

# Irvine Ranch Water District Integrated Pest Management Plan 2023 Annual Report



IPM Plan Implementation  
Irvine, California

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## **EXECUTIVE SUMMARY**

Endemic Environmental Services, Inc. (EES) has developed this Irvine Ranch Water District (IRWD) Annual Monitoring Report for the calendar year period of January 2023-November 2023 in accordance with the Integrated Pest Management (IPM) Plan that was established as of July, 2019. The purpose of the IPM Plan was to manage long-term pest prevention while protecting human health, nontarget organisms, and the surrounding environment. This Annual Monitoring Report functions to document and account for the chemical and non-chemical treatment methods employed for the land management and maintenance of the San Joaquin Marsh and the 42 Natural Treatment System (NTS) basins. The report also describes the minimization measures that were taken in compliance with the IPM Plan to ensure that the maintenance of these sites utilized environmentally sensitive pest management strategies and least-toxic control methods at each facility. The IPM Plan for IRWD was first implemented in September 2019. This Annual Monitoring Report expands on the results and recommendations that were established in the reports covering the following time frames: September-December 2019, January-December 2020, January-December 2021, and January-November 2022.

The IRWD facilities that are evaluated in this report include Rattlesnake Reservoir, San Joaquin Reservoir, Sand Canyon Reservoir, and Syphon Reservoir, with a focus on the San Joaquin Marsh Zones 1-4, and the 42 Natural Treatment System (NTS) basins throughout Irvine, California.

EES field biologists conduct monthly nonnative plant surveys at each site for the San Joaquin Marsh and the 42 NTS basins. During the nonnative plant survey, the biologists identify the native, nonnative, and invasive plant species and collect geospatial location data through the use of point and polygon data in the ArcGIS Field Maps software. In the Survey Report, the biologists provide specific treatment recommendations for each species that prioritize non-chemical removal methods such as manual removal, mechanical removal, mulching and soil solarization. Mechanical removal methods such as hula hoe, weed trimming, and mowing are recommended for large plots of nonnative plants where native plants are not present. Chemical treatment methods are only recommended for target species that pose a significant threat to the ecosystem and demonstrate continued resistance and resilience to non-chemical removal methods. When target species need to be treated chemically, spot spraying is employed to minimize the amount of pesticide used. The data that is collected at the sites is then analyzed to inform the weekly reports and identify the sites that have persistent and recurrent nonnative species over time.

EES does not survey Rattlesnake Reservoir, San Joaquin Reservoir, Sand Canyon Reservoir, and Syphon Reservoir, which are managed by IRWD's Facilities/Fleet Manager, but acreage and pesticide usage totals from those facilities have been included in this report. Additionally, the IRWD's Facilities/Fleet Manager oversees 147 other facilities that are not individually described in this report. However, these facilities have been included in the acreage totals, though no pesticides were applied at these sites.



The chemical pesticide usage at the San Joaquin Marsh and NTS sites has decreased significantly and continuously over the course of the past five years. Pesticide usage totaled 78.34 gallons (gal) in 2018 and 61.78 gallons in 2019. The first full year that the IPM was implemented was 2020 and pesticide usage significantly decreased to only 13.45 gallons. Chemical usage continued to be low in subsequent years with 14.41 gallons applied in 2021 and 14.34 gallons in 2022.

In 2023, 12.375 gallons were used across the San Joaquin Marsh and NTS sites. More specifically, 5.891 gallons were used at the San Joaquin Marsh sites and 6.484 gallons at the NTS sites. Compared to previous years, 2023 had a lower overall chemical usage but a greater usage at the San Joaquin Marsh sites. Low overall chemical usage throughout the past several years demonstrates a continued commitment to the minimization of chemical treatment methods. Through the implementation of the IPM Plan, the chemical pesticide use at the IRWD sites has been reduced by roughly 84.2% when comparing the initial totals of 2018 to the current total pesticide use in 2023.

In 2023, no herbicide usage occurred at the additional IRWD facilities that are overseen by the Facilities/Fleet Manager. This is a very significant decrease when compared to the initial total of 84 gallons in 2018, which demonstrates a 100.0% reduction in herbicide use over the past several years.

### **List Of Abbreviations & Acronyms**

ac acre(s)  
af acre-foot/acre-feet  
Cal-IPC California Invasive Plant Council  
EES Endemic Environmental Services  
EPA United States Environmental Protection Agency  
ft foot/feet  
gal gallon(s)  
I-5 Interstate 5  
I-405 Interstate 405  
IPM Integrated Pest Management  
IRWD Irvine Ranch Water District  
NTS Natural Treatment System  
SJM San Joaquin Marsh  
SR-133 State Route 133  
SR-241 State Route 241  
SR-261 State Route 261

### ***INTRODUCTION***

The Irvine Ranch Water District (IRWD) Integrated Pest Management (IPM) Plan functions to provide guidelines and measures that effectively carry out the long-term prevention of pests



while prioritizing the health and safety of the public and surrounding environment (soil conditions, water quality, etc.). An IPM is defined as a process that manages pests through environmentally and economically responsible strategies that mitigate environmental hazards and protect human health, nontarget organisms, and the circumambient ecosystem (Bright 1999). The primary approach for the IPM program is pest prevention, which is then followed up with management actions that reduce the likelihood that the pest populations will return.

This ecosystem-based management strategy is a science-based decision-making system that leverages non-chemical treatments to minimize and mitigate impacts from target pests. These non-chemical techniques include hand removal, hula hoeing, weed trimming, disking, mowing, mulching, and solarization. The use of chemical treatments such as the use of pesticides, herbicides, and insecticides is reserved only for persistent target species with high spreadability and high likelihood for impact on the surrounding ecosystem. The IPM defines specific tolerance levels to identify when a pest population has reached a level where active pest control is needed. The biologist then provides pest treatment recommendations that provide the most effective and environmentally sustainable solution.

The integration of continuous monitoring and adaptive management also ensures that feedback and improvements can be made to establish the most effective and elegant solutions over time. In order to fulfill the objectives of the IPM, site conditions must be monitored before, during, and after all treatment methods. These methods must also be assessed and revised through active adaptive management in order to ensure the IPM success criteria is being met effectively. This Annual Monitoring Report thus aims to summarize and assess these long-term pest management methods that were employed at the San Joaquin Marsh and IRWD NTS Sites for the calendar year of January 2023–November 2023.

### **Guiding Principles and Core Elements**

Following the lead of other public entities such as the City of Irvine and Irvine Unified School District, Irvine Ranch Water District (IRWD or District) is implementing this Integrated Pest Management (IPM) Plan, which focuses on long-term prevention or suppression of pests while protecting human health, the environment, and nontarget organisms. The District — steward of numerous facilities, wetlands and habitat, much of which is maintained in a native, natural state — adopts this organic-first policy for landscaping and pest control, with specific limitations on the use of pesticides and chemicals.

### **Integrated Pest Management Plan Components**

This IPM Plan includes the following components:

- A framework for implementing IPM practices at IRWD facilities and properties
- Consistency with other Orange County-area agencies' IPM approaches
- Training of staff to encourage a mindset of progressive pest-management principles
- Making the Integrated Pest Management program public (transparency)
- Monitoring and reporting of actions associated with implementation of the IPM Plan



The focus of this IPM Plan is on the pesticides (rodenticides and herbicides) that are used to control insect pests and noxious weed infestations at IRWD facilities. The purpose of this plan is to guide the use of environmentally sensitive pest management strategies and least-toxic control methods at facilities maintained and managed by IRWD. IPM is defined as managing pests (plants, fungi, insects, animals) in a way that protects human health and the surrounding environment in an economically responsible way through the most effective, least-risk option. Core elements of IPM include:

- Pest prevention to avoid the use of pesticides or other pest-control methods
- Non-chemical methods as first choice for pest control
- Use of non synthetic-based herbicides, referred to in this plan as organic
- Use of chemicals and pesticides only in target locations and for targeted species
- Never use EPA Category I or II pesticides or glyphosate in parks, playgrounds or other areas where the public congregates
- Routine inspection, reporting and monitoring
- Transparent communication

When pest prevention is unsuccessful or when noxious weeds are already established, the approach to eliminate these species from an area should follow a systematic decision-making process. This decision-making process is led through an established system of Pesticide Ranking and Use Categories. Use of non-chemical control methods should first be exercised. When physical control methods are not an option, organic control methods may be needed. EPA Category II and III Pesticides should only be used when necessary after supervisory approval or when the non-chemical methods conflict with the regulatory requirements. High-potential-hazard pesticide applications may only be considered in emergency situations that present a public health or environmental threat (ESA 2019, LSA 2020).

### **METHODS**

EES biologists conducted ground-based nonnative plant field surveys on a monthly basis at the San Joaquin Marsh and at IRWD's Natural Treatment System (NTS) basins (Baldwin 2017). All site locations that were surveyed as part of this project are identified in the Map 1 in Appendix A. During the nonnative plant survey, the biologists identified the native, nonnative, and invasive plant species and collected geospatial location data through the use of point and polygon data in the ArcGIS Field Maps software. In the Survey Report, biologists provided specific treatment recommendations for each species that prioritized non-chemical removal methods such as manual removal, mechanical removal, mulching and soil solarization (Ruiz 2003). The data that was collected was then analyzed and presented in order to track nonnative growth trends, invasive spreadability, and treatment method efficacy over time. Percent cover, treatment frequency, and total application rate measures were analyzed in order to determine the sites with the most significant nonnative plant spread and persistence throughout the year.

Chemical treatment methods such as organic chemical control and prioritized chemical pesticide control were employed only for target species that could not be successfully treated through non chemical removal methods. The specific target species were plants that were listed on the



California Invasive Plant Council (Cal-IPC) Inventory, though additional non native and invasive species have also been targeted if they demonstrated continuous spreadability and persistence at the sites. The primary target species included Spanish false fleabane (*Pulicaria paludosa*), perennial pepperweed (*Lepidium latifolium*), curly dock (*Rumex crispus*), Bermuda grass (*Cynodon dactylon*), pampas grass (*Cortaderia selloana*), herb of grace (*Bacopa monnieri*), and stinknet (*Oncosiphon piluliferum*). A Memorandum was written for each target species in order to detail the justification and decision-making process for the use of chemical treatment. The EES biologists also provided native seeding recommendations for sites with bare or exposed soil and for sites where nonnative removal activities recently took place. The seeding recommendations encourage native establishment and prevent the likelihood of nonnative species from rapidly establishing in open areas.

EES biologists did not conduct monthly surveys for Rattlesnake Reservoir, San Joaquin Reservoir, Sand Canyon Reservoir, and Syphon Reservoir as these reservoirs were managed by IRWD's Facilities/Fleet Manager. However, this report does include the chemical pesticide usage totals for all of these reservoirs based on data collected by the IRWD Facilities/Fleet Manager.

## **INTEGRATED PEST MANAGEMENT APPLICATION SITES**

### **Recycled Water Reservoirs**

IRWD owns and operates an extensive recycled water system, which includes four seasonal-storage reservoirs: Rattlesnake, San Joaquin, Sand Canyon, and Syphon. The primary purpose of these reservoirs is to provide public and commercial irrigation. The water is not palatable but is utilized for toilet flushing, for cooling towers, for dust control on construction sites, and for industrial processes such as concrete production and composting. The IRWD reservoirs operate on a seasonal basis, as they are filled with water from the surrounding recycling plants during winter months when the irrigation demand is low. The constructed dams are certified safe, frequently inspected, and restricted from public access.

#### *Rattlesnake Reservoir*

The Rattlesnake Reservoir is one such recycled water storage reservoir that is owned and operated by IRWD. Previously, the main function of the reservoir was to provide water for agricultural irrigation. It lies south of Loma Ridge and north of Portola Parkway, in between SR-261 and SR-241. The reservoir operates for both the dry and wet season flows. No chemical pesticides were used at the Rattlesnake Reservoir for the period of January-November 2023.

#### *San Joaquin Reservoir*

San Joaquin Reservoir was historically used as a source of drinking-water reservoir by seven cities and water districts, and now the reservoir is used to store recycled water. It is located south of Bonita Canyon Drive and North of Newport Ridge Drive, in between Chambord Street and San Miguel Drive. The reservoir provides roughly 1 billion gallons of seasonal water storage. The operation of this reservoir is designed to maximize water storage during the wet season when irrigation demands are lower. During the dry season, water is used to provide



landscape irrigation water for Irvine, Newport Coast, and Newport Beach. No chemical pesticides were used at the reservoir for the period of January-November 2023.

#### *Sand Canyon Reservoir*

The Sand Canyon Reservoir lies adjacent to the Strawberry Farms Golf Club, parallel to Ridgeline Drive in Irvine, California. The reservoir takes up a 42 acre (ac) area and has a water storage capacity of 250 million gal and an average depth of 18 feet (ft). The associated watershed makes up roughly 4,288 acres of the surrounding area. This reservoir is used for both seasonal and operational storage and is monitored and surveyed by Endemic on a quarterly basis for nonnative vegetation and nesting birds. No chemical pesticides were used at Sand Canyon Reservoir for the period of January-November 2023.

#### *Syphon Reservoir*

The Syphon Reservoir is located just west of State Route 133 and north of Portola Highway in Irvine, California. The reservoir has historically been used to store irrigation water and is now also used in the IRWD recycled water system as a storage facility. The reservoir is made up of a 16.2 acre area that has a water storage capacity of 174 million gallons. No chemical pesticides were used at the Syphon Reservoir for the period of January-November 2023 as all non native vegetation was removed by manual and mechanical methods.

#### **San Joaquin Marsh**

The San Joaquin Marsh (SJM) and Wildlife Sanctuary in Irvine, California is made up of 281.58 acres of coastal freshwater wetlands that provide valuable habitat for local native species while supplying natural water treatment services for the San Diego Creek. Conservation and restoration efforts have restored roughly half of the San Joaquin Marsh to a natural state that helps filter contaminants when the water is cycled through the system. The water from the San Diego Creek is naturally treated through the SJM wetlands before it reaches the protected and preserved Upper Newport Bay and the ocean.

The IRWD managed sections of the San Joaquin Marsh have been divided into four zones as a means to organize and manage the landscaping and nonnative treatments. In the past year, IPM activities at the marsh consisted entirely of manual and mechanical removal methods for nonnative plants. In alignment with the goals and objectives of the IPM Plan, no chemical pesticides were used to control the nonnative species that were present on the site. Target species such as Spanish false fleabane, perennial pepperweed, curly dock, and pampas grass were controlled through a combination of hand pulling, uprooting, weed trimming, and mowing. A total of 61 nonnative plant species were identified at the San Joaquin Marsh between January and November 2023. Table 1 identifies the number of nonnative plant species and treatment methods at each of the four zones. No chemical pesticide treatments were employed to control nonnative plant species in these four zones.



## Natural Treatment Systems

IRWD's Natural Treatment Systems have been designed from the same successful NTS that has been established at the San Joaquin Marsh. These sites function to provide an environmentally conscious and economical solution to treat dry-weather runoff. The treatment systems naturally remove contaminants from the wastewater that enters through natural and urban runoff. The NTS basins function in a similar way to the San Joaquin Marsh, though they utilize small man-made wetlands that have been integrated throughout the San Diego Creek Watershed. The strategic design treats low-flow runoff and storm flows sourced throughout Irvine by removing contaminants such as nitrogen, phosphorus, and bacteria. The design not only treats the runoff, but also prevents the potential contaminants from ultimately reaching the ecologically sensitive habitat of the Upper Newport Bay. The following section describes the nonnative plant treatment methods that were utilized from January 2023-November 2023 for each of the 42 NTS basins that have been integrated into the IPM Plan. Table 1 describes the number of invasive species identified and the treatment recommendations that have been established at each basin from the period of January 2023-November 2023, based on specific EES assessment and consultation.

### RESULTS OF 2023 INTEGRATED PEST MANAGEMENT PLAN PRACTICES

**Table 1.** Summary of Invasive Plants and Treatment Methods in NTS Basins from January to November 2023. These data are based on EES recommendations and not the ultimate amount sprayed.

Basin Name <sup>1</sup>	Total Number of Invasive Species	Treatment Methods Recommended	Target Invasive Species Present On Site	Frequency of Occurrence for Target Invasive Species
Agua Chinon A/Upper Agua Chinon A	14	Hand Removal, Hula Hoe, Herbicide, Trim, Tree Removal	Spanish false fleabane, curly dock, stinkwort	5, 4, 2
Agua Chinon B/Upper Agua Chinon B	13	Hand Removal, Hula Hoe, Mow, Herbicide	Spanish false fleabane, curly dock, stinknet	7, 7, 6
Aquila Springs	16	Hand Removal, Hula Hoe, Tree Removal,, Herbicide	Spanish false fleabane	3
Cypress Meadows A	23	Hand Removal, Hula Hoe, Mow, Herbicide	Spanish false fleabane, curly dock	7, 4
Cypress Meadows B	17	Hand Removal, Hula Hoe, Tree Removal, Herbicide	Spanish false fleabane, curly dock	2, 1
Cypress Meadows C	25	Hand Removal, Hula Hoe, Mechanical Removal, Tree Removal	None	0



Cypress Meadows D	21	Hand Removal, Hula Hoe, Tree Removal, Herbicide	Spanish false fleabane, curly dock	2, 1
District 5A/ Lower Agua Chinon A	27	Hand Removal, Hula Hoe, Mow, Herbicide	Spanish false fleabane, bermuda grass	9, 5
District 5B/ Lower Agua Chinon B	14	Hand Removal, Hula Hoe	Spanish false fleabane, bermuda grass	6, 5
District 5C/ Lower Agua Chinon C	15	Hand Removal, Hula Hoe, Herbicide	Spanish false fleabane, bermuda grass	2, 2
Eastfoot Retarding Basin	9	Hand Removal, Mechanical Removal, Hula Hoe, Mow	Bermuda grass	1
Eastwood Meadow	23	Hand Removal, Hula Hoe, Mow, Herbicide, Tree Removal	Spanish false fleabane, curly dock	5, 6
El Modena	13	Hand removal	None	0
Floral View	17	Hand Removal, Hula Hoe, Herbicide, Tree Removal	Spanish false fleabane, pampas grass	3, 1
Forge Meadows	12	Hand Removal, Hula Hoe, Herbicide	Spanish false fleabane, curly dock	7, 5
Hidden Canyon	25	Hand Removal, Hula Hoe, Herbicide	curly dock, Bermuda grass	5, 2
Iluna Springs	15	Hand Removal, Hula Hoe, Mow, Herbicide, Tree Removal, Trim	Spanish false fleabane, curly dock	3, 5
Laguna Altura North	22	Hand Removal, Hula Hoe, Mow	Spanish false fleabane,	2
Laguna Altura South	13	Hand Removal, Hula Hoe, Mow, Herbicide	Spanish false fleabane	5
Los Olivos Meadow	15	Hand Removal, Hula Hoe, Herbicide	Spanish false fleabane, curly dock	11, 4
Los Olivos South	15	Hand Removal, Hula Hoe, Herbicide	Spanish false fleabane, Bermuda grass, pampas grass, curly dock, tamarisk	9, 10, 1, 4, 1
Lower Eastfoot	18	Hand Removal, Hula Hoe, Mow, Herbicide	Spanish false fleabane, curly dock	2,2
Marine Meadows	10	Hand Removal, Hula Hoe, Tree Removal	Spanish false fleabane	2



Marshburn	17	Hand Removal, Trim, Hula Hoe, Tree Removal, Herbicide	Curly dock, Spanish false fleabane	9, 8
Middle Eastfoot	18	Hand Removal, Trim, Hula Hoe, Mechanical Removal, Herbicide	Spanish false fleabane, curly dock, Bermuda grass	2, 9, 2
Old Laguna	34	Hand Removal, Hula Hoe, Tree Removal, Herbicide	Spanish false fleabane, Curly dock, Bermuda grass	6, 6, 1
Orchard Meadow	18	Hand Removal, Hula Hoe, Mow, Herbicide	Spanish false fleabane, curly dock	8, 7
Orchard Retarding Basin	22	Hand Removal, Hula Hoe, Mow, Mechanical Removal	0	0
Port Culver	19	Hand Removal, Hula Hoe, Mow	Herb of grace	4
Portola Springs	22	Hand Removal, Hula Hoe, Herbicide	Spanish false fleabane, Bermuda grass, curly dock	2, 1, 1
Quail Meadows	21	Hand Removal, Hula Hoe, Mow, Herbicide	Spanish false fleabane, curly dock	9, 2
Quail Springs	20	Hand Removal, Hula Hoe, Herbicide, Mow, Mechanical Removal, Trim	Spanish false fleabane, curly dock	8, 12
Ridge Valley A	35	Hand Removal, Hula Hoe, Mow, Herbicide, Mechanical Removal, Tree Removal	Spanish false fleabane, curly dock	7, 6
Ridge Valley B	13	Hand Removal, Hula Hoe, Herbicide, Tree Removal	Spanish false fleabane, Bermuda grass	3, 6
Ridge Valley C	18	Hand Removal, Hula Hoe, Herbicide, Trim	Spanish false fleabane	5
Sand Canyon	12	Hand Removal, Hula Hoe, Trim, Tree Removal	Spanish false fleabane, curly dock	1, 1
Sports Park	22	Hand Removal, Hula Hoe, Herbicide	Spanish false fleabane, curly dock	6, 6
Trabuco	14	Hand Removal, Hula Hoe, Herbicide, Mow	Spanish false fleabane, curly dock, herb of grace	6, 1, 2
Trabuco East/ Parasol Park	17	Hand Removal, Hula Hoe	Spanish false fleabane	4



Turtle Ridge	21	Hand Removal, Hula Hoe, Tree Removal, Mechanical Removal	None	0
Twisted Oak	11	Hand Removal, Hula Hoe	None	0
Upper Eastfoot	10	Hand Removal, Hula Hoe, Mow, Herbicide, Trim	Bermuda grass	5
Zone 1: San Joaquin Marsh	22	Hand Removal, Tree Removal, Hula Hoe, Herbicide	Spanish false fleabane, herb of grace	7, 1
Zone 2: San Joaquin Marsh	21	Hand Removal, Hula Hoe, Tree Removal, Herbicide, Mow	Spanish false fleabane	10
Zone 3: San Joaquin Marsh	30	Hand Removal, Hula Hoe, Tree Removal, Trim, Mechanical Removal, Herbicide	Spanish false fleabane, curly dock, herb of grace	13, 13, 5
Zone 4: San Joaquin Marsh	22	Hand Removal, Tree Removal, Hula Hoe, Trim, Mow, Herbicide	Spanish false fleabane, curly dock	9, 4

1. Refer to Map 1 in Appendix for a map of basin locations.

**Summary of Integrated Pest Management Usages**

In alignment with the goals established in the IPM, chemical pesticide application has been significantly reduced at the San Joaquin Marsh, NTS basins, and other IRWD facilities when compared to pre-implementation years. Table 2 summarizes and compares the chemical pesticide use from 2018-2023. Initially, chemical pesticide use totalled 162.24 gallons for the pre-establishment year of 2018. Since then, the total pesticide use has decreased significantly for both the SJM and NTS basins and for the other IRWD Facilities. In 2023, only 12.375 gallons of pesticide use was reported.

