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).

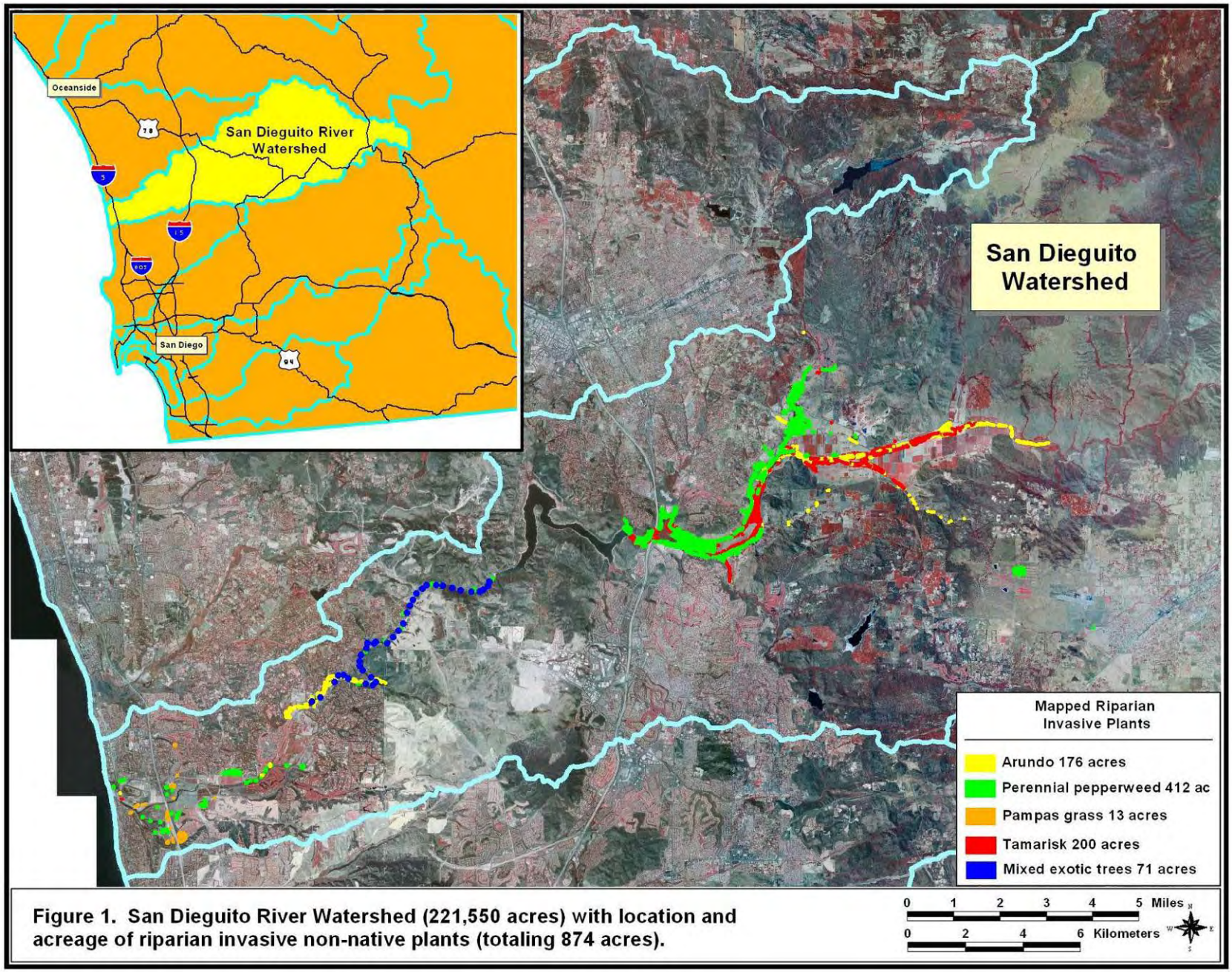


Figure 1. San Dieguito River Watershed (221,550 acres) with location and acreage of riparian invasive non-native plants (totaling 874 acres).

