

Olympia Conservation Area
Habitat Management and Monitoring Plan
2020 Annual Report
(TE58263C-0)



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**Olympia Conservation Area HMMP
2020 Annual Report**

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Executive Summary

This report documents the work that was conducted in 2020 to begin to implement the *Olympia Conservation Area Habitat Management and Monitoring Plan* (HMMP: McGraw 2020). The HMMP identifies the restoration, management and monitoring tasks, as well as adaptive management framework, for management of the Olympia Conservatio Area—a 6.3-acre conservation area located within the San Lorenzo Valley Water District’s (District’s) 180-acre Olympia Watershed Property. The Olympia Conservation Area (OCA) is a 6.3-acre area that supports endangered species and sensitive habitat found in the Santa Cruz Sandhills—a unique ecosystem found only on outcrops of Zayante soils, which supports unique assemblages of plants and animals that include seven endemic plants and animals found nowhere else in the world (Table 1; McGraw 2004b). The OCA was set aside by the District to mitigate impacts of its capital improvements and operations and maintenance projects on rare species and sensitive habitat in the Sandhills. Work to implement the HMMP is covered under federal incidental take permit TE58263C-0.

2020 Activities

In 2020, Jodi McGraw Consulting (JMc) worked with District staff to implement initial habitat management and monitoring activities in the OCA.

Habitat Management

In the first year of implementing the HMMP, which was approved by the United States Fish and Wildlife Service in summer 2020, habitat management entailed:

1. **Exotic plant management**, to control invasive plant species identified as a priority for management, in 40 mapped locations totaling 4,780 sf (Figure 2); and
2. **Conducting access management**, to ensure that he fences and signage are maintained and patrol the property to prevent impacts associated with unauthorized access to the area.

Exotic plant management occurred on Monday June 15, 2020, when Nicole Chrislock (JMc), Carly Blanchard (District), and two District operations crew members pulled four invasive plant species. French broom (*Genista monspessulana*) and Portuguese broom (*Cytisus striatus*) were mainly removed through hand pulling (Figure 3a), though a few larger individuals were removed with the use of weed wrenches. Prickly lettuce (*Lactuca serriola*) and velvet grass (*Holcus lanatus*) were removed via grubbing with the use of a Pulaski. The grass was bagged, as were the flower heads of the wild lettuce. All exotic plant biomass was hauled to the SLVWD yard on site at the Olympia Wellfield (Olympia Watershed Property) and was stacked on pavement.

To manage access, the District contracted with the Land Trust of Santa Cruz County to conduct regular patrols of the Olympia Watershed Property. The District worked with the Land Trust to ensure that the fences and signage remained intact, and to evaluate signs of unauthorized used into the OCA, which was not detected.

All relevant species protection measures were implemented to protect the listed species during the course of management, including:

1. Conducting pre-restoration project training, to help project staff identify the rare species and to discuss the species protection measures;
2. Having all habitat management treatments be supervised by a qualified biologist monitor who can detect the species including the listed insects, to salvage and relocate them as needed; and
3. Minimizing ground-disturbing activities, to protect native plants and the endangered insect habitat, and reduce the likelihood of impacting the fossorial Mount Hermon June beetle.

No individuals of the listed species were encountered during activities conducted in 2020.

Monitoring and Adaptive Management

In June 2020, JMc monitored the OCA to assess the general habitat conditions and determine the need for management as part of the Conservation Area Condition monitoring outlined in the HMMP. The purpose of this monitoring is to evaluate known stressors including exotic plants and issues related to access, as well as other factors such as erosion and disease. Table 2 identifies the results of the Conservation Area Condition Monitoring conducted in 2020. No remedial management actions or needs to adapt the plan as part of the adaptive management framework were identified in 2020.

2021 Activities

Section 4 of this report outlines the habitat restoration, enhancement, and management activities as well as the monitoring protocols proposed for 2021. These activities were identified based on the implementation schedule in the HMMP (McGraw 2020). In the event of funding limitations, the District will work with the qualified biologist and the USFWS to prioritize habitat restoration, management, and monitoring tasks and identify how any unmet needs for the site will be addressed in the future.

In 2021, management will include three elements:

1. Restore the 0.17-acre area silver wattle (*Acacia dealbata*) area;
2. Enhance the Ben Lomond wallflower population, by caging flowering individuals to prevent deer herbivory, which greatly reduces seed production and thus population growth; and
3. Control exotic plants including the patch of spring vetch (*Vicia sativa*) as well as re-treating the exotic plants managed in 2020 (Section 2.1), to prevent their reoccurrence.