**Table 2.** Pesticide Usage Comparison.

Period	Sites	Prioritized chemical pesticides (gal)	Organic pesticides (gal)	Total (gal)
2018	SJM/NTS Basins	78.34	-	162.34
	Other IRWD Facilities	84.00	-	
Jan-June 2019	SJM/NTS Basins	60.53	-	60.53
	Other IRWD	-	-	



	Facilities <sup>1</sup>			
Sept-Dec 2019	SJM/NTS Basins	0.05	1.20	1.97
	Other IRWD Facilities	0.72	-	
Jan-Dec 2020	SJM/NTS Basins	13.45	-	15.70
	Other IRWD Facilities	2.25	-	
Jan-Dec 2021	SJM/NTS Basins	14.41	-	17.41
	Other IRWD Facilities	3	-	
Jan-Nov 2022	SJM/NTS Basins	14.34	-	14.34
	Other IRWD Facilities	-	-	
<b>Jan-Nov 2023</b>	<b>SJM Basins</b>	5.891	-	12.375
	<b>NTS Basins</b>	6.484		
	<b>Other IRWD Facilities</b>	-	-	

1. This information was not tracked by the Fleet/Facilities Manager in 2019.

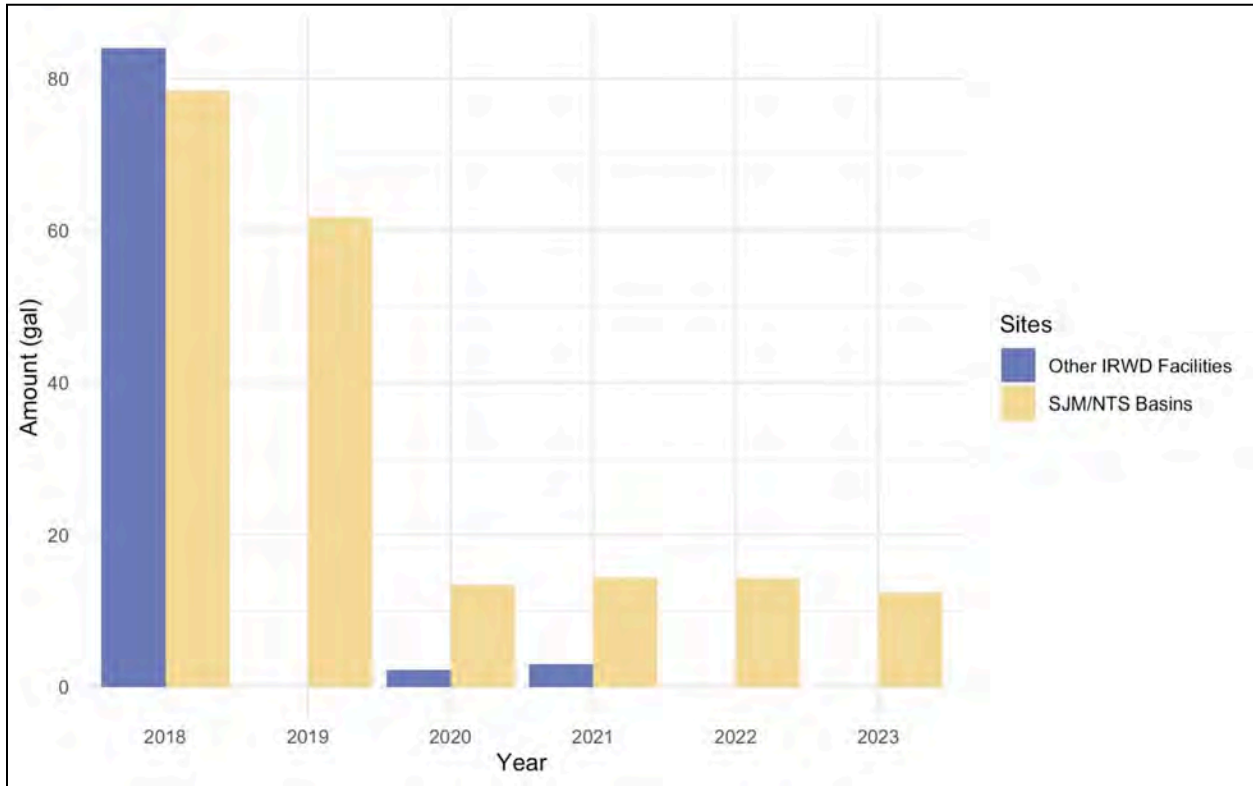
gal=gallon(s)

IRWD= Irvine Ranch Water District

N/A= Not Available

NTS= Natural Treatment System

SJM= San Joaquin Marsh



**Fig. 1** Annual herbicide usage across all sites, colored by site categories.

## **DISCUSSION AND RECOMMENDATIONS**

### **CHEMICAL TREATMENT METHODS**

The IPM activities in 2023 focused primarily on reducing the nonnative plant species at each site through manual and mechanical treatments. The use of herbicide was reserved only for target plants at the NTS sites, which was minimized through spot-treatment and selective avoidance. The chemical herbicides were applied to specific species based on past experience where the non-chemical treatments did not reduce the abundance or spread of these aggressive nonnatives. The only five target species that required herbicide from January 2023 to November 2023 were stinknet, Spanish false fleabane, herb of grace, bermuda grass and curly dock. The usage of chemical herbicide for these species has continued to be a necessary form of control and has reduced the amount of nonnative species throughout the year. The use of chemical herbicide to spot treat nonnative plant species will likely be able to be reduced in time as the existing seed bank is exhausted.

The Pesticide Usage Comparison demonstrates a continuous decline in the use of pesticides at the San Joaquin Marsh and NTS sites from 2018 to 2023 (Table 2). For the period of January 2023-November 2023, approximately 5.891 gallons of Roundup (glyphosphate) were used at the San Joaquin Marsh and 6.484 gallons at the NTS sites. Even though total pesticide usage declined in 2023, pesticide usage at the San Joaquin Marsh increased. In 2022, no pesticide was used at San Joaquin Marsh.



Tables 3 and 4 present detailed information for the quantity, frequency, average pesticide rate, and total area of pesticide use at the various NTS sites as documented by LandCare. The five sites with the highest quantity of pesticide use included: Los Olivos, District 5A/Lower Agua Chinon A, Los Olivos South, Marshburn, Sports Park. The five sites with the highest frequency of pesticide use included: Laguna Altura South, District 5A/Lower Agua Chinon A, Sports Park, Los Olivos South, and Old Laguna. The higher frequency and spread of invasive species could be attributed to a variety of factors such as open space availability, water access, prior disturbance agents, and proximity to high traffic areas. Additionally, herbicide use is assigned to plants listed as high rating on California Invasive Plant Council (CAL-IPC) who may not respond well to non-chemical treatment methods.

EES recommends that IRWD continues to strive to minimize the use of chemical pesticides while ensuring the prevention of invasive species to avoid further potential ecological and economic regional impact from invasive species. In these sites with high persistence of aggressive target species, it is recommended that the spot treatments continue to prevent further spread, while also leveraging native invasive plant removal after the target species have been cleared in order to support local ecosystem resilience.

**Table 3.** Pesticide Usage in the NTS as reported by LandCare in the Chemical Pesticide Usage Reports from January-November 2023.

Basin Name	Pesticide Name (Active ingredients)	Total Pesticide Amount Applied (gal)
Agua Chinon A/ Upper Agua Chinon A	<i>Roundup (glyphosate)</i>	0.125
Agua Chinon B/ Upper Agua Chinon B	<i>Roundup (glyphosate)</i>	0.10938
Aquila Springs	<i>Roundup (glyphosate)</i>	0.15625
Cypress Meadows A	<i>Roundup (glyphosate)</i>	0.03125
Cypress Meadows B	N/A	0
Cypress Meadows C	N/A	0
Cypress Meadows D	N/A	0
District 5A/Lower Agua Chinon A	<i>Roundup (glyphosate)</i>	0.78125
District 5B/Lower Agua Chinon B	<i>Roundup (glyphosate)</i>	0.0625
District 5C/Lower Agua Chinon C	<i>Roundup (glyphosate)</i>	0.140625
Eastfoot Retarding Basin	N/A	0
Eastwood	N/A	0
Floral View	N/A	0
Forge Meadows	<i>Roundup (glyphosate)</i>	0.046875



Hidden Canyon	<i>Roundup (glyphosate)</i>	0.0625
Illuna Springs	<i>Roundup (glyphosate)</i>	0.09375
Laguna Altura North	<i>Lifeline (glufosinate)</i>	0.046875
Laguna Altura South	<i>Roundup (glyphosate)</i>	0.3125
Los Olivos	<i>Roundup (glyphosate)</i>	1.0625
Los Olivos South	<i>Roundup (glyphosate)</i>	0.6796875
Lower Eastfoot	<i>N/A</i>	0
Marine Meadows	<i>N/A</i>	0
Marshburn	<i>Lifeline (glufosinate)</i>	0.59375
Middle Eastfoot	<i>Roundup (glyphosate)</i>	0.15625
Old Laguna	<i>Roundup (glyphosate)</i>	0.375
Orchard Meadows	<i>N/A</i>	0
Orchard Retarding Basin	<i>N/A</i>	0
Port Culver	<i>N/A</i>	0
Portola Springs	<i>Roundup (glyphosate)</i>	0.3515625
Quail Meadows	<i>N/A</i>	0
Quail Springs	<i>Roundup (glyphosate)</i>	0.328125
Ridge Valley A	<i>Roundup (glyphosate)</i>	0.09375
Ridge Valley B	<i>Roundup (glyphosate)</i>	0.09375
Ridge Valley C	<i>Roundup (glyphosate)</i>	0.125
Sports Park	<i>Roundup (glyphosate)</i>	0.390625
Trabuco	<i>Roundup (glyphosate)</i>	0.046875
Trabuco East/Parasol Park	<i>Lifeline (glufosinate)</i>	0.0625
Turtle Ridge	<i>N/A</i>	0
Twisted Oak	<i>N/A</i>	0
Upper Eastfoot	<i>Roundup (glyphosate)</i>	0.03125
<b>Total Usage:</b>	<b><i>Roundup (glyphosate)</i></b>	<b>6.484375</b>

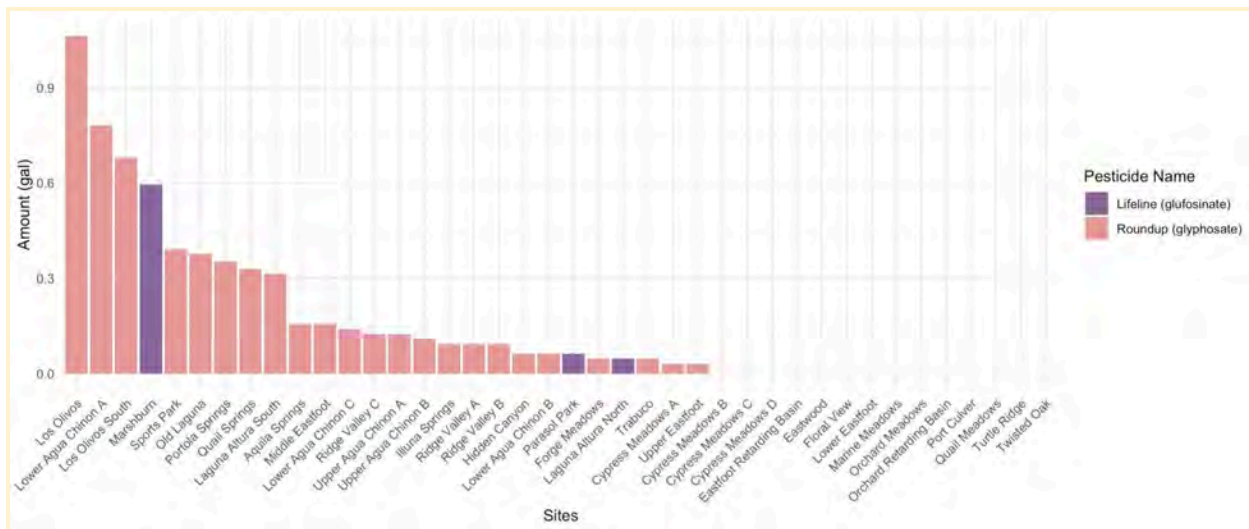


Fig. 2 Total herbicide usage per site in 2023, ranked from highest to the lowest.

Table 4. List of the eleven NTS sites with the highest pesticide usage based on total amount and total area applied.

Basin Name	Number Treatments in a Year	Average Application Rate (gal / sq. ft.)	Total area applied (sq. ft.)	Total Amount Applied (gal)
Los Olivos	2	0.00885	120*	1.0625
District 5A/Lower Agua Chinon A	5	0.00007	10,700	0.78125
Los Olivos South	4	0.000041	18,600	0.6796875
Marshburn	3	0.00009	6,500	0.59375
Sports Park	5	0.00008	4,650	0.390625
Old Laguna	4	0.0001	3,700*	0.375
Portola Springs	2	0.00050	700	0.3515625
Quail Springs	3	0.00008	4,200	0.328125
Laguna Altura South	6	0.00001	42,250	0.3125
Middle Eastfoot	2	0.00010	1,600	0.15625
Aquila Springs	2	0.00010	1,500	0.15625

\*Total area applied could not be determined for certain applications

**NON-CHEMICAL TREATMENT METHODS**

The primary treatment methods that were employed at the SJM and NTS Sites included manual and mechanical methods that led to successful eradication. A variety of physical methods exist to treat nonnative plant species, including hand removal, mechanical removal, mulch, and solarization. Hand removal of individual nonnative species proved to be the control method with the greatest selectivity and cost effectiveness with the least indirect impacts. This had the added



benefit of preservation of native species and lower impact to the surrounding environment. Manual methods also included hand digging, cutting, uprooting, and hula hoe. The manual removal strategy is most effective on newly established and small populations with limited distributions and also when target species are intermixed with native plants..

Mechanical removal methods such as weed trimming, disking, and mowing were also employed for large patches of nonnative plants that were not intermixed with native plants. Though these methods were effective in clearing large areas impacted by nonnative invasion, the technique is most effective when followed up with native habitat restoration so that the cleared areas are not quickly populated by pioneer invasive species.

In addition to LandCare using non-chemical treatment methods, the EES restoration team also implemented an approved native plant restoration strategy at three NTS sites: Los Olivos, Port Culver, and Lower Eastfoot. Non-native removal and native plant container planting were strategies used to increase native plant species cover and establishment, while also reducing nonnative plant species cover.

### *Recommendations*

Throughout the IPM implementation period for June-November 2023, several recommendations were suggested in order to minimize the use of chemical pesticides while controlling the nonnative plant populations at the NTS sites:

- **Native restoration and seeding should be prioritized in the NTS basins to prevent future nonnative species establishment.** Native habitat restoration techniques such as container planting, seeding, hydromulching, and irrigation system establishment will increase native plant biodiversity, native plant coverage, and establishment. Based on nonnative cover and the presence of target species, habitat restoration is highly recommended for the following NTS sites: Old Laguna, Hidden Canyon, Sports Park, Marshburn, Quail Springs, Los Olivos South, and Middle Eastfoot.
- **Irrigation systems should be established in the dry basin regions of the NTS sites.** Irrigation will encourage native plant growth in the early spring and summer seasons. This will allow the native plants and seeding to establish and develop resiliency to potential flooding in winter months.
- **Native grasses and rushes with strong root systems should be planted in the NTS basins.** These native grasses will lower erosion on the slopes and handle inundation in the basins. Examples of native grasses with strong root systems include rushes (*Juncus mexicanus*), salt grass (*Distichlis spicata*), and deergrass (*Muhlenbergia rigens*).
- **Flaming should not be used as a treatment method for invasive plant areas within NTS basins.** Flaming is not recommended because it is ineffective and poses dangers associated with wildfires.
- **The Chemical Pesticide Usage field-monitoring forms should document the specific areas of herbicide application.** Maintaining detailed records of the quantity, location, and species that the chemical pesticide was applied to would be very helpful



information that could later be analyzed to assess the effectiveness and continued target areas at each site.

- **Organic herbicides should not be utilized as a method for treating nonnative plant species in the NTS basins.** Conventional herbicides have been found to be more effective for controlling established nonnative plant growth. Organic herbicides are also less cost effective and require higher application rates throughout the year. The higher application rates and physical contact of organic herbicides can have potential negative impacts on native pollinators, soil, and water quality (Smith-Fiola and Gill 2017). For these reasons, mechanical removal methods and spot treated chemical herbicide treatment are recommended to control for nonnative species. As new technologies and organic herbicides develop, EES will continue to test and research the efficacy of new methods in order to ensure the most effective and up-to-date treatment methods are being employed.

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## SITE OVERVIEWS

### Natural Treatment Systems

42 Sites

#### Forge Meadow

Forge Meadow is a 2.38 acre NTS basin located adjacent to Portola Parkway in north Irvine. This basin consists of two ponds connected by a long channel. Manual removal of invasive species reduced nonnative cover within the basin; however, bristly oxtongue continued to persist throughout the year. Prevalent species included bristly oxtongue, common sowthistle, yellow sweetclover, and flax-leaved horseweed. Chemical treatment was applied once in August to manage target species.



Figure 1. Overview of Forge Meadow as of September.



## Port Culver

Port Culver is a 1.74 acre basin located north of Portola Parkway and adjacent to a large agricultural area in north Irvine. This basin consists primarily of a pilot channel, but water often overflows from the channel and spreads throughout the bottom of the basin. Manual removal was the primary method for control nonnative cover, however the target species herb of grace seemed to be unaffected by this method and persisted from September to the end of the year. Prevalent nonnative species included bristly oxtongue, flax-leaved horseweed, sweetclover, prickly sow thistle, common sowthistle, burr clover, and cheeseweed. No chemical treatment was applied to this site.



