

HARRIETT WIEDER REGIONAL PARK

2023 Annual Report

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Bolsa Chica Conservancy

Harriett Wieder Regional Park Restoration

Project Goals

Project Tasks	% Complete	Date Completed
Habitat Restoration Plan Approval	100	17-Nov-2017
Cultural Resources Management Plan	100	Dec-2017
Seed Imprinting	100	13-Jan-2017
Container Plant Installation	100	21-Apr-2017
Trench Filled, Watered, Seeded	100	5-Nov-2018
Watering Ended	100	26-Nov-2018
Deed Restriction	100	11-Feb-2020
Native Plant Cover	70% native cover	Aug- 2023
Weed Control	<5% non-native cover in 2022	Jun-22

ACTIVITIES CONDUCTED THIS SEASON

The Bolsa Chica Conservancy (BCC) broke ground on restoration of 9.5 acres of Harriett Wieder Regional Park (HWRP) in 2018 and has been working to achieve 75% native vegetation cover and <5% non-native cover. Additionally, the BCC has expanded a riparian corridor, maintains trails, and monitors wildlife.

This season, manual and chemical weed removal were a priority. Primary species included mustards (*Brassica spp.) and Hirschfeldia incana,* wild radish (*Raphanus sativus*), and yellow star thistle (*Centaurea solstitialis*). *Melilotus indicus* was especially prevalent this season and was both hand-pulled and chemically treated, but continued to re-emerge, resulting in a canopy cover of 14% (Figure 2) and was overtopping many native annuals. Due to a more intense and prolonged rainy season, invasive weeds continued to re-emerge late into the season. Many areas needed several rounds of repeated treatment and hand pulling to suppress weed seed spread. Notably, mustard, a historically stubborn weed for this project, was absent from transect surveys. Additionally, edges of the riparian corridor were weeded and signs of encampments were reported to Orange County Parks (OC Parks).

The BCC has utilized and engaged volunteers in weed removal. Thus far in 2023, 670 volunteers have aided in HWRP restoration for a total of over 4,900 man-hours of labor. Thanks to their dedicated efforts over 7,200lbs of invasive plants were removed. A few notable partners include the Adult Enrichment Center and Huntington Beach Union School District's Adult Transition Program, which both aim to provide socialization and vocational training to developmentally disabled adults. These groups attended a combined 54 volunteer events and removed a total of 2,730lbs of invasive species.

Due to record rainfall, all vegetation grew larger and for a longer period than previous years. More time and resources were needed to brush back trails to allow safe use by the public. All trails were trimmed 1-2 times a month during winter and spring, and as needed throughout the summer. Similarly, an effort was made to control trail erosion from rainfall. In areas where ground disturbance was permitted, drain channels were cut across trails to channel water away from walkways. These channels diverted water off-trail to be dispersed and absorbed by vegetation. Similarly, steep-cut erosion channels were blunted and filled in to prevent hazardous conditions for visitors.

The BCC maintains a 100ft defensible space behind the Ocean Colony homes bordering HWRP and extending into 0.25 acres of the project. In this area flashy fuel invasive weeds were chemically treated on three separate occasions. Due to the extended rainy season, mechanical mowing and hauling of fuels was pushed to July. All flashy fuel weeds were mowed and removed off-site. Grasses were trimmed to less than four inches, raked, and disposed of off-site. Similarly, trails were trimmed to create two fire breaks and all vegetation along the fence line was trimmed. Native shrubs were grouped in threes with all surrounding shrubs trimmed to less than 2 feet to prevent a fuel ladder, all per Orange County Fire Authority guidelines. With additional rains throughout the summer, this area continues to be monitored and maintained for residents' safety.

The BCC seasonally collects native seeds to be spread throughout the restoration project. Seeds were spread before rains, in various culturally-sensitive sites to encourage the spread of native growth. Species collected and spread in these areas include: *Deinandra fasciculata*, *Astragalus trichopodus*, *Phacelia distans*, *Ambrosia psilostachya*, *Corethrogyne filaginifolia,* and *Centromadia parryi ssp. australis*. In the past, California poppies were spread with limited success; this year 1lb of locally sourced *Escholzia californica* was spread throughout culturally-sensitive sites. Several individual poppies were seen growing in the culturally-sensitive sites and have continued to persist late in the season. Other species spread in areas outside of the culturally-sensitive sites include: *Eriogonum fasciculatum*, *Encelia californica, Isomeris arborea*, and *Atriplex canescens*

PROJECT TASKS

NATIVE COVER STATUS

Surveys were completed in July 2023, due to the extended rainy season, vegetation growth continued well into the summer, delaying surveys. Surveys consisted of 10 50-meter point-intercept transects, with canopy cover measured at meter intervals. Transects showed 71% native canopy cover and 20% non-native canopy cover (Figure 1). Rainfall this year also skyrocketed to 21.27 inches, over 8 inches above the region's average yearly rainfall.