In 2021, monitoring will consist of the following three elements:

1. **Restoration Area Monitoring**, to evaluate the effectiveness of the restoration project (Section 4.1.1);
2. **Photomonitoring**, to establish the baseline for plant community structure and species composition; and
3. **Conservation Area Condition Monitoring**, to examine conditions of the site on a quarterly basis to identify issues and determine the need for remedial actions.

1 Introduction

This report documents the work that was conducted in 2020 to begin to implement the *Olympia Conservation Area Habitat Management and Monitoring Plan* (HMMP: McGraw 2020). The HMMP identifies the restoration, management and monitoring tasks, as well as adaptive management framework, for management of the Olympia Conservatio Area—a 6.3-acre conservation area located within the San Lorenzo Valley Water District’s (District’s) 180-acre Olympia Watershed Property. The conservation area was set aside by the District to mitigate impacts of its capital improvements and operations and maintenance projects on rare species and sensitive habitat in the Sandhills. The HMMP was approved by the United States Fish and Wildlife Service in summer 2020, when the District initiated work to implement the plan.

This document provides brief background information about the OCA, and then describes the work conducted by the District to implement the plan in 2020 and the plan for implementation in 2021. Additional information about the OCA and its management is provided in the HMMP (Section 1.2; McGraw 2020).

1.1 Conservation Area Overview

The Olympia Conservation Area is a 6.3-acre area that supports endangered species and sensitive habitat found in the Santa Cruz Sandhills—a unique ecosystem found only on outcrops of Zayante soils, which supports unique assemblages of plants and animals that include seven endemic plants and animals found nowhere else in the world (Table 1; McGraw 2004b). The District established the Olympia Conservation Area in 2017 by granting to the Land Trust of Santa Cruz County (Land Trust) a conservation easement. The OCA was protected to compensate for impacts to sandhills species and habitat as part of the District’s Probation Tank Replacement Project, which was permitted under federal incidental take permit TE58263C-0.

Table 1: Olympia Conservation Area Summary

Species and Communities	Status in Olympia Conservation Area
<u>Species</u>	
Santa Cruz kangaroo rat	Suitable Habitat
Zayante band-winged grasshopper	Species Present
Mount Hermon June beetle	Species Present
Ben Lomond spineflower	Species Present
Ben Lomond wallflower	Species Present
Ben Lomond buckwheat	Species Present
Silverleaf Manzanita	Species Present
<u>Communities</u>	
Sand Parkland	3.3 acres
Sand Chaparral	0.94 acres
Sandhills Woodlands and Forests	2.8 acres
Riparian	0.2 acres
Ornamental	0.01 acres
Total Area	7.3 acres

¹ The Olympia Conservation Area is a 6.3-acre area that is part of the SLVWD’s 180-acre Olympia Wellfield. This plan assessed the contiguous 1.0-acre Mayer Conservation Easement area, which was previously protected but is not actively managed.

