Midpeninsula Regional Open Space District

Memorandum

DATE July 22, 2020

MEMO TO: Midpeninsula Regional Open Space District Board of Directors

THROUGH: Ana Ruiz, General Manager

FROM: Coty Sifuentes-Winter, Senior Resource Management Specialist

CC: Kirk Lenington, Natural Resource Manager

SUBJECT: Inventory and Monitoring of Vegetation on Midpeninsula Regional Open Space District Lands

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Recent correspondence and comment from the public has alleged that the Midpeninsula Regional Open Space District (District) does not monitor District lands or the impact and effectiveness of management actions on the lands it manages. This memorandum presents an overview of the major monitoring areas and data collection staff uses in fulfilling the responsibility of caring for a diverse mix of ecosystems, including estuarine, marine, oak woodland, redwood forest, coastal scrub, and oak savannah. The complex and constantly changing ecosystems of District preserves are comprised of a wide diversity of interrelated resources that sometimes have competing needs for preservation and management. The District actively inventories and monitors all sites in which any discretionary action occurs following guidelines and protocols from scientifically-validated sources and accepted best practices. Although this memorandum focuses on monitoring of vegetation, the District actively monitors other resources, including wildlife, earth sciences (i.e. hydrology and soils), and cultural resources.

Monitoring programs need to be robust enough to inform management decisions in a meaningful way, yet not be so onerous that the monitoring costs outweigh the benefits. Monitoring requirements vary depending on the activity undertaken and the conditions in the area where the activity is to occur. Individual monitoring protocols are determined on a case-by-case basis for each project at the discretion of professional Midpen biologist and resource management staff. Monitoring and reporting may also be required as part of mitigation adopted to comply with the California Environmental Quality Act, or any permits obtained to perform specific work activities.

MONITORING ON DISTRICT LANDS

Presented below are the major program areas and individual projects where Midpen staff monitor both to detect change over time (before/after) and to establish baseline conditions. Please note, this is not an exhaustive list of all types of monitoring performed on District lands.

Vegetation

Conservation Grazing Program

The monitoring program for rangeland habitats is designed to ensure that the specific rangeland uses are in compliance with site-specific Rangeland Management Plans, any agricultural conservation easements, and the stewardship goals and objectives. See attachment 1 for an example monitoring report for the Conservation Grazing Program. The following guidelines outline monitoring criteria:

- Monitor forage utilization and livestock distribution trends to ensure appropriate residual dry matter (RDM) remains on the ground to achieve desired resource management objectives, including soil stability and water quality;
- Monitor the condition of livestock infrastructure, including water systems, gates and fencing, to ensure conformity with the terms of the easement and to improve rangeland and grazing management practices;
- Monitor invasive vegetation with an emphasis on location, distribution and abundance of plant species. Describe methods for treatment or control of invasive species (grazing, herbicide application, mowing, etc.) and vegetation response to treatment methods;
- Monitor ponds to ensure habitat for special status wildlife species free of invasive predators such as fish and/or bullfrogs;
- Monitor desirable vegetation, including native grasses, wildflowers, and trees with an emphasis on location, distribution, and abundance.
- Describe any impacts, positive or negative, observed as a result of agricultural practices (farming and/or grazing);
- Monitor vegetation that was planted as part of restoration or remediation work (where applicable) with an emphasis on location, distribution, abundance, and survival rate;
- Natural climatic changes (drought, floods, fire, etc.), geologic process, and biologic cycles beyond Midpen control is noted and described, as applicable; and
- Stocking rates, herd type, and duration of grazing is noted, where applicable.

Integrated Pest Management (IPM) Program

On December 10, 2014 (R-14-34), the Board adopted the Final EIR for the IPMP and approved the IPM Guidance Manual and Policy. The District amended the Program in 2019 (R-19-11). District staff monitor all treatment areas as outlined within the Program documents (https://www.openspace.org/our-work/projects/integrated-pest-managment) and reports to the Board on an annual basis. The latest report to the Board can be found on the District website at https://www.openspace.org/sites/default/files/Midpen_IPM_Annual_Report_2018.pdf.

Midpen monitors site conditions before, during, and after treatment to determine if objectives are being met and if methods need to be revised. This methodology includes the following elements:

- Correctly identify the pest and understand its life cycle;
- Determine the extent of the problem or infestation;
- Evaluate the site conditions;
- Establish the tolerance level for control actions;
- Utilize the least harmful suite of treatment methods to control the pest at the most vulnerable stages of its life cycle; and
- Monitor pest populations and effectiveness of treatment methods.

Rare Plant Monitoring Program

Rare plant populations and rare habitats are monitored for protection, conservation planning (reduce potential for resource conflicts), land acquisition, and management on Midpen lands following guidelines and protocols from both the California Native Plant Society and California

Department of Fish and Wildlife. Depending on the activity at the site, monitoring maybe be "protocol"-level methodology approved by regulatory agencies or "occurrence"-level to be included in the State-managed California Natural Diversity Database. See attachment 2 for an example botanical and rare plant monitoring report.

Project Specific Monitoring

Mitigation Monitoring Plans (MMPs) or Vegetation Restoration Plans (VRPs) developed by the District or District Consultants, in consultation with permitting agencies, outline required mitigation measures for potential temporary and/or permanent impacts related to a project. These measures often include native plantings to restore ecological functions. The associated mitigation monitoring of installed vegetation and site conditions are reported to permitting agencies for five to ten years, or more, after a project is completed. The monitoring reports document native vegetation and ecological function reestablishment at the sites and any necessary adaptive management measures to ensure all permit conditions and MMP success criteria are achieved. An example mitigation and monitoring report can be found in Attachment 3.

Monitoring protocols for individual site monitoring was adopted in 2019 by the District. This protocol uses a multiple-hit, point intercept method to sample the presence/absence of species at sampling points along transects that cross the site to meet the following goals:

- Provide accurate and repeatable data for the study while minimizing field collection time;
- Efficiently use sampling points to detect degrees of change in vegetation communities that are suitable for management decisions; and
- Efficiently sample the sites while retaining low and consistent margins of error across sites.

The study design allows for data to be collected and easily compared over multiple years. Multiple-hit data provides a clear picture of change in species percent cover and change in functional guilds over time. These valuable community composition data can be used to guide the evaluation of vegetation communities at each site. The Covid-19 pandemic delayed the implementation of this protocol until spring of 2021.

CURRENT PROJECTS UNDERWAY

District decisions on resource management are based on the totality of peer-reviewed research and monitoring data and analysis collected during land management activities. Researchers publish new research and review papers on a regular basis, including information on the efficacy, human health and safety, and impacts to the environment. District staff regularly monitor professional literature to remain informed of current scientific findings.

Three current projects are underway to refine, update, and/or establish monitoring guidelines and protocols:

1. *Science Advisory Panel*
   On January 8, 2020 (R-20-01) the Board selected research questions for study by a Science Advisory Panel (SAP), including a question on monitoring: "How can the District effectively and efficiently monitor changes in priority plant and animal populations at the landscape scale?" The SAP will address this question in two phases, the first of which will be conducted between July and December 2020, and the second of which would be conducted (upon Board approval of funding for the second research phase) between January and June 2021. The first phase of research will seek to refine the District's monitoring objectives, identify species and communities the District wants to

prioritize, and develop a conceptual model for monitoring. In the second phase of research, the SAP would use that information to create a monitoring framework with the following elements:

- A clear problem statement that includes the temporal and spatial extent of the question;
- Ecological objectives that define desired conditions;
- Ecological and statistical justifications for monitoring elements and sampling design;
- A prioritized list of taxa that can be effectively and cost-efficiently monitored; and
- Recommendations for monitoring protocols, sampling designs, and monitoring intervals.

2. *Vegetation Map Updates*
Traditionally, ecosystem monitoring, conservation, and restoration have been conducted in a piecemeal manner at the local scale without regional landscape context. However, scientifically driven conservation and restoration decisions benefit greatly when they are based on regionally determined goals. Unfortunately, required data sets rarely exist for regionally important ecosystems. On January 23, 2019, the Board authorized the General Manager to enter into a multi-year cooperative agreement with Golden Gate National Parks Conservancy to lead in contracting for the San Mateo County regional vegetation mapping services (R-19-02). On May 27, 2020, the District expanded the project scope to include both Santa Clara and Santa Cruz Counties (R-20-50). The ultimate goals of the vegetation map update are to integrate the monitoring and assessment of ecological and environmental indicators with management practices.

3. *Wildland Fire Resiliency Program*
On May 13, 2020, the District held a California Environmental Quality Act Scoping Session for the Proposed Wildland Fire Resiliency Program (R-20-42). Included in the Wildland Fire Resiliency Program is a monitoring plan (Chapter 5) with associated protocols (Appendix that establishes baseline conditions for post treatment analysis, including pre- and post-project vegetation, soil, erosion, and water quality monitoring). All draft documents for the proposed program can be found at: https://www.openspace.org/our-work/projects/wfrp. The plan outlines a process to assess the achievement of individual fire resiliency project objectives in reducing fuel loads and identify outcomes in a manner consistent with other land management agencies to allow for comparable analysis. Monitoring of fuel loads allows the District to respond to changing conditions in real-time and adapt management activities.

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Driscoll Ranch Rangeland Monitoring - 2014

January 2015

Monitor: Clayton Koopmann

The District selected a new grazing tenant for the Driscoll Ranch property and the new tenant took over operations in January 2014 replacing Rudy Driscoll. The new tenant, Agco Hay Co., currently grazes the entire property (Sears, Foldger, and Wool) with approximately 190 cow/calf pairs. The cow herd is split into three groups which the tenant rotates between all pastures on the ranch. During the initial year of the lease agreement, the tenant installed over 20 new concrete water troughs, 7 new water storage tanks, and over 5 miles of new pipe to provide water to all pastures and enhance livestock distribution. Additionally, the tenant performed road maintenance/improvements, fence installation/repair, and treated purple starthistle throughout the year with herbicide application and hand removal.

In previous years, under Driscoll Management, nearly 300 head of cattle were run on the property year round and not all pastures were utilized. The overstocking and absence of pasture rotations resulted in unhealthy rangeland conditions on the property and an abundance of invasive vegetation. Following the initial year of management under Agco, the overall condition of the property, rangelands, and infrastructure have shown drastic improvements, even under current drought conditions. New infrastructure is well designed and well built, roads and fences are in good condition, residual dry matter (RDM) levels are within levels targeted in the grazing management plan, and invasive vegetation is far less than in years past.

Wool Ranch area (Pastures 6-8):

Historically pastures 6-8 were grazed extremely heavily and were over stocked. Cattle tended to hang out in the same locations all the time, especially around water sources. These pastures were grazed continually throughout the year and the gates all remained open with no pasture rotation or cattle exclusion from the creeks or ponds. Purple starthistle infestations were extreme in all pastures and dominated the majority of the open grassland areas and roadways in pastures 7 and 8. The overall RDM level in these pastures ranged from 0 lbs. to 600 lbs in most locations.

During 2014 Agco Hay reduced the stocking rate from historic numbers, installed and strategically placed 8 new water troughs, repaired old springs and existing water sources, installed 4 new water storage tanks, and two solar pumping systems in this area. The result was a reliable year-round water supply that allowed the tenant to rotate cattle between pastures and increased livestock distribution to achieve targeted RDM levels, averaging between 800 lbs. and 1200 lbs. across the entire area. The amount of purple starthistle is noticeably lower than previous years, grassland species diversity is higher, and wildlife numbers and diversity appear to be far higher. While purple starthistle has decreased, it is still present and should continue to be treated.

Additionally, the District installed a riparian fence along Harrington Creek to restrict livestock access to the stream channel. Agco has been diligent about maintaining the fence and ensuring that livestock aren't in Harrington Creek. The former tenant often left gates open and allowed cattle to utilize Harrington Creek as a primary water source where they would spend most of their time and had notable impacts to the stream channel, banks, and riparian vegetation.

Notes-

a. Extensive new water infrastructure is well built and functioning.
b. Purple starthistle has drastically decreased but is still present and requires continued treatment.
c. Old barn just south of DR-06 collapsed. Debris should be removed for safety.
d. Two ponds appeared to have dam failures as result of heavy December storms. Pond DR-09 and Pond DR-14 were both breached by water overflowing the dam.

Foldger Ranch area (Pastures 9-11):

Historically, the Driscoll family took in pasture cattle and ran stockers in Pastures 9-11, primarily grazing pastures 10 and 11. Pasture 9 had ample forage and water but was often not grazed because it was "too far" from the corrals according to former ranch manager. Pasture 11 was often grazed heavily with average RDM level between 0 and 400 lbs. Livestock water sources were not maintained and resulted in limited livestock distribution and cattle congregating in a few small areas.

Agco repaired 5 existing springs in these pastures, replaced old troughs, and relocated and repaired existing troughs at multiple locations. Additionally, they installed three new water storage tanks and four new concrete troughs in these pastures to enhance livestock distribution. New troughs were located on the ridge tops where water wasn't historically available. Overall, RDM levels were consistent and at targeted levels in all pastures in this area, even Pasture 9 which historically hadn't been grazed by Driscoll. The tenant repaired multiple fence lines and roads in this area. Overall invasive plant numbers are far lower than past years, though some purple star thistle is still present and will require continued attention.

Pond DR-18 has a breach in the dam (Photo Point P11-Wet) and completely full of cattails. This pond may be lost to future storms if the berm is not repaired. The road leading from pasture 11 out to pasture 10 is damaged by landslides and is narrow. This road is scheduled to be repaired with DFW grant funds in 2015.

Notes –

a. Rangeland conditions and grasslands are evenly grazed and look great in all pastures.
b. Brush encroachment is impacting grasslands in pastures 10 and 11.
c. Pond DR-18 needs to be repaired.

Sears Ranch areas (Pastures 1-5 and 12):

Historically, Driscoll's ran approximately 100-125 cows in pastures 1, 2, 3 and 4 year around coupled with the 'apple orchard' which is roughly 200 acres. Pastures 1 and 4 were grazed extremely heavily with much of the pasture displaying bare soil. Pasture 3 was grazed to roughly prescribed levels, though the upper portion of the pasture wasn't utilized as much as the lower portions. Additionally, these areas were heavily infested with invasive vegetation, most likely a result of persistently heavy use by cattle.

During 2014 Agco made numerous improvements to the water infrastructure in these pastures including the repair of two springs and installation of three new water troughs in the uplands of pasture 3, spring repair and two new troughs in pasture 5, and spring repair and trough installation in pasture 1 and 4. Additionally, they repaired and installed new fencing in many locations. As a result, the overall distribution of livestock was excellent with pastures grazed evenly and RDM levels within targeted levels. Invasive species in these pastures is far less than in years past, though purple starthistle remains to be a problem despite treatment by contractors and the tenant. Continued treatment in future years will be important in controlling infestation. During the summer of 2014 a large infestation of daisies dominated portions of pasture 4, most likely a remnant effect of long term overgrazing by the prior tenant. Cattle grazed down the daisies and pasture 4 looked good as of December 2014.

The tenant performed road maintenance on the road leading from the dog kennels up to the water tanks in pasture 3. This road is currently in fair condition but is scheduled to be repaired in 2015 using grant funds through DFW. The gravel driveway leasing to the Sears Ranch residence was repaired by the tenant as was the driveway leading to the dog kennels, though that section of road was damaged by winter storms in late 2014, primarily caused by an insufficient number of culverts and the road being sloped the wrong direction. The majority of storm water drains from the road near the corner of pastures 1, 2, and 4 where a large gully has formed and began to undercut the road.

Notes-

a. All pastures are grazed to within targeted RDM levels and look good.
b. Gully and road undercut along driveway near corner of pasture 1, 2, and 4 needs to be repaired along with drainage of driveway leading to kennels.
c. New infrastructure is functioning and really benefited overall grazing practices.
d. Road leading from kennels to water tanks in pasture 3 needs repairs (will occur in 2015).

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P1 - GRASS

MONITORS: Clayton Koopmann

PHOTO No. 6 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 1100 lb. 0-30% slope N/A >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities:

[ ] Native Grasses:

N/A WILDLIFE OBSERVED:

✓ GRAZING INFRASTRUCTURE: FENCE is GOOD

✓ ACCESS ROAD MAINTENANCE: ROAD is GOOD - GULLY ~~forming~~ WORSENING E of ROAD from RUNOFF !

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: PURPLE STARTHISTLE (2) - NEAR GATE

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P1-WET

MONITORS: Clayton Koopmann

PHOTO No. 1 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 900-1200 lb. 0-30% slope N/A >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [✓] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: Songbirds / Deer (4 bucks)

✓ GRAZING INFRASTRUCTURE: Fence & gate to N recently repaired

✓ ACCESS ROAD MAINTENANCE: Good

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Bull Thistle (2)
Italian Thistle (2)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P2 - Grass

MONITORS: Clayton Koopmann

PHOTO No. 4 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 1200-1400 lb. 0-30% slope N/A >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[✓] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities:

[✓] Native Grasses: Brome / Purple Needle Grass (good stand)

N/A WILDLIFE OBSERVED:

✓ GRAZING INFRASTRUCTURE: Fence/Gates are good

N/A ACCESS ROAD MAINTENANCE:

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

N/A INVASIVE SPECIES*: None

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P2-Wet

MONITORS: Clayton Koopmann

PHOTO No. 3 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 1600-1800 lb. 0-30% slope N/A >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[✓] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: Songbirds / Quail

✓ GRAZING INFRASTRUCTURE: Fence is good

N/A ACCESS ROAD MAINTENANCE:

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Bull Thistle (1)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P3-GRASS

MONITORS: Clayton Koopmann

PHOTO No. 8 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [✓]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 2,500 lb. 0-30% slope 1,000 lb. >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[✓] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: Deer (14)

N/A GRAZING INFRASTRUCTURE: 3 NEW Concrete TROUGHS ADDED TO P-3

✓ ACCESS ROAD MAINTENANCE: Improved by tenant (good) - waterline exposed ← 2015 ROAD WILL BE REDONE THROUGH GRANT W/ DFG.

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: ITALIAN THISTLE (2/3)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P3 -Wet

MONITORS: Clayton Koopmann

PHOTO No. 2 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

N/A RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: _____0-30% slope _____>30% slope

Estimated [ ] Actual Measurement [ ] (1200-1500 lb. + EAST)*

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [ ] Aquatic Habitat [✓] Riparian Habitat

[✓] Other Communities: Willows

[ ] Native Grasses: _____

N/A WILDLIFE OBSERVED:

✓ GRAZING INFRASTRUCTURE: Fence is good - Gate overgrown w/ BRUSH & NOT PASSABLE BY FOOT.

N/A ACCESS ROAD MAINTENANCE:

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

N/A INVASIVE SPECIES*: NONE

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P4 - Grass

MONITORS: Clayton Koopmann

PHOTO No. 5 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 800-1000 lb. 0-30% slope 600-800 lb. >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [ ] Coyote Brush/Scrub

[ ] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

N/A WILDLIFE OBSERVED:

N/A GRAZING INFRASTRUCTURE:

✓ ACCESS ROAD MAINTENANCE: Good

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: ITALIAN THISTLE (2)
DANDELIONS - Were "4" BUT NOW GONE (Sept. - Jan)
Purple Starthistle (2) - rosettes near gravel road

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P4-Wet

MONITORS: Clayton Koopmann

PHOTO No. 7 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 700-800 lb. 0-30% slope N/A >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [ ] Coyote Brush/Scrub

[ ] Oak Woodland [ ] Aquatic Habitat [✓] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: Songbirds

✓ GRAZING INFRASTRUCTURE: Corrals recently repaired / BARN ROOF is damaged /
* New concrete water trough & spring repaired (photo)

✓ ACCESS ROAD MAINTENANCE: Good

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: ITALIAN THISTLE (3)
Purple Starthistle (2) - rosettes

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P5-Grass

MONITORS: Clayton Koopmann

PHOTO No. 10 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 800-1000 lb. 0-30% slope N/A >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [ ] Coyote Brush/Scrub

[✓] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: DEER (14)

N/A GRAZING INFRASTRUCTURE:

✓ ACCESS ROAD MAINTENANCE: Good - Tenant has performed maintenance/clean culverts/diversions

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Purple Starthistle (2) - ALONG ACCESS ROAD
Yellow Starthistle (2)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P5-Wet

MONITORS: Clayton Koopmann

PHOTO No. 9 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 1000-1100 lb. 0-30% slope N/A >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [✓] Mixed Forest [ ] Coyote Brush/Scrub

[ ] Oak Woodland [✓] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

N/A WILDLIFE OBSERVED:

✓ GRAZING INFRASTRUCTURE: Fence Good - New fence around DR-05 following pond restoration in 2014

✓ ACCESS ROAD MAINTENANCE: Good

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: BULL THISTLE (2)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P6 - GRASS

MONITORS: Clayton Koopmann

PHOTO No. 11 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 1000-1200 lb. 0-30% slope 1200-1400 lb. >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[✓] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities:

[✓] Native Grasses: Brome / wild ~~Barley~~ Rye - Very good stand

✓ WILDLIFE OBSERVED: Deer (8)

N/A GRAZING INFRASTRUCTURE:

✓ ACCESS ROAD MAINTENANCE: Good- minor rutting

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

N/A INVASIVE SPECIES*: None

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT A7-Grass

MONITORS: Clayton Koopmann

PHOTO No. 16 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 1000-1200 lb. 0-30% slope N/A >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: Deer (9)

N/A GRAZING INFRASTRUCTURE:

✓ ACCESS ROAD MAINTENANCE: Good

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Purple starthistle (2/3) - Roads

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P7 - Wet

MONITORS: Clayton Koopmann

PHOTO No. 15 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 800-1000 lb. 0-30% slope N/A >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [✓] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: Deer (9) / 6 mallard (3 nesting pairs)

* ~~N/A~~ GRAZING INFRASTRUCTURE: Pond - Major breach in dam (New!)

✓ ACCESS ROAD MAINTENANCE: Good

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Purple Starthistle (2/3) - Roads

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P8- GRASS

MONITORS: Clayton Koopmann

PHOTO No. 14 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 1000lb. 0-30% slope 1200-1400 lb. >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: Deer (8 bucks)

✓ GRAZING INFRASTRUCTURE: fences good / 2 new trough & new tank w/ pump

✓ ACCESS ROAD MAINTENANCE: Good !

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Purple Starthistle (2)
Milk Thistle (2)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P8-Wet1

MONITORS: Clayton Koopmann

PHOTO No. 12 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 800-1000 0-30% slope 1100 lb. >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [✓] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: 6 Mallards (3 pairs)

✓ GRAZING INFRASTRUCTURE: Fences & Gates are good

✓ ACCESS ROAD MAINTENANCE: Good

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Purple Starthistle (5) - Along Roads
Bull Thistle (2)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

PLACE PHOTO HERE

ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P8 - Wet 2

MONITORS: Clayton Koopmann

PHOTO No. 13 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: _____0-30% slope _____>30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [✓] Mixed Forest [ ] Coyote Brush/Scrub

[ ] Oak Woodland [✓] Aquatic Habitat [ ] Riparian Habitat

[✓] Other Communities: Willows

[✓] Native Grasses: Purple needle grass - on road (very strong stand)

✓ WILDLIFE OBSERVED: Songbirds

N/A GRAZING INFRASTRUCTURE:

✓ ACCESS ROAD MAINTENANCE: Rough & very overgrown w/ BRUSH - Large rut

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Bull Thistle (1*)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT PG-GRASS-2

MONITORS: Clayton Koopmann

PHOTO No. 22 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [✓]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 800-1000 0-30% slope 1000-1200 >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

N/A WILDLIFE OBSERVED:

N/A GRAZING INFRASTRUCTURE:

✓ ACCESS ROAD MAINTENANCE: OKAY BUT UNMAINTAINED.

