San Leandro Creek Comprehensive Vegetation Management Plan (VMP)

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Acronyms and Abbreviations

ACFCD	Alameda County Flood Control and Water Conservation District
BAAQMD	Bay Area Air Quality Management District
Cal-IPC	California Invasive Plant Council
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
ECBs	Erosion control blankets
°F	Degrees Fahrenheit
FT	Federally Threatened
UPRR	Union Pacific Railroad
VMP	Vegetation Management Plan
USFWS	United States Fish and Wildlife Service

PART ONE. Introduction and Background Information

Introduction

The purpose of the San Leandro Creek Vegetation Management Plan (VMP) is to present the range of vegetation management actions that may be implemented along San Leandro Creek by the Alameda County Flood Control and Water Conservation District (ACFCD or District), to ensure a sustainable and healthy creek environment consistent with flood control objectives and operations.

The management actions addressed in the VMP will assist the District in meeting multiple vegetation management goals on District-owned properties along San Leandro Creek. These properties are located in the City of San Leandro between the Union Pacific Railroad (UPRR) tracks (downstream) and the 580 Freeway crossing (upstream)(Figure 1). The VMP presents the goals and objectives and strategies that may be used to implement specific vegetation management actions on District-owned properties.

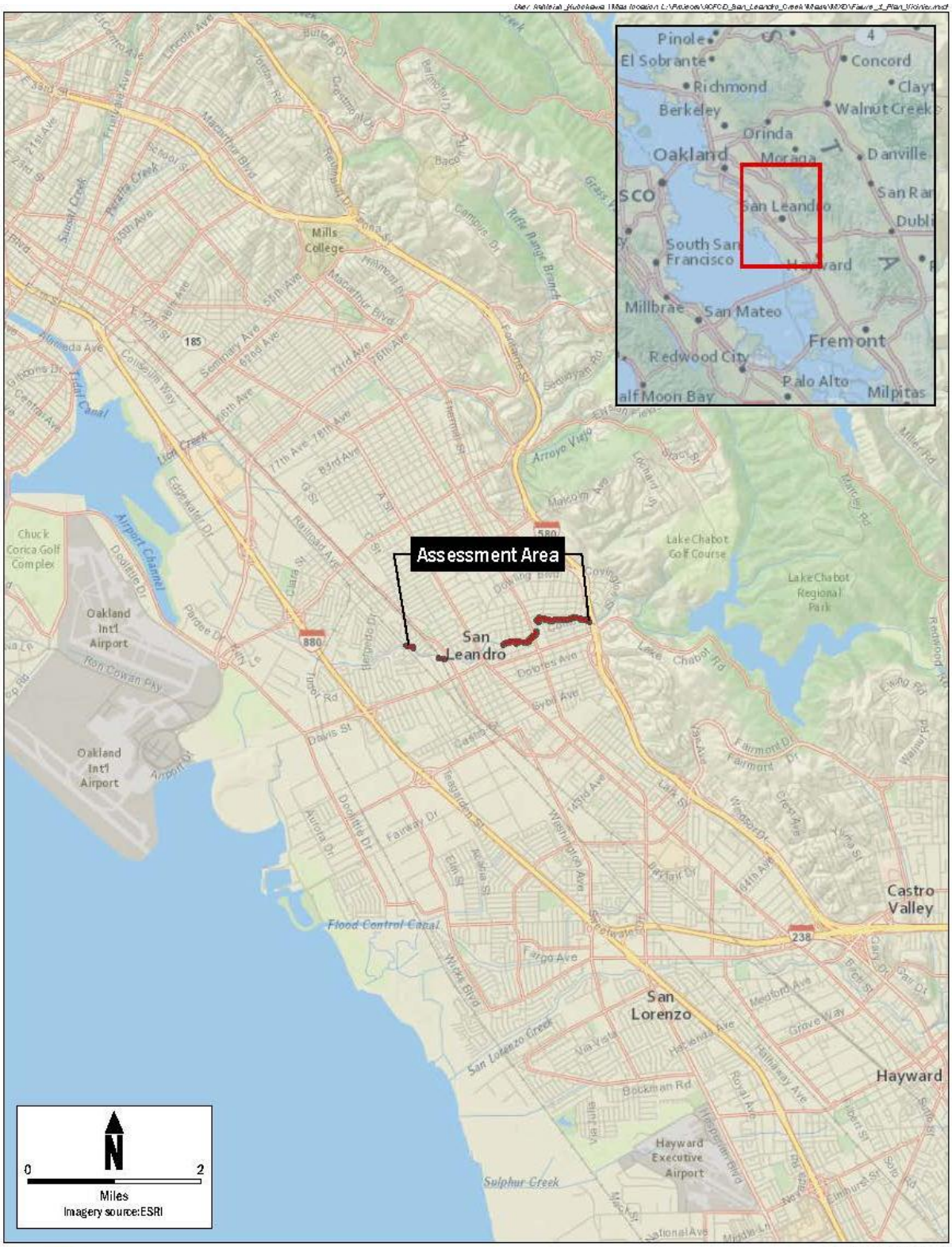
This VMP was prepared to supplement and support the District's operational procedures related to vegetation management, and to be utilized as a strategic planning tool. These operations and procedures include responding to public service calls related to tree maintenance and management, implementing small focused removal actions for other high risk trees, and to address emergency response needs during times of inclement weather with the ability to prioritize work quickly.

