required brush clearance/fuel modification and targeted, small-scale, habitat restoration/enhancement projects. COSCA's brush clearance/fuel modification maintenance activities occur annually where a required 100-foot defensible space zone between a combustible structure and hillside vegetation extends onto public open space. COSCA's brush clearance program has been in place since 1991 and has expanded as the

extent of protected open space has grown and more residential development has occurred. The current extent of fuel modification is approximately 380 acres, which is implemented with a three-way contract between COSCA, the City of Thousand Oaks, and the Conejo Recreation and Park District. Additionally, COSCA conducts annual mowing and string trimming of trail and fire road margins to provide safe trail access and reduced risk of fires caused by service vehicles utilizing access roads.

Habitat restoration/enhancement efforts have occurred at various locations in COSCA open space. These include Arroyo Conejo, Conejo Canyons, Rancho Potrero, Dos Vientos, Los Robles, Sunset Hills, Labisco Hill, and Lang Ranch. The target species have included fennel, Russian knapweed, Russian thistle, Italian thistle, mustards, milk thistle, giant reed, and Mexican fan palm. These projects were implemented in locations where native habitat was threatened by non-native invasive plant species having invasiveness ratings of moderate to high from the California Invasive Plant Council (Cal-IPC). These areas have received varying levels of treatment, both from volunteers and habitat restoration contractors. Restoration efforts are funded through the agency's operations budget, special-use funds held by COSCA, and grants. Treatment methods used within COSCA lands have consisted of manual removal and spot application of herbicide. The recommendations in this plan will provide for more expanded habitat management work in the future.

3.2 Invasive Plant Inventory

Invasive plant species that occur within COSCA lands are typical for urban interface open space areas in Southern California. These species include black mustard, bristly ox tongue, castor bean (*Ricinus communis*), fennel, Italian thistle, giant reed, Mexican fan palm, milk thistle, poison hemlock (*Conium maculatum*), shortpod mustard (*Hirschfeldia incana*), tocalote, and tree tobacco. These species all have a long history in California, Ventura County, and the Conejo Valley, and are typically targeted and treated in open space areas.

In May through September of 2021, invasive plant surveys were conducted in open space areas burned by the Hill and Woolsey Fires. High-resolution aerial imagery was also used in conjunction with field surveys. Drought conditions during the survey period likely had a negative impact on the number of species observed, but the data that was collected remains of value for planning purposes. In addition to the 2021 invasive plant inventory, COSCA staff regularly map occurrences of target species and enter location data in a Geographic Information System (GIS) to develop priority work areas.

The number of invasive plant species observed during the 2021 surveys varied throughout the Plan Area. The highest number of species were observed within riparian zones and trailheads, along trails and fire roads, and areas that historically supported native grasslands. Invasive species generally occurring in riparian zones included giant reed, Mexican fan palm, Canary Island date palm (*Phoenix canariensis*), castor bean, edible fig (*Ficus carica*), smilo grass, and tree tobacco. Invasive species commonly observed along

trails and fire roads consisted of black mustard, shortpod mustard, and tocalote, all of which favor the higher levels of disturbance in these areas that results from road/trail maintenance. Invasive species dominating historic native grasslands include annual grasses such as wild oats (*Avena* spp.) and ripgut brome (*Bromus diandrus*), as well as fennel, Russian thistle, bristly ox tongue, prickly lettuce (*Lactuca serriola*), Italian thistle, and milk thistle.

A total of 30 non-native invasive plant species were detected within the Plan Area during the 2021 inventory or are known to be in the general area and to be viable threats if they migrate onto COSCA-managed properties. These species, along with others that staff has encountered or is concerned about, their associated Cal-IPC invasiveness rating, local rating, and the locations where the species occur are provided in Table 2. The table does not contain all non-native invasive species in the Plan Area but consists of those that present credible threats to the integrity of existing native plant communities. As Cal-IPC ratings are generalized from statewide data, a local rating determined by COSCA staff is also included. The intent of the local rating is to better capture the tendency for a particular species to be invasive in the Plan Area in relation to local climate, location and soil conditions. Descriptions of the detected species can be found in Section 4.3.

Table 2: Invasive Plant Species Detected

Scientific Name	Common Name	Cal-IPC Rating	Local Rating	Location
Ailanthus altissima	Tree of heaven	Moderate	Moderate	CC
Araujia sericifera	Bladder vine	Watch	Limited	within 0.5 mi.
Arundo donax	Giant reed	High	High	AR, CC, WW
Asphodelus fistulosus	Onion weed	Moderate	Moderate	CC, LR
Avena spp.	Wild oats species	Moderate	Moderate	All
Brassica nigra	Black mustard	Moderate	Moderate	All
Bromus diandrus	Ripgut brome	Moderate	Moderate	All
Bromus madritensis	Foxtail brome	High	Moderate	All
Carduus pycnocephalus	Italian thistle	Moderate	Moderate	CC, DV, LRO, LP,
Centaurea melitensis	Tocalote	Moderate	Moderate	CC, LR, NR, OB, WR
Centaurea solstitialis	Yellow starthistle	High	High	VDM
Cirsium vulgare	Bull thistle	Moderate	Moderate	CC, OB
Conium maculatum	Poison hemlock	Moderate	Moderate	CC, WW, V
Cortaderia selloana	Pampas grass	High	Moderate	LR
Cynara cardunculus	Artichoke thistle	Moderate	Moderate	RP, VDM
Delairea odorata	Cape ivy	High	Watch (High)	within 2.5 mi.
Ehrharta calycina	Perennial veldt grass	High	High	LRO
Erodium cicutarium	Redstem filaree	Limited	Moderate	LRO, RP
Euphorbia terracina	Carnation spurge	Limited	Watch (High)	within 2.0 mi.

Scientific Name	Common Name	Cal-IPC Rating	Local Rating	Location
Festuca myuros	Rattail fescue	Moderate	Moderate	CC
Festuca perennis	Italian ryegrass	Moderate	Limited	RP
Ficus carica	Edible fig	Moderate	Limited	CC, WW
Foeniculum vulgare	Fennel	Moderate	Moderate	CC, WW
Glebionis coronaria	Crown daisy	Limited	Watch (Mod)	within 2.5 mi.
Helminthotheca echioides	Bristly ox tongue	Limited	Moderate	CC, RP, VDM
Hirschfeldia incana	Shortpod mustard	Moderate	Moderate	CC, DV, LR, NR, OB
Lactuca serriola	Prickly lettuce	n/a	Moderate	CC, WW, LR
Lamarckia aurea	Goldentop grass	n/a	Moderate	CC, WW
Lepidium latifolium	Perennial pepperweed	High	Watch (High)	In Area
Malva species	Cheeseweed	n/a	Moderate	LR, WW, CC, RP
Nerium oleander	Oleander	N/A	Limited	AR, WW
Nicotiana glauca	Tree tobacco	Moderate	Moderate	CC, LR, NR, OB, WW, WR
Pennisetum setaceum	Fountain grass	Moderate	High	CC, LR, DV, NR, V, WW
Phalaris aquatica	Harding grass	Moderate	Moderate	LP, LRO, CC
Phoenix canariensis	Canary Island date palm	Limited	Limited	WW
Raphanus sativus	Wild radish	Limited	Low	RP
Rhaponticum repens	Russian knapweed	Moderate	Moderate	RP
Ricinus communis	Castor bean	Limited	Low	CC, OB
Salsola tragus	Russian thistle	Limited	Moderate	CC, DV, LH, LR, OB, WR, WW
Schinus molle	Peruvian pepper	Limited	Low	CC, LR, WW
Schinus terebinthifolia	Brazilian pepper	Moderate	Low	WW
Silybum marianum	Milk thistle	Limited	Moderate	CC, OB, LR
Sisymbrium irio	Hedge mustard	Limited	Moderate	LP, Los Robles
Stipa miliacea	Smilo grass	Limited	Limited	LP
Tamarix species	Tamarisk	High	Moderate	in Plan Area
Tribulus terrestris	Puncture vine	Limited	Moderate	CC
Vinca major	Periwinkle	Moderate	Limited	WW
Washingtonia robusta	Mexican fan palm	Moderate	Moderate	CC, DV, LR, NR, WW
Location Abbreviations: AR - Arroyo Conejo; CC - Conejo Canyons; DV - Dos Vientos; LH - Labisco Hill; LR - Lang Ranch; LP - Los Padres; LRO - Los Robles; NR - North Ranch, OB - Oakbrook, OC - Old Conejo; RP - Rancho Potrero; SH - Sunset Hills; V - Vallecito; VDM – Vista Del Mar, WW – Wildwood; WR – Woodridge				

4.0 Management Plan

4.1 Integrated Pest Management

The overarching framework for this Plan is Integrated Pest Management (IPM). This is a strategic approach to controlling invasive non-native plant species that emphasizes ecological balance and long-term sustainability. Rather than relying solely on chemical treatments, IPM combines multiple tactics, such as manual and mechanical removal, habitat restoration, and targeted herbicide applications to reduce the spread and impact of invasive plants. The goal is to minimize harm to native ecosystems while effectively managing pest populations. Monitoring and assessment are key components of IPM, as they provide information regarding the efficacy of the program and allow for modification of strategies based on environmental conditions and the success of previous treatments. This holistic method supports biodiversity and helps prevent the unintended consequences often associated with single-method pest control.

4.2 Early Detection and Rapid Response

Early detection and rapid response (EDRR) is an important approach in managing invasive non-native plant species and will be employed as a component of this Plan. By identifying new invasions at their earliest stages, actions to prevent these species from establishing and spreading can be taken, which significantly reduces ecological damage and long-term control costs. EDRR involves systematic monitoring, public awareness campaigns, and trained personnel capable of recognizing and reporting unfamiliar plant species. Once detected, rapid response strategies—such as targeted removal, containment, or chemical treatment—are deployed to eradicate or control the invader before it becomes entrenched. This proactive approach is essential for preserving native biodiversity, maintaining ecosystem health, and protecting agricultural and recreational resources.

4.3 Regulatory Framework

Herbicide applications in California are regulated by a partnership between the California Department of Pesticide Regulation (DPR) and County Agricultural Commissioners. The DPR sets the state's pesticide policies and regulations, while the local Commissioners enforce these laws and regulations at the county level. Herbicide-related regulations are also provided by US Environmental Protection Agency. This tiered approach ensures that herbicides are safely and properly used.

The environmental review process codified by the California Environmental Quality Act (CEQA) was established to create opportunities for public agencies, decision makers, and the public to evaluate a project in the context of its potential impacts to the environment, to review and implement methods of eliminating or reducing any potentially adverse impacts, and to consider project alternatives. CEQA compliance is required for all public agencies,

municipalities, and private entities that undertake an activity that requires discretionary approval from a government agency, or for an activity that may cause either a direct or a reasonably foreseeable indirect change to the environment. Although there are many benefits associated with non-native plant removal projects, an Initial Study will be prepared for this Plan followed by a corresponding CEQA-compliant analysis document.

While many of the invasive non-native plant species included in the Plan occur in upland areas, there are several species, such as giant reed and palms, that occur in riparian areas. Depending on methodology, management projects for target species that occur in riparian areas or in areas that have been determined to be critical habitat for any special status wildlife species will require coordination with relevant regulatory agencies including the Ventura County Watershed Protection District, the California Department of Fish and Wildlife, the Los Angeles Regional Water Quality Control Board, the US Fish and Wildlife Service, and the US Army Corps of Engineers.

4.4 Contractor Requirements

As treatment of invasive non-native plant species will occur within the setting of natural habitat areas, entities that will perform treatment activities must have the appropriate skills and certifications. Contractors will be required to be skilled in both native and non-native plant identification and be able to demonstrate the successful completion of at least three non-native plant management projects within the past five years. Companies that provide herbicide application services will be required to be licensed as a pest control business with the Ventura County Agricultural Commissioner's office. In addition, individuals making chemical applications will be required to have a Qualified Applicator's License from DPR or be under the direct supervision of an individual with a QAL.

4.5 Invasive Plant Species Treatment Priority

Each of the non-native invasive plant species detected within the Plan Area is assigned a management tier priority rating (Table 3) that will be applied for occurrences in the COSCA open space regions. These ratings are defined below and were determined based on consideration of each species prevalence within the Plan Area, the feasibility of achieving control, and the potential risk for further infestation. These ratings apply to the entire Plan Area; however, priorities for individual species may shift depending on the relevant factors within each treatment area, as discussed in later sections. Additionally, species can be added to this treatment priority list on an ongoing basis, and species priorities can shift based on prevalent site conditions present at the time of treatment. Any added species are anticipated to be small, emergent populations, and treatments will utilize similar methods as are included in this plan for the species listed. This treatment priority rating will evolve based on the progress made by management activities, and in recognition of EDRR efforts. In some treatment areas, a species may be allocated to a higher or lower priority based on

existing conditions. It should be noted that this list is not exhaustive, and it is likely that other species may be present and discovered through regular monitoring. Treatment descriptions are based on published recommendations in *Weed Control in Natural Area of the Western United States* as well as the experience of COSCA staff.

Table 3: Invasive Plant Species Management Tier Priority Ratings

Priority 1	Priority 2	Priority 3
tree of heaven (*Ailanthus altissima*)	bladder vine (*Araujia sericifera*)*	onion weed *(Asphodelus fistulosus)*
giant reed (*Arundo donax*)	tocalote (*Centaurea melitensis*)	wild oats species (*Avena spp.*)
Italian thistle (*Carduus pycnocephalus*)	poison hemlock (*Conium maculatum*)	black mustard (*Brassica nigra*)
yellow starthistle *(Centaurea solstitialis)*	rattail fescue (*Festuca myuros*)	ripgut brome (*Bromus diandrus*)
bull thistle (*Cirsium vulgare*)	Italian ryegrass (*Festuca perennis*)	red brome (*Bromus madritensis ssp. rubens*)
Pampas grass (*Cortaderia selloana*)	crown daisy (*Glebionis coronaria*)*	redstem filaree (*Erodium cicutarium*)
artichoke thistle *(Cynara cardunculus)*	oleander (*Nerium oleander*)	edible fig (*Ficus carica*)
cape ivy (*Delairea odorata*)*	tree tobacco (*Nicotiana glauca*)	bristly ox tongue (*Helminthotheca echioides*)
perennial veldt grass (*Ehrharta calycina*)	fountain grass (*Pennisetum setaceum*)	shortpod mustard (*Hirschfeldia incana*)
carnation spurge (*Euphorbia terracina*)*	Harding grass (*Phalaris aquatica*)	prickly lettuce (*Lactuca serrioloa*)
fennel (*Foeniculum vulgare*)	Canary Island date palm (*Phoenix canariensis*)	goldentop grass (*Lamarckia aurea*)
perennial pepperweed (*Lepidium latifolium*)	Brazilian peppertree (*Schinus terebinthifolia*)	cheeseweed species (*Malva* spp.)
Russian knapweed (*Rhaponticum repens*)	Peruvian peppertree (*Schinus molle*)	wild radish (*Raphanus sativus*)
castor bean (*Ricinus communis*)	milk thistle (Silybum *marianum)*	smilo grass (*Stipa miliacea*)
Russian thistle *(Salsola tragus)*	hedge mustard (*Sisymbrium irio*)	
tamarisk species (*Tamarix* spp.)	periwinkle (*Vinca major*)	
puncture vine (*Tribulus terrestris*)		
Mexican fan palm *(Washingtonia robusta)*		

* a species that has yet to establish in the Plan Area, current ranking is estimated.