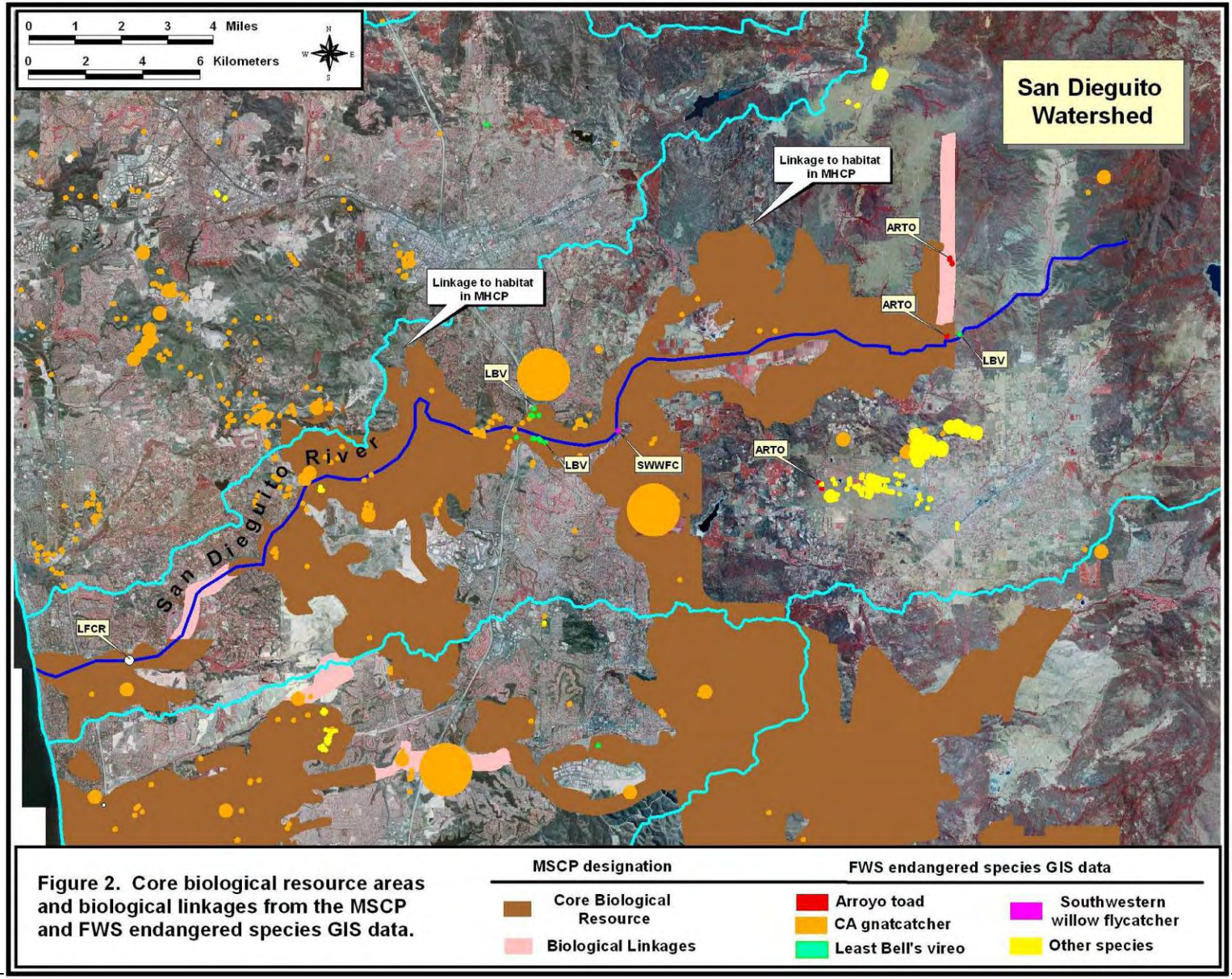


Figure 2. Core biological resource areas and biological linkages from the MSCP and FWS endangered species GIS data.