Plan Setting

San Leandro Creek is located in District Zone 13, in the City of San Leandro, Alameda County. The zone is one of the seven District Zones in Western Alameda County where the District provides flood protection and maintenance functions. The District's flood protection and maintenance functions on San Leandro Creek are limited to parcels under its ownership, between the San Francisco Bay and I-580. These functions include maintaining the vegetation, removing downed tree trunks and branches from the creek flow line to reduce damage to creek banks and private property, and pruning and removing trees that have been determined to pose a potential risk to life and property.

The VMP area is defined as District-owned properties located between Interstate Highway 580 to the east and the UPRR railroad tracks west (Figure 2). San Leandro Creek is an urban creek throughout its extent of the VMP Area. The entire reach of the VMP Area is defined by its natural creek bed, steep banks, and eucalyptus-tree dominated riparian vegetation flanked by suburban and residential development.

San Leandro Creek watershed covers 49.4 square miles, extending from the east bay hills to the San Francisco Bay. From its source it flows west into the Upper San Leandro Reservoir and then into Lake Chabot before entering a channel that meanders through urban San Leandro and finally into the San Francisco Bay near the Oakland International Airport.



URS

Alameda County Flood Control District

Comprehensive Plan to Manage Alameda County Flood Control District Vegetation along San Leandro Creek

PLAN VICINITY

Figure 1

Plan Area. Figure 2

Plan Purpose

The VMP is intended to be a tool to guide the District in implementing vegetation management actions on District-owned properties along San Leandro Creek (VMP Area). Vegetation management strategies presented in the VMP include pruning, coppicing, tree removal, planting or revegetation, erosion control and invasive species control (see Part Three –Strategies and Actions). The VMP also addresses site access and long-term monitoring associated with vegetation management activities. The VMP document is intended to guide all future management actions and decisions on the VMP. It shall be revisited periodically to meet the evolving Goals and Objectives as change in environmental conditions resulting from climate change, a change in District mission, and other significant improvements to infrastructure.

It will be the Districts policy to preserve all trees unless they pose a high level of risk for failure. For the purposes of this VMP, the District's threshold for taking action to reduce risk is established at a risk rating threshold of 9 in a 12-point rating system (see Assessment Methodology on page 9). The District will take corrective action to reduce the risk where trees are assessed at a risk rating of 9 and above, although some risk reduction such as pruning may take place at lower thresholds where warranted.

Plan Goals, Objectives and Strategies

The District defined Goals, Objectives, and Strategies are:

> **Goals** describe the desired conditions on District Lands within San Leandro Creek. Each goal translates into one or more objectives that define these conditions in measurable terms.
>
> **Objectives** are incremental steps taken to achieve a goal. Objectives derive from goals, and they provide a foundation for determining strategies, monitoring accomplishments, and evaluating success. The number of objectives per goal varies.
>
> **Strategies** are tools for meeting objectives and goals. Strategies represent a "toolbox" of different options for achieving stated management goals and objectives.

The District's goals and objectives for the VMP are presented below. The "toolkit" of available strategies to meet these goals and objectives is presented in the "Implementation" section of the document.

Goal 1: Maintain public safety.

Objective: Reduce the risk to life and property from tree failures
Objective: Reduce the risk of wildfire through reduced fuel loading
Objective: Meet routine maintenance and emergency response needs

Goal 2: Assure that the District meets its flood protection mission.

Objective: Manage vegetation that may impede flood flow
Objective: Manage vegetation that may compromise channel stability

Objective: Reduce the potential of fallen trees or limbs to obstruct stream flow or impede flood flow conveyance
Objective: Reduce creek bank erosion within the VMP

Goal 3: Promote a riparian corridor with a diverse species composition that is resilient to potential future disturbance (including insects, disease, drought, and wildfire).