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: BULL THISTLE (2/3)
PURPLE STARTHISTLE (2) - Mainly along road

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P9 - WET P9 - Grass #1

MONITORS: Clayton Koopmann

PHOTO No. 23 & 24 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 800-1000 0-30% slope 1000-1200 16. >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [✓] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

N/A WILDLIFE OBSERVED:

✓ GRAZING INFRASTRUCTURE: SPRING BOXES & ENCLOSURES RE-BUILT BY TENANT

✓ ACCESS ROAD MAINTENANCE: ROUGH W/ RUTS AND LARGE LANDSLIDE

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: BULL THISTLE (2*)
COYOTE BRUSH - ENCROACHMENT WORSENING

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

PLACE PHOTO HERE

ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P-10 - GRASS #1

MONITORS: Clayton Koopmann

PHOTO No. 20 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: ~~800-1000~~ 1200-1400 lb. 0-30% slope 1000 lb. >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

N/A WILDLIFE OBSERVED:

* ✓ GRAZING INFRASTRUCTURE: New troughs installed on ridge top in P-10 & P-11 and new water line fed via spring near hunting cabin. Tank & Pump

✓ ACCESS ROAD MAINTENANCE: Rough (cow prints) / Trench open in road from runoff

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Bull Thistle (1)
Italian Thistle (2)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P10-Grass #2

MONITORS: Clayton Koopmann

PHOTO No. 21 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 1200-1400 lb. 0-30% slope 1000-1100 lb. >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[✓] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: Deer (2)

✓ GRAZING INFRASTRUCTURE: RELOCATED AND LEVELE IRON WATER TROUGH

N/A ACCESS ROAD MAINTENANCE:

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Bull Thistle (1)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P11 - Grass

MONITORS: Clayton Koopmann

PHOTO No. 17 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 2000 lb. 0-30% slope 1000 lb. >30% slope

Estimated [✓] Actual Measurement [ ]

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[ ] Oak Woodland [ ] Aquatic Habitat [ ] Riparian Habitat

[ ] Other Communities: _____

[ ] Native Grasses: _____

✓ WILDLIFE OBSERVED: SCRUB JAYS

N/A GRAZING INFRASTRUCTURE:

* ✓ ACCESS ROAD MAINTENANCE: VERY VERY ROUGH W/ RUTS/DITCHES/SLIDES / POT HOLES

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: ITALIAN THISTLE (2') - ALONG ROAD

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GRAZING MONITORING CHECKLIST

PRESERVE Driscoll Ranch DATE Jan 7-8, 2015 PHOTO POINT P11 - Wet (NE) P11 - Wet (SW)

MONITORS: Clayton Koopmann

PHOTO No. 18-19 PURPOSE - Infrastructure [ ] Range Health [✓] Landscape [ ]

MONITORING ITEMS:

✓ RESIDUAL DRY MATTER (RDM) LBs. PER ACRE: 800-1000 0-30% slope N/A >30% slope

Estimated [✓] Actual Measurement [ ] 1500-2500 on uplands in areas away from pond/trough.

✓ PLANT COMMUNITIES OBSERVED:

[✓] Annual Grassland [ ] Mixed Forest [✓] Coyote Brush/Scrub

[✓] Oak Woodland [✓] Aquatic Habitat [ ] Riparian Habitat

[✓] Other Communities: Redwoods & Willows

[ ] Native Grasses:

✓ WILDLIFE OBSERVED: Deer (3)

✓ GRAZING INFRASTRUCTURE: Trough relocate & replumbed - working well - moved away from wetland.

✓ ACCESS ROAD MAINTENANCE: Rutted / Large ditch

✓ YEARLY RAINFALL (INCHES): [✓] < AVERAGE [ ] AVERAGE [ ] >AVERAGE

✓ INVASIVE SPECIES*: Cattails (3/4) - Dominate Pond
Italian Thistle (3) Poison Hemlock (2)
Bull Thistle (2) Berries (2)

*Relative Abundances: 1 = 1-10 / 2 = 10-100 / 3 = 100+ / 4 = Dominant Vegetation Type

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ATTACHMENT 1

ATTACHMENT 1

BAY AREA OFFICE
1720 Solano Avenue
Berkeley, CA 94707
Phone: (510) 559-9603
Fax: (510) 559-9605
www.vollmarconsulting.com

2019 BOTANICAL RESOURCES SURVEY REPORT

JOHNSTON RANCH
MIRAMONTES RIDGE OPEN SPACE PRESERVE

Half Moon Bay, San Mateo County, California

Prepared for:

Midpeninsula Regional Open Space District
330 Distel Circle, Los Altos, CA 94022
Contact: Coty Sifuentes-Winter,
650/625-6560

Prepared by:

Vollmar Natural Lands Consulting
1720 Solano Avenue, Berkeley, CA 94707
Contact: Jake Schweitzer
510/559-9603

November 2019

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Appendix B. List of All Vascular Plant Taxa Identified within the Study Area.
Appendix C. Special-Status Vascular Plant Taxa Documented in the Vicinity of the Study Area
Appendix D. Habitat Relevé Forms
Appendix E. Habitat Relevé Form Instructions and Documentation

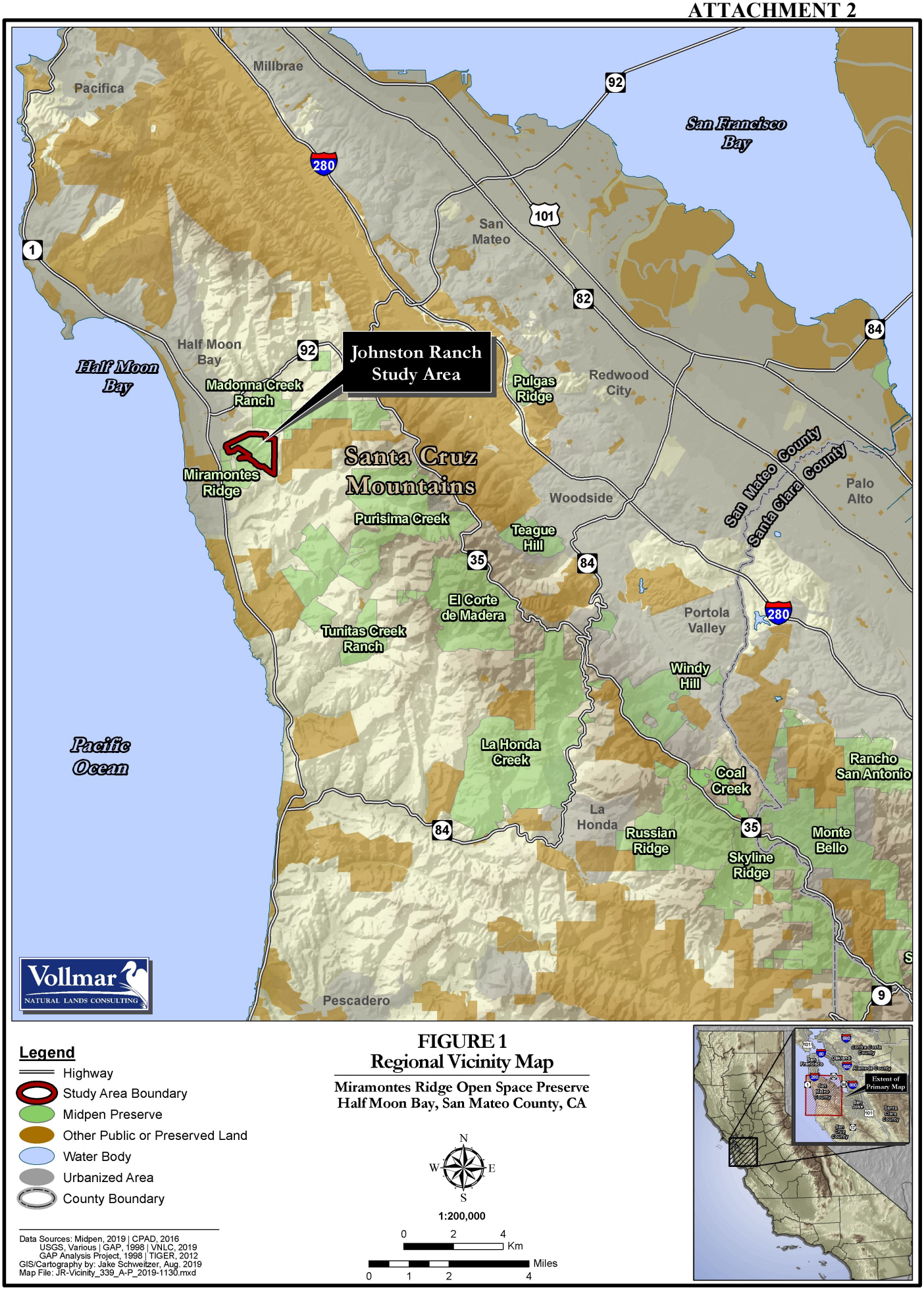
1.0 INTRODUCTION

This document presents the methods and results for botanical resource surveys conducted within the Johnston Ranch portion of the Miramontes Ridge Open Space Preserve (study area or property), located in northwestern San Mateo County, California (**Figure 1**). The botanical resource surveys were conducted by botanists from Vollmar Natural Lands Consulting (VNLC) on behalf of the Midpeninsula Regional Open Space District (District). The surveys were conducted for the purpose of compiling botanical information for the property, which has recently been acquired and established as an open space preserve. The surveys included focused surveys for special-status botanical resources as well as plot-based habitat relevé surveys to record plant species richness and habitat conditions within predominant habitat types in the study area. The surveys were scheduled to coincide with the early spring, peak spring, and summer botanical seasons for the region, during the blooming periods of special-status plants with potential to occur in the study area. No special-status plant species were observed within the study area, though one sensitive plant community as well as wetland and riparian habitats were documented during the surveys.

The Johnston Ranch study area is 418.6 acres, consisting of three separate parcels. The study area is located within the approximately 870-acre Miramontes Ridge Open Space Preserve (Preserve), which is owned and managed by the District for the purpose of habitat preservation. The study area is located just south of the City of Half Moon Bay, California (population approximately 13,000). The site is mapped on the Half Moon Bay 7½ minute U.S. Geological Survey (USGS) topographic quadrangle (**Figure 2**), within the Miramontes land grant (no township, range, or section designations). The study area is accessible from State Highway 1 by heading east on Higgins Canyon Road, which is just south of developed portions of Half Moon Bay. The property is adjacent to Higgins Canyon Road, and the main entrance to the site is 0.8 mile east of Highway 1 (**Figure 2**).

The study area consists primarily of habitats that may be broadly defined as open grasslands, coastal scrub, riparian woodland, and introduced woodlands. There are a couple of cattle stock ponds as well as fairly extensive wetlands within the grasslands. The study area is currently managed as a cattle ranch, and all existing infrastructure is reflective of this land use—unlike other portions of the greater Preserve, there are no trails or associated staging areas or other infrastructure that serve such recreational purposes. In general, the onsite grassland habitats are dominated by introduced annual plants, though there are components of coastal prairie habitats, and the grazing maintains important habitat for wildlife in the area. The District implements grazing as a management tool to sustain the grassland habitat for wildlife and to generally maintain biodiversity on the site.

Aside from passive recreation and cattle ranching, land use in the region consists primarily of agriculture and tourism of types typically associated with the coast. The residential development within and adjacent to the City of Half Moon Bay continues to expand at a relatively slow but steady pace, underscoring the value of the study area and Preserve as open space and as a working cattle ranch, thus contributing to the preservation of rural and agricultural landscapes in the region.



Legend

- Highway
- Study Area Boundary
- Midpen Preserve
- Other Public or Preserved Land
- Water Body
- Urbanized Area
- County Boundary

Data Sources: Midpen, 2019 | CPAD, 2016
USGS, Various | GAP, 1998 | VNLC, 2019
GAP Analysis Project, 1998 | TIGER, 2012
GIS/Cartography by: Jake Schweitzer, Aug. 2019
Map File: JR-Vicinity_339_A-P_2019-1130.mxd

FIGURE 1
Regional Vicinity Map

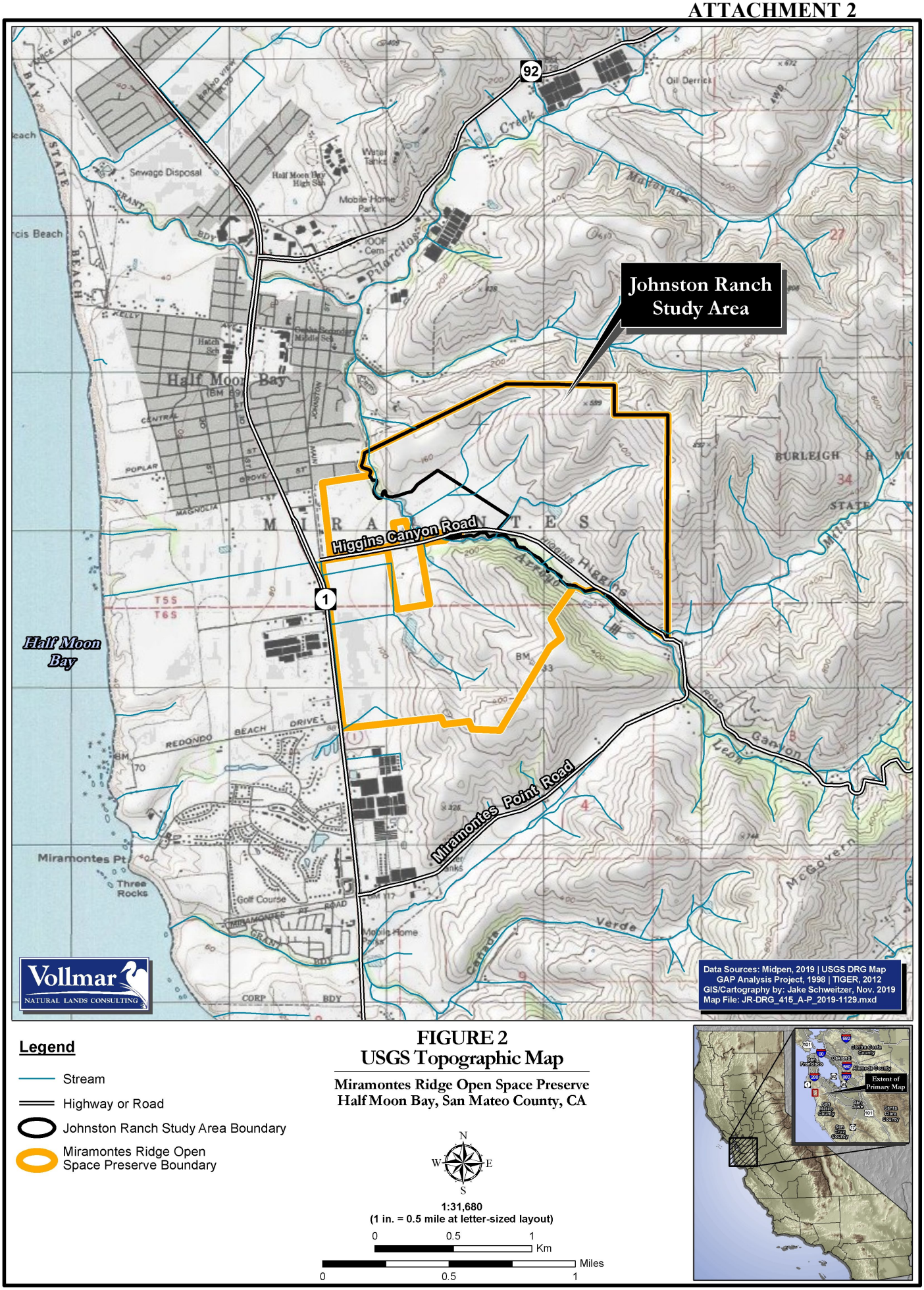
Miramontes Ridge Open Space Preserve
Half Moon Bay, San Mateo County, CA

N
W E
S

1:200,000

0 2 4 Km

0 1 2 4 Miles



Legend

- Stream
- Highway or Road
- Johnston Ranch Study Area Boundary
- Miramontes Ridge Open Space Preserve Boundary

FIGURE 2
USGS Topographic Map

Miramontes Ridge Open Space Preserve
Half Moon Bay, San Mateo County, CA

N W E S

1:31,680
(1 in. = 0.5 mile at letter-sized layout)

0 0.5 1 Km

0 0.5 1 Miles

2.0 TARGETED BOTANICAL RESOURCES

For the purposes of this report, special-status plants include federal and/or California state listed species and species of concern as well as species included within an inventory maintained by the California Native Plant Society (CNPS), including taxa of all ranks.

Sensitive habitats were also targeted as part of the botanical study. Sensitive plant communities include those designated as such by the California Department of Fish and Wildlife (CDFW), either in the List of California Sensitive Natural Communities (2018) or as alliances classified in the Manual of California Vegetation (MCV) (Sawyer et al. 2009). Alliances designated as global or state rank ("G" or "S", respectively) 1, 2, or 3 in the MCV are considered "rare or threatened" at the global and/or state level, and are therefore considered sensitive. In addition, wetland and riparian habitats are considered sensitive and are regulated by environmental regulatory agencies.

3.0 METHODS

3.1 Preliminary Review and Field Preparation

A map and a list of special-status plants documented in the vicinity of the study area were compiled prior to conducting field surveys, in order to identify special-status taxa with potential to occur on the site. The map was compiled from the most recent spatial data within the California Natural Diversity Database (CNDDB), as available from the CDFW (2019). The list was compiled from a nine-quadrangle search using the CNPS's online "Inventory of Rare and Endangered Plants" (CNPS 2019). Specifically, the search centered on the Half Moon Bay and included all eight surrounding quadrangles. The list provides information pertaining to the special-status plants, including taxonomic status, preferred habitat, elevation range, blooming period, and a determination of the presence of suitable habitat for each plant in the study area. This information guided the development of the field survey schedule and strategies for those special-status plants with potential to occur in the study area. The list of special-status plant taxa documented in the vicinity is available as **Appendix C**. The surveys were scheduled to coincide with the blooming periods of all special-status plants for which potentially suitable habitats occur in the study area.

In preparation for the habitat relevé surveys, dominant habitat types were identified on a preliminary basis using high-resolution aerial photography and generalized habitat data for the region. Two sources of aerial photography were used (see **Section 3.3** below), and the habitat data primarily consisted of Conservation Lands Network vegetation data (2011). Distinctly different habitat types were targeted for field surveys to verify the habitat types and to evaluate as potential locations for relevé plots.

3.2 Field Surveys

The botanical field surveys were conducted in the study area by Jake Schweitzer and John Vollmar, both Senior Botanists with VNLC. The 2019 surveys were conducted on March 26, April 24, and July 17. In addition, botanical information was recorded during separate plot relevé surveys on April 27. The rare plant surveys conformed to the CNPS 'Intuitive Controlled' method, whereby the entire study area was investigated, though areas with higher potential to support special-status or otherwise unique plants were surveyed with greater intensity. All plant taxa present were recorded according to the lowest taxonomic level (i.e., species, subspecies, or

variety as applicable) and dominant species and general habitat conditions were noted throughout the study area. Project maps and GPS background files depicting the project boundaries, soil unit boundaries, and other features were used to navigate throughout the study area. Field manuals, particularly the "Jepson Manual" (Baldwin et al. 2012), "Flora of the Santa Cruz Mountains of California" (Thomas 1961), and "Plants of the San Francisco Bay Region" (Beidleman and Kozloff 2014) were used to confirm the taxonomy of some plant taxa as necessary.

The methods used in the habitat plot relevé surveys correspond to those developed by the CNPS and CDFW. Plot locations were established within representative locations of dominant habitat types occurring within the study area, with an effort the capture the site's habitat diversity. "Representative" locations were selected based on conditions typically observed within the habitat types, including constituent plants and other biotic conditions as well as abiotic conditions. A total of 12 plots were established throughout the study area. Plot sizes for woody habitats (shrublands and woodlands) were 20x20 meters, and for herbaceous habitats (grasslands and herbaceous wetlands) were 10x10 meters. Data were recorded within a data collection form developed by the CNPS and CDFW for the purpose of habitat assessment and plant community classification. Parameters recorded within the plots include vegetation cover and height for each stratum (i.e., tree, shrub, and herb layers), all plant taxa and the estimated cover value of each, topography and landscape position, soil texture, hydrology, habitat elements (e.g., rock cover, litter cover, etc.), and disturbances such as invasive weeds or soil disturbance. The completed forms for each habitat type are presented in **Appendix D**. The documentation for the form and associated field methods is provided as **Appendix E**.

Within each habitat type, the most prevalent plant species from each stratum (tree, shrub/sapling/vine, and herb) were recorded in order of dominance into professional GPS units (Trimble GeoXH 6000 units) and iPads, with an effort to classify the habitat types according to the CNPS classification system (2001). The locations and population ranges of invasive plants were also recorded with GPS units on an opportunistic basis, in order to identify areas of potential management needs. The documentation of invasive plants focused on highly invasive plant species and species with potential to cause significant detrimental impacts to natural habitats within the Preserve. Representative digital photographs were taken of onsite plant communities and of general habitat conditions (**Appendix A**).

3.3 Remote Mapping

Subsequent to completing the field surveys, habitat GPS data mapped within the study area (as described above) were overlaid onto aerial photography and topographic data using ArcGIS software. The GPS data and digital photos recorded during the field surveys were used to accurately classify habitat types and boundaries with respect to their signatures on the air photos. Two sets of air photos from two different timeframes were used in the analysis, including Digital Globe 0.5-meter resolution color photography from August of 2017, and National Aerial Imagery Program (NAIP) 0.6-meter resolution color infrared (CIR) photography from June of 2016. Each photo set provided distinct advantages. Since the Digital Globe imagery is provided via ArcGIS software, it was the primary imagery used to digitize habitat polygons. The NAIP imagery allows for analysis of vegetation cover using the infrared spectral value. Using the CIR imagery, the cover and type of vegetation is easier to discern. A minimum mapping unit (MMU)

of approximately 0.25 acre was employed in the habitat analysis, based on the confidence level of field data as well as the quality of the available aerial imagery for the study area. The MMU was reduced for stock ponds, one of which is below 0.25 acre. In order to ensure consistency in the use of aerial imagery and digitized lines, the habitat boundaries were digitized at a scale of 1:1,200. As each newly identified feature was digitized, the polygon was coded according to habitat type and level of confidence. The confidence level assigned is "High" or "Moderate" based on characteristics of the aerial photography and similarity of the photography to habitat types confirmed in the field. As noted above, the habitat type coding corresponds to the CNPS habitat type classification (2001).