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

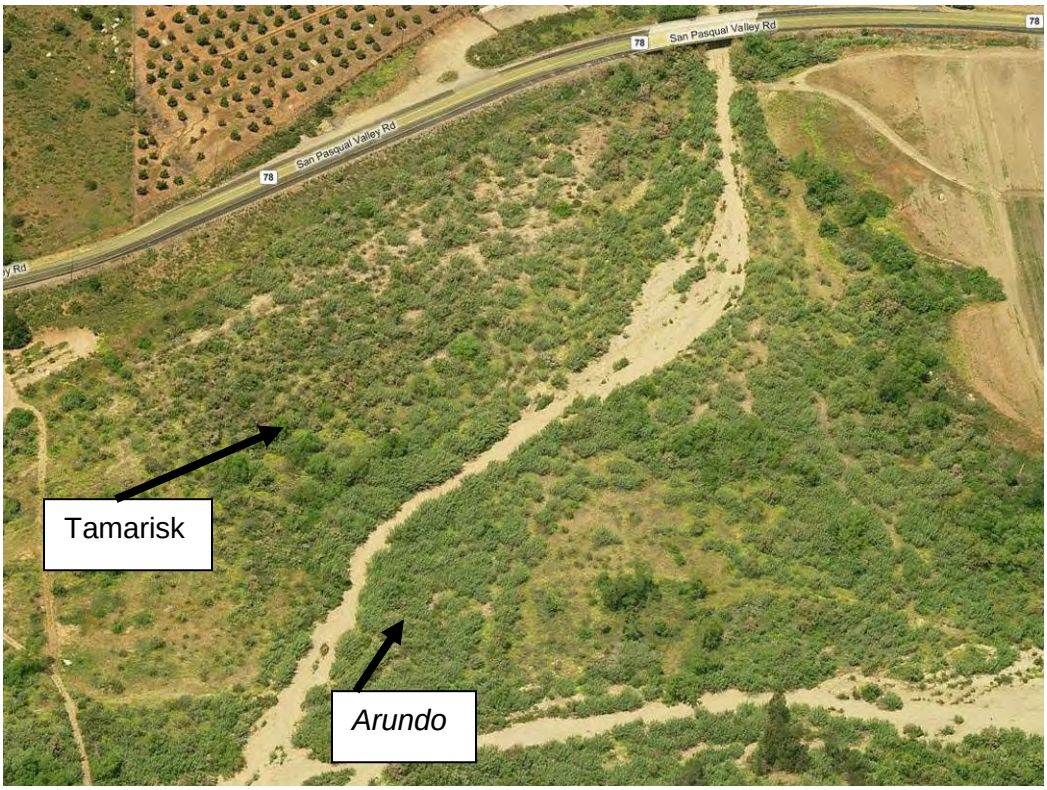


Figure 3. *Arundo* and tamarisk stands at confluence of San Dieguito and Santa Maria in spring 2007, the area has become dense stands of *Arundo* and tamarisk.

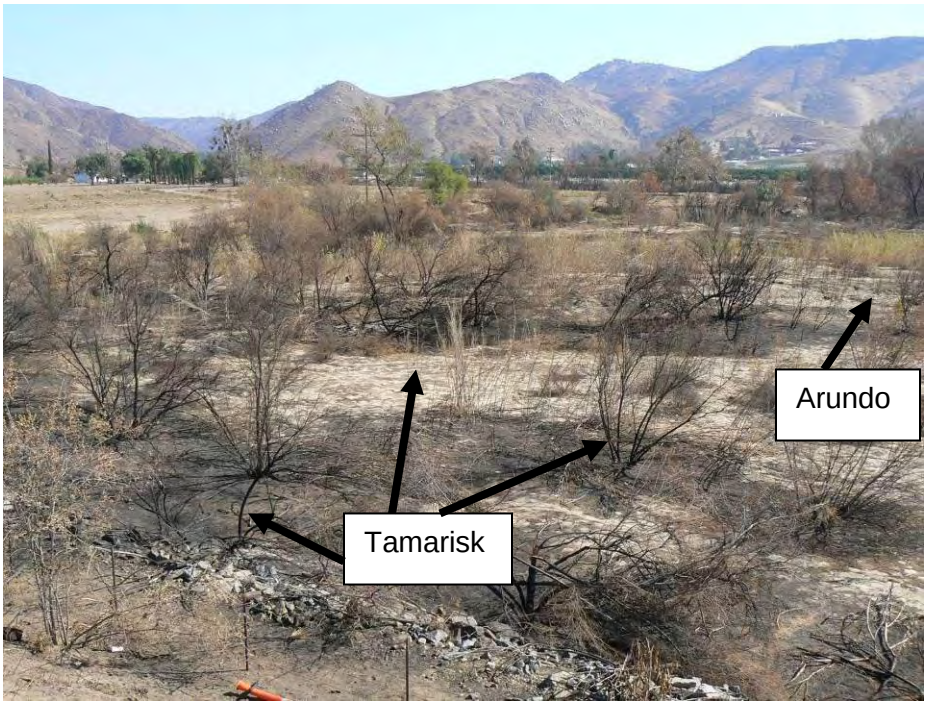


Figure 4. *Arundo* and tamarisk stands burn for a second time in 10-2007 fire at confluence of San Dieguito and Santa Maria. *Arundo* and tamarisk have nearly 100% re-sprouted by 11-08.