Objective: Actively manage non-native, invasive plant species
Objective: Actively enhance wildlife habitat
Objective: Enhance native plant cover and native plant communities
Objective: Promote a healthy, safe self-sustainable riparian corridor

The goals and objectives stated above may evolve or change over time as new priorities, concerns, or environmental considerations are introduced.

PART TWO: VMP Strategies and Actions

Implementation of the VMP

In order to meet the District's goals and objectives as outlined above, the District will develop site-specific actions. The District would employ various assessment methodologies to establish site conditions and prioritize actions.

Assessment Methodology

Vegetation and habitat data in the VMP Area was collected, compiled, and assessed including the following:

- Vegetation mapping, including tree locations
- Tree risk and condition assessment (URS and HortScience 2015).
- Potential staging areas

Tree location mapping was conducted using hand-held GPS units and data loggers to survey all trees within the VMP area. The creek centerline as well as potential staging areas was also mapped with the GPS units.

Professional arborists certified by the International Society of Arboriculture conducted an initial tree risk assessment using the 12-point system (Matheny and Clark 1991). The 12-point Scale system is a quantitative assessment of risk that allows a trained, professional arborist to estimate the probability of a tree or part of a tree failing (Failure Potential rated on 1-4 points), plus estimated size of tree part that fails (Size of Part rated on 1-4 points), plus the consequence of the failure of the tree or part thereof on another valuable resource (Target rated on 1-4 points). The rated scores of the 3- elements would add up to no more than 12 points. The higher score, the higher the risk. This method or other industry acceptable method may be used in the future. Trees may be re-assessed and monitored over time to note changes in their condition. Appendix B shows the locations of the trees on or near District property including risk category and potential access and staging areas. Not all trees shown are on District property.

A total of 337 trees were evaluated. Tree health condition ratings ranged from 0 (dead) to 5 (excellent), with an average of 3 (155 trees or 46 percent).

Vegetation Management Strategies

Each of the strategies below addresses one or more of the objectives outlined by the District for the VMP depending upon how it is implemented and with which other strategies it is implemented.

Tree Felling, Pruning, and Removal

The District may engage in VMP activities that remove, or partially remove, trees determined to pose risks to life and property, the flood control mission, or the environment. The District may also engage in partial or entire tree removal to reduce fuel loading, pest infestations (e.g. Eucalyptus lerp psillid) and the spread of pathogens (e.g. Sudden Oak Death). Different felling and removal methods that may be used are described below.

Wood decay pathogens commonly occur in trees within the VMP area

Partial Removal (Pruning): Partial tree removal includes removal of select tree parts of a tree that have a high potential to fail and/or thinning of the tree crown to reduce the wind forces acting on the tree. Pruning is an alternative approach to removing only the high risk limbs of otherwise healthy trees. Pruned limbs may have been weakened by various pathogens that cause wood decay or from structural failure (broken or cracked limbs) resulting from other factors. The remaining healthy portion of the tree would be monitored for future risk potential as it ages and grows back. Partial tree removal would be completed by removing limbs with a chainsaw or a pruning hand saw. Limbs would be removed either by climbing the tree or from a bucket truck or man-lift if feasible. If nothing beneath the tree could be damaged, and if safety conditions allowed, the limbs would be cut to fall in an uncontrolled fashion. Where property damage could result from limbing operations, the limbs would be cut and lowered in a controlled manner (e.g. with bull ropes and lowering devices, or crane hoist).

Removing limbs would be done with a chainsaw or a pruning hand saw

Whole Tree Removal: Whole tree removal includes complete removal of the tree down to the ground. It does not include removal of the stump or roots. Where there is no risk to property or to personnel safety the tree would be felled intact without prior trimming. Trees located in areas where property or safety is at risk would be removed in sections, lowering each branch or log in a controlled fashion. In addition, trees could be winched or jacked to alter the felling direction and would be felled in a manner that minimizes environmental disturbance and facilitates off-hauling.

Coppicing: The freshly cut stumps of undesirable trees would be dabbed, painted, or sprayed with an approved herbicide to prevent re-growth, as detailed below. The exception to this treatment would be native trees, which would be coppiced and allowed to re-sprout from the stump.