4.0 Environmental Setting

4.1 Regional Setting

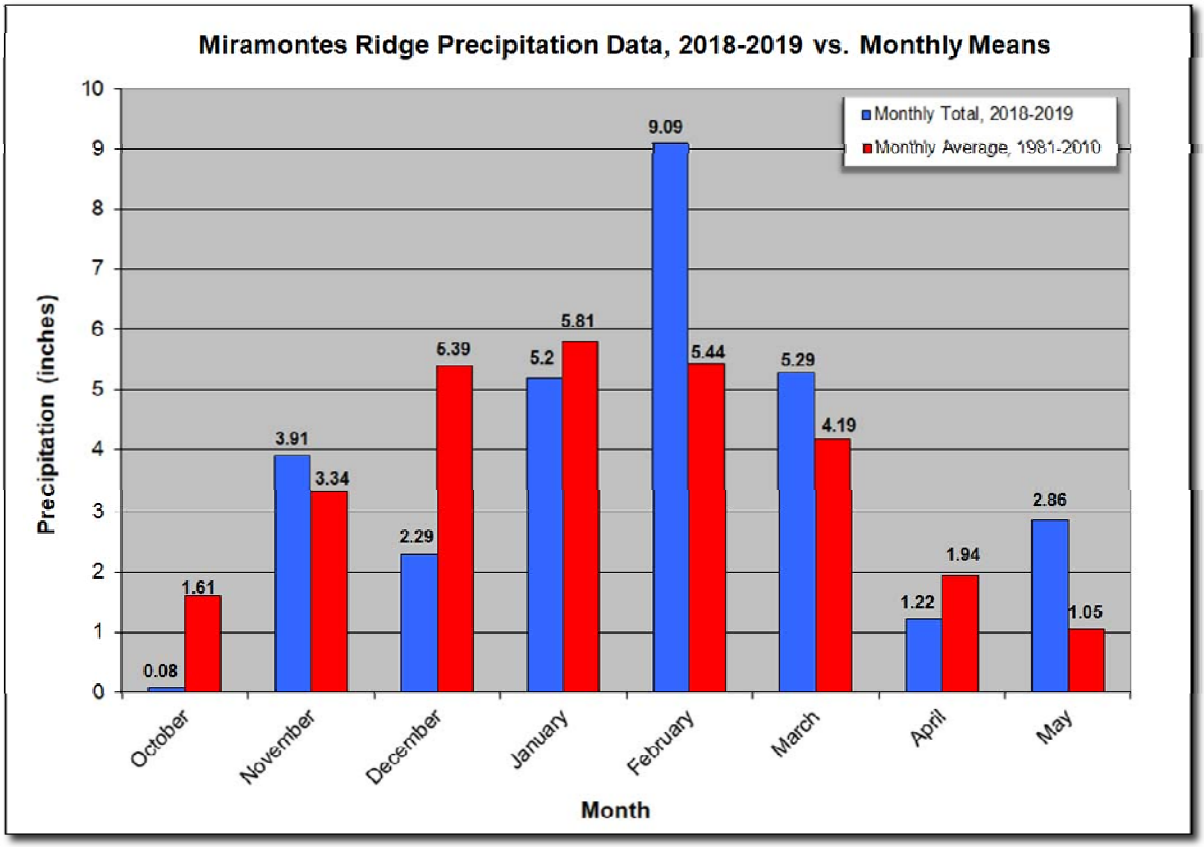
The study area encompasses the transition from flat coastal terrace to the lower western foothills of the northern Santa Cruz Mountains, just south of Half Moon Bay, California. The area is mapped along the boundary of the Jepson Manual's Central Coast (CCo) and San Francisco Bay Area (SnFrB) floristic subregions (Baldwin et al. 2012). The CCo Subregion extends from Bodega Bay (Sonoma County) in the north to Point Conception (Santa Barbara County) in the south. It includes coastal vegetation, with salt marshes and coastal prairie in the northern portion and coastal sage scrub in the southern portion. The SnFrB Subregion is defined as encompassing a notable diversity of vegetation types, from very wet redwood forest to dry oak/pine woodland and chaparral (ibid). The study area is only one mile from Half Moon Bay and the Pacific Ocean, and is on the windward side of the crest of the Santa Cruz Mountains. Therefore, it is subject to relatively high moisture levels, in the form of both precipitation and fog, as well as salt spray, and this is reflected in the plant communities. The most prevalent plant communities are grassland and coastal scrub, along with tree species that thrive in high levels of moisture and are tolerant of salt spray. Absent from the study area are xeric plant communities such as chaparral and interior oak woodlands, as well as communities associated with the immediate coast, such as coastal strand, coastal bluff scrub, and salt marsh.

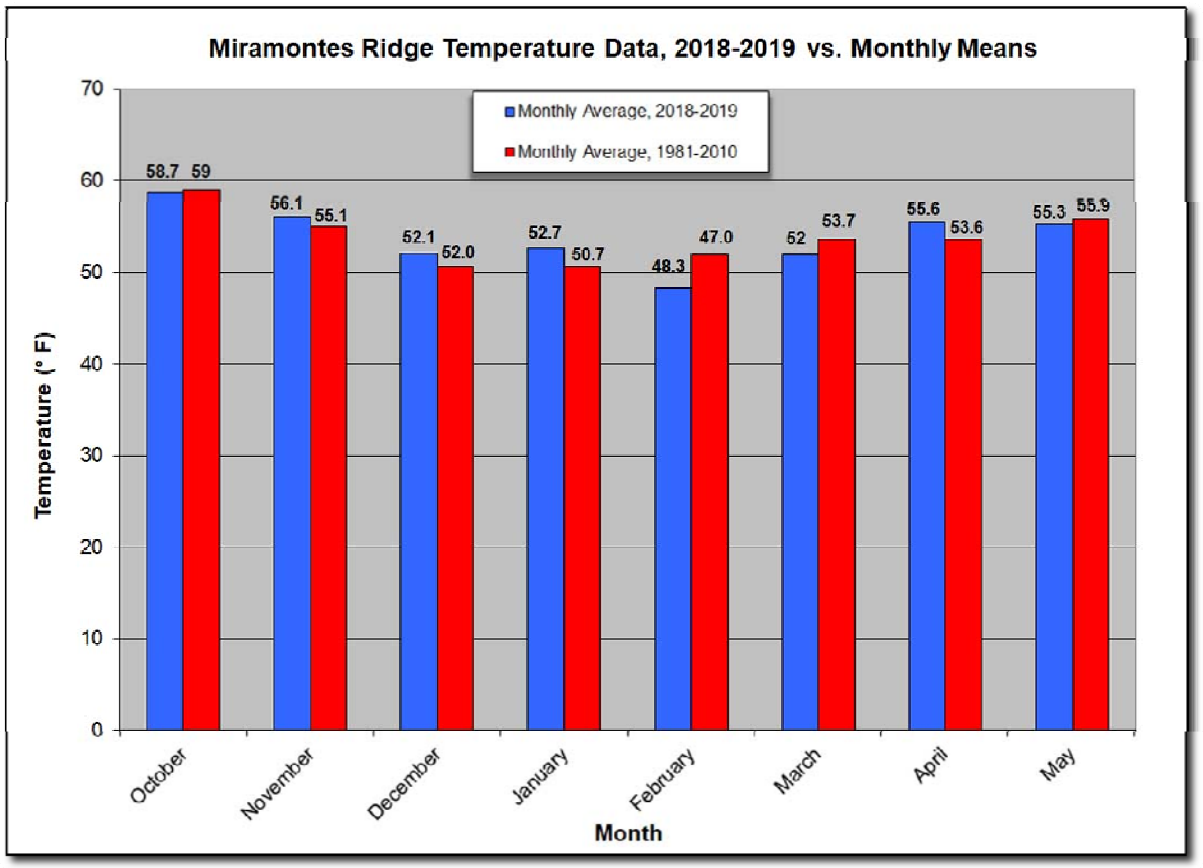
Elevation within the study area ranges from approximately 83 to 710 feet (25 to 216 meters) above sea level (USGS 1997), with elevation increasing from northwest to the northeast (**Figure 2**). Elevation continues to increase eastward up to approximately 2,000 feet at the crest of the northern Santa Cruz Mountains, a little over three miles from the study area. Though there are north-south trending ridges and valleys between the crest and the Pacific Ocean, elevation generally decreases from the crest toward the coast. Several prominent drainages conduct water from the hill slopes westward toward the Pacific Ocean, and have carved out valleys along their descent. The study area is within the Arroyo Leon Watershed (USGS 2013). Several streams within the study area flow southwestward into Arroyo Leon, which flows north into Pilarcitos Creek, which in turn flows west and discharges into Half Moon Bay.

4.2 Climate

The climate of the study area and surrounding vicinity is characterized by cool, wet winters and warm, mostly rainless summers as well as high inter- and intra-annual variability in precipitation. The study area is within the "Western Mountains, Valleys, and Coast Region" of the Army

Figure 3. Wet Season Monthly Temperature and Precipitation





Source: PRISM Climate Data (2019).

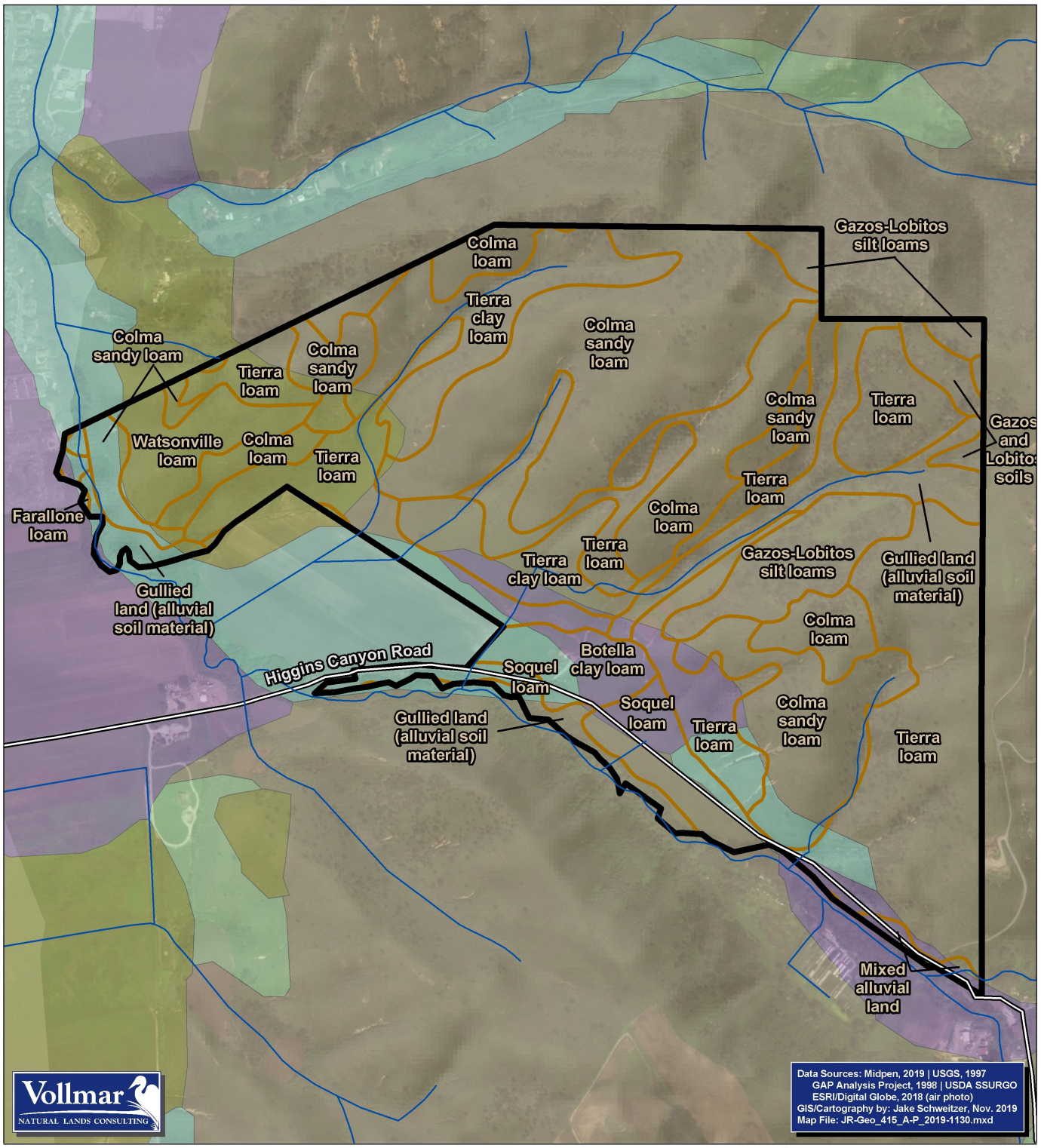
Corps of Engineers climate zones (ACOE 2010), which may be defined for floristic analyses as "coastal Mediterranean." On average, the area receives 29.6 inches of precipitation (**Figure 3)** (PRISM 2019). However, because the study area is significantly influenced by coastal maritime weather patterns, considerable moisture is available as fog through the "dry" summer season. In turn, the moisture serves to moderate temperatures, maintaining a relatively cool summer temperature with minimal fluctuations. The average annual temperature in the area (from 1981 to 2010) is 53.8 degrees, and average temperatures each month range from a low of 50.7 degrees Fahrenheit in January to a high of 61.8 degrees in September (**Figure 3**). The highest average monthly temperature is in September, as summertime fog serves to suppress temperatures such that June, July, and August experience average temperatures of only 58.5, 61.1, and 61.3 degrees, respectively (ibid).

As shown in **Figure 3** above, the study area experienced slightly higher than average rainfall during the 2018-2019 wet season, with precipitation amounting to 29.9 inches compared to a seasonal average of 28.8—104 percent of normal. Moreover, the precipitation levels were quite irregular from month to month during the wet season, with October, December, and April experiencing much less than average precipitation (5%, 42%, and 63% of normal, respectively), but all other months except January (which was only slightly lower than normal) experiencing greater than average during the timeframe. February experienced 167 percent of average precipitation. Despite the erratic precipitation patterns, average temperatures during the same timeframe were identical to the mean, at least as averaged over the wet season (100% of normal). It is expected that the 2018-2019 wet season, which is also the primary growing season for the region, provided fairly normal to slightly above average conditions for plant growth and persistence. Based on observations in the field, the high precipitation levels occurring in late winter/early spring (i.e., in February), and then again in late spring (May), both delayed and extended the blooming period for many plant species.

4.3 Geology and Soils

Geology

Four geologic formations are mapped in the study area, including Purisima formation, undividuated, late Pleistocene alluvium, Pleistocene marine terrace deposits, and medium-grained Holocene alluvium (**Figure 4**). All of these are relatively recent, primarily Pleistocene to Holocene units (i.e., several million to less than 10,000 years old) of sedimentary rocks (USGS 1998). The sediments have been uplifted by tectonic activity, then more recently incised by streams. Most of the sediments are originally derived from materials deposited in shallow marine environments resulting from turbidity currents (the marine equivalent of landslides, possibly caused by earthquakes) from the tectonic plate edges. However, for the most part, the materials are continental in origin. The majority of the site is mapped as Purisima formation, which is described as a light-colored, fossil-rich formation that is generally subject to gullying and other forms of erosion (Sloan 2006). Aside from problems associated with erosion, the mostly continental materials tend to provide relatively abundant nutrients that are necessary for plant growth, especially as compared to serpentinite and other materials from deeper within the earth.



Legend

- Stream
- Road
- Study Area Boundary
- Soil Unit Boundary (see map labels)

Geologic Formations*

- Medium-grained Holocene Alluvium
- Late Pleistocene Alluvium
- Pleistocene Marine Terrace Deposits
- Undividuated, Unmapped Quaternary Deposits
- Purisima Formation, Undividuated

*Source: USGS, based on open-file report 97-744
Legend names have been simplified

FIGURE 4
Geology and Soil Units Map

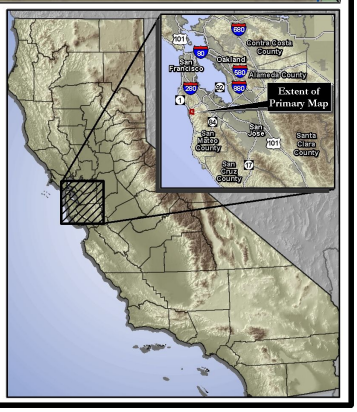
Miramontes Ridge Open Space Preserve
Half Moon Bay, San Mateo County, CA

N W E S

1:12,000
(1 in. = 1,000 ft. at letter-sized layout)

0 250 500 Meters

0 500 1,000 2,000 Feet



Soil Units

Excluding soil units that comprise less than one percent of the study area, 10 soil units are mapped within the area. The majority of the site (57.1%) is mapped as either Tierra loam or Colma sandy loam, as shown on **Figure 4**. Both of these are acidic soils derived from sedimentary materials with high loam contents and moderate organic contents (USDA 2019). **Table 1** below presents characteristics of the soil units that are significant for botanical resources. Note that all of the remaining units are also predominantly forms of loam and also derived from sedimentary materials. As the table indicates, the soil units are also generally similar in other parameters—with the exception of Botella clay loam, organic matter is low-to-moderate, and pH values are generally moderately acidic to neutral. Given this available information, all of the units may be considered moderately fertile. Two units, Soquel loam and Botella clay loam, are considered to be prime farmland soil if irrigated. Most of the soils sampled as part of data collection for the plot relevés featured at least some amount of silt and clay, along with the more dominant loam. Other than small amounts of gravel, rocks of any size are uncommon in the study area.

With the exception of the riparian corridors and perhaps some of the low-lying areas with clay soils, coastal scrub is the presumed climax plant community—in the absence of disturbances such as fire and grazing, upland habitats would likely become shrublands. One aspect of the soils that is likely to play a role in the trends of plant cover is the high susceptibility of the soils to erosion. The Purisima formation soils along the hill slopes are very well drained to excessively well drained, and this has contributed to topographic diversity, including the formation of streams and extensive gullying. The streams primarily support plant communities that are tolerant—or even dependent on—soil disturbance. In addition, a number of weedy plant species are quick to colonize eroded habitats, as is evident in stands of pampas grass (*Cortaderia jubata*) within gullies. **Figure 5** depicts mapped plant communities within the study area, including occurrences of invasive weeds. The study area plant communities are described in **Section 5.2** below.

TABLE 1. Characteristics of Soil Units Mapped within the Study Area

Soil Unit Name and Percent of Study Area[1]	Parent Material	Surface Texture[2]	pH[2]	Organic Matter[2]
Tierra loam (31.3%)	Alluvium derived from sedimentary rock	Loam	5.6, 5.8[3]	0.48-1.67%[3]
Colma sandy loam (25.8%)	Marine deposits	Sandy loam	6.1	0.63%
Tierra clay loam (9.7%)	Alluvium derived from sedimentary rock	Clay loam	5.6	0.56%
Colma loam (9.6%)	Marine deposits	Loam	6.1	2.15%
Gullied land (6.7%)	Alluvium	variable	variable	variable
Gazos-Lobitos silt loams (5.2%)	Shale	Silt loam	6.6	1.85%
Soquel loam (3.9%)	Alluvium derived from sedimentary rock	Loam	7.0	2.00%
Watsonville loam (3.2%)	Alluvium derived from sedimentary rock	Loam	5.7	1.01%
Botella clay loam (2.5%)	Alluvium derived from sedimentary rock	Clay loam	6.7	4.00%
Gazos and Lobitos soils (1.3%)	Shale	Silt loam	6.7	1.61%

Source: U.S. Department of Agriculture Natural Resources Conservation Service, SoilWeb website, 2019. Excludes slope descriptors.
1. The remaining 0.8% of the site consists of four soil units that comprise a small fraction of one percent.
2. Dominant condition. Values for surface texture, pH and organic matter correspond to the top 24 inches.
3. Depending upon erosive value of unit.

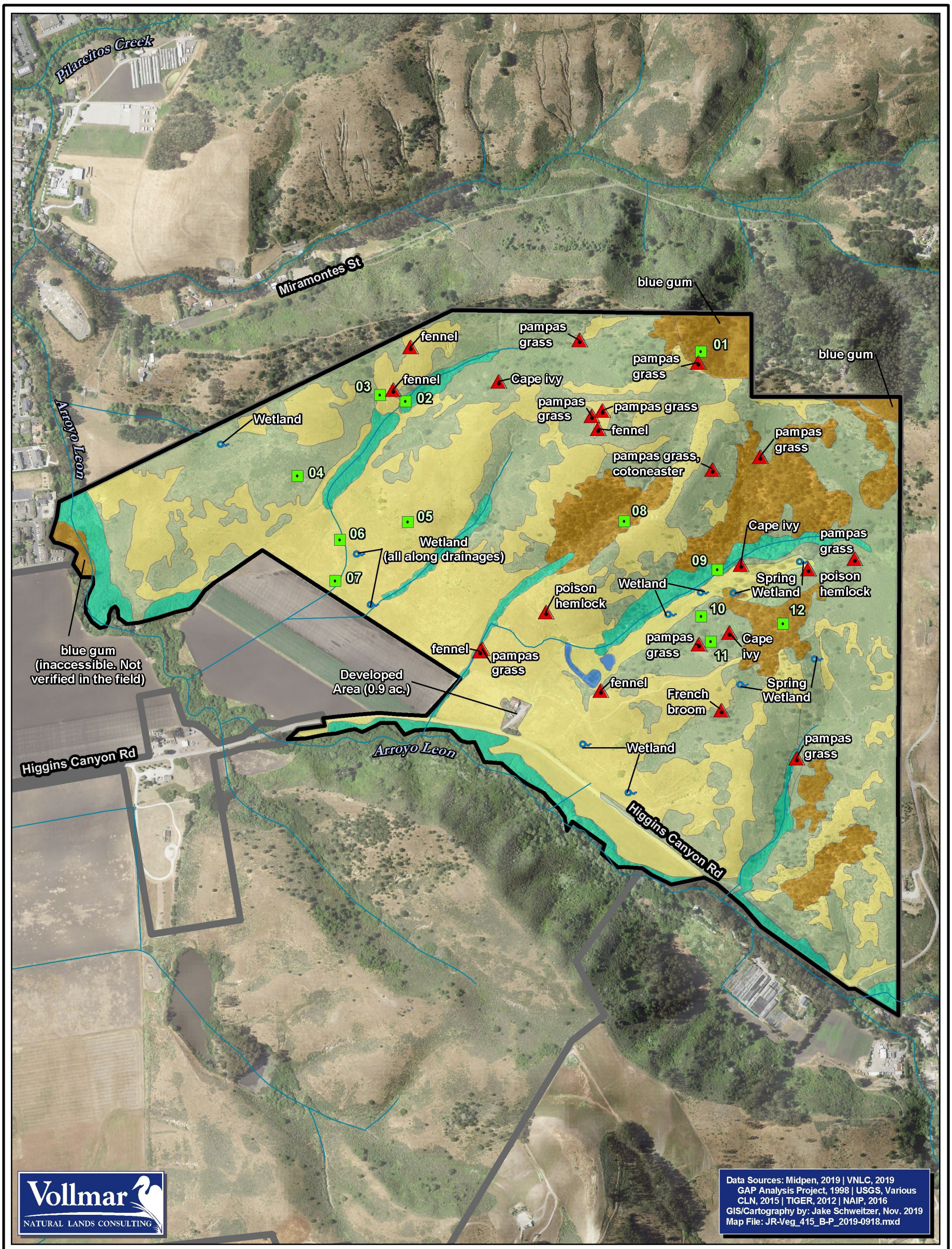
5.0 RESULTS

5.1 Summary of Key Findings

A total of 198 plant taxa were identified within the 418.6-acre study area during the 2019 field surveys, none of which are designated as special-status or otherwise considered rare (**Appendix B**). The total number of plant taxa is neither particularly high nor low for the size of the study area, but is approximately what would be expected. Of all plant taxa identified within the study area, 116 (59%) are native to California, while 82 (41%) are introduced and naturalized in the state. Two of the native taxa are native to California, but are introduced within the study area and surrounding vicinity, and both of these are considered invasive by the local chapter of the CNPS. These are Monterey pine (*Pinus radiata*) and Monterey cypress (*Hesperocyparis macrocarpa*). Among the introduced plant species, 38 (19% of all taxa) are considered invasive by the California Invasive Plant Council (Cal-IPC 2019), including four taxa that are rated as "High," 19 that are rated as "Moderate," and 15 that are rated as "Limited." A majority of the introduced and invasive plant species occur within the grasslands and more open Coastal Scrub habitats. Among the invasive species, the four species rated as High are of primary concern from a management perspective: Cape ivy (*Delairea odorata*), pampas grass (*Cortaderia jubata*), fennel (*Foeniculum vulgare*), and French broom (*Genista monspessulana*). The Moderate rated cotoneaster (*Cotoneaster franchetii*) is fairly widespread and appears to be spreading, so also should be prioritized for management. Blue gum (*Eucalyptus globulus*) is only rated as Limited, but is considered to be Moderate by the District in the Central Coast region. The species has potential to spread well beyond the current few stands, and should likewise be considered a management priority, as it has the potential to severely alter the ecology of colonized areas, and also represents a serious fire hazard. Monterey pine is invasive and also problematic in terms of ecological conditions, but is somewhat less disruptive and prone to contribute to problems with wildfire.

