FINAL

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project Conceptual Habitat Rehabilitation and Enhancement Plan

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Draft San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project Conceptual Habitat Rehabilitation and Enhancement Plan

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1 PROJECT DESCRIPTION

The San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project (SDWHR; project) is a habitat restoration project being conducted by the City of San Diego Public Utilities Department (City) established to develop and implement habitat and water quality improvements from 2015 San Diego Proposition 84 Integrated Regional Water Management (IRWM) program grant funding. The City was recently awarded Proposition 84 grant funding by the Department of Water Resources (DWR) for the Hodges Watershed Improvement Project under the San Diego IRWM program for the removal of invasive species and restoration of habitat in the San Dieguito Watershed and implementation of stormwater Best Management Practices (BMP) and other related activities.

The project described herein, focuses on the program components that include removal of invasive vegetation species and restoration of habitat within the San Dieguito Watershed. Work proposed by this Conceptual Habitat Rehabilitation and Enhancement Plan (Plan) includes riparian habitat rehabilitation and enhancement on City owned lands, including agricultural leased land located upstream of Hodges Reservoir in the eastern San Pasqual Valley at a designated site referred to from here forward as the Santa Ysabel Creek Project Area (Figure 1, Project Location). The habitat enhancement approach consists of removal and follow-up control of target invasive species and in some cases native seeding and willow cutting installation, with the habitat rehabilitation approach also including installation and establishment of native riparian plantings in areas heavily infested by invasive species.

1.1 GRANT FUNDING CONTEXT

The 2015 Proposition 84 grant agreement between DWR and San Diego County Water Authority is intended to provide State funding from the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 to assist in financing projects associated with the San Diego IRWM Program. The Hodges Watershed Improvement Project (Grant Fund Project 13) is being conducted by the City as part of the San Diego IRWM Program to develop and implement habitat and water quality improvement projects through two subprojects: (1) San Pasqual Valley Resource Management Plan and BMP Implementation Project; and (2) SDWHR. These subprojects are expected to improve water quality by reducing soil salinity and sediment and nutrient loading downstream in Hodges Reservoir through habitat restoration and BMP implementation. These projects are also designed to work in conjunction with an additional Proposition grant funded project, the Regional Emergency Storage and Conveyance Intertie Optimization Project (Project 7) for Hodges Reservoir water quality improvement and increasing water supply reliability.

This Plan addresses the requirements of SDWHR (Subproject 2) through implementation of habitat restoration in the San Dieguito Watershed above Hodges Reservoir. The Grant defines Subproject 2 as:

> Habitat restoration will involve the removal of invasive species and replanting with native species, where appropriate. Restoration will primarily occur in the eastern portion of San Pasqual Valley and will focus on the removal of salt cedar (*Tamarix ramosissima*), eucalyptus (*Eucalyptus* sp.), and giant reed (*Arundo donax*). Increased native vegetation will take up nutrients that would otherwise reach reservoir waters. Other ecosystem enhancements expected include improved habitat for wildlife and erosion control. A minimum of 17 acres will be restored through the implementation of this project component.

1.2 REGIONALLY PLANNING CONTEXT AND REGULATORY OVERSIGHT

All restoration work conducted for the SDWHR will be completed in accordance with the Mitigated Negative Declaration (MND) for the San Dieguito Watershed Invasive Non-native Plan Control Program and the California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement #1600-2008-0308-RS (SAA) issued to the San Dieguito River Park Joint Powers Authority (JPA) for the program (Appendix A). The San Dieguito Watershed Invasive Non-native Plant Control Program involves implementation of invasive non-native plant control using grant and/or mitigation funding through the San Dieguito River Valley Regional Open Space Park JPA and its partners.

These projects restore riparian habitat in the San Dieguito River Watershed through the control of invasive non-native plants, mainly giant reed, pampas grass (*Cortaderia* sp.), salt cedar, perennial pepperweed (*Lepidium latifolium*), Eucalyptus trees, and palms (*Washingtonia robusta* and *Phoenix* sp.), and the planting of native species, where appropriate. The purpose of this program is to define a systematic comprehensive approach at a watershed-wide level with established consistent methods, standards and minimization measures to allow ongoing treatment and removal of invasive species with minimal impacts to sensitive species.

1.2.1 OWNERSHIP AND CURRENT LAND USE

All work proposed in this Plan will be conducted on City-owned property located in the San Pasqual Valley. Land within the San Pasqual Valley is largely owned by the City of San Diego. The 1964 San Pasqual Valley Plan designated the valley primarily for agricultural use. In 1970, the City Council adopted a resolution designating that the valley be maintained as an agricultural preserve. The City has pursued a program to develop the valley for agricultural uses through lease agreements with agricultural enterprises (City of San Diego 2006). A portion of the SDWHR will be conducted partially on and accessed from City owned property currently managed under agricultural lease agreements.

1.3 PROJECT GOALS

The SDWHR is expected to improve water quality by the reduction of soil salinity through the removal of invasive salt cedar, and the reduction of sediment and nutrient loading downstream in Hodges Reservoir. Additional project goals include removal and control of additional invasive vegetation that displace native vegetation and degrade riparian habitats through physical and chemical means (e.g. allelopathy). Promoting native revegetation will increase the uptake of nutrients that otherwise reach reservoir waters, serve as erosion control and improve habitat for wildlife. Habitat rehabilitation and enhancement, through the removal of invasive vegetation (enhancement) and revegetation with native riparian species (rehabilitation) will increase ecological function including hydraulic functions which consist of sediment transport and flood-flow capacity, water use and flood regimes, native habitat value, and reduces fire prone conditions within riparian habitat.

Non-native perennial species that are particularly invasive to riparian habitats in the San Dieguito Watershed and identified as target invasive species for this project include salt cedar, eucalyptus, and giant reed. Perennial pepperweed, a highly invasive species was not identified within the Santa Ysabel Creek Project Area but is present downstream within the San Pasqual Valley. If encountered, it will be treated as a target invasive species and included in the rehabilitation and enhancement program. Additional non-native perennial and annual species present within dedicated rehabilitation and enhancement treatment areas will be initially removed with project implementation, but the target invasive species will constitute the focus of follow-up treatment throughout the Santa Ysabel Creek Project Area for the 3-year maintenance and monitoring program.

1.3.1 REHABILITATION AND ENHANCEMENT APPROACH

Restoration proposed in this Plan will provide a functional lift for currently degraded riparian habitats located within the Santa Ysabel Creek Project Area designated for the SDWHR. Restoration through habitat rehabilitation and enhancement will be implemented with three specific implementation strategies based on site conditions and available resources (Table 1).

1.3.1.1 Rehabilitation

Rehabilitation, which consists of invasive removal and control in combination with native planting provides the highest lift of wetland functions and services through active revegetation. Rehabilitation improves currently degraded habitat by introducing native habitat. Areas selected for rehabilitation within the Santa Ysabel Creek Project Area are currently dominated by target invasive cover with only sparse native cover present. Rehabilitation is possible in these areas because access to temporary supplemental irrigation is available to support supplemental native container planting. These areas are referred to as habitat rehabilitation treatment areas.

The rehabilitation approach consists of removal and cut-stump treatment of target invasive species and other persistent non-natives, removal of accumulated non-native biomass and debris, native container planting and seeding, and installation of a temporary irrigation system to support container plant establishment. A 3-year maintenance and monitoring program will follow to reduce nuisance weeds and complete successful kill of target invasive species, promote establishment of installed container plants and revegetation from applied and naturally occurring native seed. Areas selected for rehabilitation are generally greater than 75% existing non-native cover, so calculated rehabilitation acreage is 100% of the rehabilitation treatment area.

1.3.1.2 Enhancement

Two approaches for enhancement are proposed, based on the existing distribution and density of target invasive species cover within the Santa Ysabel Creek Project Area and site accessibility. Treatment for areas that consist of high-density target invasive cover with accessibility for material removal will focus on invasive species removal, revegetation seeding and in some cases willow cutting installation to promote native revegetation. These areas are referred to as habitat enhancement treatment areas. Enhancement for the remainder of the Santa Ysabel Creek Project Area, which consist of isolated stands of target invasive species or in areas that are difficult to access will focus on selective invasive treatment. These areas are referred to as selective target invasive control treatment areas.

The approach for habitat enhancement treatment areas includes cut-stump treatment of all target invasive vegetation and other non-natives present, removal of accumulated non-native biomass and debris and applying native seed to promote revegetation. Native container plants are not proposed for habitat enhancement treatment areas due to isolation from a reliable water source, but native willow cuttings will be installed in locations supported by natural hydrology. A 3-year maintenance and monitoring program will follow to complete successful kill of target invasive species, treat nuisance weeds to reduce competition for establishment of installed cuttings and allow for germination and cover development from applied and naturally occurring native seed. Enhancement for habitat enhancement treatment areas is expected to provide a moderate lift of wetland functions and services from promoting revegetation through propagule installation (seeding and cuttings) in combination with invasive removal and control. Habitat enhancement treatment areas are generally greater than 75% existing non-native cover and will be maintained weed free for the duration of the project, so calculated acreage is 100% of the habitat enhancement treatment areas.

Enhancement through selective control of target invasive species will be conducted for the remainder of the Santa Ysabel Creek Project Area, or selective target invasive control treatment

areas. In most cases, target invasive species within the Santa Ysabel Creek Project Area will be individually cut to grade with all cut biomass and associated non-native mulch removed from the site. Where isolated stands do not allow for vehicles access or when hand crew haul off is impractical, target invasive species will be either treated and left standing or cut to grade and placed in bench areas outside of active channels or dense native habitat, this includes all occurrences of target invasive species within the creek bed. All selective treatment enhancement areas will receive follow-up treatment conducted during the 3-year maintenance and monitoring program to complete successful kill of target invasive species. Selective treatment with follow-up control is expected to provide a low-level lift of wetland functions and services for these moderate to moderately high functioning wetlands. Calculated acreage for selective target invasive control treatment areas is the net acreage of invasive vegetation removed from the Santa Ysabel Creek Project Area.

Table 1
Santa Ysabel Creek Project Area –Treatment Area and Total Project Area Acreages

Restoration Treatment	Total Area (Ac.)	Net Treatment Area (Ac.)
Habitat Rehabilitation Treatment Areas		
Riparian Woodland/Scrub	11.77	
Total	**11.77**	
Habitat Enhancement Treatment Areas		
Riparian Woodland/Scrub	3.51	
Total	**3.51**	
Selective Target Invasive Control Treatment Areas		
Target Invasive Treatment and Biomass Removal		
Enhancement (CDFW Jurisdiction Only)	12.41	1.40[1]
Enhancement (Within CDFW/USACE Streambed)	10.06	1.33[1]
Total	**22.47**	**2.75[1]**
Target Invasive In-Place Treatment		
Enhancement (CDFW Jurisdiction Only)	8.57	0.61[1]
Enhancement (Within CDFW/USACE Streambed)	6.73	0.29[1]
Total	**15.30**	**0.90[1]**
Total Rehabilitation and Enhancement Area	**18.93**	

[1] Total restoration (enhancement) area equals cumulative acreage of target invasives species to be treated

1.3.2 SITE AND RESTORATION APPROACH SELECTION CRITERIA

Dudek and the City conducted a thorough evaluation of riparian habitat within the eastern San Pasqual Valley to select sites most appropriate to implement the project. The selection process included literature review of recent area assessments, regulatory documents and mapping data, field evaluation of prospective sites, and discussions with agricultural lessees. The initial survey area included riparian and streambed habitat in Santa Ysabel Creek and Santa Maria Creek in the upper San Dieguito River watershed, with the goal of identifying a minimum of 17-acres for restoration, as required by the SDWHR.

In order to support long-term health of the watershed, a 'top-down' approach was a primary consideration for site selection. As invasive species propagules (e.g., seed and stem segments) are readily spread through downstream transport, areas evaluated for riparian condition and infestation begin in the upper reaches of Santa Ysabel Creek and Santa Maria Creek. Selection focused on the inclusion of the upstream or 'top' limits where invasive species occur.

Reaches along Santa Ysabel creek upstream of San Pasqual Valley road (State Route 78) offered the best opportunity for implementation based on density and distribution of target invasive cover within the stream channel, and ability to implement a minimum of 17-acres of restoration within a cohesive project area.

Work within State only jurisdictional wetlands and waters, which includes stream banks and benches (terraces) is allowed, but requires specific avoidance and minimization measures, as listed in the CDFW SAA, described below and attached as Appendix A. Areas were selected for either rehabilitation or enhancement based on the extent of existing invasive species infestation, and proximity to a reliable water source. Areas that included dense target species infestations were established as dedicated treatment areas, with areas within close proximity to year-round well water selected for rehabilitation (habitat rehabilitation treatment areas), as they allowed for container planting and supplemental watering. Dedicated enhancement treatment areas (habitat enhancement treatment areas) will be seeded, and in some cases installed with cuttings, but will rely on passive revegetation due to the lack of supplemental water sources.

The remainder of the Santa Ysabel Creek Project Area will serve as a selective target invasive control treatment areas. Selective removal is proposed for habitats that were either partially infested with target perennial invasive species, for areas with limited access, or for areas of the stream corridor within federally regulated wetlands and waters (stream bed). Areas with limited access include active agricultural operations or steep streambank topography that preclude direct project access. Permits for work in federal wetlands and waters (streambed), as regulated by Army Corps of Engineers

(USACE) were not pursued, so work within the federally regulated streambed will be limited to hand tools (no vehicle access), with container planting not allowed in the stream channel.

Eucalyptus trees located within the surveyed riparian corridor were excluded from the Santa Ysabel Creek Project Area if access for initial removal was not feasible without risk of damage to adjacent agricultural operations and stream habitat or had the potential to destabilize stream banks. In most areas of the site, eucalyptus trees occur as dense monotypic stands on stream terrace habitat and on upper stream banks. Eucalyptus stands or individual trees were only proposed for removal if located in lower terrace bench habitats, and if accessible from maintenance roads or directly from terraces habitats outside of federal jurisdiction. Isolated eucalyptus in difficult to access locations within the Project areas will be girdled, treated with herbicide and left standing. Due to bank stabilization issues, no removal of Eucalyptus or other dense non-native tree stands will be conducted on stream banks.

1.4 RESPONSIBLE PARTIES

1.4.1 CITY OF SAN DIEGO PUBLIC UTILITIES DEPARTMENT

The City will be responsible for all management and financial costs associated with implementation, maintenance, and monitoring proposed for this habitat enhancement and rehabilitation project. City and their designated implementation management team will coordinate access to the Santa Ysabel Creek Project Area with the property leaseholders for contractors, monitors, applicable regulators from implementation through completion of the maintenance and monitoring period.

1.4.2 MONITORING BIOLOGIST

The City will contract with a qualified biological consultant (Monitoring Biologist) to monitor and report on enhancement and rehabilitation work described in this plan. The Monitoring Biologist must have knowledge and understanding of the native and non-native plant species and natural plant communities present within all work areas described in this plan. Training and previous experience in riparian restoration/revegetation projects in Southern California are required.

The Monitoring Biologist will oversee and coordinate implementation of the proposed enhancement and rehabilitation, interpretation of this Plan and regulatory requirements, monitor the work of all contractors conducting work, including the Restoration Contractor, and conduct horticultural monitoring and reporting during installation and through completion of the maintenance and monitoring period. The Monitoring Biologist shall also determine whether any additional measures are necessary for site protection, or to promote successful project completion. The Monitoring Biologist must hold a Pest Control Adviser license if required to make specific pest control recommendations.

1.4.3 RESTORATION CONTRACTOR

The City will hire a qualified licensed landscape contractor (Restoration Contractor) with experience in native vegetation restoration/revegetation establishment and maintenance. During the installation phase, the Restoration Contractor will be responsible for performing project installation, including removal of non-native vegetation and debris removal, irrigation system installation, planting, seeding, perimeter control, and erosion control. During the post-installation monitoring and maintenance phase, the Restoration Contractor will be responsible for weed control, erosion control, trash removal, and reseeding, as needed. In addition to tasks listed above and described in this plan, the Restoration Contractor shall be responsible for implementation of all tasks required to promote project success, as directed by the Monitoring Biologist and the City. The use of herbicides requires the contractor to possess a current Qualified Applicator License or Qualified Applicator Certificate to perform chemical control.

1.4.4 PROPERTY LESSEE

Portions of the City owned property proposed for this project and all project access routes are currently located on parcels currently under an active lease agreement for agricultural operations. The City will serve as the direct point of contact with the lease holder, with the Monitoring Biologist and Restoration Contractor assisting with pre-project planning and implementation details. Prior to implementing work, all work areas, access routes and staging areas proposed in this plan, the implementation plan documents (Section 3.3) and the final work schedule are to be further negotiated, and require review and approval by the current agricultural lessee in consultation with the City project representative. In the interest of the lessee and the property's operations, work crews will be limited in size, appropriately distributed throughout work areas and timing to minimize disruptions to agricultural operations and avoid disturbance to orchards and the agricultural infrastructure. With completion of initial implementation and onset of restoration maintenance, activity and frequency of equipment at the site will significantly decrease.

The current agricultural lessee will accommodate access to the property and provide adequate notification for any operations that may temporarily limit access to the Santa Ysabel Creek Project Area. The lessee will make accommodations for the use of well water for dust control, construction use and, as practical, water for use for supplemental irrigation. The water-use agreement and designated water point of connection location will be based on the layout, estimated water budget, and schedule provided in the final restoration implementation plan documents. If access to well water is not available, the current agricultural lessee will make accommodation for the contractor to provide water via water truck and a location to establish temporary water storage tanks to support supplemental irrigation.

2 EXISTING SITE CONDITIONS

This section describes the existing physical conditions of the Santa Ysabel Creek Project Area. Details provided herein are based on existing documentation and surveys conducted by Recon Environmental Inc. in the development of the *Jurisdictional Waters Mitigation Opportunities Assessment for the San Pasqual Valley* (Recon Environmental, Inc. 2020), Dudek for the *San Pasqual Valley Integrated Weed Management Plan* (Dudek 2013), and in a subsequent site visit conducted by Dudek restoration specialists in 2021 and 2022.

2.1 LOCATION AND GEOGRAPHY

The project is located within the eastern portion of San Pasqual Valley in the City. A significant portion of the San Pasqual Valley, including the Santa Ysabel Creek Project Area is owned by the City and is designated as one of the Cornerstone Lands of the City of San Diego's Multiple Species Conservation Program (MSCP; City of San Diego 1997).

The Santa Ysabel Creek Project Area occurs within the Santa Ysabel Creek bed and riparian corridor beginning approximately one-half-of-one mile east (upstream) of the crossing of San Pasqual Valley Road (State Route -78) and extending approximately 2.25 miles upstream to the eastern parcel boundary. The Santa Ysabel Creek Project area is bounded by agricultural lands (Citrus and Avocado Orchards) with San Pasqual Academy located along the southwestern boundary on a San Diego County owned parcel.

2.2 HYDROLOGY/JURISDICTIONAL RESOURCES

The Santa Ysabel Creek Project Area is located within the San Dieguito hydrologic unit (watershed) which comprises approximately 350 square miles. The hydrologic unit includes the San Dieguito River and its tributaries, including Cloverdale, Santa Ysabel, Guejito, and Santa Maria creeks. The Santa Ysabel Creek Project Area is specifically located within the San Pasqual hydrological area and Las Lomas Muertas hydrologic subarea of the San Dieguito hydrologic unit. The watershed level functions include sediment control, nutrient uptake, pesticide uptake, animal waste pollution moderation, and control/uptake of other non-point source pollutants (Poff et al. 2011).

The groundwater basin in the San Pasqual Valley is a significant natural resource that supports the riparian and agricultural areas (City of San Diego 2021). Groundwater is the primary source of irrigation waters for the agricultural operations in the valley, using wells to pump water from the aquifer for use in the fields. Use of groundwater has increased over time as agriculture expanded in the valley. Groundwater is generally of higher quality in the eastern part of the basin due to inflows upstream from Santa Ysabel Creek and of declining quality in the western part of the basin due to increases in salinity and nitrogen from slower basin recovery with streams the cause of the higher salts and nitrates (City of San Diego 2021).

The Santa Ysabel Creek Project Area includes a lengthy reach of Santa Ysabel Creek. The extent of waters of the U.S. delineated within this area is primarily non-wetland and determined by the lateral extent of the active floodplain and ordinary high water mark. The creek channel in the Santa Ysabel Creek Project Area is incised and confined. Wetland waters of the U.S. were only observed within the narrow low flow channel at the east end of the Santa Ysabel Creek Project Area (Figures 2a-c, Jurisdictional Aquatic Resources). The soils in the Santa Ysabel Creek Project Area are comprised largely of deep sands that are well-drained and generally non-hydric. The hydrology of these to reaches is primarily ephemeral surface flows that are of short duration.

Waters of the state and CDFW wetland/streambed include all areas delineated as waters of the U.S. in addition to riparian habitat that occurs on the many low terraces adjacent to the active floodplain and above the ordinary high water mark. City wetlands include all wetland waters of the U.S. and the adjacent riparian habitat areas.

2.3 SOILS

Soil mapping is from the U.S. Department of Agriculture (USDA) Soil Survey Geographic Database (SSURGO) (USDA 2021). Soils within the project area are presented in Table 2. As discussed above, soils in the Santa Ysabel Creek Project Area are comprised largely of deep sands that are well drained and generally non-hydric.

Table 2
Soils within the Restoration Area

Soil Mapping Unit
Cieneba-Fallbrook rocky sandy loams, 30 to 65 percent slopes, eroded
Riverwash
Tujunga sand, 0 to 5 percent slopes
Visalia sandy loam, 0 to 2 percent slopes

Source: USDA SSURGO 2021

2.4 VEGETATION

A total of 12 vegetation communities and land cover types occur within the Santa Ysabel Creek Project Area based on general physiognomy and species composition (Oberbauer et al. 2008). The Santa Ysabel Creek Project Area consists of 10 vegetation communities, and 2 land covers (streambed and disturbed land). Acreages for vegetation communities and land cover types are presented in Table 3, with their spatial distribution presented in Figures 3a-c, Vegetation Communities and Land Cover Types.

Table 3
Vegetation Communities and Land Cover Types within the Santa Ysabel Creek Project Area

Vegetation Communities and Land Cover Types	Total (Acres)
Coast Live Oak Riparian Woodland	2.86
Coastal Sage Scrub	0.23
Disturbed Land	1.56
Disturbed Mule Fat Scrub	5.69
Disturbed Willow Scrub	2.23
Willow Riparian Woodland	2.74
Disturbed Willow Woodland	13.37
Eucalyptus Woodland	2.64
Mixed Chaparral	0.96
Non-native Grassland	5.57
Streambed	14.10
Tamarisk Scrub	1.10
Total	**53.05**

2.4.1 COAST LIVE OAK RIPARIAN WOODLAND

This riparian woodland occurs along terraces adjacent to stream courses. Coast live oak (*Quercus agrifolia*) trees are the primary tree species, although some willow trees may also be present. The understory of this riparian woodland supports mule fat (*Baccharis salicifolia*), toyon (*Heteromeles arbutifolia*), lemonade berry (*Rhus integrifolia*), and various annual grasses such as the non-native ripgut grass (*Bromus diandrus*), slender wild oat (*Avena barbata*), rattail sixweeks grass (*Festuca myuros*), and the perennial native purple needlegrass (*Stipa pulchra*).

Coast live oak woodland is present in the far upstream reach of the Santa Ysabel Creek Project Area on upper stream banks and slopes transitioning from uplands to riparian stream habitat. These areas are generally low in target invasive cover and include infrequent occurrence of salt cedar. Non-native grasses and forbs are common in the understory with perennial tree tobacco (*Nicotiana glauca*) also occurring.

2.4.2 COASTAL SAGE SCRUB

This upland habitat occurs along the higher, drier areas adjacent to the stream courses. It is dominated by a mixture of shrubs comprised primarily of California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*).

Coastal sage scrub is present in the far upstream reach of the Santa Ysabel Creek Project Area and generally low in target invasive cover with infrequent occurrence of salt cedar and eucalyptus. Non-native grasses and forbs are common with perennial tree tobacco also occurring.

2.4.3 DISTURBED LAND

Areas within the study area where disturbance has removed the native vegetation and that are not currently under agriculture were considered disturbed land. These areas include dirt roads, edges of agriculture fields, dirt parking areas, and other disturbed areas.

Disturbed land in the Santa Ysabel Creek Project Area is either devoid of vegetation or supports various nonnative weed species.

2.4.4 MULE FAT SCRUB (DISTURBED)

Dominated by mule fat shrubs, this vegetation type occurs within the Santa Ysabel Creek Project Area on the low terraces adjacent to stream courses and on some mid-channel sandbars. Scattered willow trees can occur with mulefat on the low terraces as well as trees of blue elderberry (*Sambucus nigra* ssp. *caerulea*). Herbaceous species can include cocklebur (*Xanthium strumarium*) and pygmy-weed (*Crassula connata*).

Areas within the Santa Ysabel Creek Project Area are classified as disturbed mule fat scrub. They are open and support a greater number of non-natives included the target invasive species salt cedar, and a larger area of non-native annual species, such as ripgut grass, rattail sixweeks grass, and smilo grass (*Stipa miliacea*).

2.4.5 WILLOW SCRUB (DISTURBED)

Willow scrub within the Santa Ysabel Creek Project Area occurs mostly along the low terraces and on some mid-channel sandbars. This vegetation type is different than mule fat scrub in that it supports more young willow trees and fewer mule fat shrubs. Understory species are similar to that described for mule fat scrub above.

Areas within the Santa Ysabel Creek Project Area are classified as disturbed willow scrub, as they have high numbers of salt cedar trees and non-native annuals, such as ripgut grass and prickly lettuce (*Lactuca serriola*).

2.4.6 WILLOW WOODLAND (DISTURBED)/WILLOW RIPARIAN WOODLAND

This vegetation type occurs along the stream terraces and is dominated by large willow trees, including black willow (*Salix gooddingii*), red willow (*Salix laevigata*), and to a lesser extent arroyo willow (*Salix lasiolepis*). The understory can be comprised of scattered mule fat shrubs, young willow saplings, and an array of herbaceous species such as cocklebur, hoary nettle (*Urtica dioica*), and curly dock (*Rumex crispus*).

Disturbed willow riparian woodland areas are present throughout lower stream terraces for a large percentage of the Santa Ysabel Creek Project Area. These areas have a higher percentage of salt cedar trees amongst patchy mature willows. Other non-native species that occur include eucalyptus trees, Mexican fan palm (*Washingtonia robusta*), and concentrations of poison hemlock (*Conium maculatum*). Perennial pepperweed is a target invasive and was not identified within the San Ysabel Creek Project Area but is present in willow woodland downstream of the project area.

Healthy willow riparian woodland occurs in the upper reaches of the Santa Ysabel Creek Project Area. This area includes a developed willow and western sycamore (*Platanus racemosa*) canopy with only infrequent occurrences of target invasives.

2.4.7 EUCALYPTUS WOODLAND

This vegetation type occurs within upper terraces and upland streambanks and are characterized by dense monotypic stands of eucalyptus trees. These non-native trees have been planted along the edge of agricultural fields and in some places occur as invasive trees within the riparian woodlands and scrubs.

2.4.8 MIXED CHAPARRAL

A relatively small acreage of mixed chaparral vegetation occurs along the higher upland area adjacent to the stream course in the eastern reach of the Santa Ysabel Creek Project Area. This vegetation community supports open stands of laurel sumac (*Malosma laurina*), chamise (*Adenostoma fasciculatum*), and lemonade berry. The understory is dominated by mostly non-native annual grasses such as slender wild oat and red brome (*Bromus madritensis*).

2.4.9 NON-NATIVE GRASSLAND

Non-native grassland vegetation within the survey area supports a dense stand of annual grasses comprised of variable mixtures of ripgut grass, red brome, slender wild oat, rattail sixweeks grass, and foxtail barley (*Hordeum jubatum*). Scattered trees (e.g., non-native salt cedar, native blue elderberry) and shrubs (e.g., native California buckwheat, coastal goldenbush [*Isocoma menziesii*], laurel sumac, mule fat). In the Santa Ysabel Creek Project Area, it occurs on the low terraces adjacent to the stream courses.

2.4.10 STREAMBED

Streambeds within the survey area occur where the flows with the stream courses is sufficient enough to eliminate or restrict the establishment of dense vegetation. These mostly sandy soil areas can support scattered young saplings of mule fat, salt cedar, and willows, but these may be washed away during the next high volume flow event. Larger specimens of these same species can become established on the more stable of the midchannel sandbars. This habitat type is generally more open and has little to no understory than the adjacent low terraces.

2.4.11 TAMARISK SCRUB

Non-native salt cedar trees dominate this vegetation community. Although salt cedar is a target invasive plant present within most of the vegetation communities with the Santa Ysabel Creek Project Area, the larger denser, monotypic stands of salt cedar were mapped as a separate vegetation community.

2.5 SENSITIVE BIOLOGICAL RESOURCES

No special-status plant or wildlife species were observed within the Restoration Plan areas (Recon 2020). A total of 24 sensitive wildlife species have potential to occur within the Restoration Plan area: arroyo toad (*Anaxyrus californicus*), western spadefoot (*Spea hammondii*), least Bell's vireo (*Vireo bellii pusillus*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), northern harrier (*Circus hudsonius*), white-tailed kite (*Elanus leucurus*), Canada goose (*Branta canadensis*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), tricolored blackbird (*Agelaius tricolor*), yellow-breasted chat (*Icteria virens*), yellow warbler (*Setophaga petechia*), Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), coastal California gnatcatcher (*Polioptila californica californica*), coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), western bluebird (*Sialia mexicana*), southern mule deer (*Odocoileus hemionus fuliginata*), cougar (*Puma concolor*), San Diegan legless lizard (*Anniella stebbinsi*), ring-necked snake (*Diadophis punctatus*), two-striped gartersnake (*Thamnophis hammondii*), northwestern pond turtle (*Actinemys marmorata*), and Blainville's horned lizard (*Phrynosoma blainvillii*).

2.6 EXISTING RIPARIAN FUNCTIONS AND SERVICES

Currently riparian habitats within the Santa Ysabel Creek Project Area and in many areas of the greater San Pasqual Valley are degraded by invasive vegetation displacing native vegetation, reducing ecological function that sustains heathy stream systems. Within the San Ysabel Creek Project Area, invasive species that serve as the greatest causes include salt cedar, giant reed and eucalyptus trees.

Invasive perennial species particularly salt cedar and giant reed have modified hydraulic function of the stream channel, which contributes to reduce flood flow capacity, which causes erosion to stream banks and in-channel terraces and can increase downstream sediment transport. Water quality is affected when invasive species displace riparian habitat and native species that contribute to the uptake of nutrients, and combined with modified hydrology, contribute to elevated levels of nutrient and sediment loading downstream in Hodges Reservoir. Degraded riparian habitat also decreases habitat value for resident and migratory wildlife. Additionally, monotypic stands of invasive species, particularly giant reed and eucalyptus increase fire-prone conditions.

In addition to these target invasive species, other perennial and annual non-natives contribute to degraded habitat conditions. Perennial non-natives identified within the Santa Ysabel Creek Project Area include Mexican fan palm, sweet fennel (*Foeniculum vulgare*), castor bean (*Ricinus communis*), poison hemlock, tree tobacco and Peruvian pepper tree (*Schinus molle*). Non-native annual grasses and nuisance forb species common within the Santa Ysabel Creek Project Area include; slender wild oat, ripgut grass, red brome, foxtail barley, smilo grass, Italian thistle (*Carduus pycnocephalus*), bull thistle (*Cirsium vulgare*), stinknet (*Oncosiphon piluliferum*), milk thistle (*Silybum marianum*), Russian thistle (*Salsola tragus*), shortpod mustard (*Hirschfeldia incana*) and sweetclover (*Melilotus* sp.). Perennial pepperweed, a highly invasive species was not identified within the Santa Ysabel Creek Project Area but is present downstream within the San Pasqual Valley.

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3 RESTORATION WORK PLAN

The proposed project includes rehabilitation and enhancement of riparian habitat within the Santa Ysabel Creek Project Area. The restoration work plan focuses on control of target invasive non-native plants and includes the planting and seeding of native species, where appropriate. Santa Ysabel Creek Project Area is identified in Figures 4a-d, Rehabilitation and Enhancement Project Areas.

1. Rehabilitation conducted for areas with heavy infestations of target invasive vegetation and access to sources of supplemental irrigation (habitat rehabilitation treatment areas) will include:
    - Delineating the boundaries of dedicated rehabilitation treatment areas
    - Cutting to grade and treating (as-needed) target invasive vegetation and all additional non-native vegetation, and removal of all non-native biomass
    - Stabilizing erosive slopes with erosion control BMPs, as needed
    - Planting native container plants
    - Seeding with a native seed mix
    - Installing a temporary irrigation system to support installed container plants.
2. Enhancement conducted for areas with heavy infestations of target invasive vegetation, but no access to supplemental irrigation (habitat enhancement treatment areas) will include:
    - Delineating the boundaries of dedicated enhancement treatment areas
    - Cutting to grade and treating (as-needed) target invasive vegetation and all additional non-native vegetation, and removal of all non-native biomass
    - Stabilizing slopes with erosion control BMPs, as needed
    - Installing willow cuttings where conditions support establishment
    - Seeding with a native seed mix

Enhancement conducted for areas with isolated occurrences of target invasive vegetation (Selective target invasive control treatment areas) will include:

- Selective stump-cut treatment and biomass removal of target invasive vegetation in areas with access for biomass removal (vehicular or by hand)
- Selective foliar treatment of target invasive vegetation in areas with limited access or restricted from vehicular use

After initial rehabilitation and enhancement activities, follow-up maintenance and monitoring will be conducted for three years. In order to promote project success, a qualified Monitoring Biologist will be retained to conduct site monitoring and reporting, and to provide recommendations for maintenance for the duration of the 3-year maintenance and monitoring program. Performance standards were developed to ensure successful control of non-native vegetation and to promote establishment of target native vegetation.

3.1 IMPLEMENTATION STRATEGY

The restoration approach shall focus on control of target invasive species and will also provide opportunity for revegetation of native riparian habitats through active and passive restoration techniques within the Santa Ysabel Creek Project Area. The Santa Ysabel Creek Project Area, as well as downstream into the San Dieguito watershed will benefit from control of target invasive species, which will reduce potential for lateral and downstream spread. Habitat rehabilitation treatment areas and habitat enhancement treatment areas also receive removal and follow-up control of all non-natives throughout each treatment areas, which significantly reduces competition for young and developing native riparian species and allows them to gain a 'foothold' in areas previously dominated by aggressive non-native vegetation. Planting and/or seeding will promote native species richness and reduce the likelihood of invasive reinfestation. Willow cuttings will also be utilized for planting in locations with the hydrology to support willow establishment. Seeding and cutting installation also provides soil stabilization for stream banks and terrace habitat susceptible to erosion. In combination with container planting, which is proposed for habitat rehabilitation treatment areas, a significant lift of ecological function is expected through repair of degraded habitats, particularly for active restoration areas that combine revegetation with non-native plant control.