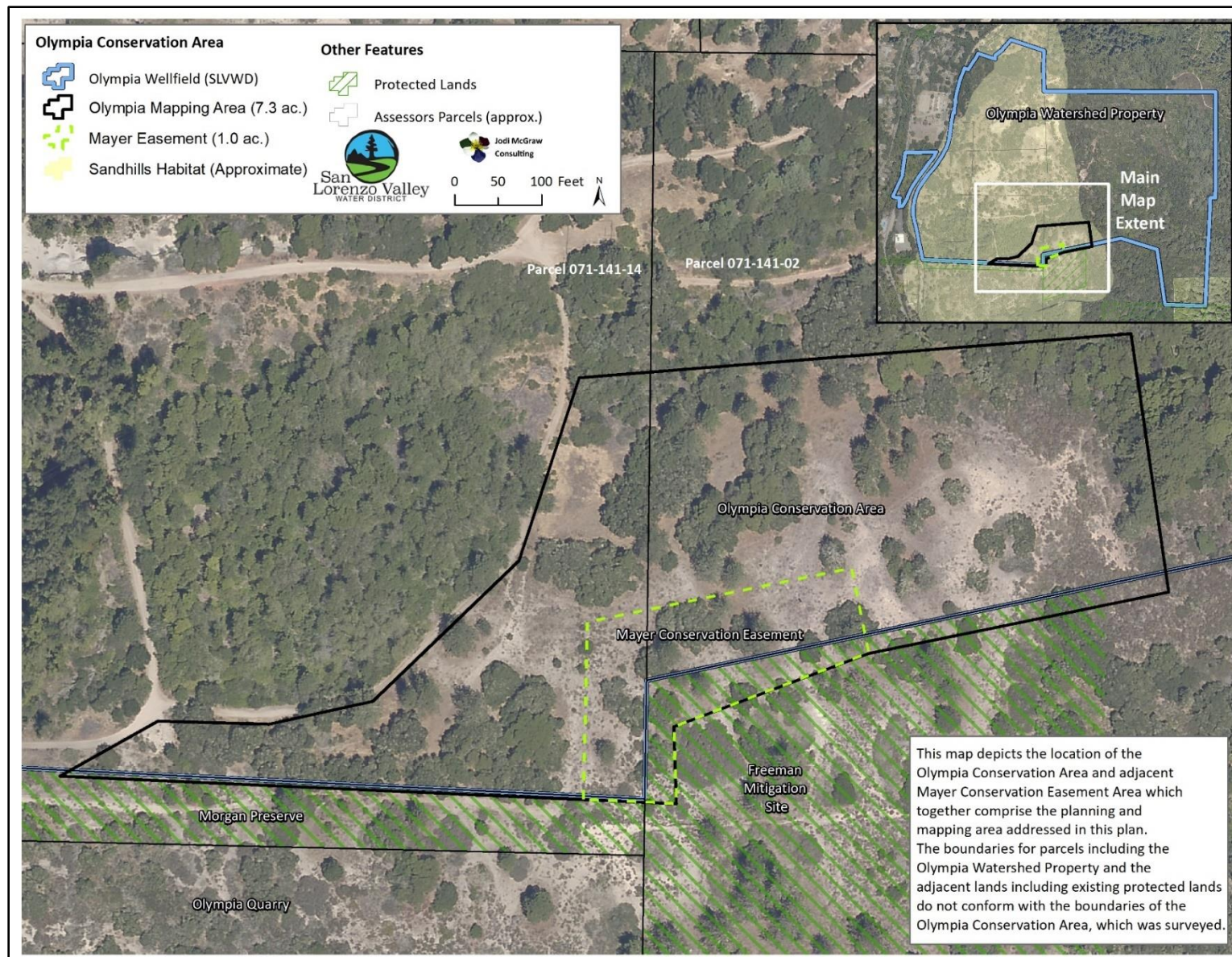


Figure 1: Olympia Conservation Area showing Mayer Conservation Easement Area and Olympia Mapping Area

Rather than setting aside just the habitat required to mitigate that project (0.995 acres; McGraw 2017), the District protected and committed to managing a larger area of Sandhills habitat to both provide for more meaningful conservation and provide a mechanism to mitigate its future capital improvement projects and operations and maintenance activities in the sandhills (McGraw 2017). With each project for which the District uses the OCA as compensatory mitigation, the District contributes funds to a non-wasting endowment used to fund implementation of the HMMP, as describe in Section 6 therein (McGraw 2020). Since its establishment, the OCA has been used to mitigate the impacts of three projects that have collectively used 2.082 acres of the habitat set aside. The remaining area is anticipated to be utilized to mitigate the impacts of future District infrastructure projects as well as operations and maintenance activities on the sandhills species, including those projects covered in a habitat conservation plan (HCP) that the District is preparing to cover activities in the sandhills over a 25-year period. The HCP is anticipated to identify additional conservation areas, as well as expand habitat restoration, management, and monitoring, as part of an update to the HMMP developed as part of the HCP planning process.

1.2 The HMMP

The HMMP describes the process by which it will be updated as part of the HCP planning process, including to fold in additional lands. In the meanwhile, it describes how the existing OCA will be restored, managed, and monitored, with greater detail provided for the initial 5-year phase of management. Specifically, the HMMP describes: the sandhills communities and species; the goals and objectives for management; the habitat management restoration, and enhancement strategies and techniques; the monitoring, reporting and adaptive management elements; a schedule, budget, and responsibilities for the initial phase of management; and guidelines for species protection during implementation of plan activities (McGraw 2020).

The HMMP addresses a 7.3-acre area that includes the OCA as well as the Mayer Conservation Easement Area—a 1.0-acre easement area established when the District granted a conservation easement in 2002 to the Center for Natural Lands Management (Figure 1). The OCA surrounds the Mayer easement on three sides; accordingly, the HMMP addressed the Mayer Conservation Easement area to enable seamless and thus more effective management. Implementation of the HMMP is covered under federal incidental take permit TE58263C-0.