Plant communities documented within the study area include the following, in order of extent: Coastal Scrub, Valley and Foothill Grassland, Introduced Woodland, and Riparian Woodland (see **Figure 5**). In addition, two large stock ponds were mapped on the figure, which, despite being small as mapped habitats go, are quite distinct from other habitats and represent an important habitat type. With the exception of Introduced Woodland and the ponds, these classes are included in the system used by the CNPS to describe habitat types for special-status plant taxa (see **Appendix C**). The Introduced Woodland type is applied to stands of introduced tree species within the study area, consisting primarily of Monterey pine and blue gum. Monterey pine is technically considered a rare plant species (CRPR 1B.2), but only within its historical native habitat, in coastal Monterey County. Blue gum is native to Australia, where it is one among roughly 750 to 800 *Eucalyptus* species. Both of these trees were brought to northern California and widely planted along coastal hill slopes, and continue to expand their range at the expense of native grassland and shrubland habitats. Among the larger stands of Coastal Scrub are localized stands of oceanspray (*Holodiscus discolor*) that form Ocean Spray Brush, which is considered a rare and threatened plant community in the MCV.

Representative photographs of each habitat are included in **Appendix A**. **Appendix B** presents a list of all vascular plant taxa identified within the study area during the 2019 field surveys, and provides information pertaining to each plant's status with respect to origin, Cal-IPC invasive



Legend

- MCV Relevé Plot Location (with plot ID)
- Invasive Plant (see map label)[1]
- Wetland Area[2]
- Stream
- Johnston Ranch Study Area Boundary
- Miramontes Ridge Preserve Boundary

Plant Communities

- Coastal Scrub (171.3 ac.)
- Valley and Foothill Grassland (166.7 ac.)
- Introduced Woodland (47.5 ac.)[3]
- Riparian Woodland (31.4 ac.)
- Pond (0.8 ac.)

1. Representative stand
2. Most wetland extend well beyond point location
3. Primarily Monterey pine, except areas indicated as blue gum

FIGURE 5
Botanical Resources Map

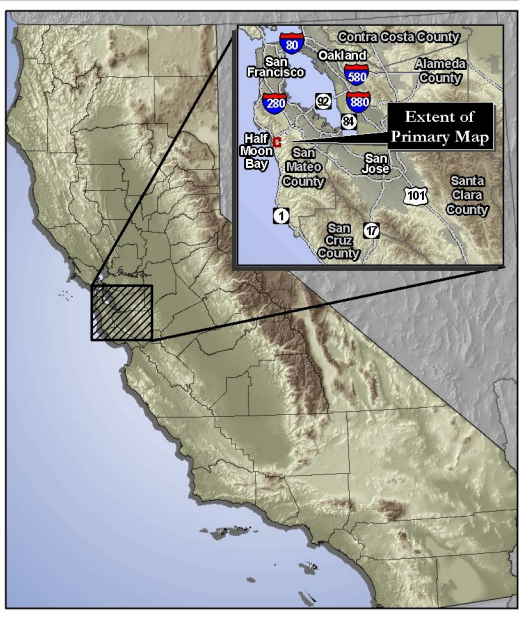
Miramontes Ridge Open Space Preserve
Half Moon Bay, San Mateo County, California

N W E S

1:9,000
(1 in. = 750 ft. at tabloid layout)

0 187.5 375 Meters

Feet
0 375 750 1,500



rank, and other taxonomic information. Habitat relevé plots were established in all of the major habitat types, as well as within seasonal wetland habitat within grassland habitat. The habitat relevé forms provide detailed ecological information pertaining to the plots and habitat types. The completed plot forms are included as **Appendix D**.

5.2 Plant Communities

Coastal Scrub

Coastal Scrub is the most widespread plant community in the study area (**Figure 5**), covering 171.3 acres, or 41 percent of the property. The community is best developed along steep slopes, but is also present along ridge tops and a few areas along the toes of the slopes. The encroachment of scrub into grassland is generally kept in check by cattle grazing and associated trampling, but as coyote brush (*Baccharis pilularis*) is highly competitive in such coastal habitats and grows very rapidly, the species is difficult to fully contain without risks of over-grazing. Aside from coyote brush, common shrub and vine species observed in this plant community include California blackberry (*Rubus ursinus*), seaside woolly sunflower (*Eriophyllum staechadifolium*), poison oak (*Toxicodendron diversilobum*), sticky monkeyflower (*Diplacus aurantiacus*), and blood currant (*Ribes sanguineum*). The invasive cotoneaster is fairly widespread along the northern-central portion of the study area, but otherwise occurs only as scattered individuals. The highly invasive French broom is present on the site, but at the time of the surveys was limited to a few individuals along the southern-central portion of the study area, within an eroded gully. Most of the onsite Coastal Scrub would be classified in the MCV as Coyote Brush Scrub, a very common habitat type that is not threatened. Many of the Coastal Scrub stands feature emergent Monterey pines, and historical aerial photography (1991, from GoogleEarth software) suggests that the larger stands of pine have replaced what was once mostly scrub habitat. As much of the Coastal Scrub is relatively open, the herbaceous layer is fairly well developed and diverse, with the most common species consisting of Pacific blacksnakeroot (*Sanicula crassicaulis*), robust vervain (*Verbena lasiostachys*), common bedstraw (*Galium aparine*), goldback fern (*Pentagramma triangularis*), rough hedgenettle (*Stachys rigida*), yerba buena (*Clinopodium douglasii*), and scarlet pimpernel (*Lysimachia arvensis*). Aside from scarlet pimpernel, all of these most dominant species from the shrub and herb strata are native, though invasive species are present in portions of the shrublands, largely as a result of incursions of cattle into the shrubs. There are fairly wide cattle trails that cut through the habitat, and the soils are highly disturbed by deep hoof prints where the clay content is high. These areas have been colonized by invasive grasses such as brome fescue and Italian ryegrass, as well as invasive forbs such as bull thistle (*Cirsium vulgare*). The highly invasive Cape ivy forms its largest stands within openings of Coastal Scrub (**Figure 5**). The most open stands of Costal Scrub are largely indistinguishable from the Valley and Foothill Grassland plant community, as described below. No special-status plants were observed in the mapped Coastal Scrub, though the habitat has the potential to support special-status plants.

Included within the greater Coastal Scrub habitat were stands of oceanspray that form Ocean Spray Brush. This is a plant community classified in the MCV that has a rarity rank of S3, G4, and thus is considered sensitive by the CNPS and CDFW. A relevé plot was established in one stand of the community, as Plot 11 as included in **Appendix D**. As shown on the relevé form, this community includes many of the same plant species as that which is dominated by coyote brush, though there are species that appeared to be more prevalent in this habitat, which appeared

to be a little more mesic. These include Indian plum (*Oemleria cerasiformis*), red elderberry (*Sambucus racemosa*), and little western bitter cress (*Cardamine oligosperma*).

Detailed habitat information pertaining to Coastal Scrub is presented in the relevé plot forms presented in **Appendix D**, plots 4, 10, and 11 (see also **Figure 5** for locations). As the forms indicate, an average of 25 plant taxa was recorded within the three 20x20 meter plots. The soil texture identified in the three plots is either "moderately fine silty clay loam" (MFSL) or "medium silt" (MESI) (see **Appendix E**, last page, for the soil key used). Litter was moderately high, primarily in the form of shrub branches and leaves, and woodrat nests constructed of such plant material were noted throughout much of the habitat (not within the plots). Aside from plant basal stems and litter, most of the ground cover was otherwise limited to a small amount of gravel—no cobbles, stones, or boulders were present within the plots. Additional habitat information is documented within the three relevé forms.

Valley and Foothills Grassland

Encompassing 166.7 acres, Valley and Foothill Grassland is nearly as widespread as Coastal Scrub in the study area, accounting for 40 percent of the site (**Figure 5**). The community is distributed throughout the study area, but is most prevalent along ridge tops and flatter portions, where the site encompasses coastal terrace topography. It is most dominant where soils are thick and rich. In addition, smaller areas of grassland that are below the MMU are present within the other plant communities, but generally consist of the same plant species. The habitats are maintained as grasslands primarily by means of grazing, especially along the hill slopes, as many such areas would soon revert to shrublands in the absence of the grazing and trampling by livestock. As noted previously, this is a deliberate habitat management strategy employed by the District to maintain open landscape as well as important habitat for a variety of plant and animal species: for example, to promote grassland-associated wildflowers and to provide upland refugia for endangered amphibians. As a result, the dominant plant species are those that can withstand grazing and trampling, primarily grasses and low-growing forbs.

Dominant species identified in the habitat include soft chess (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), brome fescue (*Festuca bromoides*), wild oats (*Avena* spp.), English plantain (*Plantago lanceolata*), birds-foot trefoil (*Lotus corniculatus*), and a variety of clovers (*Trifolium* spp.). Two attractive former cultivars that are widespread on the site are rosy sandcrocus (*Romulea rosea*) and pale flax (*Linum bienne*). Though most species in this habitat are more associated with Valley and Foothill Grassland, the site is notably mesic and within a transition zone with Coastal Prairie habitats. Therefore, there are a number of widely occurring species that are associated with Coastal Prairie and moist grasslands in general, to the extent that special-status plants associated with Coastal Prairie and "mesic" microhabitats have some potential, albeit limited, to occur in the study area. Such species include common velvet grass (*Holcus lanatus*), Italian rye grass (*Festuca perennis*), rush species (*Juncus effusus* and *J. patens*), sun cup (*Taraxia ovata*), California oat grass (*Danthonia californica*), and yellow glandweed (*Parentucellia viscosa*). Stands of native wildflowers were relatively sparse and small. Most of the grasslands were highly patchy, forming a complex mosaic of potential MCV habitat types, all of which are relatively common, with the exception of small stands of California oat grass and other native species, which were too small to qualify as mappable stands.

Also noted during the botanical surveys were several springs and seeps, as well as localized areas where depressions combine with high clay content in the soils to form seasonal wetlands. These features are not mapped in this report because they represent small microhabitats within other habitats, primarily grasslands. The locations of larger wetlands are indicated by labels on **Figure 5**. The most common plant species documented within the wetlands include common velvet grass and pennyroyal (*Mentha pulegium*). Areas of more prolonged inundation featured pale spikerush (*Eleocharis macrostachya*), seep monkeyflower (*Mimulus guttatus*), and American brooklime (*Veronica americana*), among other hydrophytes. As suggested above, many of these also occurred more sporadically throughout the grasslands. No special-status plants were documented within the onsite Valley and Foothill Grassland habitat or the more localized wetland habitats. It should be noticed that the intensity of grazing during the timeframe of the botanical surveys complicated the identification of plants in some areas as only the bases of the plants were visible. Based on habitat conditions, the habitat provides low-to-moderate potential to support special-status plants.

Detailed habitat information pertaining to Valley and Foothill Grassland is presented in relevé plot forms 3 and 5 (see also **Figure 5**). As the forms indicate, an average of 17 plant taxa were recorded within the three 20x20 meter plots, again with the caveat of intensive grazing throughout most of the habitat. The soil texture identified in the two plots is "moderately fine clay loam" (MFCL) or MFSL. Litter was relatively high for grasslands, though thatch was rather low. No cover types aside from plant basal stems, litter, and fine soil material were observed in the plots. Additional habitat information is documented within the two relevé forms.

Introduced Woodland

Scattered throughout the study area, particularly the upper hill slopes, is woodland comprised primarily of exotic tree species. Accounting for 47.5 acres, this habitat covers 11 percent of the study area. As indicated above, these areas are consist primarily of Monterey pine and blue gum, with Monterey pine forming a majority of woodland stands. All areas not labeled as "blue gum" on **Figure 5** are stands of Monterey pine. While these woodlands do provide some value as wildlife habitat, especially for nesting raptors and as cover for a variety of other animals, they are known to detrimentally alter habitat conditions and increase the risk of wildfire. Both tree species produce a high cover and depth of litter, and blue gum is infamous for its flammability and papery bark, which can transmit fire long distances from a burning tree. Often the understories below these tree species are relatively devoid of understory species, but within the study area they are fairly diverse. This is likely due at least in part to the recently development of the woodlands—historical aerial photography shows that, as recently as the early 1990s, only a few trees of each species were present within the study area, and most areas previously consisted of shrublands. Shrubs and vines are still fairly common, though primarily in the form of shade-tolerant species. The most common species observed are California blackberry, poison oak, oceanspray, and blood currant. The herbaceous understory likewise consisted of shade-tolerant species that are otherwise associated within Coastal Scrub, such as common bedstraw, yerba buena, Pacific blacksnakeroot, and rough hedgenettle. No special-status plants were observed in these habitats in the study area, and they are generally not expected given that they are exotic to the region.

Detailed habitat information for the Introduced Woodland is presented in plot forms 1, 8, and 12 (**Figure 5**). A total of 17 plant taxa were identified within the blue gum plot (Plot 1), and an average of 25 taxa was identified within the two Monterey pine plots (Plots 8 and 12). The soil texture identified in Plot 1 is medium silt loam (MESIL), and MESI and MFSL within Plots 8 and 12 (respectively). Litter was generally high—as high as 90 and 80 percent in Plots 1 and 8 (respectively), consisting primarily of leaves/needles. Litter and fine soils constituted the vast majority of ground cover, along with a small percentage of plant stems.

Riparian Woodland

Riparian Woodland occurs along Arroyo Leon as well as all of the major onsite seasonal tributaries of that stream (**Figure 5**). The cumulative area of the habitat is 31.4 acres, amounting to 7.5 percent of the study area. Although most of the habitat was found to consist of a fairly high diversity of plant species, and with a majority of native species, there was significant variability based on the presence and size of the floodplain as well as relative disturbance from erosion and cattle encroachment. Stretches with a well-developed floodplain along lower reaches, and areas of low disturbance, primarily along the headwaters, featured the highest diversity of plants. As can be seen in **Appendix D** (see also **Figure 5**) Plot 9 encompassed 50 plant taxa, which is over one-quarter of all taxa identified in the study area. This 20x20 meter plot encompasses a large floodplain as well as the stream channel. There is some cattle disturbance, but only along a rather narrow trail (which did feature a higher percentage of introduced, weedy plants). In contrast, Plot 2 is along a minor section of stream with a limited floodplain, and was notably disturbed by cattle grazing, trampling, and loafing. Only 16 plant taxa were identified in this plot. All of the Riparian Woodland habitats are dominated by arroyo willow (*Salix lasiolepis*), though red willow (*S. laevigata*) is also present, along with a few other trees, including Monterey pine along the edges. Under the MCV classification, the plant community would qualify as Arroyo Willow Thickets, an S4, G4 habitat type (i.e., relatively common and not threatened). The composition of the shrub/vine and herb strata varied based on the amount of available sunlight, though as a woodland (as opposed to a forest), most of this habitat featured at least stippled sunlight, and most of the trees are deciduous, so more light is available during the winter and early spring seasons. Common shrub and vine species identified include coast twinberry (*Lonicera involucrata*), California blackberry, thimbleberry (*Rubus parviflorus*), poison oak, red elderberry, California wax myrtle (*Morella californica*). The herb stratum was found to be quite diverse as a whole, with more sunny habitats consisting of man-root species (*Marah* sp.), rushes, common velvet grass, bull thistle and a variety of other weedy species. Cape ivy was also found along more sunny stretches of riparian woodland. More shaded and/or moist habitats consisted of a higher proportion of native herbs, such as wood strawberry (*Fragaria vesca*), hedgenettle (*Stachys* spp.), stinging nettle (*Urtica dioica*), giant horsetail (*Equisetum telmateia*), and a variety of fern species.

Detailed habitat information for the Riparian Woodland is presented in plot forms 2 and 9 (**Figure 5**). An average of 33 plant taxa were identified within the two plots (see discussion above). The soil textures identified are MFCL for Plot 2 and MFSL in Plot 9. Litter was high—as high as 60 percent in Plot 9, consisting primarily of leaves and branches. Water was present within the channel, amounting to one and three percent within Plots 2 and 9, respectively. The remaining surface cover was primarily plant basal stems and fine soils.

Pond

Two large constructed cattle stock ponds are present within the southern central portion of the study area. The ponds are adjacent to each other and cumulatively amount to 0.8 acre. Though the ponds form a minor component of the overall habitat in the study area, they form a distinct and important habitat for both special-status plants and animals as well as common plants and animals. Both ponds are formed by constructed earthen berms, and rain-fed and overland flow hydrology is augmented by water from the nearby stream, in the form of a large diversion in the southern pond and, presumably, groundwater in both. The ponds appeared to be at least one to several feet deep during the spring and summer surveys, and featured extensive open water as well as emergent marsh vegetation. Common plant species documented within and surrounding the ponds include pale spikerush, California bulrush (*Schoenoplectus californicus*), clustered dock (*Rumex conglomeratus*), tall flatsedge (*Cyperus eragrostis*), bog rush (*Juncus hesperius*), and pennyroyal. Long-leaved pondweed (*Potamogeton nodosus*) was present as floating aquatic vegetation throughout the ponds. These species are supported by soils that are saturated at least much of the year, if not all year long in typical years. Portions of the habitat may be considered "Marsh" habitat, which is classified by the CNPS as "Marshes and Swamps." The surrounding uplands featured a mix of both upland and wetland-associated plants, such as rushes, Italian rye grass, bull mallow (*Malva nicaeensis*), and a number of other weedy herbs. No relevé plots were established in the area.

5.3 Potential for Special-Status Plants

The study area encompasses habitat types that are known to support numerous special-status plants in the vicinity of the site. Based on typical micro-habitat conditions, elevation ranges, and distribution patterns of the taxa, 22 plant taxa have been identified as having some potential to occur on the site, as indicated by shading on **Appendix C**. None of these were observed during the 2019 protocol-level botanical surveys or the vegetation plot sampling.

The study area is moderately sized (418.6 acres) and encompasses three distinct CNPS habitat types as well as non-native woodlands, stock ponds with marsh vegetation, and a number of localized seasonal wetland habitats. The study area habitats support a modest number of plant taxa (198 taxa), a majority of which are native. However, many of the habitats feature at least a moderate level of disturbance from intensive cattle use and/or from invasive plants. In addition, unique microhabitats that tend to support many of the special-status plants known from the vicinity are fairly limited in the study area. There are no specialized soils such as serpentine, heavy clay, or sand, and no substantial rock outcroppings. Accounting for micro-habitat and elevation range, Valley and Foothill Grassland habitat in the vicinity is known to support four special-status plants, and Coastal Prairie supports nine. These are shaded in **Appendix C** because there is some potential for them to occur in the study area, but the onsite habitats were found to support primarily introduced species, including many invasive species. The more intact and mesic Coastal Scrub is the most likely habitat type to support special-status plants on the site—there are 12 such taxa known from Coastal Scrub in the vicinity that fall with the elevation range of the study area and are associated with microhabitats on the site. The ponds and localized seasonal wetland habitats provide potential for five special-status plants that are known from Marshes and Swamps and/or Meadows and Seeps, though in addition to being limited in area, these habitats are particularly disturbed by cattle grazing and trampling. Both habitats are dominated by highly competitive plant species that are indicative of very generalized, common

habitat conditions with respect to soils, hydrology and other factors. The type of Riparian Woodland habitat that occurs in the study area is known to support three special-status taxa, but is similar in these respects. The portions of this habitat most likely to support special-status plants are the areas with broader floodplains and the less disturbed headwater areas. A number of relatively uncommon plants (but not officially rare at the state or local levels) were identified in the latter habitat type. Overall, the site provides low-to-moderate potential to support special-status plants, but no such plants were observed during the multiple rounds of botanical surveys conducted in 2019.