Riparian planting and seeding proposed includes a combination of appropriate native herbaceous ground cover, woody shrubs and overstory canopy species typical of healthy riparian and transitional upland habitat located within Santa Ysabel Creek. Plant and seed palettes were designed to provide a treatment application tailored to the existing hydrological requirements, and existing native species present in enhancement and rehabilitation areas.

Following successful non-native species removal and planting, a 3-year maintenance and monitoring program will be conducted to ensure control of non-native vegetation and promote establishment of native riparian vegetation. Control will consist of follow-up treatment for resprouts from cut stumps remaining from removed invasive species, and spot spray of foliar treated species and non-native seedlings. Early and regular treatment is recommended to reduce competition from new growth and to deplete weed seed in the on-site soil. Installed

container plants will be monitored and watered for an initial period to promote establishment, then slowly weaned from irrigation to adapt to natural environmental conditions.

The maintenance period will address the resilient nature of invasive and non-native vegetation through follow-up treatments effecting a kill on resprouts from resilient cut stumps and foliar treated individuals, and non-native seedling germination, which will decrease the dominant non-native seed bank as the project progresses. Initial removal and focused control of non-native vegetation reduce competition for young natives and allow them to gain a 'foothold' and grow to maturity in areas previously dominated by aggressive invasive vegetation. Planting and seeding will promote native species richness and reduce the likelihood of invasive reinfestation.

3.2 PROJECT SCHEDULE

Upon appropriate approvals, the enhancement and rehabilitation program is anticipated to begin in the summer or fall of 2022, with initial work completed prior to the rainy season, where creek flows may limit access. Work may begin prior to the conclusion of the breeding/nesting bird season if a qualified biologist verifies absence of active nests. Prior to work, the City, Monitoring Biologist, Restoration Contractor and current agricultural lessee will review the restoration approach and all access points, staging areas, and irrigation points of connection and irrigation water tank storage locations proposed in the implementation plan documents. With City and lessee approval, the Monitoring Biologist in coordination with the Restoration Contractor will verify all locations for non-native and invasive vegetation removal and work area perimeters. Container plant contract grow agreements and reservation of native seed will be coordinated with the City, Monitoring Biologist and Restoration Contractor during the summer prior to planting (2022).

The initial implementation phase will consist of target invasive and non-native vegetation removal and control for all areas of the Santa Ysabel Creek Project Area. The initial implementation phase will also include clearing and hauling offsite trash and inorganic debris from dedicated enhancement and rehabilitation areas, and installation of perimeter controls (if necessary and where appropriate), a temporary irrigation system and site stabilization BMPs. The Restoration Contractor will develop and maintain a work phasing plan to schedule restoration plan implementation tasks in areas and times outside of periods of active agricultural operations (Section 3.4.2).

With completion of planting and seeding, a 120-day plant establishment period and start of the 3-year maintenance and monitoring period will be implemented. Contractor maintenance and biological monitoring will be conducted on a regular basis though the conclusion of the 3-year maintenance and monitoring program. A preliminary project schedule is shown in Table 4.

Table 4
Preliminary Project Schedule

Task	Date
Generation and approval of implementation plan documents	Summer 2022
Gain approval from Lessees for access points and use of well water	Summer 2022
Contract grow agreement with outside native nursery/Reserve seed with supplier (As needed)	Summer 2022
Submit Work Plan to Regulatory Agencies for Fall 2022 work	July 15, 2022
Site preparation (Project delineation and fencing/staking installation)	Summer-Fall 2022
Initial invasive/non-native plant removal and control	Summer-Fall 2022
Collection/installation of cuttings, container plant installation, and seed application (December 15-March 15)	Winter 2022-Early Spring 2023
120-day post-installation plant-establishment period	Winter/Spring 2023
3-year maintenance and monitoring program (includes 120-day post-installation plant-establishment period)	Winter 2023–Winter 2026

3.3 IMPLEMENTATION PLAN DOCUMENTS

Following approval of this Plan, detailed restoration implementation plan documents will be prepared to guide contractor work. The implementation plan documents will include drawings and specifications for site preparation, invasive vegetation treatment and removal, temporary irrigation system installation, and container planting and seeding. The implementation plan documents will conform to all aspects of this Plan and specific conditions required by the City and regulatory agencies. Implementation plan documents will incorporate the most current site condition information available. The final implementation plan document package shall be submitted for City approval prior to work. Plan drawings will include a site layout showing the proposed Santa Ysabel Creek Project Area depicted as invasive removal plans, irrigation plans, planting plans, and supporting details, notes and legends.

3.4 IMPLEMENTATION PLAN

3.4.1 SITE ACCESS AND STAGING AREAS

The City, Monitoring Biologist and Restoration Contractor will coordinate all site access and work on leased lands with the current agricultural lessee. All work areas, access routes and staging areas proposed in this plan, the implementation plan documents or information to be further negotiated

will require review and approval by the current agricultural lessee in consultation with the City prior to implementation. Access routes for vehicles and equipment (including ATVs and rubber-tracked vehicles), and current proposed staging areas on and adjacent to existing agricultural roads are shown in Figures 4a-d.

All equipment storage and staging will be conducted in non-habitat areas, which include disturbed or unvegetated lands (roadsides, shoulders, agricultural staging areas, and areas with bare compacted soil) identified as appropriate by the current agricultural lessee. Access routes and staging areas, as depicted were selected to avoid disturbance to agricultural operations, but may be revised based on Restoration Contractor requirements for additional site access or to accommodate current agricultural operations. Revisions will be subject to the approval of the City in conjunction with the current agricultural lessee.

To minimize impacts to agricultural lands and native habitats, the San Dieguito River Trail – San Pasqual Valley Staging Area and adjacent County lands at the San Pasqual Valley Academy may be utilized as temporary Restoration Contractor worker parking, and equipment staging and work areas (Figures 4a-b). The San Pasqual Valley Staging area is on public-accessible land and outside of the project site, so overnight use will require exclusion fencing, and may only be appropriate for temporary stockpile of removed invasive biomass. Areas appropriate for use on the San Pasqual Valley Academy parcel are currently directly adjacent to Plan areas and may be utilized for long-term storage and active work areas. The use of these sites will require pre-approval from the City and an encroachment permit from the County.

Additional access routes required through disturbed habitats within or directly adjacent to Santa Ysabel Creek shall require pre-approval from the Monitoring Biologist on a case-by-case basis. Prior to work, the Monitoring Biologist is required to flag routes that minimize impacts to existing native vegetation. Existing access trails shall be used for the majority of work, particularly for equipment needed during initial non-native vegetation removal and hauling. All work requiring equipment will be performed between September 15th and March 15th to comply with nesting/breeding bird restrictions. No heavy equipment greater than 20,000 lbs. will be used within habitat areas. No vehicles or equipment are allowed to work within the streambed, which is under the jurisdiction of USACE.

The Restoration Contractor shall be required to maintain all utilized access roads to pre-restoration project conditions for the duration of implementation and through completion of the 3-year maintenance period. The restoration contractor may be required to periodically regrade surfaces smooth, fill potholes or install additional BMP erosion control devices if road or staging area surface conditions degrade from increased vehicular use or specifically, material hauling.

The Restoration contractor is required to provide active dust control during all operations, as needed. Access roads and staging areas shall require regular watering to prevent fugitive dust, as well as vehicle operations within habitat areas. Non-vehicle work that generates dust shall also be required for dust control. Access for dust control water and low-volume construction water shall be provided by the current agricultural lessee.

Impacts to native habitats from temporary access routes shall be revegetated at the completion of the implementation phase, in accordance with this plan. Revegetation will include a minimum of native seeding from seed mixes listed in Section 3.4.6.2. Additionally, upon completion of the implementation phase and again at the conclusion of the restoration project, condition of all utilized roads and staging areas shall require the inspection of the City and current agricultural lessee to confirm adequate repair to pre-restoration project conditions.

3.4.2 WORK PHASING PLAN

The Restoration Contractor will develop and maintain work phasing plan to allow agricultural operations, including harvest and crop maintenance requirements to remain unencumbered during restoration plan implementation. This may include redirecting restoration activities including initial treatment, non-native vegetation/debris removal and haul off, or revegetation installation (irrigation and planting) away from areas of active agricultural operations, temporarily reducing crew sizes, or temporary restrictions on use of specific access roads or staging areas. The work phasing plan will be a living document that will be regularly updated based on operation scheduling requirements of the lessee. The Restoration Contractor, lessee, City and Monitoring Biologist will review and approve revisions to the work phasing plan during regular project management meetings.

3.4.3 EXISTING RESOURCE AVOIDANCE AND MINIMIZATION MEASURES

For the duration of Project, impacts to sensitive biological resources such as nesting birds, native vegetation mapped for avoidance, cultural resources, and jurisdictional waters shall be avoided, or minimized, as practicable. Impacts are anticipated to be minimal and temporary. General measures in accordance with the CDFW SAA and MND are listed below. See Section 4.1.1 and Appendices A and B for specific avoidance and minimization measures for work conducted, as defined in this plan.

- All project personnel shall be required to attend a pre-project environmental training that provides an overview and understanding of all avoidance and minimization measures required of the project permits
- All applicable permits shall be kept on site and be available at all times of active work.

- All initial clearing, cutting, and removal of existing vegetation shall occur September 16 through March 15, outside the avian breeding/nesting season Treatment of woody resprouts and new seedling germination is allowed during the breeding/nesting season (March 16 through September 15), only if a qualified biologist (monitoring biologist) conducts a pre-clearing survey 1-3 days before work and confirms the absence of breeding/nesting birds and only in areas without suitable vegetation structure for nesting.
- One day prior to a predicted rain event, the Restoration Contractor shall completely secure all work areas, so no materials can enter or be washed into the stream. During times of precipitation, no work may occur, unless related to stormwater controls.
- The removal of soil, native vegetation and native vegetative debris from all state and federal jurisdictional areas is prohibited.
- Prior to work. the perimeter of designated enhancement and rehabilitation treatment areas shall be adequately flagged (staked) and verified by the Monitoring Biologist to prevent damage to adjacent habitat.
- The Monitoring Biologist shall be on site as needed during project activity to assure that impacts to native riparian habitats are minimized. When mechanized equipment is used, there shall also be an additional person present acting as a spotter for the equipment operator. The Monitoring Biologist and the spotter shall have the authority to stop the equipment operator if necessary.
- No vehicles shall be operated within the federal jurisdictional waters and/or wetlands. Vehicles can only operate in CDFW jurisdiction if used to carry equipment and transport cut vegetation. All vehicles shall use existing roads for access to the sites; and standard pneumatic rubber-tired all-terrain vehicles (ATV's) may be used where existing road access is not available, provided that such ATV's can access without entering federal jurisdictional wetlands or waters. Approved vehicles shall only operate in open areas. No woody vegetation (>1” DBH) will be cleared of driven upon
- The Monitoring Biologist shall actively monitor all vehicle operation when conducted directly adjacent to federal jurisdictional waters and/or wetlands. The Monitoring Biologist shall install clearly visible flagging or staking, as needed along the limits of federal jurisdictional waters and/or wetlands to avoid encroachment.
- If any wildlife is encountered during the course of the project activities, said wildlife shall be allowed to leave the Santa Ysabel Creek Project Area unharmed and shall be flushed, hazed, or herded in a safe direction away from the project sites.

- No equipment shall be operated in areas of ponded or flowing water, except as otherwise specified in this CDFW Streambed alteration agreement or MND.
- Staging/storage areas for equipment and materials shall be located outside of CDFW jurisdictional habitat.
- Access to the work sites shall be via existing access roads.
- Any equipment or vehicles driven and/or operated within or adjacent to the CDFW jurisdictional habitat shall be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life.
- No equipment maintenance shall be done within or near any stream channel where petroleum products or other pollutants from the equipment may enter these areas under any flow.
- The clean-up of all spills shall begin immediately upon observation of the spill. The City and Monitoring Biologist shall be notified immediately and in turn notify CDFW of any spills and shall be consulted regarding clean-up procedures.
- All contractors, subcontractors and employees shall comply with all litter and pollution laws
- No debris, soil, silt, sand, bark, slash, sawdust, rubbish, waste, cement or concrete or washings thereof, asphalt, paint, oil or other petroleum products, or any other substances/materials associated with any project-related activity shall be allowed to contaminate the soil and/or enter or be placed where they may be washed by rainfall or runoff into the stream channel.

3.4.4 SITE PREPARATION

3.4.4.1 Fencing and Barriers

Prior to work, the Monitoring Biologist shall flag the perimeter of all rehabilitation and enhancement treatment areas. The Restoration Contractor shall mark with lathe stakes to delineate treatment area boundaries. Perimeters adjacent to agricultural operations and access roads will be staked with t-posts and natural fiber rope (Hemp/manila). Temporary fencing shall remain in place for the duration of the maintenance and monitoring period. Enhancement locations through selective invasive species control will not be staked or fenced. Prior to implementation, areas designated for rehabilitation and enhancement shall be reviewed and verified by the Restoration Contractor and Monitoring Biologist. All project perimeter t-post fencing shall be temporary and removed at the end of the restoration program.

Tree trunks (main stem segments) between 24”-36” in diameter may be salvaged from the eucalyptus removal operations (See Section 3.5.4 Invasive Vegetation/Weed Removal) and laid on the top of slope for use as barriers to deter entry into restoration areas or for blocking access onto unauthored creek crossings. The Monitoring Biologist, in consultation with the City will identify locations for placement, if needed.

3.4.4.2 Erosion Control and Streambank Stabilization

Applicable erosion-control measures in the form of BMPs shall be installed, as necessary during plan implementation. BMPs shall be used in conjunction with native seeding, planting or cuttings to stabilize existing eroded streambanks or to prevent erosion in work areas where vegetation removal may destabilize native soils. No non-native mulch will be used.

BMPs may include manufactured products, including fiber rolls (straw wattles), gravel bags, silt fencing, straw/coir blankets, which are considered temporary measures to provide short-term protections. The use of seeding, container planting and installation of willow cuttings will be used as necessary to provide long-term stability through deep rooting and surface soil protection. As soil disturbance is anticipated to be minor, BMPs shall be implemented throughout work areas in quantities and design as necessitated by grade and conditions.

BMPs (excluding silt fencing) shall be constructed from biodegradable material and be 100% certified weed-seed free. If the use of non-biodegradable materials is unavoidable due to availability or necessity of function, all non-biodegradable materials shall be completely removed from the site when they are no longer required to provide stabilization or at the end of the 3-year maintenance period.

3.4.4.3 Project Signage

No signage is proposed for the work area perimeters

3.4.5 INVASIVE VEGETATION/WEED REMOVAL

For habitat rehabilitation treatment areas and habitat enhancement treatment areas, a comprehensive non-native vegetation removal and treatment program will be conducted prior to planting and seeding. For the remainder of the Santa Ysabel Creek Project Area, in-place treatment and/or removal will be for all target invasive vegetation including salt cedar, giant reed, eucalyptus trees and perennial pepperweed. For rehabilitation and enhancement treatment areas, the initial treatment phase includes the physical removal and clearing of all non-native vegetation, with stumps cut and treated in place for target invasive species. For selective target invasive control

treatment areas, all target invasives will be treated, with the majority cut to grade and removed from the site. Herbicide retreatment shall be conducted at an appropriate interval to affect a kill on resilient perennial tree species and substantially deplete the existing on-site weed seed bank. All follow up treatment shall be conducted within an appropriate interval to prevent the development of non-native biomass that may serve to support nesting birds.

Non-native vegetation treated in habitat rehabilitation treatment areas and habitat enhancement treatment areas shall include all invasive and nuisance annual and perennial vegetation, as well as any ornamental trees, shrubs or herbaceous plant material that has naturalized on site. Work during the initial non-native vegetation removal phase will consist of hand removal, chemical treatment, and mechanical removal, or a combination of these techniques. Removals during the initial implementation phase is considered a first step in overall non-native vegetation control, with follow-up control conducted for the 3-year maintenance and monitoring program (discussed below) for species that are resilient and require repeated treatment to effectively control, and species that easily regenerate from seed or remaining root or stem segments. All pulled and cut non-native vegetation must be completely removed from the site and disposed of at an appropriate green waste or landfill facility pre-approved by the City.

Target invasive species including salt cedar, giant reed and eucalyptus have a well-developed root system, so shall be stump-cut to within 6-inches of grade and treated with herbicide. The root ball/rhizome shall remain in place to protect against soil erosion, but in most cases, all above-ground vegetation shall be completely removed from the Santa Ysabel Creek Project Area. Stump treatment is required within the first five minutes of treatment to promote translocation of herbicide into the roots and effect kill.

In isolated selective target invasive control treatment areas where removal off site is impractical. , target invasives will be cut to grade and stump treated, with collected biomass placed outside the stream bed and in areas devoid of native cover, . For eucalyptus, the Monitoring Biologist may select trees to be cut to grade, with the trunk (main stem segments) stripped of branches and laid parallel to the toe of bank slopes to provide slope stabilization. The remaining eucalyptus in isolated locations will be girdled within 24” of the base, treated with an approved herbicide and left standing to provide raptor foraging and nesting habitat until replacement native trees can grow to maturity. The monitoring biologist may choose mature eucalyptus trees in other rehabilitation and enhancement areas to either cut to grade and place for bank erosion control, or girdle and leave standing for raptor habitat.

Prior to work, the Monitoring Biologist will survey the site and flag all trees and woody perennials for in-place treatment, or removal and stump-cut treatment. Additional species may be added (including perennial peppergrass), based on survey results at the time of work

Any additional mature invasive and ornamental trees within habitat rehabilitation treatment areas and habitat enhancement treatment areas shall be removed and receive stump-cut treatment. Species surveyed on site include olive trees (*Olea europaea*), acacia trees and woody shrubs (*Acacia spp.*), evergreen ash (*Fraxinus uhdei*), castor bean and Peruvian pepper tree. Non-native palm species including Mexican fan palm and date palms (*Phoenix sp.*) shall also be cut and removed, but do not resprout so do not require post-cut herbicide treatment.

Following removal from the Santa Ysabel Creek Project Area, all larger-diameter branches from woody plant material shall be chipped (if feasible) unless approved by the Monitoring Biologist (exceptions may include treated tree trunks). Chipped material will not be utilized as mulch for on-site applications due to the large number of non-native plant propagules typically present. All accumulated non-native debris including smaller branches, leaf litter and palm fronds shall be disposed of with collected non-native herbaceous material. Large eucalyptus tree trunks (main stem segments) may be used as barriers, as discussed above (Section 3.4.4.1 Fencing and Barriers).

Pampas grass shall be physically removed from the site. Pampas grass shall be either cut to within 12 inches of grade or treated with herbicide and the remaining stump removed after plant has been weakened from herbicide; or whole plants, including the root ball physically removed. Seed heads (plumes) shall be cut, bagged, and disposed of separately, prior to vegetation removal. Bagged seed heads shall be removed from all areas of the site, including from areas approved for treated vegetation left in place.

Perennial pepperweed shall be treated per the measures listed in the MND. Generally, perennial pepperweed will be treated in place with an appropriate systemic herbicide with all seed heads bagged and disposed of separately, prior to treatment. Bagged seed heads shall be removed from all areas of the site, including from areas approved for vegetation left in place.

Herbaceous non-native annuals and dead standing biomass shall be removed by hand or by string trimming (weed whipping) in habitat rehabilitation treatment areas and habitat enhancement treatment areas. The use of string trimmers will only be used if pre-approved by the Monitoring Biologist on a case-by-case basis. String trimming will only be allowed for areas dominated by dense non-native biomass to avoid collateral impacts to native seedlings, and in areas where non-native biomass is lacking viable seed to avoid dispersal from mechanical action. All accumulated biomass shall be collected, bagged and completely removed from the site.

Guidelines for non-native control and removals and requirements for herbicide application are included in Section 4.1.1 Non-Native Plant Species Control, and the CDFW SAA and MND (Appendices A and B).

3.4.6 IRRIGATION

A temporary above-ground irrigation system will be installed in habitat rehabilitation treatment areas to support initial survival and long-term establishment of installed container plants, which benefit from consistent sources of water during the early development period. The irrigation system will be a drip system, providing low-volume application of supplied water to container plants for the first several years of the post-installation long-term maintenance period. The goal of the project is to create native, self-sustaining plant communities. Ideally, irrigation use would be slowly reduced with over time with plant establishment and discontinued before the final year of the maintenance and monitoring period to properly ween plants to ambient conditions.

The temporary aboveground irrigation system for rehabilitation treatment areas consists of a temporary above-ground distribution system with point-source (drip) emitters installed at each plant. Point-source emitters concentrate water to the base of each plant, providing deep soaks and promoting root development and long-term sustainability. All irrigation components will be installed by the Restoration Contractor under the direction of the Monitoring Biologist. All valves, lateral lines and point-source emitters shall be installed and fully operational prior to planting. Pre-soak watering shall be conducted prior to planting to prepare planting basins. The irrigation system will be activated immediately and scheduled for regular watering following planting.

The irrigation system will use an automated controller and programmable valves that would operate independent irrigation circuits, minimizing irrigation maintenance requirements for the site. All irrigation on site would consist of UV-resistant polyvinyl chloride (UV-PVC) or flexible high-density polyethylene (HDPE) tubing staked at grade.

The irrigation water source will be either from existing onsite well water or water brought to the site via tanker truck. Direct connection to existing onsite well water is the preferred source, but truck supplied water will be used if seasonal conditions or agricultural operations limit availability from existing onsite well sources. Water tanks and supplemental booster pumps will be installed at a pre-approved location within close proximity to an existing well water point of connection and allow for access for truck refill along approved access roads.

The system will be operated to provide consistent and regular watering through the plant establishment period. Points of connection will include truck coupling stations to provide direct

watering or for filling storage tanks, which will be tied to the automated system. Additionally, hose couplers will be provided along the system mainline and laterals to also allow for contractor hand-watering to supplement automated operation.

A schematic irrigation layout and water demand calculations will be provided in the Implementation Plan documents and used for planning use for lessee managed well water sources, and trucking water onto the site. The irrigation layout will depict routing of irrigation service lines from points of connection to rehabilitation treatment areas, including a dedicated creek crossing, which will include coupling stations to allow for removal during storm events and periods of extended creek flow. The City, Restoration Contractor and Monitoring Biologist shall work directly with the lessee to determine water scheduling and demand for the duration of the project. Irrigation shall stop at the earliest possible date without risking significant planting mortality. At the end of the plant establishment period, all above-ground irrigation components shall be removed from the site upon request of the City in consultation with the Monitoring Biologist.

3.4.7 PLANTING AND SEEDING

The habitat rehabilitation treatment areas will receive container plants and seeding, with habitat rehabilitation treatment areas receiving seeding. Willow cuttings will be installed in areas supported by natural hydrology. The remainder of the Santa Ysabel Creek Project Area, which receives selective target invasive species removal will not be planted or seeded. Areas of the active channel (USACE streambed) will not be planted or seeded, per the requirements of the MND.

Habitat rehabilitation treatment areas will receive a suite of planting based on local environmental factors including existing native vegetation present and adjacency to the stream channel. A riparian scrub/riparian woodland container plant planting palette and seed mix has been developed for the habitat rehabilitation treatment areas (Table 5 and 6). The riparian scrub/riparian woodland seeding palette will be applied to enhancement treatment areas.

Riparian scrub container plants and seeding will be applied to rehabilitation treatment areas in upper and lower terrace habitats dominated by non-native annual grasses, salt cedar and eucalyptus including areas mapped as non-native grassland, sparsely vegetated willow woodland, tamarisk scrub and eucalyptus woodland. Native species present in these treatment areas are patchy and it includes cover from upland native species and transitional wetland species including mule fat, arrow weed (*Pluchea sericea*) and laurel sumac. These areas are within drier terrace habitats and expected to receive only infrequent inundation during seasonal flooding events. Species selected for the plant palette include a suite of appropriate native plants identified in similar habitat on site. Structure is

intended to develop a patchwork of native vegetation, with a tall shrub canopy dominated by mule fat, coast live oak, blue elderberry and laurel sumac, interspersed with Fremont cottonwood and willows from cuttings. The selected transitional wetland species included in the container plant palette will thrive within the margins of riparian habitats and are resilient to extended drought conditions.

Willow cuttings will be used in in locations where the local hydrology will support establishment without supplemental watering. Willow cuttings will be installed along lower slopes and within lower terrace habitats along the margins of the active channel. Areas will be selected where intermittent creek flow, or ponding and saturated soils persist into the late spring. In addition to providing replacement habitat, willow cuttings are intended to provide stabilization for cleared slopes through rooting and establishment of vegetative biomass to anchor soils and resist erosion.

All seed mixes specified include a combination of quick-germinating native annual species and woody perennial shrub species. The faster-germinating nurse crop species are included to establish rapidly in the presence of suitable soil moisture and provide erosion control. Perennial shrub species will germinate and grow slowly but are expected to provide the majority of long-term habitat composition in the low-shrub vertical strata. Other native species may also encroach into the area from adjacent habitat areas and are expected to contribute additional cover, species richness, and habitat value over time.

3.4.7.1 Plant Palettes

Live propagules will be used in the form of container plants, seed and locally collected willow cuttings. Container planting is intended to provide instant habitat structure through planting of perennial large woody shrubs and trees and is expected to provide the majority of long-term habitat composition, including riparian canopy cover.

Table 5
Riparian Scrub/Riparian Woodland Plant Palette

Scientific Name	Common Name	Size	Spacing (feet on center) and Grouping	Composition
Upper Bench Canopy/Tall Shrub Container Plants (55% Cover at Maturity)				
Baccharis salicifolia	Mule fat	1 gallon	8 (groups of 3)	10%
Malosma laurina	Laurel sumac	1 gallon	15	22%
Quercus agrifolia	Coast live oak	1 gallon (deep pots)	20	3%

Table 5
Riparian Scrub/Riparian Woodland Plant Palette

Scientific Name	Common Name	Size	Spacing (feet on center) and Grouping	Composition
Sambucus nigra spp. *caerulea*	Blue elderberry	1 gallon	15	20%
Lower Bench Canopy/Tall Shrub Container Plants (55% Cover at Maturity)				
Baccharis salicifolia	Mule fat	1 gallon	8 (groups of 3)	30%
Populus fremontii	Fremont cottonwood	1 gallon	20	2%
Pluchea sericea	Arrow weed	1 gallon	8 (groups of 3)	3%
Sambucus nigra spp. *caerulea*	Blue elderberry	1 gallon	15	20%
Lower Bench and Secondary Channels and Swales on the Upper Bench Willow Cuttings[1]				
Salix exigua	Sandbar willow	Field Collected	3 (groups of 5)	N/A
Salix laevigata	Red willow	Field Collected	4 (groups of 3)	N/A
Salix lasiolepis	Arroyo willow	Field Collected	4 (groups of 3)	N/A

[1] Cuttings will be installed, as needed based on appropriate site hydrology, as determined in the field by the Monitoring Biologist

Table 6
Riparian Scrub/Riparian Woodland Seed Mix Palette

Hydroseed Mix			
Botanical Name	*Common Name*	**PLS [1,2]**	**Pounds of Bulk Seed per Acre**
Ambrosia psilostachya	western ragweed	6	1.0
Amsinckia intermedia	Common fiddleneck	29	1.0
Artemisia californica	California sagebrush	10	1.5
Artemisia douglasiana	Mugwort	10	2.0
Artemisia palmeri	Palmer's sagewort	10	1.0
Brickellia californica	*California bricklebush*	3	2.0
Chaenactus glabriuscula	*Common yellow chaenactis*	10	1.5
Eriogonum fasciculatum	Flat-topped buckwheat	5	5.0
Eschscholzia californica	*California poppy*	85	1.0

Table 6
Riparian Scrub/Riparian Woodland Seed Mix Palette

Hydroseed Mix			
Botanical Name	*Common Name*	**PLS [1,2]**	**Pounds of Bulk Seed per Acre**
Festuca microstachys	Pacific fescue	85	3.0
Isocoma menziesii	Coastal goldenbush	15	1.0
Lupinus bicolor	Miniature lupine	90	2.0
Lupinus hirsutissimus	*Stinging lupine*	80	3.0
Phacelia cicutaria	Caterpillar phacelia	80	2.0
Phacelia parryi	*Parry's phacelia*	80	1.0
Muhlenbergia rigens	Deer grass	60	2.0
Sisyrinchium bellum	Blue-eyed grass	80	1.5
Stipa pulchra	Purple needlegrass	75	2.0
Vitis girdiana	Desert wild grape	70	3.0
		Total	**38.0**

1 PLS = Pure live seed (Minimum)
2 In order to achieve the desired percent pure live seed, pounds of seed shall be adjusted if less than specified.

The Restoration Contractor is expected to secure the necessary plant material upon project implementation. The container plant and seed mix order shall require approval of the City and the Monitoring Biologist a minimum of 3 months prior to proposed planting and seeding. All substitutions for type or amount of plant or seed material must be approved by the Monitoring Biologist prior to installation. The Monitoring Biologist may provide substitutions if specified seeds or container plants are not available. Implementation of planting and seeding will require prior approval of the Monitoring Biologist based on success of the initial invasive and non-native vegetation removal.

3.4.7.2 Plant Installation

Container plants shall be provided by a nursery specializing in the propagation of native plants for native restoration, with cuttings collected on site by the Restoration Contractor. All container plants shall be ant-free and weed free. The Monitoring Biologist shall check all container plants for viability and general health and shall inspect for Argentine ant (*Linepithema humile*) and other invasive species infestation upon arrival. All plant materials not meeting acceptable standards shall be rejected.

Container planting shall be conducted in the early-winter through early-spring (December 15th to March 15th) when environmental conditions are optimal and avoiding unseasonably hot and dry weather. Cuttings shall be installed within 5-days of collection, which is anticipated for winter following the start of seasonal dormancy for willow species. Container plant and cutting layout shall require pre-approval of the Monitoring Biologist prior to planting. Locations shall be flagged in the field based on recommended spacing, grouping, and site conditions.

Standard planting procedures shall be employed for installing container plants. Holes shall be dug at twice the diameter of the root ball of the plant and the same depth as the container. Holes shall be filled with water and allowed to drain immediately prior to planting. Container plants shall be installed so that the crown of the plant is approximately 1 inch above grade. Mulch shall be applied around container plants to a diameter of 2 feet, or 1.5 times the drip line of the plant, whichever is greater. Mulch shall be 1 to 2 inches deep and contained to the planting basin. Protective cages shall be required if evidence of excessive browsing is identified on adjacent vegetation, or any indication of browsing herbivores present on site.

Individual cuttings shall be harvested from sandbar, red, and arroyo willow plants located within the Santa Ysabel Creek Project Area or within adjacent areas within Santa Ysabel Creek. Cuttings shall be harvested in the early winter following leaf drop and the start of seasonal dormancy. No more than 5% of plant mass shall be harvested from any existing plant. Live cuttings, approximately 0.75 to 1.5 inches in diameter, shall be cut from live plants and stripped of branches and leaves. Individual cuttings shall be 24-36” inches in length. Cuttings shall be submerged in water and soaked for 3 to 5 days to allow absorption of water, which stimulates root and latent leaf buds and prepare for sprouting. Individual cuttings shall be installed per the requirements of container plants or as supplemental plantings.

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4 MAINTENANCE

The 3-year maintenance period shall be successfully managed to promote growth and long-term viability of target riparian habitats, to obtain a successful kill of initially removed and treated invasive species, and to reduce the reoccurrence of weeds and promote native revegetation. The 3-year maintenance period shall consist of regular weed and target invasive vegetation control, maintaining container plants in healthy condition, irrigation operation and maintenance, site stabilization, maintaining perimeter controls, and general trash removal. Remedial action, including erosion control and replanting may be recommended as a contingency if revegetation does not adequately stabilize surface soils, or plant survival is below an acceptable standard.

4.1 MAINTENANCE SCHEDULE

The 3-year maintenance program shall begin when the installation has been certified as complete by the Monitoring Biologist. Non-native weed and invasive vegetation control are expected to dictate the maintenance schedule initially and taper substantially with effective treatment and native plant establishment.

Site maintenance shall begin immediately with completion of each implementation task and conducted as needed through completion of the 3-year maintenance period. Non-native and invasive plant control is expected to dictate the maintenance schedule during the first few years, and taper substantially with effective treatment, reduction of the on-site weed-seed bank, successful kill of persistent invasive individuals and development of self-sustaining native cover.

Control efforts for annual weeds will be conducted early in the growth phase, which during the annual growing season, which focused during the growing season (November to July), with non-native perennial species requiring treatment year-round. Additional maintenance visits may be required if control is not properly timed with weed growth or if treatment is ineffective. Target invasive and non-native vegetation control visits are expected a minimum of monthly for the first 120-days (four months) of Year 1 reducing to bimonthly for the remainder of the year. Maintenance will be conducted a minimum of quarterly during Years 2 and 3 to treat infrequent occurrences. Additional visits timed with seasonal growth or seed production may be required, as deemed necessary by the Monitoring Biologist or project maintenance needs (e.g., irrigation system or erosion control repair). Monthly inspection during the first four months is primarily to provide maintenance and inspection for container plants during the 120-day plant establishment period and to conduct treatment of quick germinating weeds and invasive species resprouts.

All maintenance performed shall comply with applicable regulatory requirements, such as the Migratory Bird Treaty Act the CDFW SAA and the MND, and state and local regulation for the use of

herbicides. If the Monitoring Biologist determines that certain maintenance activities cannot be performed in compliance with existing regulations, work shall be postponed until conditions allow, or until the restrictive period has ended for the season (Table 7 and 8).

Table 7
Minimum Maintenance Schedule

Maintenance Task	Year 1	Year 2	Year 3
Invasive non-native species control[1]	Bimonthly	Quarterly	Quarterly
Irrigation check and adjustment[2]	Monthly/ Bimonthly[3]	Quarterly	Quarterly
Container plant inspection[2]	Monthly/ Bimonthly[3]	Quarterly	Quarterly
Container Plant Replacement[1]	Fall-Winter Monthly	Fall-Winter Quarterly	Fall-Winter Quarterly
General site maintenance[2,4]	Bimonthly	Quarterly	Quarterly

Notes:

1 Maintenance will be conducted during the approved MND maintenance period listed in Table 8. Additional maintenance outside this period may be recommended due to seasonal growth or seed production, but requires pre-approval with CDFW

2 Conducted year round

3 Monthly for the 120-day plant establishment period and bimonthly for the remainder of Year 1

4 General Site maintenance includes (as needed): erosion control repair, trash and debris removal, perimeter control inspection/repair.

