

San Diego Association of Governments
Veldt Grass Removal
Final Report
Project Period: February 13, 2017 – February 13, 2019
SANDAG Contract Number: 5004949

Executive Summary

The San Elijo Lagoon Conservancy began this project in 2017 aiming to eradicate perennial veldt grass, *Ehrharta calycina* (veldt grass), from San Elijo Lagoon Ecological Reserve (Reserve). At the start of the project this highly invasive, non-native grass occurred in Diegan coastal sage scrub, southern maritime chaparral, and southern riparian scrub, covering a total of 7 acres (although additional populations were found during the project period). During the project additional occurrences were found in the Reserve, bringing the total to 8.5 acres.

At the end of this project percent cover of veldt grass was at less than 1 or 0 percent across all sites, meeting all success criteria. Each site had been treated at least twice per growing season (veldt grass goes dormant during the summer and fall and does not respond to herbicide treatment.) With that said, successful invasive species eradication takes many years to complete. It is likely that a veldt grass seed bank still exists in these sites, so there is a need for continued management going forward.

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Project Background

This project addresses the threat of perennial veldt grass, a MSP Level 3 invasive, non-native plant and its potential to invade and displace high priority species and habitats in the Reserve. In the 2012 MSP Invasive Non-Native Plant Management Priorities Report, veldt grass was listed under management level 3, and it suggested that this species should be evaluated further and that a trial funding of a portion of a management unit may be useful to evaluate if coordinated control is possible or of benefit. It was also given a “High” Cal-IPC Inventory Rating.

At the beginning of the project veldt grass occurred in 7 acres of the Reserve; in Diegan coastal sage scrub, southern maritime chaparral, and riparian scrub habitats. Due to its highly invasive nature and potential for wind dispersal, it also has the potential to invade the coastal dune habitats within the Reserve. The Reserve’s dune habitat contains the following high priority MSP species: Nuttall’s acmispon (*Acmispon prostratus*)(SO), western snowy plover (*Charadrius nivosus*)(SL), and California least tern (*Sternula antillarum browni*)(SS). Veldt grass threatens to displace Orcutt’s hazardia (*Hazardia orcuttii*)(SL), another high priority MSP species that occurs in the Reserve in coastal sage scrub habitat. Veldt grass also threatens the following species of concern: San Diego barrel cactus (*Ferocactus viridescens*)(VG), wart-stem ceanothus (*Ceanothus verrucosus*)(VF), Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*)(VF), Nuttall’s scrub oak (*Quercus dumosa*)(VF), summer holly (*Comarostaphylis diversifolia* ssp. *diversifolia*)(VG), and coastal California gnatcatcher (*Ptilioptila californica californica*)(VF).

Project Goals

The objective for this project is to reduce the total cover of veldt grass within the treatment areas to less than one percent. This project supports the first phase of the eradication effort of veldt grass in the Reserve. For any veldt grass found in the coastal dune habitat, complete eradication will be achieved. Due to large range and established seed bank, complete eradication will likely require more time and effort than this short term funding opportunity provides. SELC plans to secure funding for future phases of veldt grass eradication after the completion of this project.

Work Performed by Task

Task 1- Baseline Surveys

Budget: \$527.00

Spent: \$218.32

Match for Task: N/A

SELC staff conducted baseline surveys, mapping, and photo monitoring points for the project sites. Additional perennial veldt grass occurrences were found throughout the project period and added to the project. This task came out below budget as some of this work had already been conducted for the project proposal.

Provide in detail, the work completed for each task during the course of the entire project, any issues encountered during task completion and steps taken to address the issue(s), whether the task was

completed according to the original scope, whether the task came in at budget, and any results for the individual task. Include additional work that may be needed in the future to maintain the results/condition achieved if applicable.