In cases where an undesirable tree within the VMP Area has the potential to re-sprout and continue to be a problem, vegetation treatment, or herbicide, may be applied to control sprout growth. Herbicide selection and application would be performed by a license pesticide applicator. Invasive species with a Cal-IPC or CDFA listing status may be treated and/or removed where ground disturbance and revegetation efforts occur. In addition, non-native hazard trees planned for removal may be treated to prevent grow back. For example, many invasive species found along urban creeks re-sprout when cut, and should be considered in treatment options. The goal of the invasive species removal and treatment is to control the rate of spread, and to allow establishment of native sapling or seedlings. Restored areas will be monitored for invasive species regrowth in order to determine if follow up treatments are necessary, and to ensure that control measures are successful. Detailed information will be available regarding proposed treatments for invasive tree, shrub, vine, or herbaceous weeds within the VMP Areas.

Debris Removal

Once a tree is felled, the strategy for removal would vary depending on the number of trees and the accompanying biomass to be removed. Site access, discussed in the next section, is a paramount issue given the complex topography of the San Leandro Creek corridor and the close proximity to private land.

The District may wish to remove the entire tree in cases where equipment access allows. The removed tree trunks would be made available to the community for use in education program and community center settings. Complete removal avoids potential for any part of the removed tree to cause a future obstruction of flood flow, removes any safety hazards to people and property, and prevents or reduces fuel loading and reduces associated fire hazard. Where access permits, trees would be removed by winching them from the top of the bank or by lifting them via crane from the channel banks.

Where biomass generated from tree removal is relatively low or access restricts heavy equipment operation, the District may choose to limb trees and either lop-and-scatter or chip the material and leave the biomass to decay on site. Lop-and-scattering involves cutting branches and limbs into small pieces (e.g., less than two feet) and scattering the material around the site. The scattered material must be sufficiently small and be in contact with the ground to decompose sufficiently. Alternatively, logs could be used to buttress the embankment. This option has the effect of minimizing both the cost and environmental impacts of removal. The stumps left on site also provides wildlife habitat.

Most access locations at the surface street elevation (above San Leandro Creek) offer little to no space for decking logs or chipping branches. In the cases where space is limited materials would be either pre-processed in staging areas adjacent to the creek or removed from the creek in part or whole and loaded directly or processed at the street level as trees are loaded on trucks and space is made available.

VMP activities may require limited areas of temporary or permanent site disturbance or grading to access and remove trees. Areas where temporary grading occurred such as access roads or skid trails should be re-contoured to the pre-disturbance condition. In most cases an excavator will be used to replace soil in areas where winching or yarding of logs disturbed the soil surface or where skid trails or access roads were constructed. The upper six inches of topsoil will be conserved and replaced atop backfill where possible. Soil preparation includes any necessary decompaction of soils compacted by heavy equipment operation. Access roads, haul roads, staging areas, and landings will be decompacted by ripping and/or disking soils to at least 16 inches deep (where practical) such that soil plates or clods are no greater than four inches in diameter.

Some tree species found along San Leandro Creek may be strongly allelopathic. Allelopathic species produce toxic compounds that exude from their roots, leaves or bark tissue and limit germination of other species growing below or near them. Blue gum eucalyptus, is strongly allelopathic and produces phenolic compounds in its leaves and bark that are known to inhibit seed germination. Blue gum produces large quantities of duff that remain on the streambanks. Removal of the species, if needed, should include removal of the duff layer where practical, economical, and where it will not compromise soil or slope stability. Duff may be removed from immediate planting areas or planting basins using rakes or shovels and bagged to off-haul debris. If site is equipment accessible an excavator and dump truck staged on the creek bank may be used.

Loading tree stems using a crane onto trailers for off-hauling

Erosion Control

Erosion control strategies will be considered and applied wherever activities pose a risk of erosion or sedimentation. Disturbed soils would be seeded with native grass mix and secured with site appropriate erosion control products immediately. Native Seeds mix would be broadcasted and raked into the soil to ensure seed-soil contact to reduce seed desiccation mortality. Typically, for erosion control native seed mix (for the VMP area) at the appropriate application rate would include but not limited to:

- California brome (*Bromus carinatus*)
- Blue wild rye (*Elymus glaucus*)
- Meadow barley (*Hordeum brachyantherum*)
- Yarrow (*Achillea millefolium*)
- California poppy (*Eschscholzia californica*)
- Tomcat clover (*Trifolium willdenovii*)

Appropriate erosion control products that may be used include mulch, hydromulch, erosion control blankets (ECBs), and wattles. These products provide soil cover from raindrop splash erosion as well as provide surface roughness to slow runoff. They also keep the soil cooler and maintain soil moisture.