Figure 2. Overview of Port Culver as of July 2023.



## Orchard Meadow

Orchard Meadow is a 2.29 acre basin located north of Portola Parkway and adjacent to a large agricultural area in north Irvine. This basin consists primarily of a pilot channel, but water often overflows from the channel. Overflowing water often spreads throughout the bottom of the basin and creates a pond. Manual removal and herbicide application were the primary methods prescribed and proved effective at controlling nonnative cover. Prevalent species included bristly oxtongue, flax-leaved horseweed, yellow sweet clover, shortpod mustard, curly dock, and Spanish false fleabane. No chemical treatment was applied to this site.



Figure 3. Overview of Orchard Meadow as of October 2023.



## Lower Eastfoot

Lower Eastfoot is a 2.13 acre basin located north of Portola Parkway. This basin is adjacent to residential housing and the 261 freeway in north Irvine. The basin consists primarily of a pilot channel connected with two ponds on each side of the site. The site exhibited consistent cover of annual nonnative species. Though manual removal in late summer reduced total invasive cover in the basin, some invasives continue to persist onsite, especially bristly oxtongue. Prevalent nonnative species included bristly oxtongue, prickly lettuce, flax-leaved horseweed, and yellow sweetclover. No chemical treatment was applied to this site.



Figure 4. Overview of Lower Eastfoot showing the waterway with dense duckweed cover as of October 2023.



## Middle Eastfoot

Middle Eastfoot is a 3.16 acre basin located north of Settlers Road in north Irvine. This basin is adjacent to residential housing, the 261 freeway, and agricultural land. The basin consists primarily of a pilot channel, but water can overflow from the channel. Water often spreads throughout the bottom of the basin and creates a pond. Prevalent invasive species were bristly oxtongue, shortpod mustard, common sowthistle, white sweetclover, curly dock, Mexican primrose and burr clover. Chemical herbicide was applied three times to control Spanish false fleabane, curly dock, and bermuda grass.



Figure 5. Overview of the Middle Eastfoot basin exhibiting high cover of bristly oxtongue as of July 2023.



## Upper Eastfoot

Upper Eastfoot is a 1.35 acre basin located east of the 261 freeway in north Irvine. The basin is adjacent to residential housing and consists primarily of a pond at the base of the slope. Throughout the year, mainly hand removal and hula hoe methods maintained a low cover of nonnative plants. Nonnative species observed included rabbitsfoot grass, flax-leaved horseweed, bristly oxtongue, and burr clover. Bermuda grass, a target species, was observed during the fall and winter months and remains one of the most prevalent nonnative species on site. Because of high native cover at the site, minimal treatment recommendations were made throughout the year with no recommendations in March and April. Chemical herbicide was used two times during the year to manage bermuda grass.

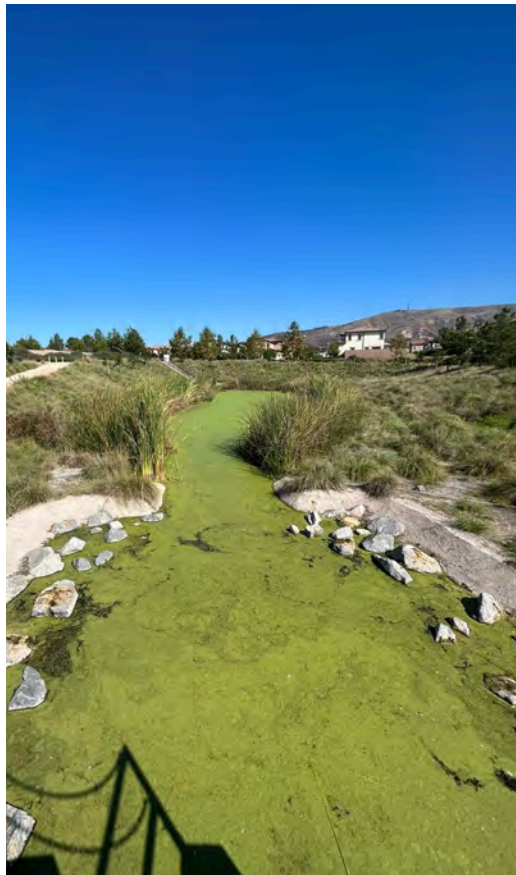


Figure 6. Overview of Upper Eastfoot as of November 2023.



## El Modena

El Modena is a 1.60 acre basin located adjacent to S. Hewes Street in north Irvine. The basin is adjacent to residential housing and consists of a single pond. Nonnative plant species were primarily removed by hand. Prevalent nonnative species included lamb's quarters, narrow-leaf birds-foot trefoil, cheeseweed and brittlebush. Nonnative red-eared sliders were observed at the site during multiple site visits throughout the year. No chemical treatment was reported for this site.



Figure 7. Overview of El Modena as of August 2023.



## Trabuco

Trabuco is an 18.06 acre basin located north of Trabuco Rd in north Irvine. The basin is adjacent to residential housing. Trabuco consists of three ponds connected by two pilot channels. Throughout the year, with the exception of March and April, the slopes and basin exhibited high annual nonnative species cover. A variety of treatment measures were used including hand removal, hula hoe, and herbicide application. Three target species were observed on site: Spanish false fleabane, curly dock, and herb of grace. Though Spanish false fleabane was observed throughout the year, curly dock was only observed in January and herb of grace in the fall months. Though treatment methods reduced the total cover of invasive plants, including some target species, some nonnative species continue to persist onsite. Some of these species include burr clover, brass buttons, sweetclover, shortpod mustard, and shepherd's purse. Bare ground was present in the basin and along the slopes throughout the year and native seeding was recommended. Chemical herbicide was applied on one occasion in July.



**Figure 8.** Overview of Trabuco as of November 2023.



### Trabuco East/Parasol Park

Trabuco East is located north of Great Park Boulevard. This basin consists mainly of a pilot channel, but water can often overflow into the basin. Throughout the year, hand removal and hula hoe were the primary methods used to reduce total invasive cover. Some invasive species continue to persist in small patches onsite. Prevalent invasive species included Spanish false fleabane, prickly sowthistle, sweetclover, scarlet pimpernel, tropical milkweed, and shortpod mustard. Low nonnative cover was reported in February and several fall months, but nonnative cover was high during the spring and summer months. Herbicide was used once during the year in January to remove Spanish false fleabane.



Figure 9. Overview of Trabuco East in May 2023 (left) and October 2023 (right).



## Cypress Meadows A

Cypress Meadow A is a 6.03 acre basin located north of the 5 freeway and adjacent to residential housing in north Irvine. This basin consists primarily of three pilot channels connected by a pond at the bottom of the basin. Throughout the year, the slopes and basin exhibited high cover by annual nonnative species despite ongoing mowing, chemical treatment, and manual removal methods. Prevalent species included prickly sowthistle, flax-leaved horseweed, Spanish false fleabane, and curly dock. Nonnative trees were documented starting September, which included Chinese elm, carrotwood, Brazilian peppertree and Camphor tree. Surrounding ornamental shrubs, such as natal plum and Japanese cheesewood, were also appearing on the slopes later in the year. Herbicide treatment was used once to control Spanish false fleabane in August.



Figure 10. Overview of Cypress Meadows A as of November 2023.



## Cypress Meadows B

Cypress Meadow B is a 1.99 acre basin located north of the 5 freeway and adjacent to residential housing in north Irvine. This basin consists primarily of a pilot channel at the bottom of the basin. Nonnative cover remained consistent throughout the year, despite manual removal. Prevalent species included bristly oxtongue, prickly sowthistle, flax-leaved horseweed, and Spanish false fleabane. Nonnative trees were documented starting September, which included Chinese elm and pomegranate. Surrounding ornamental shrubs, such as Japanese honeysuckle and Japanese cheesewood, were also appearing on the slopes later in the year. No chemical treatment was reported for this site.



Figure 11. Overview of Cypress Meadows B as of October 2023.



## Cypress Meadows C

Cypress Meadow C is a 2.61 acre basin located north of the 5 freeway and adjacent to residential housing in north Irvine. This basin consists primarily of a pilot channel at the bottom of the basin. The site exhibited lower coverage of annual nonnative species than last year, but some species continue to persist in the bottom of the basin despite manual removal methods. Prevalent species included bristly oxtongue, prickly sowthistle, common sowthistle, and Mexican primrose. Nonnative trees were documented starting September, which included Chinese elm and castor bean. Surrounding ornamental shrubs, such as Japanese honeysuckle, Japanese cheesewood and firethorn, were also appearing on the slopes later in the year. No chemical treatment was reported for this site.



Figure 12. Overview of Cypress Meadows C as of October 2023.



## Cypress Meadows D

Cypress Meadow D is a 3.19 acre basin located north of the 5 freeway and adjacent to residential housing in north Irvine. This basin consists primarily of a pilot channel at the bottom of the basin. The slopes and basin exhibited high cover of annual nonnative species. Several species still persist on the slopes and the basin, despite manual removal recommendations. Prevalent nonnative species included prickly sowthistle, common sowthistle, yellow sweetclover, bristly oxtongue, and Mexican primrose. Nonnative trees were documented starting September, which included Brazilian peppertree, Camphor tree, and Japanese privet. No chemical treatment was reported for this site.

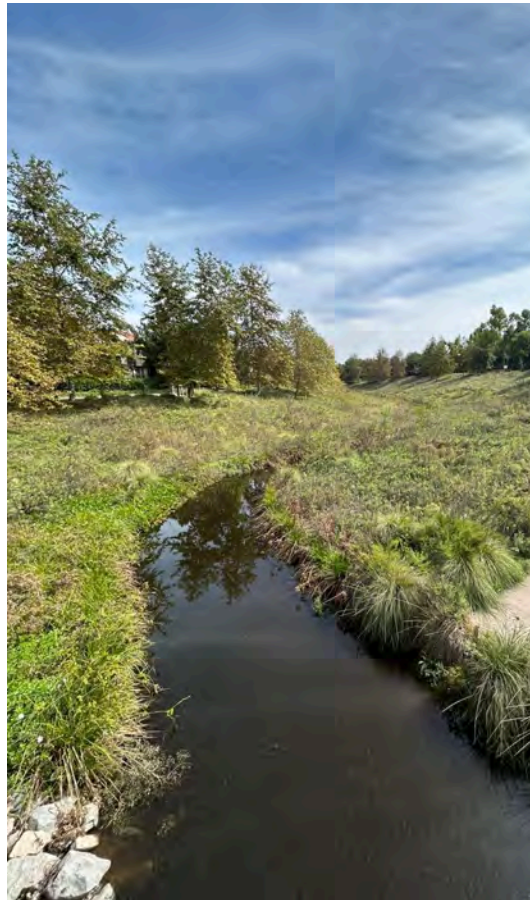


Figure 13. Overview of Cypress Meadows D as of October 2023.



## Eastfoot Retarding Basin

Eastfoot Retarding Basin is a 9.96 acre basin located east of Leafy Pass in north Irvine. The basin is adjacent to agricultural land and residential housing. This basin consists primarily of a pilot channel connected to three ponds at the bottom of the basin. Manual and mechanical removal was recommended in effort to reduce a high density of annual nonnative species on the slopes and basin bottom. Prevalent species included bristly oxtongue, prickly lettuce, common thistle and Russian thistle. After mowing in August, site restoration was recommended. No chemical treatment was reported for this site.



Figure 14. Overview of Eastfoot Retarding Basin as of November 2023.



## Quail Springs

Quail Springs is a 10.85 acre basin located south of the I-405 freeway in north Irvine. The basin is adjacent to a large open field area and residential housing. Quail Springs consists primarily of a pilot channel connected to four ponds. Throughout the year, the slopes and the basin exhibited high cover by annual nonnative species. Though mechanical, manual, and chemical methods were used to help reduce the total cover of invasive plants, some species continued to persist onsite. Prevalent species included bristly oxtongue, prickly sowthistle, shortpod mustard, black mustard, prickly lettuce, curly dock, and Spanish false fleabane. Mowing was regularly recommended for nonnatives in the basin and mowing occurred in June. Additionally, native seeding of the slopes was also recommended throughout the year. Chemical pesticides were used three times throughout the year to control dense cover of target species.



Figure 15. Overview of Quail Springs in May 2023 (left) and June 2023 (right) after mowing in the basin.



## Orchard Retarding Basin

Orchard Retarding Basin is a 0.79 acre basin located adjacent to a housing development and the Orchard Hills Staging Area. The area consists of a main basin connected to a channel. There is a paved walkway around the basin's edge. Mechanical removal was the primary method prescribed and significantly reduced the high coverage of nonnative plants by July. Indeed, from July to the end of the year, nonnative cover remained relatively low. Throughout the year prevalent invasive species included lamb's quarters, bristly oxtongue, prickly sowthistle, lamb's quarters, and prickly lettuce. No treatments of chemical herbicide were used at this site.



Figure 16. Overview of Orchard Retarding Basin as of November 2023.



## Twisted Oak

Twisted Oak is a 0.33 acre basin located northeast of Northwood High School. It consists of one circular pond. A mixture of hand removal and hula hoe methods were used on the slopes and basin to reduce the invasive plant cover, though some species still persist onsite. Prevalent invasive species included English plantain, brass buttons, bristly oxtongue, prickly sowthistle, and floating primrose-willow. Bare patches were present in the basin throughout the year and native seeding was recommended. No chemical treatment was reported for this site.



Figure 17. Overview of Twisted Oak with bare patches in the basin as of November 2023.



## Agua Chinon A/Upper Agua Chinon A

Aqua Chinon A is a 1.90 acre basin located near a housing development off of Portola Springs Road and adjacent to SR-241. Manual removal was used to reduce the amount of invasive plant species found in the basin. The most prevalent nonnatives included prickly sowthistle, common sowthistle, shortpod mustard, and curly dock. Three treatments of chemical herbicide were used to remove target species in the basin and on the slopes.

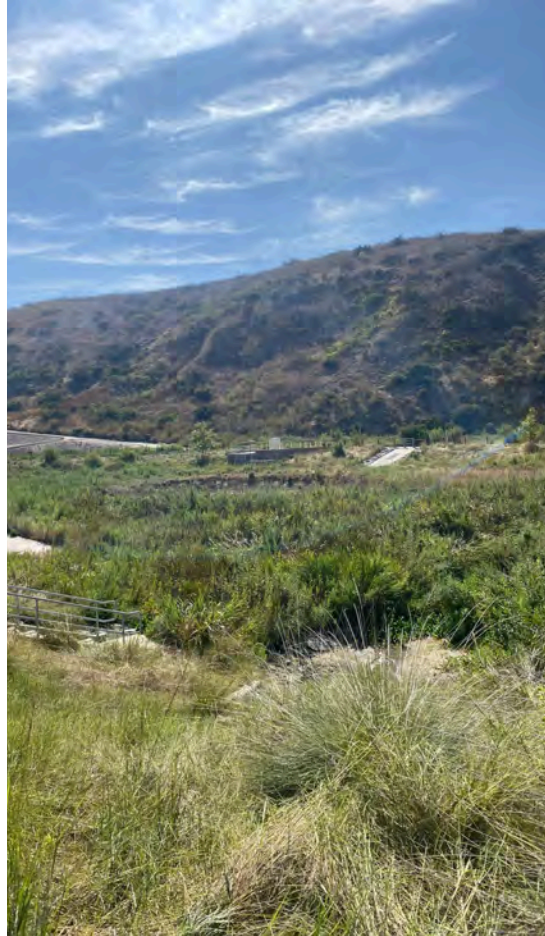


Figure 18. Overview of (Upper) Agua Chinon A as of August 2023.



### **Aqua Chinon B/Upper Agua Chinon B**

Aqua Chinon B is a 1.98 acre basin located near a housing development off of Portola Spring road and adjacent to SR-241. The basin and uplands exhibited high cover by annual nonnative plant species year-round, despite manual removal, mowing and chemical treatment. The most prevalent invasive plants were bristly oxtongue, curly dock, bur clover, Spanish false fleabane, London rocket, and rabbitsfoot grass. Chemical treatment was utilized in January and November.



Figure 19. Overview of (Upper) Agua Chinon B as of April 2023.



## Aquila Springs

Aquila Springs is a 1.17 acre basin located in the Altair Community development east of Irvine Boulevard. The basin consists of one channel and is characterized by high native cover. Manual removal was primarily used to remove nonnative plants found on the slopes and in the basin. Prevalent nonnative species were burr clover, prickly sowthistle, yellow sweetclover, and scarlet pimpernel. Nonnative trees were also documented later in the year, which included Chinese elm and castor bean. Herbicide was used onsite twice to control Spanish false fleabane.



Figure 20. Overview of Aquila Springs as of November 2023.



### Floral View

Floral View is a 2.98 acre basin located east of SR-133 and west of Floral View. It consists of one channel leading to a circular pond. The site had a moderate amount of annual nonnative plants. Manual removal was primarily used to reduce the amount of invasives, but some still persisted onsite. The most prevalent species were prickly sowthistle, yellow sweetclover, rabbitsfoot grass and Mexican primrose. Nonnative trees were also documented on the site, including Chinese elm and carrotwood. No chemical treatment was reported for this site.



Figure 21. Overview of Floral View as of October 2023.



## Hidden Canyon

Hidden Canyon is a 3.31 acre basin located south of Lake Forest Drive and adjacent to the Hidden Canyon residential development. The basin consists of two inlets which flow into one pond. This basin exhibits high nonnative species cover in the basin bottom and the south-facing slopes. Mechanical removal and chemical treatments proved effective at treating nonnative vegetation, and by August target species (i.e. curly dock, Bermuda grass) were removed from the site. Throughout the year, the most prevalent invasive species were curly dock, yellow sweetclover, flax-leaved horseweed, prickly and common sowthistle, bristly oxtongue, and shortpod mustard. Chemical herbicide was applied once in June.



Figure 22. Overview of Hidden Canyon basin with native coverage as of August 2023.



## Iluna Springs

Iluna Springs is a 2.68 acre basin located in the Altair Community development. The development is north of Irvine Boulevard in northeast Irvine. This basin consists of two inlet channels. The basin and surrounding slopes experienced moderate coverage of annual nonnative plants throughout the year. Prevalent invasive species included curly dock, common sowthistle, and rabbitsfoot grass. Chemical herbicide was utilized once in January to control target species.

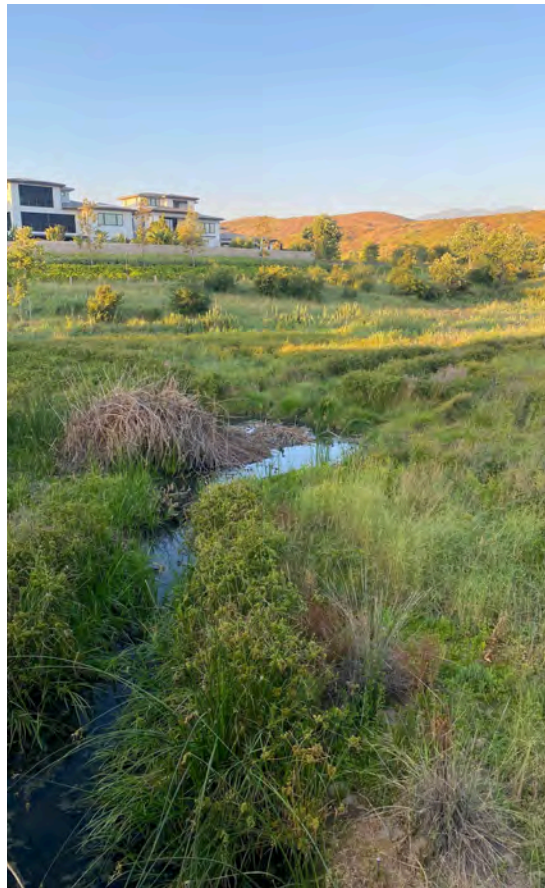


Figure 23. Overview of Iluna Springs natives on slopes and basin as of July 2023.