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.

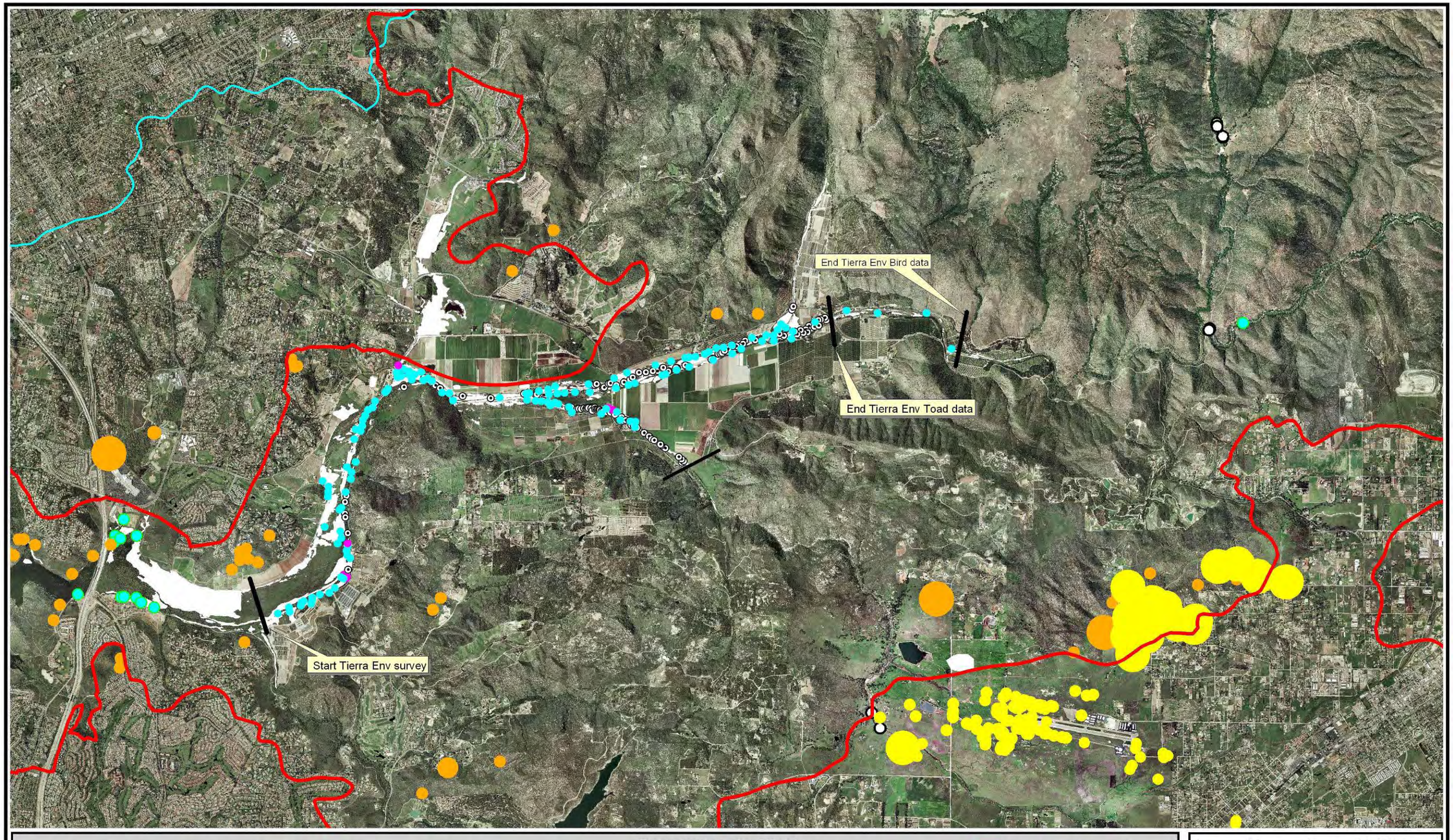


Figure 8. San Dieguito Invasive Plant Control Program: Distribution of Sensitive Species- East Watershed. San Dieguito JPA lead (covers multiple restoration projects: San Dieguito Conservancy, County, JPA).