4.5.1 Treatment of Priority 1 Species

Priority 1 species are highly invasive, considered particularly detrimental to natural areas, and are typically targeted for eradication. In most of the Plan Area these species are not exceptionally widespread, which makes complete eradication more feasible. However, if allowed to become more widespread and dominant within the Plan Area, Priority 1 species would be expected to require costly and labor-intensive management efforts. In addition to prioritization based on threats to native plant communities, some species, including Mexican fan palm and Russian thistle, are prioritized as wildfire threats to neighboring communities. While eradication is an appropriate goal for most Priority 1 species, the nature of their extent and opportunities for re-infestation also make containment and prevention viable strategies for management for some species. Management goals and strategies for each species are described in the sections below.

4.5.2 Treatment of Priority 2 Species

Priority 2 species include those targeted for containment based on their current distribution or a lower feasibility of achieving complete eradication. Management activities focused on controlling and preventing further spread of Priority 2 species will be implemented to prevent these species becoming more problematic to surrounding habitat. When opportunities arise to treat Priority 2 species alongside Priority 1 species, management efforts may be combined.

4.5.3 Treatment of Priority 3 Species

Priority 3 species are those species that have been targeted for monitoring as they are already widespread throughout the Plan Area and elsewhere within Ventura County. Priority 3 species would take substantially more effort and resources to eradicate due to their current broad distribution. They will be targeted for treatment on an as-needed basis to protect sensitive resources (including sensitive habitat, plants, or wildlife), for fuel modification and fire safety, or as part of weed management activities where treatment would be followed by the installation of native plants or seeds.

4.6 Control Options

4.6.1 Manual Removal

Manual plant removal refers to hand-pulling or removing plants with hand tools such as hoes, shovels, weed wrenches, or loppers, as well as hand-held power tools such as string trimmers or chainsaws. Manual removal may be used for annual as well as perennial species. Manual removal methods are generally effective for small or initial infestations. They can also be used as part of a follow-up control program where the number of remaining plants to be removed is small. This approach can also be used in combination with other

methods, such as chemical application, when an initial phase of biomass reduction is helpful for improving the efficacy of the following treatment.

4.6.2 Mechanical Removal

Mechanical plant removal methods include the use of heavy equipment, such as tractors or backhoes to either remove woody plant species in their entirety or to tow or power implements that mow, masticate, till, or cultivate areas where target species occur. Mowing and mastication are both methods that cut or shred above ground biomass. Tillage/cultivation involves the turning of soil and the burying of plant parts or use of implements such as rakes and harrows to disturb plant roots. These techniques are most often applied in areas where invasive species have created monocultures and when the treatment strategy includes follow-up chemical treatments that benefit from an initial phase of biomass reduction, and/or eventual installation of replacement native vegetation.

4.6.3 Chemical Control

Herbicide applications are widely used to control or eradicate infestations of weed species. Herbicides may be used selectively to control discrete but significant infestations where manual and mechanical control methods are deemed ineffective. Herbicide use will generally be integrated with other methods such as manual / mechanical removal to reduce reliance on chemicals and to avoid impacts to native plant diversity. For the purposes of this Plan, herbicides will either be applied directly to the foliage, stems, or bark of target species, or injected into the target species. In all instances, application will adhere to the parameters indicated on product labels. Large scale application of chemicals via broadcast spraying or aerial application is not being proposed, nor is application directly to soil or water.

Chemical application entails applying a mixture of herbicide and a photo-degradable marking dye to the target species. For situations where the herbicide mixture is applied to foliage by spray application, the active ingredient will be diluted with water pursuant to the dilution paraments on the product label. An adjuvant such as a non-ionic surfactant will also be added to the mixture to increase efficacy of the active ingredient when conditions warrant. For most applications, the mixture will be applied with backpack sprayers, with the intent of wetting the leaves but not to the point of dripping off. In instances where the herbicide mixture will be applied to plant stems or tree bark, the active ingredient will be diluted with water pursuant to the paraments on the product label and a surfactant will not be added. The mixture will be directly applied via a sponge dauber or similar implement, with the intent to wet the surface but not to run off. In cases where injection will be utilized, such as for palms, holes will be drilled into the trunk and small amounts of full-strength herbicide will be directly inserted into the trunk.

4.6.4 Cultural Control

Cultural control methods typically entail activities such as grazing, fire and/or prescribed burning, as well as revegetation with native species. These strategies each use a form of disturbance to suppress invasive non-native species with the intent of enhancing native vegetation. In most of COSCA's potential treatment areas, there are existing native plants present that are intended to be preserved. While grazing goats or sheep may be utilized under this plan, methods such as fire and/or prescribed burning that cause broader disturbance of larger areas, and that may have significant off-site impacts, are not being proposed as part of this Plan.

4.6.4 Biological Control

Biological control involves the use of a target species' natural enemies, generally insects, to control its competitive ability and dominance. In the United States, releasing a biological control agent for an invasive species requires approval and coordination from multiple federal and state agencies to ensure safety, effectiveness, and ecological responsibility. As biological control does not achieve eradication and is also limited to the instances where agencies have approved such non-native insects for release, use of this method is not being contemplated as part of this Plan.

4.7 Treatment Strategies for Priority 1 Species

This section describes priority 1 species, their locations and scale of infestation, management strategies, and removal methods. For each species below, information is provided on the efficacy of manual, mechanical, cultural, chemical, and biological treatment methods. For each species a preferred alternative method wis listed. In some cases, more than one method is selected based on the magnitude of the infestation.

4.7.1 Tree-of-Heaven (*Ailanthus altissima*)

Tree-of-Heaven is an aggressive, fast-growing deciduous tree that can reach 70 feet in height. It spreads via many lateral creeping roots that can create extensive clonal monocultures. It has large, pinnate-compound leaves that produce an unpleasant skunky odor, especially when crushed. This species is native to eastern Asia and was introduced to North America as a landscape plant. It is limited in distribution to one known occurrence in the Plan Area.

Project Locations and Scale

Tree-of-heaven is limited to two occurrences in the Conejo Canyons open space area. The extent of the infestation

measures under 2,000 square feet in size. Potential impacts will be limited to a small area and are mitigated through best management practices.

Management Goal and Strategy

The project goal for tree-of-heaven is eradication, which is likely achievable given the small size of the infestation. Its limited occurrence offers the opportunity to prevent future spread and larger impacts.

Methods

Preferred Alternative

Chemical: The mode of chemical application will be basal bark application, which is a method for controlling woody plants by applying concentrated triclopyr to the lower 12 to 18 inches of the plant's stem. For small saplings, a dilute mixture of triclopyr will be applied to foliage. Treated plants will be monitored for herbicide efficacy.

Alternatives Not Chosen

Manual: Seedlings may be hand-pulled, but once underground creeping roots form, hand-pulling is not effective. A weed wrench can be used on smaller trees, but the entire root system must be removed, which is unlikely to be successful.

Mechanical: The location of the existing infestation is within a larger area dominated by native plants. Machinery access is difficult and would create disturbance that can contribute to the spread of other undesirable species. The plant's ability to resprout from broken roots requires all root biomass to be removed, which is unlikely to be successful.

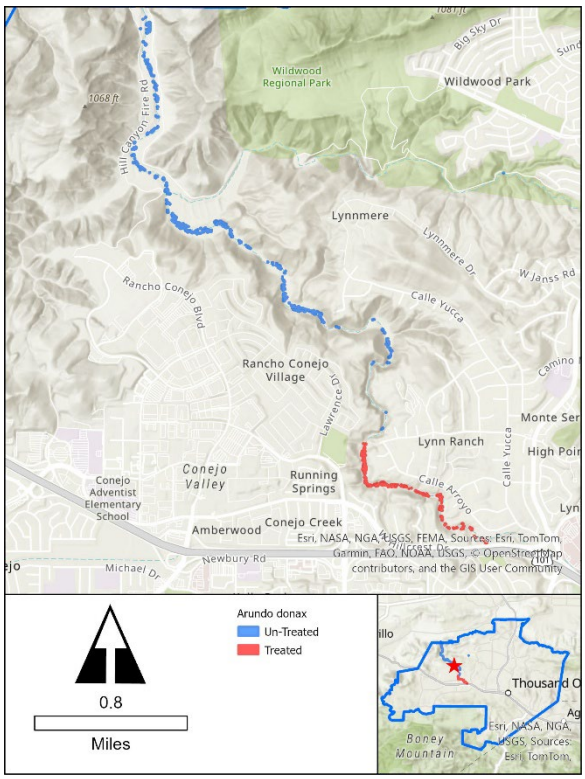
Cultural: Grazing is not a viable control method due to plant height and structure.

Biological: There are no known biocontrol agents for tree-of-heaven.

4.7.2 Giant Reed (*Arundo donax*)

Giant reed is a tall, perennial grass native to the Mediterranean region and parts of Asia, but now widespread and invasive in many subtropical and warm-temperate areas, including the southwestern United States. It grows rapidly, often reaching heights of over 20 feet, and forms dense, bamboo-like stands along waterways. With its thick rhizomatous root system, giant reed can outcompete native vegetation, reduce biodiversity, alter fire regimes, and consume large quantities of water. The plant was historically used as a building material, for erosion control, musical instruments, and has potential as a biofuel, but its

aggressive growth, ecological impacts, and tendency to escape cultivation have discouraged cultivation and promoted removal.



Project Locations and Scale

Giant reed is found along Arroyo Conejo and Conejo Creek spanning through the Wildwood, Arroyo Conejo, and Conejo Canyons open space areas. It has been removed from Arroyo Conejo upstream of Rancho Conejo Playfields Park. Downstream of the park, an approximately 2,100-foot section if the channel is generally free of this species, except for a few small patches. The infestation then resumes and extends to the downstream extent of COSCA-managed property and beyond. While dispersed over a large area, the combined acreage of giant reed stands is approximately two acres.

Management Goal and Strategy

The management goal for giant reed is twofold. The first is eradication from COSCA-managed riparian areas and the second is eradication from riparian areas in the Conejo Valley beyond COSCA jurisdiction through coordination with the respective landowners. In both cases, the removal is intended to address the ecological impacts as well as fire safety issues this species creates.

Treatment History

COSCA began giant reed removal in Arroyo Conejo in 2021. At present, a 1.8-mile reach of the stream has been cleared between W. Hillcrest Drive and Rancho Conejo Playfields Park. This project is now in a monitoring and maintenance phase where resprouts are treated on an as-needed basis and is approximately 95% complete.

Methods

Common methods for controlling and removing giant reed are described below. For this species, a combination of treatments is prescribed that include removal of biomass followed by chemical treatment.

Preferred Alternative

Manual: Utilization of manual removal only for mature stands of giant reed is not a viable option due to the expanse and depth of the rhizome mass. Only the smallest plants can be successfully removed by hand, but these are rare as giant reed does not produce viable

seeds in this region. However, removal of above-ground biomass is commonly performed when the treatment method includes follow-up chemical treatment of resprouts as this approach reduces the volume of herbicide used.

As part of this Plan, giant reed canes will be cut as close to the ground as possible and bundled for transport to a chipper via truck or tractor along existing access routes. Once chipped, the biomass will be hauled offsite for proper disposal. Ground disturbance that would be significant enough to dislodge rhizomes will be avoided to preclude spreading plant propagules to other areas. Resprouts triggered by the initial biomass removal will be treated with herbicide as discussed in the preceding section.

The current distribution of giant reed on COSCA open space lends itself to the use of manual methods for initial biomass removal rather than mechanical removal.

Chemical: The most widely adopted method for removing giant reed utilizes application of a dilute mixture of aquatic-approved glyphosate-based herbicide to foliage. Herbicide application would occur to resprouting stems after first removing above-ground biomass. Foliar applications would be made when the resprouts are approximately three feet tall, thus reducing herbicide volume (as compared to treating mature canes that can exceed 10-feet in height). Treatment will occur with a dilute mixture of aquatic-approved glyphosate herbicide. The spray mix will also include a non-ionic surfactant and a photodegradable spray pattern indicator. Follow-up applications will occur according to observations made during regular site monitoring visits. These applications will decrease sharply over time as energy stores in the plants' rhizomes are depleted.

Alternatives Not Chosen

Mechanical: Mechanical means such as excavation of rhizome masses is infeasible. This is due to the extent of habitat destruction this method would cause and because giant reed readily resprouts from rhizome fragments, excavation can fragment rhizomes and spread the infestation. Regulatory agencies have generally not approved excavation at scale and excavation is not contemplated as part of this Plan.

However, mechanical methods such as mowing or mastication can be used for initial biomass reduction in combination with follow-up chemical applications. Mowing and mastication typically occur at locations where extensive monocultures of giant reed have become established, where the potential biological impacts would be minimal, and where sufficient access exists for equipment. Mowing or mastication are not anticipated as part of this plan as the preceding criteria cannot be met.

Cultural: Grazing and burning are not successful management practices for giant reed. It is generally unpalatable to livestock due to the high silica content and hardness of mature canes. Fire is not suitable because it removes the natural competition provided by native species and simply triggers rapid resprouting from undamaged rhizomes.