Mulch: Straw mulch is a common, inexpensive, and effective method of erosion control on gentle slopes, less than 2h:1v. Weed-free straw would be applied following seeding, at a rate of 1.5-2 tons per acre and 1-2 inches deep, covering 80 percent of the soil surface. The straw should be crimped into the soil or an organic tackifier (guar gum or plantago-based) can be sprayed atop the straw to prevent it from blowing away and to more effectively retard soil loss due to overland flow. Crimping can be done following soil decompaction by track rolling a slope with a bulldozer or crimping with a sheep-foot roller attachment on a backhoe or excavator. If the site is small and inaccessible to large equipment a shovel can be used to crimp straw in loose or soft soil.

Hydromulches: Hydromulches contain a mixture of wood cellulose fibers, water, and an organic tackifier. They are a suitable alternative to straw mulch or can be used in combination with straw mulch. Hydromulch is pumped from a machine and sprayed onto a slope. Tackifiers aid in the adhesion of the mixture to the slope and help retard breakdown from initial rainstorms. Timing the hydromulching is perhaps the single most important step to successful erosion prevention. Most hydromulches break down in the first few rainstorms, so they should be applied right before the first rains in fall or winter so seed can begin germinating and hold the slope once heavier rain comes later in the season. Wood cellulose and treated wood cellulose offer more protection from the first few rainstorms and are more effective on steeper slopes. A high quality hydromulch applied at a rate of 2,500 to 3,000 lbs per acre can provide sufficient soil protection on slopes up to 3:1(horizontal:vertical units). Hydromulch applied at a rate of 2,500 lbs per acre in combination with a straw mulch application at rate of 4,000 lbs per acre can generally provide sufficient protection for slopes 4h:1v to 2h:1v. Similarly, hydroseed application is an erosion control process where a mixture of seed plus fiber mulch is added into a tank of water, slurried, and then sprayed onto bare banks.

Erosion Control Blankets (ECBs): ECBs are typically used to stabilize hillslopes greater than 2h:1v. These mats are made of jute, straw, coconut fiber, and straw-coconut fiber combinations. Jute netting is generally the cheapest of the products but offers slightly less coverage from raindrop splash erosion than straw, coconut, or coconut fiber blankets. Straw and coconut blankets should not be made with monofilament plastic netting but of loose biodegradable jute netting instead to prevent potential entrapment or entanglement of wildlife species such as frogs or salamanders. The loose natural fibers allow species to move through the blankets and the blankets degrade in several years. A cost-saving alternative that achieves more cover is to place weed-free straw on a slope then cover it with jute netting to hold down the straw. Crimping the straw into the slope prior to placing the jute netting will further increase the slope stability.

Wattles: Wattles are 9 to 12-inch diameter bundles of jute or similar biodegradable fiber such as straw or coconut coir (fiber?) that are encased in netting and used to reduce the movement of sediment. Wattles would be buried in a trench and one third of wattle diameter staked to allow water to filter through. Wattles provide secondary line of defense to protect the surface of mulched slopes. As feasible wattles would be installed along the contour of the disturbed sites as prescribed and recommended by the manufacturer.

Erosion Control installation on a steep slope consisting of jute wattles and straw

Invasive Understory Species Removal

Invasive species aggressively colonize disturbed areas quickly and easily out-compete native plants for water, nutrients, and light. The San Leandro Creek riparian corridor, like other urban creek riparian corridors in the Bay area, contains many non-native invasive vines, shrubs, and forbs that the District would control. The San Leandro Creek corridor including the VMP has large extensive invasive ivy species such as English ivy *(Hedera helix)*, Algerian ivy *(Hedera canariensis)*, and cape ivy *(Delairea odorata).* These species present significant challenges in the VMP area. English and Algerian ivy grow into the canopy of many trees which greatly increase stress on the trees. The vines compete with the trees for limited resources and add significant weight (biomass) on to the trees. Increased weight results in increased wind resistance which potentially could result in branch or whole tree failure.

Invasive vines, forbs, and shrubs in the VMP Area may be removed by hand tools or controlled with herbicides. Herbicide application is a valuable tool for controlling undesirable vegetation when hand-control is insufficient. In certain cases hand removal of vegetation on the VMP Area would be followed by herbicide treatment for more effective control results. Impermeable black plastic-tarp may also be used on specific sites to control erosion and re-growth or sprouting of the undesirable species.

Preservation of Native Vegetation

Native trees and shrubs that may be impacted during VMP activities will be preserved in place whenever possible. Exceptions may be made in cases of accessibility. Trees to be preserved will be clearly marked with flagging and fenced with orange construction fence to prevent equipment from accidentally damaging native vegetation. Wetlands or other native sensitive vegetation communities will also be avoided (where possible) and fenced to prevent disturbance.