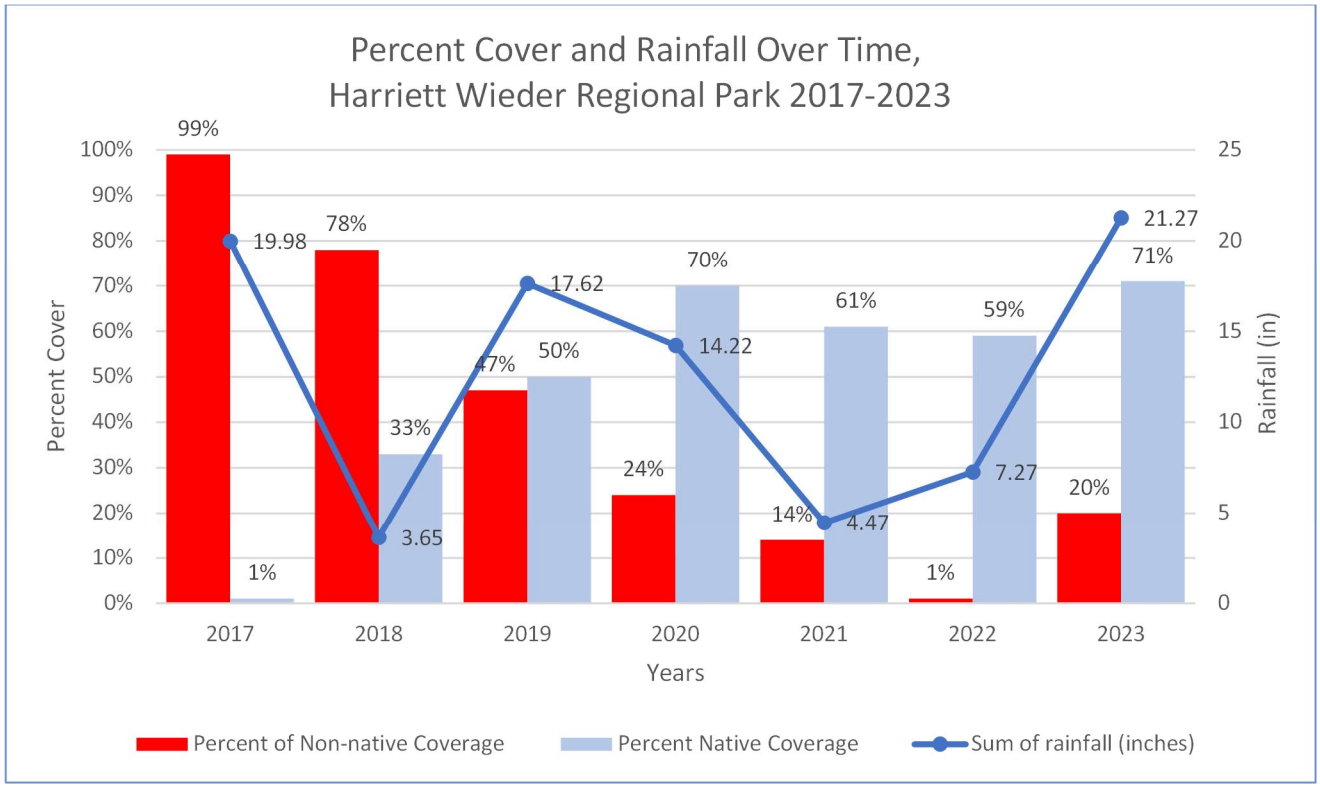

Figure 1: Percent Cover of top layer of native and non-native plant species and rainfall over time, at Harriett Wieder Regional Park from 2017 to 2023.

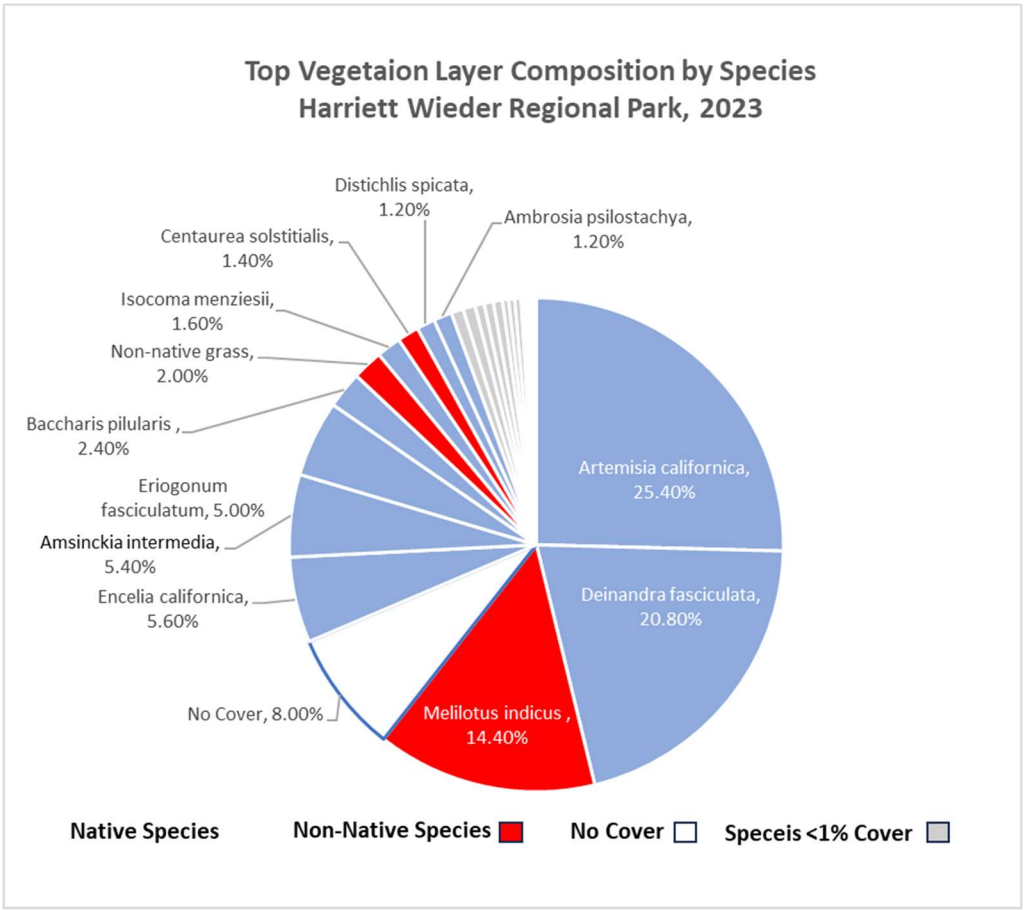

Figure 2: Percent cover of top layer of plant community by species, at Harriet Wieder Regional Park, 2023.