Table 8
Maintenance Schedule per the MND

Task	Maintenance Period
Initial foliar treatment of giant reed, tamarisk, Pampas grass	September 15–mid-December
Eucalyptus treatment and removal of biomass	September 15–January 15
Biomass reduction	Mid-January–March 15
Replacement native container planting	December 15–March 15
Watering[1]	March 15–September 15
Herbicide re-treatments	March 15–September 15
Treatment of perennial pepperweed	April 15–July 30

1 The watering period will be extended for initial plant establishment (Year One following planting) and in cases of seasonal drought conditions during Years Two and Three

4.2 MAINTENANCE ACTIVITIES

4.2.1 INVASIVE AND NON-NATIVE VEGETATION WEED CONTROL

Non-native plant control includes the control and/or physical removal invasive and nuisance annual and perennial vegetation, as well as any ornamental trees, shrubs or herbaceous plant material that has naturalized within designated areas for control. Target invasive species (salt cedar, giant reed, eucalyptus and perennial pepperweed) will be controlled throughout the Santa Ysabel Creek Project Area, with all non-native vegetation controlled in the habitat rehabilitation treatment areas and habitat enhancement treatment areas. Control shall be conducted for the duration of the 3-year maintenance program. A variety of methods shall be used to effectively control non-native plants. The control methods used will vary depending on several variables, including, but not limited to, the particular species targeted for control, the overall area to be treated/removed, the time of year, and the proximity to sensitive resources.

An integrated and adaptive vegetation management approach shall be implemented to effectively control non-native vegetation throughout the Santa Ysabel Creek Project Area. The approach uses a combination of techniques, including hand-removal, mechanical methods, and chemical treatment, to effectively control target non-native vegetation. For long-term success, an adaptive, or flexible and iterative, approach includes Restoration Contractor observation and recommendations by the Monitoring Biologist to promote success of treatment over time and drive management decisions.

Hand-removal/physical extraction of non-native plants shall be used around dense groupings of native species or clusters to be protected in place, amid standing water, or where other control methods are impractical or would cause damage to the native species.

Annual non-native plants shall be targeted for hand removal and be removed before seed-set (spring–summer). Maintenance efforts will be timed with non-native plant life cycles to effectively control prior to seed-set. If hand removal is possible only after seed-set, then seed heads shall be cut off, bagged, and removed from the site prior to biomass removal.

Chemical (or herbicide) treatment shall be used for the highly invasive plants with root systems that make physical removal impractical. Herbicide treatment is also beneficial, as it does not turn up surface soils, exposing buried seed. The Monitoring Biologist will coordinate with the Restoration Contractor/pesticide applicator to identify specific locations where herbicides may be used. Herbicide treatment may follow hand- and mechanical removal activities to increase the effectiveness of subsequent chemical treatment. Herbicide treatment for follow-up treatment shall be limited to brush application or spot treatment with close-radius spot-sprayers or wicking devices to prevent damage to

adjacent native vegetation or overspray into open water. Short-radius sprayer will only be allowed for foliar application, where removal is not practical. Broadcast-spray rigs shall not be used.

In areas where invasive perennial species and naturalized ornamental trees (including eucalyptus) were cut to grade during initial weed control efforts, stump and root sprouting is likely from these resilient species until a complete kill is obtained. Follow-up herbicide treatment shall be conducted regularly with resprouting and before significant biomass is generated that allows treated species to regain strength and vigor.

All non-native vegetation shall be controlled before seed set or shading out emerging natives. In addition to control of non-native annual and perennial plant cover, depletion of the on-site weed-seed bank is encouraged to limit future seed production of persistent non-native species through seasonally timed treatment. All debris and slash generated from non-native vegetation removal activities shall be collected and disposed of offsite in a legally acceptable manner.

During the maintenance phase, non-native invasive vegetation shall be controlled and prevented from growing to the size and structure to support nesting birds. Any initial clearing or removal of accumulated biomass conducted during the avian breeding/nesting season shall require a nesting bird survey conducted by a qualified biologist prior to start of work. See Section 3.4.2, Existing Resource Impact Avoidance and the project permits, for all required avoidance measures.

All herbicide treatment shall be performed in compliance with all applicable federal, state and local laws and regulations, City of San Diego mandated use procedures, general safety precautions, and pesticide label directions.

The Restoration Contractor shall possess a valid California qualified applicator certificate or qualified applicator license, and pest control business license or maintenance gardener pest control business license, as appropriate. The Restoration Contractor shall refer to the specific pesticide label for information on proper timing, application rates, and use restrictions. Should the Restoration Contractor require a specific pest control recommendation for any control effort, the Restoration Contractor shall consult a licensed pest control adviser for a written recommendation. Only herbicides approved by the EPA and CA DPR for use in or around aquatic settings will be permitted within the Santa Ysabel Creek Project Area. The least toxic, effective formulation regardless of derivative, with the lowest amount of material and application frequency required will be selected.

The Restoration Contractor shall comply with standards CDFW has established specific to operations, crew size and seasonal application as they relate to herbicide use, as listed in Appendices A and B.

4.2.2 TARGET INVASIVE AND NON-NATIVE SPECIES

Control of target invasive species including salt cedar, giant reed, eucalyptus and perennial pepperweed is required throughout the Santa Ysabel Creek Project Area for the duration of the project, with control of nuisance non-native perennial and annual species required for dedicated rehabilitation and enhancement treatment area.

For rehabilitation and enhancement treatment areas, aggressive, rapidly colonizing non-native plant species that compromise the quality and functions of natural habitats will be the focus of regular control. Species include those listed on the California Invasive Plant Council's (Cal-IPC) California Invasive Plant Inventory Database (Cal-IPC 2017) throughout the southwestern region of the California Floristic Province as a moderate to high threat of ecological impact to wetland/riparian and upland vegetation communities. Additional species added to the focused list include species listed by Cal-IPC as a limited threat/watch list to wetland/riparian vegetation communities with a potential to occur, or species not listed, but observed naturalized on or adjacent to the site and displacing native vegetation (Table 9). In addition to the target invasive species, some common perennial and annual invasive exotics currently observed within rehabilitation and enhancement treatment areas and expected to require focused control efforts include: Mexican fan palm, Peruvian pepper tree, acacia trees, castor bean, evergreen elm, poison hemlock, sweet fennel, as well as nuisance annual forbs and grasses.

In order to adapt to changing conditions, the Monitoring Biologist may recommend additional non-native species for focused treatment, including species that are not listed by Cal-IPC as invasive if they naturalize on site and threaten the establishment of heathy native habitat.

Non-native plant control includes the chemical treatment and/or physical removal of all perennial and annual non-native vegetation for the duration of the maintenance period. A variety of methods shall be used to effectively control target invasive plants.

Initial control shall include removal of all non-native plants present on site and is discussed in detail in Section 3.4.5, Invasive Vegetation/Weed Removal. As the initial removal phase included mass biomass removal, physical removal during the maintenance phase shall be limited to local removals of quick-growing annual and herbaceous perennial species that are threatening the development of native revegetation.

Table 9
Non-Native/Invasive Species to Control Within Rehabilitation and Enhancement Treatment Areas

Scientific Name	Common Name	Cal-IPC Rating
Annual Non-Native Species		
Brassica nigra	Black mustard	Moderate
Carduus pycnocephalus	Italian thistle	Moderate
Cirsium vulgare	Bull thistle	Moderate
Dittrichia graveolens	Stinkwort	Moderate
Hirschfeldia incana	Shortpod mustard	Moderate
Lactuca serriola	Prickly lettuce	Not Listed
Melilotus sp.	Sweetclover	Not Listed
Salsola tragus	Russian thistle	Limited
Silybum marianum	Blessed milkthistle	Limited
Stipa miliacea	Smilograss	Limited
Festuca myuros	rattail sixweeks grass	Limited
Perennial Non-Native Species		
Acacia sp.	Acacia	Watch List/Limited
Arundo donax	Giant reed	High[1]
Callistemon citrinus	Bottlebrush	Not Listed
Conium maculatum	Poison hemlock	Moderate
Cortaderia selloana	Pampas grass	High
Cynodon dactylon	Bermudagrass	Moderate
Cyperus involucratus	Umbrella plant	Not Listed
Eucalyptus sp.	Eucalyptus	Limited/Watch[1]
Foeniculum vulgare	Sweet fennel	Moderate
Lepidium latifolium	Perennial pepperweed	High
Myoporum laetum	Ngaio tree/myoporum	Moderate
Oncosiphon piluliferum	Stinknet	High
Tropaeolum majus	Nasturtium	Not Listed
Nicotiana glauca	Tree tobacco	Moderate
Olea europaea	Olive tree	Limited
Fraxinus uhdei	Evergreen ash	Not Listed
Phoenix sp.	Date palm	Limited

Table 9
Non-Native/Invasive Species to Control Within Rehabilitation and Enhancement Treatment Areas

Scientific Name	Common Name	Cal-IPC Rating
Pulicaria paludosa	Spanish sunflower	Not Listed
Ricinus communis	Castor bean	Limited
Schinus terebinthifolius	Brazilian peppertree	Moderate
Schinus molle	Peruvian peppertree	Limited
Tamarix ramosissima	Salt cedar	High [1]
Washingtonia robusta	Mexican fan palm	Moderate

[1] Target Species required for treatment throughout the project site

4.2.3 INSECT AND DISEASE MANAGEMENT

The Restoration Contractor shall notify the Monitoring Biologist if plant pests or diseases are identified and consult a licensed Pest Control Advisor if chemicals are necessary for pest control maintenance. Generally, severely diseased plants should be removed and disposed of safely and appropriately without promoting diseases spread, but only as directed by the Monitoring Biologist. Maintaining site health during the monitoring period will be the primary method of avoiding most serious insect and disease problems.

Two invasive shot hole borer (ISHB) beetles, Polyphagous shot hole borer (*Euwallacea sp.* #1) and Kuroshio shot hole borer (*Euwallacea sp.* #5) have been identified in Southern California over the past several years. ISHB target native riparian tree species including western sycamore and willows, as well as a range of ornamental trees. The primary indicators of ISHB include entrance hole borings of approximately 0.85mm in diameter, staining of the wood surrounding the hole, as well as sugary exudate, or gum-like residue. ISHB spreads *Fusarium sp.* fungi that the beetle uses as a food source, which causes Fusarium Dieback (FD) (Eskalen 2017). Advanced FD presents as limbs and trunk sections dying and falling to the ground, and ultimately death of the entire tree (Stouthamer 2017).

It is recommended that if signs of ISHB/FD are identified, the Monitoring Biologist be notified, and measures taken to reduce the impacts of infestation. Management of infested plant material may include complete removal of infected vegetation, and either burning or chipping followed by on-site solarization. It is recommended that no plant material suspected of infestation be hauled off site, as this may spread the ISHB/ FD. Any tools that come into contact with plant material suspected of being infected shall be disinfected with 5% bleach solution, 70% ethanol, 70% isopropyl, or Lysol

spray to prevent the spread of fungus. This includes disinfection from possible contract on a previous site prior to using the tools on this site, as well as after using the tools on infested material from this site.

4.3 CONTAINER PLANT INSPECTION AND REPLACEMENT

Container plant inspection shall be conducted during all regular maintenance visits with remedial action conducted in consultation with the Monitoring Biologist and if needed, replacement conducted during the late-fall or early winter maintenance visits. Container plants shall be inspected for health and evidence of stress from conditions such as lack of watering, over watering, soil disturbance (erosion or animal burrowing), competition from weeds, evidence of disease, or excessive animal browsing.

The Restoration Contactor shall address stressors and the observed effects on plant health directly with the Monitoring Biologist. Early detection and correction will promote plant development and healthy establishment, reducing the likely hood of mortality, which will require replacement. Replacement will be the responsibility of the Restoration Contractor if due to conditions that can be correctable with maintenance or remedial action. Remedial measures to promote successful establishment may include addition of native mulch in the planting basins to increase soil moisture holding capacity, adjusting irrigation timing and duration, repair irrigation line breaks, or installation of protective cages to prevent animal browsing. Evidence of disease, may require specific treatment or complete removal of infested vegetation, as discussed in Section 4.2.3.

4.4 IRRIGATION SYSTEM OPERATION AND MAINTENANCE

As discussed above, the irrigation system will be used to support establishment of native container plants and cuttings in habitat rehabilitation treatment areas. Supplemental irrigation to promote plant establishment will be primarily during the first winter and spring following planting (Year 1) and reduced to only during the drier parts of the year through Year 3. Irrigation may be used during the winter months if natural precipitation is lacking, to help compensate for the lack of rainfall or to support contingency plantings.

Irrigation use will target cessation before the completion of the 3-year maintenance and monitoring period, excepting conditions for implementation of adaptive management activities, as directed by the Monitoring Biologist. Irrigation volume will be gradually reduced over time to acclimate plants to a non-irrigated condition prior to complete cessation of irrigation. Irrigation from June to November may be minimized to allow plants to experience normal drought cycles and to promote appropriate root growth. The Restoration Contractor will maintain the irrigation system at the optimum level of operation. Consultation with the Monitoring Biologist will be necessary to determine operation run times and ultimate cessation.

With use from on-site wells, the Restoration Contractor, Monitoring Biologist and City will maintain regular communication with the agricultural lessee regarding projected supply volumes from well sources in anticipation of limited availability during the summer months or from prioritization from agricultural operations. A switch to truck supplied imported water and on-site tank storage may be required if well water is limited or unavailable for a portion or all of the irrigation period.

All aboveground components and valve boxes will be removed from the site at the end of the maintenance period. Irrigation components such as valves and sprinkler heads may be salvaged for reuse elsewhere.

4.5 TRASH REMOVAL

Trash and debris shall be removed by hand during regular maintenance visits. Trash and debris consist of all human-generated materials, or debris dumped, thrown, washed, or blown into or left within the rehabilitation site. Trash and inorganic debris washed or blown onto the site shall be removed regularly. Native deadwood and leaf litter of native trees and shrubs shall not be removed and shall be allowed to remain on site to decompose naturally for the replenishment of soil nutrients and minerals. Downed logs and native leaf litter provide valuable microhabitats for invertebrates, reptiles, small mammals, and birds.

4.6 ACCESS CONTROL

All ingress and egress to the Santa Ysabel Creek Project Area requires coordination with the current agricultural lessee. The Restoration Contractor and Monitoring Biologist shall be restricted to approved maintenance roads and maintenance pathways while on leased land, as identified on Figures 4a-d, 'Access Routes') and described in Section 3.4.1, 'Site Access and Staging Areas'. If seasonal agricultural operations require temporary restrictions, the current lessee will provide prenotification, as operations deem appropriate.

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5 MONITORING AND REPORTING

Upon successful completion of restoration installation, as determined by the Monitoring Biologist, the 3-year maintenance and monitoring period will begin. Monitoring shall include biological monitoring visits conducted periodically, as specified below, for the duration of the 3-year monitoring period. Monitoring will be conducted to track project progress and Restoration Contractor maintenance. An annual quantitative assessment will be conducted at the end of each monitoring year to evaluate achievement of established performance standards.

5.1 BIOLOGICAL MONITORING

Biological monitoring will be used to assess presence/reduction of non-native or invasive plant species, seedling recruitment from native seed application and natural sources, trash or debris accumulation, erosion and/or drainage conditions on site, wildlife presence/absence, and condition of perimeter fencing/barriers. The Monitoring Biologist shall conduct monitoring monthly for the first 120-days of the long-term monitoring period (plant establishment period), and quarterly for the remainder of the project.

Cover of target invasive species throughout the site and all non-native vegetation within designated treatment areas shall be determined by visual inspections during all site visits to evaluate effectiveness of treatment. Treatment shall be recommended immediately if detected. Fall monitoring will assess compliance with the annual performance standards and annual maintenance recommendations.

Each visit shall be documented with a site observation report, which shall be provided to the City and the Restoration Contractor. Observations regarding project progress, including deficiencies shall be noted in the site observation report, with accompanying recommendations for maintenance or remedial actions. Photographs taken on site will be included in reports, as needed to document specific site conditions or to illustrate recommendations for site maintenance.

5.1.1 ANNUAL MONITORING ASSESSMENT

Evaluation of native and non-native percent vegetative cover shall be obtained through visual estimation, with counts conducted to determine container plant survival. Container plant assessment in comparison to performance standards shall be conducted by the Monitoring Biologist during the spring monitoring visit.

Permanent photo-documentation points will be established at key locations throughout the Santa Ysabel Creek Project Area to visually document the status of the vegetation on site. The

Monitoring Biologist will designate representative photo-documentation points prior to implementing work and document site conditions at all milestone events including existing conditions prior to program implementation and following initial removals and planting, and at the end of each maintenance year. Photo-documentation will be included in annual reports Additionally, photographs will be taken of any significant management issues or biological observations, including photographs of changing conditions within rehabilitation and enhancement Areas.

5.2 PERFORMANCE STANDARDS

Performance standards were established to adequately evaluate successful implementation of this program, which intent is the control of target invasive species prevalent in the San Dieguito watershed. As this project also intends to increase riparian functions through planting and/or weed control in designated treatment areas, additional performance standards have been included to track progress and Restoration Contractor Performance.

Performance standards will focus on successful control of target invasive species for all rehabilitation and enhancement treatment areas and selective removal areas, with control of all non-natives required for the rehabilitation and enhancement treatment areas, and survival criteria required for planted container plants installed in rehabilitation treatment areas.

Maintaining these standards through the 3-year maintenance and monitoring program will indicate that rehabilitation and enhancement areas are progressing toward the long-term goals of the plan. If efforts fail to meet the performance standards in any 1 year, the Monitoring Biologist may recommend implementation of remedial action the following year to enhance progress to a level of conformance with the original standards. Remedial actions may include replacement container planting, native seeding, or additional non-native and invasive plant control measures. To maintain container plant survival requirements, replacement with native container plants adapted to specific site conditions will be accepted, as recommended by the Monitoring Biologist. Although no performance standards have been developed for overall native cover, the Monitoring Biologist will track native cover establishment and make recommendations for remedial action (i.e., reseeding, additional erosion control) if replacement cover is not adequately protecting the site from localized erosion.

Performance Standards:

- Maintain the Santa Ysabel Creek Project Area free (0% cover) of target invasive vegetation, including salt cedar, giant reed, eucalyptus, and perennial pepperweed

- Maintain container plants at 80% survival through the end of the 3-year maintenance period.
    - Container plants shall achieve 100% survival at the end of the 120-day plant establishment period
    - Any natural recruitment of native species of similar structure and adapted to on site conditions within rehabilitation treatment areas will count towards replacement
    - Survival of cuttings will not count towards overall mortality
- Rehabilitation and enhancement treatment areas shall be maintained below 10% non-native vegetation cover for the duration of the 3-year maintenance period
    - Non-native vegetation is defined as persistent species listed in Table 9.

5.3 REPORTING

5.3.1 INSTALLATION COMPLETION AS-BUILT REPORT

The Monitoring Biologist will generate a brief report documenting successful completion of installation for Santa Ysabel Creek Project Area. This report shall initiate the beginning of the 3-year maintenance and monitoring period. Reports shall include as-built documentation of all treatment areas and summarize revegetation treatment.

The report shall be submitted to the City within 45 days of installation completion and shall include the following:

- Map with established photo-documentation points, the overall project boundary and designated rehabilitation and enhancement treatment areas
- Description of treatment completed for each area, including:
    - Estimate of gross invasive species treated and left standing and treated and removed, by acre
    - Planting palettes by installed species, quantity and container size
    - Acreage of seed mix applied
    - Acreage of all rehabilitation and enhancement treatment areas
    - Any slope/bank stabilization and barrier installation
- Photos from established photo-documentation points prior to implementation and following rehabilitation and enhancement installation

5.3.2 ANNUAL REPORTS

Monitoring reports will be submitted to the City annually for distribution to the applicable regulatory agencies, as needed for the 3-year maintenance and monitoring program. Annual reports outlining the results of the monitoring and maintenance will be generated following the anniversary date of the start of the maintenance and monitoring period. The maintenance and monitoring period will begin upon certified completion of project installation by the Monitoring Biologist.

Annual report will describe the restoration progress of the Santa Ysabel Creek Project Area derived from qualitative field observations. The reports will provide a comparison of annual performance standards with field conditions; identify all shortcomings and recommend additional maintenance or remedial measures necessary for the successful completion of the project. Annual reports also will include the following:

- A list of names, titles, and companies of all persons who prepared the content of the annual report and participated in monitoring activities
- Figures, including photographs from established photo-documentation points, depicting site progress
- Maps identifying monitoring areas, planting zones, and weed removal areas as appropriate
- Percentages of vegetation cover (native and non-native) by visual estimation for each treatment area

6 COMPLETION OF RESTORATION

At the end of the 3-year maintenance and monitoring period, the Restoration Contractor and City shall conduct a site review of the project to confirm that the rehabilitation and enhancement project has met performance goals, access road restoration is adequate, and removal of contractor equipment, fencing or other temporary installed structures is complete. With successful completion of the restoration program, the City may choose to continue periodic weed management to ensure that target invasive, and other persistent non-native vegetation do not recolonize the site.

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7 REFERENCES

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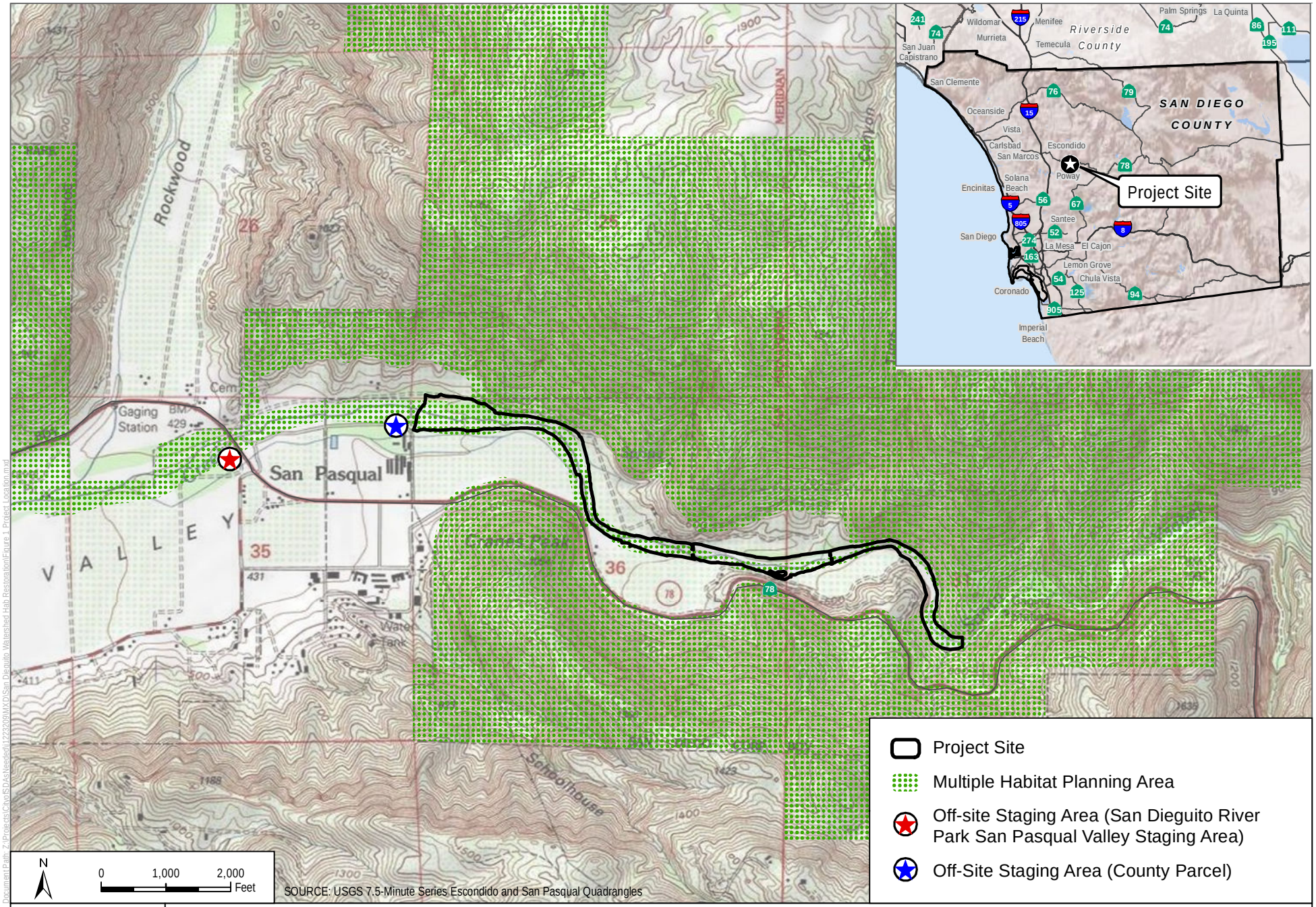

DUDEK

The City of SAN DIEGO

Conceptual Habitat Rehabilitation and Enhancement Plan

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Figure 1 - Project Location

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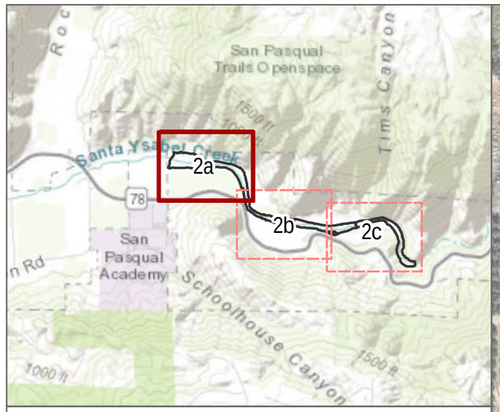

Santa Ysabel Creek Project Site

Existing Jurisdictional Delineation

Federal (USACE)

Non-wetland Water

Wetland

State (CDFW) and City

Streambed

Wetland

SOURCE: JURISDICTIONAL DELINEATION-RECON 2020; AERIAL-SANGIS IMAGERY 2019

N

0 125 250 Feet

Santa Ysabel Creek

78

SAN PASQUAL VALLEY RD

DUDEK

The City of SAN DIEGO

Conceptual Habitat Rehabilitation and Enhancement Plan

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Figure 2a - Federal, State and City Jurisdictional Wetlands and Waters

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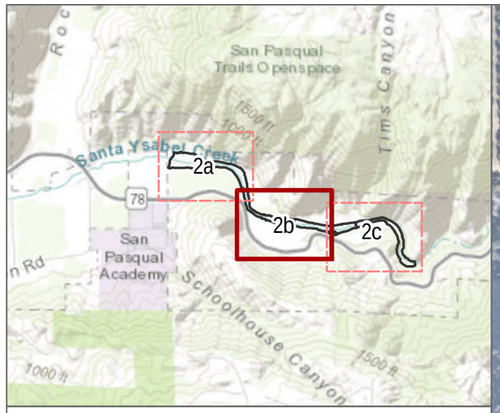

Santa Ysabel Creek Project Site

Existing Jurisdictional Delineation

Federal (USACE)

Non-wetland Water

Wetland

State (CDFW) and City

Streambed

Wetland

SOURCE: JURISDICTIONAL DELINEATION-RECON 2020; AERIAL-SANGIS IMAGERY 2019

N

0 125 250 Feet

Santa Ysabel Creek

78

SAN PASQUAL VALLEY RD

DUDEK

The City of SAN DIEGO

Conceptual Habitat Rehabilitation and Enhancement Plan

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Figure 2b - Federal, State and City Jurisdictional Wetlands and Waters

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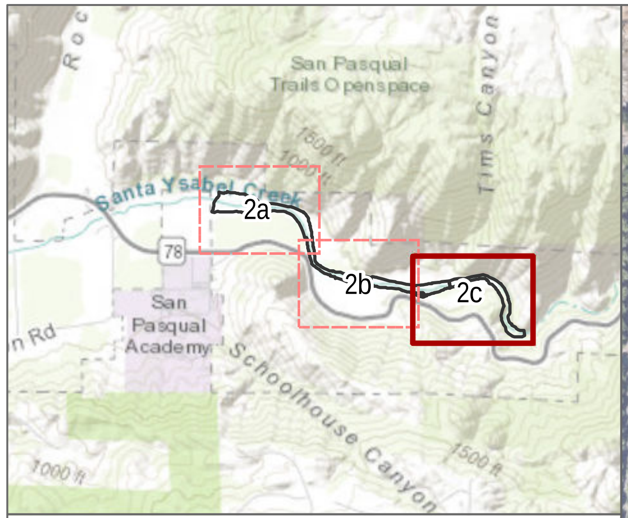


Santa Ysabel Creek Project Site

Existing Jurisdictional Delineation

Federal (USACE)

Non-wetland Water

Wetland

State (CDFW) and City

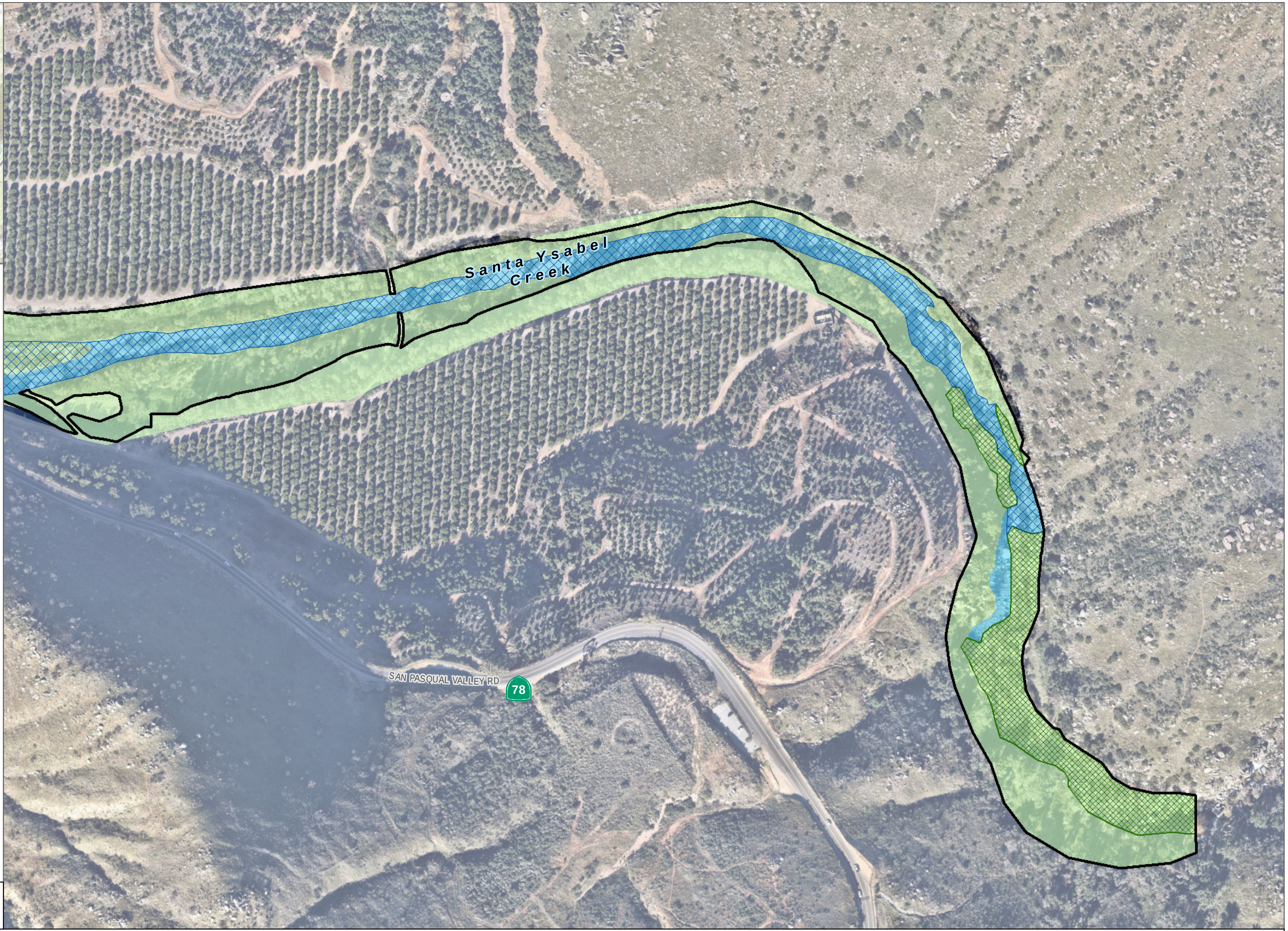
Streambed

Wetland

SOURCE: JURISDICTIONAL DELINEATION-RECON 2020;
AERIAL-SANGIS IMAGERY 2019

N

0 125 250 Feet



DUDEK

The City of SAN DIEGO

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Conceptual Habitat Rehabilitation and Enhancement Plan

Figure 2c - Federal, State and City Jurisdictional Wetlands and Waters

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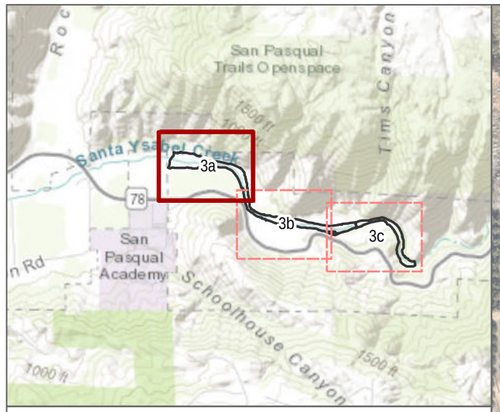

Santa Ysabel Creek Project Site

Vegetation Communities/Land Covers

- Coast Live Oak Riparian Woodland
- Coastal Sage Scrub
- Disturbed Land
- Eucalyptus Woodland
- Mixed Chaparral
- Disturbed Mule Fat Scrub
- Non-native Grassland
- Streambed
- Tamarisk Scrub
- Willow Riparian Woodland
- Disturbed Willow Scrub
- Disturbed Willow Woodland

SOURCE: VEGETATION COMMUNITIES-RECON 2020; AERIAL-SANGIS IMAGERY 2019

N

0 125 250 Feet

Santa Ysabel Creek

78

SAN PASQUAL VALLEY RD

DUDEK

The City of SAN DIEGO

Conceptual Habitat Rehabilitation and Enhancement Plan

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Figure 3a - Existing Vegetation Communities and Land Covers

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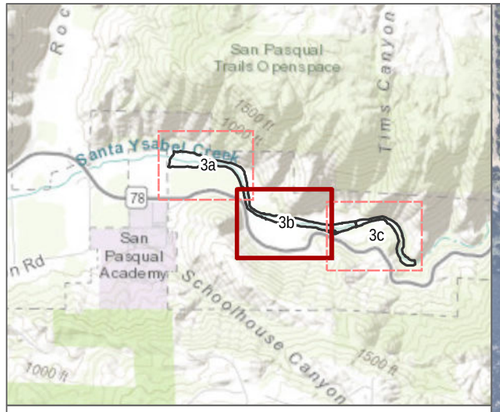