Task 2- Invasive Species Treatment

Budget: \$35,000.00

Spent: \$17,233.77

Match for Task: \$N/A

Our subcontractor ACS Habitat Management (ACS) conducted invasive species treatment for this project. Each site was treated twice per growing season (December through April), once after the initial flush of growth and a second treatment in the spring for any resprouts or seedlings. At the end of the project each project site had been successfully treated six times. ACS experimented with different herbicides during the project, using both glyphosate and imazapyr (separately). Glyphosate was used at 2.5% concentration and imazapyr at 1.25%. Imazapyr proved more successful and will be used for future treatments. We did not encounter any issues regarding this task.

This task came out well below budget. The cost of the herbicide treatments turned out much lower than the estimate ACS provided for us when applying for the project.

Task 3- Monitoring

Budget: \$4,958.00

Spent: \$5661.68

Match for Task: \$N/A

SELC Associate Biologist Joe DeWolf conducted qualitative and quantitative monitoring of the project sites throughout the project. For all project sites, percent coverage of veldt grass was collected and calculated (Table 1), and photo points were taken to determine the efficacy of the treatments (Appendix 2). Since the veldt grass occurred in coastal sage scrub, southern maritime chaparral, riparian, and marsh habitats, bird nesting clearance surveys were required to be completed before treatments during nesting season. Joe DeWolf conducted these surveys. This task came out over budget since additional veldt grass occurrences were found during the project.

Task 4- Mapping

Budget: \$2,588.00

Spent: \$3,799.74

Match for Task: \$N/A

SELC Associate Biologist Joe DeWolf and GIS Specialists Kristie Hill and Alys Arenas conducted site mapping and GIS database management. Several new occurrences were discovered during the project, which required additional field mapping. Mapping data was shared and updated with subcontractors throughout the project as sites responded to treatments. SELC staff also created for quarterly and final project reports. This task came out over budget since additional veldt grass occurrences were found during the project.

Task 5- Project Management

Budget: \$1,772.00

Spent: \$4,647.13

Match for Task: \$N/A

SELC Associate Biologist Joe DeWolf planned, scheduled and managed all project activities and tasks. This task came out over budget for two main reasons. One, this project was given a six month extension, resulting in an extra winter season to plan and conduct treatments and other project tasks. Two, additional veldt grass occurrences were found during the project, resulting in additional more sites to manage.

Task 6- Administrative

Budget: \$4,158.00

Spent: \$4,088.02

Match for Task: \$N/A

SELC Associate Biologist Joe DeWolf prepared all quarterly reports and final report. SELC Finance Director prepared all billing invoices.

Conclusions

This project was successful in achieving the goal of reducing cover of veldt grass to less than one percent in all treatment sites. The majority of sites reached zero percent coverage, and only a few of the larger sites are at less than one percent coverage at the time of this report (See Table 1 for more detailed information and numbers). Due to the well-established seed bank in some of these larger sites, seed germination is still occurring. This possibility was expected and mentioned in the project proposal, and SELC will continue to secure funding for future phases of this project. Since the coverage and density of seedlings is low, manual removal by SELC volunteers will be a useful resource in eradication going forward.

This project was carried out from February 13, 2017 to February 13 2019. A six-month extension was granted in August 2018. Due to the timing of this project, we were able to treat veldt grass in three separate winter growing seasons (veldt grass goes dormant in the summer and fall and does not respond to herbicide). The herbicide treatments during the first winter season proved very successful in that ninety-nine percent of all individuals were successfully killed. There was a very low incidence of individuals surviving herbicide treatment and re-sprouting during the second season (less than one percent). Treatments during seasons two and three focused on treating seedlings that had germinated from the existing seed bank.

This project provides valuable information for future veldt grass eradication efforts in the region. Herbicide treatment was shown to be extremely effective in eradicating veldt grass individuals. There was a very low incidence of resprouting (less than once percent). Our contractors (ACS Habitat Mangement) used two different kinds of herbicides during the project; a 2.5% concentration of glyphosate herbicide and DyneAmic surfactant, and a 1.5% concentration of Polaris herbicide

(Imazypyr). Imazypyr proved to be the more successful herbicide as it required less frequent re-treatments, while glyphosate sometimes required multiple treatments to kill individual plants. It was observed in this project that veldt grass flowers in March-April and sets seed in April-May. As with any invasive plant, treatments should be conducted prior to flowering to prevent an additional generation of seeds from forming. However, if this window is missed, it is still possible to successfully treat veldt grass as late as May and June before it begins going dormant.