## Laguna Altura North

Laguna Altura North is a 0.86 acre basin located north of the Laguna Altura housing development and south of I-405. This site had high levels of native recruitment with native plants such as willow herb, western vervain, and saltmarsh aster establishing strongly within the basin. Nonnative species, such as bristly oxtongue, prickly sowthistle, cheeseweed, and common purslane, were prevalent throughout the year, however, target species such as Spanish false fleabane only occurred in August. Mechanical removal were the primary methods of nonnative control and herbicide application was only utilized in January.



Figure 24. Laguna Altura North basin with emerging natives as of July 2023 (left) and basin with healthy native establishment as of September 2023 (right).



## Laguna Altura South

Laguna Altura South is a 0.75 acre basin located west of the Laguna Altura housing development and east of SR-133. Mechanical removal were the primary treatments for control invasives and were consistently recommended throughout the year. Prevalent invasive species included prickly sowthistle, flax-leaved horseweed, rabbitsfoot grass, barnyard grass, and scarlet pimpernel. Chemical herbicide was used six times to control Spanish false fleabane.



Figure 25. Laguna Altura South basin filled with emerging flax-leaved horseweed as of July 2023 (left) and a site overview as of October 2023 (right).



## Los Olivos

Los Olivos is a 3.19 acre basin located east of San Diego Creek and adjacent to the Los Olivos housing development. This basin has two inlet channels that flow into one pond. Nonnative cover was controlled primarily by hand removal and herbicide application. Prevalent invasive species included flax-leaved horseweed, bristly oxtongue, bull thistle, burr clover, rabbitsfoot grass, yellow and white sweetclover, prickly sowthistle, and shortpod mustard. Target species, Spanish false fleabane, and curly dock, were present throughout the year. Chemical herbicide was applied every month from January to November, a total of 11 times, to control Spanish false fleabane and curly dock.



Figure 26. Overview of Los Olivos basin with emerging invasives as of July 2023 (left) and a site overview as of November 2023 (right).



## Los Olivos South

Los Olivos South is a 2.70 acre basin located east of SR-133 and adjacent to the Laguna Alta housing development. Throughout the year, mechanical removal and herbicide applications were recommended to control nonnative invasive cover. The prevalent invasive species included Bermuda grass, Spanish false fleabane, flax-leaved horseweed, bristly oxtongue, and prickly sow thistle. Two notable invasives occurred at this site. In July, tamarisk was identified and removed from the site, and in December, pampas grass was identified and removed from the site. Chemical herbicide was applied four times during the year in April, June, July, and October to control target species.

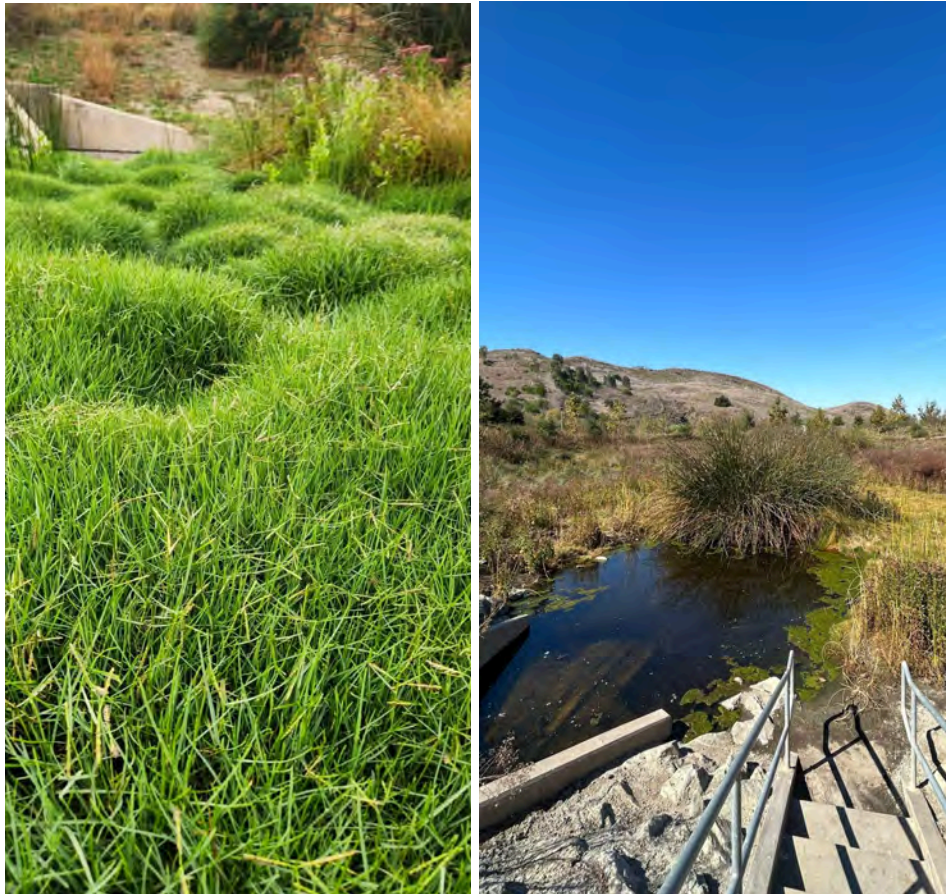


Figure 27. Los Olivos South basin filled with Bermuda grass as of October 2023 (left) and a site overview as of November 2023 (right).



## Marine Meadows

Marine meadows is a 1.66 acre basin located west of the SR-133 and I-5 highways. The basin is adjacent to Great Park and a housing development. The basin had moderate nonnative cover in bare areas and only a total of ten nonnative species occurred. Mechanical removal were the primary recommended treatments to reduce invasive plant species, with prevalent species being bristly oxtongue, yellow sweetclover, rabbitsfoot grass, common lantana, and common sowthistle. In August, Chinese elm was identified and removed. Throughout the year, Marine Meadows experienced relatively low nonnative cover. No chemical treatment was reported for this site.



Figure 28. Overview of Marine Meadows as of November 2023.



## Marshburn

Marshburn is a 14.04 acre basin located at the intersection of Irvine Boulevard and Ridge Valley in Irvine. This basin also serves as a flood retention basin. Marshburn consists of two channels that flow into one large pond. Before spring, the basin bottom and slopes were bare. In the spring, nonnative annual species emerged and by fall had occupied 47% or higher of the site. Mechanical removal and herbicide application were the primary methods used to reduce invasive cover; however, several species continue to persist. Prevalent species included yellow and white sweetclover, bristly oxtongue, curly dock, Spanish false fleabane, wild radish, perennial rye, barnyard grass, and castor bean. Trimming of dense bulrush was also recommended in the fall. Three treatments of chemical herbicide were applied in July, August, and September.



Figure 29. Overview of Marshburn with high invasive cover as of November 2023 (left) and flowering bristly oxtongue intermixed with native rough cocklebur in July 2023 (right).



## Old Laguna

Old Laguna is a 2.81 acre basin located west of Laguna Canyon Road and south of I-405. This basin consists of two small channels that flow into one large pond. The slopes and basin exhibited a relatively high diversity of nonnative cover. Mechanical removal and herbicide application were the methods primarily used to reduce the total cover of invasive plants. Prevalent nonnative species included flax-leaved horseweed, yellow sweetclover, Spanish false fleabane, curly dock, common purslane, floating primrose, and prickly sowthistle. In January, a tuckeroo tree was identified and removed and in November a Chinese elm was identified and removed. Chemical herbicide was applied during the months of April, May, June, and July, to remove target species.



Figure 30. Overview of Old Laguna as of September 2023 (left) and floating primrose and algae in the waterway as of July 2023 (right).



## Portola Springs

Portola Springs Meadow is a 0.89 acre basin located north of Irvine Boulevard and east of SR-133. This basin consists of two inlets. Throughout the year, the site had primarily native cover on slopes and relatively moderate nonnative cover in the basin. Mechanical removal was the primary method used to control invasive species. Prevalent species included flax-leaved horseweed, rabbitsfoot grass, yellow sweet clover, and common purslane. In August and September, three invasive tree species were identified, acacia, Chinese elm, and Peruvian pepper tree, and were subsequently removed. Chemical herbicide was used two times, in May and July, to control Spanish false fleabane, Bermuda grass, and curly dock.



Figure 31. Overview of Portola Springs as of November 2023.



## Quail Meadow

Quail Meadow is a 1.40 acre basin located north of Quail Hill Shopping Center in Irvine. This basin consists of a small sediment catchment pond at the inlet, after which water percolates into the ground. In January and February, there was low nonnative cover in the basin and along the slopes. In the spring months, nonnative cover increased in the basin and persisted for the majority of the summer. Mowing, manual removal, and herbicide were used to reduce the abundance of invasives such as bristly oxtongue, prickly lettuce, red brome, prickly sowthistle, umbrella sedge, brass buttons, sweetclover, scarlet pimpernel, Spanish false fleabane and common purslane. Two treatments of chemical herbicide were used to remove target species.



Figure 32. Overview of Quail Meadow with relatively bare slopes in August 2023.



## Ridge Valley A

Ridge Valley A is a 6.44 acre basin located east of SR-133. It consists of two inlets that flow into one pond. High nonnative cover persisted throughout the year with fewer nonnative species present during the winter months. Dominant invasive species include bristly oxtongue, prickly sowthistle, flax-leaved horseweed, yellow and white sweetclover, shortpod mustard, common lamb's quarters, and Brazilian pepper tree. Two target species, curly dock and Spanish false fleabane, were both present for the majority of the year (January-August). Since August, both of these species have not been observed in noteworthy quantities. Chemical herbicide was used two times during the months of June and August.

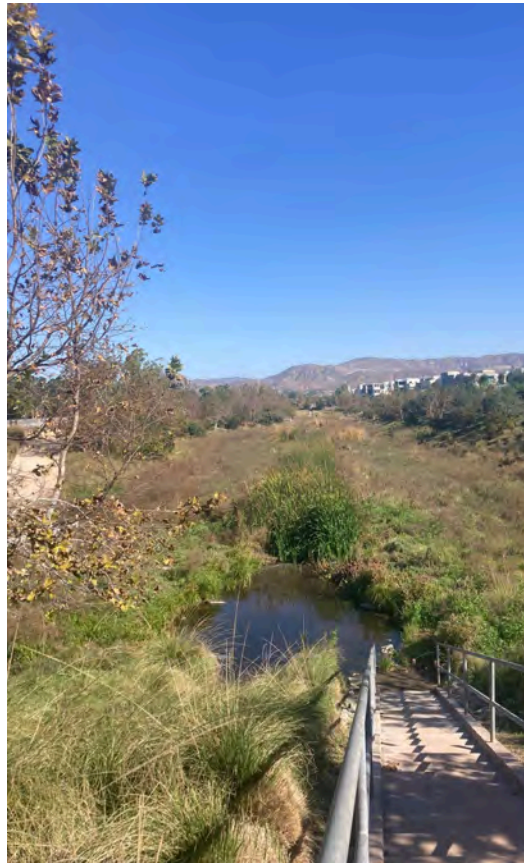


Figure 33. Overview of Ridge Valley A in October 2023.



## Ridge Valley B

Ridge Valley B is a 1.65 acre basin located east of SR-133 and adjacent to Ridge Valley A NTS basin. Ridge Valley B consists of a channel that flows into Ridge Valley A. The basin slopes exhibit moderate nonnative cover and the basin exhibits healthy native cover. Dominant invasive species along the slopes included sweetclover, prickly sowthistle, bermuda grass, scarlet pimpernel, and Spanish false fleabane. Throughout the year, native seeding was recommended on the west-facing slope. Chemical herbicide was applied in April and then again in November to control target species.



Figure 34. Overview of Ridge Valley B with healthy basin native cover in November 2023.



## Ridge Valley C

Ridge Valley C is a 4.68 acre basin located east of SR-133 and adjacent to Ridge Valley B. The basin consists of one long channel with a pond in the center. Throughout the year, the majority of nonnative coverage was found on the slopes while the basin had relatively high native coverage. Hand removal, hula hoe, and herbicide removal methods were used to reduce nonnative cover. Despite removal efforts, some nonnative species persisted on site. Dominant nonnative species included flax-leaved horseweed, prickly sowthistle, common sowthistle, bristly oxtongue and shortpod mustard. Though Spanish false fleabane was not observed from January to April, the species was present in noticeable quantities in subsequent months. Chemical herbicide was applied in July and then again in September to control target species.



Figure 35. Overview of Ridge Valley C with high native cover in the basin, October 2023.



## Sports Park

Sports Park is a 1.95 acre basin located north of the I-5 freeways at the corner of Marine Way and Skyhawk. The site exhibited relatively high annual nonnative cover, especially in the summer and fall months. Dominant invasive species included Spanish false fleabane, curly dock, burr clover, bristly oxtongue, and common sowthistle. The two target species observed at the site, Spanish false fleabane and curly, persisted throughout the year despite treatment methods. Chemical herbicide was applied on site two times during the months of August and September.



Figure 36. Overview of Sports Park as of November 2023.



## Turtle Ridge

Turtle Ridge is a 1.97 acre basin located south of Shady Canyon Drive. The basin is adjacent to an open field and residential housing. Turtle Ridge consists of a pond surrounded by vegetated slopes. Though the site exhibited high nonnative cover, no target species were observed. Prevalent nonnative species included flax-leaved horseweed, prickly sowthistle, sweetclover, rabbitsfoot grass, and bristly oxtongue. Throughout the year, native seeding was recommended for bare ground along the south facing slope. No chemical treatment was reported for this site.



Figure 37. Overview of Turtle Ridge with dense algae in June 2023 (left) and minimal algae in October 2023 (right).



### Eastwood Meadow

Eastwood Meadow is a 1.88 acre basin located east of Ridgeline Drive. The site exhibited high nonnative cover in open patches of the basin. Dominant nonnative species included bristly oxtongue, prickly sowthistle, yellow sweetclover, shepherd's purse, rabbitsfoot grass and cheeseweed. Manual removal, and chemical methods were used to reduce nonnative cover. Nonnative trees, including Chinese elm and Brazilian peppertree, were documented in the site. No chemical treatment was reported for this site.



Figure 38. Overview of Eastwood as of October 2023 (left) and the basin dominated by Spanish false fleabane, rabbitsfoot grass and other invasive plants in July 2023 (right).



## Sand Canyon

Sand Canyon is a 43.50 acre basin located east of Ridgeline Drive in north Irvine. The basin is adjacent to a golf course and primarily consists of a large pond. Sand Canyon has dense riparian habitat to the south of the pond. The site was only surveyed in April and twelve purslane nonnative species were recorded. Two of these nonnative species were target species: Spanish false fleabane and curly dock. No chemical herbicide was applied.

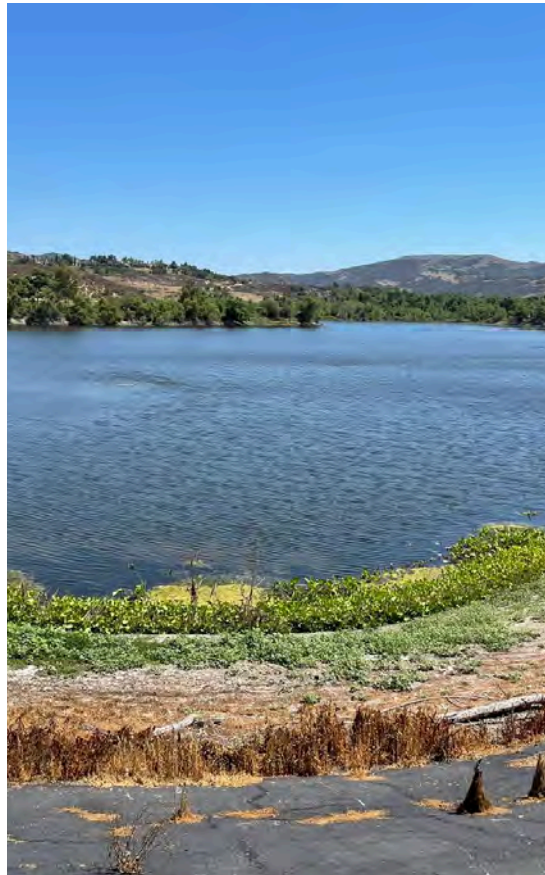


Figure 39. Overview of the Sand Canyon waterway.



## District 5A/Lower Agua Chinon A

District 5A is a 3.21 acre site that is located to the southeast of the Great Park Sports Complex, northeast of the I-5 freeway. High nonnative cover persists, despite chemical treatment and manual removal. Dominant nonnative species included prickly sowthistle, shortpod mustard, rabbitsfoot grass, and bristly oxtongue. Chemical herbicides were applied to the site five times for nonnative species management.



Figure 40. Overview of District 5A/ Lower Agua Chinon A as of October 2023.



## District 5B/Lower Agua Chinon B

District 5B is a 2.27 acre site located to the southeast of the Great Park Sports Complex and is adjacent to District 5A. Moderate nonnative cover persists despite manual removal and chemical treatment. Prevalent nonnative species included shortpod mustard, scarlet pimpernel, prickly sowthistle, and common purslane. Chemical herbicides were applied once to control for nonnative vegetation, although they were not recommended.



Figure 41. Overview of District 5B/Lower Agua Chinon B as of October 2023.



## District 5C/Lower Agua Chinon C

District 5C is a 2.97 acre site located to the southeast of the Great Park Sports Complex and adjacent to District 5B. Throughout the year, slopes had high native cover and the basin bottom had large bare patches. Manual removal was primarily used to remove annual nonnative species. Dominant invasive species included prickly sowthistle, spotted spurge, bristlegrass and shortpod mustard. Due to the presence of bare ground, native seeding was recommended. Chemical herbicide was applied twice to control Spanish false fleabane.



Figure 42. Overview of District 5C/Lower Agua Chinon C as of November 2023 (left) and the bare basin recommended for seeding (right).



## San Joaquin Marsh And Wildlife Sanctuary

### Zone 1: San Joaquin Marsh Landscaping

San Joaquin Marsh Landing Zone 1 is a 90.7 acre section of the San Joaquin Marsh and Wildlife Sanctuary, which is a restoration area and natural treatment system for water from San Diego creek (Figure 43). Manual treatment methods and herbicide application were employed to control nonnative species. Dominant nonnative species included Mexican bush sage, brittlebush, sweetclover, flax-leaved horseweed, Spanish false fleabane, prickly sowthistle, and common lamb's quarters. Two target species, Spanish false fleabane and herb of grace, were observed on site. Spanish false fleabane remains a prevalent and persistent species whereas herb of grace was first observed this year in November.

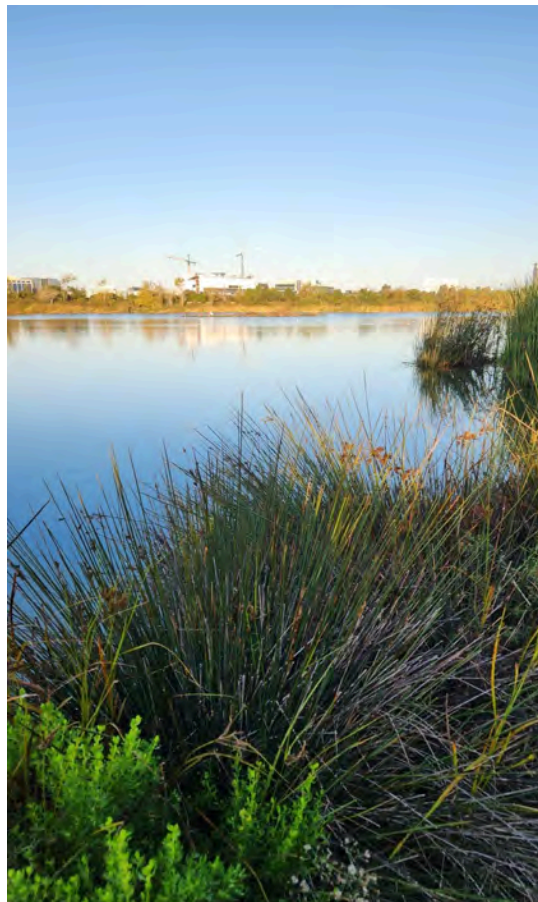


Figure 43. Overview of San Joaquin Marsh Zone 1 as of November 2023.



## Zone 2: San Joaquin Marsh Landscaping

San Joaquin Marsh Landing Zone 2 is a 60.8 acre section of the San Joaquin Marsh and Wildlife Sanctuary, which is a restoration area and natural treatment system for water from San Diego Creek. Zone 2 exhibited high cover of annual nonnative species. Dominant nonnative species included dwarf nettle, prickly sowthistle, common fig, lamb's quarters, creeping saltbush, flax-leaved horseweed, castor bean, smartweed, Spanish false fleabane, and bristly oxtongue. Spanish false fleabane, a target species, was observed in noteworthy quantities every survey month.