Santa Ysabel Creek Project Site

Vegetation Communities/Land Covers

- Coast Live Oak Riparian Woodland
- Coastal Sage Scrub
- Disturbed Land
- Eucalyptus Woodland
- Mixed Chaparral
- Disturbed Mule Fat Scrub
- Non-native Grassland
- Streambed
- Tamarisk Scrub
- Willow Riparian Woodland
- Disturbed Willow Scrub
- Disturbed Willow Woodland

SOURCE: VEGETATION COMMUNITIES-RECON 2020; AERIAL-SANGIS IMAGERY 2019

N

0 125 250 Feet

Santa Ysabel Creek

78

SAN PASQUAL VALLEY RD

DUDEK

The City of SAN DIEGO

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Conceptual Habitat Rehabilitation and Enhancement Plan

Figure 3b - Existing Vegetation Communities and Land Covers

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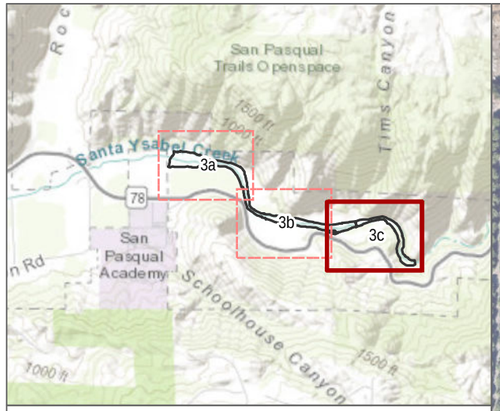

Santa Ysabel Creek Project Site

Vegetation Communities/Land Covers

- Coast Live Oak Riparian Woodland
- Coastal Sage Scrub
- Disturbed Land
- Eucalyptus Woodland
- Mixed Chaparral
- Disturbed Mule Fat Scrub
- Non-native Grassland
- Streambed
- Tamarisk Scrub
- Willow Riparian Woodland
- Disturbed Willow Scrub
- Disturbed Willow Woodland

SOURCE: VEGETATION COMMUNITIES-RECON 2020; AERIAL-SANGIS IMAGERY 2019

N

0 125 250 Feet

Santa Ysabel Creek

SAN PASQUAL VALLEY RD

78

DUDEK

The City of SAN DIEGO

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Conceptual Habitat Rehabilitation and Enhancement Plan

Figure 3c - Existing Vegetation Communities and Land Covers

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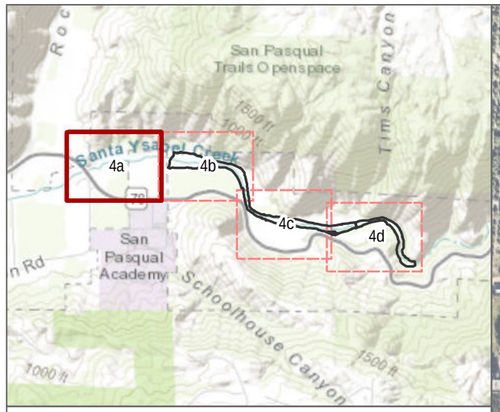

Santa Ysabel Creek Project Site

Off-site Staging Location

Off-Site Staging Area (County Parcel)

Access Route

SOURCE: REHABILITATION/ENHANCEMENT-DUDEK 2021; AERIAL-SANGIS IMAGERY 2019

N

0 125 250 Feet

DUDEK

The City of SAN DIEGO

Conceptual Habitat Rehabilitation and Enhancement Plan

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Figure 4a - Santa Ysabel Creek Rehabilitation and Enhancement Project Site

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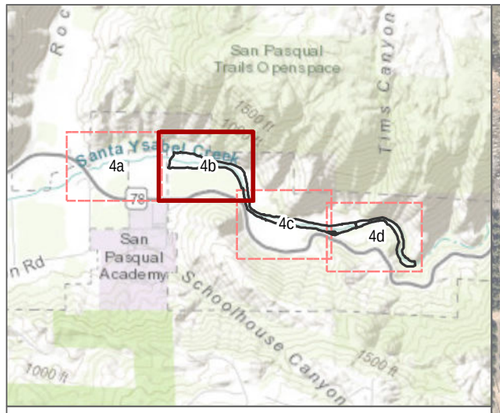

Santa Ysabel Creek Project Site

Temporary Staging and Work Area

Off-Site Staging Area (County Parcel)

Access Route

Habitat Rehabilitation Treat Areas

Riparian Woodland/Riparian Scrub

Habitat Enhancement Treatment Areas

Riparian Woodland/Riparian Scrub

Selective Target Invasive Control Treatment Areas

Enhancement – Treat Invasives in Place (CDFW Only Jurisdiction)

Enhancement – Treat and Remove Invasives (CDFW Only Jurisdiction)

Enhancement – Treat Invasives in Place (CDFW/USACE Streambed)

Enhancement – Treat and Remove Invasives (CDFW/USACE Streambed)

SOURCE: REHABILITATION/ENHANCEMENT-DUDEK 2021; AERIAL-SANGIS IMAGERY 2019

N

0 125 250 Feet

Temporary Staging and Work Area

Off-Site Staging Area (County Parcel)

Santa Ysabel Creek

Temporary Staging and Work Area

Temporary Staging and Work Area

78

SAN PASQUAL VALLEY RD

DUDEK

The City of SAN DIEGO

Conceptual Habitat Rehabilitation and Enhancement Plan

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Figure 4b - Santa Ysabel Creek Rehabilitation and Enhancement Project Site

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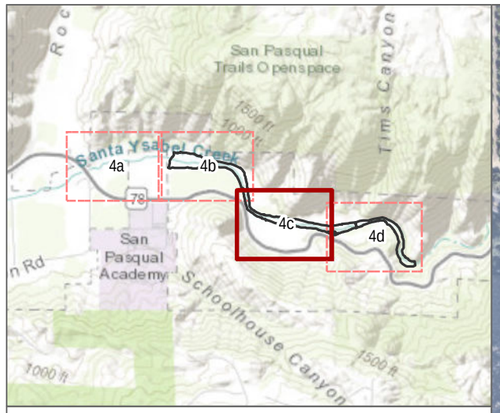

Santa Ysabel Creek Project Site

Temporary Staging and Work Area

Access Route

Habitat Enhancement Treatment Areas

Riparian Woodland/Riparian Scrub

Selective Target Invasive Control Treatment Areas

Enhancement – Treat Invasives in Place (CDFW Only Jurisdiction)

Enhancement – Treat and Remove Invasives (CDFW Only Jurisdiction)

Enhancement – Treat Invasives in Place (CDFW/USACE Streambed)

Enhancement – Treat and Remove Invasives (CDFW/USACE Streambed)

Temporary Staging and Work Area

Santa Ysabel Creek

78

SAN PASQUAL VALLEY RD

SOURCE: REHABILITATION/ENHANCEMENT-DUDEK 2021; AERIAL-SANGIS IMAGERY 2019

N

0 125 250 Feet

DUDEK

The City of SAN DIEGO

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Conceptual Habitat Rehabilitation and Enhancement Plan

Figure 4c - Santa Ysabel Creek Rehabilitation and Enhancement Project Site

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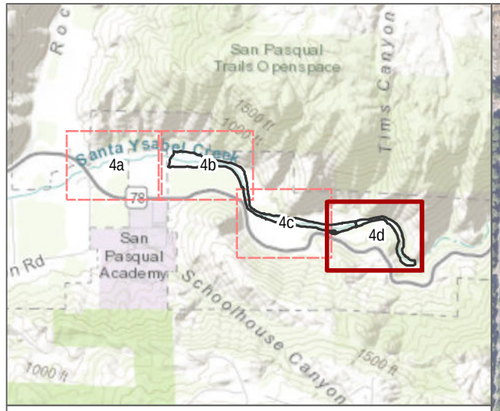

- Santa Ysabel Creek Project Site
- Temporary Staging and Work Area
- Access Route

Selective Target Invasive Control Treatment Areas

- Enhancement – Treat Invasives in Place (CDFW Only Jurisdiction)
- Enhancement – Treat and Remove Invasives (CDFW Only Jurisdiction)
- Enhancement – Treat Invasives in Place (CDFW/USACE Streambed)
- Enhancement – Treat and Remove Invasives (CDFW/USACE Streambed)

SOURCE: REHABILITATION/ENHANCEMENT-DUDEK 2021; AERIAL-SANGIS IMAGERY 2019

N

0 125 250 Feet

Santa Ysabel Creek

Temporary Staging and Work Area

SAN PASQUAL VALLEY RD

78

DUDEK

The City of SAN DIEGO

Conceptual Habitat Rehabilitation and Enhancement Plan

San Dieguito Watershed Habitat Restoration for Ecosystem Service Enhancement Project

Figure 4d - Santa Ysabel Creek Rehabilitation and Enhancement Project Site

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APPENDIX A

Streambed Alteration Agreement #1600-2008-0308-RS

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
www.wildlife.ca.gov

EDMUND G. BROWN, Jr., Governor
CHARLTON H. BONHAM, Director

January 9, 2019

Ms. Shawna Anderson
San Dieguito River Park Joint Powers Authority
18375 Sycamore Creek Road
Escondido, California 92025

Dear Ms. Anderson:

Extension of Agreement Regarding Proposed Stream or Lake Alteration, Notification No. 1600-2008-0308-R5, San Dieguito Invasive Plant Control Project

The California Department of Fish and Wildlife (Department) received your Request to Extend Lake or Streambed Alteration Agreement and extension fee, for the above referenced Agreement. The Department hereby grants your request to extend the Agreement expiration from March 15, 2019, to March 15, 2024. All other conditions in the original Agreement remain in effect.

Copies of the original Agreement and this letter must be readily available at project worksites and must be presented when requested by a Department representative or other agency with inspection authority.

If you have any questions regarding this letter, please contact Kelly Fisher at (858) 467-4207 or kelly.fisher@wildlife.ca.gov.

Sincerely,

Gail K. Sevrens
Environmental Program Manager

State of California – The Resources Agency ARNOLD SCHWARZENEGGER, *Governor*

DEPARTMENT OF FISH AND GAME
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123
(858) 467-4201

August 17, 2009

Ms. Shawna Anderson
San Dieguito River Park JPA
14103 Highland Valley Road
Escondido, CA 92025

Dear Ms. Anderson:

Enclosed is Streambed Alteration Agreement **#1600-2008-0308-R5** that authorizes work on the San Dieguito Lagoon JPA San Dieguito Watershed Invasive Non-native Plant Control Program in San Diego County. This action is authorized under Section 1602 of the Fish and Game Code and has been approved by the California Department of Fish and Game. Pursuant to the requirements of the California Environmental Quality Act (CEQA), the Department filed a Notice of Determination (NOD) on the project on August 17, 2009. Under CEQA regulations, the project has a 30-day statute of limitations on court challenges of the Department's approval.

The Department believes that the project fully meets the requirements of the Fish and Game Code and CEQA. However, if court challenges on the NOD are received during the 30-day period, then an additional review or even modification of the project may be required. If no comments are received during the 30-day period, then any subsequent comments need not be responded to. This information is provided to you so that if you choose to undertake the project prior to the close of the 30-day period, you do so with the knowledge that additional actions may be required based on the results of any court challenges that are filed during that period.

Please contact Tamara Spear at (858) 467-4223 if you have any questions regarding the Streambed Alteration Agreement.

Sincerely,

Stephen M. Juarez
Environmental Program Manger

Enclosure

Revised 11/05

CALIFORNIA DEPARTMENT OF FISH AND GAME
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

Notification No.1600-2008-0308-R5

AGREEMENT REGARDING PROPOSED STREAM OR LAKE ALTERATION

THIS LONG-TERM AGREEMENT, entered into between the California Department of Fish and Game, hereinafter called the Department, and San Dieguito River Park Joint Power Authority (JPA), 14103 Highland Valley Road (858)674-2275 X 13, (Point of Contact: Shawna Anderson), hereinafter called the Applicant, is as follows.

WHEREAS, pursuant to Section 1602 of the California Fish and Game Code, the Applicant, on the 13th day of August, 2008, notified the Department that they intend to divert or obstruct the natural flow of, or change the bed, channel, or bank of, or use material from streambeds located within the San Dieguito River watershed, San Diego County.

WHEREAS, the Department has determined that such operations may substantially adversely affect existing fish and wildlife resources within the San Dieguito River watershed including the following: **Birds -** least Bell's vireo (*Vireo bellii bellii*), yellow-breasted chat (*Icteria virens),* Cooper's hawk (*Accipiter cooperii*), white-tailed kite (*Elanus leucurus*), southwesterm willow flycatcher (*Empidonax trailii extimus*), yellow warbler (*Dendroica petechia*); **Amphibians -** arroyo southwestern toad (*Bufo microscaphus*); **Reptiles -** two-striped garter snake (*Thamnophis hammondii*); **Plants -** San Diego milk vetch (*Astragalus oocarpus*), smooth tarplant (*Centromadia pungens* ssp. *laevis*); and other aquatic and wildlife resources supported by the habitats within the Department's jurisdiction.

THEREFORE, the Department hereby proposes measures to protect fish and wildlife resources during the Applicant's work. The Applicant hereby agrees to accept and implement the following measures/conditions as part of the proposed work. The following provisions constitute the limit of activities agreed to and resolved by this Agreement. The signing of this Agreement does not imply that the Applicant is precluded from doing other activities subject to Fish and Game Code Section 1600 *et seq.* at the site. However, activities not specifically agreed to and resolved by this Agreement shall be subject to separate notification pursuant to Fish and Game Code Section 1600 *et seq.*

If the Applicant's work changes from that stated in the notification specified above, this Agreement is no longer valid and a new notification shall be submitted to the Department. Failure to comply with the provisions of this Agreement and with other pertinent code sections, including but not limited to Fish and Game Code Sections 5650, 5652, 5901, 5931, 5937, and 5948, may result in prosecution.

Nothing in this Agreement authorizes the Applicant to trespass on any land or property, nor does it relieve the Applicant of responsibility for compliance with applicable federal, state, or local laws or ordinances. A consummated Agreement does not constitute the Department's endorsement of the proposed operation, or assure the Department's concurrence with permits required from other agencies.

Term and Effective Date

This Agreement becomes effective the date of Department's signature and project activities will be terminated by March 15, 2019. Any amendment of the termination date shall be by written mutual consent of the Applicant and the Department, and shall be in compliance with the Department's regulations, policies, and procedures in effect as of the date of such amendment.

Extension

The Applicant may request one extension of the Agreement in accordance with Fish and Game Code Section 1605(g); the Applicant shall request the extension of this Agreement prior to its termination. The one extension may be granted for up to five years from the date of termination of the Agreement and is subject to Departmental approval. The extension request and fees shall be submitted to the Department's South Coast Region at the above address, Attn: Streambed Alteration Program – SAA#1600-2008-0308-R5. If the Applicant fails to request the extension prior to the Agreement's termination, then the Applicant shall submit a new notification with fees and required information to the Department. Any construction/impacts that occur under an expired Agreement are a violation of Fish and Game Code Section 1600 *et seq*.

Project Location

The project is located within the San Dieguito River watershed in San Diego County, as depicted in Figure 1, "San Dieguito River Watershed Location and Acreage of Riparian Invasive Non-Native Plants".

Project Description

The Applicant proposes to alter streambeds within the San Dieguito River watershed to accommodate the San Dieguito River Park JPA Invasive Non-native Plant Removal and Habitat Restoration Project. The purpose of the project is to "enhance ecological function" of the San Dieguito River watershed by removing non-native invasive plants including giant reed (*Arundo donax*), tamarisk, (*Tamarisk* sp.), pampas grass (*Cortaderia* sp.), invasive palms, pepperweed (*Lepidium latifolium*), castor bean and eucalyptus. After removing invasive plants, the program also includes replanting the treated areas with appropriate native vegetation. Initial treatment and removal of invasive plants would occur over a period of 5-10 years depending on funding availability. Project activity and work time periods will consist of the following and are

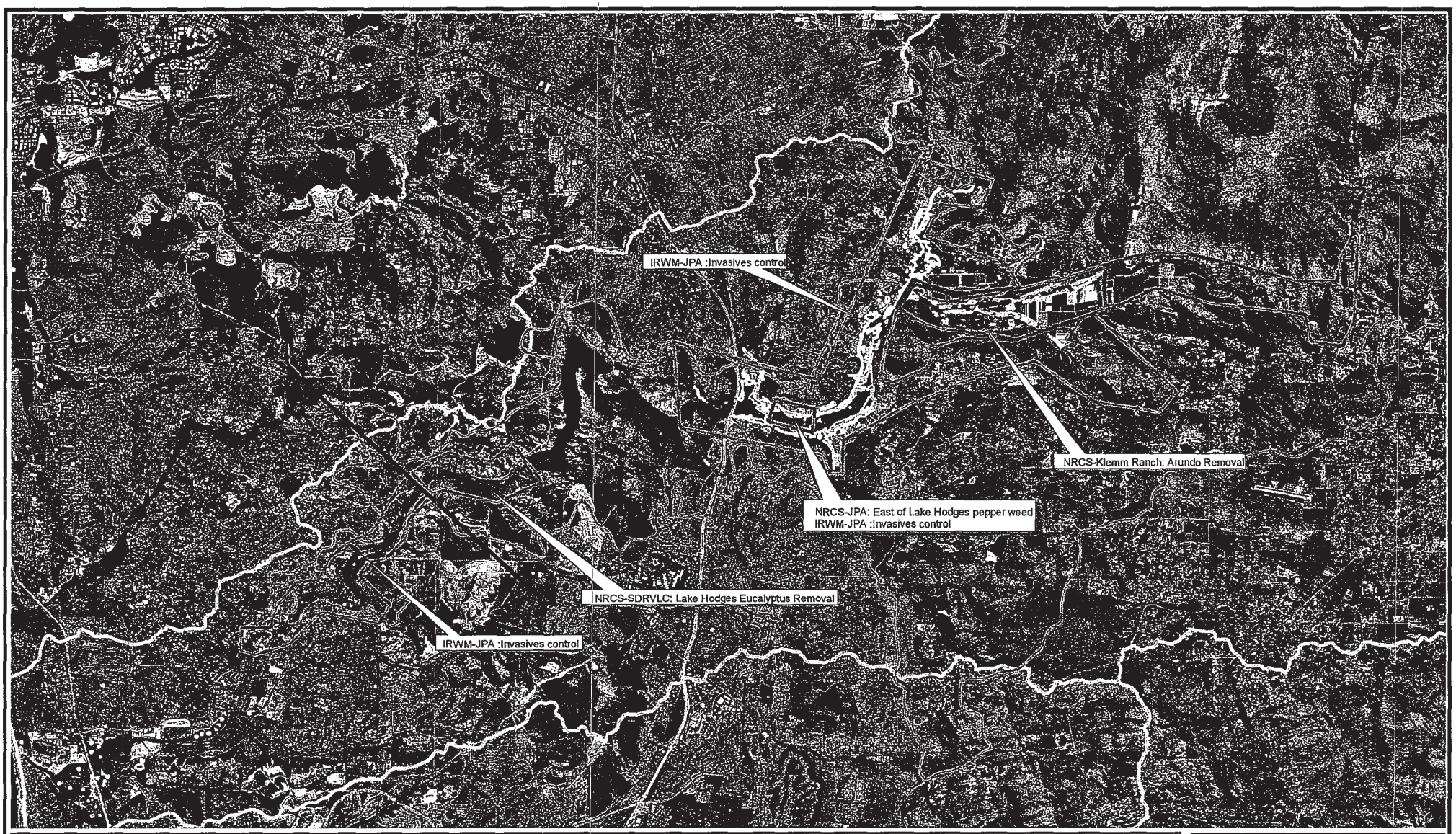

Figure 1. San Dieguito Invasive Plant Control Program: Distribution of Invasive non-native plants. San Dieguito JPA lead (covers multiple restoration projects: San Dieguito Conservancy, County, JPA).

further detailed in the attached Appendix 1:

a) Initial foliar treatment of *Arundo*, tamarisk, pampas grass in the fall - between September 15 and mid-December

b) Biomass reduction – between mid-January and March 15

c) Re-vegetation activities - between December 15 and March 15

d) Maintenance Activities, which includes watering and herbicide re-treatments - between March 15 and September15

e) Treatment of perrenial pepperweed - between April 15 and July 30

f) Eucalyptus Treatment and removal of biomass – between September 15 and January 15

Impacts

Approximately 874 acres of non-native invasive plants will be impacted by the project. Impacts to native vegetation shall be limited to that necessary to gain access to stands invasive non-native plants identified for removal.

Compensatory Mitigation

There is no compensatory mitigation required for this project, however the Applicant shall mitigate at a minimum 5:1 ratio for impacts that occur beyond those authorized by this Agreement. In the event that additional mitigation is required, the type of mitigation shall be determined by the Department and may include creation, restoration, enhancement, and/or preservation.

CONDITIONS

General

1. The agreed work includes activities associated with the Project Location and Project Description provided above. Specific work areas and mitigation measures are described on/in the plans and documents submitted by the Applicant including: "Notification of Lake or Streambed Alteration" dated August 13, 2008; "DFG 1600 Streambed Alteration Permit: Supporting Documents", dated August 4, 2008; a "Mitigated Negative Declaration", SCH #2009051065; and shall be implemented as proposed unless directed differently by this Agreement.

2. The purpose of this Streambed Alteration Agreement is for the Applicant to coordinate and/or oversee an Invasive Plant (predominantly *Arundo* and pepperweed) Removal and Habitat Restoration. The work shall be implemented through contracts with public and/or private licensed herbicide applicators. The Applicant shall be responsible for, and shall oversee the work done by these entities to ensure that the conditions in this Streambed Alteration Agreement are followed.

3. The Applicant shall develop and implement a training program for all project personnel prior to initiation of Project Activities to provide an overview and understanding of all the conditions in this Agreement. All project workers and persons associated with the Project Activities shall attend this training. Personnel that become involved in the Project Activities after the Project Activities have been initiated shall receive the same training before entering the Project site.

4. The Applicant shall provide a copy of the Agreement to all contractors, subcontractors, and the Applicant's project supervisors. Copies of the Agreement shall be readily available at work sites at all times during periods of active work and must be presented to any Department personnel, or personnel from another agency upon demand.

5. The Applicant shall notify the Department, in writing, at least five days prior to initiation of Project activities identifying current treatment areas on a map along with the names of property owners. Notification shall be sent to the South Coast Region office at the above address, Attn: Streambed, SAA#1600-2008-0308-R5.

6. In the event that the project scope, nature, or environmental impact is altered by the imposition of subsequent permit conditions by a local, state or federal regulatory authority, the Applicant shall notify the Department of any imposed project modification that interferes with compliance with Department conditions.

7. This Agreement does not authorize the take of any candidate species or species listed as threatened or endangered under the California Endangered Species Act (Fish

& G. Code, § 2050 *et seq.*). If the proposed work could affect any candidate, threatened, or endangered species, the Applicant shall contact the Department and shall not commence the work without the Department's prior approval.

Time Restrictions

8. To avoid impacts to nesting birds, the Applicant shall conduct project activity within California Department of Fish and Game (CDFG) jurisdictional habitats as outlined in the Project Description of this Agreement, unless otherwise agreed to by the Department.

9. If work is performed within the stream channel during the winter storm period the Applicant shall continually monitor the five day weather forecast. If precipitation is forecasted (>40% chance), the Applicant shall completely secure the site, so no materials may enter or be washed into the stream one day prior to precipitation, unless the Department has provided prior written approval to the contrary. During periods of precipitation, no construction activities may occur; only activities involving the prevention of materials from entering the stream or being washed downstream may be conducted.

Habitat Protection

10. The Applicant shall have a qualified biologist on site as needed during project activity to assure that impacts to native riparian habitats are minimized. When mechanized equipment is used, there shall also be an additional person present acting as a spotter for the equipment operator. The equipment operator, spotter and biologist will use two-way radios to communicate with one another. The biologist and the spotter shall have the authority to stop the equipment operator if necessary.

11. The perimeter of the work sites shall be adequately flagged by a qualified biologist to exclude activities from, and prevent damage to, adjacent CDFG jurisdictional habitat.

Exotic Vegetation Eradication Control

12. As described in submitted documents, the reduced biomass from the treated *Arundo* will be mowed into mulch and left within the original footprint of the treated area. Although a certain amount of mulch may be desirable to reduce erosion, the Applicant shall monitor the treated areas to determine if excessive mulch adversely limits recovery of native vegetation, or is otherwise detrimental to fish and wildlife (biological resources). If it is determined that excessive mulch is detrimental to biological resources, the excessive mulch will be removed and disposed of in a legal manner. In all cases it shall be placed in a manner which prevents its reestablishment in CDFG jurisdictional habitat, and in such a manner so that it does not negatively effect other sensitive native habitat communities

13. The removal of soil, native vegetation, and vegetative debris from the CDFG jurisdictional habitat is prohibited, except as otherwise specified within this Agreement; however, the Applicant may remove all human generated debris, such as lawn and farm cuttings, garbage and trash.

14. All herbicide use conditions for mixing, application, and clean-up shall conform to all applicable federal, State, and local regulations and shall be done by a licensed applicator. Herbicide mixing sites shall be located only in areas devoid of vegetation, and where there is no potential of a spill reaching a vegetated area or a stream, for example, avoid mixing at a storm drain water inlet.

15. No vehicles shall be operated within the stream except as authorized in the Project Description of this Agreement or as follows: vehicles may be used to carry equipment and transport cut vegetation; all vehicles shall use existing roads for access to the sites; truck-based sprayers may be used only where existing roads are adjacent to exotic species and where exotic plants are growing in large clumps with no native vegetation adjacent; and, small soft rubber-tired ATV's may be used where existing road access is not available, provided that such ATV's can access the central channel without entering wetland areas.

16. Truck-based sprayers (herbicide) may be used only where existing roads are adjacent to exotic species and where exotic plants are growing in large clumps with no native vegetation adjacent. Backpack sprayers shall be used in all situations where the exotic plants are growing in small clumps interspersed with the native vegetation, and in those situations where truck or ATV access is limited or impossible.

17. The application of herbicides shall be conducted in such a manner to minimize overspray of herbicide on to adjacent native vegetation (e.g. willow, oak and sycamore) Herbicide shall be applied only on calm days to prevent airborne transfer (drift) of the herbicide. The Department recognizes small individuals of native woody species may inadvertently be damaged during the non-exotic plant removal activity. Should collateral damage occur, native woody vegetation shall be left to re-sprout

18. Any herbicide used where there is the possibility that the herbicide could come into contact with water shall be approved for use in an aquatic environment (*e.g.* Rodeo).

Aquatic and Wildlife Migration Protection

19. If any wildlife is encountered during the course of the project activities, said wildlife shall be allowed to leave the project area unharmed and shall be flushed, hazed, or herded in a safe direction away from the project sites.

Equipment and Access

20. No equipment shall be operated in areas of ponded or flowing water, except as otherwise specified in this Agreement.

21. Staging/storage areas for equipment and materials shall be located outside of CDFG jurisdictional habitat except as described in the project description.

22. Access to the work sites shall be via existing roads and access ramps or as described in the project description.

23. Any equipment or vehicles driven and/or operated within or adjacent to the CDFG jurisdictional habitat shall be checked and maintained daily, to prevent leaks of materials that if introduced to water could be deleterious to aquatic life.

24. No equipment maintenance shall be done within or near any stream channel where petroleum products or other pollutants from the equipment may enter these areas under any flow.

Pollution, Litter and Cleanup

25. The clean-up of all spills shall begin immediately upon observation of the spill. The Department shall be notified immediately by the Applicant of any spills and shall be consulted regarding clean-up procedures.

26. The Applicant shall comply with all litter and pollution laws. All contractors, subcontractors and employees shall also obey these laws and it shall be the responsibility of the Applicant to ensure compliance.

27. Spoil sites shall not be located within a stream, where spoil could be washed back into a stream, or where it could cover aquatic or riparian vegetation.

28. No debris, soil, silt, sand, bark, slash, sawdust, rubbish, construction waste, cement or concrete or washings thereof, asphalt, paint, oil or other petroleum products, or any other substances/materials associated with any project-related activity shall be allowed to contaminate the soil and/or enter into or be placed where they may be washed by rainfall or runoff into a stream or lake. Any of these substances/materials, placed within or where they may enter a stream or lake, by the Applicant or any party working under contract, or with the permission of the Applicant, shall be removed immediately upon observation of their presence. When operations are completed, any excess materials or debris shall be removed from the work area.

Notification and Reporting

29. An annual report shall be submitted to the Department by May 15 of each year for the duration of the Project. The report shall include a map of the treated areas showing the number of acres removed, treated, and re-treated, disposal specifics, the effects of leaving mulched biomass in place and a summary of the general successes and failures of the program. Photos from designated photo stations shall be included as well as GIS maps.

30. Each summer (July 15th) a 'work plan' outlining expected non-native plant control and re-vegetation will be prepared and submitted to the Department. This will allow DFG to remain aware of the intended work program each fall.

31. Pursuant to Fish and Game Code section 1605(g), every four (4) years until this agreement expires the Applicant shall submit a Status Report to the Department no later than ninety (90) days prior to the end of each four-year period. Upon receipt of the Status Report, the Department will contact the applicant to schedule an on-site inspection and meet the requirements specified in Fish and Game Code section 1605(g)(3). Each Status Report shall include the following information:

a) A copy of the original SAA and all amendments thereto;

b) The status of each activity covered by the SAA;

c) An evaluation of the success or failure of the measures in the SAA to protect the fish and wildlife resources that the activities (the SAA covers) may substantially adversely affect;

d) A discussion of any factors that could increase the predicted adverse impacts on fish and wildlife resources, and a description of the resources that may be adversely affected; and

e) Photo documentation consisting of "before and after" photos of areas within the project sites adjacent to habitats where heavy equipment was used to complete the Covered Activity.

32. Immediately notify the Department in writing if monitoring reveals that any of the protective measures were not implemented during the period indicated in this program, or if it anticipates that measures will not be implemented within the time period specified.

33. Immediately notify the Department if any of the protective measures not providing the level of protection that is appropriate for the impact that is occurring, and recommendations, if any, for alternative protective measures.

Administrative

34. The Department reserves the right to suspend or cancel this Agreement under one or more of, but not limited to, the following circumstances:

a. the Department determines that the information provided by the Applicant in support of the Notification/Agreement is incomplete or inaccurate;
b. the Department obtains new information that was not known to it in preparing the terms and conditions of the Agreement;
c. the project or project activities as described in the notification/Agreement change; and
d. the conditions affecting fish and wildlife resources change or the Department determines that project activities will result in a substantial adverse effect on the environment.

Before any suspension or cancellation of the Agreement, the Department will notify the Applicant in writing of the circumstances which the Department believes warrant suspension or cancellation. The Applicant will have seven working days from the date of receipt of the Department's notification to respond in writing to the circumstances described in the notification. Upon receipt of the Department's notification, the Applicant shall cease all project activities specified in the notification and shall not reinitiate them until the Department informs the Applicant in writing that methods and/or measures have been identified, agreed upon, and shall be implemented to adequately address the reasons for the Department's notification.

35. This Agreement may be amended at any time by mutual agreement of the parties. Any amendments to this Agreement shall be made in a separate writing, signed by the parties, and attached to this Agreement. Any approved amendments shall become part of this Agreement.

36. It is understood the Department has entered into this Agreement for purposes of establishing protective features for fish and wildlife. The decision to proceed with the project is the sole responsibility of the Applicant, and is not required by this Agreement. It is further agreed that all liability and/or incurred cost related to or arising from the Applicant's project and the implementation of the fish and wildlife protective conditions of this Agreement, remain the sole responsibility of the Applicant. The Applicant agrees to hold harmless the State of California and the Department against any related claim made by any party or parties for personal injury or any other damages.

37. The Department reserves the right to enter the project site at any time to ensure compliance with terms/conditions of this Agreement.

CONCURRENCE

San Dieguito River Park JPA

Susan A Carter Date: 8/13/09
Signature

SUSAN A CARTER
Printed Name

DEPUTY DIRECTOR
Title

CALIFORNIA DEPARTMENT OF FISH AND GAME

Date: 18 Aug 2009

Stephen M. Juarez
Environmental Program Manager
South Coast Region

Prepared by: Tamara A. Spear, Environmental Scientist

Appendix 1

Various types of work and specific measures:

Initial Foliar Treatment of *Arundo*, tamarisk, pampas grass (excluding pepperweed): Herbicide Application

1) No more then three crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 16 individuals- and no more then five people will be working together at a given spot.
4) Herbicide application will occur with either backpack sprayers (3 gallon) or hand held power sprayers. Power sprayers are moved by ATV's and consist of a small gas powered engine (3 hp) on a trailer with a tank/reservoir (50gal useable volume).
5) To reduce the chance/impact of spillage, work crews can only mix herbicide, refill power sprayers (using concentrate and water: i.e. mixing), load mixed chemical into ATV's (for refilling backpack sprayers or power sprayers), and refuel (ATV's or power sprayer) in staging areas. Mixed chemical (application strength) may be added to sprayers in the field.
6) Staging areas are disturbed sites such as roads, shoulders, graded areas, or sites with compacted soil that support no vegetation or weedy vegetation.
7) Foliar spraying will not occur when ambient wind speeds exceed 5 miles per hour.
8) Crew members will avoid wading through streams whenever possible.
9) Each crew may use up to 2 ATV's (typically one is used- to move mixed herbicide to crews in the field).
10) ATV's will not drive in channel areas.
11) ATV's will operate only in open areas- woody vegetation (>1" DBH) will not be cleared or driven upon.
12) Site preparation is carried out prior to treatment of *Arundo*. Preparation entails separating, or creating a space, between stands of *Arundo* and native vegetation. This allows the *Arundo* to be treated without affecting the native woody vegetation. The space between *Arundo* and native vegetation is created by pushing, detangling and/or trimming the vegetation. Both *Arundo* and native woody vegetation may be trimmed. However, woody vegetation may not be trimmed that is in excess of four inches in diameter. Excessive trimming of *Arundo* is not usually carried out because this triggers re-sprouting which results in a much longer re-treatment cycle (before vegetation removal, see species conservation measures).
13) All regulations involving use of herbicides will be followed including BMP's. All applicators will be licensed and certified. Aquatic herbicide formulations will be used when near open water, including any additives (spreading agents and dye's).
14) A marking dye will be used to assure that drift or overspray onto non-target vegetation is not occurring.

15) All garbage and waste material generated by the work crew will be removed from the site.

Biomass reduction (lowering dead or live *Arundo* cane)

This biomass reduction section pertains to areas below the dam (no arroyo toads). Two areas along creeks may also have reduction- but a site visit and specific authorization will be given when that area is treated.

Large *Arundo* stands (>1/8 acre or >75 feet across) are usually cut or mowed to allow for active native plant restoration and to speed up the decomposition of the dead *Arundo* cane. Scattered smaller stands are left to decompose naturally (they are left standing). Typically all biomass reduction methods are used on sites with large stands of *Arundo* due to factors including: amount and distribution of native woody vegetation, access to the site and site topography, visibility of the site, and input from the property owner.