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APPENDIX A:

Representative Photographs of the Study Area (March, April, and July, 2019)

APPENDIX A. Representative Photographs of the Study Area

Blue Gum Introduced Woodland at Relevé Plot 1
Northeastern Portion of the Study Area

Riparian Woodland at Relevé Plot 2
Northern-Central Portion of the Study Area

APPENDIX A. Representative Photographs of the Study Area

Valley and Foothill Grassland at Relevé Plot 3
Northern-Central Portion of the Study Area

Coastal Scrub at Relevé Plot 4
Northwestern Portion of the Study Area

APPENDIX A. Representative Photographs of the Study Area

Mesic Grassland/Seasonal Wetland at Relevé Plot 6
Northwestern Portion of the Study Area

Mesic Grassland/Seasonal Wetland at Relevé Plot 7
Northwestern Portion of the Study Area

APPENDIX A. Representative Photographs of the Study Area

Monterey Pine Introduced Woodland at Relevé Plot 8
Central Portion of the Study Area

Riparian Woodland at Relevé Plot 9
Northern-Central Portion of the Study Area

APPENDIX A. Representative Photographs of the Study Area

Coastal Scrub at Relevé Plot 10
Central-Eastern Portion of the Study Area

Ocean Spray Brush Form of Coastal Scrub (MCV S3 G4) at Relevé Plot 11
Central-Eastern Portion of the Study Area

APPENDIX A. Representative Photographs of the Study Area

Monterey Pine Introduced Woodland at Relevé Plot 12
Central Portion of the Study Area

Pond with Emergent Marsh
Southern-Central Portion of the Study Area

APPENDIX A. Representative Photographs of the Study Area

Columbine Wildflowers in Riparian Woodland (stream headwaters)
Eastern Portion of the Study Area

Close-up of Disturbed Seasonal Habitat
Southern-Central Portion of the Study Area

APPENDIX B:

List of All Vascular Plant Taxa Identified within the Study Area, March, April, and July, 2019

APPENDIX B. Vascular Plants Identified within Johnston Ranch Portion of Miramontes Ridge Open Space Preserve, 2019. Compiled by Vollmar Natural Lands Consulting for Midpeninsula Regional Open Space District

Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Adoxaceae (Muskroot Family)	*Sambucus racemosa* var. *racemosa*	Red Elderberry	Native	N/A	Perennial	Tree, Shrub	1-5
Agavaceae (Century-plant Family)	*Chlorogalum pomeridianum* var. *pomeridianum*	Wavyleaf Soap Plant	Native	N/A	Perennial	Forb/herb	6-10
Anacardiaceae (Sumac Family)	*Toxicodendron diversilobum*	Western Poison Oak	Native	N/A	Perennial	Shrub, Vine	6-10
Apiaceae (Carrot Family)	*Angelica tomentosa*	Woolly Angelica	Native	N/A	Perennial	Forb/herb	<1
Apiaceae (Carrot Family)	*Conium maculatum*	Poison-Hemlock	Naturalized	Moderate	Biennial	Forb/herb	1-5
Apiaceae (Carrot Family)	*Foeniculum vulgare*	Fennel	Naturalized	High	Biennial, Perennial	Forb/herb	1-5
Apiaceae (Carrot Family)	*Heracleum maximum*	Cow Parsnip	Native	N/A	Perennial	Forb/herb	<1
Apiaceae (Carrot Family)	*Sanicula crassicaulis*	Pacific Blacksnakeroot	Native	N/A	Perennial	Forb/herb	1-5
Araceae (Arum Family)	*Lemna minor*	Common Duckweed	Native	N/A	Perennial	Forb/herb (aquatic)	1-5
Asteraceae (Aster Family)	*Achillea millefolium*	Common Yarrow	Native	N/A	Perennial	Forb/herb	1-5
Asteraceae (Aster Family)	*Anthemis cotula*	Mayweed	Naturalized	N/A	Annual	Forb/herb	<1
Asteraceae (Aster Family)	*Artemisia californica*	California Sagebrush	Native	N/A	Perennial	Shrub	1-5
Asteraceae (Aster Family)	*Artemisia douglasiana*	Mugwort	Native	N/A	Perennial	Forb/herb	1-5
Asteraceae (Aster Family)	*Baccharis pilularis* ssp. *consanguinea*	Coyote Brush	Native	N/A	Perennial	Shrub	26-50
Asteraceae (Aster Family)	*Carduus pycnocephalus* ssp. *pycnocephalus*	Italian Thistle	Naturalized	Moderate	Annual	Forb/herb	1-5
Asteraceae (Aster Family)	*Cirsium brevistylum*	Clustered Thistle	Native	N/A	Annual, Biennial, Perennial	Forb/herb	<1
Asteraceae (Aster Family)	*Cirsium vulgare*	Bull Thistle	Naturalized	Moderate	Biennial	Forb/herb	<1

ATTACHMENT 2

Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Asteraceae (Aster Family)	*Cotula coronopifolia*	Brass-Buttons	Naturalized	Limited	Perennial	Forb/herb	<1
Asteraceae (Aster Family)	*Crepis vesicaria* ssp. *taraxacifolia*	Beaked Hawksbeard	Naturalized	N/A	Annual, Biennial	Forb/herb	<1
Asteraceae (Aster Family)	*Delairea odorata*	Cape-Ivy	Naturalized	High	Perennial	Forb/herb, Vine	26-50
Asteraceae (Aster Family)	*Eriophyllum staechadifolium*	Seaside Woolly Sunflower	Native	N/A	Perennial	Forb/herb	1-5
Asteraceae (Aster Family)	*Gamochaeta ustulata*	Featherweed	Native	N/A	Perennial	Forb/herb	<1
Asteraceae (Aster Family)	*Grindelia stricta* var. *platyphylla*	Oregon Gumweed	Native	N/A	Perennial	Forb/herb	<1
Asteraceae (Aster Family)	*Helenium puberulum*	Rosilla	Native	N/A	Annual, Perennial	Forb/herb	<1
Asteraceae (Aster Family)	*Helminthotheca echioides*	Bristly Ox-Tongue	Naturalized	Limited	Annual, Perennial	Forb/herb	1-5
Asteraceae (Aster Family)	*Hypochaeris glabra*	Smooth Cat's-Ear	Naturalized	Limited	Annual	Forb/herb	<1
Asteraceae (Aster Family)	*Hypochaeris radicata*	Rough Cat's-Ear	Naturalized	Moderate	Perennial	Forb/herb	1-5
Asteraceae (Aster Family)	*Lactuca virosa*	Bitter Lettuce	Naturalized	N/A	Annual, Biennial	Forb/herb	<1
Asteraceae (Aster Family)	*Leucanthemum vulgare*	Ox-Eye Daisy	Naturalized	Moderate	Perennial	Forb/herb	<1
Asteraceae (Aster Family)	*Logfia gallica*	Daggerleaf Cottonrose	Naturalized	N/A	Annual	Forb/herb	<1
Asteraceae (Aster Family)	*Madia sativa*	Coast Tarweed	Native	N/A	Annual	Forb/herb	1-5
Asteraceae (Aster Family)	*Matricaria discoidea*	Pineapple Weed	Native	N/A	Annual	Forb/herb	1-5
Asteraceae (Aster Family)	*Pseudognaphalium beneolens*	Cudweed	Native	N/A	Perennial	Forb/herb	<1
Asteraceae (Aster Family)	*Pseudognaphalium californicum*	Ladies' Tobacco	Native	N/A	Annual, Biennial	Forb/herb	<1
Asteraceae (Aster Family)	*Psilocarphus tenellus*	Slender Woolly-Marbles	Native	N/A	Annual	Forb/herb	<1
Asteraceae (Aster Family)	*Senecio vulgaris*	Common Groundsel	Naturalized	N/A	Annual, Biennial	Forb/herb	<1

ATTACHMENT 2

Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Asteraceae (Aster Family)	*Silybum marianum*	Milk Thistle	Naturalized	Limited	Annual, Biennial	Forb/herb	<1
Asteraceae (Aster Family)	*Symphyotrichum* sp. (NF-unconfirmed)	California Aster	Native	N/A	Perennial	Forb/herb, Subshrub	1-5
Asteraceae (Aster Family)	*Sonchus asper* ssp. *asper*	Prickly Sow Thistle	Naturalized	N/A	Annual	Forb/herb	<1
Asteraceae (Aster Family)	*Sonchus oleraceus*	Common Sow Thistle	Naturalized	N/A	Annual	Forb/herb	1-5
Azollaceae (Azolla Family)	*Azolla filiculoides*	Pacific Mosquitofern	Native	N/A	Annual	Forb/herb (aquatic)	1-5
Blechnaceae (Chain Fern Family)	*Woodwardia fimbriata*	Giant Chain Fern	Native	N/A	Perennial	Forb/herb	<1
Boraginaceae (Borage Family)	*Myosotis discolor*	Yellow and Blue Forget-me-not	Naturalized	N/A	Annual	Forb/herb	<1
Brassicaceae (Mustard Family)	*Barbarea orthoceras*	American Yellowrocket	Native	N/A	Biennial, Perennial	Forb/herb	<1
Brassicaceae (Mustard Family)	*Barbarea vulgaris*	Yellow Rocket	Naturalized	N/A	Biennial	Forb/herb	<1
Brassicaceae (Mustard Family)	*Capsella bursa-pastoris*	Shepherd's Purse	Naturalized	N/A	Annual	Forb/herb	1-5
Brassicaceae (Mustard Family)	*Cardamine californica*	Milk Maids	Native	N/A	Perennial	Forb/herb	1-5
Brassicaceae (Mustard Family)	*Cardamine oligosperma*	Little Western Bittercress	Native	N/A	Annual, Biennial, Perennial	Forb/herb	1-5
Brassicaceae (Mustard Family)	*Hirschfeldia incana*	Mediterranean Mustard	Naturalized	Moderate	Annual, Biennial, Perennial	Forb/herb	<1
Brassicaceae (Mustard Family)	*Lepidium strictum*	Upright Pepperweed	Native	N/A	Annual	Forb/herb	<1
Brassicaceae (Mustard Family)	*Nasturtium officinale*	Water Cress	Native	N/A	Perennial	Forb/herb	1-5
Brassicaceae (Mustard Family)	*Rorippa palustris* ssp. *palustris*	Bog Yellowcress	Native	N/A	Annual, Perennial	Forb/herb	<1
Caprifoliaceae (Honeysuckle Family)	*Lonicera involucrata* var. *ledebourii*	Coast Twinberry	Native	N/A	Perennial	Shrub	6-10
Caryophyllaceae (Pink Family)	*Cerastium glomeratum*	Sticky Mouse-Ear Chickweed	Naturalized	N/A	Annual	Forb/herb	<1

Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Caryophyllaceae (Pink Family)	*Stellaria media*	Common Chickweed	Naturalized	N/A	Annual, Perennial	Forb/herb	1-5
Convolvulaceae (Morning-glory Family)	*Convolvulus arvensis*	Bindweed	Naturalized	N/A	Perennial	Vine, Forb/herb	1-5
Cucurbitaceae (Cucumber Family)	*Marah fabacea*	California Man-Root	Native	N/A	Perennial	Forb/herb/vine	<1
Cucurbitaceae (Cucumber Family)	*Marah oregana*	Coast Man-Root	Native	N/A	Perennial	Forb/herb/vine	1-5
Cupressaceae (Cypress Family)	*Hesperocyparis macrocarpa**	Monterey Cypress*	Native	Limited	Perennial	Tree	<1
Juncaceae (Rush Family)	*Juncus occidentalis*	Slender Juncus	Native	N/A	Perennial	Graminoid	1-5
Cyperaceae (Sedge Family)	*Carex densa*	Dense Sedge	Native	N/A	Perennial	Graminoid	<1
Cyperaceae (Sedge Family)	*Carex globosa*	Round-Fruited Sedge	Native	N/A	Perennial	Graminoid	<1
Cyperaceae (Sedge Family)	*Cyperus eragrostis*	Tall Flatsedge	Native	N/A	Perennial	Graminoid	<1
Cyperaceae (Sedge Family)	*Eleocharis macrostachya*	Pale Spikerush	Native	N/A	Perennial	Graminoid	11-25
Cyperaceae (Sedge Family)	*Isolepis cernua*	Low Bulrush	Native	N/A	Annual	Graminoid	<1
Cyperaceae (Sedge Family)	*Schoenoplectus californicus*	California Bulrush	Native	N/A	Perennial	Graminoid	6-10
Dennstaedtiaceae (Bracken Fern Family)	*Pteridium aquilinum* var. *pubescens*	Hairy Brackenfern	Native	N/A	Perennial	Forb/herb	1-5
Dipsacaceae (Teasel Family)	*Dipsacus sativus*	Fuller's Teasel	Naturalized	Moderate	Biennial	Forb/herb	<1
Dryopteridaceae (Wood Fern Family)	*Dryopteris arguta*	Coastal Woodfern	Native	N/A	Perennial	Forb/herb	1-5
Dryopteridaceae (Wood Fern Family)	*Polystichum imbricans* ssp. *imbricans*	Rock sword fern	Native	N/A	Fern	Ferm	<1
Dryopteridaceae (Wood Fern Family)	*Polystichum munitum*	Western Sword Fern	Native	N/A	Perennial	Forb/herb	<1
Equisetaceae (Horsetail Family)	*Equisetum telmateia* ssp. *braunii*	Giant Horsetail	Native	N/A	Fern	Fern	<1
Euphorbiaceae (Spurge Family)	*Euphorbia peplus*	Petty Spurge	Naturalized	N/A	Annual	Forb/herb	<1

ATTACHMENT 2

Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Fabaceae (Pea Family)	*Genista monspessulana*	French Broom	Naturalized	High	Perennial	Shrub	<1
Fabaceae (Pea Family)	*Lathyrus vestitus* var. *vestitus*	Hillside Pea	Native	N/A	Perennial	Forb/herb	<1
Fabaceae (Pea Family)	*Lotus corniculatus*	Bird's-Foot Trefoil	Naturalized	N/A	Perennial	Forb/herb	1-5
Fabaceae (Pea Family)	*Lupinus affinis*	Fleshy Lupine	Native	N/A	Annual	Forb/herb	<1
Fabaceae (Pea Family)	*Lupinus bicolor*	Miniature Lupine	Native	N/A	Annual	Forb/herb	1-5
Fabaceae (Pea Family)	*Medicago polymorpha*	California Burclover	Naturalized	Limited	Annual, Perennial	Forb/herb	1-5
Fabaceae (Pea Family)	*Trifolium angustifolium*	Narrow-Leaved Clover	Naturalized	N/A	Annual	Forb/herb	1-5
Fabaceae (Pea Family)	*Trifolium campestre*	Hop Clover	Naturalized	N/A	Annual, Biennial	Forb/herb	1-5
Fabaceae (Pea Family)	*Trifolium dubium*	Little Hop Clover	Naturalized	N/A	Annual	Forb/herb	<1
Fabaceae (Pea Family)	*Trifolium fragiferum*	Strawberry Clover	Naturalized	N/A	Perennial	Forb/herb	<1
Fabaceae (Pea Family)	*Trifolium hybridum*	Alsike Clover	Naturalized	N/A	Annual, Perennial	Forb/herb	<1
Fabaceae (Pea Family)	*Trifolium subterraneum*	Subterranean Clover	Naturalized	N/A	Annual	Forb/herb	1-5
Fabaceae (Pea Family)	*Trifolium willdenovii*	Tomcat Clover	Native	N/A	Annual	Forb/herb	<1
Fabaceae (Pea Family)	*Vicia americana* ssp. *americana*	American Vetch	Native	N/A	Perennial	Vine, Forb/herb	<1
Fabaceae (Pea Family)	*Vicia gigantea*	Giant Vetch	Native	N/A	Perennial	Forb/herb	1-5
Fabaceae (Pea Family)	*Vicia sativa* ssp. *nigra*	Smaller Common Vetch	Naturalized	N/A	Annual	Vine, Forb/herb	1-5
Fabaceae (Pea Family)	*Vicia sativa* ssp. *sativa*	Spring Vetch	Naturalized	N/A	Annual	Vine, Forb/herb	<1
Fabaceae (Pea Family)	*Vicia tetrasperma*	Sparrow Vetch	Naturalized	N/A	Annual	Vine, Forb/herb	1-5
Gentianaceae (Gentian Family)	*Centaurium tenuiflorum*	Slender Centaury	Naturalized	N/A	Annual	Forb/herb	<1

ATTACHMENT 2

Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Geraniaceae (Geranium Family)	*Erodium botrys*	Longbeak Stork's Bill	Naturalized	N/A	Annual, Biennial	Forb/herb	1-5
Geraniaceae (Geranium Family)	*Erodium moschatum*	Greenstem Filaree	Naturalized	N/A	Annual, Biennial	Forb/herb	<1
Grossulariaceae (Currant Family)	*Ribes californicum*	Hillside Gooseberry	Native	N/A	Perennial	Shrub	<1
Grossulariaceae (Currant Family)	*Ribes menziesii*	Gooseberry	Native	N/A	Perennial	Shrub	<1
Grossulariaceae (Currant Family)	*Ribes sanguineum* var. *glutinosum*	Blood Currant	Native	N/A	Perennial	Shrub	1-5
Iridaceae (Iris Family)	*Iris douglasiana*	Douglas Iris	Native	N/A	Perennial	Forb/herb	<1
Iridaceae (Iris Family)	*Romulea rosea* var. *australis*	Rosy Sandcrocus	Naturalized	N/A	Perennial	Forb/herb	1-5
Iridaceae (Iris Family)	*Sisyrinchium bellum*	Western Blue-Eyed-Grass	Native	N/A	Perennial	Forb/herb	<1
Juncaceae (Rush Family)	*Juncus bufonius* var. *occidentalis*	Western Toad Rush	Native	N/A	Annual	Graminoid	<1
Juncaceae (Rush Family)	*Juncus effusus* ssp. *pacificus*	Pacific Rush	Native	N/A	Perennial	Graminoid	1-5
Juncaceae (Rush Family)	*Juncus hesperius*	Bog Rush	Native	N/A	Perennial	Graminoid	6-10
Juncaceae (Rush Family)	*Juncus occidentalis*	Western Rush	Native	N/A	Perennial	Graminoid	1-5
Juncaceae (Rush Family)	*Juncus patens*	Spreading Rush	Native	N/A	Perennial	Graminoid	6-10
Juncaceae (Rush Family)	*Juncus xiphioides*	Iris-Leaved Rush	Native	N/A	Perennial	Graminoid	<1
Juncaceae (Rush Family)	*Luzula comosa* var. *comosa*	Hairy Wood Rush	Native	N/A	Perennial	Graminoid	<1
Juncaginaceae (Arrow-grass Family)	*Triglochin scilloides*	Flowering-Quillwort	Native	N/A	Annual	Forb/herb (aquatic)	<1
Lamiaceae (Mint Family)	*Clinopodium douglasii*	Yerba Buena	Native	N/A	Perennial	Forb/herb, Subshrub	6-10
Lamiaceae (Mint Family)	*Mentha pulegium*	Pennyroyal	Naturalized	Moderate	Perennial	Forb/herb	1-5
Lamiaceae (Mint Family)	*Mentha spicata*	Spearmint	Naturalized	N/A	Perennial	Forb/herb	<1

Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Lamiaceae (Mint Family)	*Stachys rigida* var. *quercetorum*	Rough Hedgenettle	Native	N/A	Perennial	Forb/herb	1-5
Lamiaceae (Mint Family)	*Stachys rigida* var. *rigida*	Hedgenettle	Native	N/A	Perennial	Forb/herb	<1
Linaceae (Flax Family)	*Linum bienne*	Pale Flax	Naturalized	N/A	Annual, Biennial, Perennial	Forb/herb	6-10
Lythraceae (Loosestrife Family)	*Lythrum hyssopifolia*	Hyssop Loosestrife	Naturalized	Limited	Annual, Perennial	Forb/herb	1-5
Malvaceae (Mallow Family)	*Malva nicaeensis*	Bull Mallow	Naturalized	N/A	Annual, Biennial	Forb/herb	<1
Malvaceae (Mallow Family)	*Sidalcea malviflora*	Checkerbloom	Native	N/A	Perennial	Subshrub, Forb/herb	<1
Myricaceae (Bayberry Family)	*Morella californica*	Wax Myrtle	Native	N/A	Perennial	Tree, Shrub	<1
Myrsinaceae (Myrsine Family)	*Lysimachia arvensis*	Scarlet Pimpernel	Naturalized	N/A	Annual, Biennial	Forb/herb	1-5
Myrtaceae (Myrtle Family)	*Eucalyptus globulus*	Blue Gum	Naturalized	Limited	Perennial	Tree	26-50
Onagraceae (Evening Primrose Family)	*Epilobium brachycarpum*	Tall Annual Willowherb	Native	N/A	Annual	Forb/herb	<1
Onagraceae (Evening Primrose Family)	*Epilobium ciliatum* ssp. *ciliatum*	Fringed Willowherb	Native	N/A	Perennial	Forb/herb	1-5
Onagraceae (Evening Primrose Family)	*Taraxia ovata*	Sun Cup	Native	N/A	Perennial	Forb/herb	1-5
Orobanchaceae (Broom-rape Family)	*Bellardia trixago*	Mediterranean Linseed	Naturalized	Limited	Annual	Forb/herb	<1
Orobanchaceae (Broom-rape Family)	*Castilleja affinis* ssp. *affinis*	Coast Indian Paintbrush	Native	N/A	Perennial	Forb/herb, Subshrub	<1
Orobanchaceae (Broom-rape Family)	*Parentucellia viscosa*	Yellow Glandweed	Naturalized	Limited	Annual	Forb/herb	1-5
Orobanchaceae (Broom-rape Family)	*Triphysaria pusilla*	Dwarf Owl's-Clover	Native	N/A	Annual	Forb/herb	<1
Orobanchaceae (Broom-rape Family)	*Triphysaria versicolor* ssp. *versicolor*	Yellow-beak Owl's Clover	Native	N/A	Annual	Forb/herb	1-5
Oxalidaceae (Wood-Sorrel Family)	*Oxalis corniculata*	Creeping Woodsorrel	Naturalized	N/A	Annual, Perennial	Forb/herb	<1

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Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Oxalidaceae (Wood-Sorrel Family)	*Oxalis pes-caprae*	Bermuda Buttercup	Naturalized	Moderate	Perennial	Forb/herb	<1
Oxalidaceae (Wood-Sorrel Family)	*Oxalis pilosa*	Hairy wood sorrel	Native	N/A	Annual	Forb/herb	<1
Papaveraceae (Poppy Family)	*Eschscholzia californica*	California Poppy	Native	N/A	Annual, Perennial	Forb/herb	<1
Papaveraceae (Poppy Family)	*Fumaria capreolata*	White Ramping Fumitory	Naturalized	N/A	Perennial	Forb/herb	<1
Phrymaceae (Lopseed Family)	*Diplacus aurantiacus*	Sticky Monkeyflower	Native	N/A	Perennial	Shrub	<1
Phrymaceae (Lopseed Family)	*Mimulus guttatus*	Seep Monkeyflower	Native	N/A	Annual, Perennial	Forb/herb	1-5
Pinaceae (Pine Family)	*Pinus radiata**	Monterey Pine*	Native	Limited	Perennial	Tree	26-50
Pinaceae (Pine Family)	*Pseudotsuga menziesii* var. *menziesii*	Douglas-Fir	Native	N/A	Perennial	Tree	1-5
Plantaginaceae (Plantain Family)	*Kickxia elatine*	Sharpleaf Cancerwort	Naturalized	N/A	Annual	Forb/herb	<1
Plantaginaceae (Plantain Family)	*Plantago coronopus*	Buckhorn Plantain	Naturalized	N/A	Annual, Biennial	Forb/herb	<1
Plantaginaceae (Plantain Family)	*Plantago erecta*	California plantain	Native	N/A	Annual	Forb/herb	<1
Plantaginaceae (Plantain Family)	*Plantago lanceolata*	English Plantain	Naturalized	Limited	Annual, Biennial, Perennial	Forb/herb	1-5
Plantaginaceae (Plantain Family)	*Veronica americana*	American Brooklime	Native	N/A	Perennial	Forb/herb	1-5
Poaceae (Grass Family)	*Agrostis exarata*	Spike Bent Grass	Native	N/A	Perennial	Graminoid	<1
Poaceae (Grass Family)	*Avena barbata*	Slender Wild Oat	Naturalized	Moderate	Annual	Graminoid	6-10
Poaceae (Grass Family)	*Brachypodium distachyon*	Annual False-Brome	Naturalized	Moderate	Annual	Graminoid	1-5
Poaceae (Grass Family)	*Briza minor*	Annual Quaking Grass	Naturalized	N/A	Annual	Graminoid	1-5
Poaceae (Grass Family)	*Bromus diandrus*	Ripgut Brome	Naturalized	Moderate	Annual, Perennial	Graminoid	1-5