With unprecedented record rainfall after three years of drought, weeds returned to the project in force. Staff, interns, and volunteers attempted to control increased weed growth through a combination of hand-pulling and chemical treatment, heavily focusing on priority species of mustards, wild radish, and yellow star-thistle. Weeding efforts were effective at preventing large priority perennial weeds but allowed fast-growing annuals to persist and out-pace natives, with yellow sweetclover (*Melilotus indicus*) making up 14.4% canopy cover (Figure 2). However, sweet clover is an annual herb that does not appear on California Invasive Plant Council's priority weed lists and does not pose a significant risk to established perennial native species. This shift from predominantly woody and highly aggressive weeds, to herbaceous, typically low-lying weeds indicates that overall control methods have been effective, and the project is moving towards a maintenance level state.

Furthermore, about 6 acres of the project were container planted, while approximately 3.5 acres were only hand-seeded with annuals to preserve culturally-sensitive sites (Figure 3). Areas where container plants were used have notably higher native cover and established perennial native species. Figure 4 shows native and non-native canopy cover by transect. Transects 2, 4, 6, 7, and 9 all intersect established coastal sage scrub where container plants were used; these areas range from 78% to over 90% native cover with an 82% average overall. (Figure3).



Figure 3: Map of Harriett Wieder Regional Park project area with transect locations, cultural sites, and areas of seasonal pooling.

In contrast, transects that intersect culturally-sensitive sites where only hand-seeding was performed show notably lower native cover. Transects 1, 5, and 8 all intersect culturally-sensitive sites and range from 36% and 58% native cover (Figure 4). These areas are also where non-native species persist, with each transect showing 38% non-native cover. Similarly, there are several areas of the project where water pools after rain events (Figure 3). In these areas container plants had low survivability and persisted with lower native cover. Transects 1, 3, and 10 all intersect these seasonal pools and range from 50% to 78% native cover and 24% to 38% non-native canopy cover.

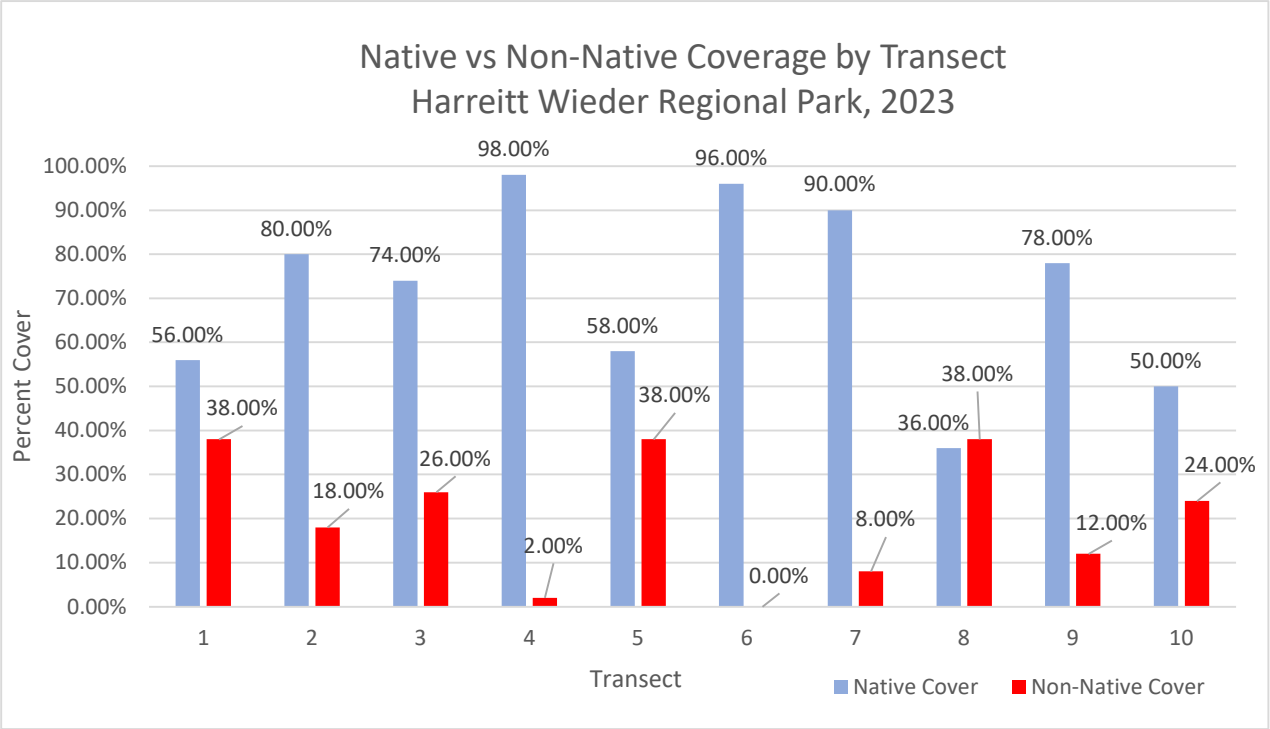

Figure 4: Percent cover of native and non-native plant species by transect. Harriett Wieder Regional Park, 2023.

Promisingly, existing shrubs seem adapted and thriving without additional watering or maintenance. Existing shrubs have resisted prolonged drought conditions and excessive rainfall, showing that species that are established are resilient and hardened to local conditions. Native shrubs continue to seed and produce progeny, with pups extending into trails and creeping into hand-seeded areas (Figure 5).