Figure 44. Overview of San Joaquin Marsh Zone 2 (left) and Spanish false fleabane found onsite (right) in November 2023.



### Zone 3: San Joaquin Marsh Landscaping

San Joaquin Marsh Landing Zone 3 is a 35.6 acre section of the San Joaquin Marsh and Wildlife Sanctuary, which is a restoration area and natural treatment system for water from San Diego creek. Zone 3 exhibited high nonnative cover and had the greatest number of nonnative species compared to other zones. Manual removal and herbicide application were recommended to control high cover of annual nonnative species. Dominant nonnative species included flax-leaved horseweed, shortpod mustard, curly dock, London rocket, herb of grace, cowpen daisy, Mexican tea, petty spurge, brass buttons, dwarf nettle, rabbitsfoot grass, prickly sowthistle, creeping saltbush, sweetclover, Spanish false fleabane, and bristly oxtongue.



Figure 45. Overview of San Joaquin Marsh Zone 3 in September 2023 (left) and dense herb of grace found onsite in November 2023 (right).



#### Zone 4: San Joaquin Marsh Landscaping

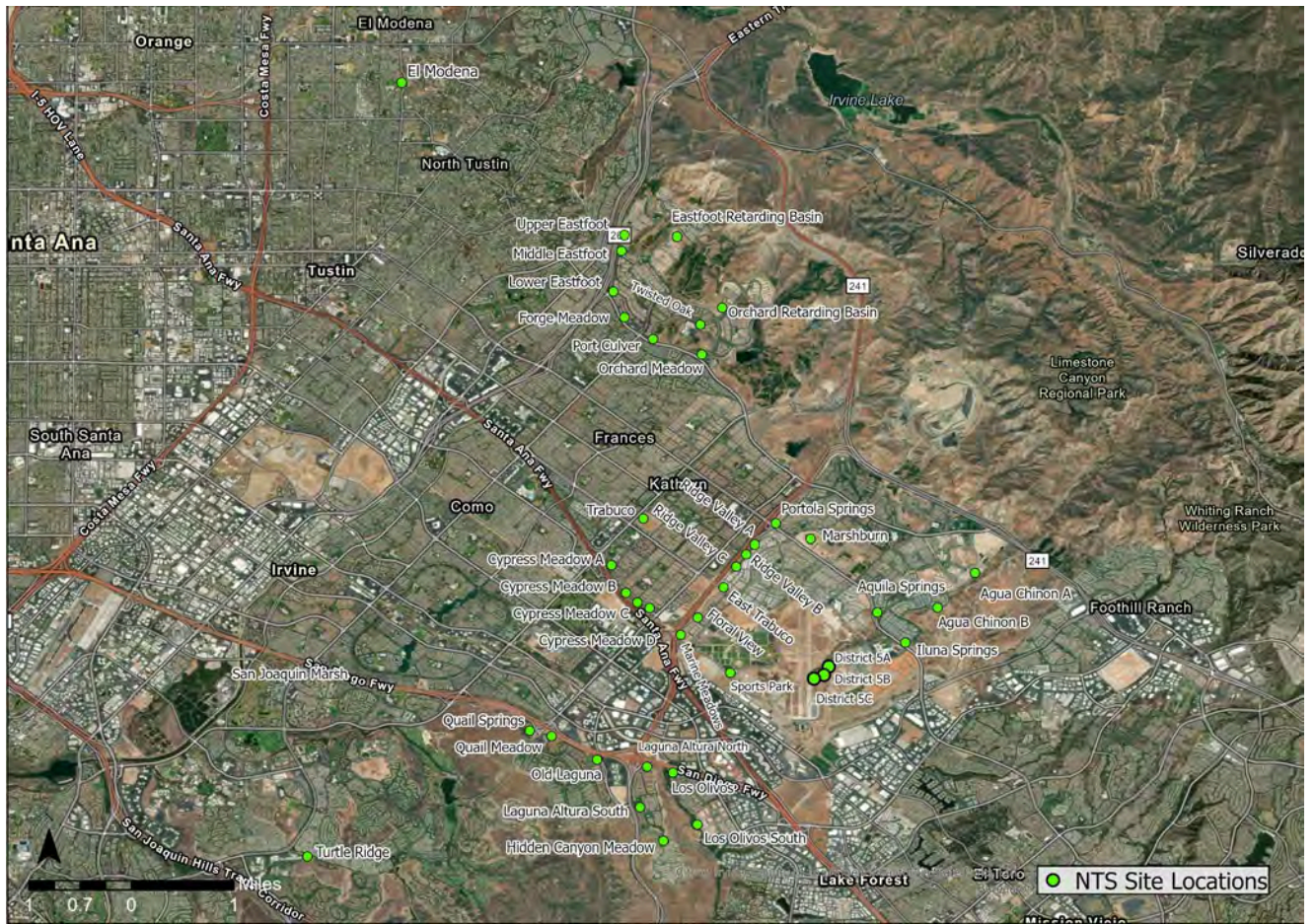
San Joaquin Marsh Landing Zone 4 is a 62.3 acre section of the San Joaquin Marsh and Wildlife Sanctuary, which is a restoration area and natural treatment system for the water from the San Diego Creek. Manual removal methods and herbicide application were employed to control nonnative species. Dominant nonnative species included bristly oxtongue, shortpod mustard, flax-leaved horseweed, herb of grace, prickly sowthistle, dwarf nettle, petty spurge curly dock, and Spanish false fleabane. Several nonnative tree species requiring tree removal were also observed throughout the year. Prevalent nonnative tree species found included common fig, Callery pear, Mexican fan palm, olive tree, camphor tree, South African coral tree, and carrotwood.



Figure 46. Mexican fan palm (left) and common fig (right) found at San Joaquin Marsh Zone 4 in November 2023.



### APPENDIX A - SITE MAPS



Map 1. Overview of Map Locations throughout Irvine, California.

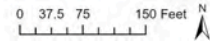


● Herbicide Treated Points (1)      □ Site Boundaries

**Invasive Coverage**

■ 0% - 20% (1)

■ 41% - 60% (1)



**Points**

(1154) [Herbicide] Curly Dock

**Polygons**

(1635-B) [Herbicide] Spanish False Fleabane

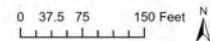
(1636-B) [Herbicide] Spanish False Fleabane

**Persistence**

● >6 Months (1)

■ 3-6 Months (2)

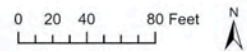
□ Site Boundaries



**Map 2.** Forge Meadow Herbicide Application Areas between Jan-Nov 2023 showing total cover (top) and persistence of herbicide-prescribed invasive plants before treatment (bottom).



Site Boundaries



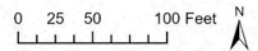
**Map 3.** Map of Port Culver. Herbicide application was not recommended.



**Map 4.** Orchard Meadow Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasive plants before treatment (bottom).



Site Boundaries



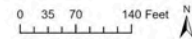
**Map 5.** Map of Lower Eastfoot. No herbicide was recommended or applied between January-November 2023.



● Herbicide Treated Points (1)      □ Site Boundaries

**Invasive Coverage**

- 41% - 60% (1)
- 61% - 80% (2)



**Points**  
(1633) [Herbicide] Spanish False Fleabane

**Polygons**  
(1851) [Herbicide] Bermuda Grass  
(1934) [Herbicide] Bermuda Grass  
(2067-B) [Herbicide] Spanish False Fleabane

**Persistence**  
● 1-2 Months (1)      ■ 3-6 Months (1)  
■ 1-2 Months (2)      □ Site Boundaries



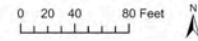
**Map 6.** Middle Eastfoot Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



● Herbicide Treated Points (1)      □ Site Boundaries

**Invasive Coverage**

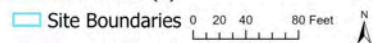
■ 0% - 20% (1)  
■ 41% - 60% (1)



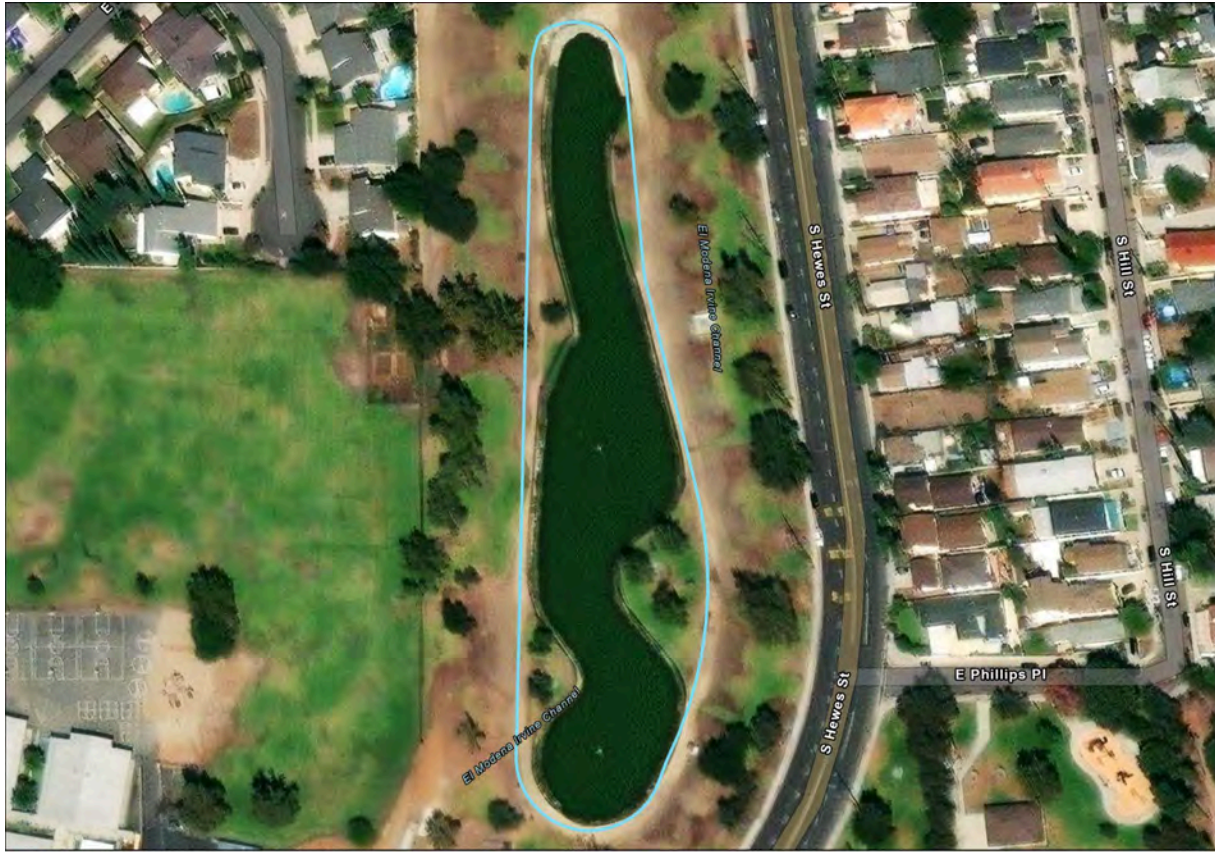
**Points**  
(1933) [Herbicide] Bermuda Grass

**Polygons**  
(1931) [Herbicide] Bermuda Grass  
(1932) [Herbicide] Bermuda Grass

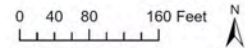
**Persistence**  
● 2-3 Months (1)  
■ 2-3 Months (2)



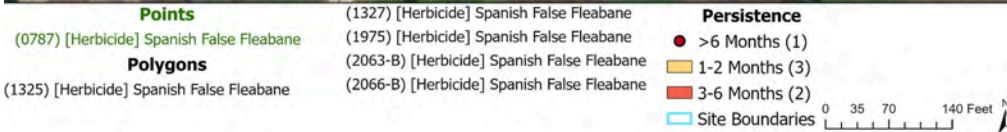
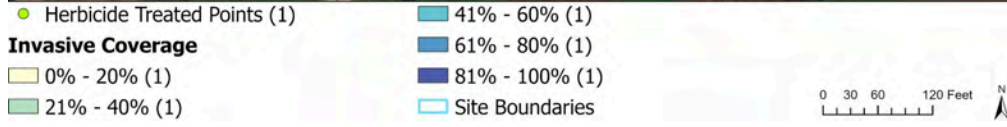
**Map 7.** Upper Eastfoot Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



Site Boundaries



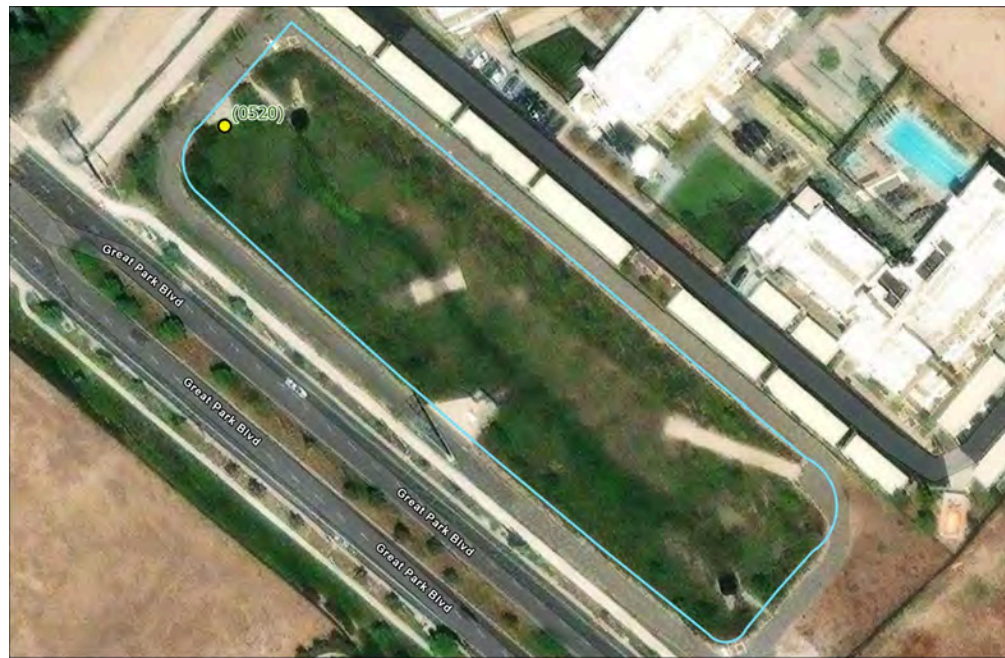
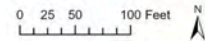
**Map 8.** Map of El Modena. No herbicide was recommended or applied between January-November 2023.



**Map 9.** Trabuco Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).

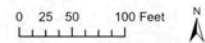


● Herbicide Treat Points  
□ Site Boundaries



**Point**  
0520 [Herbicide] Spanish False Fleabane

Persistence (Month)  
● 0-1  
□ Site Boundaries



**Map 10.** Trabuco East Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



**Map 11.** Cypress Meadows A Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



● Herbicide Treated Points (1)      □ Site Boundaries



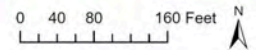
**Points**  
(1302) [Herbicide] Spanish False Fleabane

**Persistence**  
● 1-2 Months (1)  
□ Site Boundaries

**Map 12.** Cypress Meadows B Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



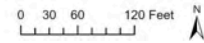
Site Boundaries



**Map 13.** Map of Cypress Meadows C. Herbicide application was not recommended.

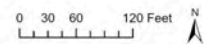


● Herbicide Treated Points (1)      □ Site Boundaries



**Points**  
(1306) [Herbicide] Curly Dock

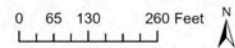
**Persistence**  
● 1-2 Months (1)  
□ Site Boundaries



**Map 14.** Cypress Meadows D Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



Site Boundaries



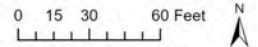
**Map 15.** Map of Eastfoot Retarding Basin. Herbicide application was not recommended.



**Map 16.** Quail Springs Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



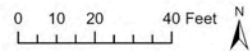
Site Boundaries



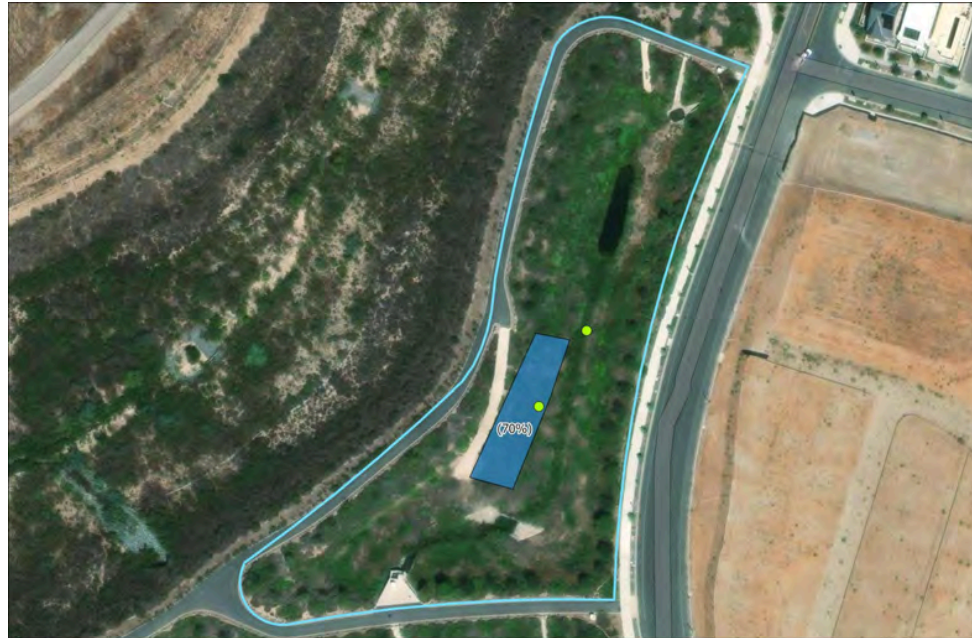
**Map 17.** Map of Orchard Retarding Basin. Herbicide application was not recommended.



Site Boundaries



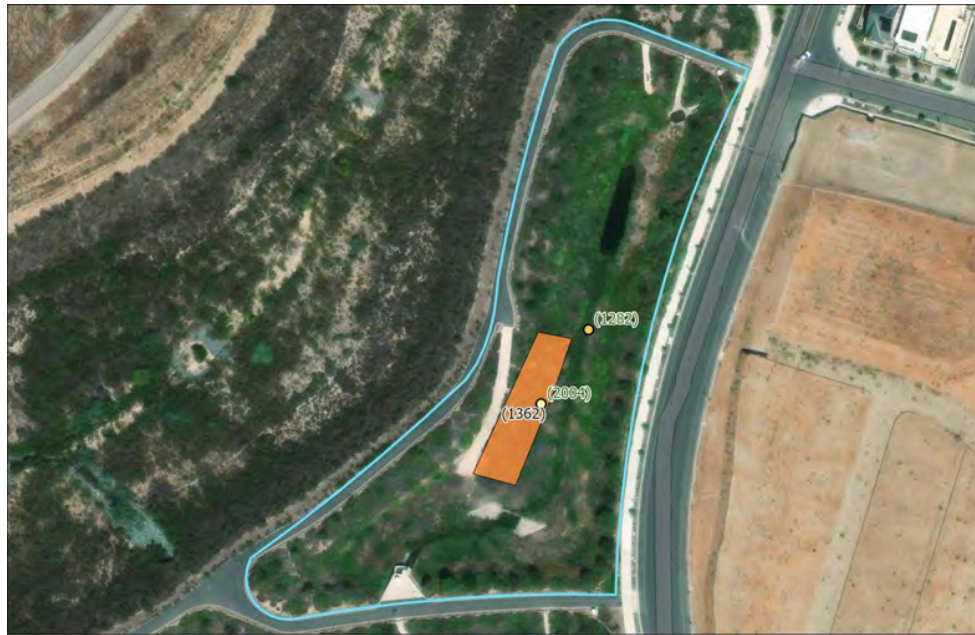
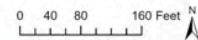
**Map 18.** Map of Twisted Oak. Herbicide application was not recommended.