ATTACHMENT 2

Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Poaceae (Grass Family)	*Bromus hordeaceus*	Soft Chess	Naturalized	Limited	Annual	Graminoid	6-10
Poaceae (Grass Family)	*Bromus laevipes*	Woodland Brome	Native	N/A	Perennial	Graminoid	<1
Poaceae (Grass Family)	*Cortaderia jubata*	Pampas Grass	Naturalized	High	Perennial	Graminoid	6-10
Poaceae (Grass Family)	*Danthonia californica*	California Oatgrass	Native	N/A	Perennial	Graminoid	1-5
Poaceae (Grass Family)	*Elymus triticoides*	Beardless Wild Rye	Native	N/A	Perennial	Graminoid	<1
Poaceae (Grass Family)	*Festuca arundinacea*	Tall Fescue	Naturalized	Moderate	Perennial	Graminoid	<1
Poaceae (Grass Family)	*Festuca bromoides*	Brome Fescue	Naturalized	N/A	Annual	Graminoid	11-25
Poaceae (Grass Family)	*Festuca perennis*	Italian Rye Grass	Naturalized	Moderate	Annual	Graminoid	11-25
Poaceae (Grass Family)	*Gastridium phleoides*	Nit Grass	Naturalized	N/A	Annual	Graminoid	1-5
Poaceae (Grass Family)	*Holcus lanatus*	Common Velvet Grass	Naturalized	Moderate	Perennial	Graminoid	11-25
Poaceae (Grass Family)	*Hordeum marinum* ssp. *gussoneanum*	Mediterranean Barley	Naturalized	Moderate	Annual	Graminoid	1-5
Poaceae (Grass Family)	*Phalaris aquatica*	Harding Grass	Naturalized	Moderate	Perennial	Graminoid	1-5
Poaceae (Grass Family)	*Poa annua*	Annual Blue Grass	Naturalized	N/A	Annual	Graminoid	<1
Poaceae (Grass Family)	*Polypogon maritimus*	Mediterranean Beard Grass	Naturalized	N/A	Annual	Graminoid	<1
Poaceae (Grass Family)	*Stipa lepida*	Foothill Needle Grass	Native	N/A	Perennial	Graminoid	<1
Poaceae (Grass Family)	*Stipa miliacea* var. *miliacea*	Smilo Grass	Naturalized	Limited	Perennial	Graminoid	<1
Poaceae (Grass Family)	*Stipa pulchra*	Purple Needle Grass	Native	N/A	Perennial	Graminoid	<1
Polemoniaceae (Phlox Family)	*Navarretia squarrosa*	Skunkweed	Native	N/A	Annual	Forb/herb	<1
Polygonaceae (Buckwheat Family)	*Persicaria punctata*	Dotted Smartweed	Native	N/A	Perennial	Forb/herb	<1

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Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Polygonaceae (Buckwheat Family)	*Rumex acetosella*	Sheep Sorrel	Naturalized	Moderate	Perennial	Forb/herb	1-5
Polygonaceae (Buckwheat Family)	*Rumex conglomeratus*	Clustered Dock	Naturalized	N/A	Perennial	Forb/herb	<1
Polygonaceae (Buckwheat Family)	*Rumex crispus*	Curly Dock	Naturalized	Limited	Perennial	Forb/herb	1-5
Polygonaceae (Buckwheat Family)	*Rumex pulcher*	Fiddle Dock	Naturalized	N/A	Perennial	Forb/herb	<1
Potamogetonaceae (Pondweed Family)	*Potamogeton nodosus*	Long-Leaved Pondweed	Native	N/A	Perennial	Forb/herb (aquatic)	6-10
Pteridaceae (Maidenhair Fern Family)	*Adiantum jordanii*	California Maidenhair	Native	N/A	Perennial	Forb/herb	<1
Pteridaceae (Maidenhair Fern Family)	*Pentagramma triangularis* ssp. *triangularis*	Goldback Fern	Native	N/A	Perennial	Forb/herb	<1
Ranunculaceae (Buttercup Family)	*Aquilegia formosa*	Western Columbine	Native	N/A	Perennial	Forb/herb	<1
Ranunculaceae (Buttercup Family)	*Ranunculus muricatus*	Spinyfruit Buttercup	Naturalized	N/A	Annual, Biennial, Perennial	Forb/herb	<1
Rhamnaceae (Buckthorn Family)	*Frangula californica* ssp. *californica*	California Coffeeberry	Native	N/A	Perennial	Shrub	6-10
Rosaceae (Rose Family)	*Cotoneaster franchetii*	Cotoneaster	Naturalized	Moderate	Perennial	Shrub	1-5
Rosaceae (Rose Family)	*Drymocallis glandulosa* var. *glandulosa*	Sticky Cinquefoil	Native	N/A	Perennial	Forb/herb	<1
Rosaceae (Rose Family)	*Fragaria vesca*	Wood Strawberry	Native	N/A	Perennial	Forb/herb	1-5
Rosaceae (Rose Family)	*Heteromeles arbutifolia*	Toyon	Native	N/A	Perennial	Tree, Shrub	1-5
Rosaceae (Rose Family)	*Holodiscus discolor* var. *discolor*	Oceanspray	Native	N/A	Perennial	Shrub	26-50
Rosaceae (Rose Family)	*Horkelia californica* var. *californica*	California Horkelia	Native	N/A	Perennial	Forb/herb	<1
Rosaceae (Rose Family)	*Oemleria cerasiformis*	Indian Plum	Native	N/A	Perennial	Tree, Shrub	1-5
Rosaceae (Rose Family)	*Rosa gymnocarpa* var. *gymnocarpa*	Wood Rose	Native	N/A	Perennial	Shrub, Subshrub	<1

ATTACHMENT 2

Family Name	Scientific Name	Common Name	Origin	Cal-IPC Rank[1]	Duration	Habit	Pct Cover[2]
Rosaceae (Rose Family)	*Rubus parviflorus*	Thimbleberry	Native	N/A	Perennial	Shrub	<1
Rosaceae (Rose Family)	*Rubus ursinus*	California Blackberry	Native	N/A	Perennial	Subshrub	6-10
Rubiaceae (Madder Family)	*Galium aparine*	Common Bedstraw	Native	N/A	Annual	Vine, Forb/herb	1-5
Rubiaceae (Madder Family)	*Galium murale*	Tiny Bedstraw	Naturalized	N/A	Annual	Forb/herb	<1
Rubiaceae (Madder Family)	*Sherardia arvensis*	Field Madder	Naturalized	N/A	Annual	Forb/herb	<1
Salicaceae (Willow Family)	*Salix laevigata*	Red Willow	Native	N/A	Perennial	Tree	11-25
Salicaceae (Willow Family)	*Salix lasiolepis*	Arroyo Willow	Native	N/A	Perennial	Tree, Shrub	26-50
Salicaceae (Willow Family)	*Salix sitchensis*	Sitka Willow	Native	N/A	Perennial	Tree, Shrub	26-50
Scrophulariaceae (Figwort Family)	*Scrophularia californica*	California Figwort	Native	N/A	Perennial	Forb/herb	1-5
Solanaceae (Potato Family)	*Solanum americanum*	American Black Nightshade	Native	N/A	Annual, Perennial	Subshrub, Forb/herb	<1
Solanaceae (Potato Family)	*Solanum douglasii*	Greenspot Nightshade	Native	N/A	Perennial	Subshrub, Forb/herb	<1
Urticaceae (Nettle Family)	*Urtica dioica* ssp. *holosericea*	Stinging Nettle	Native	N/A	Perennial	Forb/herb	1-5
Verbenaceae (Verbena Family)	*Verbena lasiostachys* var. *scabrida*	Robust Vervain	Native	N/A	Perennial	Forb/herb	1-5
Woodsiaceae (Cliff Fern Family)	*Athyrium filix-femina* var. *cyclosorum*	Western Lady Fern	Native	N/A	Fern	Fern	<1

1. California Invasive Plant Council, 2019
2. Among stratum and within habitat type in which taxon occurs
* Native to California, but not to study area. Considered invasive by local CNPS chapter.

Notes: Nomenclature corresponds to Jepson Manual, Second Edition (Baldwin et al. 2012) and Jepson Online Interchange (2019).
NF = No flower at time of observance.

APPENDIX C:

Special-Status Plant Taxa Documented in the Vicinity of the Study Area (CNPS 9-Quad Search)

APPENDIX C. Special-status Vascular Plant Taxa Documented in the Vicinity of the Johnston Ranch Portion of Miramontes Ridge Open Space Preserve, Half Moon Bay, California. Compiled by Vollmar Natural Lands Consulting, 2019.

Shaded entries indicate taxa with the highest potential to occur within the study area, based on the habitat and distribution of taxon

Scientific Name Common Name (Family)	Status[1] Federal/ State/CRPR	Habitat, Elevation, and Blooming Period[2]	Potential for Occurrence within the Study Area
Acanthomintha duttonii San Mateo thorn-mint (Lamiaceae)	FE/CE/1B.1	Chaparral, Valley and foothill grassland, serpentinite; 160-985 feet; April-June	Not expected. No serpentinite within study area.
Agrostis blasdalei Blasdale's bent grass (Poaceae)	--/--/1B.2	Coastal bluff scrub, Coastal dunes, Coastal prairie; 0-490 feet; May-July	Suitable habitat present. Not observed during 2019 study.
Allium peninsulare var. *franciscanum* Franciscan onion (Alliaceae)	--/--/1B.2	Cismontane woodland, Valley and foothill grassland, clay, volcanic, often serpentinite; 170-1,000 feet; (April) May-June	Low quality habitat present (primarily documented on the eastern side of the Santa Cruz Mountains). (Not observed during 2019 surveys.
Amsinckia lunaris bent-flowered fiddleneck (Boraginaceae)	--/--/1B.2	Coastal bluff scrub, Cismontane woodland, Valley and foothill grassland; 5-1,640 feet; March-June	Suitable habitat present. Not observed during 2019 surveys.
Arabis blepharophylla coast rockcress (Brassicaceae)	--/--/4.3	Broadleafed upland forest, Coastal bluff scrub, Coastal prairie, Coastal scrub, rocky; 5-3,610 feet; February-May	Not expected. No suitable habitat present.
Arctostaphylos andersonii Anderson's manzanita (Ericaceae)	--/--/1B.2	Broadleafed upland forest, Chaparral, North Coast coniferous forest, openings, edges; 195-2,495 feet; November-May	Suitable habitat present. Not observed during 2019 surveys.
Arctostaphylos montaraensis Montara manzanita (Ericaceae)	--/--/1B.2	Chaparral (maritime), Coastal scrub; 260-1,640 feet; January-March	Suitable habitat present, though more associated with maritime chaparral (which is absent from the site). Not observed during 2019 surveys.
Arctostaphylos regismontana Kings Mountain manzanita (Ericaceae)	--/--/1B.2	Broadleafed upland forest, Chaparral, North Coast coniferous forest, granitic or sandstone; 1,000-2,395 feet; December-April	Not expected. Study area is below species elevation range.
Astragalus nuttallii var. *nuttallii* ocean bluff milk-vetch (Fabaceae)	--/--/4.2	Coastal bluff scrub, Coastal dunes; 5-395 feet; January-November	Not expected. No suitable habitat present.
Astragalus pycnostachyus var. *pycnostachyus* coastal marsh milk-vetch (Fabaceae)	--/--/1B.2	Coastal dunes (mesic), Coastal scrub, Marshes and swamps (coastal salt, streamsides); 0-100 feet; (April) June-October	Suitable habitat present (though typically more strictly coastal). Not observed during 2019 surveys.

Scientific Name Common Name (Family)	Status[1] Federal/ State/CRPR	Habitat, Elevation, and Blooming Period[2]	Potential for Occurrence within the Study Area
Calandrinia breweri Brewer's calandrinia (Montiaceae)	--/--/4.2	Chaparral, Coastal scrub, sandy or loamy, disturbed sites and burns; 30-4,005 feet; (January) March-June	Low quality habitat present (typically occurs on gravely soils). Not observed during 2019 surveys.
Calochortus umbellatus Oakland star-tulip (Liliaceae)	--/--/4.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland, often serpentinite; 325-2,295 feet; March-May	Low quality habitat present (no serpentinite). Not observed during 2019 surveys.
Castilleja ambigua var. *ambigua* johnny-nip (Orobanchaceae)	--/--/4.2	Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Valley and foothill grassland, Vernal pools margins; 0-1,425 feet; March-August	Suitable habitat present. Not observed during 2019 surveys.
Centromadia parryi ssp. *parryi* pappose tarplant (Asteraceae)	--/--/1B.2	Chaparral, Coastal prairie, Meadows and seeps, Marshes and swamps (coastal salt), Valley and foothill grassland (vernally mesic), often alkaline; 0-1,380 feet; May-November	Low quality habitat present (no alkaline soils). Not observed during 2019 surveys.
Chloropyron maritimum ssp. *palustre* Point Reyes bird's-beak (Orobanchaceae)	--/--/1B.2	Marshes and swamps (coastal salt); 0-35 feet; June-October	Not expected. Primarily associated with immediate coast.
Chorizanthe cuspidata var. *cuspidata* San Francisco Bay spineflower (Polygonaceae)	--/--/1B.2	Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub, sandy; 5-705 feet; April-July (August)	Not expected. No sandy soils within study area.
Cirsium andrewsii Franciscan thistle (Asteraceae)	--/--/1B.2	Broadleafed upland forest, Coastal bluff scrub, Coastal prairie, Coastal scrub, mesic, sometimes serpentinite; 0-490 feet; March-July	Low quality habitat present (no serpentinite). Not observed during 2019 surveys.
Cirsium fontinale var. *fontinale* Crystal Springs fountain thistle (Asteraceae)	FE/CE/1B.1	Chaparral (openings), Cismontane woodland, Meadows and seeps, Valley and foothill grassland, Serpentinite seeps; 145-575 feet; (April) May-October	Not expected. No serpentinite seeps within study area.
Collinsia multicolor San Francisco collinsia (Plantaginaceae)	--/--/1B.2	Closed-cone coniferous forest, Coastal scrub, sometimes serpentinite; 95-820 feet; (February) March-May	Suitable habitat present (though no serpentinite). Not observed during 2019 surveys.
Cypripedium fasciculatum clustered lady's-slipper (Orchidaceae)	--/--/4.2	Lower montane coniferous forest, North Coast coniferous forest, usually serpentinite seeps and streambanks; 325-7,990 feet; March-August	Not expected. No serpentinite within study area.

Scientific Name **Common Name (Family)**	**Status[1] Federal/ State/CRPR**	**Habitat, Elevation, and Blooming Period[2]**	**Potential for Occurrence within the Study Area**
Cypripedium montanum mountain lady's-slipper (Orchidaceae)	--/--/4.2	Broadleafed upland forest, Cismontane woodland, Lower montane coniferous forest, North Coast coniferous forest; 605-7,300 feet; March-August	Not expected. No suitable habitat present.
Dirca occidentalis western leatherwood (Thymelaeaceae)	--/--/1B.2	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Cismontane woodland, North Coast coniferous forest, Riparian forest, Riparian woodland, mesic; 80-1,395 feet; January-March (April)	Suitable habitat present. Not observed during 2019 surveys.
Elymus californicus California bottle-brush grass (Poaceae)	--/--/4.3	Broadleafed upland forest, Cismontane woodland, North Coast coniferous forest, Riparian woodland; 45-1,540 feet; May-August (November)	Suitable habitat present. Not observed during 2019 surveys.
Eriophyllum latilobum San Mateo woolly sunflower (Asteraceae)	FE/CE/1B.1	Cismontane woodland (often serpentinite, on roadcuts), Coastal scrub, Lower montane coniferous forest; 145-1,085 feet; May-June	Not expected. No serpentinite within study area.
Erysimum franciscanum San Francisco wallflower (Brassicaceae)	--/--/4.2	Chaparral, Coastal dunes, Coastal scrub, Valley and foothill grassland, often serpentinite or granitic, sometimes roadsides; 0-1,805 feet; March-June	Not expected. No serpentinite within study area.
Fritillaria biflora var. *ineziana* Hillsborough chocolate lily (Liliaceae)	--/--/1B.1	Cismontane woodland, Valley and foothill grassland, serpentinite; 490 feet; March-April	Not expected. No serpentinite within study area.
Fritillaria lanceolata var. *tristulis* Marin checker lily (Liliaceae)	--/--/1B.1	Coastal bluff scrub, Coastal prairie, Coastal scrub; 45-490 feet; February-May	Suitable habitat present. Not observed during 2019 surveys.
Fritillaria liliacea fragrant fritillary (Liliaceae)	--/--/1B.2	Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland, Often serpentinite; 5-1,345 feet; February-April	Low quality habitat present (no serpentinite). Not observed during 2019 surveys.
Grindelia hirsutula var. *maritima* San Francisco gumplant (Asteraceae)	--/--/3.2	Coastal bluff scrub, Coastal scrub, Valley and foothill grassland, sandy or serpentinite; 45-1,310 feet; June-September	Low quality habitat present (no sandy soils and no serpentinite). Not observed during 2019 surveys.
Hesperevax sparsiflora var. *brevifolia* short-leaved evax (Asteraceae)	--/--/1B.2	Coastal bluff scrub (sandy), Coastal dunes, Coastal prairie; 0-705 feet; March-June	Marginal suitable habitat present (not true coastal prairie). Not observed during 2019 surveys.
Hesperolinon congestum Marin western flax (Linaceae)	FT/CT/1B.1	Chaparral, Valley and foothill grassland, serpentinite; 15-1,215 feet; April-July	Not expected. No serpentinite within study area.

Scientific Name Common Name (Family)	Status[1] Federal/ State/CRPR	Habitat, Elevation, and Blooming Period[2]	Potential for Occurrence within the Study Area
Horkelia cuneata var. *sericea* Kellogg's horkelia (Rosaceae)	--/--/1B.1	Closed-cone coniferous forest, Chaparral (maritime), Coastal dunes, Coastal scrub, sandy or gravelly, openings; 30-655 feet; April-September	Low quality habitat present (no sandy or gravelly soil present). Not observed during 2019 surveys.
Horkelia marinensis Point Reyes horkelia (Rosaceae)	--/--/1B.2	Coastal dunes, Coastal prairie, Coastal scrub, sandy; 15-2,475 feet; May-September	Not expected. No sandy soils within study area.
Iris longipetala coast iris (Iridaceae)	--/--/4.2	Coastal prairie, Lower montane coniferous forest, Meadows and seeps, mesic; 0-1,970 feet; March-May	Suitable habitat present. Not observed during 2019 surveys.
Lasthenia californica ssp. *macrantha* perennial goldfields (Asteraceae)	--/--/1B.2	Coastal bluff scrub, Coastal dunes, Coastal scrub; 15-1,705 feet; January-November	Suitable habitat present, but primarily observed on the immediate coast. Not observed during 2019 surveys.
Leptosiphon ambiguus serpentine leptosiphon (Polemoniaceae)	--/--/4.2	Cismontane woodland, Coastal scrub, Valley and foothill grassland, usually serpentinite; 390-3,705 feet; March-June	Not expected. No serpentinite within study area.
Leptosiphon croceus coast yellow leptosiphon (Polemoniaceae)	--/CC/1B.1	Coastal bluff scrub, Coastal prairie; 30-490 feet; April-June	Marginal suitable habitat present (not true coastal prairie). Not observed during 2019 surveys.
Leptosiphon rosaceus rose leptosiphon (Polemoniaceae)	--/--/1B.1	Coastal bluff scrub; 0-330 feet; April-July	Not expected. No suitable habitat present.
Lessingia arachnoidea Crystal Springs lessingia (Asteraceae)	--/--/1B.2	Cismontane woodland, Coastal scrub, Valley and foothill grassland, serpentinite, often roadsides; 195-655 feet; July-October	Not expected. No serpentinite within study area.
Lessingia hololeuca woolly-headed lessingia (Asteraceae)	--/--/3	Broadleafed upland forest, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland, clay, serpentinite; 45-1,000 feet; June-October	Not expected. No serpentinite within study area.
Lilium maritimum coast lily (Liliaceae)	--/--/1B.1	Broadleafed upland forest, Closed-cone coniferous forest, Coastal prairie, Coastal scrub, Marshes and swamps (freshwater), North Coast coniferous forest, sometimes roadside; 15-1,560 feet; May-August	Not expected. Not documented in the vicinity.
Limnanthes douglasii ssp. *ornduffii* Ornduff's meadowfoam (Limnanthaceae)	--/--/1B.1	Meadows and seeps, Agricultural fields; 30-65 feet; November-May	Not expected. Study area is above species elevation range.

Scientific Name **Common Name (Family)**	**Status[1] Federal/ State/CRPR**	**Habitat, Elevation, and Blooming Period[2]**	**Potential for Occurrence within the Study Area**
Lupinus arboreus var. *eximius* San Mateo tree lupine (Fabaceae)	--/--/3.2	Chaparral, Coastal scrub; 295-1,805 feet; April-July	Suitable habitat present. Not observed during 2019 surveys.
Malacothamnus aboriginum Indian Valley bush-mallow (Malvaceae)	--/--/1B.2	Chaparral, Cismontane woodland, Rocky, granitic, often in burned areas; 490-5,575 feet; April-October	Not expected. No suitable habitat present.
Malacothamnus arcuatus arcuate bush-mallow (Malvaceae)	--/--/1B.2	Chaparral, Cismontane woodland; 45-1,165 feet; April-September	Not expected. No suitable habitat present.
Malacothamnus davidsonii Davidson's bush-mallow (Malvaceae)	--/--/1B.2	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland; 605-3,740 feet; June-January	Suitable habitat present, but primarily documented on the eastern side of the Santa Cruz mountains.
Malacothamnus hallii Hall's bush-mallow (Malvaceae)	--/--/1B.2	Chaparral, Coastal scrub; 30-2,495 feet; (April) May-September (October)	Suitable habitat present, but primarily documented on the eastern side of the Santa Cruz mountains.
Microseris paludosa marsh microseris (Asteraceae)	--/--/1B.2	Closed-cone coniferous forest, Cismontane woodland, Coastal scrub, Valley and foothill grassland; 15-1,165 feet; April-June (July)	Suitable habitat present, but not documented in the vicinity.
Monolopia gracilens woodland woolythreads (Asteraceae)	--/--/1B.2	Broadleafed upland forest (openings), Chaparral (openings), Cismontane woodland, North Coast coniferous forest (openings), Valley and foothill grassland, Serpentine; 325-3,935 feet; (February) March-July	Low quality habitat present (no serpentine and no recent burns). Not observed during 2019 surveys.
Pedicularis dudleyi Dudley's lousewort (Orobanchaceae)	--/CR/1B.2	Chaparral (maritime), Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland; 195-2,955 feet; April-June	Suitable habitat present. Not observed during 2019 surveys.
Pentachaeta bellidiflora white-rayed pentachaeta (Asteraceae)	FE/CE/1B.1	Cismontane woodland, Valley and foothill grassland (often serpentinite); 110-2,035 feet; March-May	Low quality habitat present (no serpentinite). Not observed during 2019 surveys.
Plagiobothrys chorisianus var. *chorisianus* Choris' popcornflower (Boraginaceae)	--/--/1B.2	Chaparral, Coastal prairie, Coastal scrub, mesic; 5-525 feet; March-June	Suitable habitat present. Not observed during 2019 surveys.
Polemonium carneum Oregon polemonium (Polemoniaceae)	--/--/2B.2	Coastal prairie, Coastal scrub, Lower montane coniferous forest; 0-6,005 feet; April-September	Suitable habitat present. Not observed during 2019 surveys.

ATTACHMENT 2

Scientific Name Common Name (Family)	Status[1] Federal/ State/CRPR	Habitat, Elevation, and Blooming Period[2]	Potential for Occurrence within the Study Area
Potentilla hickmanii Hickman's cinquefoil (Rosaceae)	FE/CE/1B.1	Coastal bluff scrub, Closed-cone coniferous forest, Meadows and seeps (vernally mesic), Marshes and swamps (freshwater); 30-490 feet; April-August	Suitable habitat present. Not observed during 2019 surveys.
Ranunculus lobbii Lobb's aquatic buttercup (Ranunculaceae)	--/--/4.2	Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, Vernal pools, mesic; 45-1,540 feet; February-May	Not expected. No vernal pools.
Senecio aphanactis chaparral ragwort (Asteraceae)	--/--/2B.2	Chaparral, Cismontane woodland, Coastal scrub, sometimes alkaline; 45-2,625 feet; January-April (May)	Suitable habitat present, but primarily documented on the eastern side of the Santa Cruz Mountains.
Silene scouleri ssp. *scouleri* Scouler's catchfly (Caryophyllaceae)	--/--/2B.2	Coastal bluff scrub, Coastal prairie, Valley and foothill grassland; 0-1,970 feet; (March-May) June-August (September)	Suitable habitat present. Not observed during 2019 surveys.
Silene verecunda ssp. *verecunda* San Francisco campion (Caryophyllaceae)	--/--/1B.2	Coastal bluff scrub, Chaparral, Coastal prairie, Coastal scrub, Valley and foothill grassland, sandy; 95-2,115 feet; (February) March-June (August)	Low quality habitat present (no sandy soils). Not observed during 2019 surveys.
Trifolium hydrophilum saline clover (Fabaceae)	--/--/1B.2	Marshes and swamps, Valley and foothill grassland (mesic, alkaline), Vernal pools; 0-985 feet; April-June	Not expected. No vernal pools and no alkaline habitats within study area.
Triphysaria floribunda San Francisco owl's-clover (Orobanchaceae)	--/--/1B.2	Coastal prairie, Coastal scrub, Valley and foothill grassland, usually serpentinite; 30-525 feet; April-June	Low quality habitat present (no serpentinite), but primarily documented on the eastern side of the Santa Cruz Mountains.