Figure 5: Mature Encelia californica and progeny of sprouting Encelia californica at Harriett Wieder Regional Park project site.

Relevé surveys were also conducted to evaluate differences in plant communities from landscape influences. Three major influences were identified: areas where container plants were used, areas where only hand-seeding was used, and areas where water seasonally pools. These factors have created distinct differences in the composition of plant species. Relevés were used to qualitatively differentiate between these assemblages.

Within a 10-meter by 10-meter area, plant species were recorded, categorized by Lifeform Class, and percent cover was estimated by Cover Class. Lifeform Class was broken into the following categories: Woody, representing perennial plants with woody stems or trunks; Forb, representing herbaceous, broadleaf plants that are not grass-like, stems are green, and do not persist year-round; Grass-like representing, monocotyledonous plants having narrow leaves, hollow stems, and clusters of very small, usually wind-pollinated flowers; and Succulent, representing plants having thick fleshy tissues adapted to water storage. Cover Class was used to estimate percent cover of each species, with a [1] representing 0-1% cover, a [2] representing 1-5% cover, a [3] representing 5-25% cover, a [4] representing 25-50% cover, a [5] representing 50-70% cover, and a [6] representing 75-100% cover.

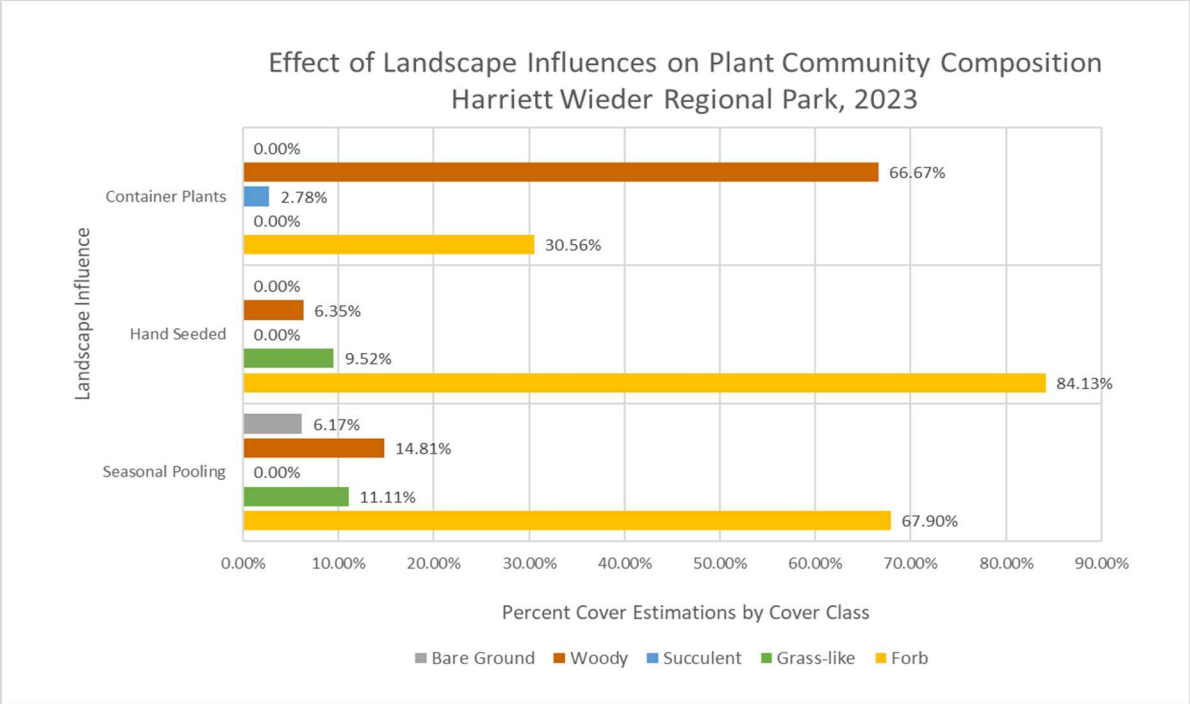

Figure 6: The effects of using container plants, hand-seeding only, and of seasonal pooling on average percent cover of woody, succulent, grass-like, forb and bare ground throughout the Harriett Wieder Regional Park project area, 2023.

Figure 6 shows the difference in plant communities by landscape influence. Areas planted with container plants were dominated by woody species at an estimated 66.67%. Forbs were the next most common species at 30.56% cover, with occasional 2% cover of succulent species, mostly remnants of cactus planting. In contrast, areas that were hand-seeded were dominated by forbs at an estimated 84.13% cover; grass-like and woody species appeared at much lower rates of 9.52% and 6.35%, respectively. Interestingly, although areas with seasonal pooling were originally planted with container plants, the current plant community more closely resembles the hand-seeded areas. Areas with seasonal pooling were dominated by an estimated 67.9% forbs, followed by woody species at 14.8%

and grass-like species at 11.11% species. Notably, areas with pooling also exhibited greater cover of bare ground, without vegetation. This difference in pooling and container planted areas is likely due to container plant mortality from prolonged moisture with lack of drainage. Native plants that favor dry, and well-draining soils are not able to survive the seasonal pooling, causing the area to be dominated by forbs and grasses, and leaving areas of bare ground exposed.