1.3 The Report

This report was prepared to document the HMMP activities during 2020, the first year of implementation. Per the HMMP, the report documents the following:

1. **Section 2-Habitat Management, Restoration, and Enhancement:** The habitat restoration, management, and enhancement activities conducted, and the species protection measures implemented;
2. **Section 3- Monitoring and Adaptive Management:** Results of monitoring conducted, and any new information and changed conditions as well as modifications to management and monitoring approaches identified through the adaptive management framework; and
3. **Section 4-2021 Activities:** The planned management and monitoring for the following year based on the schedule in the HMMP (McGraw 2020).

2 Habitat Restoration, Enhancement, and Management

This section outlines the habitat management implemented in 2020, which entailed:

1. Exotic plant management, to control invasive plant species identified as a priority for management, within a total 4,780 sf;
2. Conducting access management, to prevent impacts associated with unauthorized access to the area.

That year, the management plan was being finalized, reviewed, and approved; accordingly, work was limited to addressing exotic plants identified the highest priority for treatment based on their impacts and/or threats, and maintaining the fences and signage.

2.1 Exotic Plant Management

In 2020, JMc worked with District staff to implement the high-priority invasive plant management projects in the OCA as outlined for Year 1 in the HMMP, which called for removal of invasive brooms and thistles in the first year of management.

On Monday June 15, 2020 Nicole Chrislock (JMc), Carly Blanchard (District), and two District operations crew members pulled four invasive plant species:

1. French broom (*Genista monspessulana*);
2. Portuguese broom (*Cytisus striatus*);
3. Velvet grass (*Holcus lanatus*); and
4. Prickly lettuce (*Lactuca serriola*).

The treatment areas included 40 mapped patches totaling 4,780 square feet (Figures 2 and 3).

Prior to the treatment, JMc examined the site to identify locations for these and other invasive thistle species, including bull thistle (*Cirsium vulgare*) and Italian thistle (*Carduus pycnocephalus*); while these species were mapped in 2018, they were not observed in 2020 and were not treated.

French broom and Portuguese broom were mainly removed through hand pulling (Figure 3a), though a few larger individuals were removed with the use of weed wrenches. Prickly lettuce and velvet grass were removed via grubbing with the use of a Pulaski. The grass was bagged, as were the flower heads of the wild lettuce. All exotic plant biomass was hauled to the SLVWD yard on site at the Olympia Wellfield (Olympia Watershed Property) and was stacked on pavement.

The area should be treated for invasive plants in spring 2021, prior to flowering of annual species.