Going forward, SELC will continue monitoring these sites for continued seed germination. There continues to be a stronghold of veldt grass on the adjacent Caltrans easements, so future collaboration from Caltrans is needed to reduce the likelihood of veldt grass being further dispersed into the Reserve. Currently, these easements are active construction zones as part of the Build NCC freeway expansion. Once this project is completed we will reach out to Caltrans in hopes of building a partnership to prevent further dispersal veldt grass and other non-native, invasive plants.

In conclusion, this project contributed to the conservation of MSP species by preventing the decline of these species and their habitats. Perennial veldt grass is a highly invasive species that has been shown to spread and outcompete native species in just a short time period. By eradicating perennial veldt grass from the Reserve, we are greatly decreasing the potential for it to be dispersed by wind and/or tidal currents towards these MSP species.

Table 1. Acreage and percent coverage of veldt grass in project sites.

Site Name	Acres	% Coverage Pre-Treatment	% Coverage Post-Treatment
EC116	1.14	20%	<1%
HW01	1.64	30%	<1%
HW02	0.03	80%	0
HW03	0.07	50%	<1%
HW04	0.0002	10%	0
HW05	0.003	80%	0
M201	0.01	68%	0
RE03	0.001	25%	0
RE04	0.05	25%	0
RE05	0.0004	25%	0
RE06	0.005	50%	0
RE07	0.002	50%	0
RE08	1.45	60%	0
RE09	0.006	50%	0
RE10	0.004	50%	0
RE11	0.0001	100%	0
RE12	0.01	50%	0
SC09	0.11	60%	0
SI02	0.003	75%	0
SI03	0.001	50%	0
SI04	0.068	25%	0
SOH01	3.7	15%	<1%
SOH02	0.01	20%	0
SOH03	0.18	80%	<1%
SOH04	0.06	50%	0

Appendix 1. Photographs

Photograph 1: May 2016. Site HW02 before initial treatments. Notice the dry, beige-colored seedheads of the veldt grass.



Photograph 2: March 2019. Site HW02 after several treatments. Veldt grass has been reduced to less than one percent coverage in this site.



Photograph 3: April 2016. A different view of site HW02 pre-treatment. The red inflorescence of the veldt grass is easy to see in contrast to the surrounding vegetation.



Photograph 4: March 2019. Site HW02 after several herbicide treatments.



Photograph 5: April 2016. Site RE11 before treatments.



Photograph 6: March 2019. RE11 after several treatments. This site was located on the border of the Reserve and the Caltrans freeway embankment. Fortunately (for this project), a large portion of this veldt grass occurrence was graded and removed for a freeway construction project. A significant population of veldt grass still exists on nearby portions of the freeway embankment.



Photograph 7: April 2018. Veldt grass seedling, top left, next to salt grass (*Distichlis spicata*) in site HW03.



Photograph 8: April 2018. Natural recruitment of native ferns (*Polypodium californicum*) resprouting around dead veldt grass in site HW02.