Note: nomenclature corresponds to the most recent Jepson Interchange

1. State or federal listing: F = Federal; C = California; E = endangered; T = threatened; R = rare
   CRPR List 1B = Plants rare, threatened or endangered in CA and elsewhere; List 2B = Plants rare, threatened or endangered in California but more common elsewhere; List 3 = More information is needed about plant; List 4 = Plants of limited distribution, a watch list
   CRPR: '.1' = Seriously threatened in CA; '.2' = Fairly threatened in CA; '.3' = Not very threatened in CA
2. Underlined habitat = present within the project area

APPENDIX D:

Habitat Relevé Forms

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance / Association	*Eucalyptus* spp. - *Ailanthus altissima - Robinia pseudoacacia* Woodland Semi-Natural Alliance

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or **RA**

Database #:	Date:	Name of recorder: Rebecca Wang
415 - 01	4/24/2019	Other surveyors: John Vollmar
	UID:	Location Name: Johnston Ranch

GPS name: Bad Elf For Relevé only: **Bearing°,** left axis at ID point_____ **of Long / Short** side

UTME 5 5 2 2 3 9 **UTMN** 4 1 4 6 0 4 3 **Zone: 10 NAD83** GPS error: **ft./ m./ PDOP** _____

Decimal degrees: **LAT** ___ ___ . ___ ___ ___ ___ ___ ___ **LONG** ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? Yes / No If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___

Camera Name: RWC **Cardinal photos at ID point:** Clockwise from N 123-126

Other photos:

Stand Size (acres): <1 **1-5,** >5 | **Plot Area (m²): 100 /** _____ | **Plot Dimensions** 20 x 20 **m** | **RA Radius**____ **m**

Exposure, Actual °: 60 **NE** NW SE SW Flat Variable | **Steepness, Actual °:** 20 **0°** **1-5°** **> 5-25°** **> 25**

Topography: Macro: top upper mid lower bottom | **Micro:** convex flat concave **undulating**

Geology code: SAND **Soil Texture code:** MESIL | **Upland** or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 0 BA Stems: 1 Litter: 90 Bedrock: 0 Boulder: 0 Stone: 0 Cobble: 0 Gravel: 0 Fines: 9 =100%

% Current year bioturbation 0 **Past bioturbation present? Yes / No** | **% Hoof punch** 0

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Small, isolated invasive eucalyptus stand.

Disturbance code / Intensity (L,M,H): 5 / H _____/____ _____/____ _____/____ _____/____ **"Other"** _____ / ____

II. HABITAT DESCRIPTION

Tree DBH : T1 (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Eucalyptus globulus

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Pinus radiata /to NW , Non-native annual grassland /to S

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb E **Shrub** E **Tree** E **Other identification or mapping information:**

Database #: 415 - 01 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: 0 **Total % Vasc Veg cover:** 40

% Cover - **Conifer tree / Hardwood tree:** 3 / 25 **Regenerating Tree:** 5 **Shrub:** 30 **Herbaceous:** 2

Height Class - Conifer tree / Hardwood tree: 5 / 9 **Regenerating Tree:** 4 **Shrub:** 4 **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
T	*Eucalyptus globulus*	30		
S	*Frangula californica*	15		
S	*Toxicodendron diversilobum*	10		
S	*Baccharis pilularis*	3		
T	*Pseudotsuga menziesii*	3		
S	*Rubus ursinus*	2		
H	*Galium aparine*	1		
S	*Holodiscus discolor*	1		
H	*Achillea millefolium*	+		
H	*Bromus laevipes*	+		
H	*Geranium dissectum*	+		
H	*Helenium puberulum*	+		
H	*Marah fabacea*	+		
H	*Oemleria cerasiformis*	+		
H	*Sanicula crassicaulis*	+		
H	*Sonchus asper*	+		
H	*Vicia tetrasperma*	+		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance *Salix lasiolepis* Shrubland Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or **RA**

Database #:	Date:	Name of recorder: Rebecca Wang
415 - 02	4/24/2019	Other surveyors: John Vollmar
	UID:	Location Name: Johnston Ranch

GPS name: Bad Elf For Relevé only: **Bearing°,** left axis at ID point_____ **of Long / Short** side

UTME 5 5 1 5 6 3 **UTMN** 4 1 4 5 9 2 0 **Zone: 10 NAD83** GPS error: **ft./ m./ PDOP** _____

Decimal degrees: **LAT** ___ ___ . ___ ___ ___ ___ ___ ___ **LONG** ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? Yes / No If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___ ___

Camera Name: RWC **Cardinal photos at ID point:** Clockwise from North 102-105

Other photos: 093 (woodrat nest)

Stand Size (acres): <1, 1-5, >5 | Plot Area (m²): 100 / _____ **| Plot Dimensions** 20 x 20 **m | RA Radius**____ **m**

Exposure, Actual °: 210 **NE NW SE SW Flat Variable | Steepness, Actual °:** 2 **0° 1-5° > 5-25° > 25**

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating

Geology code: Alluvium **Soil Texture code:** MFCL **| Upland** or **Wetland Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 1 BA Stems: 2 Litter: 7 Bedrock: 0 Boulder: 0 Stone: 0 Cobble: 0 Gravel: 0 Fines: 90 =100%

% Current year bioturbation 0 **Past bioturbation present? Yes / No | % Hoof punch** 1

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Salix lasiolepis stand with woodrat nests in the middle. Creek channel is not very downcut, unlike other parts of the site.

Disturbance code / Intensity (L,M,H): None/____ _____/____ _____/____ _____/____ _____/____ **"Other"** _____ / ____

II. HABITAT DESCRIPTION

Tree DBH : T1 (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.) **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Salix lasiolepis

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Annual grasslands / N and S , _____ /_____

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb E **Shrub** E **Tree** E **Other identification or mapping information:**

Database #: 415 - 02 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: 1 **Total % Vasc Veg cover:** 75

% Cover - **Conifer tree / Hardwood tree:** 0 / 55 **Regenerating Tree:** 0 **Shrub:** 10 **Herbaceous:** 20

Height Class - Conifer tree / Hardwood tree: N/A / 5 **Regenerating Tree:** N/A **Shrub:** 2 **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
T	*Salix lasiolepis*	55		
H	*Holcus lanatus*	12		
H	*Bromus laevipes*	5		
S	*Rubus ursinus*	5		
S	*Toxicodendron diversilobum*	3		
S	*Rubus parviflorus*	2		
H	*Carex densa*	1		
H	*Polystichum imbricans*	1		
H	*Vicia tetrasperma*	1		
H	*Carduus pycnocephalus*	+		
H	*Dryopteris arguta*	+		
H	*Fragaria vesca*	+		
H	*Juncus patens*	+		
S	*Lonicera involucrata*	+		
H	*Rumex sp.* (no flower)	+		
H	*Torilis arvensis*	+		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance Annual grassland (no formal MCV classification) Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or **RA**

Database #:	Date:	Name of recorder: Rebecca Wang
415 - 03	4/24/2019	Other surveyors: John Vollmar
	UID:	Location Name: Johnston Ranch

GPS name: Bad Elf For Relevé only: **Bearing°,** left axis at ID point_____ **of Long / Short** side

UTME 5 5 1 5 0 4 **UTMN** 4 1 4 5 9 3 4 **Zone: 10 NAD83** GPS error: **ft./ m./ PDOP** _____

Decimal degrees: **LAT** ___ ___ . ___ ___ ___ ___ ___ ___ **LONG** ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? Yes / No If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___ ___

Camera Name: RWC **Cardinal photos at ID point:** Clockwise from North 098-101

Other photos:

Stand Size (acres): <1, 1-5, >5 | Plot Area (m²): 100 / _____ **| Plot Dimensions** 10 x 10 **m | RA Radius**____ **m**

Exposure, Actual °: 160 **NE NW SE SW Flat Variable | Steepness, Actual °:** 10 **0° 1-5° > 5-25° > 25**

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating

Geology code: Alluvium **Soil Texture code:** MFCL **| Upland** or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 0 **BA Stems:** 3 **Litter:** 10 **Bedrock:** 0 **Boulder:** 0 **Stone:** 0 **Cobble:** 0 **Gravel:** 0 **Fines:** 87 **=100%**

% Current year bioturbation 2 **Past bioturbation present? Yes / No | % Hoof punch** 15

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Grazed grassland, but in better condition and less impacted by excess cattle as compared to area around corral. Grassland representative of drier grasslands on site.

Disturbance code / Intensity (L,M,H): 4 / L _____/____ _____/____ _____/____ _____/____ **"Other"** _____ / ____

II. HABITAT DESCRIPTION

~~**Tree DBH : T1** (<4" dbh), **T2** (4-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (> 24" dbh), **T6** multi-layered (T5 or T4 layer under T5, >60% cover)~~

Shrub: S1 seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous H1 (<12" plant ht.), **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: _____

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: _____/_____, _____/_____

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb P **Shrub** E **Tree** N/A **Other identification or mapping information:**

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**

(Revised March 27, 2018)

Database #: 415 - 03 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: 0 **Total % Vasc Veg cover:** 65

% Cover - **Conifer tree / Hardwood tree:** 0 / 0 **Regenerating Tree:** 0 **Shrub:** + **Herbaceous:** 65

Height Class - Conifer tree / Hardwood tree: N/A / N/A **Regenerating Tree:** N/A **Shrub:** 1 **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular

% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
H	*Festuca bromoides*	30		
H	*Bromus hordeaceus*	10		
H	*Erodium botrys*	5		
H	*Juncus bufonius*	4		
H	*Trifolium subterraneum*	4		
H	*Trifolium dubium*	3		
H	*Juncus occidentalis*	2		
H	*Romulea rosea*	2		
H	*Taraxia ovata*	2		
SE	*Baccharis pilularis*	1		
H	*Bellardia trixago*	1		
H	*Lythrum hyssopifolia*	1		
H	*Plantago lanceolata*	1		
H	*Briza minor*	+		
H	*Danthonia californica*	+		
H	*Helminthotheca echioides*	+		
H	*Hypochaeris radicata*	+		
H	*Linum bienne*	+		
H	*Lysimachia arvensis*	+		
H	*Sonchus asper*	+		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance *Baccharis pilularis* Shrubland Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or **RA**

Database #:	Date:	Name of recorder: Rebecca Wang
415 - 04	4/24/2019	Other surveyors: John Vollmar
	UID:	Location Name: Johnston Ranch

GPS name: Bad Elf For Relevé only: **Bearing°,** left axis at ID point_____ **of Long / Short** side

UTME 5 5 1 3 1 0 **UTMN** 4 1 4 5 7 4 9 **Zone: 10 NAD83** GPS error: **ft./ m./ PDOP** _____

Decimal degrees: **LAT** ___ ___ . ___ ___ ___ ___ ___ ___ **LONG** ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? Yes / No If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___ ___

Camera Name: RWC **Cardinal photos at ID point:** Clockwise from North 106-109

Other photos:

Stand Size (acres): <1, 1-5, >5 | **Plot Area (m²): 100 /** _____ | **Plot Dimensions** 20 x 20 **m** | **RA Radius**____ **m**

Exposure, Actual °: 160 **NE NW SE SW Flat Variable** | **Steepness, Actual °:** 7 **0° 1-5° > 5-25° > 25**

Topography: Macro: top upper mid lower bottom | **Micro: convex flat concave undulating**

Geology code: Alluvium **Soil Texture code:** MFCL | **Upland** or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 0 BA Stems: 2 Litter: 5 Bedrock: 0 Boulder: 0 Stone: 0 Cobble: + Gravel: 2 Fines: 91 =100%

% Current year bioturbation 0 **Past bioturbation present? Yes / No** | **% Hoof punch** 1

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Mix of large dead plants and young recruits. Mature, self-reproducing stand.

Disturbance code / Intensity (L,M,H): 4 / L ____/____ ____/____ ____/____ ____/____ **"Other"** _____ / ____

II. HABITAT DESCRIPTION

~~**Tree DBH : T1** (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (> 24" dbh), **T6** multi-layered (T3 or T4 layer under T5, > 60% cover.)~~

Shrub: S1 seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (> 20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (> 6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Baccharis pilularis

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Annual grassland / N , Salix lasiolepis / E

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb E **Shrub** E **Tree** N/A **Other identification or mapping information:**

Database #: 415 - 04 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: + **Total % Vasc Veg cover:** 70

% Cover - **Conifer tree / Hardwood tree:** 0 / 0 **Regenerating Tree:** 0 **Shrub:** 40 **Herbaceous:** 40

Height Class - Conifer tree / Hardwood tree: N/A / N/A **Regenerating Tree:** N/A **Shrub:** 3 **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
S	*Baccharis pilularis*	40		
H	*Bromus hordeaceus*	35		
H	*Holcus lanatus*	2		
H	*Conium maculatum*	1		
H	*Juncus patens*	1		
H	*Vicia tetrasperma*	1		
H	*Carduus pycnocephalus*	+		
H	*Carex globosa*	+		
S	*Diplacus aurantiacus*	+		
H	*Festuca bromoides*	+		
H	*Geranium dissectum*	+		
H	*Helminthotheca echioides*	+		
H	*Lysimachia arvensis*	+		
H	*Pseudognaphalium californicum*	+		
H	*Sanicula crassicaulis*	+		
H	*Stachys rigida*	+		
H	*Torilis arvensis*	+		
S	*Toxicodendron diversilobum*	+		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance Annual grassland (no formal MCV classification exists) Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or **RA**

Database #:	Date:	Name of recorder: Rebecca Wang
415 - 05	4/24/2019	Other surveyors: John Vollmar
	UID:	Location Name: Johnston Ranch

GPS name: Bad Elf For Relevé only: **Bearing°,** left axis at ID point_____ **of Long / Short** side

UTME 5 5 1 5 6 3 **UTMN** 4 1 4 5 6 4 7 **Zone: 10 NAD83** GPS error: **ft./ m./ PDOP** _____

Decimal degrees: **LAT** ___ ___ . ___ ___ ___ ___ ___ ___ **LONG** ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? Yes / No If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___ ___

Camera Name: RWC **Cardinal photos at ID point:** No photos taken

Other photos:

Stand Size (acres): <1, 1-5, >5 | Plot Area (m²): 100 / _____ **| Plot Dimensions** 10 **x** 10 **m | RA Radius**____ **m**

Exposure, Actual °: 230 **NE NW SE SW Flat Variable | Steepness, Actual °:** 10 **0° 1-5° > 5-25° > 25**

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating

Geology code: Alluvium **Soil Texture code:** MFSL **| Upland** or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 0 BA Stems: 3 **Litter:** 3 **Bedrock:** 0 **Boulder:** 0 **Stone:** 0 **Cobble:** 0 **Gravel:** 0 **Fines:** 94 **=100%**

% Current year bioturbation 2 **Past bioturbation present? Yes / No | % Hoof punch** 5

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Typical annual grassland.

Disturbance code / Intensity (L,M,H): 4 / L ____/____ ____/____ ____/____ ____/____ **"Other"** _____ / ____

II. HABITAT DESCRIPTION

~~**Tree DBH: T1** (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)~~

~~**Shrub: S1** seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)~~

Herbaceous H1 (<12" plant ht.), **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<3ft. stem ht.), **2** (3-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Non-native Annual Grassland

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Salix lasiolepis / to S , Baccharis pilularis / to far N , Eleocharis macrostachya / to far W

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb P **Shrub** N/A **Tree** N/A **Other identification or mapping information:**

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**

(Revised March 27, 2018)

Database #: 415 - 05 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: 0 **Total % Vasc Veg cover:** 70

% Cover - **Conifer tree / Hardwood tree:** 0 / 0 **Regenerating Tree:** 0 **Shrub:** 0 **Herbaceous:** 70

Height Class - Conifer tree / Hardwood tree: N/A / N/A **Regenerating Tree:** N/A **Shrub:** N/A **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular

% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
H	*Festuca bromoides*	24		
H	*Bromus hordeaceus*	17		
H	*Trifolium subterraneum*	10		
H	*Bromus diandrus*	5		
H	*Erodium botrys*	5		
H	*Trifolium dubium*	5		
H	*Juncus occidentalis*	1		
H	*Romulea rosea*	1		
H	*Taraxia ovata*	1		
H	*Bellardia trixago*	+		
H	*Danthonia californica*	+		
H	*Foeniculum vulgare*	+		
H	*Hypochaeris radicata*	+		
H	*Linum bienne*	+		
H	*Lythrum hyssopifolia*	+		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form ATTACHMENT 2

(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance *Lolium perenne** Herbaceous Semi-Natural Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or **RA**

Database #:	Date:	Name of recorder: Rebecca Wang
415 - 06	7/17/2019	Other surveyors: John Vollmar
	UID:	Location Name: Johnston Ranch

GPS name: Bad Elf For Relevé only: **Bearing°,** left axis at ID point_____ **of Long / Short** side

UTME 5 5 1 4 1 2 **UTMN** 4 1 4 5 6 0 6 **Zone: 10 NAD83** GPS error: **ft./ m./ PDOP** _____

Decimal degrees: **LAT** ___ ___ . ___ ___ ___ ___ ___ ___ **LONG** ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? Yes / No If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___ ___

Camera Name: JSP **Cardinal photos at ID point:** Clockwise from North 662-665

Other photos:

Stand Size (acres): <1, **1-5,** >5 | **Plot Area (m²): 100 /** _____ | **Plot Dimensions** 10 x 10 **m** | **RA Radius**____ **m**

Exposure, Actual °: 160 NE NW **SE** SW Flat Variable | **Steepness, Actual °:** 2 0° **1-5°** > 5-25° > 25

Topography: Macro: top upper mid **lower** bottom | **Micro:** convex **flat** concave undulating

Geology code: Alluvium **Soil Texture code:** MFCL | **Upland** or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 0 BA Stems: 3 Litter: 3 Bedrock: 0 Boulder: 0 Stone: 0 Cobble: 0 Gravel: 0 Fines: 94 =100%

% Current year bioturbation 0 **Past bioturbation present? Yes / No** | **% Hoof punch** 20

Fire evidence: Yes / No circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Open Juncus stand, probably with sub-surface water outside the main swale.

Initially visited on 4/24/2019. Point revisited in July for peak bloom.

Disturbance code / Intensity (L,M,H): 4 / M ____/____ ____/____ ____/____ ____/____ **"Other"** _____ / ____

II. HABITAT DESCRIPTION

Tree DBH : T1 (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Juncus patens

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Eleocharis macrostachya / E , Annual grassland further E

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb E **Shrub** E **Tree** N/A **Other identification or mapping information:**

*Inactive name, but consistent with MCV classification name

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**

(Revised March 27, 2018)

Database #: 415 - 06 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: 0 **Total % Vasc Veg cover:** 65

% Cover - **Conifer tree / Hardwood tree:** 0 / 0 **Regenerating Tree:** 0 **Shrub:** 2 **Herbaceous:** 65

Height Class - Conifer tree / Hardwood tree: N/A / N/A **Regenerating Tree:** N/A **Shrub:** 2 **Herbaceous:** 2

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular

% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
H	*Festuca perennis*	40		
H	*Holcus lanatus*	20		
H	*Juncus hesperius*	5		
H	*Mentha pulegium*	4		
H	*Helminthotheca echioides*	3		
H	*Lotus corniculatus*	2		
H	*Juncus patens*	2		
S	*Baccharis pilularis*	1		
H	*Parentucellia viscosa*	1		
H	*Symphyotrichum sp.* (no flower)	1		
H	*Carex densa*	+		
H	*Cirsium vulgare*	+		
H	*Cyperus eragrostis*	+		
H	*Festuca bromoides*	+		
H	*Hordeum marinum ssp. gussoneanum*	+		
H	*Linum bienne*	+		
H	*Lythrum hyssopifolia*	+		
H	*Rumex crispus*	+		
H	*Rumex pulcher*	+		
H	*Trifolium fragiferum*	+		
H	*Vicia sativa*	+		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance Seasonal wetland (no formal MCV classification exists) Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or RA

Database #:	Date:	Name of recorder: Rebecca Wang
415 - 07	7/17/2019	Other surveyors: John Vollmar
	UID:	Location Name: Johnston Ranch

GPS name: Bad Elf For Relevé only: **Bearing°,** left axis at ID point_____ **of Long / Short** side

UTME 5 5 1 3 9 5 **UTMN** 4 1 4 5 5 1 3 **Zone: 10 NAD83** GPS error: **ft./ m./ PDOP** _____

Decimal degrees: **LAT** ___ ___ . ___ ___ ___ ___ ___ ___ **LONG** ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? Yes / No If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___ ___

Camera Name: JSP **Cardinal photos at ID point:** Clockwise from North 666-669

Other photos:

Stand Size (acres): <1, 1-5, >5 | **Plot Area (m²): 100 /** _____ | **Plot Dimensions** 10 x 10 **m** | **RA Radius**____ **m**

Exposure, Actual °: N/A **NE NW SE SW Flat Variable** | **Steepness, Actual °:** 0 **0° 1-5° > 5-25° > 25**

Topography: Macro: top upper mid lower bottom | **Micro: convex flat concave undulating**

Geology code: Alluvium **Soil Texture code:** MFSL | **Upland** or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 0 **BA Stems:** 2 **Litter:** 1 **Bedrock:** 0 **Boulder:** 0 **Stone:** 0 **Cobble:** 0 **Gravel:** 0 **Fines:** 97 **=100%**

% Current year bioturbation 0 **Past bioturbation present? Yes / No** | **% Hoof punch** 25

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Eleocharis marsh with some Juncus. Eleocharis follows wettest part of swale, while adjacent Juncus type is in a wet terrace.