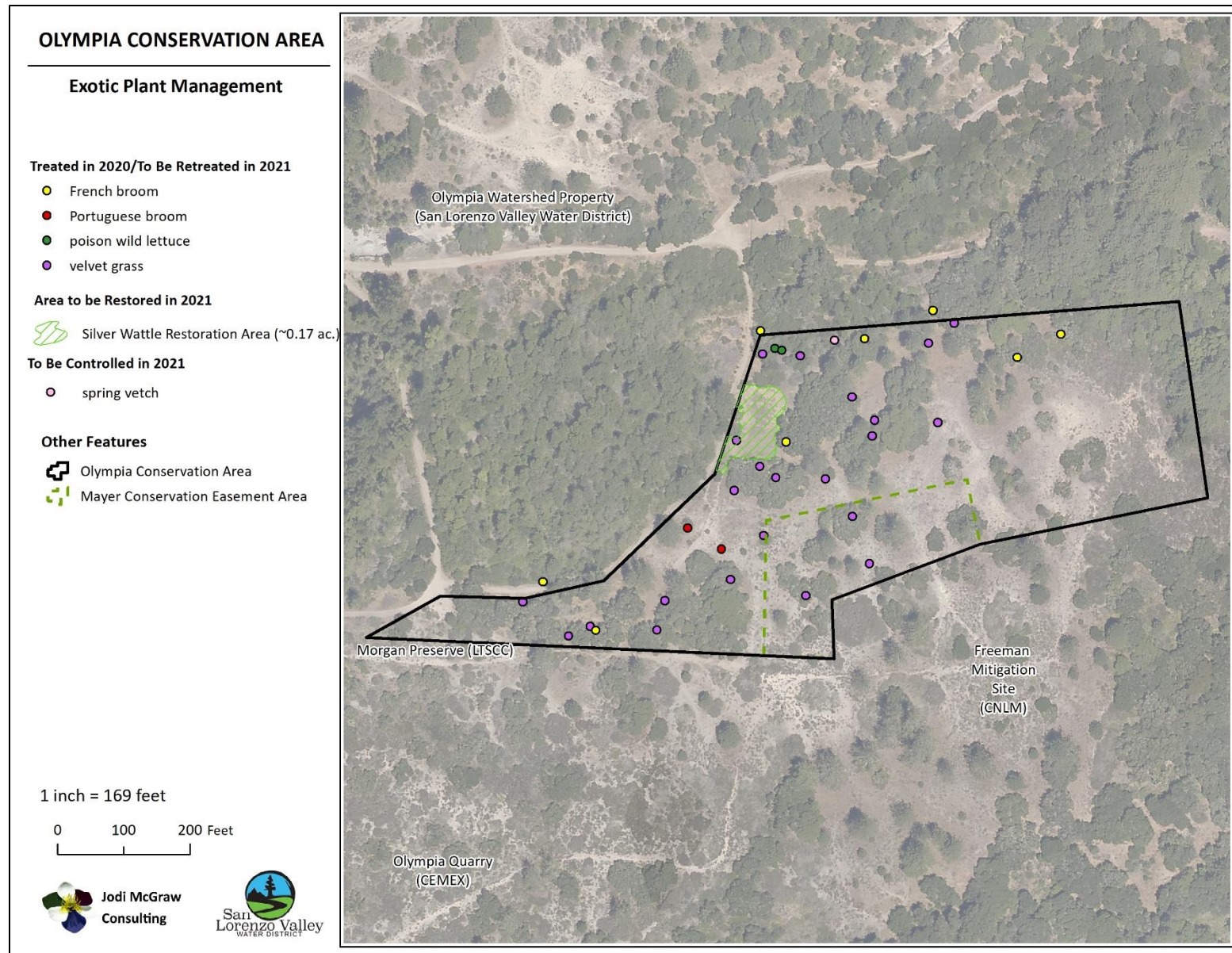


Figure 2: Exotic plant management treatment areas



Figure 3: Exotic plant management images, showing: a) District staff removing French broom seedlings, b) French broom biomass being loaded onto tarps to remove from the site, c) an area of dense French broom before, and after (d) treatment, and e) an area of Portuguese broom before, and after (f) treatment. Photographs by Jodi McGraw Consulting.

2.2 Access Management

In 2020, District staff conducted tasks to manage access at the Olympia Watershed Property, of which the OCA is a part.

1. **Site Patrols:** in 2020, the District worked with the Land Trust of Santa Cruz County to have the entire Olympia Watershed Property patrolled to assess public uses including detect any access into the Olympia Conservation Area.
2. **Fence and Sign Maintenance:** The District maintained the current fences and signs that are designed to promote compliance with the closure of OCA to unsupervised public access.

In 2020, the Land Trust staff did not report any issues related to the OCA. The fences and signs installed to protect the conservation area have remained intact.

2.3 Species Protection Measures

During the course of management in 2020, JMc and District staff implemented the relevant species protection measures identified in Appendix C of the HMMP. These measures are collectively designed to reduce short-term, direct negative impacts to the listed species including the Mount Hermon June beetle, Zayante winged-grasshopper, Ben Lomond spineflower, and Ben Lomond wallflower during the course of management. The following outlines the relevant measures implemented in 2020:

1. **Conduct Pre-Restoration Project Training:** Prior to exotic plant management, JMc provided an environmental awareness training to the District staff. The training provided workers information about the rare species and the steps to be taken to reduce impacts on them during the course of removing the exotic plants, including monitoring the soil and plant roots for Mount Hermon June beetle live stages, and avoiding impacts to native plant species including by hauling biomass via designated access routes and on tarps.
2. **Monitor All Restoration Treatments:** A JMc biologist was on site during implementation of all treatments and conducted the following tasks.
 - a. Examined habitat within the treatment areas, access routes, and other affected areas, in order to detect and protect the listed species. Specifically, the biologist examined soil and plant roots disturbed by the restoration treatments, to salvage Mount Hermon June beetle; however, no individuals were observed.
 - b. Advised restoration personnel on appropriate access routes to and within treatment areas, in order to minimize impacts to listed species and their habitats, including native plants species, wherever feasible.
 - c. Facilitated restoration crew implementation of other species protection measures.
3. **Minimize Ground-Disturbing activities:** To limit impacts to the fossorial Mount Hermon June beetle and Zayante band-winged grasshopper, restoration personnel minimized activities that displace or compact soil, such as digging, grading, and removing vegetation. The following are specific measures used to minimize ground disturbance.
 - a. Restoration personnel staged project materials, equipment, vehicles, and biomass (e.g. exotic plant piles) on designated staging areas located in degraded habitat.