● Herbicide Treated Points (2)      □ Site Boundaries

**Invasive Coverage**

■ 61% - 80% (1)



**Points**

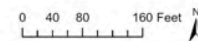
(1282) [Herbicide] Bermuda Grass  
(2004) [Herbicide] Spanish False Fleabane

**Polygons**

(1362) [Herbicide] Spanish False Fleabane

**Persistence**

○ 0-1 Month (1)      ■ 2-3 Months (1)  
● 1-2 Months (1)      □ Site Boundaries



**Map 19.** (Upper) Agua Chinon A Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



**Invasive Coverage**  
41% - 60% (1)

Site Boundaries



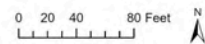
**Polygons**

(1700) [Herbicide] Spanish False Fleabane, Bermuda Grass

**Persistence**

1-2 Months (1)

Site Boundaries



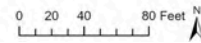
**Map 20.** (Upper) Agua Chinon B Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



**Invasive Coverage**

- 0% - 20% (1)
- 61% - 80% (1)

Site Boundaries

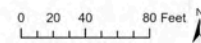


**Polygons**

- (1465) [Herbicide] Spanish False Fleabane
- (2062-B) [Herbicide] Spanish False Fleabane

**Persistence**

- 0-1 Month (1)
- 2-3 Months (1)
- Site Boundaries



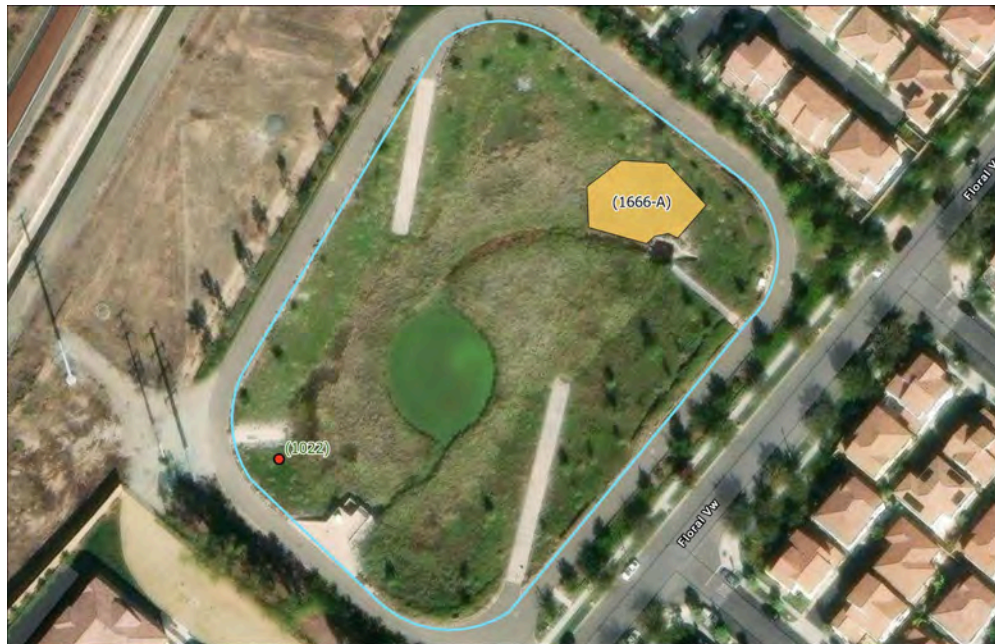
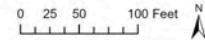
**Map 21.** Aquila Springs Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



● Herbicide Treated Points (1)      □ Site Boundaries

**Invasive Coverage**

■ 0% - 20% (1)



**Points**

(1022) [Herbicide] Pampas Grass

**Polygons**

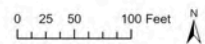
(1666-A) [Herbicide] Spanish False Fleabane

**Persistence**

● 3-6 Months (1)

■ 1-2 Months (1)

□ Site Boundaries

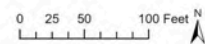


**Map 22.** Floral View Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



- Points**
- (1173) [Herbicide] Curly Dock
  - (1174) [Herbicide] Curly Dock
  - (1175) [Herbicide] Curly Dock
  - (1331) [Herbicide] Bermuda Grass

- Persistence**
- 1-2 Months (3)
  - 2-3 Months (1)
  - Site Boundaries



**Map 23.** Hidden Canyon Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



● Herbicide Treated Points (3)      □ Site Boundaries

**Invasive Coverage**

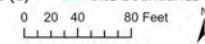
- 0% - 20% (1)
- 21% - 40% (1)



**Points**  
 (0758) [Herbicide] Spanish False Fleabane  
 (1834) [Herbicide] Spanish False Fleabane  
 (2214) [Herbicide] Spanish False Fleabane

**Polygons**  
 (0944) [Herbicide] Spanish False Fleabane  
 (1171) [Herbicide] Curly Dock

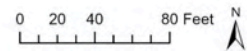
**Persistence**  
 ● 0-1 Month (1)      ■ 3-6 Months (1)  
 ● 1-2 Months (1)      ■ >6 Months (1)  
 ● >6 Months (1)      □ Site Boundaries



**Map 24.** Iluna Springs Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



Site Boundaries

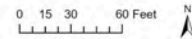


**Map 25.** Map of Laguna Altura North. Herbicide application was not recommended.



● Herbicide Treated Points (1)      □ Site Boundaries

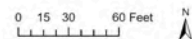
**Invasive Coverage**  
 ■ 21% - 40% (2)



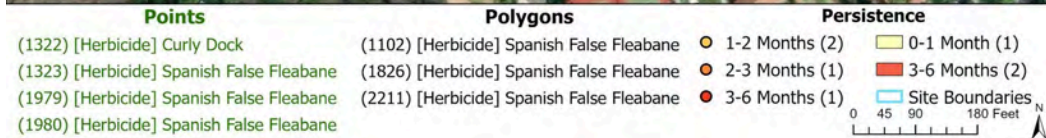
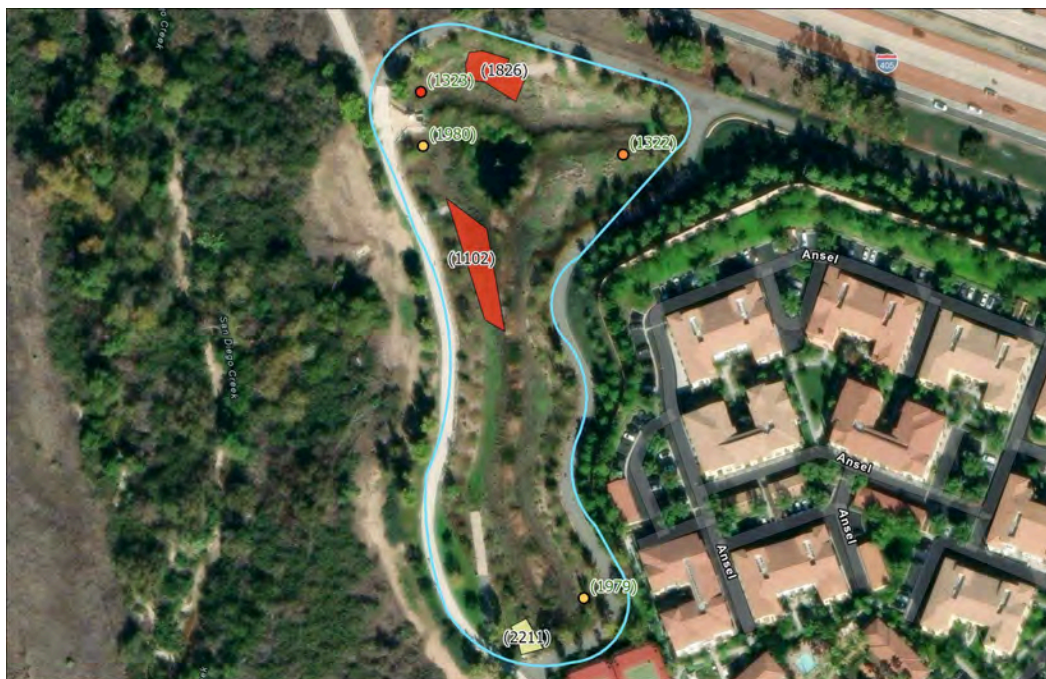
**Points**  
 (1241) [Herbicide] Spanish False Fleabane

**Polygons**  
 (1240) [Herbicide] Spanish False Fleabane  
 (1681) [Herbicide] Spanish False Fleabane

**Persistence**  
 ● 3-6 Months (1)  
 ■ 1-2 Months (2)  
 □ Site Boundaries



**Map 26.** Laguna Alta South Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



**Map 27.** Los Olivos Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).

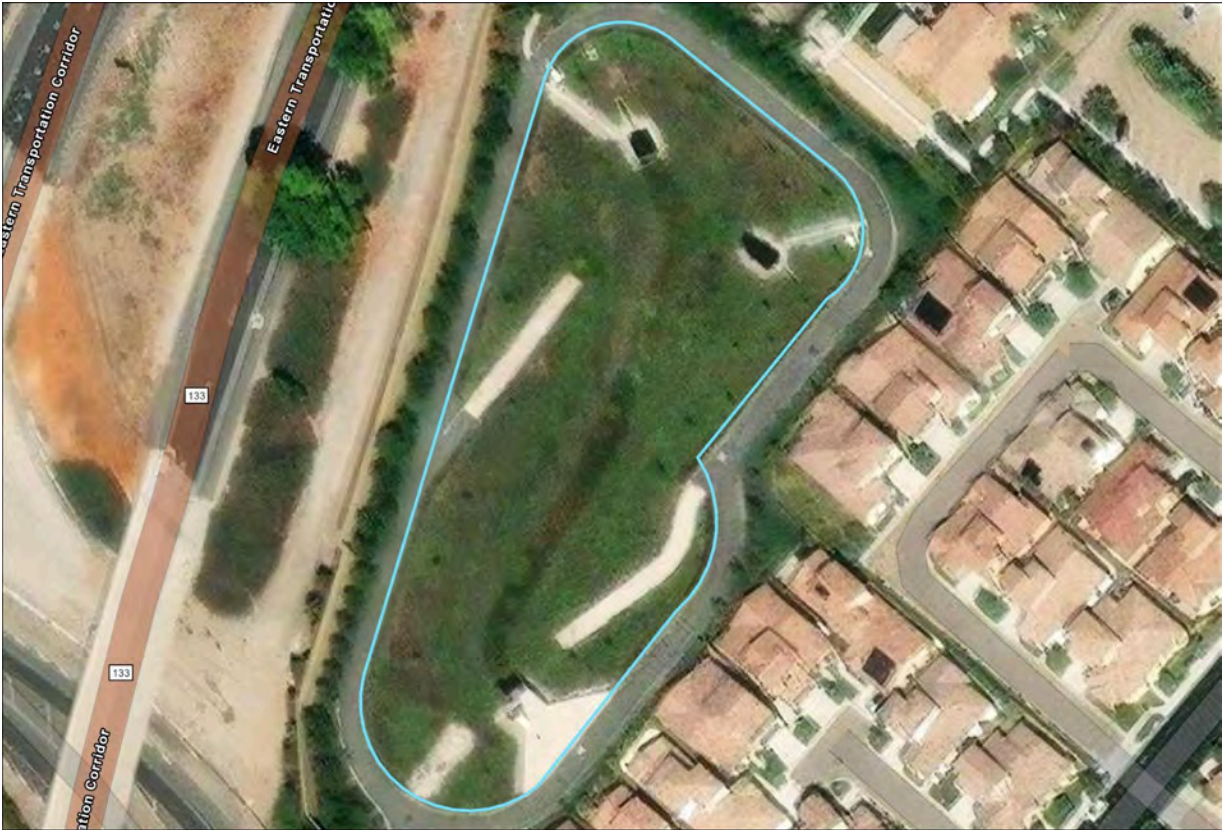


- Herbicide Treated Points (5)
- 81% - 100% (1)
- 21% - 40% (1)
- 41% - 60% (1)
- Site Boundaries

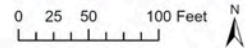


- | Points                                    | Polygons   | Persistence       |
|---|--|-------------------|
| (1450) [Herbicide] Tamarisk               | (0829) [Herbicide] Bermuda Grass, Curly Dock             | ● 0-1 Month (1)   |
| (1822) [Herbicide] Bermuda Grass          | (1057) [Herbicide] Bermuda Grass, Spanish False Fleabane | ● 1-2 Months (4)  |
| (1823) [Herbicide] Pampas Grass           | (1820) [Herbicide] Bermuda Grass                         | ■ >6 Months (2)   |
| (2073) [Herbicide] Bermuda Grass          |  | □ Site Boundaries |
| (2221) [Herbicide] Spanish False Fleabane |  | ■ 3-6 Months (1)  |

**Map 28.** Los Olivos South Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



Site Boundaries



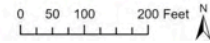
**Map 29.** Map of Marine Meadows. Herbicide application was not recommended.



● Herbicide Treated Points (8)      □ Site Boundaries

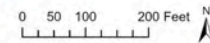
**Invasive Coverage**

- 0% - 20% (2)
- 21% - 40% (1)



- |   |   |
|---|---|
| <b>Points</b>                             | (1799) [Herbicide] Spanish False Fleabane |
| (1131) [Herbicide] Spanish False Fleabane | (2204) [Herbicide] Spanish False Fleabane |
| (1132) [Herbicide] Curly Dock             |   |
| (1212) [Herbicide] Curly Dock             |   |
| (1213) [Herbicide] Curly Dock             |   |
| (1459) [Herbicide] Spanish False Fleabane |   |
| (1790) [Herbicide] Spanish False Fleabane |   |
| <b>Polygons</b>                           |   |
| (1129) [Herbicide] Curly Dock             |   |
| (1214) [Herbicide] Curly Dock             |   |
| (1792) [Herbicide] Spanish False Fleabane |   |

- Persistence**
- 0-1 Month (1)
  - 1-2 Months (2)
  - 3-6 Months (3)
  - >6 Months (2)
  - Site Boundaries



**Map 30.** Marshburn Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



● Herbicide Treated Points (3)      □ Site Boundaries

**Invasive Coverage**

■ 21% - 40% (1)



**Points**

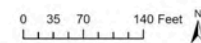
- (1145) [Herbicide] Spanish False Fleabane
- (1146) [Herbicide] Spanish False Fleabane
- (1195) [Herbicide] Curly Dock

**Polygons**

- (1290) [Herbicide] Curly Dock

**Persistence**

- 3-6 Months (1)
- >6 Months (2)
- 2-3 Months (1)
- Site Boundaries



**Map 31.** Old Laguna Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



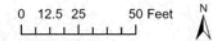
**Map 32.** Portola Springs Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



● Herbicide Treated Points (1)      □ Site Boundaries

**Invasive Coverage**

■ 0% - 20% (1)  
■ 81% - 100% (1)



**Points**

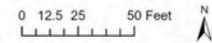
(1170) [Herbicide] Curly Dock

**Polygons**

(1002) [Herbicide] Spanish False Fleabane  
(1113) [Herbicide] Spanish False Fleabane

**Persistence**

● 3-6 Months (1)  
■ 3-6 Months (1)  
■ >6 Months (1)  
□ Site Boundaries



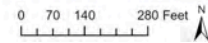
**Map 33.** Quail Meadow Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



● Herbicide Treated Points (6)      □ Site Boundaries

**Invasive Coverage**

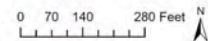
■ 21% - 40% (1)



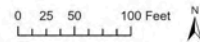
**Points**  
 (1140) [Herbicide] Curly Dock  
 (1144) [Herbicide] Spanish False Fleabane  
 (1191) [Herbicide] Curly Dock  
 (1192) [Herbicide] Spanish False Fleabane

(1294) [Herbicide] Curly Dock  
 (1379) [Herbicide] Tamarisk  
**Polygons**  
 (1378) [Herbicide] Broadleaved Pepperweed,  
 Spanish False Fleabane

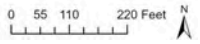
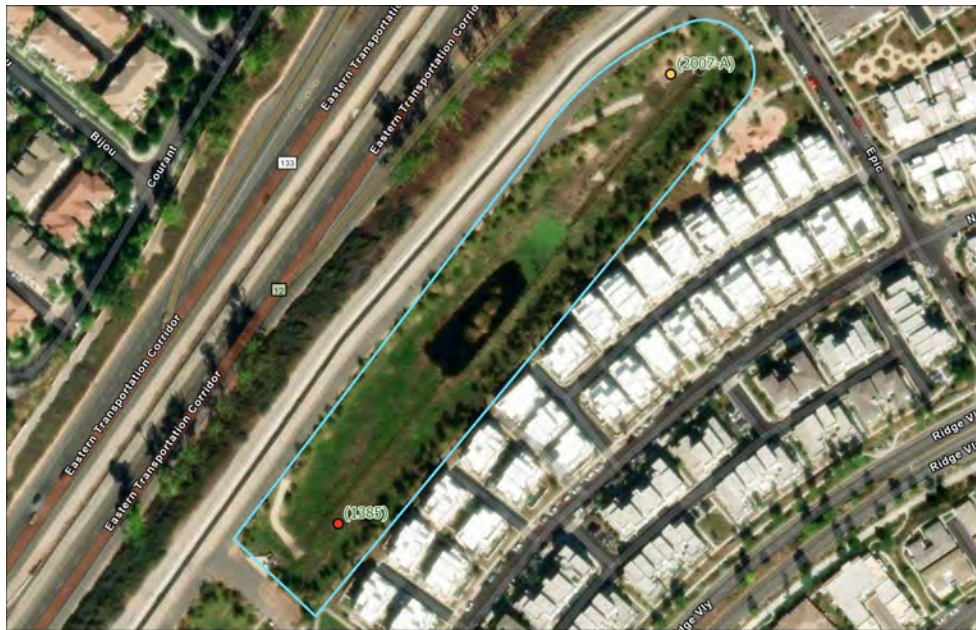
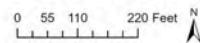
**Persistence**  
 ● 1-2 Months (1)      ■ 3-6 Months (1)  
 ● 3-6 Months (5)      □ Site Boundaries



**Map 34.** Ridge Valley A Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



**Map 35.** Ridge Valley B Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



**Map 36.** Map of Ridge Valley C Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).

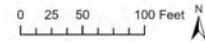


● Herbicide Treated Points (1)      □ Site Boundaries

**Invasive Coverage**

■ 0% - 20% (1)

■ 41% - 60% (1)



**Points**

(1166) [Herbicide] Curly Dock

**Polygons**

(1344) [Herbicide] Spanish False Fleabane

(1346) [Herbicide] Spanish False Fleabane, Curly Dock

(1880) [Herbicide] Spanish False Fleabane

**Persistence**

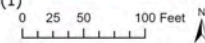
● 1-2 Months (1)

■ 0-1 Month (1)

■ 1-2 Months (1)

■ 3-6 Months (1)

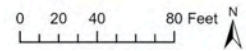
□ Site Boundaries



**Map 37.** Sports Park Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



Site Boundaries



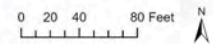
**Map 38.** Map of Turtle Ridge. Herbicide application was not recommended.