Preservation of Habitat Trees

The District may wish to retain select dead trees/snags, particularly those with hollowed interiors, to enhance wildlife habitat for cavity-nesting birds and other wildlife in San Leandro Creek.

Cavity nesting birds and other wildlife utilize habitat trees

Site Access

Site access to the VMP area is primarily restricted by private land ownership and physical constraints. While access via District property will be prioritized, the ability to negotiate access agreements with private land owners where needed may be critical to the success of a VMP implementation.

A major limiting factor to access the VMP Area is steep San Leandro Creek bank slopes. The Steep banks limit ready construction crews and equipment access to locations on the VMP requiring some type of action.

Site access will also depend on in-stream features that prevent use as temporary access and availability of areas or openings that could be used as potential staging areas for equipment during a

needed action involving debris removal, flow-line clearance and revegetation and/or planting. For any potential management action, the District would investigate and identify in-stream features, potential staging/landing areas or terraces wide enough to accommodate vehicular traffic within or near the action area. VMP activity access options are described below:

Access by foot: VMP activities that require only planting, pruning, thinning, or involve limited activity are not expected to require developing new access roads or trails. In these instances activities would require only hand tools, saws, and tree climbing equipment. Depending on VMP location, crews will prioritize access via District property. If access through District property is not feasible or safe, crews will access tree locations through private property with landowner prior approval.

Access by foot with indirect equipment access: Vegetation removal activities that are located close enough to where a crane may be staged could be conducted with minimal access improvements. In such cases, access would be limited to foot traffic to the vegetation and indirect access for placing the crane and staging materials. Permit from the City of San Leandro will be obtained prior to actions that involves staging sites located on City Roads. Where access through public land is not available, the District may negotiate temporary from adjacent private landowner.

Access by machinery via existing road: Two existing maintenance roads provide adequate access for equipment to the VMP area; 1. via Saint Mary's Avenue (easterly limits) and 2. Alvarado Street through Alvarado Park (westerly limits).

An existing maintenances road provides access onto the VMP area from the end of Saint Mary's Avenue to conduct needed management actions from Interstate 580 downstream (upstream) to the footbridge crossings at Cary Drive/ Haas Avenue (downstream). The VMP area at this location is flanked on both sides of the creek by private land ownership. As warranted the existing road would temporary graded for equipment access and restored after VMP actions are complete.

There is a concrete access ramp located on the southeast side of the Alvarado Street Community park "Alvarado Park", that would be use as point to the VMP area upstream to a point just past the UPRR overcrossing where a deep pool prevents further upstream passage. This access location would allow equipment such as bulldozers, excavators, skidders, log forwarders, trucks, and chippers to reach most of the VMP area between Alvarado Street and the UPRR tracks if warranted.

Access by machinery via crane: Some reaches of San Leandro Creek do not provide equipment access from District land down to the streambed. Depending on the type and size of the vegetation removal operation machinery may be required to operate from the streambed to remove vegetation from areas inaccessible by crane or where biomass cannot be left onsite. If a temporary or permanent access road cannot be constructed down to the streambed from District land then equipment would need to be lowered into the streambed using a crane. The longest inaccessible reach of stream is from Huff Avenue to Cary Drive/Haas Avenue. A crane set-up at the end of Huff Avenue or on the Bancroft Avenue overcrossing could lower equipment into the creek area or remove biomass from the streambed and load the material onto awaiting trucks. A crane operating from Cary Drive could be used to remove debris from the streambed to reduce the amount of material being hauled out of the Saint Mary's Road access point.

Access by machinery via existing and identified new access roads: In areas where additional access roads would facilitate VMP activities (e.g. where indirect access via crane is not feasible), new access roads may be constructed into the creek. These new access roads would be permanent and available for future VMP activities. Similar equipment would use this new access graded down to the streambed. Temporary access roads would be restored to previous contours and revegetated following construction.

Revegetation

Revegetation is a tool the District would employ to meet all of their stated management goals for the VMP. Revegetation stabilizes streambanks, improves the water quality of the creek, improves VMP Area aesthetics, provides habitat for wildlife, and reduces opportunities for non-native species invasions. Revegetation activities should immediately follow vegetation removal activities and begin with seeding and planting of appropriate native vegetation.