- b. Restoration personnel confined ground-disturbing activities to the designated restoration areas, and to access routes identified by the JMc biologist.
- c. Restoration personnel carried, rather than dragged, materials between the staging area(s) and the treatment areas.
- d. Restoration personnel removed all plant biomass (e.g. branches and trunks) from the OCA.

3 Monitoring and Adaptive Management

In 2020, monitoring was used to evaluate the conditions of the OCA; the plan was evaluated for adaptations to increase its effectiveness as outlined in Section 5.3 of the HMMP (McGraw 2020).

3.1 Monitoring

In 2020, the Olympia Conservation Area was monitored in June 2020 to assess general habitat conditions and determine the need for management as part of the Conservation Area Condition monitoring outlined in the HMMP. The purpose of this monitoring is to evaluate known stressors including exotic plants and issues related to access, as well as other factors such as erosion and disease. Table 2 identifies the results of the Conservation Area Condition Monitoring conducted in 2020.

Table 2: Results of 2020 Conservation Area Condition Monitoring		
Condition	Methods	Observations
Access Management		
Fences	Visually inspect fence and document	The fences inhibiting access to the OCA from the public access trail was intact.
Signs	Visually inspect interpretive and 'sensitive habitat' signs	The interpretive sign and sensitive habitat signs were intact.
Access	Look for signs of access including footprints, dog and horse tracks and feces, debris, play equipment, etc.	No signs of access other than that by the Land Trust patrol and JMc biologists were identified.
Exotic Plants		
Early Detection-Rapid Response	Visually inspect conservation area with an emphasis on invasion 'hot spots' (e.g. perimeter, trails, riparian area, etc.) to detect new invasive plant occurrences	No new invasive plant species were detected
Examine Prior Invasive Plant Treatment Areas	Visually inspect prior invasive plant treatment areas to assess the need for follow-up treatments	No monitoring was conducted in 2020 after the treatment
Other Factors		
Other Factors	Monitors should examine the site for other conditions that could influence management, including plant die-off or dieback due to disease or drought	There is some limited die back of silverleaf manzanita due to the apparent fungal pathogen; however, it is not a management issue. No other issues were identified.

3.2 Adaptive Management

No issues or changes to the OCA conditions were identified during the course of initial management and monitoring that would merit adjustments to the plan or other adaptative management.

4 2021 Management and Monitoring

This section outlines the habitat restoration, management, and monitoring planned for 2021. It was developed based on the schedule for the first five years of management as outlined in the HMMP and the results of management and monitoring in 2020.

As discussed in the HMMP, the District will fund using the proceeds from the endowment. Should the endowment proceeds be insufficient to cover annual costs, as may be the case initially, the District will use annual budget appropriations to cover the remaining costs. In the event of funding limitations, the District will work with the qualified biologist and the USFWS to prioritize habitat restoration, management, and monitoring tasks and identify how any unmet needs for the site will be addressed in the future.

4.1 Habitat Restoration, Enhancement, and Management

In 2021, the District will implement three habitat restoration, enhancement, and management projects:

1. Restore the 0.17-acre area degraded by a prior stand of silver wattle (*Acacia dealbata*);
2. Enhance the Ben Lomond wallflower population, by caging flowering individuals to prevent deer herbivory, which greatly reduces seed production and thus population growth; and
3. Control exotic plants including the patch of spring vetch (*Vicia sativa*) as well as re-treating the exotic plants managed in 2020 (Section 2.1), to prevent their reoccurrence.

4.1.1 Restoration

In 2021, the District will initiate restoration of a 0.17-acre area in the northwestern corner of the Olympia Conservation Area that supports dense exotic annual grasses and forbs including rip gut brome, rattail fescue, and smooth cat's ears (Figure 2). The treatment area previously supported a stand of silver wattle (*Acacia dealbata*), which was removed by the District between October 2011 and January 2012 as part of a larger effort to control the invasive tree throughout the Olympia Watershed Property (SLVWD 2012). Despite the passage of time to allow the site to be naturally revegetated, the degraded habitat features only low cover and diversity of native plants (e.g., sparse California poppy, *Eschscholzia californica*). It does not support the four endemic plants, and is not suitable for the Zayante band-winged grasshopper due to the dense growth of exotic grasses. The lack of native plant recolonization reflects the following interrelated factors (McGraw 2004a,b):

1. The nitrogen-fixing acacias increased the soil nitrogen, which promotes competitive exotic grasses over native herbaceous plants adapted to the low-nutrient Zayante soil;
2. The branches and leaf litter that were left on the soil surface, which inhibit establishment of smaller-seeded native plants and can promote larger seeded exotic plants, such as ripgut brome;
3. The strong competitive effects of the exotic annual grasses and forbs on the native herbaceous plants.