The normal biomass reduction process is: 1) a large mower mows stands, 2) hand crews cut all Arundo that mowers could not reduce, 3) a smaller mower mows hand cut *Arundo*. Some sites that do not have mowing access may be cut by hand and chipped.

Biomass reduction occurs from mid-January up to March 15th, but most work is completed by late February to allow for replanting. As mentioned previously, some sites may be mowed first (anytime between Sep 15th and January 15th) and then the re-sprouting cane is treated. These sites typically are high fire risk sites- or are sites where immediate biomass reduction is needed.

Mowing:

Mowing is carried out using a fixed tooth or hammer flail mowing attachment mounted on a tractor. The mowing attachment mulches the dead (or live) *Arundo* cane into a layer about 4" thick (thickness varies at site from ½" to 10"). The mowing attachment and tractor do not dig into the soil surface or change topography of the site. All tractors are rubber tired. Several sizes of tractors are used: from a larger 45,000 lb tractor with four large tires (about 56" by 18") with a mowing implement 100" wide to a smaller size 8,000 lb tractor with two large (48" x 16") and two small tires (24" x 12") with a mowing implement 74" wide. Live or dead *Arundo* stands are mowed standing and piles of dead *Arundo* stacked by hand crews are mowed.

1) No native vegetation is mowed.
2) No mowing occurs in the stream channel.
3) No mulched/mowed biomass will be placed in the channel.
4) All mowed material is over previously existing stands of *Arundo*, no open habitat or native vegetation will be covered with *Arundo* mulch.

Cutting by hand crews:

Crews cut dead *Arundo* using chainsaws operated by hand. Hand tools (loppers and machetes)

may be used, but in limited situations.

1) Crews are of 16 or fewer individuals will work in teams of 5 or less. For each team one person cuts and the other team members pull, haul, and stack the cut dead *Arundo* cane.
2) No more than one crew may operate at a given site.
3) No more then three sites may be active on the watershed at once.
4) Crews typically do not use ATV's, but sites far from roads with previously used trails for ATV's (during the fall herbicide application) may re-use these same access routes in open areas. No ATV use can occur in channel areas or in areas with native woody vegetation.
5) Chippers may be used at sites where mowing is not possible due to site topography. Typically this is on tributaries where creeks have deep profiles. Chippers may be staged on roads and may chip material onto disturbed/maintained areas outside the creek profile, chip into areas where *Arundo* previously existed, or ship into containers for hauling off site.

Re-vegetation (native planting) Activities: Between December 15th and March 15th

1) No more then two crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 12 individuals.
4) Each crew may use up to 2 ATV's to move plants from staging areas to planting locations. ATV's typically drive only in areas that have been mowed (on dead *Arundo* mulch) or along established compacted trails and roads. Some sites that are flat and connected to roads, may allow use of a 4 wheel drive truck to access mowed areas and deliver plants.
5) ATV's will not drive in channel areas.
6) ATV's will operate only in open areas, usually on mowed dead *Arundo* mulch- no woody vegetation (>1" DBH) will be cleared or driven upon.

Maintenance Activities (watering and re-treatments): Between March 15th and Sep 15th

1) No more then two crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 6 individuals.
4) No areas may be worked in that have vegetation structure suitable for nesting (work only in mowed areas with new plantings).
5) No powered equipment may be used within the riparian vegetation zone. Watering and treatment with back packs or power sprayers may occur- but all trucks (which have a gas powered pump) will operate along access roads, road shoulders or in staging areas. Only foot crews will enter riparian habitat restoration areas.
6) Avian monitors may be used as requested.

Treatment of Perrenial Pepperweed: Between April 15th and July 30th

1) No more then two crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 8 individuals- and no more then four people will be working together at a given spot.
4) Herbicide application will occur with either backpack sprayers (3 gallon) or hand held power sprayers. Power sprayers will be operated using long lines- with tanks and motors mounted on trucks, trailers (pulled by ATV's), or tractors. Aquatic formulations will be used if standing water is present. Upland formulations will be used in areas away from standing water. All label guidelines will be followed.
5) Trucks and tractors may only use roads and established trails (compacted areas). ATV's may be used in open areas with no woody structure (other then occasional large mature gallery trees that have no low branching structure). Spray rigs may be used on ATV's in some areas where cover is high. Old fields with no native cover may have treatments using tractors or truck mounted spray rigs- but only outside of arroyo toad areas.
6) To reduce the chance/impact of spillage, work crews can only mix herbicide, refill power sprayers (using concentrate and water: i.e. mixing), load mixed chemical into ATV's (for refilling backpack sprayers or power sprayers), and refuel (ATV's or power sprayer) in staging areas. Mixed chemical (application strength) may be added to sprayers in the field.
7) Staging areas are disturbed sites such as roads, shoulders, graded areas, or sites with compacted soil that support no vegetation or weedy vegetation.
8) Foliar spraying will not occur when ambient wind speeds exceed 5 miles per hour.
9) Crew members will avoid wading through streams whenever possible.
10) Each crew may use up to 2 ATV's (typically one is used- to move mixed herbicide to crews in the field).
11) ATV's will not drive in channel areas.
12) ATV's will operate only in open areas- woody vegetation (>1" DBH) will not be cleared or driven upon.
13) Avian monitors will pre-survey pepperweed sites one to three days prior to work. Sites with active vireo or willow flycatcher use will have a monitor on site during work activity and a minimum 100' buffer will be maintained. Any additional conditions requested under FWS Technical Assistance will be followed.

Eucalyptus: Treatment and biomass

1) The eucalyptus control component will be conducted in phases to avoid denudation of 8trees within the stream channel.
2) No more then three crews will be active on the watershed at one time.
3) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).

4) Crew size will not exceed 20 individuals- and no more then five people will be working together at a given spot.
5) Herbicide application is typically cut stump, injection and or girdling. Some smaller class plants may have basal bark treatment.
6) To reduce the chance/impact of spillage, work crews can only mix herbicide, load mixed chemical into ATV's (for refilling backpack sprayers), and refuel (ATV's) in staging areas.
7) Staging areas are disturbed sites such as roads, permanent trails, shoulders, graded areas, or sites with compacted soil that support no vegetation or weedy vegetation.
8) Crew members will avoid wading through streams whenever possible.
9) Each crew may use up to 2 ATV's (typically one is used- to move mixed herbicide to crews in the field).
10) ATV's will not drive in channel areas.
11) ATV's will operate only in open areas- woody vegetation (>1" DBH) will not be cleared or driven upon.
12) A rubber tire skidder will be used to haul cut eucalyptus to the staging area for chipping/masticating.
13) The skidder may only operate in open areas- no removal of native vegetation is permitted. Some smaller class shrubs and sub shrubs may be crushed- these should re-sprout. Re-vegetation of areas used by skidder will restore or exceed density of woody vegetation that existed prior to work.
14) Many areas are not traversable by any rubber tired equipment. Biomass in these areas will be bundled and helicoptered out. Helicopters may not cross power lines. They will deposit cut material along roads, permanent trails, or degraded compacted areas with no native vegetation. Mastication (chipping) of material will then occur at deposition site. Material will be spread on roads, trails, of degraded areas having no native vegetation. This will only occur in areas outside of arroyo toad habitat (areas below dam). Mulched material may not exceed 4" depth.
15) If material is chipped at the Highland Valley Road site, it will be hauled off site or spread on compacted areas (old roads or road shoulders).
16) Larger trees may be girdled or treated by injection and left standing (to leave structure for wildlife). Typically trees over 16" DBH are left standing unless they occur near roads or trails (to leave high canopy and nest cavities for wildlife).

NOTICE OF DETERMINATION

TO: ☒ Office of Planning and Research

For U.S. Mail:
P.O. Box 3044
Sacramento, CA 95812-3044

Street Address:
1400 Tenth Street
Sacramento, CA 95814

FROM: Department of Fish and Game
South Coast Region
4949 Viewridge Avenue
San Diego, Ca 92123
Contact: Tamara Spear
Phone: (858)467-4223

LEAD AGENCY:
San Dieguito River Par JPA
14103 Highland Valley Road
Escondido, CA 92025

SUBJECT: Filing of Notice of Determination pursuant to § 21108 of the Public Resources Code

State Clearinghouse Number: 20090510

Project Title: San Dieguito Watershed Invasive Non-native Plant Control Program

Project Location: San Dieguito Watershed in San Diego County.

Project Description: The Applicant proposes to alter streambeds within the San Dieguito River watershed to accommodate the San Dieguito River Park JPA Invasive Non-native Plant Removal and Habitat Restoration Project. The purpose of the project is to "enhance ecological function" of the San Dieguito River watershed by removing non-native invasive plants including giant reed (*Arundo donax*), tamarisk, (*Tamarisk* sp.), pampas grass (*Cortaderia* sp.), invasive palms, pepperweed (*Lepidium latifolium*), castor bean and eucalyptus. After removing invasive plants, the program also includes replanting the treated areas with appropriate native vegetation. Initial treatment and removal of invasive plants would occur over a period of 5-10 years depending on funding availability. (Streambed Alteration Agreement #1600-2008-0308-R5)

This is to advise that the Department of Fish and Game (DFG), acting as ☐ the lead agency / ☒ a responsible agency approved the above-described project on August 17, 2009 and has made the following determinations regarding the above described project:

1. The project will not have a significant effect on the environment. (This determination is limited to effects within DFG's jurisdiction when DFG acts as a responsible agency.)
2. ☐ An environmental impact report / ☐ A negative declaration / ☒ A Mitigated Negative Declaration was prepared for this project pursuant to CEQA.
3. Mitigation measures ☒ were / ☐ were not made a condition of DFG's approval of the project.
4. A mitigation reporting or monitoring plan ☐ was / ☒ was not adopted by DFG for this project.
5. A Statement of Overriding Considerations ☐ was / ☒ was not adopted by DFG for this project.
6. Findings ☐ were / ☒ were not made by DFG pursuant to Public Resources Code § 21081(a). The Department did, however, adopt findings to document its compliance with CEQA.
7. Compliance with the environmental filing fee requirement at Fish and Game Code § 711.4 (check one):
   - ☐ Payment is submitted with this notice.
   - ☒ A copy of a receipt showing prior payment is on file with the Department.
   - ☐ A copy of the Lead Agency's Certificate of Fee Exemption and De Minimis Impact Finding is attached to this notice.

☐ Lead Agency certification: DFG, as Lead Agency, has made the final EIR with comments and responses and record of project approval, or the Negative Declaration, available to the General Public at the DFG office identified above.

☒ Responsible Agency statement: The final EIR, Negative Declaration or Mitigated Negative Declaration that was prepared by the Lead Agency for this project is available to the General Public at the office location listed above for the Lead Agency. DFG's record of decision is available at the DFG office identified above.

Signature: _____ Date: 18 Aug 2009
Environmental Program Manager

Date Received for filing at OPR:

DFG Rev. 3/2005

CALIFORNIA DEPARTMENT OF FISH AND GAME
AGREEMENT REGARDING PROPOSED STREAM OR LAKE ALTERATION
No. 1600-2008-0308-R5

CEQA FINDINGS

INTRODUCTION:

The California Environmental Quality Act ("CEQA"; Public Resources Code §21000, *et seq.*), and the State CEQA Guidelines ("Guidelines"; 14 Cal.Code Regs. 15000, *et seq.*) require that prior to reaching a decision on a project, a Responsible Agency must consider the environmental effects of the project as shown in the Mitigated Negative Declaration **("MND")** prepared by the Lead Agency.

As the Lead Agency for the San Dieguito Watershed Invasive Non-native Plant Control Program, the San Dieguito River Park JPA adopted the Mitigated Negative Declaration, SCH#20090510, filed June 24, 2009. The Lead Agencies findings are that the Mitigated Negative Declaration adequately addresses all environmental issues associated with the project.

The California Department of Fish and Game (CDFG) is issuing a Streambed Alteration Agreement to the project applicant, San Dieguito JPA. The Applicant proposes to alter streambeds within the San Dieguito River watershed in San Diego to accommodate the San Dieguito River Park JPA Invasive Non-native Plant Removal and Habitat Restoration Project. The purpose of the project is to "enhance ecological function" of the San Dieguito River watershed by removing non-native invasive plants including giant reed (*Arundo donax*), tamarisk, (*Tamarisk* sp.), pampas grass (*Cortaderia* sp.), invasive palms, pepperweed (*Lepidium latifolium*), castor bean and eucalyptus. After removing invasive plants, the program also includes replanting the treated areas with appropriate native vegetation. Initial treatment and removal of invasive plants would occur over a period of 5-10 years depending on funding availability.

The CDFG is a Responsible Agency under CEQA for the purpose of approving the Streambed Alteration Agreement necessitated by the Lead Agency's project. As a CEQA Responsible Agency, CDFG is required by Guidelines §15096 to review the environment document certified by the Lead Agency approving the project and to make certain findings concerning the project's potential to cause significant, adverse environmental effects. However, when considering alternatives and mitigation measures approved by the Lead Agency, a Responsible Agency is more limited than the Lead Agency. CDFG has responsibility for mitigating or avoiding only the direct or indirect environmental effects of the streambed alteration agreement that it approves.

■ *FINDING:* CDFG has considered the Mitigated Negative Declaration adopted by the Lead Agency. CDFG has independently concluded that the Streambed Alteration Agreement should be issued under the terms and conditions specified therein. CDFG finds that with the mitigation measures incorporated into the Streambed Alteration Agreement, there will be no significant effects from the project.

□ *FINDING:* CDFG has considered the Mitigated Negative Declaration adopted by the Lead Agency. CDFG has independently concluded that the Streambed Alteration Agreement should be issued under the terms and conditions specified therein. CDFG finds that changes have been incorporated into the project that will avoid or substantially lessen the significant environmental effect as identified in the final Mitigated Negative Declaration. In particular, CDFG finds that the measures incorporated into the Streambed Alteration Agreement will ensure there will be no significant effects from project.

The Project is Approved.

DATE: 18 Jun 2009

Environmental Program Manager, South Coast Region
California Department of Fish and Game

APPENDIX B

San Dieguito Watershed Invasive Non-Native Plant Control Program Mitigated Negative Declaration

San Dieguito River Valley
Regional Open Space Park
14103 Highland Valley Road
Escondido, CA 92025
(858) 674-2270 Fax (858) 674-2280
www.sdrp.org

MITIGATED NEGATIVE DECLARATION

PROJECT NAME:

San Dieguito Watershed Invasive Non-native Plant Control Program

PROJECT LOCATION:

The proposed project is located within the San Dieguito River Watershed in San Diego County, California (Figure 1).

PROJECT DESCRIPTION:

Invasive non-native plant control for: habitat restoration, water conservation, and fire risk reduction. Please see attached Initial Study for more information.

LEAD AGENCY/PROJECT PROPONENT:

San Dieguito River Park Joint Powers Authority (JPA)

RESPONSIBLE/TRUSTEE AGENCIES INVOLVED (Agencies that will use the environmental document, permits required, & related environmental review and consultation requirements of these agencies):

Army Corps of Engineers
National Marine Fisheries Service/Habitat Conservation Division
California Department of Transportation
California Coastal Commission
California Department of Fish & Game
California Department of Parks and Recreation/Office of Historic Preservation
Regional Water Quality Control Board (9)
State Water Resources Control Board
City of San Diego
County of San Diego

DETERMINATION:

The San Dieguito River Park JPA conducted an Initial Study of the project, which determined that the proposed project could have a potentially significant effect on

the environment. However, it has been determined that there will not be a significant effect in this case because measures have been made a part of the project that would avoid or mitigate the effects to the point where clearly no significant effect on the environmental would occur. Based on this determination and in accordance with California Public Resources Code Section 21964.5, this Mitigated Negative Declaration has been prepared.

Copies of the Mitigated Negative Declaration and the Initial Study are available at the office location of the San Dieguito River Park JPA at: 14103 Highland Valley Road, Escondido, CA 92025

5/12/09

Shawna Anderson, AICP DATE
Environmental Planner
858-674-2275, ext. 13

SAN DIEGUITO RIVER VALLEY REGIONAL OPEN SPACE PARK
PARK JOINT POWERS AUTHORITY
14103 Highland Valley Road
Escondido, CA 92025 (858) 674-2270

INITIAL STUDY

Project Name

San Dieguito Watershed Invasive Non-native Plant Control Program

Project Location

The proposed project would be conducted within the San Dieguito Watershed in San Diego County, California but would occur primarily along impacted riparian corridors and adjacent upland areas.

Environmental Setting

The project area is the riparian and transitional habitat in the San Dieguito Watershed. The riparian habitat along most of the San Dieguito River and its tributaries is undeveloped (not channelized with concrete banks and bottoms), retaining much of its natural, unmodified characteristics. Lake Hodges Dam, constructed in 1922, is located on the lower third of the watershed forming Hodges Reservoir. Many culverts, bridges, and crossings modify function and habitat- as the area has two main urbanized zones (Del Mar and Rancho Bernardo/Escondido) and two large north/south freeway corridors (Interstates 5 and 15). The landscape is dominated by open space and agriculture surrounded by rural and suburban residential communities. Zoning in the project area varies. A substantial portion of the San Pasqual Valley where much of the invasive plants exist is zoned for agricultural use (AG-1-1). The river corridor downstream of Hodges Dam is zoned open space and flood area, and some of the land closer to and within the San Dieguito Lagoon is zoned rural residential and open space. A significant portion of the river corridor is protected open space that makes up the San Dieguito River Park. The JPA and other public agencies assist in managing these lands.

Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement)

The watershed based invasive control program will operate under Army Corps of Engineers (ACOE) Regional General Permit (RGP) 41. State Historic Office will also review the project under this permit. The Fish and Wildlife Service (FWS) has completed an informal consultation with the San Dieguito River Park JPA for the project (Appendix 1). The FWS has determined

that no adverse effect to listed species is likely to occur as long as minimization and avoidance measures are followed. An application to the Department of Fish and Game 1600 permit (streambed alteration agreement) process has also been submitted. Minimization and avoidance measures and conditions in the permit are expected to be similar to those outlined in this MND and from the FWS. All terms and conditions outlined in all permits will be followed and annual reports will be prepared and submitted to FWS, DFG and ACOE.

Access agreements (rights of entry) would also be required from the City and County of San Diego for access onto public land as obtained by the JPA in the past for similar projects.

Project Description

The program involves implementation of invasive non-native plant control using grant and/or mitigation funding through the San Dieguito JPA and its partners. These projects restore riparian habitat in the San Dieguito River Watershed through the control of invasive non-native plants, mainly *Arundo donax,* pampas grass, tamarisk, perennial pepperweed (*Lepidium latifolium),* eucalyptus, and palms, and the planting of native species (Figure 1, Table 1). Funding sources that have been used or may be used in the future to implement the project include, but are not limited to: State Water Resources Control Board, Wildlife Conservation Board (WCB), Coastal Conservancy, Department of Water Resources, County of San Diego, CA Department of Fish and Game, California Department of Food and Agriculture (CDFA), CA Resources Agency, Environmental Protection Agency (EPA), US Fish and Wildlife Service, Natural Resources Conservation Service, fees and fines, donations, foundations, and mitigation projects.

Until now, treatment/removal of invasive species by the JPA and the San Dieguito River Valley Conservancy has occurred on a case-by-case project site basis. This approach necessitated obtaining individual permits for each project site with a limited coordinated approach. Over the past two years, more funding opportunities have become available to the JPA for more large-scale invasive species treatment that would allow a more aggressive approach to removing these species from the watershed. The purpose of this project is to define a systematic comprehensive approach at a watershed-wide level with established consistent methods, standards and minimization measures to allow ongoing treatment and removal of invasive species with minimal impacts to sensitive species. Initial treatment and removal of invasive plants would occur over a period of 5-10 years depending on funding availability. Follow-up treatment, maintenance, and management would occur on an ongoing basis. The project would allow the JPA to conduct invasive plant control and removal under blanket permits approved by the regulatory agencies. Other public or private entities that treat/control invasive plants in the region (e.g., County of San Diego) may do so under their own permits. Coordination would be conducted through the San Diego Weed Management Area.

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Purpose and Need

Several adopted resource management plans for the San Dieguito Watershed area establish the need for removal of invasive plants to restore and enhance native habitat. These plans include the

San Dieguito River Park Concept Plan (1994), Park Master Plan for the Coastal Area of the San Dieguito River Park (2000), San Dieguito Watershed Management Plan (2006; Action 4.5.4.1), and the City of San Diego MSCP Subarea Plan (1997; General Management Directive 1.5.2). The invasive non-native plant control and riparian restoration program for the San Dieguito Watershed is based on a systematic watershed-wide control of target species that provides long term ecological and resource protection benefits. This process, along with details related to restoration and exotic plant control methods have been developed in coordination with the CA Department of Fish and Game, USGS Biological Resources Division and the US Fish & Wildlife Service.

The San Dieguito invasive non-native plant control and re-vegetation program's primary goal is to enhance ecological function. Invasive non-native plants are displacing native vegetation, modifying hydrologic functions including sediment transport, water use, and flood regimes. In addition to these impacts, non-native plants, particularly *Arundo donax*, create fire prone conditions within riparian habitat. Fires occur much more frequently and with a greater intensity. A systematic and comprehensive invasive plant control program will provided a substantial benefit to the native fauna and flora that inhabit San Dieguito Watershed.

Ecological Impacts of Invasive Species

The following summary of impacts caused by targeted invasive non-native plants draws from literature and communication with many different sources- a listing of the literature is available on line at: http://www.cal-ipc.org/ip/management/plant_profiles. Information on invasive non-native plants contained in the 'Invasive Plant Inventory: Plant Assessment Forms' and chapters from "Invasive Plants of California's Wildlands" are viewable at the website, these provide good overviews of impacts caused by each invasive non-native plant.

Arundo and pampas grass, tamarisk, perennial pepperweed, eucalyptus, and palms pose a serious threat to the native flora and fauna, and are a significant flood and fire risk to the community (Figures 3-7). The plants have severe and negative impacts on biological, hydrological, and geomorphologic functions within the riparian system. The target invasive non-native plants are crowding out native plants and are not typically utilized as a food resource by wildlife and have poor structure for nesting and shelter. These target invasive non-native plants out-compete native vegetation forming monotypic stands that interfere with native plant succession and establishment. *Arundo* is a tall perennial grass that typically forms dense stands on disturbed sites, sand dunes, riparian areas and wetlands. *Arundo* and pampas grass alter hydrology by utilizing twice as much water as native vegetation and filling in areas that would otherwise remain open habitat, which is important for regulating flows. Creek and river flow capacity is reduced by excessive biomass that can cause overbank flows and flooding. *Arundo* and pampas grass are extremely flammable throughout the year as mature stands contain large amounts of dead material (Figures 3-4). Stands are also tall and well ventilated, contributing to fast moving hot fires that are carried up into any existing riparian woodland canopy. Riparian areas with extensive amounts of *Arundo* experience fires frequently, which would otherwise be an unusual

event. Some riparian systems with extensive *Arundo* stands are moving from a natural flood regulated system to a fire dominated system, which is drastically altering the ecosystem. Flooding is a natural process in a functional riparian ecosystem. *Arundo*, however, can alter the flood regime by blocking flows with its thick growth, creating unstable banks due to its poorly developed root systems that easily fragment, and contributing to bridge and flood control structure failure by becoming lodged against bridge pylons and blocking and diverting flows. Eventually enough water backs up against the bridge or other structure causing the structure to fail or flows to bypass the structure, causing extensive damage. Large stands of eucalyptus trees are found in several portions of the watershed, posing a fire risk and reduced value to wildlife in comparison to native forest canopy (Figure 6 & 7).

Invasive Non-Native Plants within the San Dieguito River Watershed

Areas mapped include most riparian zones and undeveloped upland areas; additional acreage exists in urbanized areas. All mapping is of "fully infested stands" as defined by the Army Corps of Engineers (RGP 41 (>80% cover)). Many of these areas burned in the Witch Creek Fire in October 2007. The fires did not kill the non-native plants for the most part- it only reduced the amount of above ground biomass. Not all of this acreage will be treated under this program- significant initial control work has already occurred on Perennial Pepperweed (about an 70% reduction in cover has occurred over the past five years) and large projects have treated much of tamarisk and Arundo in the upper watershed that burned in the fires.

TABLE 1. Mapped invasive non-native plants on San Dieguito River Watershed (data is also presented in Figure 1).

Species/Type	Acreage
Arundo	175
Brazilian pepper tree	1
Canary island date palm	3
Eucalyptus	65
Mexican fan palm	5
Pampas grass	12
Perennial pepperweed	468
Tamarisk	379
Other inv non-natives	66
Total	**1,174**

Invasive plant control and restoration projects in the San Dieguito Watershed can be broken into three main regions: areas below Lake Hodges, and areas above Lake Hodges subdivided by whether or not they burned in wildland fires in 2007 (Figure 1). Areas that burned in October 2007 may not require reduction of biomass following treatments as most of the biomass burned during the fire (particularly stands of Arundo and tamarisk). Areas above the dam support significant populations of three listed species that use riparian habitat: least Bell's vireo, southwestern willow flycatcher, and arroyo toad (Figure 2 & 8). These species have not been observed below the dam.

Treatment Methods of Invasive Non-native Plants:

This program will utilize avoidance measures and methods that have been developed with FWS and DFG over the past 10 years on several other large watershed eradication programs. The main 'method' is avoidance- not being in habitat areas during active breeding of wildlife. One target plant requires treatments during early/mid-summer (perennial pepperweed), so additional measures outline pre-checking habitat prior to treatments.

The invasive plant control program will conduct treatments on target plants (*Arundo*, tamarisk, eucalyptus, etc.) in a phased manner over the next five to ten years depending on funding availability. The treatment cycle typically involves foliar application of herbicide (typically an aquatic approved herbicide- Glyphosate, Imazapyr, or a mixture of the two) in either the fall or early spring. Work begins September 15th and usually ends by mid December or may occur when plants are actively growing prior to March 15th. No aerial spraying would occur.

The bulk of control and re-vegetation activities will occur between September 15th and March 15th each year. Some maintenance activities (watering of newly planted natives and weed control with backpacks) may occur outside this time frame, but only in areas that have no suitable vegetation (structure) for nesting. Perennial pepperweed (*Lepidium latifolium*) can only be treated during summer, special conditions for summer treatments are outlined the FWS permit in Appendix 1 (avian pre-surveys). Avoidance is the main measure used by the program to assure that no harassment or take of wildlife species occurs (with or without listed status). A specific treatment method is described below for each of the major invasive plant types.

Arundo donax

The treatment cycle for *Arundo donax* typically involves foliar application of herbicide (typically an aquatic approved herbicide- Glyphosate, Imazapyr, or a mixture of the two) in either the fall or early spring. Hand held sprayers or backpacks would be used to apply the herbicide. Initial treatment would either occur in the fall followed by biomass reduction if necessary (see below) 4-6 months later or biomass would be reduced first and regrowth would be treated after resprouting.

Biomass reduction (if carried out) may occur either before or after herbicide treatment. Biomass reduction is typically required if significant plant biomass is present (plants cover > ¼ acre). For Arundo, biomass reduction entails either mowing or hand cutting the *Arundo* cane. Hand cut *Arundo* is stacked and mowed, chipped, or left to decompose naturally. Arundo biomass mulch is left within the original footprint of the stand or may be spread over compacted areas (roads, parking areas, shoulders, etc). Areas above Lake Hodges dam that burned in the 2007 fires will not require biomass reduction; the treated cane may be left standing to decay naturally in place. The treated post fire re-sprouting biomass will decay within two to three years- much more rapidly then mature unburned Arundo stands. Unburned stands above the dam (typically in

degraded areas that are not Arroyo toad habitat, all sites are checked with FWS) and areas below the dam may have biomass reduction, particularly where stands are dense and large (>1/4 acre).

Large Woody Non-native Vegetation

This category of non-natives includes eucalyptus (red and blue gums), tamarix, Peruvian pepper, palms (Canary Island Date Palm and Mexican Fan Palm), *Myoporum laetum*, and *Ailanthus altissima* (tree of heaven), where they are impacting the native habitat. Eucalyptus treatment and removal is described in detail below. The other larger tree species are treated using the cut stump method where larger trees are cut and stumps treated with Garlon. Smaller trees, such as *Myoporum*, can be completely removed.

Eucalyptus

The main eucalyptus stands within the river channel below the Hodges Dam will be treated and removed using a phased approach so as not to remove large areas of trees all at one time. As the smaller trees are removed, areas will be revegetated with native trees and shrubs (willows, sycamores, see Table 2) and given time to establish and mature somewhat before additional eucalyptus are removed. This approach is meant to maintain vegetative cover and scenic quality within the stream channel as the invasive species control project moves downstream along the 1.8-mile long river corridor.

Treatment of eucalyptus trees will be dependent on access to the site and how much rock is present. Areas directly below Hodges Dam have limited access and extensive cover of rock (Figure 7). This makes it impossible to reduce the eucalyptus in place. This area will require that felled trees be hauled to staging areas where it will be chipped and spread on trails, roads, parking lots or taken off site (as green waste). Staging is proposed at the existing trail staging area (Figure 11). Cut stumps will be treated with Garlon. Larger trees may be girdled or treated by injection and left standing (to leave structure called “snags” for wildlife). Typically trees over 16” DBH (Diameter Breast Height) will be left standing (to leave high canopy and nest cavities for wildlife) unless they occur near roads or trails. Rubber-tired skidders will be used to haul felled trees to a staging area for chipping. Areas too rocky for the skidder require that cut material be hauled by hand or bundled and picked up by a helicopter and taken to the staging/chipping area (Figure 11). All conditions described under mowing of Arundo stands would apply including: no material may be placed in the low flow channel areas, no grading, and no use of tracked equipment (which would significantly disturb soil surfaces).

A few smaller stands of eucalyptus occur along Highland Valley Road and other locations along the river above the dam (Figure 6). These sites burned in 2007 and are within 200 yards of roads. These stands will be cut (trees felled) and stumps treated. Larger cut material will be loaded into bins for use as firewood and smaller material will be chipped and spread over compacted areas or taken off site. Larger trees may be girdled and left standing on site for wildlife. Any work above the dam and within arroyo toad habitat will comply with conditions

outlined in the agreement between FWS and the JPA (Attachment 1). These conditions include seasonal work restrictions (September 15 through December), no biomass reduction above the dam, no spreading of mulch on soils that may be used by the toad).

Perennial Pepperweed

Perennial pepperweed once infested over 400 acres of the valley above the dam (Figures 1 and 5). Seven years of active control has significantly reduced the density and distribution of the plant in many areas, but it is a difficult plant to kill and not all areas have been treated. Different herbicides may be used depending on location of the plant: in areas with open water only aquatic formulations of Glyphosate and Imazapyr may be used. In drier locations Telar may be used, which has been shown in numerous studies to be the most effective herbicide on the plant. Pepperweed must be treated when green, preferably in late bolt/pre-flowering stage. This necessitates use of avian monitors to 'pre-check' sites for sensitive bird species to avoid areas where sensitive avian species are present. Sites with active use will be avoided (see Appendix 1). Most of the dense pepperweed stands are in areas where arroyo toads have not been recorded. Some scattered patches of pepperweed higher in the watershed do occur within toad habitat however, and additional avoidance measures must be followed in these areas (see previous paragraph about Eucalyptus).

Re-vegetation of Treated Areas:

Active re-vegetation will be a component of the proposed invasive species control project for most site areas. Effective control of target invasive plants is required prior to re-vegetation to avoid situations where re-treatments would harm a significant number of new plantings. This can be achieved fairly rapidly for Arundo, based on experience with other successfully treated areas of Arundo infestation in the County - a site that is treated in the fall can be reduced and planted five months later in early spring. Areas that were previously burned are proposed to be replanted with native plants the following year (they would have a fall treatment and then a re-treatment and immediate planting in year two). Eucalyptus control sites can be planted as soon as trees are taken down and biomass is moved off site. Planting should be timed from fall to early spring to take advantage of seasonal rainfall. Pepperweed is perhaps the most difficult of the control plants to re-vegetate as it is difficult to be sure high enough control has occurred. Typically 80% control is achieved by year three, allowing planting in year four.

Plant size varies from 1 gallon/D60 to rose pots (2" x 2"). Plant pallet varies based on presence or absence of tree canopy and position in the habitat (near channel, low bench, high bench etc). All growth forms of native plants are to be used: tree, shrub, half shrub, vine and perennial herb. As a class- shrubs dominate the percentage of plants planted in the field. This is due to the fact that tree canopy is frequently still present on control sites- the Arundo, tamarisk and pepperweed have pushed out shrub cover and filled in open and herb covered areas. Planting is typically at a density of 150 to 200 plants per acre- with a 5 year goal of 125 plants per acre live and established. The upper watershed is characterized by a much more open (low cover) assemblage

of native shrubs and trees. A higher density of 250 to 300 plants per acre will be used when the target vegetation is the only vegetation occurring on the site and the area has hydrology that will support dense riparian growth. Additional 'fill in' planting occurs in successive years on sites until native plant establishment occurs. Depending on rainfall and water table position, plants are usually watered in and left. Supplemental watering may be needed, but occurs by hand and only for two or three cycles. The goal is to assist native plantings in becoming established enough to survive through the summer and fall of the first year. Once this occurs- plants usually become established. Average survival rates vary by species- but typically exceed 70% (as demonstrated through large programs on San Luis Rey Watershed and Carlsbad HU). Restored sites typically attain high cover from planted shrubs and trees by year five (often even year three), which helps to shade out ruderal weeds that would otherwise begin to migrate into the site as the reduced biomass/mulch begins to break down.

Table 2: Proposed Typical Site Plant Pallet

Scientific name	***Common Name***
Trees	
Platanus racemosa	Sycamore
Populus fremontii	Cottonwood
Quercus agrifolia	Coast Live Oak
Salix laevigata	Large leaf willow
Salix goodingii	Black willow
Salix lasiolepis	Arroyo willow
Shrubs	
Baccharis salicifolia	Mulefat
Heteromeles arbutifolia	Christmas berry
Salix exigua	Sandbar willow
Sambucus mexicana	Mexican elderberry
Half-shrubs, vines, ground covers	
Artemisia douglasiana	Mugwort
Rosa californica	California rose
Rubus ursinus	CA blackberry
Urtica dioca	Hoary nettles
Vitis girdiana	CA grape

Environmental Analysis

See discussion below and attached Initial Study checklist.

Biological Resources:

Existing Conditions

The San Dieguito Watershed provides habitat for several Federal and State listed animal species including: southwest arroyo toad, southwestern willow flycatcher, and least Bell's vireo, as well as other sensitive species (Figure 8). Information from the California Department of Fish and Game's California Natural Diversity Database (CNDDB) is presented in Figures 9 and 10.