SOUTHERN TARPLANT POPULATION

Surveys for *Centromadia parryi ssp. australis* (CNPS 1B.1) were conducted to monitor populations. All areas were surveyed, and populations located (Figure 7). All individuals were counted by tracing stems to the soil level; only stems that emerge from the soil level were counted as individuals. Figure 8 shows the number of *Centromadia* individuals and rainfall over time. Surveys showed a decrease in population this year with 1857 individuals compared to 4433 individuals in 2022 surveys (Figure 8). We believe this drop in population is due both to a delayed growing season and lack of available space from being outpaced by earlier season plant species. *Centromadia* prefers warm, dry conditions, and disturbed soils to grow. Due to the unusually long rainy season this year, cooler and wetter conditions extended well into June, causing *Centromadia* to delay emerging until late July/early August. This later emergence allowed faster growing natives and non-natives to overtop and crowd out *Centromadia* sprouts. However, notably, two patches of *Centromadia* were found in an area not previously seen; 3 individuals were found in area B on the overlook where *Centromadia* had been hand-seeded the previous year (Figure 7).

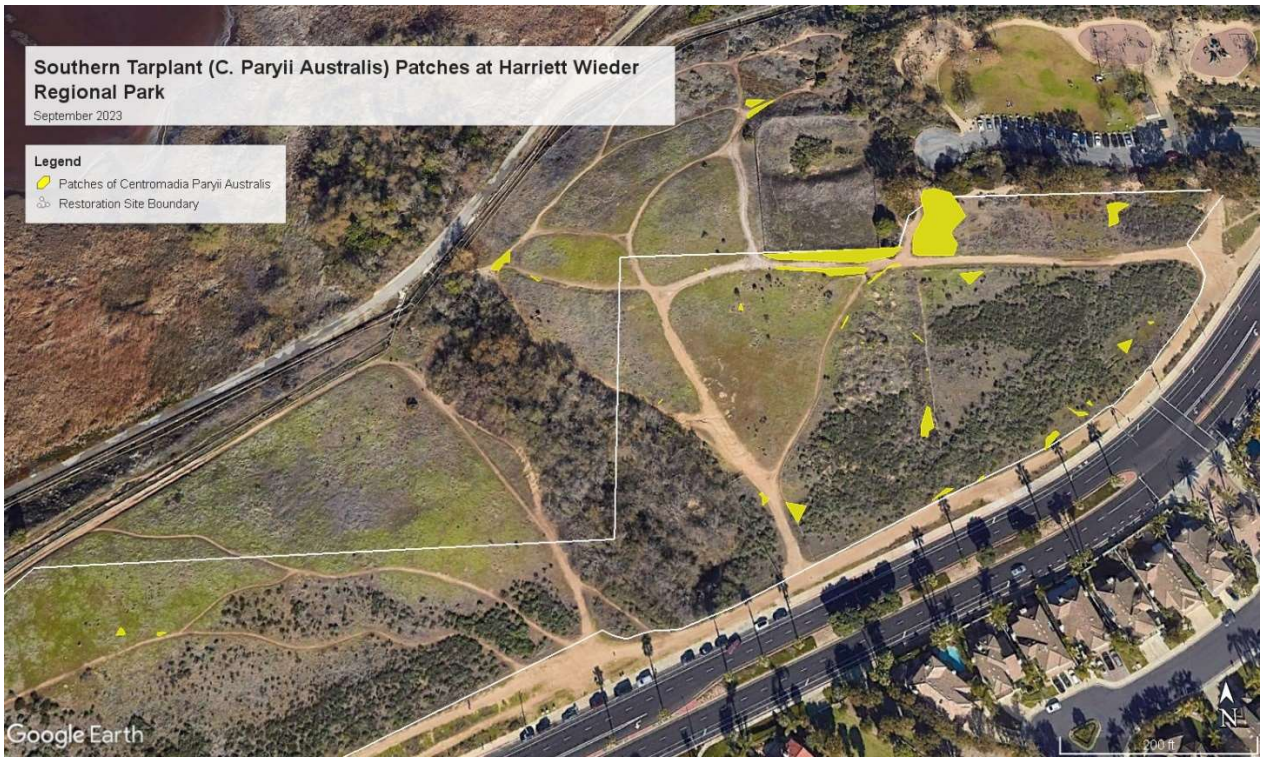

Figure 7: Map of Centromadia paryii ssp. australis populations at Harriett Wieder Reginal Park.