The planting palette for revegetation will vary depending on the location and size of a given activity, but will conform to the distribution and composition of existing native species. Blending of species with different shade-tolerance and moisture requirements would be implemented to establish an ecotonal transition from one vegetation community to the next. Plantings would be irregularly-spaced and at times clustered to increase habitat complexity. In general the tree planting palette would include the following species (most already exist on the site*:*

- *Alder (Alnus sp.)*
- California bay *(Umbellularia Californica)*
- Buckeye *(Aesculus Californicus)*
- Coast live oak *(Quercus agrifolia)*
- Cottonwood *(Populus Fremontii)*
- California Box elder *(Acer negundo)*
- Dogwood *(Cornus sp.)*
- Maple *(Acer macrophylum)*
- Sycamore *(Plantanus racemosa)*
- Willow *(Salix sp)*

Prior to planting, exposed areas would be prepared by grading, conditioning and/or scarified for a successful revegetation or planting. Depending on the area in the VMP, preparation would include recontouring access roads, decompacting soils, and removing thick allelopathic duff, as needed.

Planting would occur in the fall or early winter, soon after the rainy season begins to improve establishment success. Planting may occur at other times of the year if plants are regularly irrigated. If container plants are used, they should be thoroughly watered at the time of planting with at least five gallons of water. Temporary water basins should be constructed around shrubs and trees and left in place until the plants are established generally within the first one to two years after planting.

During plant installation, a three foot ring of mulch (preferably local, coarse wood mulch) would be placed around each container shrub or tree planting in the temporary water basin. Mulch should be

maintained at least four inches deep to help increase soil moisture and reduce weed seed germination.

Above-ground browse protection typically consists of double-walled plastic enclosures (tubex®) on smaller plants or seed installations or a six foot wire enclosure (field fence) used on larger trees and shrubs. Browse protection may not be necessary for some species that are commonly browse-resistant like coyote brush and sagebrush and plug plantings or pole cuttings.

Maintenance and Monitoring

The District would implement maintenance and conduct regular monitoring on the VMP Area consistent with the goals and objectives established in this plan and required permits conditions.

Site maintenance of new plantings would occur regularly. For instance, watering of plantings in the summer months, and weeding within planting basins may be necessary to aid establishment of plantings for a few years. In order to support planting survival, invasive weeds in the vicinity of the planting area should be treated during each site visit. Hand-weeding and herbicide application would be strategies implemented to support planting and seedling establishment. Herbicide application should be reduced after the initial treatment and limited to those species where it is the most practical method of eradication. Only a licensed pesticide applicator shall apply herbicides.

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APPENDIX A: Habitat and Channel Information

Vegetation Communities

Vegetation communities in the VMP Area include riparian and upland areas containing a combination of native and non-native species common to creek corridors in the region. Both communities are highly influenced by adjacent private properties, many of which contain a mixture of native and non-native plant species that grow into District property and interact with the existing plant communities. The riparian and upland communities in the VMP Area are dominated by bluegum eucalyptus (*Eucalyptus globulus*), a non-native tree species that provides a tall and fairly continuous canopy over the creek and its banks. The understory is dominated by cover of non-native vines. While the riparian area is dominated by living eucalyptus trees, the upland community is dominated by leaf litter, shrubs, and downed tree branches.

The distribution and growth potential of native trees in the VMP Area is limited due to the abundance of mature eucalyptus. Although limited in distribution and extent, the native tree and shrub species in the VMP Area include coast live oak (*Quercus lobata*), California buckeye (*Aesculus californica*), arroyo willow (*Salix lasiolepis*), blue elderberry (*Sambucus nigra*), California bay laurel (*Umbellularia californica*), toyon (*Heteromeles arbutifolia*), poison oak (*Toxicodendron diversilobum*), and coyote brush (*Baccharis pilularis*).

Special Status Plant Species

No state or federally listed plant species are within the VMP area. Only one plant species, the Diablo helianthella has potential habitat present in the VMP area. The Diablo helianthella is neither state nor federally listed, but is listed as rare by the California Native Plant Society. The likelihood of it occurring in the VMP area is low because the preferred soil conditions (thin and rocky) are not present (refer to the companion CEQA Initial Study document for further details).

Invasive Plant Species

Non-native, invasive species colonize disturbed areas quickly, often out-competing native plants for water, nutrients, and light. Plant species with a Cal-IPC or California Department of Food and Agriculture (CDFA) ratings of high or moderate are considered invasive within the VMP Area. Non-native, non-invasive species include any other species that are not indigenous to the area but lack a Cal-IPC or CDFA listing status. In addition to stands of bluegum eucalyptus, a species that is rated "moderate" by the Cal-IPC (2014a), the VMP Area contains low-growing invasive vines that provide dense ground cover, such as cape ivy (*Delairea odorata*), periwinkle (*Vinca major*), English ivy (*Hedera helix*), and Himalayan blackberry (*Rubus armeniacus*). English and Algerian ivy also grow in the canopy of many trees in the VMP Area adding wind resistance and weight. The VMP Area includes some dense clumps of invasive giant reed (*Arundo donax*) that compete with native shrubs and trees for light and resources. Non-native, invasive species identified in the VMP Area include, but are not limited to, species listed in Table 1.