Much of the San Dieguito River Valley is identified as core biological habitat with critical regional wildlife corridors according to the adopted Natural Communities and Conservation Plans (NCCP) including the Multiple Species Conservation Plan (MSCP) for both the City of San Diego and unincorporated County (Figure 2). Substantial portions of the watershed are under public ownership and are protected from development. The Hodges Reservoir/San Pasqual Valley core area represents one of the largest continuous blocks of habitat in the MSCP area and serves as a major east-west corridor. This area includes core gnatcatcher and cactus wren populations (cactus wren populations were significantly affected by the October 2007 wildfires), large expanses of grassland that provides valuable raptor foraging habitat, and valuable wetlands habitat in San Pasqual Valley which supports several MSCP target species dependent on riparian habitats. Sensitive vegetation types found within the project area include southern willow scrub, mule fat scrub, freshwater marsh, Diegan coastal sage scrub, and native grassland. Proposed treatment areas are dominated by the invasive plants described in the project description section of this MND. Threatened and endangered animal species in the project area include California gnatcatcher, cactus wren, arroyo toad, least Bell's vireo, and southwestern willow flycatcher.

According to the CNDDB, two sensitive plant species, San Diego milk vetch (*Astragalus oocarpus*) and smooth tarplant (*Centromadia pungens* ssp. *Laevis*), may exist within the project proposed treatment areas. Both have very limited distributions in California.

Potential Impacts

Potential impacts to biological resources that could occur from active invasive species treatment and removal if not properly controlled and managed would include:

- Disturbance to or trampling of native species from uncontrolled access or staging of equipment
- Impacts to sensitive bird and animal species from unlimited or uncontrolled access or heavy equipment movement
- Impacts to sensitive animal species from inappropriate use of herbicide by non-licensed applicators or during breeding/nesting season where sensitive species are present
- Potential destruction of or disturbance to nests if trees are cut or removed during nesting season
- Impacts to adjacent native habitat if not identified and avoided prior to treatment and removal of invasive plants
- Crushing or damaging sensitive plant species that may exist within or adjacent to the treatment area

Measures that have been incorporated into the Project to Avoid Significant Biological Impacts:

The types of habitat restoration and enhancement activities proposed for this project and described in this MND are considered by the US Fish & Wildlife Service and the Army Corps of Engineers to be a form of mitigation for potential impacts to riparian habitat as a result of treatment and removal of invasive plant species. An informal consultation with FWS staff occurred for this project in July through September 2008. The resulting documentation from this technical assistance process is included in Appendix 1 of this MND. Based on the information contained in the application, the FWS has determined that impacts to listed species are unlikely as long as conditions outlined in the Request and 'Technical Assistance' letter are followed.

Adherence to the following measures will ensure that no significant impacts to biological resources would occur from this project:

- Non-native plant control methods will be used that minimize impacts to native vegetation. These methods include: preparing target plants for herbicide application by separating them from native vegetation, using targeted foliar application of herbicide by crews on foot, using qualified licensed-applicator contractors who have experience treating non-native plants in sensitive riparian habitat, and using herbicides that are approved for use in wetlands (aquatic approved formulations of glyphosate and imazapyr) which have no negative impact on wildlife species.

- All mixing of herbicides and maintenance of equipment to occur only in areas that are naturally devoid of native vegetation, that are adjacent to existing roads, and have compacted disturbed soils. These areas are not sensitive species habitat, they are not adjacent to the river channel, and they have no cover of native woody vegetation.

- A qualified biologist will oversee work activities to assure that conditions of regulatory permits are being followed. No restoration activities with heavy equipment shall occur during the designated breeding season for the two endangered bird species occurring in the project area. The two federally listed species in the project area, least Bell's vireo (*Vireo pusillus bellii*) and southwestern willow flycatcher (*Empidonax traillii extimus*), are migratory and are usually not present in the habitat during most of the restoration activities (from September 15th to March 15th).

- Annual reports to regulatory agencies that have issued permits will be provided by the JPA documenting work and compliance: US Army Corps of Engineers, Department of Fish and Game, and Fish and Wildlife Service. All permits clearly indicate work conditions, and minimization & avoidance measures. Regulatory agencies, county project managers and the project biologist assure compliance with these conditions. Any violations would result in termination of active work and possible fines or a request for compensatory mitigation.

Detailed Avoidance and Minimization Measures:

The JPA will be responsible for monitoring the non native plant control program to ensure that the following avoidance and minimization measures will be followed. The project monitor will be responsible for conducting pre-construction meetings with project contractors, flagging work areas and areas to be avoided as defined below, monitoring pre-construction avian surveys where appropriate in time periods defined below, and documenting project progress.

BIOLOGICAL RESOURCES

Initial Foliar Treatment of Arundo, tamarisk, pampas grass (excluding pepperweed): Herbicide Application

1) No more then three crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 16 individuals- and no more then five people will be working together at a given spot.
4) Herbicide application will occur with either backpack sprayers (3 gallon) or hand held power sprayers. Power sprayers are moved by ATV's and consist of a small gas powered engine (3 hp) on a trailer with a tank/reservoir (50gal useable volume).
5) To reduce the chance/impact of spillage, work crews can only mix herbicide, refill power sprayers (using concentrate and water: i.e. mixing), load mixed chemical into ATV's (for refilling backpack sprayers or power sprayers), and refuel (ATV's or power sprayer) in staging areas. Mixed chemical (application strength) may be added to sprayers in the field.
6) Staging areas are disturbed sites such as roads, shoulders, graded areas, or sites with compacted soil that support no vegetation or weedy vegetation.
7) Foliar spraying will not occur when ambient wind speeds exceed 5 miles per hour.
8) Crew members will avoid wading through streams whenever possible.
9) Each crew may use up to 2 ATV's (typically one is used- to move mixed herbicide to crews in the field).
10) ATV's will not drive in channel areas.
11) ATV's will operate only in open areas- woody vegetation (>1" DBH) will not be cleared or driven upon.
12) Site preparation is carried out prior to treatment of *Arundo*. Preparation entails separating, or creating a space, between stands of *Arundo* and native vegetation. This allows the *Arundo* to be treated without affecting the native woody vegetation. The space between *Arundo* and native vegetation is created by pushing, detangling and/or trimming the vegetation. Both *Arundo* and native woody vegetation may be trimmed. However, woody vegetation may not be trimmed that is in excess of four inches in diameter. Excessive trimming of *Arundo* is not usually carried out because this triggers re-sprouting which results in a much longer re-treatment cycle (before vegetation removal, see species conservation measures).
13) All regulations involving use of herbicides will be followed including BMP's. All applicators will be licensed and certified. Aquatic herbicide formulations will be used

when near open water and all additives including any additives (spreading agents and dye's).

14) A marking dye will be used to assure that drift or overspray onto non-target vegetation is not occurring.
15) All garbage and waste material generated by the work crew will be removed from the site.

Biomass reduction (lowering dead or live *Arundo* cane or other target plants)

This biomass reduction section pertains to areas below the dam (no arroyo toads). Two areas along creeks may also have reduction- but a site visit and specific authorization will be given when that area is treated (Figure 5).

Large *Arundo* stands (>1/8 acre or >75 feet across) are usually cut or mowed to allow for active native plant restoration and to speed up the decomposition of the dead *Arundo* cane. Scattered smaller stands are left to decompose naturally (they are left standing). Typically all biomass reduction methods are used on sites with large stands of *Arundo* due to factors including: amount and distribution of native woody vegetation, access to the site and site topography, visibility of the site, and input from the property owner.

The normal biomass reduction process is: 1) a large mower mows stands, 2) hand crews cut all Arundo that mowers could not reduce, 3) a smaller mower mows hand cut Arundo. Some sites that do not have mowing access may be cut by hand and chipped.

Biomass reduction occurs from mid-January up to March 15, but most work is completed by late February to allow for replanting. As mentioned previously, some sites may be mowed first (anytime between Sep 15th and January) and then the re-sprouting cane is treated. These sites typically are high fire risk sites- or are sites where immediate biomass reduction is needed.

Mowing:

Mowing is carried out using a fixed tooth or hammer flail mowing attachment mounted on a tractor. The mowing attachment mulches the dead (or live) *Arundo* cane into a layer about 4" thick (thickness varies at site from ½" to 10"). The mowing attachment and tractor do not dig into the soil surface or change topography of the site. All tractors are rubber tired. Several sizes of tractors are used: from a larger 45,000 lb tractor with four large tires (about 56" by 18") with a mowing implement 100" wide to a smaller size 8,000 lb tractor with two large (48" x 16") and two small tires (24" x 12") with a mowing implement 74" wide. Live or dead *Arundo* stands are mowed standing and piles of dead *Arundo* stacked by hand crews are mowed.

1) No native vegetation is mowed.
2) No mowing occurs in the stream channel.
3) No mulched/mowed biomass will be placed in the channel.
4) All mowed material is over previously existing stands of *Arundo*, no open habitat or native vegetation will be covered with *Arundo* mulch.

Cutting by hand crews:

Crews cut dead *Arundo* using chainsaws operated by hand. Hand tools (loppers and machetes) may be used, but in limited situations.

1) Crews are of 16 or fewer individuals will work in teams of 5 or less. For each team one person cuts and the other team members pull, haul, and stack the cut dead *Arundo* cane.
2) No more than one crew may operate at a given site.
3) No more then three sites may be active on the watershed at once.
4) Crews typically do not use ATV's, but sites far from roads with previously used trails for ATV's (during the fall herbicide application) may re-use these same access routes in open areas. No ATV use can occur in channel areas or in areas with native woody vegetation.
5) Chippers may be used at sites where mowing is not possible due to site topography. Typically this is on tributaries where creeks have deep profiles. Chippers may be staged on roads and may chip material onto disturbed/maintained areas outside the creek profile, chip into areas where *Arundo* previously existed, or ship into containers for hauling off site.

Re-vegetation (native planting) Activities: Between December 15th and March 15th

1) No more then two crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 12 individuals.
4) Each crew may use up to 2 ATV's to move plants from staging areas to planting locations. ATV's typically drive only in areas that have been mowed (on dead *Arundo* mulch) or along established compacted trails and roads. Some sites that are flat and connected to roads, may allow use of a 4 wheel drive truck to access mowed areas and deliver plants.
5) ATV's will not drive in channel areas.
6) ATV's will operate only in open areas, usually on mowed dead *Arundo* mulch- no woody vegetation (>1" DBH) will be cleared or driven upon.

Maintenance Activities (watering and re-treatments): Between March 15th and Sep 15th

1) No more then two crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 6 individuals.
4) No areas may be worked in that have vegetation structure suitable for nesting (work only in mowed areas with new plantings).
5) No powered equipment may be used within the riparian vegetation zone. Watering and treatment with back packs or power sprayers may occur- but all trucks (which have a gas powered pump) will operate along access roads, road shoulders or in staging areas. Only foot crews will enter riparian habitat restoration areas.
6) Avian monitors may be used as requested.

Treatment of Perrenial Pepperweed: Between April 15th and July 30th

1) No more then two crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 8 individuals- and no more then four people will be working together at a given spot.
4) Herbicide application will occur with either backpack sprayers (3 gallon) or hand held power sprayers. Power sprayers will be operated using long lines- with tanks and motors mounted on trucks, trailers (pulled by ATV's), or tractors. Aquatic formulations will be used if standing water is present. Upland formulations will be used in areas away from standing water. All label guidelines will be followed.
5) Trucks and tractors may only use roads and established trails (compacted areas). ATV's may be used in open areas with no woody structure (other then occasional large mature gallery trees that have no low branching structure). Spray rigs may be used on ATV's in some areas where cover is high. Old fields with no native cover may have treatments using tractors or truck mounted spray rigs- but only outside of arroyo toad areas.
6) To reduce the chance/impact of spillage, work crews can only mix herbicide, refill power sprayers (using concentrate and water: i.e. mixing), load mixed chemical into ATV's (for refilling backpack sprayers or power sprayers), and refuel (ATV's or power sprayer) in staging areas. Mixed chemical (application strength) may be added to sprayers in the field.
7) Staging areas are disturbed sites such as roads, shoulders, graded areas, or sites with compacted soil that support no vegetation or weedy vegetation.
8) Foliar spraying will not occur when ambient wind speeds exceed 5 miles per hour.
9) Crew members will avoid wading through streams whenever possible.
10) Each crew may use up to 2 ATV's (typically one is used- to move mixed herbicide to crews in the field).
11) ATV's will not drive in channel areas.
12) ATV's will operate only in open areas- woody vegetation (>1" DBH) will not be cleared or driven upon.
13) Avian monitors will pre-survey pepperweed sites one to three days prior to work. Sites with active vireo or willow flycatcher use will have a monitor on site during work activity and a minimum 100' buffer will be maintained. Any additional conditions requested under FWS Technical Assistance will be followed.

Eucalyptus: Treatment and biomass

The eucalyptus plant control component will be conducted in phases to avoid denudation of trees within the stream channel. Segments of the stream channel will be treated at one time per the measures below. Native trees will be planted per the Re-vegetation measures described above to replace removed eucalyptus within each channel segment and given time to mature before moving downstream.

1) No more then three crews will be active on the watershed at one time.

2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 20 individuals- and no more then five people will be working together at a given spot.
4) Herbicide application is typically cut stump, injection and or girdling. Some smaller class plants may have basal bark treatment.
5) To reduce the chance/impact of spillage, work crews can only mix herbicide, load mixed chemical into ATV's (for refilling backpack sprayers), and refuel (ATV's) in staging areas.
6) Staging areas are disturbed sites such as roads, permanent trails, shoulders, graded areas, or sites with compacted soil that support no vegetation or weedy vegetation.
7) Crew members will avoid wading through streams whenever possible.
8) Each crew may use up to 2 ATV's (typically one is used- to move mixed herbicide to crews in the field).
9) ATV's will not drive in channel areas.
10) ATV's will operate only in open areas- woody vegetation (>1" DBH) will not be cleared or driven upon.
11) A rubber tire skidder will be used to haul cut eucalyptus to the staging area for chipping/masticating (Figure 3).
12) The skidder may only operate in open areas- no removal of naitve vegetation is permitted. Some smaller class shrubs and sub shrubs may be crushed- these should re-sprout. Re-vegetation of areas used by skidder will restore or exceed density of woody vegetation that existed prior to work.
13) Many areas are not traversable by any rubber tired equipment. Biomass in these areas will be bundled and helicoptered out (Figure 3). Helicopters may not cross power lines. They will deposit cut material along roads, permanent trails, or degraded compacted areas with no native vegetation. Mastication (chipping) of material will then occur at deposition site. Material will be spread on roads, trails, of degraded areas having no native vegetation. This will only occur in areas outside of arroyo toad habitat (areas below dam). Mulched material may not exceed 4" depth.
14) If material is chipped at the Highland Valley Road site (above dam, Figure 5), it will be hauled off site or spread on compacted areas (old roads or road shoulders).
15) Larger trees may be girdled or treated by injection and left standing (to leave structure for wildlife). Typically trees over 16" DBH are left standing unless they occur near roads or trails (to leave high canopy and nest cavities for wildlife).

The following measures are listed in the attached Environmental Checklist and would assure that impacts to land use, cultural resources, and hazards are avoided:

LAND USE

No work will occur on private or public property without prior notification and permission from the land owner.

No work will occur in areas that are leased for farming operations without prior notification and permission from the owner.

NOISE

All work will comply with the applicable, adopted noise regulations and ordinances.

CULTURAL RESOURCES

To assure avoidance of impacts a record search for registered archaeological sites will be carried out for each project site at the South Coastal Information Center. Any mowing and restoration work near or within registered sites will have a certified archeologist and a cultural monitor on site to assure that no impacts to cultural resources occur.

If archaeological or cultural features or materials are identified by the archaeologist during the mowing, work will stop immediately in that area. No archaeological or cultural materials will be collected. Work will be diverted away from the sensitive areas, which will remain intact. If approved by the archaeological monitor, hand cutting of Arundo and other invasive plants may take place around identified milling features or other cultural resource/areas. Plant biomass will be carried to areas with no sensitive resources and mulching will occur at that location

HAZARDS

During restoration activities contractors will employ best management practices for spill control and prevention in accordance with state regulations.

Restoration equipment storage and staging will be conducted in non-habitat areas (already disturbed areas such as road sides, shoulders, parking lots, and areas with bare compacted soil).

All mixing of herbicides and maintenance of equipment will occur only in areas that are devoid of vegetation and that are adjacent to existing roads (staging areas as described above).

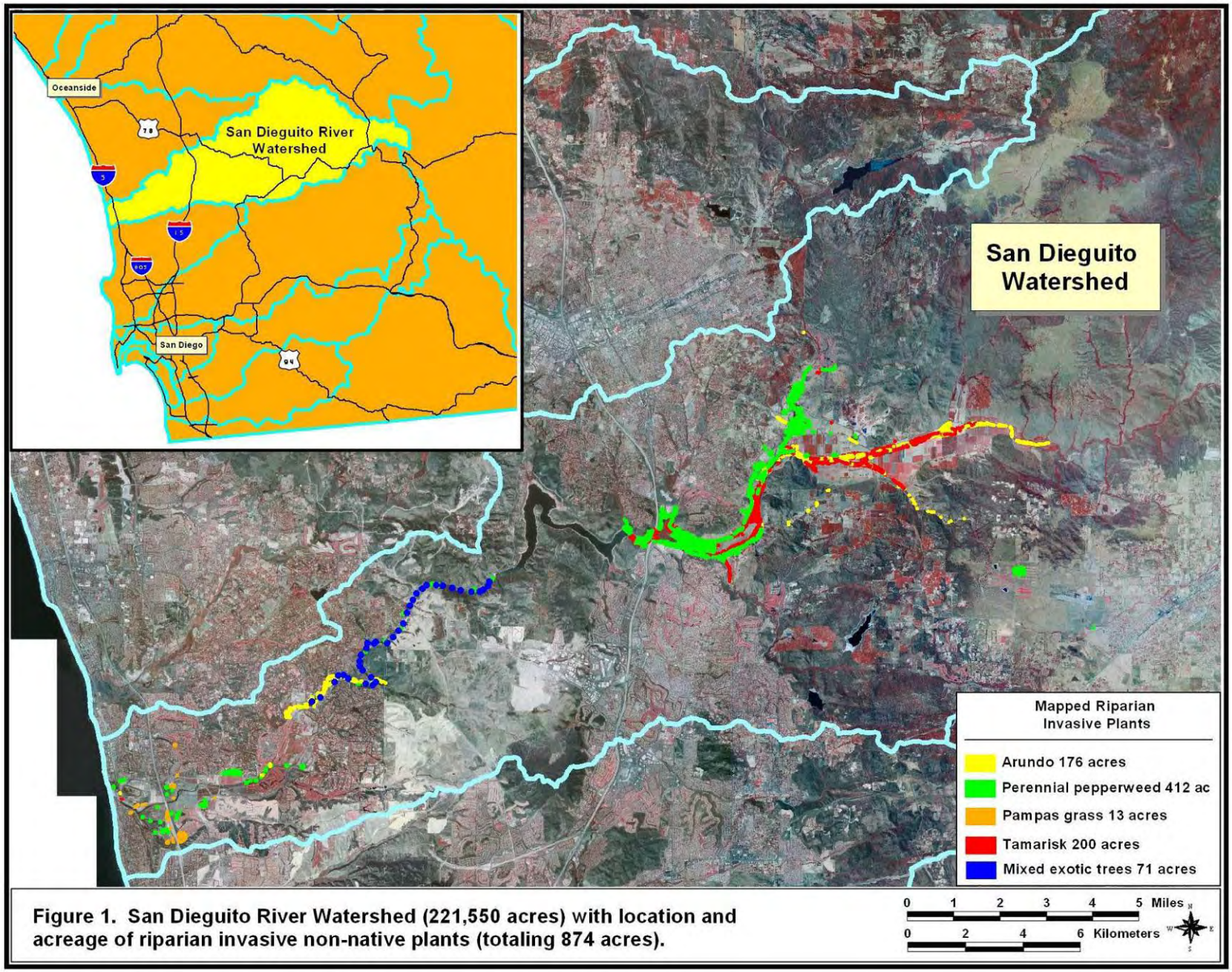


Figure 1. San Dieguito River Watershed (221,550 acres) with location and acreage of riparian invasive non-native plants (totaling 874 acres).

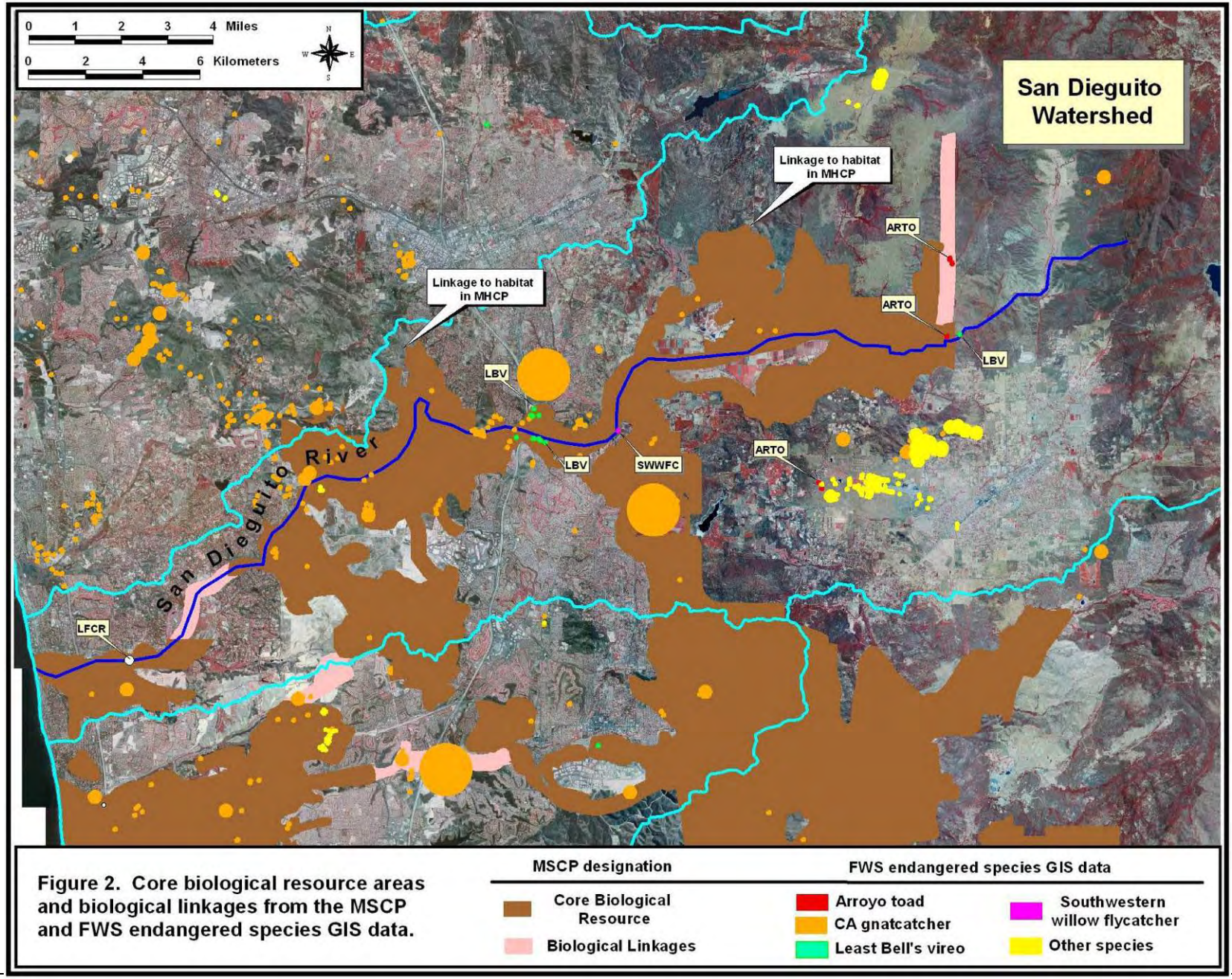


Figure 2. Core biological resource areas and biological linkages from the MSCP and FWS endangered species GIS data.

Four months after Arundo driven fire in 2001 on San Dieguito River, approximately 45 acres burned. View from bridge at top of photo below.

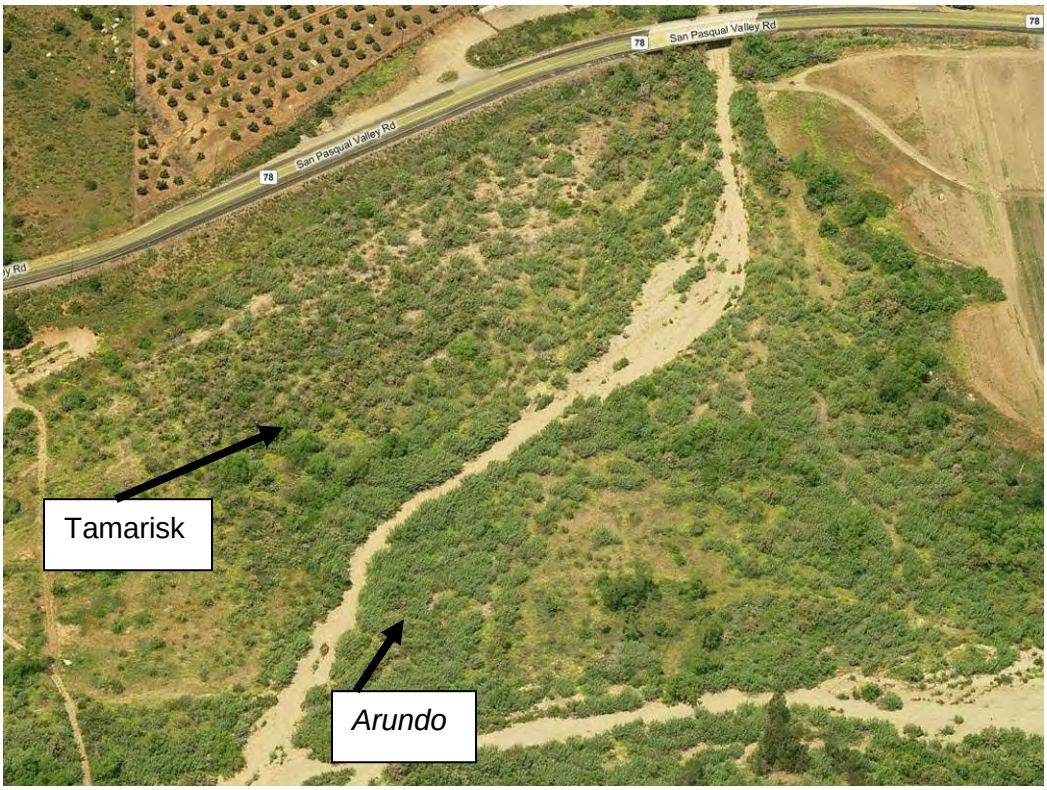


Figure 3. *Arundo* and tamarisk stands at confluence of San Dieguito and Santa Maria in spring 2007, the area has become dense stands of *Arundo* and tamarisk.

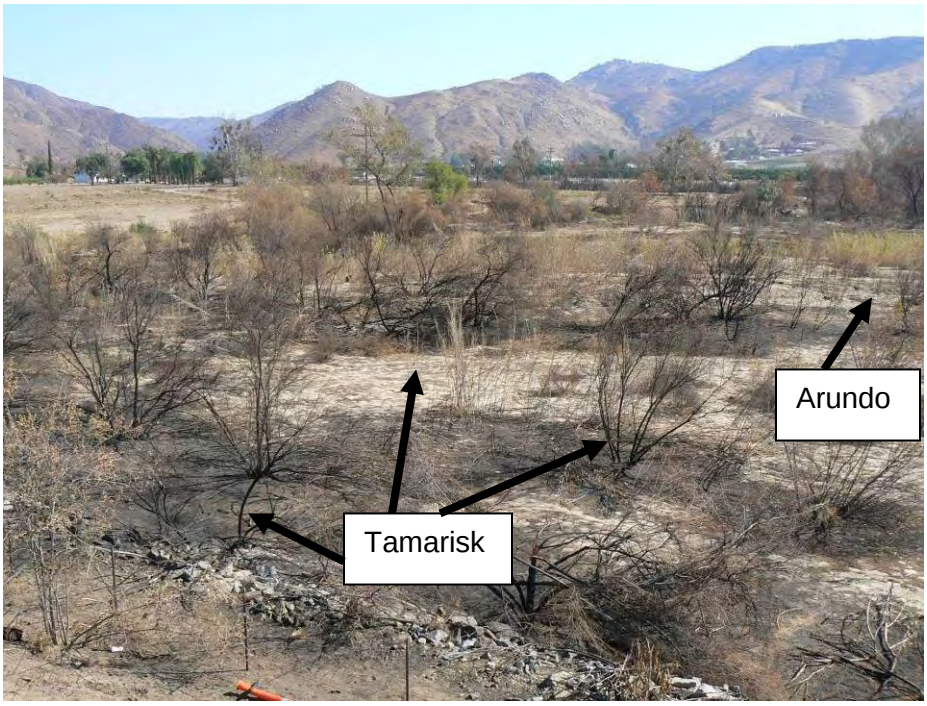


Figure 4. *Arundo* and tamarisk stands burn for a second time in 10-2007 fire at confluence of San Dieguito and Santa Maria. *Arundo* and tamarisk have nearly 100% re-sprouted by 11-08.

Figure 5. Perennial pepperweed quickly and vigorously re-sprouted (from its extensive root system) after the 10-2007 fire. Burned willows were slower to re-sprout (6-08).

Figure 6. Eucalyptus stand along Highland Valley Road 6/2008 - post 10-2007 fire.

Figure 7. Eucalyptus stand below dam with existing haul road visible.

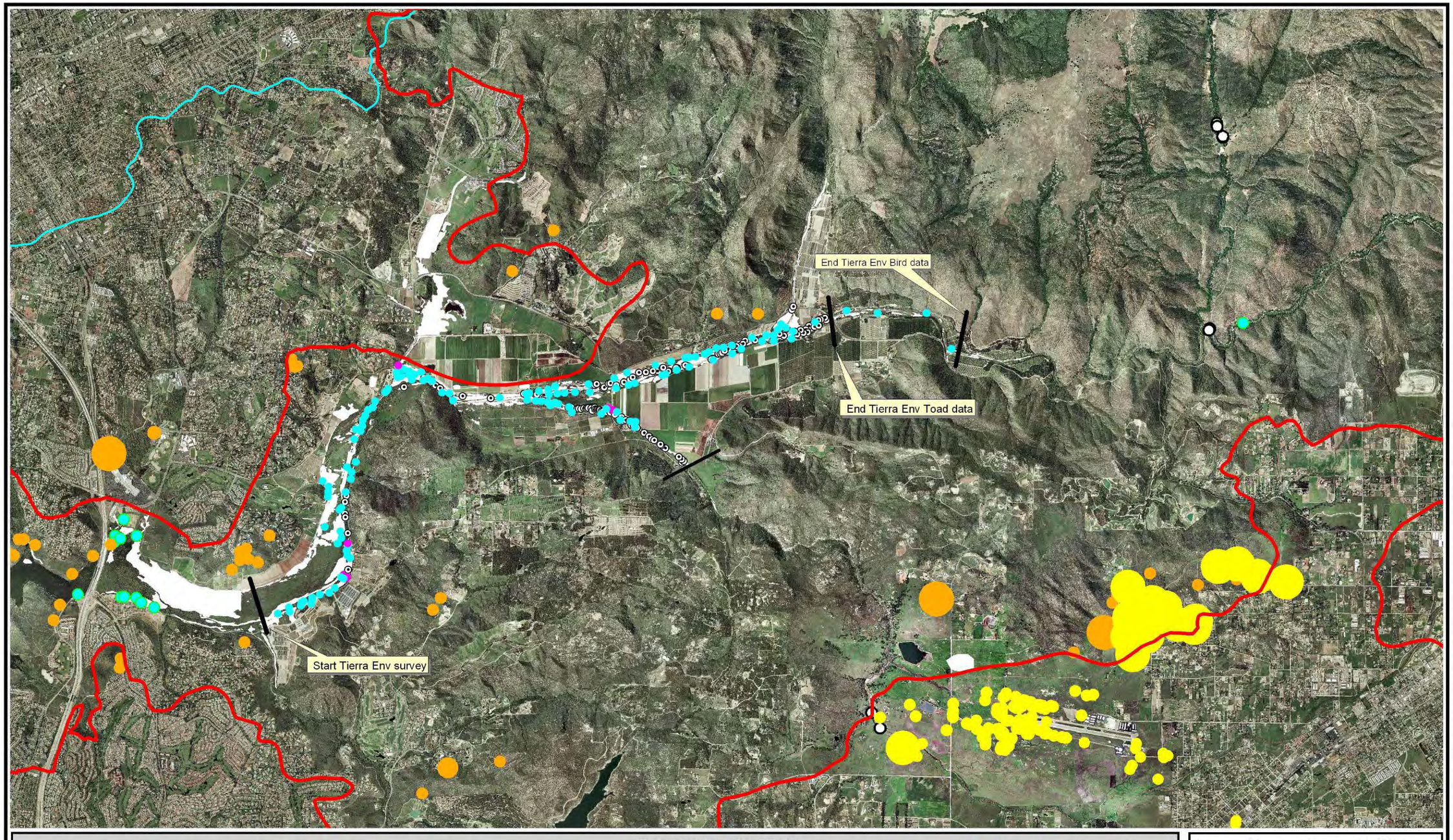


Figure 8. San Dieguito Invasive Plant Control Program: Distribution of Sensitive Species- East Watershed. San Dieguito JPA lead (covers multiple restoration projects: San Dieguito Conservancy, County, JPA).