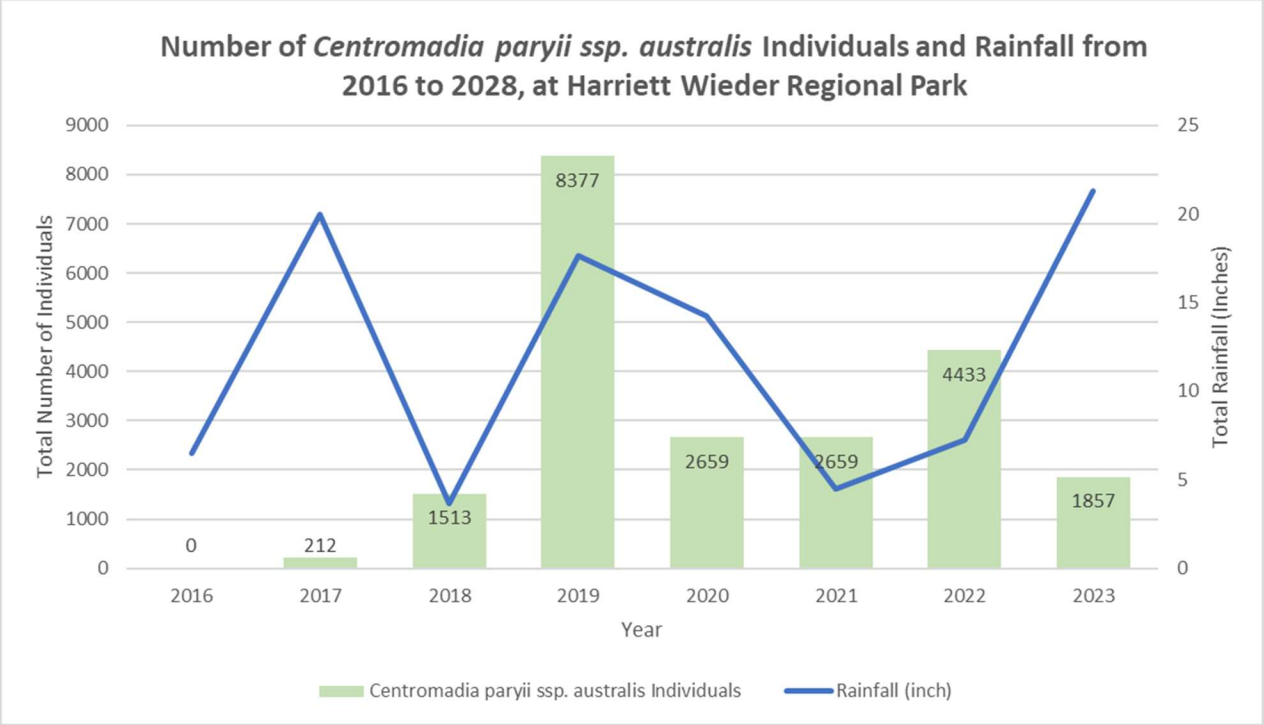

Figure 8: Number of individuals of Centromadia paryii ssp. australis and rainfall (Inches) at Harriett Wieder Regional Park from 2016 to 2023.

CACTUS COVER

During 2018 project installation, 30' x 30' cactus plots each with 30 one-gallon container cacti were installed with prickly pear (*Opuntia littoralis*) and coastal cholla (*Cylindropuntia prolifera),* and plots identified with wooden stakes. Survivability has been monitored throughout the project timeline with little success. In previous years, fungal rot caused container plant mortality, likely due to poorly draining soil accumulating moisture. Cactus plots were replanted in 2019 and again in 2020, however, were overtopped by coastal sage scrub and mortality rate remained high. Additionally, several disgruntled visitors continued to vandalize cactus plots by uprooting, smashing, and covering cactus with stones; over 200 cactus plants were vandalized two years in a row. Other vandalism events include theft of several cactus containers during staging prior to planting in spring 2018, removal and movement of cactus plot stakes, and theft of security cameras placed to monitor plots.

Cactus plots were resurveyed in August and December of 2023. Cactuses were observed within 8 of the original plots as well as several individuals outside of original planting sites, likely moved during vandalism attempts (Figure 9 and Figure 10). Stakes that were used to mark cactus plots were once again missing or moved, and rocks were found piled on surviving cactus (Figure 12). Surviving cacti were small and sparse with the majority of individuals under 1ft and making up less than 5% cover (Figure 9 and Figure 10). Many individuals also displayed signs of fungal rot. Cholla has maintained limited success with about six of the original plots displaying individuals <1ft high and one individual reaching nearly 3 feet high (Figure 12). Prickly pear additionally continues to struggle with only 9 plots displaying any prickly pear, most <1ft high. One notable area of relative success is the slope bordering the HWRP parking lot where three plots of prickly roughly 3-5ft wide by 2ft tall were found.



Figure 9: Map of current surviving Opuntia littoralis and Cylindropuntia prolifera patches by percent cover, and original cactus planting sites at Harriett Wieder Regional Park, Site A. December 2023.