Table 3 outlines the elements of a restoration action plan for this area, based on the framework in the HMMP.

Table 3: Restoration Action Plan for the 0.17-acre silver wattle area

Plan Element	Description
Goals and Objectives	Goal: Restore habitat for the native herbaceous plants and Zayante band-winged grasshopper, and enhance habitat for the Mount Hermon June beetle in the 0.17-acre area where silver wattle was removed. Objectives: - O1: Establish an assemblage of native plant species similar in structure and species composition to the adjacent sand parkland habitat surrounding the treatment area; specifically, the restoration areas will have native plant richness and native plant cover that is at least 90% of that found in the adjacent sand parkland habitat surrounding the Project site after five years. - O2: Establish Ben Lomond spineflower in the restoration area, with average absolute cover of at least 5% after five years. - O3: Establish Ben Lomond wallflower in the restoration area, with average absolute cover of at least 1% after five years. - O4: Establish Ben Lomond buckwheat in the restoration area, with average absolute cover of at least 3% after five years. - O5: Provide food for the Mount Hermon June beetle by establishing a diverse assemblage of native plants, including native plant cover and richness that is at least 90% of that in adjacent sand parkland habitat surrounding the Project site after five years. - O6: Provide suitable habitat for the Zayante band-winged grasshopper, by establishing native plant species that are either host plants for the Zayante band-winged grasshopper (ZBWG) or that provide important habitat for ZBWG, such as silver bush lupine (<i>Lupinus albifrons</i> var. <i>albifrons</i>) and bristly golden aster (<i>Heterotheca sessiliflora</i> ssp. <i>echioides</i>), which should achieve at least 3% cover in the restoration areas, while average absolute exotic plant cover will be less than 20% after five years. - O7: Prevent widespread establishment of any invasive plants, including brooms, thistles, velvet grass, which will collectively average no more than 5% absolute cover after 5 years.
Treatments	
Remove litter and woody debris	In the fall, remove all of the remaining tree leaf litter, woody debris (i.e., branches), and also thatch from exotic annual grasses and forbs, using rakes and McLeods. Avoid impacting native perennial plants, but the remainder of the area should feature bare ground (open sand soil). Remove the biomass to the District yard or green waste.

Table 3: Restoration Action Plan for the 0.17-acre silver wattle area

Plan Element	Description
Broadcast Seed	In the fall, disperse a mix of site-collected native plant seed that includes Ben Lomond spineflower, Ben Lomond wallflower ¹ , Ben Lomond buckwheat, silver bush lupine, and sessile golden aster, and a mix of additional site-collected native plant seeds of herbs and subshrubs characteristic of sand parkland (Section 2.5.3, Appendix B).
Control Exotic Plants	Control exotic plants using appropriate manual and mechanical methods each spring, including: - weed whacking dense and tall exotic grasses and forbs, where doing so will not significantly impact the native plants; - hand pulling or using a hoe to remove isolated plants (e.g., brooms, thistles, invasive vines).
Species Protection Measures	Implement the following relevant species protection measures which are summarized here and described in greater detail in Appendix C: Measure #4: Conduct initial treatment in the fall after native plants have set seed and at the end of the endangered insects flight seasons. Measure #7: Flag any native plants to be retained within the treatment area prior to raking. Measure #8: Conduct a pre-project training for all workers to ensure that the measures are implemented and species impacts minimized. Measure #9: Have a biologist monitor (as well as implement) the restoration treatments. Measure #10: Minimize soil disturbance below 2" below the soil surface, to avoid impacts to fossorial Mount Hermon June beetles. Measure #12: Minimize impacts to native species by retaining those that can be retained within the treatment area. Measure #15: Conduct all fuel equipment maintenance (e.g., for the weed whacker) to avoid spills and leakage within the habitat.
Monitoring	Monitor for five years using annual qualitative monitoring in the spring to visually assess site conditions and evaluate plant establishment including invasive plant species, to determine the need for follow-up treatments. In Years 1, 3, and 5, visually estimate plant species cover in 10, 2m x 2m plots randomly located throughout the treatment area. To compare habitat to intact habitat, quantify plant species cover in 10, 2m x 2m plots randomly located in intact sand parkland habitat near the treatment area. Use the cover estimates to assess achievement of objective O1-O7.