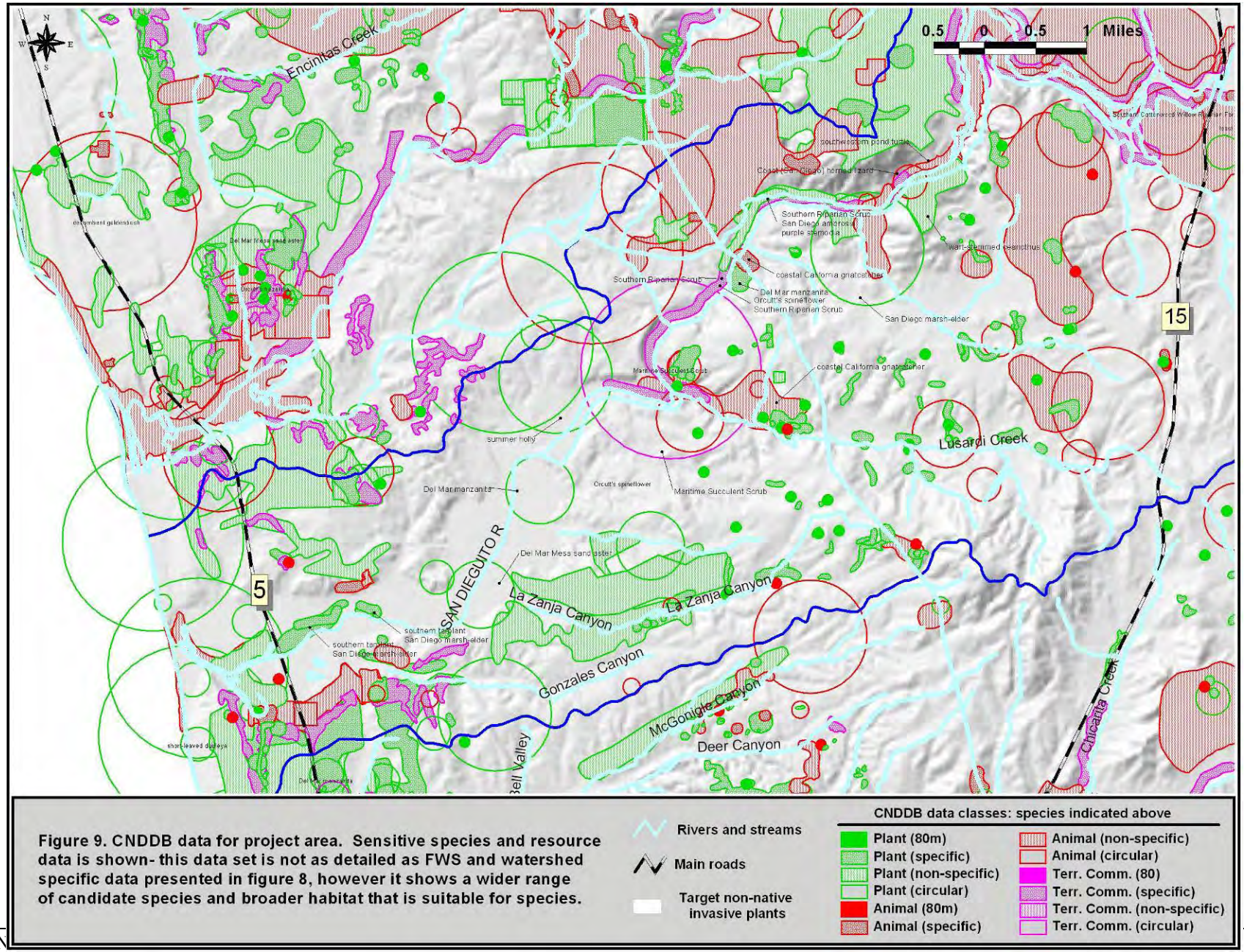


Figure 9. CNDDB data for project area. Sensitive species and resource data is shown- this data set is not as detailed as FWS and watershed specific data presented in figure 8, however it shows a wider range of candidate species and broader habitat that is suitable for species.

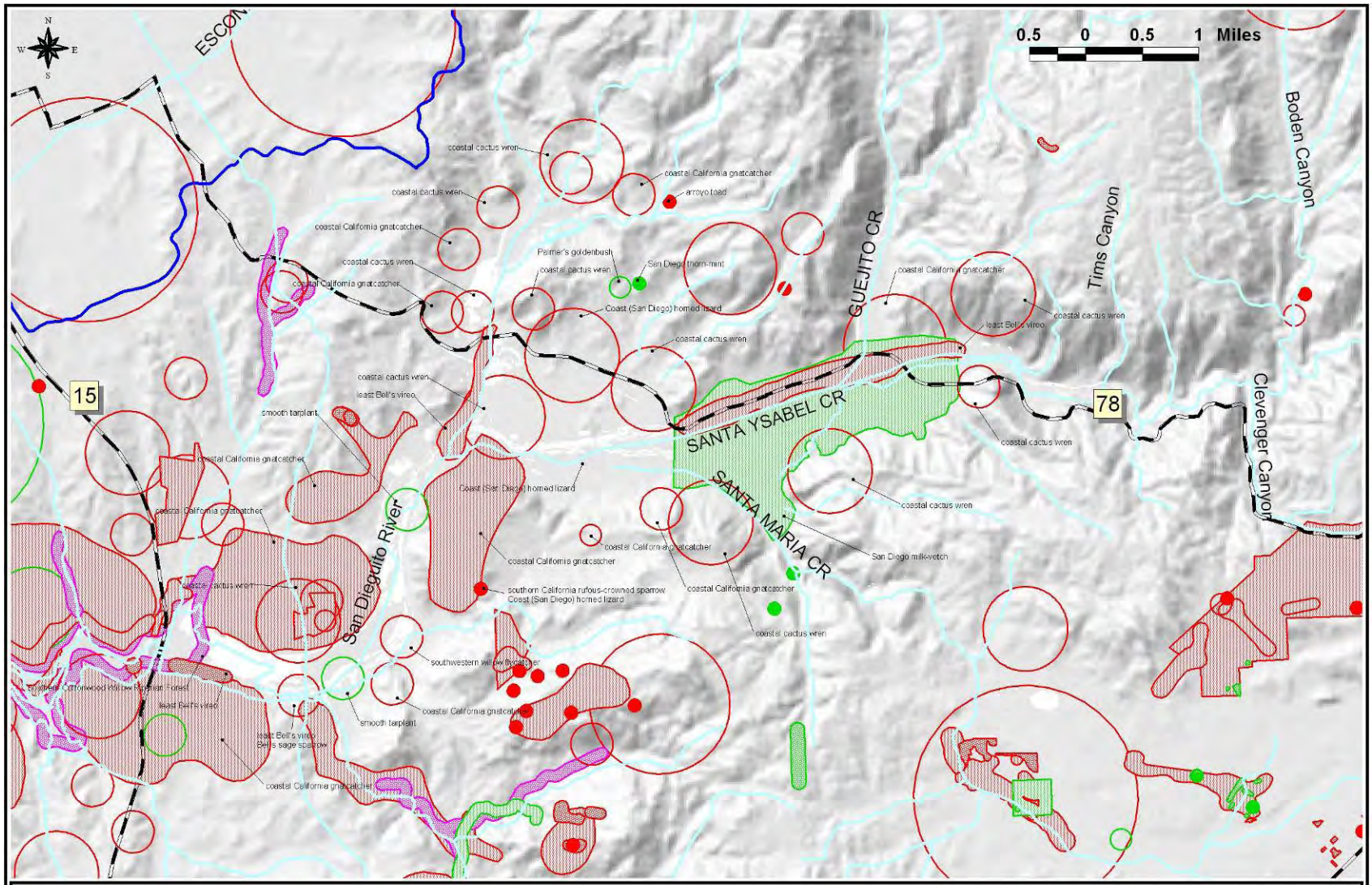


Figure 10. CNDDB data for project area. Sensitive species and resource data is shown- this data set is not as detailed as FWS and watershed specific data presented in figure 8, however it shows a wider range of candidate species and broader habitat that is suitable for species.

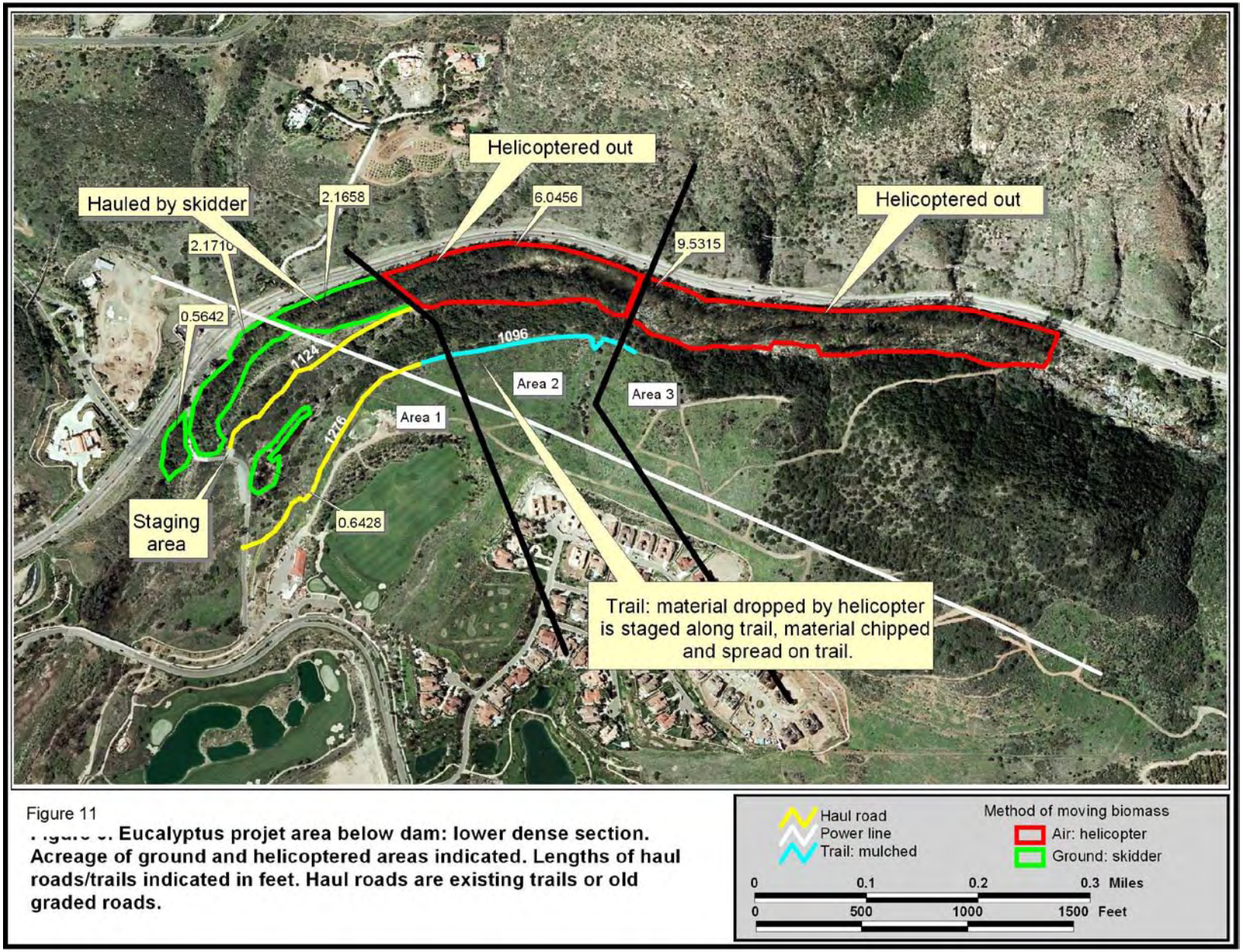


Figure 11

Eucalyptus projet area below dam: lower dense section. Acreage of ground and helicoptered areas indicated. Lengths of haul roads/trails indicated in feet. Haul roads are existing trails or old graded roads.

ENVIRONMENTAL ANALYSIS CHECKLIST

ISSUES & SUPPORTING DATA SOURCES:	Potential Significant Effect	Less than Significant w/ Mitigation	Less than Significant Impact	No Impact
1. LAND USE & PLANNING. Would the project:				
a) Conflict with general plan designation or zoning?	☐	☐	☐	☒
No impact. The project will work within multiple zoning areas (residential, commercial, agricultural, and open space) and various areas covered under general plans. However the project does not change land use designation or create a new land use, as nothing is constructed and no changes in rights of use occur. Project activities may occur on both public and private lands- but only with clear 'right of entry' or authorization from the property owner or entity managing the land.				
b) Conflict with applicable environmental plans or policies of agencies with jurisdiction over the project?	☐	☐	☐	☒
No impact. The proposed project would comply with existing land use plans. No construction, land use change, or change in zoning would occur. The program facilitates Cities, the County and other entities in complying with environmental regulations by creating a watershed based program that controls invasive non-native vegetation. No work occurs without explicit permission from persons or the entity owning lands where project activities would occur. This project will enhance water quality, habitat function and reduce risk of fire and flood damage for all properties on the watershed. This project implements portions of regional plans related to control of invasive non-native plants for water conservation, habitat enhancement and fire/flood risk reduction.				
c) Disrupt or divide the physical arrangement of an established community (e.g. low income, minority)?	☐	☐	☐	☒
No impact. There will be no physical structures built and no displacement or separation of communities.				
d) Conflict with adjacent, existing or planned land uses?	☐	☐	☐	☒
No impact. The project does not involve construction or change existing land use. Work will not occur on private property without prior notification and permission from the owner.				
2. AGRICULTURE. Would project:				
a) Convert Farmlands listed as "Prime", "Unique" or of "Statewide Importance," as shown on the State Farmland Mapping and Monitoring Program, to non-agricultural use?	☐	☐	☐	☒
No impact. The project does not convert farmland to non-agricultural use.				
b) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	☐	☐	☐	☒
No impact. Areas of farmland exist adjacent to parts of the riparian floodplain that will be restored; however the project will have no affect on use/conversion of adjacent farmlands. No work will be done in areas that are leased for agricultural operations without prior notification and permission from the owner. Control on invasive non-native plants on a watershed scale is a benefit to agricultural operations as it reduces their long term control costs- many of the target plants are listed noxious weeds that CDFA regulates including: Arundo, perennial pepperweed, tamarisk, and others.				
3. POPULATION & HOUSING. Would project:				
a) Cumulatively exceed adopted regional or local population projections?	☐	☐	☐	☒
No impact. The proposed project does not affect population growth.				
b) Induce substantial growth in an area directly or indirectly through project in an undeveloped area or extension of major infrastructure?	☐	☐	☐	☒
No impact. The proposed project does not directly or indirectly affect population growth.				
c) Displace existing housing affecting a substantial number of people?	☐	☐	☐	☒
No impact. People would not be displaced as a result of this project.				

4. GEOPHYSICAL. Would project result in or expose people to impacts involving:

a) Local fault rupture? ☐ ☐ ☐ ☒

No impact. No project related activities could rupture an earthquake fault. The project area is open space in riparian habitat. The project will not include structures for human occupancy or facilities that would be considered essential to sustain life, so the project would not expose people or structures to potential substantial adverse effects related to these hazards.

b) Seismicity: ground shaking or liquefaction? ☐ ☐ ☐ ☒

No impact. The project site is not located within a known liquefaction area and it is unlikely for the project to be affected by seismic-related ground failure.

c) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? ☐ ☐ ☐ ☒

No impact. The proposed project would not require water or sewer service, septic tanks, or alternative wastewater disposal.

d) Landslides or mudslides? ☐ ☐ ☐ ☒

No Impact. The location of project activities is relatively flat and the project area would not be subject to landslides.

e) Erosion, changes in topography or unstable soil conditions from excavation, grading or fill? ☐ ☐ ☐ ☒

No Impact. The restoration project does not disturb the soil surface and therefore will not result in substantial erosion or loss of topsoil. Areas with stands of *Arundo* and other target non-native plants that are mowed will have a layer of mulch covering the soil surface. This mulch layer, existing root structure of treated plants and re-vegetation with native plants make soil erosion unlikely and will reduce long term erosion rates as native woody plantings have better root structure then Arundo.

f) Subsidence of the land? ☐ ☐ ☐ ☒

No impact. The site is not located near unstable geologic units.

g) Expansive soils? ☐ ☐ ☐ ☒

No impact. The site is not located in an area known for expansive soils.

h) Unique geologic or physical features? ☐ ☐ ☐ ☒

No impact. The project will not alter any unique geologic or physical features within the project area.

5. HYDROLOGY & DRAINAGE. Would the project:

a) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in manner which would result in:

i) substantial erosion or siltation on- or off-site? ☐ ☐ ☐ ☒

No Impact. The restoration project will not change or modify the low flow channel position. No structures or bank channel modifications will occur as part of the project. The soil surface will not be disturbed; therefore no substantial erosion or siltation on- or off-site will occur.

ii) a substantial increase in the rate or amount of surface runoff in manner which would result in flooding on- or off-site? ☐ ☐ ☐ ☒

No Impact. The restoration project will not change or modify the low flow channel position. No construction structures or bank channel modifications will occur as part of the project. The risk of flooding will be reduced by the restoration project through the reduction of *Arundo* and pampas grass biomass in the flood zone. *Arundo* is documented as increasing flood risk in riparian areas. No changes or re-direction of surface runoff is associated with the project.

b) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? ☐ ☐ ☐ ☒

No Impact. The project will not contribute to or change storm water run-off.

c) Place within a 100-year flood hazard area structures which would impede or redirect flood flows? ☐ ☐ ☐ ☒

No Impact. The project does not involve the constructions of any structures.

d) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, or inundation by seiche, tsunami, or mudflow? ☐ ☐ ☐ ☒

No impact. The project would not expose people to seiche, tsunami, or mudflow. The project reduces the likelihood of flooding by controlling Arundo which contributes significantly to flood damage (through diversion of water or biomass damming on structures).

6. WATER QUALITY. Would the project:

a) Violate any water quality standards or waste discharge requirements? ☐ ☐ ☐ ☒

No impact. Restoration activities will not impact channel areas with water flow or result in the discharge of any contaminants. No soil disturbance will occur on site and no biomass will be placed in the active river/stream channel. Aquatic approved herbicides will be used for treatments of non-native plants. These herbicides are approved for use by open water by the Environmental Protection Agency. The active ingredients are glyphosate and imazypyr which have extremely low toxicity to wildlife (Appendix II). No direct applications of herbicide to water will occur.

b) Substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of a local groundwater table level? ☐ ☐ ☐ ☒

No Impact. Treatments of *Arundo* and other non-native will result in increased supply of groundwater and increased infiltration which will help raise groundwater levels. *Arundo* and pampas grass utilize twice as much water as native riparian woody vegetation and occupies areas that would have been a mixture of riparian habitat and open spaces. Completion of the project will provide approximately 400 acre feet of water per year for increased surface flows and groundwater recharge.

c) Otherwise substantially degrade water quality? ☐ ☐ ☐ ☒

No Impact. The project will not affect water quality. Aquatic approved herbicides will be used for treatments of non-native plants. These herbicides are approved for use in aquatic habitats by the Environmental Protection Agency. The active ingredients are glyphosate and imazypyr (Appendix II). Surfactants, when used, are approved for use by open water. Surfactant products (such as No-Foam A and Sure Spreader) are approved for use in aquatic systems. No direct applications of herbicide to water will occur. Treatments do not occur during rain events or when rain is forecast within 24hrs. Control of target invasive species will improve water quality over the long term by reducing the frequency of fires, naturalizing shade structure along open water (effecting temperature regimes) and normalizing organic debris cycles (over abundant Arundo growth is creating above normal amounts of organic material in the system).

7. TRANSPORTATION/CIRCULATION. Would the project result in:

a) Increased vehicle trips or traffic congestion beyond adopted policies and/or forecasts? ☐ ☐ ☐ ☒

No impact. This project would not significantly increase vehicle trips or traffic congestion.

b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways? ☐ ☐ ☐ ☒

No impact.

c) Safety hazards from design features (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)? ☐ ☐ ☒ ☐

Less than significant impact. The project would have no effect on area roadway design or cause significant traffic/transportation hazards. Work crews will use tractors and other equipment- but in unimproved areas and staging areas. Any temporary movement of equipment or work near roads will be signed. Crews will not stop or divert traffic.

d) Inadequate emergency access or access to nearby uses? ☐ ☐ ☐ ☒

No impact. The project does not propose changes to access in surrounding areas.

e) Insufficient parking capacity on-site or off-site? ☐ ☐ ☐ ☒

No impact. The project will not affect parking capacity.

f) Hazards or barriers for pedestrians or bicyclists? ☐ ☐ ☐ ☒

No impact. The project does not involve permanent modification of trails, bike lanes, or road shoulders/sidewalks. Some areas may have improved access and safety once non-native plants are controlled/reduced/and or removed- where non-native plants encroach on these areas. Temporary closing of road shoulders/sidewalks/trails may occur while work is carried out- but these effects will be temporary and signage will clearly designate work areas.

g) Conflicts with adopted policies supporting alternative transportation (e.g. bus turnouts, bicycle racks)? ☐ ☐ ☐ ☒

No impact. The project does not conflict with existing transportation policies.

h) Rail, waterborne or air traffic impacts? ☐ ☐ ☐ ☒

No impact. The project does not affect rail, waterborne or air traffic.

i) Change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? ☐ ☐ ☐ ☒

No impact. The proposed project would not affect air traffic patterns.

8. AIR QUALITY. Would the project:

a) Exceed any SCAQMD standard or contribute to air quality deterioration beyond projections of SCAQMD? ☐ ☐ ☒ ☐

Less than significant impact. The proposed project will generate minor short-term air emissions. Short-term air emissions will occur during restoration activities- clearing *Arundo* biomass from the project site. Some dust is generated when the dried *Arundo* biomass is mowed, however this is a very local and short-term effect. No significant soil disturbance will occur, which is typically the main source of particulate air pollution. Dust emissions will be well below significant thresholds and would occur from Sep 15th to Mar 15th. No long-term emissions will result from implementation of this project.

b) Expose sensitive population groups to pollutants in excess of acceptable levels? ☐ ☐ ☐ ☒

No impact. This project will not expose anyone in the populations to pollutants in excess of acceptable levels. No population groups are nearby areas that would be sprayed. Herbicide is local foliate and does not travel. No aerial spraying.

c) Alter air movement, moisture, or temperature, or cause any change in climate? ☐ ☐ ☐ ☒

No impact. This project will not affect these environmental factors. The project will substantially reduce the risk of fire and the intensity of fire events, if they were to occur, by reducing non-native plant biomass- which is far more substantial and flammable then native riparian vegetation. Reduced fire occurrence and intensity resulting form the project improve air quality.

d) Create objectionable odors affecting a substantial number of people? ☐ ☐ ☐ ☒

No Impact. The project would not create offensive odors. The project areas are typically wildlands or undeveloped open spaces that do not affect a substantial number of people.

9. NOISE. Would the project:

a) Increase existing noise levels? ☐ ☐ ☒ ☐

Less Than Significant Impact. All work with equipment will be performed between Sep 15 and Mar 15. During this time period there may be temporary or periodic increases in ambient noise levels due to workers carrying out invasive non-native plant treatments and restoration activities. Non-native plant biomass reduction may occur from mid September 15th to early March. This work will involve the use of chainsaws and/or a tractor with a mowing attachment. Noise generated from the restoration activities are insignificant due to their short duration and low levels in comparison to highway noise and surrounding land uses. In addition, most activities are within undeveloped open space areas with limited public use/access. The following avoidance and minimization measures are in place to assure that noise level thresholds are not exceeded.

(1) All construction vehicles or equipment, fixed or mobile, operated within 1,000' of a dwelling shall be equipped with properly operating and maintained mufflers.

(2) All operations shall comply with San Diego County Codified Ordinance (Noise Control).

(3) Stockpiling and/or vehicle staging areas shall be located as far as practicable from dwellings.

b) Expose people to noise levels exceeding adopted County standards? ☐ ☐ ☒ ☐

Less Than Significant Impact. Work occurs in wildland and open space areas. Standard types of equipment are used (tractors, chainsaws, etc.). The proposed restoration activities will occur between 7:30 a.m. and 4:30 p.m. on Mondays through Saturdays from September 15th to March 15th. All project work would fall within normal working hours. Restoration activities will be conducted during the non-breeding season, thus avoiding noise impacts to endangered species and nesting birds. Noise levels will comply with City and County standards.

The following avoidance and minimization measures are in place to assure that noise level thresholds are not exceeded.

(1) All construction vehicles or equipment, fixed or mobile, operated within 1,000' of a dwelling shall be equipped with properly operating and maintained mufflers.

(2) All operations shall comply with Orange County Codified Ordinance Division 6 (Noise Control).

(3) Stockpiling and/or vehicle staging areas shall be located as far as practicable from dwellings.

c) If located within an airport land use plan or, where such plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels? ☐ ☐ ☐ ☒

No Impact. The project is not located within an airport land use plan or within two miles of a public airport or public use airport.

10. BIOLOGICAL RESOURCES. Would the project impact:

a) Endangered, threatened or rare species or their habitats (including but not limited to plants, fish, insects, animals and birds)? ☐ ☒ ☐ ☐

Less Than Significant Impact with Mitigation, Minimization and Avoidance Measures. The type of restoration activities carried out in this project are considered by the CA Department of Fish & Game, the US Fish & Wildlife Service and the Army Corps of Engineers to be a form of mitigation for impacts to riparian habitat (e.g. for small permanent impacts and temporary impacts). The result of this project will be habitat improvement for the three federally listed species in the project area: least Bell's vireo (*Vireo pusillus bellii*), southwestern willow flycatcher (*Empidonax traillii extimus*) and the arroyo southwestern toad (*Bufo californicus*) (See Appendix I). The FWS Technical Assistance letter and DFG 1600 permits outline specific impact minimization and avoidance measures to protect these listed species. Both agencies conclude that the project is a net benefit and does not cause a significant adverse effect. The following avoidance and minimization measures are in place to assure that there will be less than significant impacts to these species due to the utilization of a methodology that avoids impacts:

- Non-native plant control methods will be used that avoid impacts to non-target native vegetation. These methods include: preparing target plants for herbicide application by separating them from native vegetation (see project description), using targeted foliar application of herbicide by crews on foot, using highly qualified contractors who have experience treating non-native plants in sensitive riparian habitat, and using herbicides that are approved for use in wetlands (aquatic approved formulations of glyphosate and imazapyr) which have no negative impact on wildlife species (Appendix I).

- A biologist will oversee work activities to assure that conditions of DFG and FWS permits are being followed.

- No restoration activities with heavy equipment shall occur during the designated breeding season for the two endangered bird species occurring in the project area. The two federally listed species in the project area, least Bell's vireo (*Vireo pusillus bellii*) and southwestern willow flycatcher (*Empidonax traillii extimus*), are migratory and are usually not present in the habitat during most of the restoration activities (from September 15th to March 15th).

- To avoid impacts to the arroyo southwestern toad (only for upper San Dieguito Watershed) the following project methodologies are in place as determined stated in the Technical Assistance letter from US Fish & Wildlife:

d) Arundo, tamarisk and eucalyptus control work will only occur between September 15th and March 15th.
e) No soil movement/disturbance, or bank/channel modifications will occur.
f) No heavy equipment (>20,000 lbs) will be used.
g) No biomass reduction within Arroyo toad habitat areas may occur (sites may be checked by FWS and determined to be 'unsuitable habitat').
h) Biomass, if removed/moved in toad habitat areas, will be done my hand and taken to staging areas and twhere it will be chipped/reduced and spread over compacted disturbed soils (parking lots, shoulders, trails, etc.) or taken to a green waste facility.
i) Crews will avoid walking through flowing channel areas. Crew sizes will be limited to less than 15 individuals working in small teams.

- No native plants are endangered within the project areas, candidate species will be avoided during work activities. Only target invasive non-native plants will be treated.

- All mixing of herbicides and maintenance of equipment will occur only in areas that are devoid of native vegetation, that are adjacent to existing roads, and have compacted disturbed soils. These areas are not sensitive species habitat, they are not adjacent to the river channel, and they have no cover of native woody vegetation.

Annual reports document work and compliance are provided to regulatory agencies that have issued permits: US Army Corps of Engineers, Department of Fish and Game, and Fish and Wildlife Service. All permits clearly indicate work conditions, and minimization & avoidance measures. Regulatory agencies, county project managers and the project biologist assure compliance with these conditions. Any violations would result in termination of active work and possible fines or a request for compensatory mitigation.

b) Locally designated species (e.g. heritage trees)?	☐	☐	☐	☒

No impact. The project does not affect locally designated species.

c) Locally designated natural communities (e.g. oak forest, coastal habitat, etc.)?	☐	☐	☒	☐

Less Than Significant Impact. The project restores and protects native habitat and open space. Natural communities will be worked in- but they will be enhanced and fire and flood risk will be reduced.

d) Wetland habitat (e.g. marsh, riparian and vernal pool)?	☐	☐	☒	☐

Less Than Significant Impact. The restoration project will restore native riparian habitat, improving habitat quality for listed wildlife species. The type of restoration activities carried out in this project (non-native plant control and native replanting) are considered by the CA Department of Fish & Game, the US Fish & Wildlife Service and the Army Corps of Engineers to be mitigation for impacts to riparian habitat (e.g. for small permanent impacts and temporary impacts). The methodology described above (see project description and section IV (b)) will avoid negative impacts to the riparian habitat and endangered species that are found within the system. *Arundo* and other target non-native plants severely impact the biological function of the riparian system by increasing fire and flood damage, modifying hydrology, and out competing native vegetation (effecting food and nesting resources). The project is a net benefit, restoring riparian habitat.

e) Wildlife dispersal or migration corridors?	☐	☐	☐	☒

No impact. The project will not alter channel position or otherwise impede water flows. No equipment will operate in channels or flowing water. No cut or reduced non-native plant biomass will be left in low flow channel areas.

f) Adopted or proposed conservation plans and policies (e.g. Natural Community Conservation Plan or Resource Management Plan)? ☐ ☐ ☐ ☒

No Impact. The restoration project does not conflict with any existing conservation plans. The overall effect of the restoration project is to enhance riparian habitat. Control of invasive non-native plant species is a high priority within several plans including: Multiple Species Conservation Plans, watershed plans and integrated resource management plans. This program will facilitate completion of those goals in an efficient and comprehensive manner.

11. AESTHETICS. Would the project:

a) Affect a scenic vista or view open to the public? ☐ ☐ ☐ ☒

No Impact. No scenic vistas in the project area would be negatively affected. The project would improve scenic views by removing stands of *Arundo* and pampas grass which would make mature native trees (sycamores, cottonwoods, oaks, and willows) more visible. Rock formation and river channel areas would also have increased visibility. *Arundo* and pampas grass removal will have the long-term affect of saving the mature trees by reducing competition for limited resources and reducing the risk of devastating wildland riparian fires throughout the system. The net effect will be to improve scenic riverine and coastal vistas by removing non-native vegetation that is impacting these resources.

b) Affect a designated scenic highway? ☐ ☐ ☒ ☐

Less than significant impact. Some non-native palms, eucalyptus and Brazilian pepper trees will be removed, but these trees are in 'wildland' areas with other native vegetation so visual impacts are minor. The river downstream of the Hodges Dam is visible from Del Dios Highway, a scenic highway. Areas where large stands of eucalyptus exist would be done in a phased manner and planted with native trees and shrubs to replace the lost trees. This would minimize visual impacts. Rock outcroppings and historical buildings will not be impacted. The immediate effect of the project will be to make mature native trees in river systems more visible, improving scenic riverine resources while reducing risk of fire from non-native plants that are a significant fire threat (*Arundo*, pampas grass, palms, and eucalyptus).

c) Substantially degrade the existing visual character or quality of the site and its surroundings? ☐ ☐ ☒ ☐

Less than significant impact. Project areas are vegetated wildland 'open space'. Non-native plant control and re-vegetation with natives will restore these areas. Riparian restoration will result in mature native vegetation and the river becoming more visible, improving the visual character of the riparian corridor.

d) Create light or glare beyond the physical limits of the project site? ☐ ☐ ☐ ☒

No impact. No new source of light or glare would be created so there would be no impact.

12. CULTURAL/SCIENTIFIC RESOURCES, Would the project:

a) Disturb archaeo or paleo resources? ☐ ☐ ☒ ☐

Less than significant impact. See 12 (b).

No impact on paleological resources. Work activities will not move or destroy rocks or rock formations. Additionally no grading or significant soil disturbance will occur.

b) Affect historical resources? ☐ ☐ ☒ ☐

Less than significant impact. Treatment of non-native plants would have no impact. Reduction of treated biomass and re-vegetation would have a less than significant impact. Significant disturbance of soil does not occur- no grading, use of tracked equipment, or other mechanized movement of soil occurs. The State Historic Office has concurred that impacts are unlikely during biomass reduction using these methods.

To assure avoidance of impacts a search of registered archaeological sites is carried out for each project area at the South Coastal Information Center. Any mowing and restoration work near or within registered sites will have a certified archeologist and a cultural monitor on site to assure that no impacts to cultural resources occur.

If archaeological or cultural features or materials are identified by the archaeologist during the mowing, work will stop immediately in that area. No archaeological or cultural materials will be collected. Work will be diverted away from the sensitive areas, which will remain intact. If approved by the archaeological monitor, hand cutting of *Arundo* and other invasive plants may take place around identified milling features or other cultural resource/areas. Plant biomass will be carried to areas with no sensitive resources and mulching will occur at that location.

c) Have the potential to cause a physical change which would affect unique ethnic cultural values? ☐ ☐ ☒ ☐

Less than significant impact. No grading or significant soil disturbance will occur, making the changes to unique cultural resources unlikely. Target non-native vegetation was not a component of the landscape utilized by native cultures.

13. RECREATION. Would project:

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? ☐ ☐ ☐ ☒

No impact. The project would not increase the use of existing parks and recreational facilities.

b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? ☐ ☐ ☐ ☒

No impact. No recreational facilities would be constructed or expanded.

c) Conflict with adopted recreational plans or policies? ☐ ☐ ☐ ☒

No impact. The project does not conflict with adopted recreational plans or policies.

14. MINERAL RESOURCES. Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? ☐ ☐ ☐ ☒

No impact. This project will not impact future availability of sand or rock for mining.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? ☐ ☐ ☐ ☒

No impact. This project will not impact future availability of sand or rock for mining.

15. HAZARDS. Would the project:

a) Create a hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? ☐ ☐ ☒ ☐

Less Than Significant Impact. Fuel and plant herbicides (glyphosate, imzapyr) will be transported and used on site during habitat restoration. Plant herbicides used in the restoration of sites have very low toxicity and are approved for use in aquatic areas (appendix II). No disposal of materials will occur at project sites. The following BMPs will be in place to ensure that there are no significant impacts to the environment:

- The transport of hazardous materials is regulated by the State and the transport of such materials to the site would comply with these regulations.
- During restoration activities contractors will employ best management practices for spill control and prevention. With prevention and management in place, any spills of hazardous materials are considered less than significant.
- Restoration equipment storage and maintenance will be conducted in non-wetland areas (degraded staging areas such as road sides, shoulders, parking lots, and areas with bare compacted soil.

All mixing of herbicides and maintenance of equipment will occur only in areas that are devoid of vegetation and that are adjacent to existing roads (staging areas as described above).

b) Create a hazard to the public or the environment through reasonably foreseeable upset & accident conditions involving the release of hazardous materials into the environment? ☐ ☐ ☒ ☐

Less Than Significant Impact. Some hazardous materials, such as fuel and plant herbicides, would be transported and used at the site during restoration activities, which could create a hazard to the environment should a significant spill occur. The BMPs incorporated into the project (see above) would reduce the hazards to a less than significant level.

c) Exposure of people to existing sources of health hazards? ☐ ☐ ☐ ☐

d) For a project located within an airport land use plan or, where such plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? ☐ ☐ ☐ ☒

No impact. The site is not located within an airport land use plan or within 2 miles of a public airport or public use airport.

e) **For a project within the vicinity of private airstrip, would the project result in a safety hazard for people residing or working in the project area?** ☐ ☐ ☐ ☒

No impact. The site is not located within the vicinity of a private airstrip.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? ☐ ☐ ☐ ☒

No impact. The project activities are typically in open space areas and do not necessitate closing or blocking roads, or restricting there use. Project activity would not alter emergency response or emergency evacuation routes.

g) Expose people or structures to a significant risk or loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? ☐ ☐ ☐ ☒

No impact. The project will not expose people or structures to significant risk of loss, injury or death involving wildland fires. The control of *Arundo* and other non-native plants and replacement with native riparian vegetation will reduce the risk of wildland fire. A significant reduction of fire risk will occur.