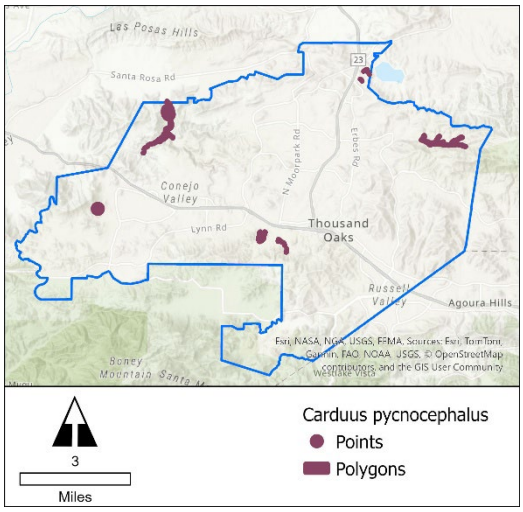
Biological: While a wasp (*Tetramesa romana*) and a scale insect (*Rhizaspidiotus donacis*) have been identified as control agents for giant reed, other methods would still need to be utilized to achieve eradication.

4.7.3 Italian Thistle (*Carduus pycnocephalus*)

Italian thistle is a spiny, annual herb native to Europe and western Asia. It is now invasive in many parts of the United States, particularly California. It typically colonizes disturbed areas, grasslands, and open woodlands, forming dense stands that crowd out native vegetation. The plant is characterized by its deeply lobed, spiny leaves and clusters of pink flower heads. Italian thistle reproduces prolifically by seed and can form thick, dry thatch that increases fire risk. Seeds are relatively short-lived in the soil, lasting approximately 2-3 years. Its sharp spines also deter grazing by wildlife, further reducing the ecological quality of invaded habitats.

Treatment History

COSCA began treatments in 2021 in selected priority areas in the Los Robles, Conejo Canyons, and Sunset Hills open space areas. Populations in these areas are substantially reduced but continued work is still necessary.



Project Locations and Scale

Italian thistle is found primarily on the edges of riparian zones or in shaded areas with higher soil moisture, although it can also be found in grassland areas provided soil moisture is adequate. Focus areas for this species include the Hawk Canyon area in the Conejo Canyons open space, the Oak Creek Canyon loop in the Los Robles open space, portions of the Los Padres trail in the Los Padres open space area, the Sunrise Loop in the Sunset Hills area.

These populations are widely spread and none constitute an area large enough that removal will create any substantial disturbance to adjacent habitat areas.

Management Goal and Strategy

The management goal for Italian thistle is control and containment in areas where conditions support its expansion. As initial treatment areas come under control, Italian

thistle treatment sites will expand to include larger sections of Hill Canyon along the Conejo Creek corridor.

Methods

Common methods for controlling Italian thistle are described below.

Preferred Alternative

Manual: Italian thistle will be removed manually by hand-pulling or use of a weeding tool inserted into the soil to cut the stem at or slightly below the soil surface to prevent a new stem from sprouting. Cut plants that are in flower must be removed from the site as they still may be able to make viable seeds. A continued effort over several seasons is necessary to exhaust the seed bank.

Alternatives Not Chosen

Mechanical: Mowing or string trimming during the growing season can reduce seed production but must be done on a weekly basis during the season to prevent resprouts from seeding. Plants typically resprout after cutting.

Chemical: Aminopyralid is listed among the most effective herbicides for Italian thistle. However, the nature of the current infestations best lends itself to manual removal.

Cultural: Livestock generally avoid eating Italian thistle plants, but some may eat the flower heads. Fire may impact populations of this species, but the distribution of this plant does not lend itself to fire as it mainly occurs on trail margins has the plant formed large monocultural infestations.

Biological: Several biocontrol agents have become established in the western United States, but only one in California. It is unknown whether these are present in the plan area, and the current infestation does not show evidence of any insect damage.

4.7.4 Yellow Star Thistle (*Centaurea solstitialis*)

Yellow starthistle is a highly invasive annual herb native to southern Europe and western Asia. It is easily recognized by its bright yellow, thistle-like flowers surrounded by sharp, stiff spines and deeply lobed gray-green leaves. Preferring disturbed soils, it aggressively colonizes grasslands, rangelands, and roadsides, displacing native vegetation and reducing forage quality for livestock. Yellow starthistle can form dense monocultures that alter fire regimes and soil chemistry, and its spiny flower heads can injure grazing animals. This species is considered a noxious

weed in many parts of the western United States due to its ecological and economic impacts.

Project Locations and Scale

Yellow star thistle has only been identified in one location on COSCA lands. It is in the Vista del Mar open space area and occurs sporadically over an approximately five-acre area. In 2025, these plants were manually pulled, bagged, and removed from the site prior to seed set. This infestation lies upwind of other COSCA-managed lands, particularly the Rancho Potrero open space area. As such, eradication of this species is a priority to reduce the opportunity for the species to migrate onto other COSCA property.

Management Goal and Strategy

The management goal for yellow star thistle is eradication where currently present and prevention of spread of this species onto other COSCA managed land. Monitoring open space areas near disturbed areas and roadways will be implemented for early detection and rapid response.

Methods

Common methods for controlling yellow star thistle are described below.

Preferred Alternative

Manual: If yellow star thistle is detected on COSCA open space, it will be prioritized for immediate treatment, which will begin with manual pulling or cutting of plant stems just below soil level. Manual removal is best for small infestations and requires removal of all the above-ground biomass to prevent fertilization of flowers by pollinators who may still visit plants after they are pulled. Ideal treatment timing is during early flowering, when plants are easy to recognize.

Chemical: Of the chemical alternatives, aminopyralid and glyphosate have shown to be the most effective. If conditions require chemical treatment, it will take the form of spot spraying of dilute herbicide mixtures on individual plants to prevent impacts to non-target species. Chemical treatments would only be necessary if extensive infestations were established. The manual and mechanical methods proposed above aim to prevent the establishment of larger infestations.

Alternatives Not Chosen

Mechanical: Mowing can be a successful strategy to reduce seed production, but timing is crucial for success. Mowing too early can stimulate increased seed production and harm competing grasses, while mowing too late helps scatter seed that has set. Tillage is not recommended as the disturbance of the soil can recruit additional invasive species.

Cultural: Grazing alone has not proven to be a successful strategy, but when high intensity/short duration grazing is timed properly it can help reduce seed production. Fire

can be effective if timed properly, however, repeated burning is necessary, and climatic conditions heavily influence the ability to burn more than once in a season. Cultural control is more appropriate for larger existing infestations that what is occurring on COSCA property.

Biological: Six insects have become established in the western United States for the control of yellow star thistle. While these may reduce seed production, this alone is not sufficient to manage the species.

4.7.5 Bull Thistle (*Cirsium vulgare*)

Bull thistle is a biennial plant native to Europe and Asia but now widespread in many parts of the world. It is easily recognized by its spiny leaves, stout stems, and purple flower heads. The plant reproduces by seed and is often found in disturbed soils, pastures, and roadsides, where it can form dense stands.

Project Locations and Scale

This species has been identified in past years in the Hawk Canyon portion of the Conejo Canyons open space. These plants have been removed, and no other occurrences have been identified.

Management Goal and Strategy

The management strategy for this species is prevention and eradication by removing individual plants, if identified.

Methods

Common methods for controlling bull thistle control are described below.

Preferred Alternative

Manual: If bull thistle is detected on COSCA open space, it will be prioritized for immediate treatment, which will begin with manual treatment (pulling, hoe, string trimmer). Cutting plant stems just below soil level improves efficacy. Manual removal is best for small infestations and requires removal of all the above-ground biomass to prevent fertilization of flowers by pollinators who may still visit plants after they are pulled. Ideal treatment timing is during early flowering, when plants are easy to recognize.

Alternatives Not Chosen

Mechanical: Mowing can be a successful strategy to reduce seed production, but timing is crucial for success. Mowing too early can stimulate increased seed production and harm competing grasses, while mowing too late helps scatter seed that has set. Tillage is not

recommended as the disturbance of the soil can recruit additional invasive species. Existing populations are dispersed in nature and do not justify impacting larger areas through mowing.

Chemical: Of the chemical alternatives, aminopyralid and triclopyr have shown to be effective. Chemical treatments would only be necessary if extensive infestations were established. The manual and mechanical methods proposed above aim to prevent the establishment of larger infestations.

Cultural: Grazing may be effective in managing bull thistle, but primarily through increasing the competitiveness of desired species. Sheep, goats, and horses, but not cattle, will feed on small plants. Grazing timing, intensity, and which animals are used is important. Cultural control is more appropriate for larger existing infestations, and none has been identified in the Plan Area.

Biological: Several species of insects have become established in the western United States for the control of bull thistle and similar species. The efficacy of these varies by region and have not proven to significantly add to control efforts.

4.7.6 Pampas Grass (*Cortaderia selloana*)

Pampas grass is a tall, perennial ornamental grass native to South America, particularly the Pampas regions of Argentina, Brazil, and Uruguay. It features large, plumes atop long, arching leaves that can grow up to 10 feet tall. Widely planted for landscaping, pampas grass has become invasive in many regions, including parts of California and coastal areas, where it spreads aggressively by wind-dispersed seeds and dense clumps of rhizomes. Its rapid growth and dense stands can outcompete native plants, alter habitats, and increase fire risk due to the accumulation of dry foliage ant thatch.

Project Locations and Scale

The known distribution of pampas grass is limited to small groupings or single plants at three locations in the Lang Ranch, Rancho Potrero, and Dos Vientos open spaces. Coverage is generally under 100 square feet at each location. The existing plants have been present for several years and significant expansion has not been observed. Despite the limited scale and distribution in the project area, the species has the capacity to spread rapidly when available habitat conditions present, such as following a fire. Removing all known plants prevents the risk of further spread.

Management Goal and Strategy

The management goal for pampas grass is eradication from all open space areas. The number of individual plants is small enough that control can be achieved with a modest effort.

Methods

Common methods for controlling pampas grass are described below.

Preferred Alternative

Chemical: For the larger individual plants, treatment will consist of a foliar application of a dilute mixture of a glyphosate-based herbicide. Plants will be trimmed prior to herbicide application to reduce the volume of herbicide necessary.

Alternatives Not Chosen

Manual: Hand pulling or use of hand tools can be effective for small plants. However, no seedlings were observed on survey sites, and the existing plants are too large for hand pulling. If small seedlings are found during project work, they will be hand-pulled.

Mechanical: Mechanical removal is not recommended because it would require excavation and excess soil disturbance within otherwise healthy and sensitive plant communities. Use of machinery is likely to cause disturbance to adjacent plants and existing access routes and may contribute to the spread of other invasive plants.

Cultural: Grazing is not a successful strategy for managing this species, and it readily resprouts after fire.

Biological: There are no known biocontrol agents for pampas grass.

4.7.7 Artichoke Thistle (*Cynara cardunculus)*

Artichoke thistle is a robust perennial plant in the sunflower family native to the Mediterranean region. This species is a wild biotype of a commercially grown artichoke variety. It produces large, deeply lobed, silvery-green leaves and tall flowering stalks topped with striking purple thistle-type blooms. Artichokes are widely cultivated both as an ornamental and for their edible stems and flower buds, but when left to go to seed, subsequent seedlings have become an aggressive invasive species in some regions, particularly in California. Its deep root system and prolific seed production allow it to outcompete native vegetation, making it a management concern in natural areas.

Project Locations and Scale

Artichoke thistle is found in scattered occurrences in the Rancho Potrero and Vista del Mar open space. These are small areas and treatments in past years have prevented the infestation from expanding.

Management Goal and Strategy

The management goal for artichoke thistle is eradication, followed by monitoring. A systematic approach over several seasons is anticipated to be successful in eradicating the species from COSCA properties. As artichoke seeds can spread via wind dispersal, post removal monitoring will occur as infestations exist on neighboring private properties to the west and southwest and artichokes remain in cultivation in agricultural areas to the west and northwest.

Methods

Common methods for controlling artichoke thistle are described below.

Preferred Alternatives

Manual: Manual removal is an effective strategy for plants in the seedling stage as plants are small enough to pull from the soil. Pulling or digging are not feasible for large, established plants as the size of the tap root is too large to be easily pulled and digging plants up would cause a significant amount of soil disturbance. Cutting and bagging the seed heads prior to seed maturation can reduce the spread of seeds.

Chemical: Aminopyralid- and triclopyr-based products successfully control this species. This method will be used to treat established plants that are too large for manual removal methods.

Alternatives Not Chosen

Mechanical: Repeated cultivation can eliminate this species, but this method is not appropriate in natural areas with only scattered occurrences. Mowing can reduce biomass and seed production but will not keep the plant from regrowing. If performed, mowing must be combined with chemical treatments to eradicate the species.

Cultural: Livestock generally do not graze artichoke thistles due to the spiny leaves, but goat grazing can reduce seed production. Burning can be used to remove biomass but will not keep the plant from regrowing. If performed, both methods must be combined with chemical treatment to eradicate the species.

Biological: The artichoke fly was accidentally introduced in California but is not an approved biocontrol agent. The impact on wild artichoke thistles is unknown.

4.7.8 Cape Ivy (*Delairea oderata)*

Cape ivy, which is sometimes also called German ivy, is a fast-growing, perennial vine native to South Africa. It has fleshy, lobed, ivy-like leaves and produces clusters of small, yellow, daisy-like flowers that bloom in winter and spring. This species spreads rapidly by both seeds and vegetative fragments, often forming dense mats that smother native vegetation and alter habitats. Even small nodes of the plant can root to make new plants. In California and other coastal regions, it is considered a highly invasive weed of riparian areas, forests, and coastal scrub.

Project Locations and Scale

Cape ivy has not been documented on COSCA property, but there are occurrences in Ventura County.

Management Goal and Strategy

The management goal for cape ivy is monitoring and early detection followed by rapid response that aims for eradication. This species will be among those placed on a watch list for monitoring as it is highly invasive and capable of infesting large areas. Identifying any infestation early will provide an opportunity to eradicate it before it becomes widespread.

Methods

Common methods for controlling cape ivy are described below.

Preferred Alternatives

Manual: Manual control of cape ivy requires removal of all parts of a plant. Hand pulling can be successful but depends on the nature of the soil within which this species is rooted. Harder and compacted soils make hand removal very difficult, and successful extraction of all roots may not be feasible. If site assessment indicates that all parts of the plants cannot be systematically removed, control efforts would shift to chemical control. All pulled or cut biomass must be removed from the site to prevent rooting of vine nodes.