¹ A 2081(a) permit from the California Department of Fish and Wildlife will be obtained prior to handling Ben Lomond wallflower individuals.

4.1.2 Ben Lomond Wallflower Enhancement

In 2021, the District will begin caging adult Ben Lomond wallflower to prevent herbivory by deer, which greatly reduces seed production and could contribute to declines in the already small population that could lead to its extirpation as a result of demographic or environmental stochasticity (McGraw 2020).

During February of each year, a biologist will search areas known or likely to be occupied by Ben Lomond wallflower to identify individuals that are likely to flower that spring based on their size and/or evidence of bolting (i.e., initiation of a flowering stalk). These individuals will then be caged using 4' tall wire cages made of 2" avian wire or 2" x 4" welded wire, or other cage materials with a minimum opening of 2", which is necessary to avoid limiting access by pollinators such as the chalcidon checkerspot butterfly (*Euphydryas chalcedona*).

4.1.3 Exotic Plant Management

In 2021, exotic plant management will be conducted to treat the following exotic plants (Figure 2):

1. Treat spring vetch (*Vicia sativa*), which has not yet been treated; and
2. Conduct follow up treatments for the invasive brooms, thistles, and velvet grass treated in 2020.

All exotic plants will be managed through manual or mechanical means; no herbicides will be used. The treatments will be conducted in a manner to minimize negative impacts on the endangered species and sensitive habitat, as Section 4.1.2 of the HMMP (McGraw 2020).

4.2 Monitoring

In 2021, monitoring will consist of the following three elements:

4. **Restoration Area Monitoring**, to evaluate the effectiveness of the restoration project (Section 4.1.1);
5. **Photomonitoring**, to establish the baseline for plant community structure and species composition; and
6. **Conservation Area Condition Monitoring**, to examine conditions of the site on a quarterly basis to identify issues and determine the need for remedial actions.

4.2.1 Restoration Area Monitoring

In 2021, the restoration area will be monitored to ensure that the treatments are achieving the goals and objectives and identify the need for any follow-up treatments or other remedial actions. The monitoring designs will be developed as part of the project, to reflect their nature including areal extent, goals, and objectives, but will generally include two elements: 1) qualitative assessments of conditions of the site, and 2) collection of quantitative data using systematic methods based on sound scientific sampling and the use of descriptive and inferential statistical analyses to evaluate specific metrics that reflect the desired conditions (i.e., success criteria) and track changes over time and/or compare conditions to reference sites, where appropriate. Table 3 provides outlines how monitoring will be implemented for this project. These results of project monitoring will be used not only to evaluate and

document effectiveness and inform implementation of future work. As noted, the specific details of project monitoring will be developed based on the project.

4.2.2 Photomonitoring

In 2020, the District will use photomonitoring to:

1. **Document the baseline conditions** of the Olympia Conservation Area; and
2. **Evaluate changes in habitat conditions** including plant community structure and general species composition over time.

A series of permanent photomonitoring stations will be established throughout the OCA. The stations will be located to capture important baseline conditions as well as representative conditions including:

1. **Plant Associations:** Representative conditions of the 14 plant associations (Table 2);
2. **Endemic Plant Occurrences:** Patches of the four rare plants;
3. **Endemic Insect Habitat:** Suitable habitat for the Zayante band-winged grasshopper and Mount Hermon June beetle;
4. **Management Issues:** Invasive plants, dense exotic plants, ingress/egress areas, and erosion features (i.e., trails on steep slopes).

To facilitate relocation, photostation locations will be permanently monumented on the ground (e.g., using a metal plate or stake) and recorded using a resource-grade GPS. At each point, the general subject and view direction (azimuth) will be recorded for each photograph. The digital photographs will be labeled according to the station, azimuth, and date; for example, P05_143_20200504 would be the name of a photograph taken at photostation 5 with an azimuth of 143 degrees on May 4, 2020. Labeling photos in this way will enable them to be viewed sequentially to readily evaluate changes over time when stored in the same digital file folder.

4.2.3 Conservation Area Condition Monitoring

In 2021, the OCA will be monitored to assess factors that can influence the goals and objectives, including exotic plants and access as outlined in Table 2. This condition monitoring will be conducted quarterly in January, April, July, and October by a biologist who can identify exotic plants as well as evaluate access, erosion, disease, and other issues

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