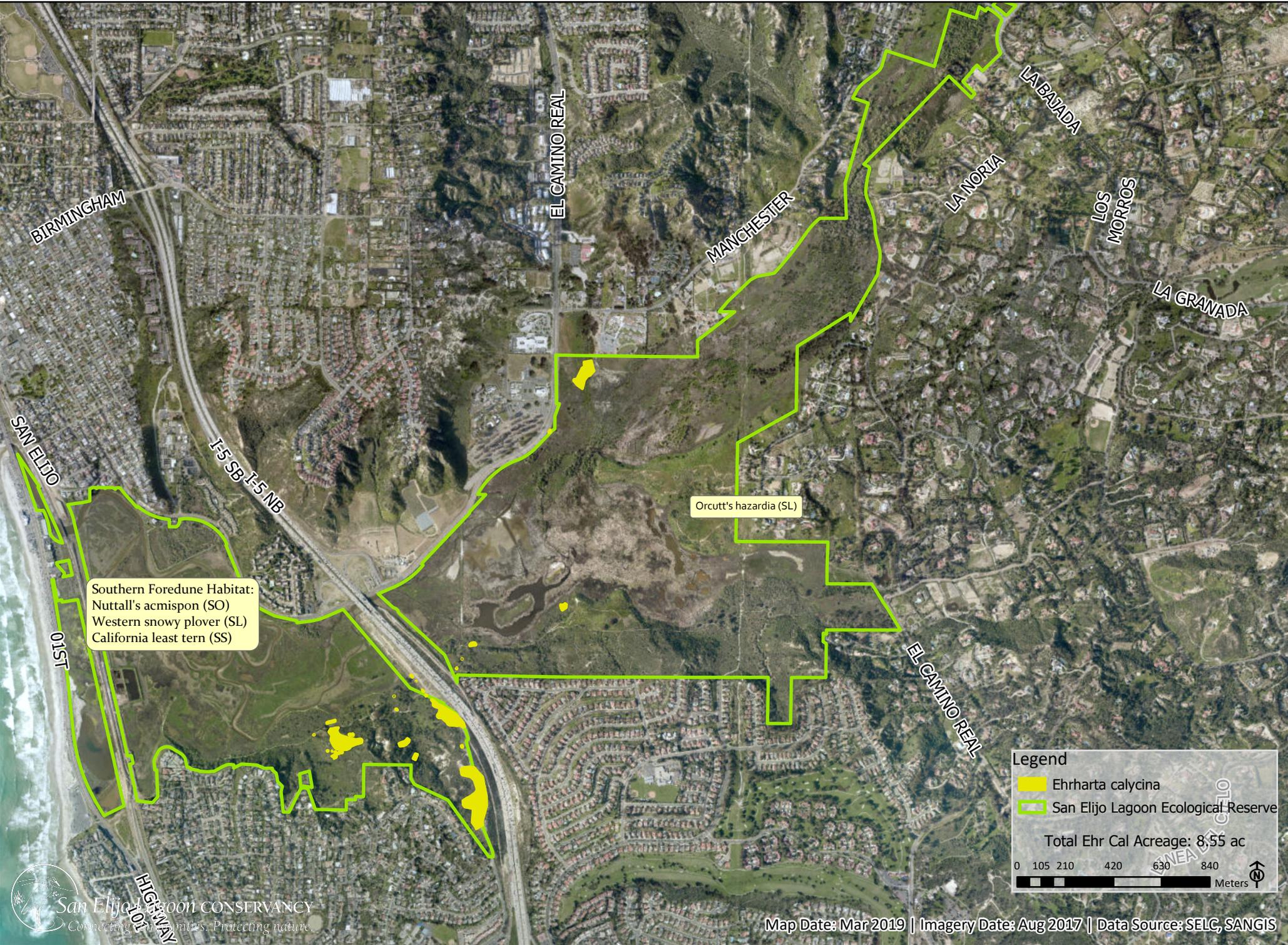
Photographs 9 and 10: May 2017. ACS Habitat Management re-treating site HW01. Notice most of the veldt grass is dead from a previous treatment, so contractors are searching for possible resprouts and seedlings after a late spring rain.



Photographs 11: June 2017. ACS Habitat Management treating site EC116. This is one of the veldt grass occurrences that was discovered during the project. SELC staff found this site in May, after the veldt grass had already gone to seed. Notice the dry seed heads on the plants. They had not yet reached dormancy however, so the site still responded to herbicide treatments.



Appendix 2. Map of veldt grass at San Elijo Lagoon Ecological Reserve



San Elijo Lagoon CONSERVANCY
 Connecting communities. Protecting nature.

Map Date: Mar 2019 | Imagery Date: Aug 2017 | Data Source: SELC, SANGIS

Ehrharta calycina in San Elijo Lagoon Ecological Reserve - Project Results