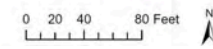
● Herbicide Treated Points (1)      □ Site Boundaries

**Invasive Coverage**

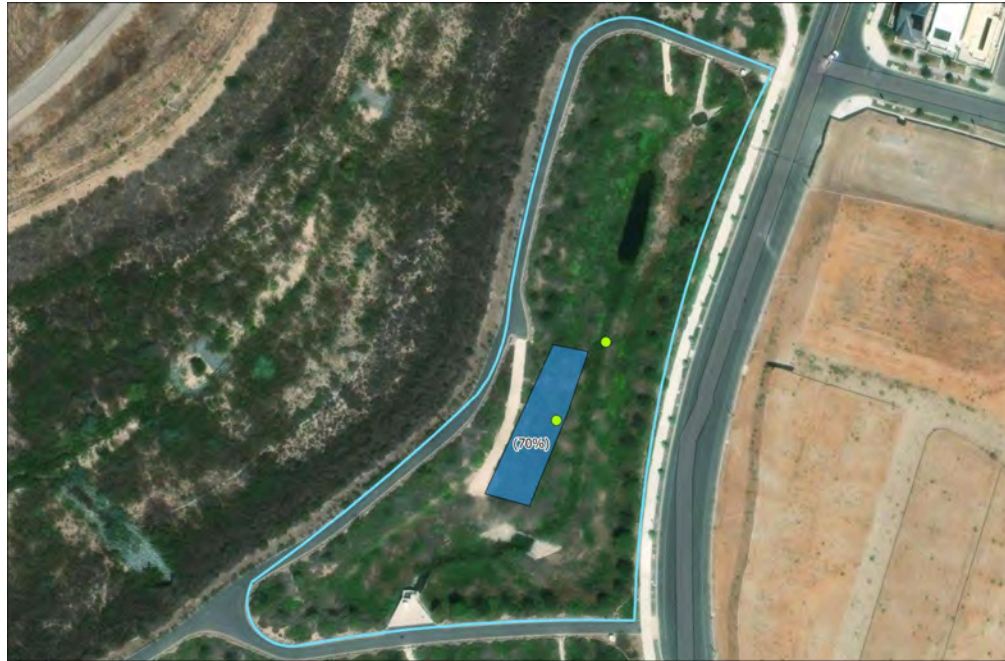
■ 61% - 80% (1)



<b>Points</b>	<b>Persistence</b>
(1162) [Herbicide] Curly Dock	● >6 Months (1)
<b>Polygons</b>	■ 3-6 Months (1)
(1339) [Herbicide] Spanish False Fleabane	□ Site Boundaries



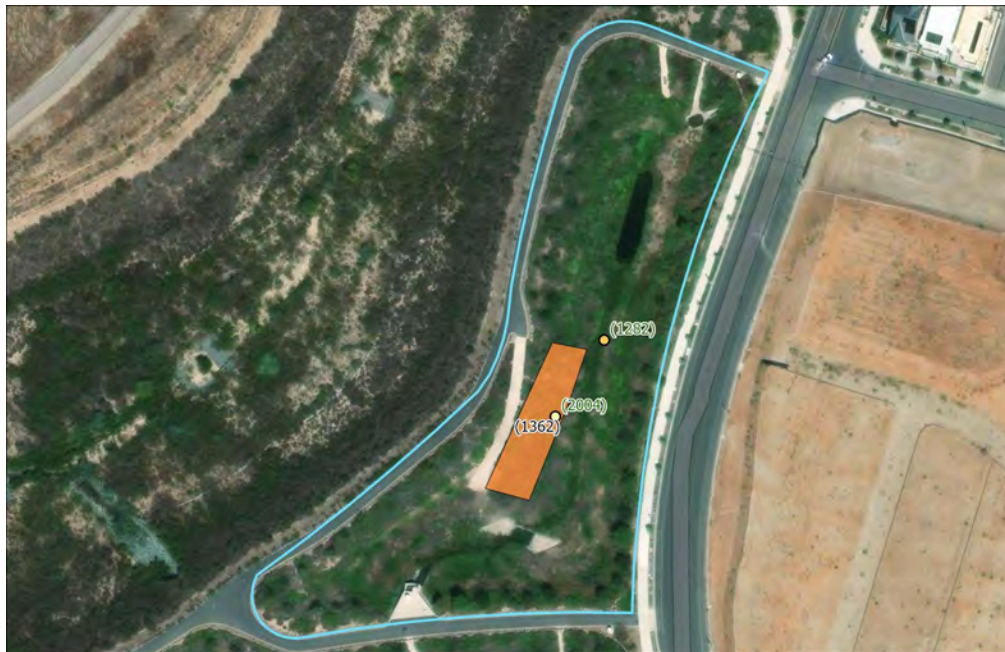
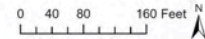
**Map 39.** Eastwood Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



● Herbicide Treated Points (2)      □ Site Boundaries

**Invasive Coverage**

■ 61% - 80% (1)



**Points**

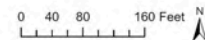
(1282) [Herbicide] Bermuda Grass  
(2004) [Herbicide] Spanish False Fleabane

**Polygons**

(1362) [Herbicide] Spanish False Fleabane

**Persistence**

○ 0-1 Month (1)      ■ 2-3 Months (1)  
● 1-2 Months (1)      □ Site Boundaries

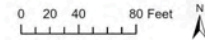


**Map 40.** District 5A/Lower Agua Chinon A Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



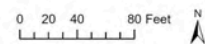
**Invasive Coverage**  
41% - 60% (1)

Site Boundaries



**Polygons**  
(1700) [Herbicide] Spanish False Fleabane, Bermuda Grass

**Persistence**  
1-2 Months (1)  
Site Boundaries

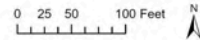


**Map 41.** District 5B/Lower Agua Chinon B Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



**Invasive Coverage**  
0% - 20% (1)  
21% - 40% (1)

Site Boundaries

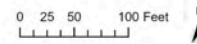


**Polygons**

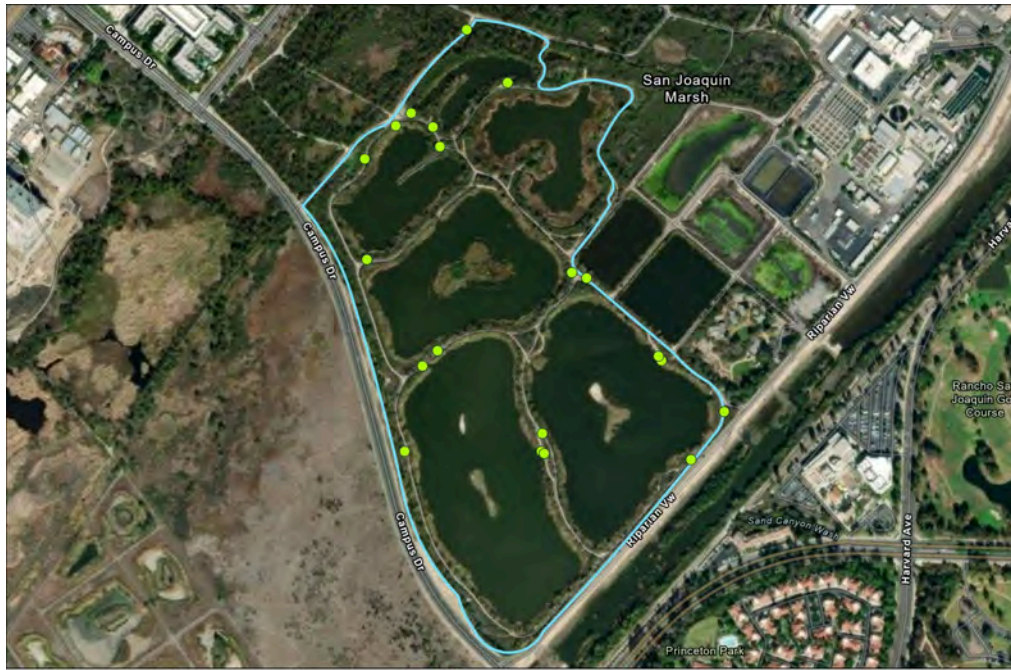
(1888) [Herbicide] Spanish False Fleabane  
(1889) [Herbicide] Bermuda Grass

**Persistence**

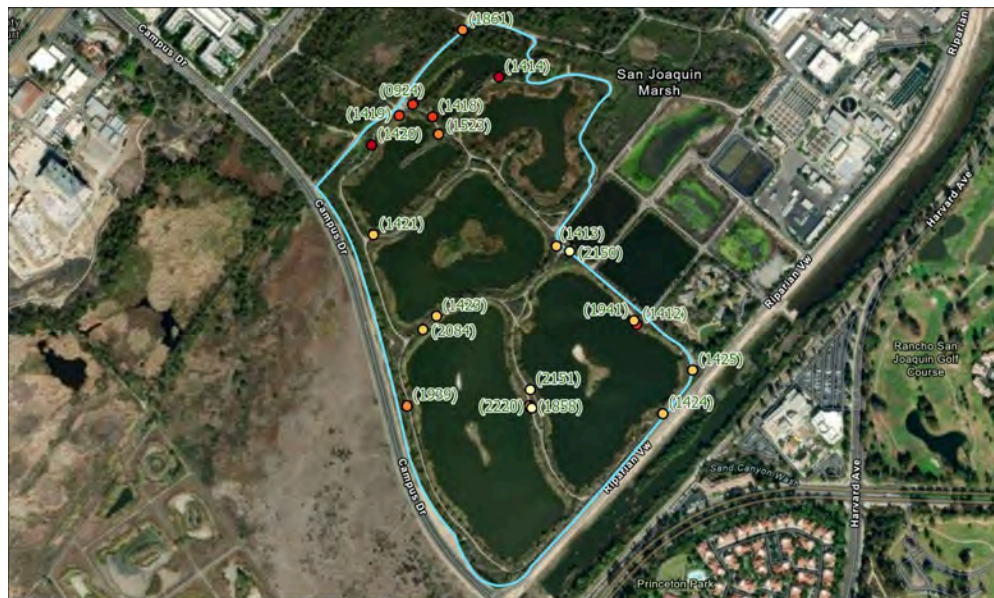
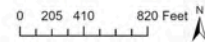
1-2 Months (2)  
Site Boundaries



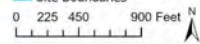
**Map 42.** District 5C/Lower Agua Chinon C Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



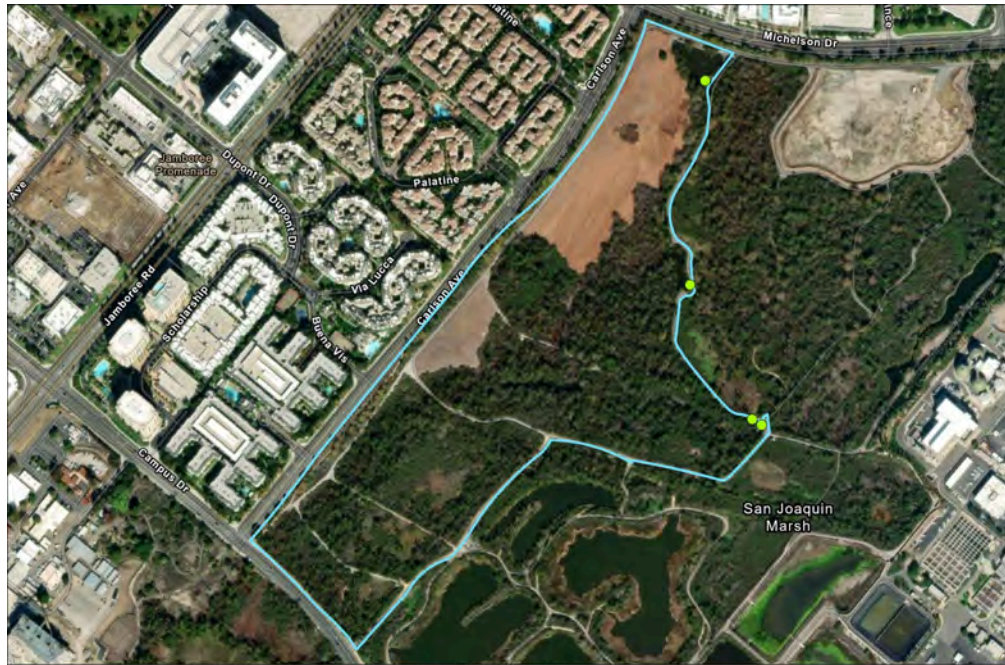
● Herbicide Treated Points (20)      □ Site Boundaries



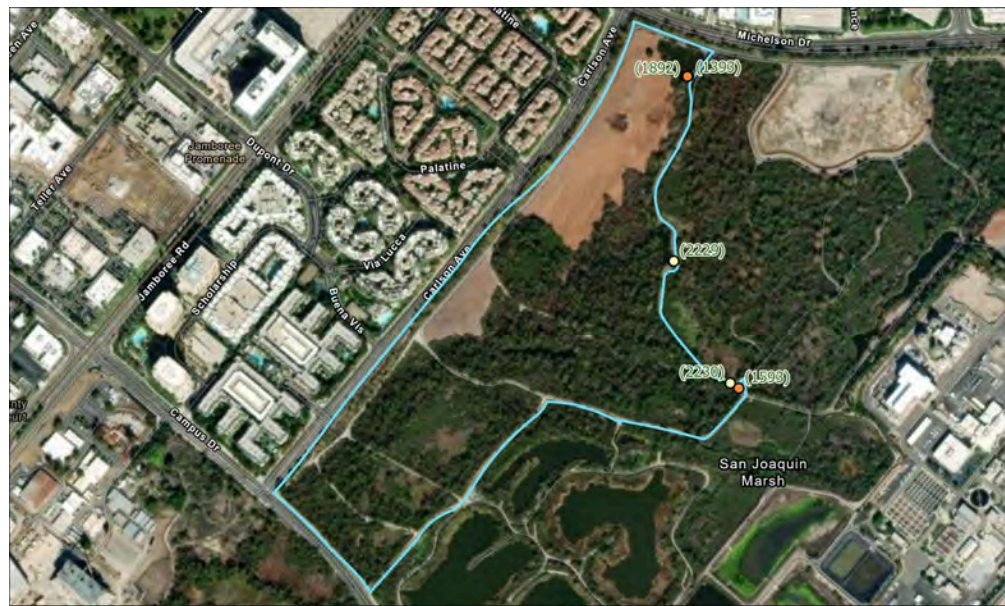
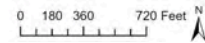
Points			Persistence
(0924) [Herbicide] Spanish False Fleabane	(1420) [Herbicide] Spanish False Fleabane	(1861) [Herbicide] Spanish False Fleabane	○ 0-1 Month (3)
(1412) [Herbicide] Spanish False Fleabane	(1421) [Herbicide] Spanish False Fleabane	(1939) [Herbicide] Spanish False Fleabane	● 1-2 Months (7)
(1423) [Herbicide] Spanish False Fleabane	(1423) [Herbicide] Spanish False Fleabane	(1941) [Herbicide] Pepperweed	● 2-3 Months (4)
(1413) [Herbicide] Spanish False Fleabane	(1424) [Herbicide] Spanish False Fleabane	(2084) [Herbicide] Spanish False Fleabane	● 3-6 Months (4)
(1414) [Herbicide] Spanish False Fleabane	(1425) [Herbicide] Spanish False Fleabane	(2150) [Herbicide] Perennial Pepperweed	● >6 Months (2)
(1418) [Herbicide] Spanish False Fleabane	(1523) [Herbicide] Spanish False Fleabane	(2151) [Herbicide] Spanish False Fleabane	□ Site Boundaries
(1419) [Herbicide] Spanish False Fleabane	(1858) [Herbicide] Spanish False Fleabane	(2220) [Herbicide] Spanish False Fleabane	0 225 450 900 Feet



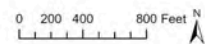
**Map 43.** San Joaquin Marsh Zone 1 Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



● Herbicide Treated Points (5)      □ Site Boundaries



Points	Persistence
(1393) [Herbicide] Spanish False Fleabane	○ 0-1 Month (2)
(1593) [Herbicide] Spanish False Fleabane	● 2-3 Months (2)
(1892) [Herbicide] Spanish False Fleabane	● 3-6 Months (1)
(2229) [Herbicide] Curly Dock	□ Site Boundaries
(2230) [Herbicide] Curly Dock	



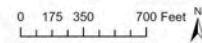
**Map 44.** San Joaquin Marsh Zone 2 Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



● Herbicide Treated Points (24)      □ Site Boundaries

**Invasive Coverage**

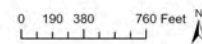
■ 0% - 20% (1)



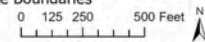
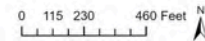
Points	Polygons
(0738) [Herbicide] Spanish False Fleabane	(1398) [Herbicide] Spanish False Fleabane
(0740) [Herbicide] Spanish False Fleabane	(1415) [Herbicide] Spanish False Fleabane
(0745) [Herbicide] Spanish False Fleabane	(1620) [Herbicide] Spanish False Fleabane
(1118) [Herbicide] Spanish False Fleabane	(1801) [Herbicide] Spanish False Fleabane
(1223) [Herbicide] Spanish False Fleabane	(1802) [Herbicide] Spanish False Fleabane
(1224) [Herbicide] Spanish False Fleabane	(1804) [Herbicide] Spanish False Fleabane
(1348) [Herbicide] Spanish False Fleabane	(1805) [Herbicide] Spanish False Fleabane
(1359) [Herbicide] Spanish False Fleabane	(1806) [Herbicide] Spanish False Fleabane
	(1807) [Herbicide] Spanish False Fleabane
	(1808) [Herbicide] Spanish False Fleabane
	(1811) [Herbicide] Spanish False Fleabane
	(1812) [Herbicide] Spanish False Fleabane
	(1915) [Herbicide] Spanish False Fleabane
	(2016) [Herbicide] Spanish False Fleabane
	(2155) [Herbicide] Spanish False Fleabane
	(2157) [Herbicide] Spanish False Fleabane
	(2161) [Herbicide] Spanish False Fleabane

**Persistence**

● 0-1 Month (4)      ● >6 Months (7)  
 ● 1-2 Months (2)      ● >6 Months (1)  
 ● 2-3 Months (3)      ● 3-6 Months (8)



**Map 45.** San Joaquin Marsh Zone 3 Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



Points	
(0988) [Herbicide] Spanish False Fleabane	(1407) [Herbicide] Spanish False Fleabane
(0989) [Herbicide] Spanish False Fleabane	(1408) [Herbicide] Spanish False Fleabane
(1353) [Herbicide] Spanish False Fleabane	(1482) [Herbicide] Spanish False Fleabane
(1394) [Herbicide] Spanish False Fleabane	(1483) [Herbicide] Curly Dock
	(1813) [Herbicide] Spanish False Fleabane

Persistence	
○ 0-1 Month (2)	
● 1-2 Months (4)	
● 3-6 Months (2)	
● >6 Months (1)	
□ Site Boundaries	

**Map 46.** San Joaquin Marsh Zone 4 Herbicide Application Areas between January-November 2023 showing total cover (top) and persistence of herbicide-prescribed invasives before treatment (bottom).