Table 1. Non-native invasive species in the VMP Area

Common Name	Scientific Name	Rating Status*
English ivy	*Hedera helix*	High (Cal-IPC)
Algerian ivy	*Hedera canariensis*	High (Cal-IPC)
cape ivy	*Delairea odorata*	High (Cal-IPC)
giant reed	*Arundo donax*	High (Cal-IPC)
periwinkle	Vinca major	Moderate (Cal-IPC)
Himalayan blackberry	*Rubus armeniacus*	High (Cal-IPC)
Blue gum eucalyptus	*Eucalyptus globulus*	Moderate (but Currently being re-assessed, Cal-IPC)
*Ratings obtained from the California Invasive Plant Inventory Database on February 6, 2015 at http://www.cal-ipc.org/paf/		

The dominant not-native, invasive species in the VMP Area is bluegum eucalyptus. The majority of the bluegum trees in the VMP Area range in height from 50 to 150 feet tall and are 24 to 72 inches in diameter. Blue gum eucalyptus is an evergreen tree that is native to Australia and was introduced to California in the 1850s. The tree was planted in many cases as a wind-break and is characterized by a rapid growth rate and invasive roots that strongly inhibit rooting of other species (Esser 1997; Hatch 2007). Individual trees of the species tend to live for 100-150 years.

Bluegum eucalyptus is also given a high fire hazard rating in comparison with native grass and tree species, which are given low to moderate ratings (Cal-IPC 2014b). Leaf, bark, and seed drop create excessive ground fuels, and volatile compounds in the leaves can cause explosive burning in intense fires. The bark catches fire readily, and deciduous bark streamers and lichen epiphytes tend to carry fire into the canopy of surrounding trees (Esser 1997).

Wildlife Habitat

Due to the heavily urbanized setting and associated human disturbance, suitable habitat for wildlife populations in the VMP Area is limited. The eucalyptus-dominated riparian habitat supports a moderate diversity of bird species. The riparian corridor within the VMP Area contains suitable foraging and breeding habitat for many species of birds, and nesting habitat for raptors is present within the eucalyptus trees. The upland habitat within the riparian corridor provides cover for several species of reptiles, amphibians, and mammals.

San Leandro Creek supports several native fish species such as the resident rainbow trout (*Oncorhynchus mykiss*); Sacramento sucker (*Catostomus occidentalis*); threespine stickleback (*Gasterosteus aculeatus*); and sculpins (*Cottus sp.*). There are also several invasive species found in the creek, including carp (*Cyprinus carpio*), and centrachids. Historically, the federally-threatened Central California Coast steelhead (*Oncorhynchus mykiss*) was present in San Leandro Creek but it is

currently assumed to be absent. The habitat along the project reach does not currently support steelhead because of restricted flows caused by two upstream dams: Chabot Dam and Lower San Leandro Dam in the upper watershed.

Special-Status Animal Species

There are approximately 14 special-status animal species that are known to occur within the vicinity of the VMP Area (CNDDB 2014) (refer to the companion CEQA Initial Study document for further details). Based on the presence of suitable habitat, only three of these species have the potential to occur within the VMP Area and are known to breed or could potentially breed in the VMP Area: Central California Coast Steelhead (*Oncorhynchus mykiss*) and California Red-legged Frog (*Rana draytonii*) are both federally threatened (FT) species that are currently absent from the VMP Area. The Western Red Bat (*Lasiurus blossevillii*) may occasionally roost in trees in the VMP Area, but no breeding habitat is present.

Channel Geomorphology

The low-flow channel of San Leandro Creek is reportedly perennial from Chabot Dam downstream for approximately 1 mile to near Bancroft Street (Leidy 2005). The width of the low flow (active channel) along the VMP Area is approximately 8-15 feet with flow depth ranging from approximately 0.5-2 feet in the spring. The creek banks are steep with narrow floodplain terraces on the inner meander bends. Channel bed sediments comprise a diverse array of grain sizes from sand to gravel to cobble.

Appendix B – Tree Risk Assessment Maps

URS

Alameda County Flood Control and Water Conservation District

Comprehensive Plan to Manage Alameda County Flood Control District Vegetation along San Leandro Creek

POTENTIAL ACCESS AND STAGING LOCATIONS

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