Chemical: Chemical treatment is recommended for infestations that cannot be managed manually. Both triclopyr- and glyphosate-based herbicides applied in a dilute foliar application can be successful in treating this species. Follow-up monitoring and treatment is necessary to treat resprouts. Chemical methods will be utilized if manual management is not successful.

Alternatives Not Chosen

Mechanical: Mowing is not recommended because even small parts of the plant can root and spread infestations.

Cultural: Grazing and burning are not successful control methods. Cape ivy is toxic to livestock.

Biological: One biological control agent is permitted for release in California, the shoot tip-galling fly (*Parafreutreta regalis*). As the approval status is relatively recent, the full impact of this insect on existing populations of cape ivy has yet to be fully determined.

4.7.9 Perennial Veldt Grass (*Ehrharta calycina)*

Perennial veldt grass is a long-lived bunchgrass native to South Africa. It forms tussocks and can grow up to 3 feet tall. Individual flowers are nondescript and are arranged in loose panicles. Introduced as a pasture and ornamental grass, it has become highly invasive in coastal California and other Mediterranean climates. Its ability to form thick stands and accumulate large amounts of thatch increases fire risk and displaces native plant communities.

Project Locations and Scale

Perennial veldt occurs in two locations at the Los Padres open space; both located along the eastern portion of the Los Robles Trail. There are no additional known infestations on COSCA property as habitat conditions in most Conejo Valley open space areas are not ideal for this species.

Management Goal and Strategy

The management strategy for perennial veldt grass is monitoring and eradication.

Methods

Common methods for controlling perennial veldt grass are described below.

Preferred Alternative

Chemical: A glyphosate-based herbicide will be used to treat this species. Where plants are intermixed with desirable native species, herbicide will be applied with a dauber to prevent impacts to non-target species. In instances where native vegetation is not present, application will occur with a backpack sprayer. If feasible, plants may also be cut prior to application to reduce the amount of herbicide that is applied. When feasible during trimming

activities, seed heads will be collected and disposed to reduce further deposition to the seed bank.

Alternatives Not Chosen

Manual: Seedlings may be hand-pulled, but all parts of the plant must be removed. This species is presently growing in a rocky substrate and considerable ground disturbance would be necessary to remove the full extent of plant roots.

Mechanical: Mowing may be used to control seed production but does not kill the plants.

Cultural: While this species may be vulnerable to intense grazing, the remote location of the known occurrences and the existing chaparral plant community does not lend itself to grazing. The limited distribution of this species also does not lend itself to burning, as the area lies in a very high fire hazard severity zone.

Biological: There are no biological controls for perennial veldt grass.

4.7.10 Geraldton Carnation Spurge (*Euphorbia terracina)*

Geraldton carnation spurge is a perennial herb native to the Mediterranean region. It typically grows in clumps and produces a milky sap characteristic of spurge species. This species spreads readily in disturbed sites and coastal habitats, where it can form dense infestations. It is considered an invasive weed throughout the western states as it outcompetes native species. Its sap is toxic to humans and some livestock and causes skin irritation.

Project Locations and Scale

Geraldton carnation spurge has been documented at one location on COSCA property in the North Ranch open space area.

Management Goal and Strategy

The management goal for carnation spurge is eradication, which is likely achievable due to the small size of the infestation. Its limited occurrence offers the opportunity to prevent future spread and larger impacts.

Methods

Common methods for controlling Geraldton carnation spurge are described below.

Preferred Alternatives

Chemical: Treatment will consist of foliar application of a dilute mixture of glyphosate-based herbicide following biomass reduction to reduce the volume of herbicide necessary.

Manual: Small patches of small plants will be treated by pulling or hoeing prior to seed production. If plants have set seed, the pulled or hoed biomass will be bagged for disposal. Multiple passes are usually required throughout the year and for several years to successfully eradicate this species.

Alternatives Not Chosen

Mechanical: Mowing can reduce seed production but is not a successful management method. Mowing can be used to reduce biomass in preparation for chemical treatments.

Cultural: Spurges are toxic to cattle and horses. Sheep and goats have been successfully used on this species to reduce populations by grazing when plants are young. However, grazing does not eradicate the species. Fire is not a successful management method as it does not impact the roots, and fire stimulates new shoots from root buds.

Biological: Several non-native insects have been released to control carnation spurge across western states. One, the *Aphthona* spp. flea beetle has been successful in some areas while less effective in others.

4.7.11 Fennel (*Foeniculum vulgare*)

Fennel is a highly aromatic, perennial herb native to the Mediterranean but widely naturalized in many parts of the world, including California. It features feathery, finely dissected leaves and tall, hollow stems that can reach up to six feet in height. The plant produces umbrella-like clusters of small yellow flowers in the summer, followed by aromatic seeds with a licorice-like scent. Fennel thrives in sunny, disturbed areas such as roadsides and grasslands, where it can outcompete native species, often becoming invasive. It is valued for its culinary and medicinal uses, but its aggressive growth poses ecological concerns in native habitats.

Project Locations and Scale

Fennel populations are present throughout the plan area as either isolated occurrences or larger infestations. While fennel is primarily a threat in grassland habitats, it can also expand into areas of coastal sage scrub.

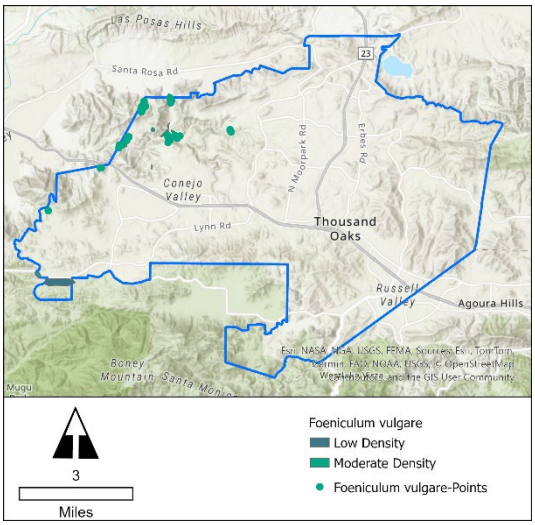
Management Goal and Strategy

The management goal for fennel is eradication, with priorities being in areas where it has impacted native plant communities as well as where past efforts have already reduced its extent. In the Western Plateau section of the Conejo Canyons open space and Rancho Potrero open space areas for example, the fennel population has decreased significantly

after several years of treatment. In contrast, a significant and dense population exists on private property immediately to the west of Rancho Potrero. This infestation is a significant seed source that facilitates the continued spreading of fennel onto open space property. Success in managing fennel long-term at this location will require working in partnership with the neighboring property owner. Expanding existing control efforts onto this adjacent property serves an important public purpose.

Treatment History

COSCA began management of this species approximately 10 years ago. These efforts were focused on the Western Plateau area in the Conejo Canyons open space. In 2021, the project expanded to cover a portion of the Dos Vientos open space northwest of the Rancho Potrero open space and portions of the Rancho Potrero open space. The actions included in this plan are directed toward completing the removals over several additional seasons and expanding into new impact areas.



Methods

Common methods for controlling fennel are described below. This plan recommends chemical treatment as the primary method with manual removal where feasible.

Preferred Alternatives

Chemical: Triclopyr-based products successfully control this species. Application will occur by spot spraying a dilute mixture of triclopyr on the stalks and base of the plant. If a target plant is in bloom at the time of application, its flowers will be avoided to prevent any potential impacts to pollinator species that visit this plant.

Manual: Manual removal is an effective strategy for plants in the seedling stage as plants are small enough to pull from the soil. Pulling or digging are not feasible for large, established plants as the size of the root is too large to be easily pulled and digging plants up would cause a significant amount of soil disturbance. Some plants may regenerate from remaining roots if not completely removed.

Alternatives Not Chosen

Mechanical: Mechanical removal is not contemplated as a removal method as the locations where fennel occurs are situated in otherwise healthy and sensitive plant communities. Use of machinery is likely to cause disturbance to adjacent plants and existing access routes and may contribute to the spread of other invasive plants.

Cultural: Grazing is not a viable control method and can contribute to the spread of the species via seed dispersal. Fire is not successful as the plant can readily re-grow from undamaged roots. While fire can reduce biomass, post-burn chemical applications are necessary to eradicate the plants.

Biological: Because cultivated fennel is closely related to this species, there are no available biocontrol agents.

4.7.12 Perennial Pepperweed (*Lepidium latifolium*)

Perennial pepperweed is a robust, invasive perennial plant in the mustard family (Brassicaceae), native to southern Europe and western Asia. It grows up to 6 feet tall, with thick, woody stems and waxy, lance-shaped leaves that give it a gray-green appearance. The plant produces dense clusters of small white flowers from late spring to summer, followed by small, rounded seed pods. This species spreads aggressively by both seed and a deep, extensive root system, allowing it to dominate wetlands, riparian areas, and disturbed sites. Its rapid colonization and dense growth can displace native vegetation, alter soil salinity, and reduce habitat quality for wildlife.

Project Locations and Scale

This species has not been identified on COSCA property but is known to exist in the general area.

Management Goal and Strategy

The management goal for perennial pepperweed is monitoring and early detection followed by rapid response that aims for eradication. This species will be among those placed on a watch list for monitoring as it is highly invasive and capable of infesting large areas. Identifying any infestation early will provide an opportunity to eradicate it before it becomes widespread.

Methods

Common methods for controlling perennial pepperweed are described below. This plan recommends chemical treatment if this species is observed on COSCA property.

Preferred Alternatives

Chemical: Due to the extensive root system of this species, chemical application has been demonstrated to be the most effective control method. For this species, a foliar application of a dilute mixture of aquatic-approved glyphosate would be used.

Alternatives Not Chosen

Manual: Seedlings can be removed by hand, but seedlings are not often encountered. Most small plants are connected to larger underground root systems that cannot be easily removed by hand. Root fragments as small as half an inch can sprout new plants.

Mechanical: Cultivation and tilling typically spread the infestation by breaking up and spreading root fragments.

Cultural: Livestock animals will graze perennial pepperweed, but they do not kill the plants due to the extensive root system. Pepperweed plants easily regrow when grazing is discontinued.

Biological: Biological controls are being tested, but none have been approved or released in the United States.

4.7.13 Russian Knapweed (*Rhaponticum repens*)

Russian knapweed is a deep-rooted, long-lived perennial in the Asteraceae family, native to Eurasia and invasive in much of western North America. It grows up to three feet tall, with gray-green, lance-shaped leaves and thistle-like purple flowers that bloom from late spring through summer. Russian knapweed spreads aggressively through both seed and an extensive creeping root system. It colonizes disturbed areas, pastures, roadsides, and riparian zones, where it forms dense monocultures that outcompete native vegetation. It is difficult to control, toxic to horses and is considered a noxious weed in many regions.

Project Locations and Scale

Russian knapweed is isolated to one population at the Rancho Potrero open space. It occurs along the eastern property boundary that is shared with the National Park Service (NPS). Plants are dispersed and have not formed monocultural stands.

Management Goal and Strategy

This is a small and relatively new population of this species; the goal is eradication. As this species is known to be aggressive it presents a substantial risk to native plant communities. Treating it prior to the formation of dense stands offers the best opportunity to prevent further infestation. Treatments are anticipated to occur annually until the species is no longer detected. As plants are also located on the adjacent NPS property, treatment coordination occurs with NPS to prevent an ongoing infestation.

Treatment History

This species has been treated for four seasons. The population has been substantially reduced since the initial treatment. It is anticipated that eradication is possible with two additional seasons of treatment.

Methods

Common methods for controlling perennial pepperweed are described below.

Preferred Alternative

Chemical: Due to the extensive root system of this species, chemical application has been demonstrated to be the most effective control method. For this species, a foliar application of a dilute mixture of aminopyralid would be used.

Alternatives Not Chosen

Manual: Small seedlings can be hand-pulled. Hand-pulling does not control established plants due to their larger root systems; such plants readily regrow if pulled.

Mechanical: Mowing can suppress the above-ground biomass, but mowing must be continuous over time. Once mowing stops, the plant will regrow from existing roots. Mowing also stimulates the production of additional shoots, so it results in a higher density of plants. Tillage of the area fragments the root mass and can result in expansion of the population and possible transport off site. Repeated tillage over two to three seasons may destroy the root systems but may also contribute to recruitment of other invasive species in the disturbed areas and prevents the establishment of native plants. Because the current population is dispersed, tillage and mowing would create more impacts than benefits.

Cultural: Grazing is not a viable treatment because livestock avoid this species due to bitter taste, and grazing does not address the root system. Similarly, fire is not a successful strategy for extirpating this species but can be used to reduce biomass.

Biological: Two insects have been released and have become stablished in several western states. These are the Russian knapweed gall nematode and Russian knapweed mite. It is unknown whether these are present in the plan area, and the current infestation does not show evidence of any systemic damage.

4.7.14 Castor Bean (*Ricinus communis*)

Castor bean is a fast-growing, shrubby perennial native to Africa. It is easily recognized by its large, glossy, palmate leaves and distinctive spiny seed pods that contain highly toxic castor beans. Despite its toxicity, castor oil extracted from seeds is used in a variety of industrial and medicinal applications. The plant thrives in disturbed areas, making it a problematic invasive species in natural habitats. In addition, castor bean is a host species for polyphagus shot hole borer (*Euwallacea* spp.) which also attacks several native tree species.

Project Locations and Scale

This species is most common in the Hill Canyon and Arroyo Conejo open space areas, mostly along Arroyo Conejo Creek. There are no large monocultural stands of castor bean in COSCA open space.

Management Goal and Strategy

The management goal is eradication, which can be achieved through removal of individual plants and managing seedlings that germinate after the removal of mature plants.

Methods

Common methods for controlling castor bean are described below.

Preferred Alternatives

Manual: Seedlings can be pulled by hand or removed with tools such as a hoe. Small to moderate sized plants will be removed by hand pulling or use of a weed wrench. Care must be taken to wear gloves as the plant is toxic. If seed heads are present at the time of plant removal, they will be cut, bagged, and removed to an appropriate location for disposal.

Chemical: Large plants will be cut at the stump followed by application of concentrated triclopyr to the remaining stump, or by applying herbicide as a basal bark treatment. As with manual removal, if seed heads are present at the time of treatment, they will be cut, bagged, and removed to an appropriate location for disposal.