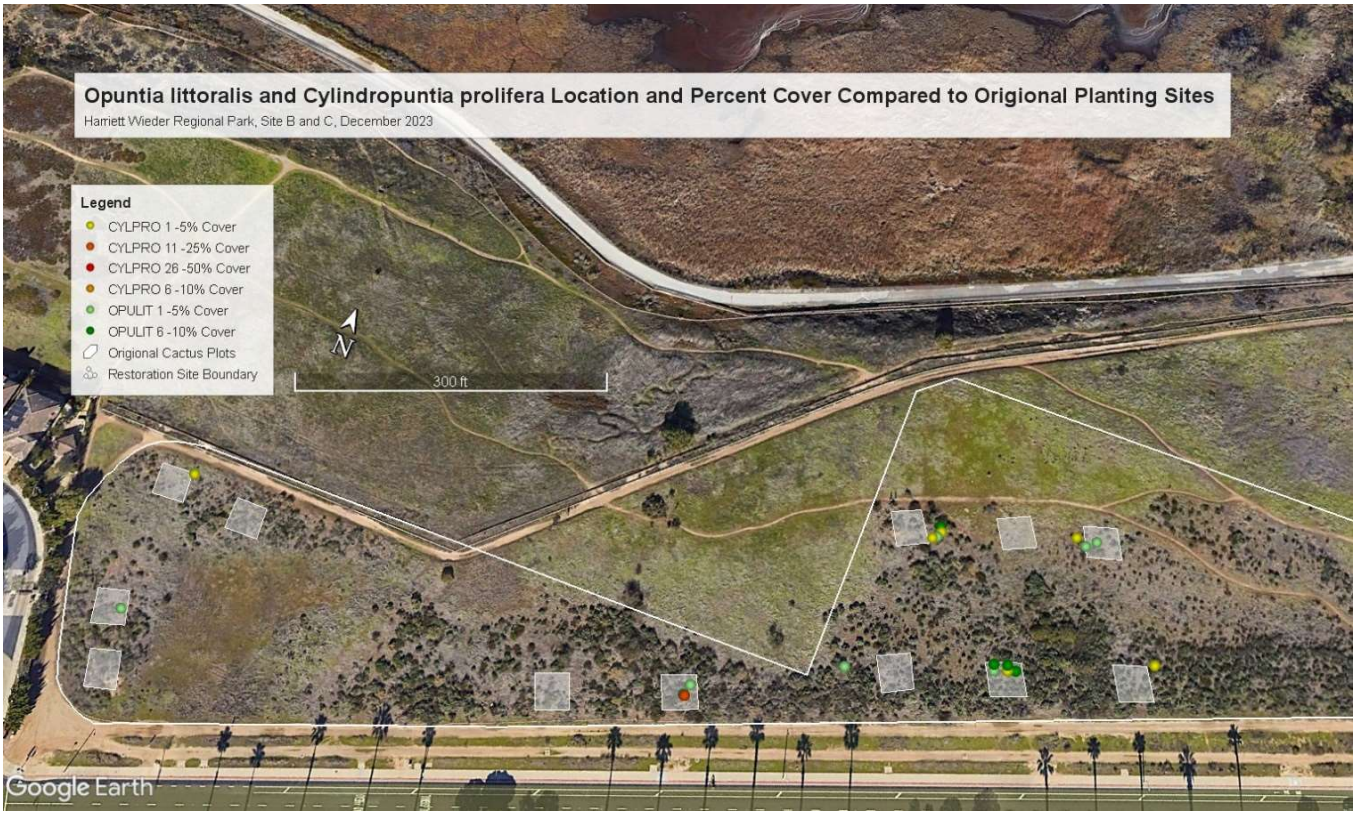

Figure 10: Map of current surviving Opuntia littoralis and Cylindropuntia prolifera patches by percent cover, and original cactus planting sites at Harriett Wieder Regional Park, Site B and C. December 2023.

Both prickly pear (*Opuntia littoralis*) and coastal cholla (*Cylindropuntia prolifera*) species prefer southern facing slopes with well-draining soil. In contrast, HWRP's relatively flat terrain, and heavily compacted soils offers few suitable locations. The BCC is maintaining 45 container pots of cholla with plans to outplant a final attempt in plots with most success. Due to the forecasted El Niño season, the BCC will delay planting until early spring, when soil will no longer be inundated to prevent the recurrence of fungal rot, and before harsh summer heat moves in. That said, due to past season's consistent failure, the BCC is not confident that HWRP has appropriate conditions to support a healthy cactus population.



Figure 11: (Left) Cylindropuntia prolifera, <1ft tall, shovel for scale. (Right) Opuntia littoralis <1ft tall, overtopped by coastal sage scrub plants.



Figure 12: (Left) Only healthy Cylindropuntia prolifera about 3ft tall, and one Opuntia littoralis <2ft tall, surrounded by coastal sage scrub plants. (Right) Rocks piled on top of Opuntia littoralis.

PARTNERS ENGAGED

The BCC engaged partners throughout 2023. BCC conducts annual surveys and removal of EDRR species *Dittrichia graveolens* (stinkwort). The BCC collaborates with the California Resources Corp (CRC), Bolsa Chica oilfield operator, to look for and remove stinkwort on the CRC along the northern fenced border of HWRP, to prevent spread of invasive weeds onto the project. This year, twenty-five 50-gallon trash bags of invasive stinkwort and sweet fennel (*Foeniculum vulgare*) were removed.



Figure 13: (Left) Adult Enrichment Center volunteer holding large Brassica nigra. (Right) Volunteers from Goodr stand on pile of invasive mustard plants.

The BCC regularly recruits and hosts volunteers to aid in invasive plant removal. Notable groups included a group of corporate volunteers from Goodr, who volunteered on 3 occasions and removed a total of 506 lbs. of invasive species (Figure 13). Additionally, the Adult Enrichment Center and Huntington Beach Union School District's Adult Transition Program, both groups that focus on vocational training and socialization for adults with developmental disabilities, regularly volunteered several times a month in weed removal. They volunteered a combined 56 days and removed a total of 3,017 lbs. of weeds. Additionally, Huntington Beach Mesa Middle School brought 100 volunteers and removed almost 2,000 lbs. of invasive mustard.

The BCC has been working with OC Parks to develop and improve volunteer involvement at HWRP. The BCC is planning to partner with OC Parks' Let's Go Outside program to bring experienced volunteers to HWRP on a recurring basis to assist in invasive weed removal. The BCC is also working to train long term volunteers in leading weed removal service events and performing outreach tabling to increase volunteer involvement.

CHALLENGES THIS SEASON

An unusual rainy season created several challenges this season. Southern California experienced an unprecedented atmospheric river that deposited over 20 inches of rain over the greater Orange County area. Although rain is important for plant growth and a healthy ecosystem, too much too quickly can be detrimental to drought tolerant native plants. The increased rain allowed regrowth of many natives that had died-back during the past three drought years; however, several areas of the project became inundated with moisture, overwatering natives and causing roots to rot. Additionally, invasives were super-charged, quickly overtopping natives. Invasive mustard species throughout California experienced a super-bloom, quickly taking over wildlands. Similarly, sweet clover grew very tall, very quickly, some stems stretching over four feet tall, out-pacing and out-shading native forbs. Overgrowth of vegetation also created challenges for maintaining trails, which needed to be mowed on a near weekly basis to maintain safety for visitors, thus pulling resources from weeding efforts. Similarly, flooded trails caused people to walk off-trail trampling vegetation and creating cut-through paths in project areas. These cut-throughs were blocked and obscured with trimmed brush.

Another challenge was disturbance by off-trail vehicles. Tire tracks left by off-trail ATVs, cars, and bikes cut through habitat and damaged several large perennial shrubs. Dirt bike riders have repeatedly dug jumps and have been reported harassing other visitors. Dirt bike trails have particularly exacerbated trail erosion, due to tire tracks and jumps cutting deep tracks into trails where rain run-off then flows.