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***APPENDIX B - MEMORANDA AND CHEMICAL PESTICIDE USAGE REPORTS***

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 4-18-05

Time: 11:00 PM

Personnel: Zacarias Campos

Application Equipment Used: Backpack Spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Sports Park					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 4-21-23

Time: 10:00 am

Personnel: Zacarias Campos

Application Equipment Used: Backpack Sprayer

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Legum altura South					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 4-15-13

Time: 8:00 am

Personnel: Tomas Palacios

Application Equipment Used: Back Pack Spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Los Olivos South.					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 4-26-23

Time: 8:00 am

Personnel: Lorenzina Campos

Application Equipment Used: Back Pack Spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Ridge Valley B					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 4-14-23

Time: 12:00 PM

Personnel: Veronica Campos

Application Equipment Used:

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: District 5-A					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type <i>(e.g., herbicide, fungicide, pesticide)</i>	Trade Name <i>(e.g., Roundup, Garlon 4, Diflufen 4L)</i>	Active Ingredient <i>(e.g., Glyphosate, Triallate, Dichlorophenyl)</i>	Application Rate <i>(e.g., 8 oz/300 sq.ft.)</i>	Total Area Applied
Herbicide	Round up	Glyphosate	14-08	3,000 sq

**Summary of Results:**

Large empty lined area for writing summary results.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 4-26-13

Time: 1:00 PM

Personnel: Luciano Campos

Application Equipment Used: Backpack Spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					<input checked="" type="checkbox"/>
Other: Los Olivos					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
<input checked="" type="checkbox"/>						

### Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other

# IRWD - Integrated Pest Management Field Monitoring Form

## Non-Organic Chemical Control Methods:

Type <small>(e.g., herbicide, fungicide, insecticide)</small>	Trade Name <small>(e.g., Roundup, Garlon 4, Diuran 4L)</small>	Active Ingredient <small>(e.g., Glyphosate, Triclopyr, Dichlorophenyl)</small>	Application Rate <small>(e.g., 8 oz/300 sq.ft.)</small>	Total Area Applied
herbicide	Roundup	Glyphosate	16-02	16-02

### Summary of Results:

A large rectangular area with horizontal lines for writing a summary of results.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 4-17-23

Time: 9:45 am

Personnel: Zakarias Campos

Application Equipment Used: Backpack Spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Old lagoon					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 4-10-13

Time: 8:00am

Personnel: Cacarias Campos

Application Equipment Used: Backpack Spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Quail Springs.					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 4-17-23

Time: 1:00 am

Personnel: Zacarias Campos

Application Equipment Used: Backpack Spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Quail Meadows					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <i>(e.g., hand pulling, shovel, hoe)</i>	Mechanical Removal <i>(e.g., mowing, string trimmer)</i>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <i>(e.g., acetic acid, d-limonene)</i>	Iron-based Herbicides	Phytotoxic Oils	Other



**IRWD - Integrated Pest Management Field Monitoring Form**

Date: 8-7-23

Time: 10:00am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

**Location of Pesticide Application:**

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Forge Meadows					

**Target Pests:**

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

**Non-Chemical Control Methods:**

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

**Organic Chemical Control Methods:**

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

Non-Organic Chemical Control Methods:

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlon 4, Duron 4L)	Active Ingredient (e.g., glyphosate, Trifluralin, Dichlorophenyl)	Application Rate (e.g., 8 oz/200 sq.ft.)	Total Area Applied
herbicide	Roundup	glyphosate	6-92	600 sq

Summary of Results:

Summary of Results section containing multiple horizontal lines for handwritten notes.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 8-18-23

Time: 10:30 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Sports Park					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 8-15-23

Time: 11:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: <u>Aguilaa Springs</u>					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

# IRWD - Integrated Pest Management Field Monitoring Form

## Non-Organic Chemical Control Methods:

Type <i>(e.g., herbicide, fungicide, insecticide)</i>	Trade Name <i>(e.g., Roundup, Garlon 4, Diuron 4L)</i>	Active Ingredient <i>(e.g., glyphosate, Triatopyr, Dichlorophenyl)</i>	Application Rate <i>(e.g., 8 oz/100 sq ft)</i>	Total Area Applied
herbicide	Roundup	glyphosate	8-07	800 SF

### Summary of Results:

IRWD Form 1-2000

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 8-4-23

Time: 8:30 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Marshburn					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 8-31-23

Time: 9:30 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Ridge valley A					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 8-1-23

Time: 10:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: CYPRESS A					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlon 4, Diuron 4L)	Active Ingredient (e.g., glyphosate, triclopyr, dichlorophenyl)	Application Rate (e.g., 8 oz/300 sq ft)	Total Area Applied
herbicide	Roundup	glyphosate	4 oz	350 sf

**Summary of Results:**

Lined area for recording summary results.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1/26/23

Time: 12:30pm

Personnel: Zacarias Campos

Application Equipment Used: - backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: District 5-C					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1-10-23

Time: 8:00 am

Personnel: Zaccarias Campos

Application Equipment Used: Back Pack Spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: <u>Patola Springs</u>					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <i>(e.g., hand pulling, shovel, hoe)</i>	Mechanical Removal <i>(e.g., mowing, string trimmer)</i>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <i>(e.g., acetic acid, d-limonene)</i>	Iron-based Herbicides	Phytotoxic Oils	Other

Non-Organic Chemical Control Methods:

Type (e.g., herbicide, fungicide, pesticide)	Trade Name (e.g., Roundup, Garlon 4, Duran 4)	Active Ingredient (e.g., Glyphosate, Triclopyr, Dichlorophenyl)	Application Rate (e.g., 8 oz/300 sq.ft)	Total Area Applied
herbicide	Roundup	Glyphosate	4 oz	400 sq

Summary of Results:

[This section contains a large area of blank horizontal lines for writing.]

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1-27-23

Time: 10:00 am

Personnel: Zucarias Campos

Application Equipment Used: Backpack Spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Aguchinon B					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1-27-23

Time: 12:00 PM

Personnel: Zaccario Campos

Application Equipment Used: Backpack Spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Agua Chino - A					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1/25/23

Time: 1:30pm

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: District 5-A					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <i>(e.g., hand pulling, shovel, hoe)</i>	Mechanical Removal <i>(e.g., mowing, string trimmer)</i>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <i>(e.g., acetic acid, d-limonene)</i>	Iron-based Herbicides	Phytotoxic Oils	Other

# IRWD - Integrated Pest Management Field Monitoring Form

## Non-Organic Chemical Control Methods:

Type <i>(e.g., herbicide, fungicide, insecticide)</i>	Trade Name <i>(e.g., Roundup, Garlon 4, Dicron 41)</i>	Active Ingredient <i>(e.g., glyphosate, Triclopyr, Dichlorophenyl)</i>	Application Rate <i>(e.g., 8 oz/300 sq.ft.)</i>	Total Area Applied
herbicide	ROUNDUP	glyphosate	8 oz	1500 SF

## Summary of Results:

Summary of Results section containing multiple blank horizontal lines for handwritten notes.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1/25/23

Time: 2:00pm

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: District 5 B					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

Non-Organic Chemical Control Methods:

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlon 4, Diuron 4L)	Active Ingredient (e.g., glyphosate, Triflopyr, Dichlorophenyl)	Application Rate (e.g., 8 oz/300 sq.ft)	Total Area Applied
herbicide	Round up	glyphosate	8 oz	2000 SF

Summary of Results:

Lined area for recording summary of results.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1/24/13

Time: 11:30am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Laguna Altaura South					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <i>(e.g., hand pulling, shovel, hoe)</i>	Mechanical Removal <i>(e.g., mowing, string trimmer)</i>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <i>(e.g., acetic acid, d-limonene)</i>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1/24/23

Time: 1:30 pm

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Laguna Alta North					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal <i>(e.g., hand pulling, shovel, hoe)</i>	Mechanical Removal <i>(e.g., mowing, string trimmer)</i>	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides <i>(e.g., acetic acid, d-limonene)</i>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1/20/23

Time: 12:00 pm

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Parasol Park					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <i>(e.g., hand pulling, shovel, hoe)</i>	Mechanical Removal <i>(e.g., mowing, string trimmer)</i>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <i>(e.g., acetic acid, d-limonene)</i>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1/19/23

Time: 10:30 am

Personnel: Zacarias Campos

Application Equipment Used: Back pack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Quail Springs					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <i>(e.g., hand pulling, shovel, hoe)</i>	Mechanical Removal <i>(e.g., mowing, string trimmer)</i>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <i>(e.g., acetic acid, d-limonene)</i>	Iron-based Herbicides	Phytotoxic Oils	Other

Non-Organic Chemical Control Methods:

Type (e.g., herbicide, fungicide, pesticide)	Trade Name (e.g., Roundup, Garlan 4, Duran 4L)	Active Ingredient (e.g., Glyphosate, Triflopyr, Dichlorophenyl)	Application Rate (e.g., 8 oz/800 sq.ft.)	Total Area Applied
herbicide	Roundup	Glyphosate	20 oz	1200 SF

Summary of Results:

Lined area for summary of results.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1/19/23

Time: 11:30am

Personnel: Zacarias Campos

Application Equipment Used: - backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Quail Meadows					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type <small>(e.g., herbicide, fungicide, pesticide)</small>	Trade Name <small>(e.g., Roundup, Garlon 4, Diuron 4L)</small>	Active Ingredient <small>(e.g., Glyphosate, Triclopyr, Dichlorophenyl)</small>	Application Rate <small>(e.g., 8 oz/300 sq.ft)</small>	Total Area Applied
herbicide	Roundup	glyphosate	8 oz	800 SF

**Summary of Results:**

Summary of Results section containing multiple horizontal lines for handwritten notes.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1/18/23

Time: 9:40 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Los Olivos					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, α-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



**IRWD - Integrated Pest Management Field Monitoring Form**

Date: 1/17/23

Time: 10:30 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

**Location of Pesticide Application:**

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Illuna Springs					

**Target Pests:**

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

**Non-Chemical Control Methods:**

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

**Organic Chemical Control Methods:**

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 7-6-13

Time: 8:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Marshburn					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 7-4-23

Time: 10:00am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

**Location of Pesticide Application:**

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Los Olivos South					

**Target Pests:**

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

**Non-Chemical Control Methods:**

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

**Organic Chemical Control Methods:**

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlon 4, Diuron 4L)	Active Ingredient (e.g., glyphosate, Trifluralin, Dichlorophenyl)	Application Rate (e.g., 8 oz/500 sq.ft.)	Total Area Applied
herbicide	Roundup	glyphosate	24 oz	2600 Sf

**Summary of Results:**

A large rectangular area with horizontal lines for handwritten notes, currently blank.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 7-24-23

Time: 12:00pm

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Lower Agon Chimn A					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 7-21-23

Time: 9:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Laguna Alta South					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other

Non-Organic Chemical Control Methods:

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlon 4, Diuron 4L)	Active Ingredient (e.g., Glyphosate, Trifluralin, Dithiopyr)	Application Rate (e.g., 8 oz/100 sq.ft)	Total Area Applied
herbicide	Roundup	glyphosate	8.02	6505

Summary of Results:

Lined area for entering summary of results, consisting of approximately 25 horizontal lines.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 7-18-23

Time: 7:30 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Sports Park					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

**IRWD - Integrated Pest Management Field Monitoring Form**

**Non-Organic Chemical Control Methods:**

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlon 4, Diuran 4L)	Active Ingredient (e.g., glyphosate, Trifluralin, Dieldrin)	Application Rate (e.g., 8 oz/300 sq.ft.)	Total Area Applied
herbicide	Roundup	glyphosate	12-02	1000 SF

**Summary of Results:**

Lined area for handwritten summary of results.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 7-10-23

Time: 9:00am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Trabuco					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 7-13-23

Time: 1:30 pm

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: <u>agulla Springs</u>					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

Non-Organic Chemical Control Methods:

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlon 4, Diuron 4L)	Active Ingredient (e.g., glyphosate, Trifluralin, Dichlorophenyl)	Application Rate (e.g., 8 oz/100 sq.ft.)	Total Area Applied
herbicide	Roundup	glyphosate	12-02	750 SF

Summary of Results:

Summary of Results section containing multiple horizontal lines for text entry.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 7-27-23

Time: 01:00

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Old Laguna					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 7-31-23

Time: 9:00am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Ridge Valley C					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 6-22-23

Time: 8:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Laguna Alhara South					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type <small>(e.g., herbicide, fungicide, insecticide)</small>	Trade Name <small>(e.g., Roundup, Garlon 4, Diuron 4L)</small>	Active Ingredient <small>(e.g., glyphosate, Malopyr, Dichlorophenyl)</small>	Application Rate <small>(e.g., 8 oz/100 sq.ft.)</small>	Total Area Applied
herbicide	Roundup	glyphosate	8-02	

**Summary of Results:**

Lined area for handwritten notes and results summary.

**IRWD - Integrated Pest Management Field Monitoring Form**

Date: 6-20-23

Time: 10:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

**Location of Pesticide Application:**

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Hidden Canyon					

**Target Pests:**

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

**Non-Chemical Control Methods:**

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

**Organic Chemical Control Methods:**

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 8-19-23

Time: 10:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Sports Park					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other

# IRWD - Integrated Pest Management Field Monitoring Form

## Non-Organic Chemical Control Methods:

Type (e.g., herbicide, fungicide, pesticide)	Trade Name (e.g., Roundup, Garlon 4, Duran 4L)	Active Ingredient (e.g., glyphosate, Picloram, Dichlorophenyl)	Application Rate (e.g., 8 oz/500 sq.ft)	Total Area Applied
herbicide	Roundup	glyphosate	16-08	1400

## Summary of Results:

Summary of Results section containing a large grid of empty lines for handwritten notes.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 6-23-23

Time: 10:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Lower Agua Chino A					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 8-29-23

Time: 12:00 pm

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Ridge Valley A.					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlon 4, Diuran 4L)	Active Ingredient (e.g., glyphosate, Metolopyr, Dichlorophenyl)	Application Rate (e.g., 8 oz/100 sq.ft)	Total Area Applied
herbicide	Roundup	glyphosate	6-02	1,100 ft

**Summary of Results:**

Summary of Results section containing multiple horizontal lines for handwritten notes.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 6-27-23

Time: 10:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Upper Agua Chino B					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type (e.g., herbicide, fungicide, pesticide)	Trade Name (e.g., Roundup, Carlton 4, Bluron 4L)	Active Ingredient (e.g., glyphosate, Metolach, Dichlorophenyl)	Application Rate (e.g., 8 oz/100 sq.ft)	Total Area Applied
herbicide	Roundup	glyphosate	8-oz	700-sf

**Summary of Results:**

Summary of Results section containing multiple horizontal lines for handwritten notes.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 6-27-13

Time: 9:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Upper Agua Chino A					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlon 4, Diuran 4L)	Active Ingredient (e.g., glyphosate, Trifluralin, Dieldrin)	Application Rate (e.g., 8 oz/100 sq.ft.)	Total Area Applied
herbicide	Roundup	glyphosate	8.0Z	6,000 SF

**Summary of Results:**

Summary of Results section with multiple horizontal lines for data entry.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 6-25-23

Time: 1:00 pm

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Old Laguna					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, citric acid)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 9-15-23

Time: 8:30am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Los Olivos South					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



**IRWD - Integrated Pest Management Field Monitoring Form**

Date: 5-12-13

Time: 10:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

**Location of Pesticide Application:**

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Laguna Alta South					

**Target Pests:**

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

**Non-Chemical Control Methods:**

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

**Organic Chemical Control Methods:**

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 5-23-23

Time: 1:00 PM

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: District 5 - A					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

Non-Organic Chemical Control Methods:

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlon 4, Diuran 4L)	Active Ingredient (e.g., glyphosate, Trifluralin, Dichlorophenyl)	Application Rate (e.g., 3 oz/100 sq.ft.)	Total Area Applied
herbicide	Roundup	glyphosate	32-02	2500

Summary of Results:

Summary of Results section containing multiple horizontal lines for handwritten notes.

**IRWD - Integrated Pest Management Field Monitoring Form**

Date: 5-24-23

Time: 10:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

**Location of Pesticide Application:**

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Potholes Springs					

**Target Pests:**

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

**Non-Chemical Control Methods:**

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

**Organic Chemical Control Methods:**

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



**IRWD - Integrated Pest Management Field Monitoring Form**

Date: 5-25-23

Time: 9:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

**Location of Pesticide Application:**

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: <u>Agua Chino A</u>					

**Target Pests:**

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

**Non-Chemical Control Methods:**

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

**Organic Chemical Control Methods:**

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



**IRWD - Integrated Pest Management Field Monitoring Form**

Date: 5-26-23

Time: 8:00am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

**Location of Pesticide Application:**

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Old Laguna					

**Target Pests:**

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

**Non-Chemical Control Methods:**

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

**Organic Chemical Control Methods:**

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type <i>(e.g., herbicide, fungicide, insecticide)</i>	Trade Name <i>(e.g., Roundup, Garlon 4, Duron 4L)</i>	Active Ingredient <i>(e.g., glyphosate, Triclopyr, Dichlorophenyl)</i>	Application Rate <i>(e.g., 8 oz/100 sq ft)</i>	Total Area Applied
herbicide	Roundup	glyphosate	8-oz	9000 sq ft

**Summary of Results:**

Summary of Results section with multiple horizontal lines for handwritten notes.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 11-5-23

Time: 11:00 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Upper East Foot					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 11/13/23

Time: 9:00am

Personnel: Zacarias Campos

Application Equipment Used: Backpack Spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Middle East Foot					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

# IRWD - Integrated Pest Management Field Monitoring Form

## Non-Organic Chemical Control Methods:

Type (e.g., herbicide, fungicide, pesticide)	Trade Name (e.g., Roundup, Garlon 4, Diuron 4L)	Active Ingredient (e.g., glyphosate, Triclopyr, Dichlorophenyl)	Application Rate (e.g., 8 oz/300 sq.ft.)	Total Area Applied
herbicide	Roundup	glyphosate	12 oz	800 SF

## Summary of Results:

Lined area for handwritten notes.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 11/28/23

Time: 10:00 am

Personnel: Zacarias Campos

Application Equipment Used: Backpack spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Upper Agua Chino-B					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 11/30/23

Time: 10:00 am

Personnel: Zacarias Campos

Application Equipment Used: Backpack spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Ridge Valley B					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type (e.g., herbicide, fungicide, pesticide)	Trade Name (e.g., Roundup, Garlon 4, Diuran 4L)	Active Ingredient (e.g., Glyphosate, Triclopyr, Dichlorophenyl)	Application Rate (e.g., 8 oz/300 sq.ft)	Total Area Applied
herbicide	Roundup	glyphosate	8 oz	800 SF

**Summary of Results:**

Lined area for recording summary results.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 10-26-23

Time: 01:30am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

### Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Lower Laguna Chino C					

### Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

### Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

### Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, citric acid)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 10-16-23

Time: 0:30 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Quail Springs					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type (e.g., herbicide, fungicide, insecticide)	Trade Name (e.g., Roundup, Garlan 4, Duran 4L)	Active Ingredient (e.g., Glyphosate, Trifluralin, Dichlorophenyl)	Application Rate (e.g., 8 oz/300 sq ft)	Total Area Applied
herbicide	Roundup	glyphosate	6-07	1,000 SF

**Summary of Results:**

Summary of Results section containing multiple horizontal lines for handwritten notes.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 10-19-23

Time: 1200pm

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					<input checked="" type="checkbox"/>
Other: SportsPark					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
<input checked="" type="checkbox"/>						

## Non-Chemical Control Methods:

Manual Removal (e.g., hand pulling, shovel, hoe)	Mechanical Removal (e.g., mowing, string trimmer)	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides (e.g., acetic acid, d-limonene)	Iron-based Herbicides	Phytotoxic Oils	Other



**IRWD - Integrated Pest Management Field Monitoring Form**

Date: 10-16-23

Time: 1:00 PM

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

**Location of Pesticide Application:**

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Los Olivos South					

**Target Pests:**

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

**Non-Chemical Control Methods:**

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

**Organic Chemical Control Methods:**

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

Non-Organic Chemical Control Methods:

Type (e.g., herbicide, fungicide, pesticide)	Trade Name (e.g., Roundup, Garlon 4, Difluralin 4L)	Active Ingredient (e.g., Glyphosate, Trihalopyr, Dichlorophenyl)	Application Rate (e.g., 8 oz/800 sq.ft.)	Total Area Applied
herbicide	Roundup	glyphosate	16-07	1000 SF

Summary of Results:

Summary of Results section containing multiple horizontal lines for handwritten notes.

# IRWD - Integrated Pest Management Field Monitoring Form

Date: 01-13-23

Time: 1:30 pm

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Middle EstFoot.					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 9-7-23

Time: 9:00 AM

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Marshburn					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 9-29-23

Time: 10:30 am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Ridge Valley C					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <i>(e.g., hand pulling, shovel, hoe)</i>	Mechanical Removal <i>(e.g., mowing, string trimmer)</i>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <i>(e.g., acetic acid, d-limonene)</i>	Iron-based Herbicides	Phytotoxic Oils	Other



# IRWD - Integrated Pest Management Field Monitoring Form

Date: 1-22-23

Time: 10:00am

Personnel: Zacarias Campos

Application Equipment Used: backpack spray

## Location of Pesticide Application:

San Joaquin Marsh	Rattlesnake Reservoir	San Joaquin Reservoir	Sand Canyon Reservoir	Syphon Reservoir	Natural Treatment Systems
					✓
Other: Laguna Alora South					

## Target Pests:

Noxious Weed	Aquatic Plants	Algae	Invertebrates	Rodent	Fungi	Other
✓						

## Non-Chemical Control Methods:

Manual Removal <small>(e.g., hand pulling, shovel, hoe)</small>	Mechanical Removal <small>(e.g., mowing, string trimmer)</small>	Mulch	Beneficial Insects	Trapping	Other

## Organic Chemical Control Methods:

Natural Acid Herbicides <small>(e.g., acetic acid, d-limonene)</small>	Iron-based Herbicides	Phytotoxic Oils	Other

**Non-Organic Chemical Control Methods:**

Type <small>(e.g., herbicide, fungicide, insecticide)</small>	Trade Name <small>(e.g., Roundup, Garlon 4, Diuron 4L)</small>	Active Ingredient <small>(e.g., glyphosate, Trifluralin, Dichlorophenyl)</small>	Application Rate <small>(e.g., 8 oz/500 sq.ft)</small>	Total Area Applied
herbicide	Roundup	glyphosate	8 oz	100 SF

**Summary of Results:**

Summary of Results section containing multiple horizontal lines for handwritten notes.