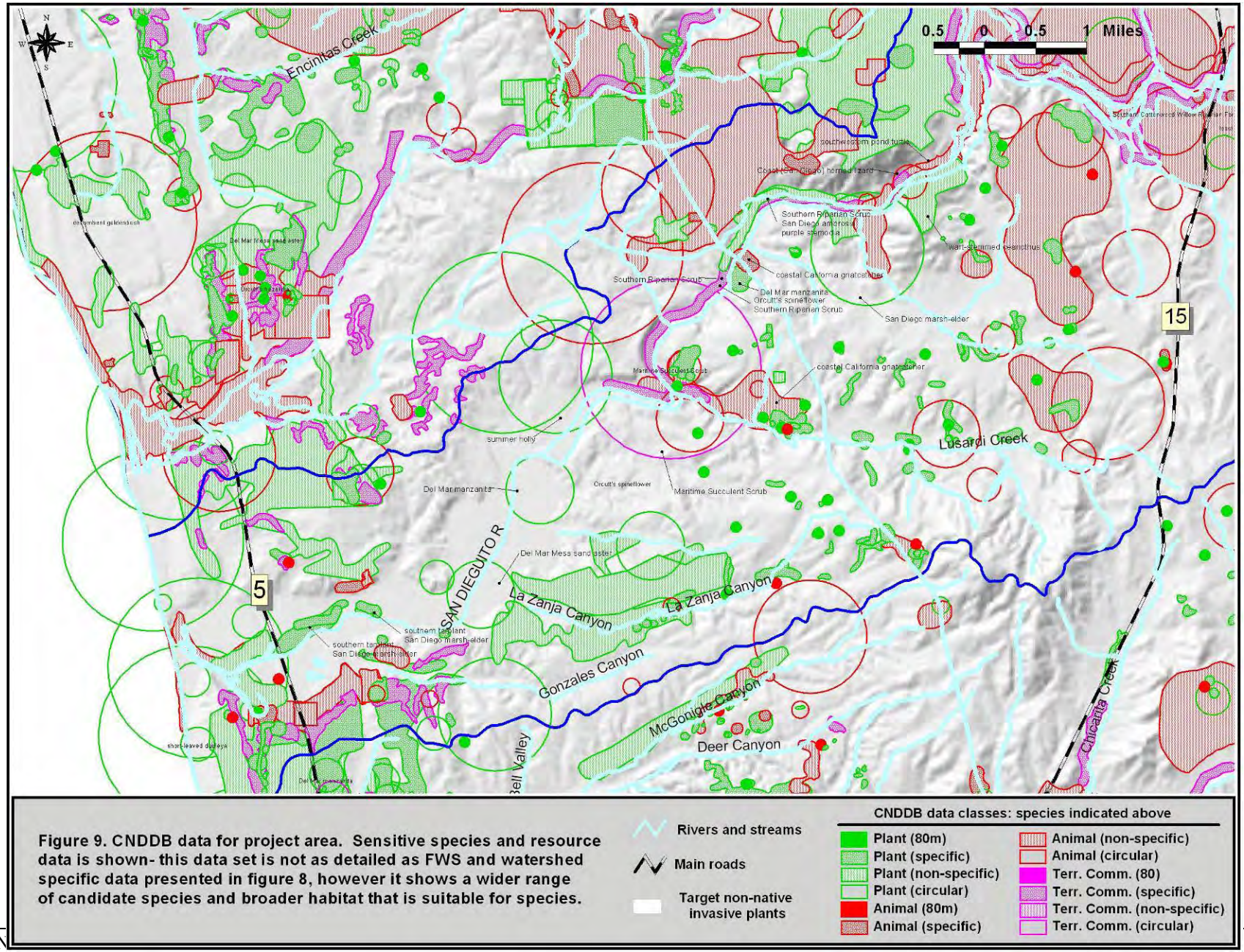


Figure 9. CNDDB data for project area. Sensitive species and resource data is shown- this data set is not as detailed as FWS and watershed specific data presented in figure 8, however it shows a wider range of candidate species and broader habitat that is suitable for species.