APPENDIX

Table 1: Species Planted at HWRP Restoration and Surviving Plants

Species Name	Common Name	Plants Surviving	Seeded (lb/ac)	#Planted per acre	Other types of planting	Description
Acmispon americanus	American lotus	Few	0.2			
Acmispon glaber	Deer weed	Few	0.75			
Amblyopappus pusillus	Dwarf coastweed	Few				on site
Ambrosia chammissonis	Beach bur-sage	Few				in sandy spots
Ambrosia confertiflora	Weak-leaved burweed	Many				on site
Ambrosia psilostachya	Western ragweed	Many+	0.85			
Amsinkia menziesii var. intermedia	common fiddleneck	Many+	0.25			

Aristida purpurea	Purple three-awn	Few to 0			pinch of seeds	
Artemisia californica	CA sagebrush	Many+	1.5	155		
Artemisia douglasiana	Mugwort	Few	0.8			
Artemisia dracunculus	tarragon	Few to 0	0.5			
Astragulus trichopodus	Ocean locoweed	Many				on site
Atriplex canescens	Fourwing saltbush	Few		1		
Baccharis glutinosa	Marsh Baccharis	Few			cuttings	
Baccharis pilularis	Coyote brush	Many +		45		
Baccharis salicifolia	Mule fat	Many			cuttings	
Bromus carinatus	California brome	Many	1.5			
Calystegia macrostegia	Morning glory	Few to 0			pinch of seeds	
Camissoniopsis cherianthifolia	Beach evening primrose	Few	0.15			
Castilleja exserta	purple owl's clover	Few to 0	0.4			
Centromadia parryi ssp. australis	Southern tarplant	Many	0.5			
Chamissoniopsis micrantha	Sm-flower evening primrose	Few				on site
Corethrogyne filaginifolia	Sand aster	Many				on site
Croton californicus	California croton	Few	0.5			
Croton setiger	Turkey mullein	Many+	0.7			
Curcurbita foetidissima	coyote melon	Few			2 melons	
Deinandra fasciculatum	fascicled tarweed	Many+	2			
Deinandra paniculata	Paniculate tarplant	Few			spread in seed mix	
Distichlis spicata	Salt grass	Many+	1			
Elymus triticoides	Creeping wildrye	0	1			
Encelia californica	CA brittlebush	Many+	1.5	35		
Ericameria palmeri	Grassland goldenbush	Few to 0	0.5			
Eriogonum fasciculatum	California buckwheat	Many+	0.8	155		
Eriogonum parvifolium	Cliff buckwheat	Few	1.3	27		

Eriophyllum confertiflorum	Long-stemmed golden yarrow	Few to 0	0.25			
Eschscholzia californica	California poppy	Few	0.2			
Euphorbia polycarpa	Small-seed Sandmat	Many				on site
Frankenia salina	Alkali heath	Many+	0.02			
Grindelia camporum	Gumplant	Few	0.5			
Helianthus annuus	Western sunflower	Few to 0				
Heliotropium curassavicum	Alkali heliotrope	Few	0.5	1		season 2
Heteromeles arbutifolia	toyon	Few to 0				
Isocoma menziesii menziesii	Coast goldenbush	Many+	2			
Lasthenia californica	Coastal goldfields	Few	0.25			
Layia platyglossa	Tidy tips	Many	0.35			
Lotus scoparius (Acmispon glaber)	coastal deerweed	Few	0.75			
Lupinus bicolor	Miniature lupine	Few	2.5			
Lupinus succulentus	Arroyo lupine	Many	1.5			
Lycium californica	California boxthorn	Few to 0		10		
Malocothamnes fasciculatus	Bush mallow	Few to 0	0.5			added liquid smoke
Malosma laurina	Laurel sumac	Few		5		
Malvela leprosa	Alkali mallow	Few	2	2		season 2
Marah macrocarpus	Man-root	Few			pinch of seeds	
Melica californica	Ca melic grass	Few to 0			pinch of seeds	
Mimulus aurantiacus	Monkeyflower	Few	1	22		
Mirabilis californica	California wishbone bush	Few	0.2			
Nassella cernua	Nodding needlegrass	Few to 0			pinch of seeds	
Opuntia littoralis	Coastal prickly pear	Many		40		
Peritoma isomeris	Bladderpod	Many		35		
Phacelia ramosissima	Branching phacelia	Many +	0.5			

Rhus integrifolia	Lemonadeberry	Few		30		
Plantago erecta	CA plantain	Many	1.5			
Pluchia ordorata	Marsh fleabane	Few				on site
Pseudognaphalium biolettii	Bicolored cudweed	Few	0.2			
Pseudognaphalium californicum	CA everlasting	Few	0.3			
Salix goodingii	black willow	Many		17		
Salix lasiolepis	arroyo willow	Few		34		
Salvia apiana	White sage	Few	0.6	30		
Salvia columbariae	Chia	Few			pinch of seeds	
Salvia mellifera	Black sage	Many	0.5	17		
Sambucus nigra ssp. caerulea	Blue elderberry	Few to 0		<1		
Sesuvium verucosum	Western sea-purslane	Few	0.6			season 2
Sisyrinchium bellum	CA blue-eyed grass	Few	0.1			
Stipa lepida	Foothill Needlegrass	Few	2	121		
Stipa pulchra	Purple needlegrass	Few	7	121		
Trifolium wildenovii	Valley clover	Early	0.25			
Verbena lasiostachys	Western verbena	Few	1			

Table 1: For reference as needed. Complete list of plant species planted and estimation of current surviving plants. Few to 0 represents <10 individuals; Few represents 10-100 individuals; Many represents 100-1000 individuals; Many + represents 1000+ individuals; Early represents species that exhibited initial growth but died out. Harriett Wieder Regional Park, 2023.