16. PUBLIC SERVICES. Would project result in need(s) for new/altered government facilities/services in:

a) Fire protection? ☐ ☐ ☐ ☒

No impact. The project would not result in new or altered government facilities in fire protection.

b) Police protection? ☐ ☐ ☐ ☒

No impact. The project would not result in new or altered government facilities in police protection.

c) Schools? ☐ ☐ ☐ ☒

No impact. The project would not result in new or altered government facilities for schools.

d) Maintenance of public facilities, including roads? ☐ ☐ ☐ ☒

No impact. The project would not result in any changes to the maintenance of public facilities, including roads.

e) Other government services? ☐ ☐ ☐ ☒

No impact. The project would not result in new or altered government facilities in other government service areas.

17. UTILITIES & SERVICE SYSTEMS. Would project result in needs for new or substantial alterations in:

a) Power or natural gas? ☐ ☐ ☐ ☒

No impact. The restoration project will not result in new or substantial alterations in power or natural gas.

b) Communications systems? ☐ ☐ ☐ ☒

No impact. The restoration project will not result in new or substantial alterations to communications systems.

c) Local or regional water treatment or distribution facilities? ☐ ☐ ☐ ☒

No impact. The restoration project will not result in new or substantial alterations to water treatment or distribution facilities.

d) Sewer or septic tanks? ☐ ☐ ☐ ☒

No impact. The restoration project will not result in new or substantial alterations to sewer lines or septic tanks.

e) Solid waste disposal? ☐ ☐ ☐ ☒

No impact. The restoration project will not create solid waste that needs to be disposed of.

MANDATORY FINDINGS

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory? ☐ ☐ ☒ ☐

Less than significant impact. The restoration activities carried out in this project are considered by DFG, FWS and ACOE to be a form of mitigation for impacts to riparian habitat. *Arundo* and non-native plant control and re-vegetation with native riparian species, increases the quality of riparian habitat for fish and wildlife species. This project will directly enhance the riparian habitat, benefiting the endangered species that inhabit the San Dieguito Watershed. The FWS Technical Assistance Letter and DFG permits assure that as long as impact minimization and avoidance measures are followed, no significant impacts would result. The project does not impact important examples of the major periods of California or prehistory.

b) Does the project have the potential to achieve the short-term environmental goals to the disadvantage of the long-term environmental goals? ☐ ☐ ☐ ☒

No impact. The invasive plant control program provides long term environmental benefits by implementing watershed based eradication of *Arundo*, pampas grass and other invasives. This makes the projects sustainable over the long term and helps assure that habitat improvements, water conservation and fire/flood risk reduction are not just temporary enhancements but long term benefits. Watershed based implementation is built around pre-mapping of invasive non-native plant distributions (completed: Figure 1), watershed based permitting to facilitate comprehensive control and restoration (completed: FWS, ACOE, SWCB and in process: CEQA and DFG), and coordinated and planned implementation, all of which assure that target plant population are treated in a systematic and sustainable fashion.

c) Does the project have possible environmental effects which are individually limited but cumulatively considerable? ("cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.) ☐ ☐ ☒ ☐

Less than significant impact. The proposed project has been found to have less than significant impacts as determined by FWS Section 7 consultation. No cumulatively considerable impacts would be realized when viewed in connection with the effects of existing or future proposed projects. This project is part of a watershed wide habitat improvement program that will ensure that the project benefits are long lasting.

d) Does project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly ☐ ☐ ☐ ☒

No impact. The project has been found to have no impacts or less than significant environmental impacts which are temporary. Therefore, the project would not cause substantial adverse effects on human beings.

DETERMINATION:

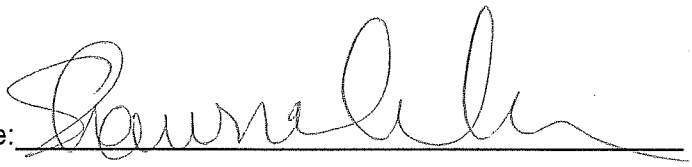
Choose One of the Following

Based upon the evidence in light of the whole record documented in the attached environmental checklist explanation, cited incorporations and attachments, **I find that the proposed project**:

COULD NOT have a significant effect on the environment, and a negative declaration (ND) will be prepared pursuant to CEQA Guidelines Article 6, 15070 through 15075. ☐

COULD have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures have been added to the project. A negative declaration (ND) will be prepared pursuant to CEQA Guidelines Article 6, 15070 through 15075. ☒

MAY have a significant effect on the environment which has not been analyzed previously. Therefore, an environmental impact report (EIR) is required. ☐

Signature: 

Environmental Planner: **Shawna Anderson**
Telephone: **858-674-2275 x 13**

NOTE: All referenced and/or incorporated documents may be reviewed at:

San Dieguito River Park JPA
14103 Highland Valley Road, Escondido CA 92025

APPENDIX 1

USFWS has already completed a 'Technical Assistance Letter' for the program. The letter states that as long as minimization and avoidance measures are followed (as outline in the plan submitted by San Dieguito Rive Park JPA), harassment and or take of listed species is unlikely. A section 7 consultation with the Service is not required at this time.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

In Reply Refer To:
FWS-SDG-08B0725-08TA0838

SEP 08 2008

Ms. Shawna Anderson, Environmental Planner
San Dieguito River Park JPA
14130 Highland Valley Road
Escondido, California 92025

Subject: Request for Technical Assistance on the Invasive Plant Control and Re-vegetation for the San Dieguito Watershed Project, San Diego County, California

Dear Ms. Anderson:

This letter is in response to a July 15, 2008, letter from Jason Giessow, your representative, requesting our concurrence that the proposed Invasive Plant Control and Re-vegetation Project (project) for the San Dieguito Watershed may affect, but is not likely to adversely affect the federally-listed endangered least Bell's vireo (*Vireo bellii pusillus*; vireo) and arroyo toad (*Bufo californicus*; arroyo toad).

The San Dieguito River Park JPA (JPA) is initiating a watershed based invasive non-native plant control and re-vegetation program on the San Deiguito Watershed. The project consists of a watershed based invasive non-native plant control and re-vegetation program with an emphasis on *Arundo*, pampas grass, eucalyptus, and perennial pepperweed (other species may be controlled if observed). The program will start at Lake Hodges and will work downstream to the estuary.

The bulk of control and re-vegetation activities will occur between September 15 and March 15 each year. Some maintenance activities (i.e., watering of plantings and weed control) may occur outside this time frame, but only in areas that have no suitable vegetation for avian nesting. In addition, pepperweed will require treatment during early summer when it is actively growing.

The typical treatment cycle will start with foliar application of glyphosphate herbicide in the fall. Work will begin September 15 and usually end by early December. Areas above the dam that burned in the 2007 fires will be left in place (no biomass reduction). Biomass reduction below the dam may occur where stands are dense and large (over 1/8 acres). Biomass reduction will occur from mid-January up to March 15, but most work is completed by late February. Biomass reduction will entail either mowing or hand cutting the dead *Arundo* cane/pampas grass. Hand cut *Arundo* will be stacked and mowed, chipped, or left to decompose naturally. The normal biomass reduction process is: 1) a large mower mows stands, 2) hand crews cut all *Arundo* that mowers could not reduce, 3) a smaller mower mows hand cut *Arundo*. Some sites that do not have mowing access may be cut by hand and chipped. Mowing will be carried out using a fixed

tooth or hammer flail mowing attachment mounted on a tractor. The mowing attachment mulches the dead (or live) *Arundo* cane into a layer about 4" thick (thickness varies at site from ½" to 10"). The mowing attachment and tractor do not dig into the soil surface or change topography of the site. All tractors are rubber tired. Several sizes of tractors are used: from a larger 45,000 lb tractor with four large tires (about 56" by 18") with a mowing implement 100" wide to a smaller size 8,000 lb tractor with two large (48" x 16") and two small tires (24" x 12") with a mowing implement 74" wide. Live or dead *Arundo* stands are mowed standing and piles of dead *Arundo* stacked by hand crews are mowed. *Arundo* biomass mulch will be left within the original footprint of the stand or may be spread over compacted areas (roads, parking areas, shoulders, etc.). No mulch will be spread over soil above the dam that could be used by arroyo toads.

Eucalyptus biomass will not be mowed in place. Instead, the biomass will be cut and material will be chipped and spread on trails, roads, parking lots or taken off site. Cut stumps will be treated with Garlon. Larger trees may be girdled to leave structure for wildlife. Below the dam, rubber tire skidders will be used to move/drag cut trees to staging areas for chipping. Areas that are too rocky for the skidder will have cut material bundled and then a helicopter will pick up the material and take it to the staging area.

Based on project information above, and the attached list of avoidance/minimization measures that were proposed as part of the technical assistance request, the Service concurs that the proposed project may affect, but will not likely adversely affect the vireo and arroyo toad. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

If you have any questions regarding this letter, please contact Michelle Moreno of my staff at (760) 431-9440.

Sincerely,

Karen A. Goebel
Assistant Field Supervisor

Attachment

ATTACHMENT

Avoidance and Minimization Measures for the San Dieguito Watershed Invasive Plant Control and Re-vegetation Project

Initial Foliar Treatment of Arundo, tamarisk, pampas grass (excluding pepperweed): Herbicide Application

1) No more then three crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 16 individuals- and no more then five people will be working together at a given spot.
4) Herbicide application will occur with either backpack sprayers (3 gallon) or hand held power sprayers. Power sprayers are moved by ATV's and consist of a small gas powered engine (3 hp) on a trailer with a tank/reservoir (50gal useable volume).
5) To reduce the chance/impact of spillage, work crews can only mix herbicide, refill power sprayers (using concentrate and water: i.e. mixing), load mixed chemical into ATV's (for refilling backpack sprayers or power sprayers), and refuel (ATV's or power sprayer) in staging areas. Mixed chemical (application strength) may be added to sprayers in the field.
6) Staging areas are disturbed sites such as roads, shoulders, graded areas, or sites with compacted soil that support no vegetation or weedy vegetation.
7) Foliar spraying will not occur when ambient wind speeds exceed 5 miles per hour.
8) Crew members will avoid wading through streams whenever possible.
9) Each crew may use up to 2 ATV's (typically one is used- to move mixed herbicide to crews in the field).
10) ATV's will not drive in channel areas.
11) ATV's will operate only in open areas- woody vegetation (>1" DBH) will not be cleared or driven upon.
12) Site preparation is carried out prior to treatment of *Arundo*. Preparation entails separating, or creating a space, between stands of *Arundo* and native vegetation. This allows the *Arundo* to be treated without affecting the native woody vegetation. The space between *Arundo* and native vegetation is created by pushing, detangling and/or trimming the vegetation. Both *Arundo* and native woody vegetation may be trimmed. However, woody vegetation may not be trimmed that is in excess of four inches in diameter. Excessive trimming of *Arundo* is not usually carried out because this triggers re-sprouting which results in a much longer re-treatment cycle (before vegetation removal, see species conservation measures).
13) All regulations involving use of herbicides will be followed including BMP's. All applicators will be licensed and certified. Aquatic herbicide formulations will be used when near open water and all additives including any additives (spreading agents and dye's).

14) A marking dye will be used to assure that drift or overspray onto non-target vegetation is not occurring.
15) All garbage and waste material generated by the work crew will be removed from the site.

Biomass reduction (lowering dead or live *Arundo* cane)

1) No native vegetation is mowed.
2) No mowing occurs in the stream channel.
3) No mulched/mowed biomass will be placed in the channel.
4) All mowed material is over previously existing stands of *Arundo*, no open habitat or native vegetation will be covered with *Arundo* mulch.
5) Crews are of 16 or fewer individuals will work in teams of 5 or less. For each team one person cuts and the other team members pull, haul, and stack the cut dead *Arundo* cane.
6) No more than one crew may operate at a given site.
7) No more then three sites may be active on the watershed at once.
8) Crews typically do not use ATV's, but sites far from roads with previously used trails for ATV's (during the fall herbicide application) may re-use these same access routes in open areas. No ATV use can occur in channel areas or in areas with native woody vegetation.
9) Chippers may be used at sites where mowing is not possible due to site topography. Typically this is on tributaries where creeks have deep profiles. Chippers may be staged on roads and may chip material onto disturbed/maintained areas outside the creek profile, chip into areas where *Arundo* previously existed, or ship into containers for hauling off site.

Re-vegetation (native planting) Activities: Between December 15th and March 15th

1) No more then two crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 12 individuals.
4) Each crew may use up to 2 ATV's to move plants from staging areas to planting locations. ATV's typically drive only in areas that have been mowed (on dead *Arundo* mulch) or along established compacted trails and roads. Some sites that are flat and connected to roads, may allow use of a 4 wheel drive truck to access mowed areas and deliver plants.
5) ATV's will not drive in channel areas.
6) ATV's will operate only in open areas, usually on mowed dead *Arundo* mulch- no woody vegetation (>1" DBH) will be cleared or driven upon.

Maintenance Activities: Between March 15th and Sep 15th

1) No areas may be worked in that have vegetation structure suitable for nesting (work only in mowed areas with new plantings).

2) No powered equipment may be used at the restoration sites (only watering and treatments with backpacks). The water truck does have a gas powered pump, but this will operate along access roads or in staging areas.
3) Avian monitors may be used as requested.

Treatment of Perrenial Pepperweed: Between April 15th and July 15th

1) No more then two crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).
3) Crew size will not exceed 8 individuals- and no more then four people will be working together at a given spot.
4) Herbicide application will occur with either backpack sprayers (3 gallon) or hand held power sprayers. Power sprayers will be operated using long lines- with tanks and motors mounted on trucks, trailers (pulled by ATV's), or tractors.
5) Trucks and tractors may only use roads and established trails (compacted areas). ATV's may be used in open areas with no woody structure (other then occasional large mature gallery trees that have no low branching structure). Spray rigs may be used on ATV's in some areas where cover is high.
6) To reduce the chance/impact of spillage, work crews can only mix herbicide, refill power sprayers (using concentrate and water: i.e. mixing), load mixed chemical into ATV's (for refilling backpack sprayers or power sprayers), and refuel (ATV's or power sprayer) in staging areas. Mixed chemical (application strength) may be added to sprayers in the field.
7) Staging areas are disturbed sites such as roads, shoulders, graded areas, or sites with compacted soil that support no vegetation or weedy vegetation.
8) Foliar spraying will not occur when ambient wind speeds exceed 5 miles per hour.
9) Crew members will avoid wading through streams whenever possible.
10) Each crew may use up to 2 ATV's (typically one is used- to move mixed herbicide to crews in the field).
11) ATV's will not drive in channel areas.
12) ATV's will operate only in open areas- woody vegetation (>1" DBH) will not be cleared or driven upon.
13) Stands of pepperweed within areas of active toad use will have a toad biologist check the area for toad activity (usually at night and or early morning). If active use is occurring- the Service will be contacted for permission to work. Areas may be skipped in years of high toad activity (as dictated by rainfall patterns).

Eucalyptus: Treatment and biomass

1) No more then three crews will be active on the watershed at one time.
2) Only one crew will operate at a given site at a time (sites are separated by at least one mile- and are usually on entirely different reaches of the watershed).

3) Crew size will not exceed 20 individuals- and no more then five people will be working together at a given spot.
4) Herbicide application is typically cut stump, injection and or girdling. Some smaller class plants may have basal bark treatment.
5) To reduce the chance/impact of spillage, work crews can only mix herbicide, load mixed chemical into ATV's (for refilling backpack sprayers), and refuel (ATV's) in staging areas.
6) Staging areas are disturbed sites such as roads, permanent trails, shoulders, graded areas, or sites with compacted soil that support no vegetation or weedy vegetation.
7) Crew members will avoid wading through streams whenever possible.
8) Each crew may use up to 2 ATV's (typically one is used- to move mixed herbicide to crews in the field).
9) ATV's will not drive in channel areas.
10) ATV's will operate only in open areas- woody vegetation (>1" DBH) will not be cleared or driven upon.
11) A rubber tire skidder will be used to haul cut eucalyptus to the staging area for chipping/masticating.
12) The skidder may only operate in open areas- no removal of naitve vegetation is permitted. Some smaller class shrubs and sub shrubs may be crushed- these should re-sprout. Re-vegetation of areas used by skidder will restore or exceed density of woody vegetation that existed prior to work.
13) Many areas are not traversable by any rubber tired equipment. Biomass in these areas will be bundled and helicoptered out. Helicopters may not cross power lines. They will deposit cut material along roads, permanent trails, or degraded compacted areas with no native vegetation. Mastication (chipping) of material will then occur at deposition site. Material will be spread on roads, trails, of degraded areas having no native vegetation. This will only occur in areas outside of arroyo toad habitat (areas below dam). Mulched material may not exceed 4" depth.
14) If material is chipped at the Highland Valley Road site, a map and visit will be made to determine if there area suitable areas for spreading mulch

Annual report of completed and planned activities: due August 15th Annually

1) A brief annual report summarizing completed and planned work activities- with maps.
2) All partners working with the JPA will be indicated.
3) A list of biological monitors used to meet avian monitoring requirements will be provided.
4) A summary of any substantive emails or phone consultations with the Service will be given.

APPENDIX 2

Aquatic approved herbicides approved by EPA for use in aquatic systems:

1. Imazapyr:

(Currently only Habitat® is registered as an approved aquatic formulation)

Habitat®: Label & MSDS

2. Glyphosate:

(Multiple formulations exist- Aquamaster® is presented as an example)

Aquamaster®: Label & MSDS

BASF Corporation

BASF

MATERIAL SAFETY DATA SHEET

Agricultural Products Group
P.O Box 13528,
Research Triangle Park, NC 27709
(919) 547-2000

EMERGENCY TELEPHONE NUMBERS:

BASF Corporation: 1 (800) 832-HELP

CHEMTREC: 1 (800) 424-9300

Product No.: 58A119 **Habitat ® Herbicide**

Date Prepared: 9/22/2003 **Date Revised: 1/21/2004**

SECTION I

Trade Name: Habitat ® Herbicide

Chemical Name: 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid, salt with 2-propanamine (1:1)

Synonyms: Isopropylamine of imazapyr; AC252, 925; **Formula:** C(13)H(15)N(3)O(3).C(3)H(9)N

Chemical Family: Imidazolinone **Mol Wt:** 320.4

SECTION II - INGREDIENTS

COMPONENT	CAS NO.	%	PEL/TLV - SOURCE
Isopropylamine salt of imazapyr	81510-83-0	28.7	0.5 mg/m3 TWA BASF recommended
Inerts	N/A	71.3	None established

SARA Title III Section 313: Not listed

SECTION III - PHYSICAL DATA

BOILING/MELTING POINT@760mm Hg: N/D **pH:** 6.6 - 7.2

VAPOR PRESSURE mmHg @ 20°C: N/D

SPECIFIC GRAVITY OR BULK DENSITY: 1.04 - 1.07 g/mL

SOLUBILITY IN WATER: Soluble

APPEARANCE: Clear blue liquid **ODOR:** Ammonia **INTENSITY:** Slight

SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD): >210°F SFCC **AUTOIGNITION TEMP:** > 200° F

FLAMMABILITY LIMITS IN AIR (% BY VOL): **LOWER:** N/D **UPPER:** N/D

NFPA 704 HAZARD CODES

HEALTH: 1 **FLAMMABLE:** 1 **INSTABILITY:** 0 **OTHER:** N/R

NFPA 30 STORAGE CLASSIFICATION: Class IIIB

EXTINGUISHING MEDIUM Use water fog, foam, CO(2), or dry chemical extinguishing media.

SPECIAL FIREFIGHTING PROCEDURES Firefighters should be equipped with self-contained breathing apparatus and turnout gear.

UNUSUAL FIRE EXPLOSION HAZARDS None known.

SELECT ACRONYM KEY

N/A - Not available; N/D - Not determined; N/R - Not rated; N/E - Not established

SECTION V - HEALTH DATA

TOXICOLOGICAL TEST DATA:

Data for formulated product:

Rat, Oral LD50 (combined sexes) > 5000 mg/kg

Rabbit, Dermal LD50 (combined sexes) > 2000 mg/kg

Rat, Inhalation LC50 (4 hr) > 4.62 mg/L

Rat, Inhalation LC50 (1 hr calculated) > 18.48 mg/L

Rabbit, Eye Irritation - Not Irritating

Rabbit, Skin Irritation - Mildly irritating

Guinea pig, Dermal Sensitizer - Not Sensitizer

OSHA, NTP, or IARC Carcinogen: Not listed.

EFFECTS OF OVEREXPOSURE:

See Product Label and Directions For Use for additional precautionary statements.

CAUTION

Avoid contact with skin, eyes, and clothing. Avoid breathing spray mist.

Existing medical conditions aggravated by this product:

None known.

FIRST AID PROCEDURES

If on skin:	Wash with plenty of soap and water. Get medical attention if irritation persists.
If in eyes:	Flush eyes with plenty of water. Call a physician if irritation persists.
If inhaled:	Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.
If swallowed:	Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. If person is unconscious, do not give anything by mouth and do not induce vomiting.
Note to physician:	Treat symptomatically. No specific antidote.
Note:	Have the product container or label with you when calling a poison control center or doctor or going for treatment.

SECTION VI - REACTIVITY DATA

STABILITY: Stable. Do not store below 32° F or above 100° F.

CONDITIONS TO AVOID: Store in original container in cool,dry, well ventilated place away from ignition sources, heat or flame.

CHEMICAL INCOMPATIBILITY: Oxidizing agents and reducing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Including but not limited to oxides of carbon and nitrogen.

HAZARDOUS POLYMERIZATION: Does not occur.

CONDITIONS TO AVOID: Does not polymerize.

CORROSIVE TO METAL: Mild steel, brass **OXIDIZER:** No

SECTION VII - PERSONAL PROTECTION

Users of a pesticidal end use product should refer to the product label for personal protective equipment requirements.

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

Respiratory Protection:
Supplied air respirators should be worn if large quantities of mist/dust are generated or prolonged exposure possible.

Eye Protection:
Chemical goggles when respirator does not provide eye protection.

Protective Clothing:
Gloves and protective clothing as necessary to prevent skin contact.

Ventilation:
Whenever possible, engineering controls should be used to minimize the need for personal protective equipment.

SECTION VIII - ENVIRONMENTAL DATA

ENVIRONMENTAL TOXICITY DATA

See the product label for information regarding environmental toxicity.

SARA 311/312 REPORTING

FIRE: N PRESSURE: N REACTIVITY: N ACUTE: Y CHRONIC: N TPQ(lbs): N/R

SPILL AND LEAK PROCEDURES:

In case of large scale spillage of this product, avoid contact, isolate area and keep out animals and unprotected persons. Call CHEMTREC (800 424-9300) or BASF Corporation (800 832-HELP). For a small spill, wear personal protective equipment as specified on the label.
FOR A LIQUID SPILL: Dike and contain the spill with inert material (sand, earth, etc.) and transfer the liquid and solid diking materials to separate containers for disposal.
FOR A SOLID SPILL: Sweep solid into a drum for re-use or disposal. Remove personal protective equipment and decontaminate it prior to re-use.

HAZARDOUS SUBSTANCE SUPERFUND: No RQ(lbs): None

WASTE DISPOSAL METHOD:

Pesticide wastes are acutely hazardous. Wastes resulting from this product may be disposed of on site or at an approved waste disposal facility. Improper disposal of excess pesticide, spray mix or rinsate is a violation of federa law. If these wastes cannot be disposed of according to label instructions, contact the state agency responsible for pesticide regulation or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

HAZARDOUS WASTE 40CFR261: No HAZARDOUS WASTE NUMBER: None

CONTAINER DISPOSAL:

FOR PLASTIC CONTAINERS: Triple rinse (or equivalent) and add rinsate to the spray tank. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke.
FOR BULK CONTAINERS: Reusable containers should be returned to the point of purchase for cleaning and re-filling.
FOR MINIBULK CONTAINERS: Clean all tanks on an approved loading pad so rinsate can be collected and mixed into the spray solution or into a dedicated tank. Using a high pressure sprayer, rinse several times with small volumes of water to minimize rinsate.

SECTION IX - SHIPPING DATA - PACKAGE AND BULK

D.O.T. PROPER SHIPPING NAME (49CFR172.101-102):
None

HAZARDOUS SUBSTANCE (49CFR CERCLA LIST):
None

RQ(lbs): None

D.O.T. HAZARD CLASSIFICATION (CFR 172.101-102):

PRIMARY
None

SECONDARY
None

D.O.T. LABELS REQUIRED (49CFR172.101-102):
None

D.O.T. PLACARDS REQUIRED (CFR172.504):
None

POISON CONSTITUENT (49CFR172.203(K)):
None

BILL OF LADING DESCRIPTION

Compounds, tree or weed killing, NOIBN
This product is not regulated by the Department of Transportation (DOT). It does not meet the definition of DOT corrosive (49 CFR 173.136).

CC NO.: Not applicable **UN/NA CODE:**

SECTION X - ADDITIONAL INFORMATION

Habitat ® Herbicide

KEEP OUT OF REACH OF CHILDREN

CAUTION

BASF Corporation

Agricultural Products Group
P.O.Box 13528,
Research Triangle Park, NC 27709
(919) 547-2000

DISCLAIMER

IMPORTANT: WHILE THE DESCRIPTIONS, DESIGNS, DATA AND INFORMATION CONTAINED HEREIN ARE PRESENTED IN GOOD FAITH AND BELIEVED TO BE ACCURATE, IT IS PROVIDED FOR YOUR GUIDANCE ONLY. BECAUSE MANY FACTORS MAY AFFECT PROCESSING OR APPLICATION/USE, WE RECOMMEND THAT YOU MAKE TESTS TO DETERMINE THE SUITABILITY OF A PRODUCT FOR YOUR PARTICULAR PURPOSE PRIOR TO USE. NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH, OR THAT THE PRODUCTS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS. IN NO CASE SHALL THE DESCRIPTIONS, INFORMATION, DATA OR DESIGNS PROVIDED BE CONSIDERED A PART OF OUR TERMS AND CONDITIONS OF SALE. FURTHER, YOU EXPRESSLY UNDERSTAND AND AGREE THAT THE DESCRIPTIONS, DESIGNS, DATA, AND INFORMATION FURNISHED BY BASF HEREUNDER ARE GIVEN GRATIS AND BASF ASSUMES NO OBLIGATION OR LIABILITY FOR THE DESCRIPTION, DESIGNS, DATA AND INFORMATION GIVEN OR RESULTS OBTAINED, ALL SUCH BEING GIVEN AND ACCEPTED AT YOUR RISK.

MONSANTO COMPANY

Material Safety Data Sheet
Commercial Product

1. PRODUCT AND COMPANY IDENTIFICATION

Product name
AquaMaster[TM] Herbicide

EPA Reg. No.
524-343
Product use
Herbicide
Chemical name
Not applicable.
Synonyms
None.
Company
MONSANTO COMPANY, 800 N. Lindbergh Blvd., St. Louis, MO, 63167
Telephone: 800-332-3111, **Fax:** 314-694-5557
Emergency numbers
FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT Call CHEMTREC - Day or Night: 1-800-424-9300 toll free in the continental U.S., Puerto Rico, Canada, or Virgin Islands. For calls originating elsewhere: 703-527-3887 (collect calls accepted).
FOR MEDICAL EMERGENCY - Day or Night: 314-694-4000 (collect calls accepted).

2. COMPOSITION/INFORMATION ON INGREDIENTS

Active ingredient
Isopropylamine salt of N-(phosphonomethyl)glycine; {Isopropylamine salt of glyphosate}

Composition

COMPONENT	CAS No.	% by weight (approximate)
Isopropylamine salt of glyphosate	38641-94-0	53.8
Water	7732-18-5	46.2

OSHA Status
This product is not hazardous according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

3. HAZARDS IDENTIFICATION

Emergency overview
Appearance and odour (colour/form/odour): Colourless - Amber / Liquid, (viscous) / Odourless

CAUTION!

Potential health effects
Likely routes of exposure
Skin contact, eye contact, inhalation
Eye contact, short term
Not expected to produce significant adverse effects when recommended use instructions are followed.
Skin contact, short term
Not expected to produce significant adverse effects when recommended use instructions are followed.
Inhalation, short term

Not expected to produce significant adverse effects when recommended use instructions are followed.

Refer to section 11 for toxicological and section 12 for environmental information.

4. FIRST AID MEASURES

Eye contact
Immediately flush with plenty of water.
If easy to do, remove contact lenses.

Skin contact
Take off contaminated clothing, wristwatch, jewellery.
Wash affected skin with plenty of water.
Wash clothes and clean shoes before re-use.

Inhalation
Remove to fresh air.

Ingestion
Immediately offer water to drink.
Do NOT induce vomiting unless directed by medical personnel.
If symptoms occur, get medical attention.

Advice to doctors
This product is not an inhibitor of cholinesterase.

Antidote
Treatment with atropine and oximes is not indicated.

5. FIRE-FIGHTING MEASURES

Flash point
none

Extinguishing media
Recommended: Water, foam, dry chemical, carbon dioxide (CO2)

Unusual fire and explosion hazards
None.
Environmental precautions: see section 6.

Hazardous products of combustion
Carbon monoxide (CO), phosphorus oxides (PxOy), nitrogen oxides (NOx)

Fire fighting equipment
Self-contained breathing apparatus.
Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protection recommended in section 8.

Environmental precautions
SMALL QUANTITIES:
Low environmental hazard.

LARGE QUANTITIES:
Minimise spread.
Keep out of drains, sewers, ditches and water ways.
Notify authorities.

Methods for cleaning up
SMALL QUANTITIES:
Flush spill area with water.
LARGE QUANTITIES:
Absorb in earth, sand or absorbent material.
Dig up heavily contaminated soil.
Collect in containers for disposal.
Refer to section 7 for types of containers.
Flush residues with small quantities of water.
Minimise use of water to prevent environmental contamination.

Refer to section 13 for disposal of spilled material.

7. HANDLING AND STORAGE

Good industrial practice in housekeeping and personal hygiene should be followed.

Handling
Avoid contact with skin and eyes.
When using do not eat, drink or smoke.
Wash hands thoroughly after handling or contact.
Thoroughly clean equipment after use.
Do not contaminate drains, sewers and water ways when disposing of equipment rinse water.
Refer to section 13 for disposal of rinse water.
Emptied containers retain vapour and product residue.

Storage
Minimum storage temperature: -15 °C
Maximum storage temperature: 50 °C
Compatible materials for storage: stainless steel, aluminium, fibreglass, plastic, glass lining
Incompatible materials for storage: galvanised steel, unlined mild steel, see section 10.
Keep out of reach of children.
Keep away from food, drink and animal feed.
Keep only in the original container.
Partial crystallization may occur on prolonged storage below the minimum storage temperature.
If frozen, place in warm room and shake frequently to put back into solution.
Minimum shelf life: 5 years.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne exposure limits

Components	Exposure Guidelines
Isopropylamine salt of glyphosate	No specific occupational exposure limit has been established.
Water	No specific occupational exposure limit has been established.

Engineering controls
No special requirement when used as recommended.

Eye protection

No special requirement when used as recommended.

Skin protection
No special requirement when used as recommended.

Respiratory protection
No special requirement when used as recommended.

When recommended, consult manufacturer of personal protective equipment for the appropriate type of equipment for a given application.

9. PHYSICAL AND CHEMICAL PROPERTIES

These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

Colour/colour range:	Colourless - Amber
Form:	Liquid, (viscous)
Odour:	Odourless
Flash point:	none
Specific gravity:	1.206 @ 20 °C / 15.6 °C
Solubility:	Water: Completely miscible.
pH:	4.6 - 4.8 @ 63 g/l
Partition coefficient (log Pow):	< 0.000 (active ingredient)

10. STABILITY AND REACTIVITY

Stability
Stable under normal conditions of handling and storage.

Hazardous decomposition
Thermal decomposition: Hazardous products of combustion: see section 5.

Materials to avoid/Reactivity
Reacts with galvanised steel or unlined mild steel to produce hydrogen, a highly flammable gas that could explode.

11. TOXICOLOGICAL INFORMATION

This section is intended for use by toxicologists and other health professionals.

Data obtained on product and components are summarized below.

Acute inhalation toxicity
Rat, LC50, 4 hours, aerosol:
Slightly toxic.
FIFRA category III.
No 4-hr LC50 at the maximum achievable concentration.

Skin sensitization
Guinea pig, 9-induction Buehler test:
Positive incidence: 0 %

Mutagenicity
Micronucleus test(s):
Not mutagenic.
Ames test(s):
Not mutagenic with and without metabolic activation.

Isopropylamine salt of glyphosate (62%)

Data obtained on product and components are summarized below.

Acute oral toxicity
Rat, LD50 (limit test): > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.
No mortality.
Mouse, LD50 (limit test): > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.
No mortality.
Acute dermal toxicity
Rabbit, LD50 (limit test): > 5,000 mg/kg body weight
Practically non-toxic.
FIFRA category IV.
No mortality.
Skin irritation
Rabbit, 6 animals, Draize test:
Days to heal: 3
Primary Irritation Index (PII): 0.0/8.0
Essentially non irritating.
FIFRA category IV.
Acute inhalation toxicity
Rat, LC50, 4 hours, aerosol: > 4.24 mg/L
Practically non-toxic.
FIFRA category IV.
No mortality. Maximum attainable concentration.
Skin sensitization
Guinea pig, Buehler test:
Positive incidence: 0 %

N-(phosphonomethyl)glycine; {glyphosate}

Mutagenicity
In vitro and in vivo mutagenicity test(s):
Not mutagenic.
Repeated dose toxicity
Rabbit, dermal, 21 days:
NOAEL toxicity: > 5,000 mg/kg body weight/day
Target organs/systems: none
Other effects: none
Rat, oral, 3 months:
NOAEL toxicity: > 20,000 mg/kg diet
Target organs/systems: none
Other effects: none
Chronic effects/carcinogenicity
Mouse, oral, 24 months:
NOEL tumour: > 30,000 mg/kg diet
NOAEL toxicity: ~ 5,000 mg/kg diet
Tumours: none
Target organs/systems: liver
Other effects: decrease of body weight gain, histopathologic effects
Rat, oral, 24 months:
NOEL tumour: > 20,000 mg/kg diet