Alternatives Not Chosen

Mechanical: Mechanical pulling with heavy equipment and cutting followed by tilling can be successful as well, but these methods create significant disturbance which can then make the treatment area vulnerable to other weed infestations.

Cultural: Grazing is not a viable control strategy as the plant is toxic. Fire is not an appropriate control strategy due to the scattered distribution of existing infestations. In addition, low intensity fire does not kill mature plants and they readily resprout.

Biological: Castor bean is a crop in some locations, used to produce castor oil, so efforts to identify a biocontrol agent have not occurred. Many diseases and pests are known to damage castor bean crops, but these have not impacted the species locally.

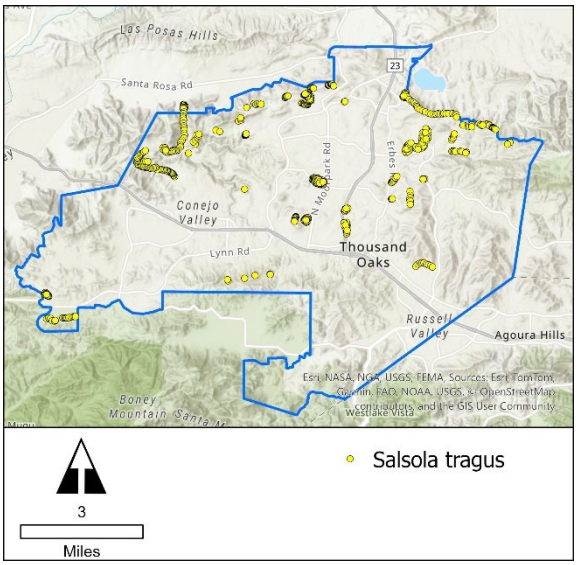
4.7.15 Russian Thistle (*Salsola tragus*)

Russian thistle or tumbleweed is an annual plant that thrives in disturbed and arid environments. It grows into a rounded, bushy shrub. At maturity, dry plants often detach from their roots during high wind events, dispersing seeds widely as the plants roll across the landscape. This species is highly tolerant of drought, saline soil, and poor growing conditions, making it a successful colonizer of disturbed locations. Its rapid spread and dense growth can displace native vegetation. Locally, Russian thistle exhibits a reproduction strategy marked two germination periods. Initial germination occurs in June-July and forms larger plants, and a second germination occurs in the fall that generates smaller plants. It is considered a noxious weed and contributes to fire hazards as detached plants can not only accumulate against fences and homes but can also carry fire across a landscape if ignited during windy conditions.

Project Locations and Scale

Russian thistle is widespread throughout COSCA open space areas, primarily along trail and access road margins and in previously disturbed areas. In some locations, the species has formed large infestations. Such occurrences are found in areas dominated by non-native grasslands where native shrub cover is lacking. It is more limited in areas dominated by native plant communities such as coastal sage scrub and chaparral.

Treatment History



COSCA has undertaken targeted removal of Russian thistle in several specific areas, including the Labisco Hill open space, and portions of the Dos Vientos, Conejo Canyons, Wildwood, Sunset Hills, and Lang Ranch – Woodridge open space areas. At the Dos Vientos location, Russian thistle removal was initiated in 2020 and is essentially complete. At Labisco Hill, treatment was initiated in 2019 and has been very successful in reducing the accumulation of dead plant matter against backyard fences of neighboring properties. In Conejo Canyons and Wildwood, Russian thistle is commonly treated with herbicide along access road margins. The species was also manually removed from two locations Conejo Canyons in 2017. One effort was volunteer based while the other was performed by a contractor. Both projects reduced the infestation for several years. For the Sunset Hills and Lang Ranch – Woodridge areas, treatment of the species along trail margins as well as where it is present in monocultural stands was initiated in 2024. Going forward, management efforts for this species are anticipated to occur over a larger expanse, focusing on areas where the species may pose a fire threat to neighboring residential areas.

Management Goal and Strategy

The widespread distribution of Russian thistle in COSCA open space as well as in adjacent areas makes eradication of the species within COSCA open space an unrealistic management goal. Rather, the goal is a reduction of Russian thistle density systemwide to a level where it does not threaten native plant communities or generate a fire hazard for neighboring residential areas, combined with eradication in specific areas where sensitive habitat is present.

Methods

Common methods for controlling Russian thistle are described below.

Preferred Alternatives

Manual: In areas where infestations are small, individual plants will be removed by hand pulling, or with hand tools by cutting the stem below the surface of the soil. This type of treatment is effective for groups of small plants and scattered occurrences of single, larger plants. A sustained effort over two to three seasons can exhaust the seed bank as seeds are generally viable for only one to three years.

Chemical: In areas where infestations are dense, plants will be treated with a dilute foliar application of a triclopyr-based herbicide. Plants will be treated when they are relatively small, as herbicide efficacy is greater on young plants and less is needed to cover foliage.

Alternatives Not Chosen

Mechanical: Mowing and tillage may offer some control, but the dispersed nature of the infestation does not lend itself to mechanical treatments due to access constraints. Such methods would also cause more disturbance than necessary and contribute to recruitment of invasive species.

Cultural: Livestock grazing can be successful with small plants, but this method is not practical due to access and fencing constraints and the dispersed nature of the infestation. This method is also time consuming, and it is unlikely that grazing could achieve timely removal prior to seed set.

Biological: Two species of moth have been released for the control of Russian thistle in the U.S., but they have not been an effective treatment.

4.7.16 Tamarisk Species (*Tamarix* spp.)

Tamarisk, or saltcedar, is a group of shrubs and small trees native to Eurasia and Africa that have become invasive in parts of North America. This genus is well adapted to arid environments and is highly tolerant of saline soils, often thriving along rivers, streams, and wetlands. The plant produces feathery, scale-like foliage and small pink to white flowers that grow in dense clusters. Tamarisk is notorious for consuming large amounts of water and drying up wetland areas. It is well suited to surviving in arid areas due to its deep roots. However, its roots also absorb salts from deep soil layers. The salts then excreted through the plant's leaves. As the salty leaf litter falls to the ground, salts are subsequently deposited onto the soil surface, which then inhibits the recruitment, growth, and survival of native vegetation. Tamarisk's aggressive spread has made it a significant management concern for ecosystems in the western United States.

The most invasive tamarisk plants in California are likely hybrids between species and have developed a more aggressive reproduction strategy by generating many more seeds than the parent species. In addition to reproduction by seed, tamarisk can also reproduce vegetatively from root fragments.

Project Locations and Scale

There are no known occurrences of tamarisk on COSCA property, but the species has been observed within the larger plan area in ornamental landscapes.

Management Goal and Strategy

The management strategy for tamarisk is monitoring for early detection, and rapid response for treatment. The management goal is eradication from COSCA open space if found.

Methods

Common methods for controlling tamarisk are described below.

Preferred Alternatives

Manual: Only small seedlings can be hand pulled. Once plants are larger their roots become too large to completely remove. Remaining root fragments can generate new plants. As such, manual removal is likely to only temporarily reduce the extent of the infestation rather than eradicate it.

Chemical: If tamarisk is found on COSCA property and it is too large to manually remove, chemical treatments will be applied. Tamarisk plants taller than ten feet in height will be cut close to the ground and a triclopyr-based herbicide will be applied to the remaining stump. For plants between four to ten feet tall, a basal bark application of a triclopyr-based herbicide will be applied to the lower 12-15 inches of the trunk. Plants smaller than four feet in height will be treated with a foliar application of triclopyr mixed with aminopyralid.

Alternatives Not Chosen

Mechanical: Mowing, chopping, chaining, and disking can be used to reduce biomass density temporarily, but do not eradicate the plants. However, when these methods are combined with chemical treatment, successful control of tamarisk can be achieved. These methods are more appropriate for large infestations but create a significant amount of disturbance. If tamarisk is discovered on COSCA property, it is more likely to be single plants or a very small infestation.

Cultural: Burning is not a successful strategy as tamarisk resprouts rapidly. There is little nutrient value in tamarisk for grazing, although goats, cattle, and sheep will consume it if no other feed source is available. This may reduce seed production but does not kill the plants.

Biological: The saltcedar leaf beetle has made a significant impact on tamarisk populations in some areas of the southwestern United States. The insect defoliates tamarisk trees by feeding on the leaves. Multiple years of defoliation by the beetle can reduce tamarisk populations by approximately 60%. The best success has been achieved outside of California, but releases of related beetles better suited to California's climate have improved control.

4.7.17 Puncture Vine (*Tribulus terrestris*)

Puncture vine is a low-growing annual plant that often spreads across dry, sandy, or disturbed soils. It produces small yellow flowers and hard, spiny seeds, commonly called “goatheads” due to their shape, that can easily penetrate animal feet, shoes, or tires. During the early 1900s, its spiny seeds easily punctured early car tires, giving rise to the name “puncture vine.” Native to warm regions of Europe, Asia, and Africa, it has become invasive in many parts of the world, particularly in arid and semi-arid environments and has been listed as a Noxious Weed in several western US states. While this species is not currently threatening the ecology of COSCA open space, it is included in the priority 1 group because it degrades recreational experiences on open space trails due to bicycle tire punctures and dog paw injuries.

Project Locations and Scale

Puncture vine is most prevalent in disturbed areas adjacent to roadways and within disturbed utility corridors within the plan area, but no known populations have been observed on COSCA open space. There is a population in Hill Canyon, however, at the Santa Rosa Valley Park that has the potential to spread toward COSCA-managed property to the south.

Management Goal and Strategy

The management strategy for puncture vine is monitoring for early detection, and rapid response for treatment. The management goal is prevention or eradication from COSCA open space if found.

Methods

Common methods for controlling puncture vine are described below. This plan recommends manual removal methods in the event this species is observed on COSCA property.

Preferred Alternative

Manual: Hand pulling is feasible for small populations when the soil is moist. Pulling will be done prior to the fruiting stage. Alternatively, hoeing with shallow tilling less than 1-inch deep is a successful strategy. COSCA intends to use manual methods as the primary treatment. In treated areas, seeds remaining on the surface will be collected by rolling carpet over the ground to pick up seeds. Prevention of resprouts can be achieved by applying a thick much layer and planting competitive native vegetation.

Alternatives Not Chosen

Mechanical: Mowing is not a successful method because the plants grow close to the ground and produce seed below the level of a mower blade. Tillage is ineffective as it can bury existing seeds deeper into the soil.

Cultural: Puncture vine is poisonous to livestock, so grazing is not a viable option. The low growth also makes this species less vulnerable to damage by fire.

Chemical: A wide array of herbicides are effective for managing puncture vine. However, many of these are pre-emergents which may cause impacts to seed from desirable species. While a dilute foliar application of glyphosate-based herbicide is a common post-emergent treatment, it does not address the spiny seeds.

Biological: Two species of weevil were released as biocontrols in 1961. These have been effective in limiting the expanse of puncture vine, but not eradication.

4.7.18 Mexican Fan Palm (*Washingtonia robusta*)

Mexican fan palm is a tall, slender palm native to northwestern Mexico, widely planted as an ornamental tree in warm climates around the world. It can reach heights of up to 100 feet, featuring a narrow trunk that can commonly be covered with the bases of old frond stems and crowned by a dense canopy of large, fan-shaped, deeply lobed leaves. This palm is drought-tolerant and is often used in landscaping for streets, parks, and gardens, especially in Mediterranean and desert regions. Mexican fan palm can naturalize in some areas, spreading by seed and occasionally competing with native vegetation in riparian habitats. This palm also poses a fire hazard if dead fronds and the bases of frond stems are not removed from the trunk as the tree grows. Such accumulations create “skirts” or “beards” as they hang down around the trunk, creating a “fuel ladder” that can help fire climb from the ground into the canopy. Burning fronds from unmaintained palms can also dislodge during wildfires and constitute a threat if carried by wind toward nearby developed areas.

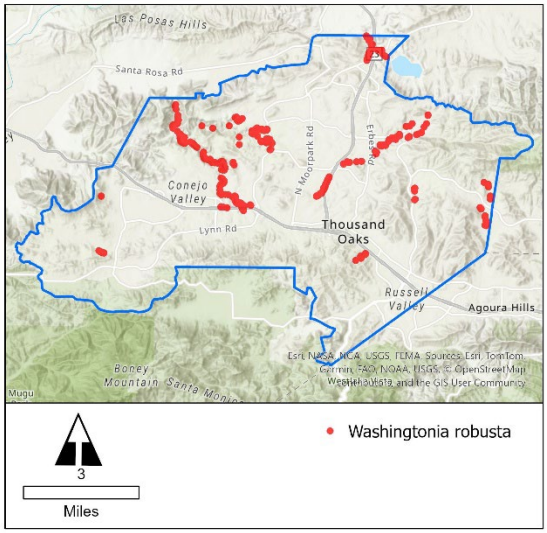
Treatment History

Beginning in 2021, COSCA initiated an effort to control Mexican fan palms in a 1.8-mile section of Arroyo Conejo Creek as there are a significant number if palms in this area. At that time, the cost for removing large mature trees fell outside of the project budget. In response, the scale of the project was reduced and focused on removing palms ten feet and under in height. Palms smaller than four feet in height were treated with a dilute foliar application of

aquatic-approved glyphosate, while trees between four and ten feet where cut at the trunk base and manually removed. The remaining palms not addressed by the 2021 project are planned for future removal.

Project Locations and Scale

Over 700 Mexican fan palms have been mapped using aerial imagery throughout the plan area. They primarily occur along riparian corridors. It is anticipated that many additional smaller palms that were not detectable in aerial images are present in these areas.



Management Goal and Strategy

The management goal for Mexican fan palms is eradication from COSCA open space. Preventing re-infestation will require annual monitoring as many palms still exist within residential areas near open space. The management strategy may include a public outreach component to inform the community about the ecological and fire risks associated with this species to encourage removal of palms on private properties.

Methods

Treatment of Mexican fan palm will be based on plant height and location and will consist of manual or chemical methods. Plant height is a consideration as it governs the accessibility of the apical meristem tissue, which is the single point from which a palm grows. Height is also a consideration regarding wildlife as there are a variety of avian and bat species that may use mature palms for shelter and nesting. Location in proximity to homes and community infrastructure, such as electrical lines and drainage facilities, also influences treatment strategies.

Three size classes are identified for the purpose of assigning treatment methods. Seedlings refer to palms that are under one foot in height. Small trees are between one and 14 feet in height. Mature trees are above 14 feet in height.