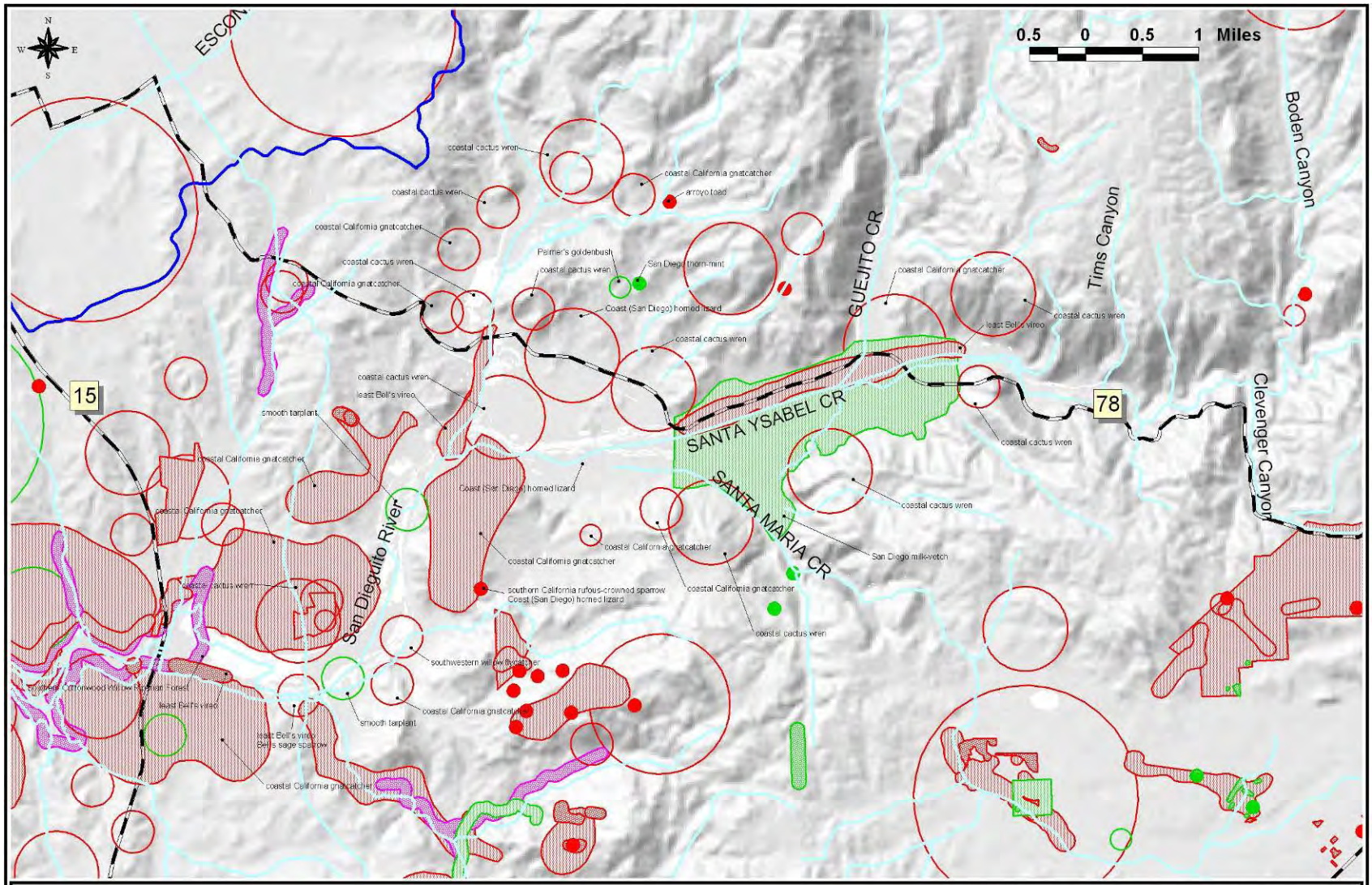


Figure 10. CNDDB data for project area. Sensitive species and resource data is shown- this data set is not as detailed as FWS and watershed specific data presented in figure 8, however it shows a wider range of candidate species and broader habitat that is suitable for species.