Preferred Alternatives

Manual: Where soil conditions permit, seedlings will be hand-pulled or removed with common landscaping tools. This is likely only possible in sandy or saturated soil as firmer soils typically prevent complete extraction of the plant, including the meristematic portion. Small trees between two and 14 feet will be cut at the base of the trunk with a chainsaw. The cut plant will be left to decompose onsite if in an upland area and outside of a fuel

modification zone. Otherwise, it will be moved to an appropriate location outside the fuel modification zone. If in a riparian corridor, the cut plant will be moved away from any active waterway to prevent mobilization during high flow events.

Mature trees that are within 100 feet of homes and infrastructure will be cut at the base of the trunk and removed from the site per the following: crowns and bearded/skirted trunk sections will be left onsite overnight so that any wildlife species utilizing the fronds can escape before the biomass is hauled away for disposal. The trunks of felled trees will be cut into sections and left onsite for several weeks to dry out prior to removal to make handling and loading easier.

Chemical: Where manual removal is not feasible, seedlings and small trees between one and two feet in height will be treated with a spot spray of diluted aquatic-approved triclopyr or glyphosate to the tissue at the base of the frond stems where the apical tissue is located. This approach reduces the amount of herbicide necessary in comparison to a foliar application and prevents damage to non-target adjacent plants. Mature trees located 100 feet or more from homes and / or public infrastructure will be treated with a direct injection of glyphosate into the trunk. The dead tree will be left in place to naturally decompose.

Alternatives Not Chosen

Mechanical: Mowing, mastication, tillage, or excavation are infeasible for this species due to the variability of plant heights, the fibrous nature of the trunk, and the impacts that would be caused by the associated machinery.

Cultural: Grazing and fire are not appropriate strategies for controlling palms.

Biological: There is no introduced biocontrol for Mexican fan palms. However, the invasive South American palm weevil, which has killed thousands of Canary Island date palms in San Diego County, can kill Mexican fan palms. The weevil has not spread north of San Diego County at present, and Mexican fan palm is not their preferred host.

4.8 Treatment Strategies for Priority 2 Species

This section describes strategies for Priority 2 species and focuses on treatment methods for selected species that may be opportunistically addressed in planned weed management efforts for Priority 1 species or other weed management activities.

4.8.1 Bladder Vine (*Araujia sericifera*)

Bladder vine, sometimes also called bladder flower, is a fast-growing perennial vine native to South America. It produces twining stems with milky sap and forms dense tangles that can smother trees, shrubs, and other vegetation. The plant bears pale, tubular flowers followed by large, balloon-like seed pods that split open to release wind-dispersed seeds. Known for its invasive tendencies in Mediterranean-type climates, it poses a threat to native habitats and ornamental landscapes.

Young plants and seedlings can be pulled by hand, but gloves will be used due to the irritating milky sap. Mature vines can be cut at ground level. If the remaining root crown is not large, it can be dug out to prevent resprouting. Otherwise, a glyphosate or triclopyr-based herbicide can be immediately applied to the remaining stump to kill the root system. All seed pods will be collected and destroyed before they split to limit seed spread. Because seeds remain viable and disperse widely by wind, monitoring for several years is essential to remove any new seedlings.

4.8.2 Tocalote (*Centaurea melitensis*)

Tocalote or Maltese star thistle, is an annual herb native to the Mediterranean region and invasive in parts of the western United States. It is closely related to yellow star thistle, a Priority 1 species in this plan. Tocalote has spiny, yellow flower heads and narrow, lobed leaves that form a rosette in the plant's early growth stages. The plant thrives in disturbed areas, along roadsides, and in grasslands, where it competes aggressively with native vegetation. Its spines make it a nuisance for recreation and land management.

Tocalote is distributed throughout the open space system and eradication is likely not possible. The management strategy for this species is containment. This would occur by removing individual plants concurrently with the treatment of Priority 1 species or as part of other weed management activities where this species would be replaced by competitive native plants and weed control occurs as a component of the project. While this species can be managed with repeated pulling and cutting over multiple years to prevent seeding, chemical control is also commonly used. In the near term, COSCA intends to use manual removal methods if this species is encountered during the management of Priority 1 species.

4.8.3 Poison Hemlock (*Conium maculatum*)

Poison hemlock is a biennial herb native to Europe and is now widespread across North America and other regions. It typically grows in disturbed sites, along roadsides, riverbanks, and waste areas, often forming dense stands. The plant has smooth, hollow stems marked with distinctive purple blotches, finely divided fern-like leaves, and clusters of small white flowers arranged in umbrella-shaped heads. All parts of the plant contain potent alkaloids that are toxic if ingested. Its ability to create monocultures makes it a concern for ecological health. The plant spreads by seed only and most seeds fall near the parent plant, although some distribution also occurs by birds or water.

The management goal for poison hemlock is eradication. The primary strategy is to prevent the plant from generating seeds through manual or mechanical treatment. This effectively interrupts the reproduction cycle and depletes the seed bank in the soil within treatment areas. Approximately three years of treatment is needed to exhaust the seed bank. The removal method will be determined based upon site conditions and accessibility and may also include foliar application of a dilute mixture of aquatic-approved glyphosate if necessary.

4.8.4 Rattail Fescue (*Festuca myuros*)

Rattail fescue is an annual grass native to Europe and Asia that has become widespread in many temperate regions. It grows in dense clumps with slender stems and narrow leaves. The plant produces long, bristly seed heads that give it a distinctive tail-like appearance. Rattail fescue is considered invasive in disturbed areas, rangelands, and roadsides, where it competes with native plants. This species occurs in non-native grasslands on COSCA properties.

The management goal for this species is containment and replacement with appropriate native grass species when opportunities arise in coincidence with other weed management activities. Common management practices include mowing or grazing prior to seed set over several seasons and seeding with native grass species. Limiting soil disturbance in open space can help reduce the incidence of most species of invasive annual grasses.

4.8.5 Italian Ryegrass (*Lolium multiflorum*)

Italian ryegrass is a fast-growing annual or short-lived perennial grass native to Europe. It is widely cultivated as a forage crop and cover crop because of its rapid establishment and high-quality feed for livestock. The plant has glossy, bright green leaves and produces dense seed heads that allow it to spread easily. While valuable in agriculture, it can become invasive in disturbed areas and compete with native grasses.

The management goal for this species is containment and replacement with appropriate native grass species when opportunities arise. This species forms a dense thatch of dead material over time, so removing thatch is necessary at the outset of management actions. Thatch can be removed mechanically and through herbivory. Common management practices include mowing prior to seed set over several seasons and seeding with native grass species. Limiting soil disturbance in open space can help reduce the incidence of most species of invasive annual grasses.

4.8.6 Crown Daisy (*Glebionis coronaria*)

Crown daisy or garland chrysanthemum is an annual plant in the daisy family native to the Mediterranean region. It produces bright yellow to yellow-and-white flower heads that are both ornamental and attractive to pollinators. While cultivated as a leafy vegetable in Asian cuisine, it has escaped cultivation in some regions and can become invasive, spreading rapidly in disturbed sites and competing with native vegetation. The plant thrives in sunny locations with well-drained soil, making it successful both in gardens and as a colonizer in naturalized areas. There are no known populations on COSCA property, but this species is found within 2.5 miles of open space areas.

The management strategy for crown daisy is early detection, containment and replacement with native species. Common management practices include hand pulling and mowing prior to seed set over several seasons and seeding with native grass species. Limiting soil disturbance in open space can help reduce the spread of this species.

4.8.7 Oleander (*Nerium oleander*)

Oleander is an evergreen shrub native to the Mediterranean region that is widely planted as an ornamental for its showy flowers and tolerance to heat, drought, and poor soils. It is toxic to humans and animals, with all plant parts containing potent cardiac glycosides. Outside cultivation, oleander can escape into riparian areas, disturbed sites, and coastal habitats, where it forms dense stands that displace native vegetation and reduce wildlife habitat. Its hardiness and prolific seed production make it a potentially invasive species in regions with warm climates. Oleander plants have been observed in the Arroyo Conejo and Wildwood open spaces. They occur in riparian areas where sufficient moisture is available.

The management goal for oleander is eradication from known locations. Cutting the plant with immediate application of a glyphosate-based herbicide to the remaining stump, followed by regular monitoring and removal of seedlings, is the most reliable long-term management strategy. The herbicide will be aquatic approved if the plants are growing in riparian areas.

4.8.8 Tree Tobacco (*Nicotiana glauca*)

Tree tobacco is a fast-growing, spindly shrub or small tree native to South America, now widely naturalized and considered invasive in parts of California and the southwestern United States. It features thick, bluish-green leaves and tubular yellow flowers that bloom year-round. All parts of the plant are toxic due to high levels of anabasine and nicotine, posing risks to humans and livestock. Tree tobacco thrives in disturbed areas like roadsides as well as riparian zones, where it can outcompete native vegetation and form dense stands. This species is most prevalent in the Lang Ranch, Conejo Canyons, and Wildwood open space areas.

The management goal for tree tobacco is population reduction and containment. In the case of tree tobacco, specific removal projects will be undertaken in addition to removal while treating Priority 1 species. Removal of small to medium sized plants will be undertaken by manual pulling or use of a weed wrench. Larger plants will be cut at ground level and glyphosate-based herbicide will be applied to the remaining stump. The herbicide will be aquatic approved if the plants are growing in riparian areas.

4.8.9 Fountain Grass (*Pennisetum setaceum*)

Fountain grass is a fast-growing, clump-forming perennial bunchgrass native to North Africa and the Middle East. It thrives in hot, dry climates and disturbed areas. In many regions including parts of the southwestern United States, it has become an aggressive invasive species. Fountain grass spreads rapidly by wind-dispersed seeds and can rapidly form monocultures that displace native vegetation and alter natural ecosystems. Its dense growth also increases fire risk, making it a significant concern for land management and conservation efforts.

This species is also commonly used as ornamental grass in residential and commercial landscaping throughout the plan area, so there is an abundant supply of seeds to reinfest treated areas. Known locations in open space are in the Dos Vientos, Vallecito, Conejo Canyons, Wildwood, and North Ranch open space areas.

The management goal for fountain grass is containment of current populations to prevent further spread into the interior portions of open space. For treatment, priority will be given to occurrences located in interior open space areas and strategically important perimeter areas. Scattered, small individual plants will be hand pulled, and the area monitored for resprouts and/or new seedlings. Larger stands will be treated by first string trimming low to the ground and then applying a foliar application of a glyphosate-based herbicide. When feasible during trimming activities, seed heads will be collected and removal to an appropriate location for disposal.

4.8.10 Harding Grass (*Phalaris aquatica*)

Harding grass is a robust perennial bunchgrass native to the Mediterranean region. It is widely planted as a forage crop because of its rapid growth, high productivity, and tolerance to drought and poor soils. It can escape cultivation and become invasive, forming dense stands that displace native plants and alter fire regimes. The grass reproduces both by seed and vegetative growth, making long-term management and control challenging once established. This species has been observed in the Rancho Potrero, Lang Ranch, Los Robles, and Arroyo Conejo open space areas. Most occurrences consist of scattered individual plants.

Scattered, small individual plants will be hand pulled, and the area monitored for resprouts and/or new seedlings. Larger stands will be treated by first

string trimming low to the ground and then applying a foliar application of a glyphosate-based herbicide. When feasible during trimming activities, seed heads will be collected and disposed to reduce further deposition to the seed bank.

4.8.11 Canary Island Date Palm (*Phoenix canariensis*)

Canary Island date palm or phoenix palm is a large, long-lived palm native to the Canary Islands and widely planted as an ornamental for its stately appearance. It features a thick trunk topped with a dense crown of long, arching fronds, and can grow over 60 feet tall. While valued in landscapes, it can escape cultivation in some regions, spreading into riparian areas and coastal habitats where it competes with native vegetation. Its size and prolific seed production makes it difficult to remove once established outside of managed settings. There are scattered occurrences of this species in the Arroyo Conejo and Wildwood open space areas. It prefers growing conditions similar to those of Mexican fan palm.

The management goal for this species is eradication, which will be undertaken in coordination with Mexican fan palm removal, utilizing the same methodologies. While the South American palm weevil has killed thousands of Canary Island date palms in San Diego County, the non-native invasive weevil has not yet become established in Ventura County.

4.8.12 Peruvian and Brazilian Pepper Trees (*Schinus molle and S. terebinthifolia*)

Peruvian and Brazilian pepper trees are fast-growing, evergreen trees native to the arid regions of South America and widely naturalized in California and other warm climates. Peruvian pepper trees feature drooping branches with narrow bright green leaves, while Brazilian pepper trees have upright branches with somewhat wider, dark green leaves. Both species have creamy-yellow flowers when blooming and pink to red pepper berries. Both species are drought tolerant, with Peruvian pepper trees being more so, and both are commonly found in residential landscaping near open space. The trees are mildly invasive in parts of California, where they can outcompete native vegetation and disrupt local ecosystems. These species are scattered throughout the open space system but have not formed large monocultural stands on COSCA property.

The management strategy for this species is containment by removing individual trees concurrently with the treatment of Priority 1 species or as opportunities arise. Eradication is unlikely as neighboring developed areas are a seed source. Seedlings and small trees will be removed by hand or with tools such as a weed wrench. Mature trees will be treated using direct injection of concentrated triclopyr into the trunk of the tree. Once trees are dead, they will be cut down and removed from open space and the area will be monitored for seedlings.

4.8.13 Milk Thistle (*Silybum marianum*)

Milk thistle is a robust, spiny biennial herb native to the Mediterranean region. It is easily identified by its striking purple flower heads and glossy green leaves marked with distinctive white veins. The plant readily colonizes in disturbed areas, roadsides, and post-fire landscapes, where it can become invasive and outcompete native vegetation. This species is most common in the Conejo Canyons open space, particularly in Hill Canyon. It is also found in the Lang Ranch open space area.

The management strategy for this species is containment with eventual eradication. Treatment would occur concurrently with the treatment of Priority 1 species or as opportunities arise to replace this species with competitive native plants. The primary management method will be cutting the plant stem below the soil surface with hand tools or cutting the plants with string trimmers prior to flowering. A secondary approach will be to clip and bag flower heads before seed is mature. Mowing and trimming require multiple treatments throughout the season.