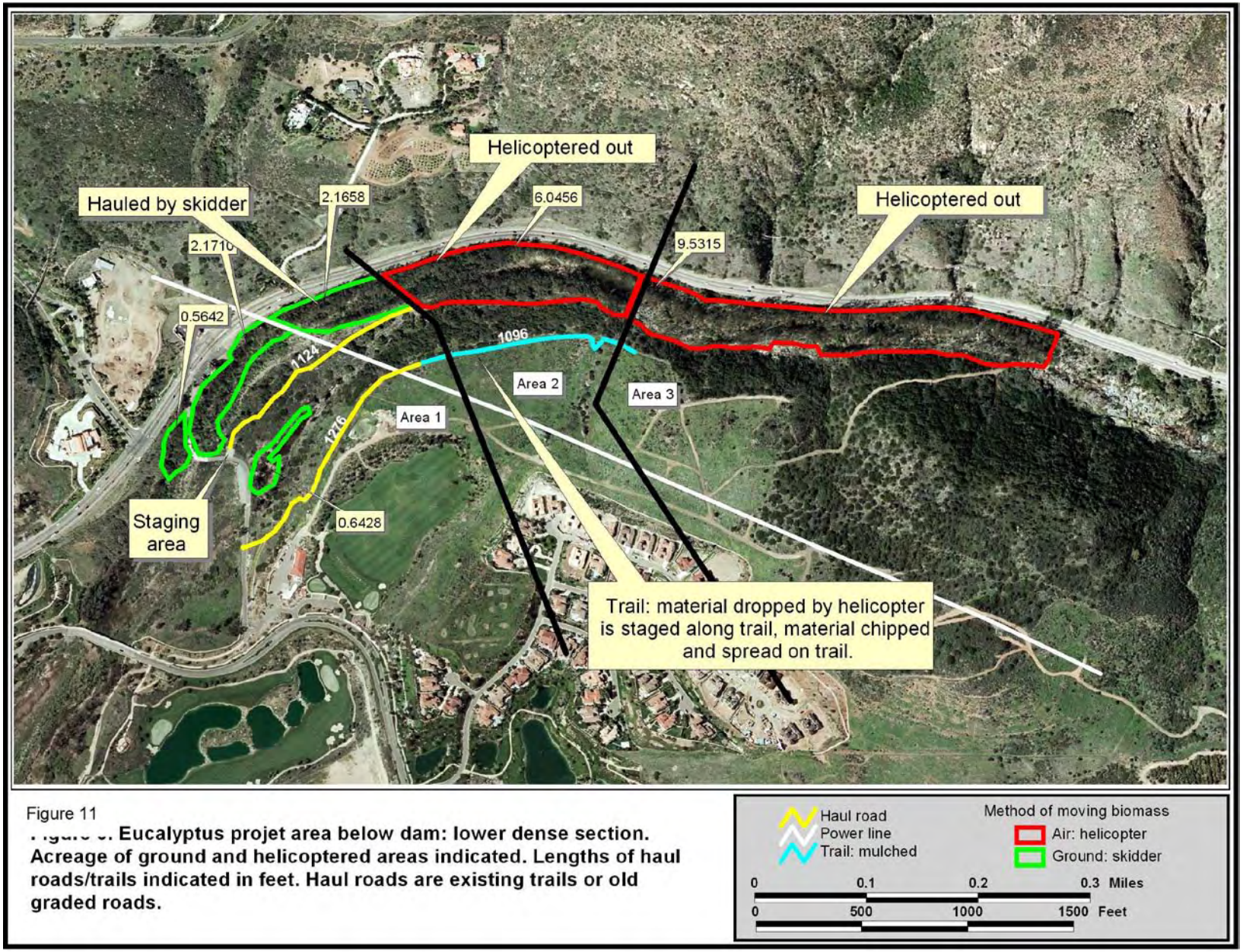


Figure 11

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:

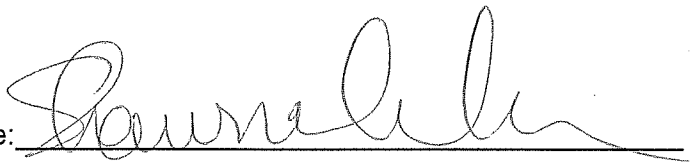
Choose One of the Following

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