4.8.14 Other Mustards (*Sisymbrium* species)

The *Sisymbrium* genus includes a set of similar species known under common names including London rocket and hedge mustard. These annual mustards are native to Eurasia and have spread widely in disturbed areas worldwide. These species grow quickly in winter and spring, producing tall, branching stems with small yellow flowers. The plant thrives in roadsides, fields, and post-fire landscapes, where it can form dense stands that out-compete native species. Its abundant seed production and ability to colonize disturbed soils make it a troublesome invasive weed in many regions. Mustards in this genus are found in the Los Robles and Los Padres open space areas.

The management strategy for these mustards is to prevent expansion into native plant communities when opportunities arise to replace the species with competitive native

species. Treatment would occur using manual (hand pulling) and possibly mechanical (mowing) methods

4.8.15 Periwinkle (*Vinca major*)

Periwinkle is a trailing evergreen groundcover native to the Mediterranean region. It produces glossy, dark green leaves and showy violet-blue flowers, making it a popular ornamental plant. Outside of cultivation, it often spreads aggressively in riparian areas, woodlands, and shaded habitats, where it forms dense mats that suppress native vegetation. Its vigorous growth and ability to root at stem nodes make it difficult to control once established in natural areas. There are isolated occurrences of this species in the Wildwood open space area.

The management strategy for periwinkle is an opportunistic replacement with native species on sites coincident with treatment of Priority 1 species or grassland management projects. Treatment would occur using manual methods, such as hand pulling.

4.9 Treatment Strategies for Priority 3 Species

Priority 3 species are generally widespread on COSCA property and throughout southern California (except for edible fig). Due to the scale of regional infestations, eradication of these species is not a realistic goal and COSCA is not proposing projects based solely on the presence of any one of these species. As these species do have the ability to outcompete native vegetation and are threats to habitat continuity, the primary goal for Priority 3 species is impact reduction by replacing these species with competitive native species where opportunities exist. These species will be treated opportunistically as part of control efforts on Priority 1 species or as part of other weed management activities such as habitat restoration projects. All these species are most likely to be found in grassland vegetation communities. When encountered, it is anticipated that these species will be manually, mechanically, or culturally (prescribed grazing) removed unless conditions arise that warrant spot application of herbicide onto solitary plants. No broadcast spraying of herbicide is considered under this plan.

4.9.1 Onion Weed (*Asphodelus fistulosus*)

Onionweed or hollow-stem asphodel, is a perennial herb native to the Mediterranean region. It has slender, rush-like leaves and produces numerous star-shaped white to pinkish flowers marked with darker midveins. The plant spreads easily by seed and can form dense stands in grasslands and disturbed sites. Due to these characteristics, it is considered an invasive weed in many regions as it readily displaces native vegetation.

4.9.2 Wild Oats (*Avena* spp.)

Avena species, commonly known as wild oats, are annual grasses native to the Mediterranean region and now widespread in many parts of the world. They produce tall, slender stems with nodding seed heads that disperse readily, allowing the species to colonize open and disturbed areas. Wild oats species are highly competitive, often forming dense stands that reduce the abundance of native grasses and forbs. Because of its prolific seed production and adaptability to varied soils, wild oats are considered an invasive weed in rangelands and natural habitats.

4.9.3 Black Mustard (*Brassica nigra*)

Black mustard is an annual plant native to Eurasia that has become widespread in many regions, including North America. It grows rapidly, producing tall, upright stems with small yellow flowers, and has deeply lobed, dark green leaves The plant often forms dense stands in disturbed areas, grasslands, and along roadsides. Its robust growth enables it to outcompete native vegetation. Its tendency to increase fire risk and spread aggressively makes it a significant invasive species in many ecosystems.

4.9.4 Ripgut Brome (*Bromus diandrus*)

Ripgut brome is an annual grass native to the Mediterranean region that has spread widely in disturbed areas and rangelands throughout North America. It produces tall, coarse stems with large, finely barbed seed heads that can injure livestock and wildlife. The species grows rapidly in the cool season and often forms dense stands that crowd out native plants. Because of its sharp, penetrating seeds and high fuel load, it is a problematic invasive species and a contributor to increased fire risk.

4.9.5 Foxtail Brome (*Bromus madritensis*)

Foxtail brome is a winter annual grass native to the Mediterranean region. It produces slender stems and seed heads are clustered toward the top of each stem. This species often invades deserts, grasslands, and disturbed areas, where it forms dense stands that compete with native plants. Its dry biomass greatly increases wildfire risk, making it a serious invasive weed in arid and semi-arid ecosystems.

4.9.6 Redstem Filaree (*Erodium cicutarium*)

Redstem filaree or storksbill, is a low-growing annual or biennial herb native to the Mediterranean region. It produces finely divided leaves and small pink to purple flowers, followed by distinctive corkscrew-like seedpods. The plant is widespread in disturbed areas, grasslands, and rangelands, where it can form dense carpets that compete with native vegetation. Although considered invasive, it is also grazed by livestock and wildlife, which has contributed to its persistence across many regions.

4.9.7 Edible Fig (*Ficus carica*)

Edible fig is a deciduous tree native to Mediterranean regions and western Asia and widely cultivated for its fruit. It produces large, lobed leaves and small, inconspicuous flowers that are enclosed within the fruit. As the fruit is appealing to wildlife, it easily escapes cultivation and often becomes established in riparian zones. Its ability to grow in a variety of soils and produce abundant seeds makes this species invasive when it encounters suitable climates and conditions.

4.9.8 Bristly Ox Tongue (*Helminthotheca echioides*)

Bristly ox tongue is an annual or biennial herb in the sunflower family native to Europe and North Africa. It is characterized by its rough, bristly leaves with prominent blister-like pimples, stems that are sometimes reddish in color, and yellow, dandelion-like flowers. Bristly ox tongue grows in disturbed areas, roadsides, and grasslands, thriving in dry, nutrient-poor soils. Due to its abundant seed production, it can spread aggressively and readily competes with native vegetation.

4.9.9 Shortpod Mustard (*Hirschfeldia incana*)

Shortpod mustard is a perennial herb in the mustard family native to the Mediterranean region. It has a rounded form, produces clusters of small, bright yellow flowers on its many-branched stems, and has moderately lobed, dark green leaves. The plant is well adapted to disturbed sites, roadsides, and grasslands, where it can persist year-round. Its ability to produce large numbers of seeds allows it to spread quickly and outcompete native vegetation in a variety of habitat types.

4.9.10 Prickly Lettuce (*Lactuca serrioloa*)

Prickly lettuce is an annual or biennial herb in the sunflower family native to Eurasia and North Africa and widely distributed in California. It has spiny stems and leaves and is the wild form of cultivated lettuce. The plant produces small yellow flower heads in summer, which produce wind-dispersed seeds that allow it to colonize disturbed areas rapidly. It is considered an invasive weed in many regions and competes with native plants in a variety of habitat types.

4.9.11 Goldentop Grass (*Lamarckia aurea*)

Goldentop grass is a small annual grass native to the Mediterranean region but widely naturalized in California. It typically grows in dense clumps and produces golden, brushy seed heads that give the plant a distinctive appearance. This species thrives in disturbed soils, roadsides, and open grasslands, often spreading quickly in the spring. In some areas it is considered invasive, as it can displace native annuals and alter the composition of sensitive habitats.

4.9.12 Cheeseweed Species (*Malva spp.*)

Malva species, commonly known as mallows, are annual or perennial herbs that are widespread across California and thrive in disturbed soils. They are easily recognized by their rounded, lobed leaves and pink to purple flowers with distinctive darker veins. Many species produce flat, disk-shaped seed pods that resemble small “cheese wheels.” Several *Malva* species are invasive weeds, as they can form dense stands that compete with native plants in a variety of habitat types.

4.9.13 Wild Radish (*Raphanus sativus*)

Wild radish is an annual or biennial herb that has escaped cultivation and naturalized widely in California. It is characterized by rough, bristly stems, deeply lobed leaves, and showy four-petaled flowers that range in color from white to pink or purple with darker veins. The plant produces elongated seed pods and reproduces readily in disturbed sites, roadsides, and grasslands. The species can be invasive, forming dense stands that outcompete native vegetation.

4.9.14 Smilo Grass (*Stipa miliacea*)

Smilo grass is a clumping perennial grass native to Eurasia. It thrives in dry or moist locations in disturbed areas, along roadsides, ditches, and riparian areas generally in coastal or foothill areas. It produces long, erect stems that bear many clusters of seeds. Smilo grass can form dense stands that compete with native plant species, and its dry biomass increases fuel loads in riparian areas. Both characteristics make it a problematic invasive species in native ecosystems.

5.0 Environmental Concerns and Safety

All invasive weed control methods influence the biotic and abiotic components of an ecosystem. These include the manual, mechanical, cultural, biological and chemical methods presented in this plan. While it is possible to minimize these risks, it is important to recognize that all invasive weed control methods may pose some level of risk to the environment, as well as the health of wildlife and people. COSCA's goal is to seek the best balance between protection of the environment and effectiveness of the control method to attain the planned outcome. This goal is weighed against the alternative of doing nothing, which will perpetuate and expand the damage to native plant communities.

The sections below describe the potential impacts of varying treatment approaches and offer general recommendations for mitigating potential impacts. More specific best management practices are found in the following chapter.

5.1 Potential Impacts of Manual Plant Removal

Manual removal of invasive plants is often seen as the least environmentally impactful method as it avoids large scale site disturbance and use of herbicides. However, manual removal still has potential impacts that center on soil disturbance, increased human presence at a project site, possible injuries, and possible wildlife disturbance.

Soil disturbance around removed plants can provide an ideal opportunity for the re-establishment of seedlings or recruitment of new invasive species. Because hand removal often includes having more people, such as volunteers and workers, present of the site, this can result in the trampling of other vegetation, further soil disturbance, soil compaction, and disturbance of wildlife. For many species, manual removal may be less effective than alternative methods as it can require multiple rounds of treatment that can cause greater impact over time. Other possible hazards that may be encountered with manual removal include injuries to workers, exposure to toxic plant species, and exposure to wildlife such as venomous snakes and insects. In most cases, human presence on a site will exclude interactions with wildlife.

Most of these potential impacts can be reduced by having workers wear proper personal protective equipment (PPE), providing training in the avoidance of toxic plants and venomous wildlife, pre-project surveys to identify any potential risks to wildlife, avoiding work during wildlife breeding and nesting seasons, limiting work crew size, and scheduling work to avoid conditions that can lead to further site damage such as wet soils or extreme heat.

5.2 Potential Impacts of Mechanical Plant Removal

Heavy equipment, such as tractors and backhoes which may be used for mechanical plant removal methods, can cause extensive soil disturbance and alter soil structure through compaction. Soil disturbance can result in damage to existing native vegetation on a site and create ideal conditions for the recruitment of other invasive species. Large scale soil disturbance may also contribute to soil erosion. Use of heavy equipment may also present a risk to wildlife species if they are unable to get out of the path of oncoming equipment quickly enough. Tilling soil has the potential to alter soil structure and impact soil health. The use of power hand tools, such as chainsaws or bladed brush cutters, can also present safety risks for operators if not used properly. This equipment also has the potential to generate sparks if chains or blades contact rocks, which can be dangerous in areas near dry grass or brush due to the potential for sparks to ignite such vegetation.

Risks presented by heavy equipment and powered hand tools can be mitigated by scheduling the work to avoid wildlife nesting or breeding seasons, stabilizing disturbed soils to prevent erosion, continuing monitoring of weed regrowth or recruitment, and installing competitive native vegetation. Risks associated with handheld power tools can be mitigated when workers wear appropriate PPE and complete training on the use and safety of relevant tools.

As with heavy equipment, tillage can damage soil structure, alter soil biology by reducing essential soil bacteria and fungi, leave soil vulnerable to wind and water erosion, impact air quality (dust/particulates), and leave land vulnerable to invasive plant recruitment. Furthermore, tillage can bury weed seeds deeper in the soil and prolong management

efforts. Where invasive species reproduce from rhizomes, soil tillage can stimulate regrowth and expansion of invasive plant populations.

Impacts from tillage and cultivation can be mitigated by scheduling the work to avoid nesting or breeding seasons of wildlife, scheduling for soil moisture optimization, stabilizing disturbed soils to prevent erosion, continuing monitoring of weed regrowth or recruitment, and installing competitive native vegetation. This plan does not anticipate the use of tillage or cultivation because the impacts would likely exceed the benefits based on current invasive species distributions and site conditions.

Mowing is a popular strategy for addressing weeds along roadsides and recreational areas and is less impactful than heavy equipment and tillage because soil is generally not disturbed. However, mowing also has the potential to increase the release of particulate matter, including dust, as well as engine exhaust into the air and during mowing operations. Mowing may also be a fire hazard in dry conditions if blades strike rocks and create sparks. It can also impact insect populations by destroying beneficial plants, and if not properly timed, it can favor certain invasive plant species. Lastly, as with mechanical removal and tillage, mowing has the potential to disturb or injure wildlife, including ground-nesting birds.

Mowing impacts can be mitigated by scheduling the work when plants are not in bloom and thereby attracting insects, when sparks are not likely to ignite dry vegetation, and prior to invasive species going to seed. It can also be scheduled outside the bird nesting season unless bird surveys have been undertaken and the work is being actively monitored by a biologist skilled in avian species.

5.3 Potential Impacts of Cultural Plant Removal

Cultural weed management methods primarily include livestock grazing and prescribed fire but may also include the sowing or broadcasting of native seeds onto treated areas. Grazing as a weed management method can have both positive and negative environmental impacts. Properly managed grazing can reduce invasive plant cover, limit seed production, and promote the recovery of native vegetation by creating space and reducing competition. It also recycles nutrients through manure and can help maintain open habitats that benefit certain wildlife species. Alternatively, poorly managed grazing may lead to soil compaction, erosion, loss of native plant diversity, introduction of weed seeds through animal movement, and degradation of riparian areas if livestock congregate near water sources. Grazing impacts can be mitigated through specific timing, appropriate intensity (the number and species of animals) and duration of the grazing activity.

Prescribed fire as a weed management method can produce a range of environmental impacts. When carefully planned, fire can reduce seed banks of invasive species, stimulate germination of native plants adapted to fire, and restore natural disturbance regimes that support ecosystem health. It also recycles nutrients into the soil and can help control dense

vegetation that suppresses native growth. However, prescribed fire may promote fire-adapted invasive species, release large amounts of carbon and particulates into the air, cause short-term wildlife displacement, and increase erosion risks by temporarily removing protective vegetation cover. An often-overlooked impact is on small animals and insects that cannot escape the burn area. Impacts of prescribed burning can be mitigated through proper timing, working with local fire officials to plan and manage the action, implementing post-fire soil conservation practices, and confining prescribed fire to more remote areas away from urban areas. COSCA is not contemplating the use of prescribed fire as part of this Plan.

5.4 Potential Impacts of Biological Controls

Using biological controls to manage invasive non-native plant species is a complex endeavor that requires careful ecological assessment and long-term monitoring. Introducing natural enemies—such as insects, fungi, or pathogens—can offer sustainable suppression, but it carries the risk of unintended consequences, including harm to native species, biodiversity loss, disruption of existing ecosystems, or the introduced control agents becoming invasive themselves. As biological control does not achieve eradication and is also limited to the instances where agencies have approved such non-native insects for release to control the plant species included in this Plan, use of this method is not being contemplated.

5.5 Potential Impacts of Chemical Plant Removal

The potential risks of herbicide use have been documented in scientific literature and discussed in the press. For example, improper use of chemicals can lead to potential problems including spray or vapor drift, water contamination, toxicity to wildlife or humans, herbicide resistance in target species, as well as reduction in plant diversity. Managing impacts involves choosing the most appropriate product and application method, observing chemical application limits stated on the product labels, and implementing safeguards during the preparation and application process.

Spray or Vapor Drift

Several factors influence the movement of chemical sprays or vapors away from their intended target. These include the method of application, droplet size, wind speed, atmospheric stability, humidity, temperature, and the chemical and physical properties of the substances used. As wind speed increases, both the amount of material displaced and the distance it travels has the potential to increase. In addition, inversion conditions—when a layer of cool air is trapped beneath warmer air—limit vertical air mixing. Under these conditions, small droplets may remain suspended in the air column and drift into unintended areas even in light winds. Low humidity and high temperatures can accelerate evaporation, reduce droplet size and increase the potential for airborne movement as well.

Vapor drift occurs when a substance transitions from a liquid or solid into a gas. The potential for this depends on the volatility and formulation of the compound. Vapor drift is most likely under high temperatures and with more volatile chemical formulations, especially certain ester-based compounds, which are particularly susceptible to volatilization above 80°F.

The method and height of chemical application also affect drift behavior. Cut-stump applications involve applying the chemical directly to the face of a freshly cut stump using a wick or sponge applicator. This method is less likely to disperse products as they are not airborne at any stage. The direct injection method involves drilling holes into the plant and injecting herbicide using a syringe-type of device. This method is the least likely to impact non-target plants as the herbicide is contained within the target plant and thereby inaccessible to other plants and wildlife. With foliar applications however, the greater the height of the nozzle tip or "release point", the farther droplets must travel before reaching their target, increasing exposure to air currents. Nozzle settings, spray tank pressure, and droplet size all affect how far a droplet can travel in the wind. Adjusting nozzles to produce large droplet size as well as reducing tank pressure are effective ways of mitigating drift hazards. As such, nozzles will be calibrated for drop sizes appropriate for the site conditions. Biomass of target species will also be cut low to the ground prior to herbicide treatments to lower the release point of the herbicide. This will reduce both the volume of herbicide used and potential for drift. Additionally, applications will be conducted when wind is calm or minimal, humidity is high, and temperatures are relatively low to avoid the potential of volatilization and off-target drift.

Groundwater and Surface Water Contamination

Water contamination in natural resource areas often stems from point sources—discrete, identifiable locations where pollutants are introduced into the environment. Such contamination is typically characterized by high concentrations in localized areas and can pose significant risks to water quality and ecosystem health.

Water contamination of both ground and surface waters may occur from spills or leaks at chemical storage or handling sites, improper disposal of materials, or equipment rinsing in areas allowing chemical substances to enter streams, ditches, or other water bodies either directly or through runoff. This may happen unintentionally, such as if a spill occurs where chemicals are mixed or when rainfall carries residues from treated plants into adjacent surface waters, or when inadequate buffer zones fail to prevent spray from drifting into aquatic systems.

To reduce the risk of contamination of surface or ground waters, chemical application will not occur within 24 hours before and after a forecast rain event, spray application will not occur within 20 feet of a waterway, and appropriate best management practices will be used during chemical mixing, including the use of drip pans when chemicals are mixed and

loaded into application equipment. Spray equipment will also be properly calibrated and maintained to ensure optimum function and spill kits will be included in project equipment.

Herbicide Resistance

The development of chemical resistance in target species is more likely to occur when the same active ingredient, or substances with the same mode of action, are used repeatedly at the same location and not all target plants are systematically treated. Over time, this can lead to the establishment of plants that are resistant to treatment, thereby reducing treatment effectiveness. While resistance issues more commonly occur in settings where frequent chemical application occurs to large monocultures of plants, natural habitat areas may still face similar risks if herbicides are used repeatedly without variation. Under this Plan, only spot treatment of individual target plants would occur, and treated areas will be monitored for success. If a particular herbicide does not prove effective, another appropriate herbicide will be utilized to ensure success. Without surviving progeny, resistant strains cannot form.

Impacts on Plant Diversity

Consistent use of herbicide, especially broad-spectrum chemical or large-scale applications, can unintentionally favor species that are naturally more tolerant to the mode of action of a particular herbicide. Even selective treatments can affect non-target plants if not performed carefully, and repeated chemical use may lead to a decline in overall native plant diversity. Where feasible, and to maintain native plant diversity, an integrated management strategy will be employed; one that combines manual, mechanical, cultural, and chemical tools in a thoughtful and site-specific manner. Under this Plan, only spot treatment of individual target plants utilizing safe application practices will occur and treated areas will be monitored to ensure that native forbs and sensitive species are not inadvertently suppressed.

Toxicity

Chemical toxicity to humans and wildlife is a function of dosage and exposure, and these are determined by the product and quantity used, treatment location, timing, site conditions, and application methodologies. When not applied properly, herbicide treatments can pose health risks to humans and wildlife. The highest risk of exposure occurs during the preparation and application of herbicides, or when individuals enter treated areas before the chemical has dried. The most common routes of entry are through the skin (dermal) and respiratory system (inhalation). Eye exposure may also occur during mixing or application, particularly if splashes happen. Dermal exposure is often the result of cross-contamination, such as when contaminated gloves touch other parts of the body.

An individual's response to a chemical exposure can vary based on several factors, including the specific compound, the amount of exposure, the area of the body affected, and the rate at which the substance is processed and eliminated. Sensitivity to a given dose

is not uniform, and children and smaller individuals may be more susceptible to effects than adults. Common signs of low-level exposure may include skin or eye irritation, headache, or nausea. Higher level exposures may cause blurred vision, dizziness, heavy sweating, weakness, stomach pain, vomiting, and more serious health effects.

Exposure risks are minimized by following established safety procedures, observing label restrictions, and using appropriate personal protective equipment while working with chemical products. Exposure of the public to chemicals will be prevented through the temporary closure of areas being treated if applications are planned along public trail routes. Potential chemical application locations are generally not on public trail routes, so exposure of the public is not anticipated.

Wildlife may also be vulnerable to herbicide use under certain conditions. However, herbicides by design are formulated to affect the metabolic systems of plants. Plant metabolic pathways do not exist in humans or wildlife species. To minimize exposure of sensitive fauna to chemical applications, product use will not exceed allowable rates. Chemical application to plants species that wildlife may utilize as forage will not occur when animals are present. In cases where target plant species are utilized by pollinators, chemical products will not be applied to flowering portions of these species.

5.6 Herbicide Information

The range of herbicides available for use on infestations of invasive non-native plants is limited due to label restrictions regarding use in wildlands and near water. This Plan proposes using three from this group which have been selected for their proven efficacy in treating the plant species included herein. They were also selected for their safety to non-target species (plant and animal), low susceptibility to drift or vaporization, and low ability to contaminate groundwater or surface water. The use of herbicides can substantially increase mortality rates of persistent non-native invasive plants, which thereby reduces the need for prolonged maintenance periods which reduces environmental impacts. These herbicides are approved by the Environmental Protection Agency (EPA), are registered by the CA Department of Pesticide Regulation and are described below.

Aminopyralid

Aminopyralid is a selective systemic herbicide in the pyridine-carboxylic acid family, effective against invasive broadleaf weeds such as knapweeds, thistles, and starthistles that threaten grasslands and natural areas. As a synthetic auxin, it mimics plant growth hormones, disrupting cell division and translocation, which provides long-lasting control while leaving most grasses and monocots unharmed. Its long-lasting residual activity makes it especially valuable in wildlands where infestations are dense, and repeated treatments may be difficult due to access constraints.

Aminopyralid degrades primarily through microbial metabolism, with half-life ranging from 1–12 months, depending on site conditions. It is soluble in water and has moderate to high mobility with the ability to leach through soils. Aminopyralid is stable in water but breaks down quickly with sunlight with an estimated half-life of 0.6 days. It is practically non-toxic to mammals, birds, fish, insects, and aquatic invertebrate species. Due to its persistence in organic matter however, vegetation treated with aminopyralid will not be chipped for beneficial reuse.

When aminopyralid is carefully targeted, and damage to susceptible surrounding vegetation is avoided, it is a useful tool for reducing invasive broadleaf weeds and promoting the recovery of native grasses in wildland ecosystems.

Aminopyralid is identified for use on three species included in this plan: yellow star thistle, artichoke thistle, and Russian knapweed. Treatment would occur by spot application of diluted foliar spray. The scattered distribution and low occurrence rate of these species limit potential negative impacts due to the limited volume of herbicide that would be necessary for effective treatment and because treatment will not be concentrated in any single locations.

Glyphosate

Glyphosate is a non-selective, systemic herbicide used to control many invasive plant species. It works by inhibiting the synthesis of aromatic amino acids necessary in plant growth, effectively eliminating treated vegetation. If not applied carefully, glyphosate can cause non-target impacts due to its non-selectivity.

Glyphosate is strongly adsorbed to soil particles, which prevents it from leaching excessively or from being absorbed from the soil by non-target plants. It is degraded primarily by microbial metabolism in the soil, with a half-life averaging 60 days. In water, glyphosate is rapidly dissipated through adsorption to suspended and bottom sediments and has a half-life of 12 days to ten weeks depending on water properties. Glyphosate is of relatively low toxicity to birds, mammals, and fish.

Glyphosate is used in natural areas because of its effectiveness on a wide range of plant species. Its low soil residual activity, and relatively low toxicity to animals make it a practical tool for habitat restoration projects in a variety of native plant communities.

Glyphosate is identified for use on several species included in this Plan: bladder vine, giant reed, Pampas grass, cape ivy, perennial veldt grass, carnation spurge, perennial pepperweed, tree tobacco, fountain grass, Harding grass, and palms. For the species in this group that occur in riparian areas, an aquatic-approved formulation of glyphosate will be used. As glyphosate is non-selective, application will consist of targeted methods that limit impacts to surrounding desirable vegetation such as daubing or direct injection. In cases

where vegetation will be treated by foliar spray, target plants will be trimmed first to reduce the amount of surface area to be treated.

Triclopyr

Triclopyr is a selective systemic herbicide in the pyridine-carboxylic acid family widely used for controlling invasive woody plants and broadleaf weeds in rangelands, forests, grasslands, and natural areas. It has little to no effect on grass species. It mimics the plant hormone auxin, leading to uncontrolled growth and plant death. Two formulations, salt and ester, allow for use in foliar sprays, cut-stump, basal bark, and soil treatments, making it versatile for wildland invasive plant management.

Triclopyr degrades primarily through microbial metabolism, with an average soil half-life of 30 days. Offsite movement through surface or subsurface runoff is a possibility as it has only moderate rates of adsorption to soil particles. In water, the salt formulation is soluble, and with adequate sunlight, may degrade in several hours. The ester is not water-soluble and can take significantly longer to degrade. It can bind with the organic fraction of the water column and be transported to the sediments. Both the salt and ester formulations are relatively non-toxic to terrestrial wildlife and insect species. The ester formulation, however, can be extremely toxic to fish and aquatic invertebrates. The ester formulation is also prone to volatilization if used in foliar spray applications during hot weather.

Triclopyr is used in wildland vegetation management because of its effectiveness against invasive woody plants and its flexibility in application methods. When applied selectively, such as through cut-stump or basal bark treatments, damage to susceptible surrounding vegetation is minimized and exposure beyond the application site is avoided.

Triclopyr is identified for use on nine species included in this Plan: tree of heaven, bladder vine, artichoke thistle, cape ivy, fennel, palm seedlings, castor bean (large), Russian thistle, and pepper trees. These applications are specified as cut-stump or direct injection treatments on all except palm seedlings (foliar). Such applications do not result in exposure of other plants directly. The intended application methods and the dispersed nature of the target plant populations are not anticipated to cause negative impacts due to the limited volume of herbicide that would be necessary for effective treatment.

Adjuvants

Adjuvants are any material added to an herbicide spray solution to enhance or modify the performance of the solution. These may include surfactants, activators, compatibility agents, buffers and acidifiers, depositions aids, de-foaming agents, thickeners, and dyes.

The most common type of adjuvants are surfactants, which enhance the emulsifying, dispersing, spreading, sticking, or wetting properties of a spray solution by facilitating the binding of two types of surfaces, such as oil and water. Surfactants reduce the surface tension of a spray solution to allow better contact with plant surfaces. Some herbicide

solutions already contain surfactants, which may have toxicity of their own, while aquatic-approved formulations do not contain them and generally require the addition of a surfactant suitable for use in aquatic areas. Chemical applications in natural areas primarily use non-ionic surfactants, which carry a neutral charge, are stable across a wider pH range, are low-foaming, and are highly biodegradable. Only non-ionic surfactants will be used in spray mixes under this Plan.

Dyes are another common adjuvant and are used as spray pattern indicators to identify areas where chemicals have been applied. These facilitate thorough application of a product as they aid in marking which plants have been sprayed, as well as preventing over-application. Dyes are photodegradable and typically fade in 48 hours. Spray pattern indicators will be used in spray mixes for projects under this Plan.

In situations where the water to be used for a tank mix is known to be hard, ammonium sulfate is commonly used to improve the effectiveness of active ingredients by counteracting antagonistic ions such as calcium and magnesium. The use of ammonium sulfate is applicable for each of the three herbicides identified in this Plan.

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