Disturbance code / Intensity (L,M,H): 4 / M _____/____ _____/____ _____/____ _____/____ **"Other"** _____ / ____

II. HABITAT DESCRIPTION

~~**Tree DBH : T1** (<4" dbh), **T2** (4-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (> 24" dbh), **T6** multi-layered (T5 or T4 layer under T5, >60% cover)~~

Shrub: S1 seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.) **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Eleocharis macrostachya

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Juncus patens / N , Annual grassland / S and E

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb E **Shrub** E **Tree** N/A **Other identification or mapping information:**

Database #: 415 - 07 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: 0 **Total % Vasc Veg cover:** 80

% Cover - **Conifer tree / Hardwood tree:** 0 / 0 **Regenerating Tree:** 0 **Shrub:** 1 **Herbaceous:** 80

Height Class - Conifer tree / Hardwood tree: N/A / N/A **Regenerating Tree:** N/A **Shrub:** 1 **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
H	*Eleocharis macrostachya*	20		
H	*Festuca perennis*	20		
H	*Lotus corniculatus*	15		
H	*Mentha pulegium*	5		
H	*Holcus lanatus*	5		
H	*Trifolium fragiferum*	5		
H	*Juncus patens*	3		
H	*Juncus hesperius*	2		
H	*Hordeum brachyantherum*	2		
S	*Baccharis pilularis*	1		
H	*Rumex crispus*	1		
H	*Rumex pulcher*	1		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance *Pinus muricata - Pinus radiata* Forest Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or **RA**

Database #:	Date:	Name of recorder: Rebecca Wang
415 - 08	4/24/2019	Other surveyors: John Vollmar
	UID:	Location Name: Johnston Ranch

GPS name: Bad Elf For Relevé only: Bearing°, left axis at ID point_____ of **Long / Short** side

UTME 5 5 2 0 5 5 UTMN 4 1 4 5 6 5 0 Zone: 11 NAD83 GPS error: ft./ m./ PDOP _____

Decimal degrees: LAT ___ ___ . ___ ___ ___ ___ ___ ___ LONG ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? **Yes** / **No** If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___ ___

Camera Name: RWC **Cardinal photos at ID point:** Clockwise from N 127-130

Other photos:

Stand Size (acres): **<1, 1-5, >5** | **Plot Area (m²): 100 /** _____ | **Plot Dimensions** 20 x 20 **m** | **RA Radius**____ **m**

Exposure, Actual °: 280 **NE** **NW** **SE** **SW** **Flat** **Variable** | **Steepness, Actual °:** 18 **0°** **1-5°** **> 5-25°** **> 25**

Topography: Macro: top upper mid lower bottom | **Micro: convex flat concave undulating**

Geology code: SAND **Soil Texture code:** MFSL | **Upland** or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 0 **BA Stems:** 1 **Litter:** 80 **Bedrock:** 0 **Boulder:** 0 **Stone:** 0 **Cobble:** 0 **Gravel:** 0 **Fines:** ≈100%

% Current year bioturbation 0 **Past bioturbation present? Yes / No** | **% Hoof punch** 30

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Medium aged stand with some old trees and some recruits.

Disturbance code / Intensity (L,M,H): 4 / L ____/____ ____/____ ____/____ ____/____ **"Other"** _____ / ____

II. HABITAT DESCRIPTION

Tree DBH : **T1** (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: **S1** seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: **H1** (<12" plant ht.) **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Pinus radiata

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Non-native annual grassland / to S , Baccharis pilularis scrub mix to S

Confidence in Alliance identification: L M H **Explain:** _____

Phenology (E,P,L): Herb E **Shrub** E **Tree** E **Other identification or mapping information:**

Database #: 415 - 08 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: 0 **Total % Vasc Veg cover:** 50

% Cover - **Conifer tree / Hardwood tree:** 30 / 0 **Regenerating Tree:** 1 **Shrub:** 30 **Herbaceous:** 5

Height Class - Conifer tree / Hardwood tree: 8 / N/A **Regenerating Tree:** 4 **Shrub:** 1 **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
T	*Pinus radiata*	30		
S	*Rubus ursinus*	25		
H	*Sanicula crassicaulis*	5		
S	*Toxicodendron diversilobum*	3		
H	*Bromus laevipes*	1		
H	*Juncus patens*	1		
S	*Baccharis pilularis*	+		
H	*Carex densa*	+		
H	*Carex globosa*	+		
H	*Clinopodium douglasii*	+		
H	*Fragaria vesca*	+		
H	*Galium aparine*	+		
H	*Geranium dissectum*	+		
H	*Oxalis corniculata*	+		
H	*Pentagramma triangularis*	+		
H	*Senecio vulgaris*	+		
H	*Sherardia arvensis*	+		
H	*Sonchus oleraceus*	+		
H	*Taraxia ovata*	+		
H	*Vicia americana*	+		
H	*Vicia sativa ssp. nigra*	+		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance *Salix lasiolepis* Shrubland Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or **RA**

Database #:	Date:	Name of recorder: Jake Schweitzer
415 - 09	4/24/2019	Other surveyors:
	UID:	Location Name: Johnston Ranch

GPS name: GPS 2 For Relevé only: **Bearing°,** left axis at ID point_____ **of Long / Short** side

UTME 5 5 2 2 7 6 **UTMN** 4 1 4 5 5 3 5 **Zone: 10 NAD83** GPS error: **ft./ m./ PDOP** 24

Decimal degrees: **LAT** ___ ___ . ___ ___ ___ ___ ___ ___ **LONG** ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? Yes / No If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___

Camera Name: JS **Cardinal photos at ID point:** 892-895

Other photos: 896 - stream center

Stand Size (acres): <1, 1-5, >5 | Plot Area (m²): 100 / _____ **| Plot Dimensions** 10 **x** 40 **m | RA Radius**____ **m**

Exposure, Actual °: 255 **NE NW SE SW Flat Variable | Steepness, Actual °:** 10 **0° 1-5° > 5-25° > 25**

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating

Geology code: _____ **Soil Texture code:** MFSL **| Upland** or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 3 **BA Stems:** 3 **Litter:** 60 **Bedrock:** 0 **Boulder:** 0 **Stone:** 0 **Cobble:** 0 **Gravel:** 1 **Fines:** 33 **=100%**

% Current year bioturbation 0 **Past bioturbation present? Yes / No | % Hoof punch** 1

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Seasonal stream corridor. Litter is made up of leaves and branches.

Disturbance code / Intensity (L,M,H): 5 / M 4 / L ____/___ ____/___ ____/___ **"Other"** _____ / ___

II. HABITAT DESCRIPTION

Tree DBH : T1 (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.) **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.); **2** (2-10ft. ht.); **3** (10-20ft. ht.); **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter); **2** (1.5-6" diam.); **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Salix lasiolepis

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Annual grasslands /_____, _____/_____

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb E **Shrub** E **Tree** E **Other identification or mapping information:**

Database #: 415 - 09 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: + **Total % Vasc Veg cover:** 70

% Cover - **Conifer tree / Hardwood tree:** 5 / 40 **Regenerating Tree:** 2 **Shrub:** 15 **Herbaceous:** 20

Height Class - Conifer tree / Hardwood tree: _____/_____ **Regenerating Tree:** _____ **Shrub:** _____ **Herbaceous:** _____

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	Stratum	Species	% cover
T	*Salix lasiolepis*	35	H	*Equisetum telmateia*	+
S	*Lonicera involucrata*	15	H	*Foeniculum vulgare*	+
T	*Pinus radiata*	5	S	*Frangula californica*	+
T	*Salix laevigata*	5	H	*Galium aparine*	+
H	*Stachys rigida* var. *quercetorum*	5	H	*Geranium dissectum*	+
S	*Rubus ursinus*	4	H	*Helminthotheca echioides*	+
H	*Fragaria vesca*	3	H	*Heracleum maximum*	+
H	*Stachys rigida* var. *rigida*	3	H	*Juncus effusus*	+
H	*Urtica dioica*	3	H	*Poa annua*	+
H	*Delairea odorata*	2	H	*Scrophularia californica*	+
SA	*Salix lasiolepis*	2	H	*Solanum americanum*	+
H	*Carex densa*	1	H	*Sonchus asper*	+
H	*Holcus lanatus*	1	H	*Trillium chloropetalum*	+
S	*Holodiscus discolor*	1	H	*Vicia gigantea*	+
H	*Marah oregana*	1	H	*Vicia tetrasperma*	+
S	*Morella californica*	1	H	*Woodwardia fimbriata*	+
H	*Polystichum munitum*	1			
H	*Ribes sanguineum*	1			
H	*Sambucus racemosa*	1			
H	*Sanicula crassicaulis*	1			
S	*Toxicodendron diversilobum*	1			
H	*Achillea millefolium*	+			
H	*Angelica tomentosa*	+			
H	*Artemisia douglasii*	+			
H	*Athyrium filix-femina*	+			
H	*Bromus laevipes*	+			
H	*Cardamine oligosperma*	+			
H	*Carex globosa*	+			
H	*Cirsium brevistylum*	+			
H	*Cirsium vulgare*	+			
H	*Clinopodium douglasii*	+			
H	*Conium maculatum*	+			
H	*Cyperus eragrostis*	+			
H	*Elymus glauca*	+			
H	*Epilobium ciliatum*	+			

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance *Baccharis pilularis* Shrubland Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or **RA**

Database #:	Date:	Name of recorder: Jake Schweitzer
415 - 10	4/24/2019	Other surveyors:
	UID:	Location Name: Johnston Ranch

GPS name: GPS 2/JS iPad For Relevé only: **Bearing°,** left axis at ID point_____ **of Long / Short** side

UTME 5 5 2 2 3 9 **UTMN** 4 1 4 5 4 2 8 **Zone: 10 NAD83** GPS error: **ft.** **m./ PDOP** _____

Decimal degrees: **LAT** ___ ___ . ___ ___ ___ ___ ___ ___ **LONG** ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? **Yes** / **No** If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___

Camera Name: JS **Cardinal photos at ID point:** 897-900

Other photos:

Stand Size (acres): **<1, 1-5, >5** | **Plot Area (m²): 100 /** _____ | **Plot Dimensions** 20 x 20 **m** | **RA Radius**____ **m**

Exposure, Actual °: 330 **NE** **NW** **SE** **SW** **Flat** **Variable** | **Steepness, Actual °:** 18 **0°** **1-5°** **> 5-25°** **> 25**

Topography: Macro: top upper mid lower bottom | **Micro: convex flat concave undulating**

Geology code: _____ **Soil Texture code:** MESI | **Upland** or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 0 BA Stems: 2 Litter: 5 Bedrock: 0 Boulder: 0 Stone: 0 Cobble: 0 Gravel: + Fines: 93 =100%

% Current year bioturbation 1 **Past bioturbation present?** **Yes** / **No** | **% Hoof punch** 1

Fire evidence: Yes / **No** (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Moderately steep coastal scrub habitat along north-facing slope.

Disturbance code / Intensity (L,M,H): 5 / L 4 / L _____/___ _____/___ _____/___ **"Other"** _____ / ___

II. HABITAT DESCRIPTION

Tree DBH : T1 (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Baccharis pilularis

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Grassland/wetland / to North, Pinus radiata / to South

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb E **Shrub** E **Tree** E **Other identification or mapping information:**

Database #: 415 - 10 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: 0 **Total % Vasc Veg cover:** 80

% Cover - **Conifer tree / Hardwood tree:** 5 / 0 **Regenerating Tree:** 1 **Shrub:** 65 **Herbaceous:** 10

Height Class - Conifer tree / Hardwood tree: 6 / N/A **Regenerating Tree:** 5 **Shrub:** 3 **Herbaceous:** 2

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
S	*Baccharis pilularis*	35		
S	*Rubus ursinus*	15		
S	*Eriophyllum staechadifolium*	5		
T	*Pinus radiata*	5		
S	*Holodiscus discolor*	4		
H	*Clinopodium douglasii*	3		
S	*Toxicodendron diversilobum*	3		
H	*Asteraceous* (no flower--early leaf forms)	2		
S	*Ribes sanguineum*	2		
H	*Sanicula crassicaulis*	2		
H	*Symphyotrichum sp.* (no flower)	2		
H	*Stachys rigida*	2		
H	*Verbena lasiostachys*	2		
H	*Dryopteris arguta*	1		
H	*Festuca bromoides*	1		
H	*Galium aparine*	1		
S	*Lonicera involucrata*	1		
S	*Morella californica*	1		
H	*Pentagramma triangularis*	1		
SA	*Pinus radiata*	1		
H	*Sonchus asper*	1		
H	*Achillea millefolium*	+		
H	*Barbarea orthoceras*	+		
H	*Carex densa*	+		
H	*Conium maculatum*	+		
H	*Galium porrigens*	+		
H	*Geranium dissectum*	+		
H	*Helenium puberulum*	+		
H	*Juncus patens*	+		
H	*Lysimachia arvensis*	+		
H	*Marah fabacea*	+		
S	*Symphoricarpos albus*	+		
H	*Torilis arvensis*	+		
H	*Vicia tetrasperma*	+		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance *Holodiscus discolor* Shrubland Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or RA

Database #:	Date:	Name of recorder: Jake Schweitzer
415 - 11	4/24/2019	Other surveyors:
	UID:	Location Name: Johnston Ranch

GPS name: GPS 2 For Relevé only: Bearing°, left axis at ID point_____ of Long / Short side

UTME 5 5 2 2 6 1 UTMN 4 1 4 5 3 7 0 Zone: 10 NAD83 GPS error: ft./ m./ PDOP 31"

Decimal degrees: LAT ___ ___ . ___ ___ ___ ___ ___ ___ LONG ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? **Yes** / No If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: Base point ID _____ Projected UTMs: UTME ___ ___ ___ ___ ___ ___ UTMN ___ ___ ___ ___ ___ ___

Camera Name: JS Cardinal photos at ID point: 903-906

Other photos:

Stand Size (acres): **<1,** 1-5, >5 | Plot Area (m²): 100 / _____ | Plot Dimensions 20 x 20 m | RA Radius____ m

Exposure, Actual °: 345 NE **NW** SE SW Flat Variable | Steepness, Actual °: 15 0° 1-5° **> 5-25°** > 25

Topography: Macro: top **upper** mid lower bottom | Micro: convex flat concave **undulating**

Geology code: _____ Soil Texture code: MESI | **Upland** or Wetland/Riparian (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 0 BA Stems: 2 Litter: 10 Bedrock: 0 Boulder: 0 Stone: 0 Cobble: 0 Gravel: 1 Fines: 87 =100%

% Current year bioturbation 1 Past bioturbation present? Yes / **No** | % Hoof punch +

Fire evidence: Yes / **No** (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Steep north-facing slope supporting Holodiscus discolor. Most litter is made up of branches.
Many woodrat nests in the area, including collapsed nests. Non-vasular cover is moss on the ground.

Disturbance code / Intensity (L,M,H): 5 / L 4 / L ____/___ ____/___ ____/___ "Other" _____ / ___

II. HABITAT DESCRIPTION

Tree DBH : **T1** (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: **S1** seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: **H1** (<12" plant ht.), **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Holodiscus discolor

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: _____/_____, _____/_____

Confidence in Alliance identification: L M **H** Explain: _____

Phenology (E,P,L): Herb P Shrub P Tree E Other identification or mapping information:

Database #: 415 - 11 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: + **Total % Vasc Veg cover:** 80

% Cover - **Conifer tree / Hardwood tree:** 10 / 0 **Regenerating Tree:** + **Shrub:** 70 **Herbaceous:** 10

Height Class - Conifer tree / Hardwood tree: 7 / N/A **Regenerating Tree:** 5 **Shrub:** 4 **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
S	*Holodiscus discolor*	37		
S	*Oemleria cerasiformis*	15		
S	*Eriophyllum staechadifolium*	10		
T	*Pinus radiata*	10		
S	*Baccharis pilularis*	5		
S	*Sambucus racemosa*	5		
H	*Sanicula crassicaulis*	5		
H	*Clinopodium douglasii*	3		
H	*Asteraceous* (no flower)	1		
H	*Dryopteris arguta*	1		
H	*Marah fabacea*	1		
H	*Poaceae sp.* (no flower)	1		
H	*Scrophularia californica*	1		
S	*Toxicodendron diversilobum*	1		
H	*Cardamine oligosperma*	+		
H	*Cerastium glomeratum*	+		
H	*Chlorogalum pomeridianum*	+		
SE	*Eriophyllum staechadifolium*	+		
H	*Festuca bromoides*	+		
H	*Galium aparine*	+		
H	*Pentagramma triangularis*	+		
H	*Phalaris aquatica*	+		
S	*Rubus ursinus*	+		
H	*Sonchus asper*	+		

Unusual species: _____

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

For Office Use:	Final database #:	Final vegetation type:	Alliance *Pinus muricata - Pinus radiata* Forest Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION circle: **Relevé** or **RA**

Database #:	Date:	Name of recorder: Jake Schweitzer
415 - 12	4/24/2019	Other surveyors:
	UID:	Location Name: Johnston Ranch

GPS name: JS iPad/GPS 2 For Relevé only: **Bearing°,** left axis at ID point_____ **of Long / Short** side

UTME 5 5 2 4 2 8 **UTMN** 4 1 4 5 4 1 0 **Zone: 10 NAD83** GPS error **ft./ m./ PDOP** ____

Decimal degrees: **LAT** ___ ___ . ___ ___ ___ ___ ___ ___ **LONG** ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? Yes No If No, cite from GPS to stand: distance (m) _____ bearing ° _____ inclination ° _____

and record: **Base point ID** _____ **Projected UTMs: UTME** ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___ ___

Camera Name: **Cardinal photos at ID point: From north, clockwise 884-887**

Other photos:

Stand Size (acres): <1, 1-5, >5 | Plot Area (m²): 100 / _____ **| Plot Dimensions** 20 x 20 **m | RA Radius**____ **m**

Exposure, Actual °: _____ **NE NW SE SW Flat Variable | Steepness, Actual °:** 17° **0° 1-5° > 5-25° > 25**

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating

Geology code: _____ **Soil Texture code:** MESI **| Upland** or **Wetland/Riparian** (circle one)

% Surface cover: (Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

H_20: 0 **BA Stems:** 2 **Litter:** 65 **Bedrock:** 0 **Boulder:** 0 **Stone:** 0 **Cobble:**0 **Gravel:** 0 **Fines:** 33 **=100%**

% Current year bioturbation 0 **Past bioturbation present? Yes / No | % Hoof punch** 1

Fire evidence: Yes No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Moderately steep northwest facing slope with Pinus radiata dominant. Probably coastal scrub in the past.

Most of the litter consists of pine needles, plus branches and cones. Non-vascular vegetation = Lichen

Disturbance code / Intensity (L,M,H): 5 / M ____/____ ____/____ ____/____ ____/____ **"Other"** _____ / ____

II. HABITAT DESCRIPTION

Tree DBH : T1 (<1" dbh), **T2** (1-6" dbh), **T3** (6-11" dbh), **T4** (11-24" dbh), **T5** (>24" dbh), **T6** multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), **S2** young (<1% dead), **S3** mature (1-25% dead), **S4** decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), **H2** (>12" ht.)

~~**Desert Riparian Tree/Shrub: 1** (<2ft. stem ht.), **2** (2-10ft. ht.), **3** (10-20ft. ht.), **4** (>20ft. ht.)~~

~~**Desert Palm/Joshua Tree: 1** (<1.5" base diameter), **2** (1.5-6" diam.), **3** (>6" diam.)~~

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Pinus radiata

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: Baccharis pilularis all around ____/_____, _____/_____

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb E **Shrub** E **Tree** E **Other identification or mapping information:**

Combined Vegetation Rapid Assessment and Relevé Field Form **ATTACHMENT 2**
(Revised March 27, 2018)

Database #: 415 - 12 SPECIES SHEET

IV. VEGETATION DESCRIPTION

% NonVasc cover: + **Total % Vasc Veg cover:** 60

% Cover - **Conifer tree / Hardwood tree:** 40 / 0 **Regenerating Tree:** 1 **Shrub:** 10 **Herbaceous:** 5

Height Class - Conifer tree / Hardwood tree: 8 / N/A **Regenerating Tree:** 5 **Shrub:** 2 **Herbaceous:** 1

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
T	*Pinus radiata*	40		
S	*Rubus ursinus*	7		
H	*Symphyotrichum* sp. (no flower)	3		
H	*Artemisia douglasiana*	2		
H	*Galium aparine*	2		
S	*Toxicodendron diversilobum*	2		
H	*Clinopodium douglasii*	1		
S	*Holodiscus discolor*	1		
SA	*Pinus radiata*	1		
S	*Ribes sanguineum*	1		
H	*Scrophularia californica*	1		
H	*Stachys rigida* var. *quercetorum*	1		
H	*Angelica tomentosa*	+		
S	*Baccharis pilularis*	+		
H	*Bromus laevipes*	+		
H	*Cardamine californica*	+		
H	*Carex* sp. (no flower)	+		
H	*Conium maculatum*	+		
S	*Diplacus aurantiacus*	+		
H	*Dryopteris arguta*	+		
H	*Geranium dissectum*	+		
H	*Holcus lanatus*	+		
H	*Juncus patens*	+		
H	*Lonicera involucrata*	+		
H	*Marah oregana*	+		
H	*Sanicula crassicaulis*	+		
H	*Vicia tetrasperma*	+		

Unusual species: _____

APPENDIX E:

Habitat Relevé Form Instructions and Documentation

APPENDIX E
PROTOCOL FOR THE CNPS
RELEVÉ SAMPLING FIELD FORM

Introduction

This protocol describes the methodology for the relevé vegetation sampling techniques. The same environmental data are collected for both techniques. For more background on the relevé and rapid assessment sampling methods, see the relevé and rapid assessment protocols at www.cnps.org. Note that this form has been adapted for the Loma Fire Habitat Study, Santa Clara County, California. Some attributes have been removed that are not applicable to the study, and several attributes related to post-fire habitat conditions have been added.

For this project, collect rapid assessments in woody vegetation and relevés in herbaceous vegetation.

Defining a Stand

A stand is the basic physical unit of vegetation in a landscape. It has no set size. Some vegetation stands are very small, such as a portion of a vernal pool, and some may be several square kilometers in size, such as forest types. All samples should be in stands that meet the minimum mapping unit of 1 acre for upland and 0.5 acre for special stands such as small wetlands, riparian and serpentine barrens.

A stand is defined by two main unifying characteristics:

1) It has compositional integrity. Throughout the site, the combination of species is similar. The stand is differentiated from adjacent stands by a discernable boundary that may be abrupt or indistinct.
2) It has structural integrity. It has a similar history or environmental setting that affords relatively similar horizontal and vertical spacing of plant species. For example, a hillside forest originally dominated by the same species that burned on the upper part of the slopes, but not the lower, would be divided into two stands. Likewise, sparse woodland occupying a slope with very shallow rocky soils would be considered a different stand from an adjacent slope with deeper, moister soil and a denser woodland or forest of the same species.

The structural and compositional features of a stand are often combined into a term called homogeneity. For an area of vegetated ground to meet the requirements of a stand, it must be homogeneous (uniform in structure and composition throughout).

Location of GPS Points

For relevés, one corner will be considered the plot Identifier (ID point) and should be in the SW corner, if possible. If it is taken in another corner, this should be noted in the Site history section.

Definitions of fields in the protocol

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Relevé or RA: Circle the appropriate survey type.

Database #: This is the unique ID number for or all relevé and rapid assessments, in the form of SSNFxxxx.

Date: Date of the sampling.

Name of recorder: The full name of the recorder should be provided for the first field form for the day. On successive forms, initials can be recorded.

Other Surveyors: The full names of each person assisting should be provided for the first field form for the day. On successive forms, initials of each person assisting can be recorded.

Location Name: The name of the property, park, or the location within large holdings (like USFS or BLM properties).

GPS name: The name/number assigned to each GPS unit. This can be the serial number if another number is not assigned.

UTM coordinates: Easting (UTME) and northing (UTMN) location coordinates using the Universal Transverse Mercator (UTM) grid. Record the information from your GPS unit. These coordinates are always the base point of the survey. Soil samples and photos are taken from this point, and exposure, steepness, topography, etc. are measured here. If the GPS is not within the stand (i.e., the point is projected), these are the UTMs of the base point.

For relevé plots, take the waypoint in the southwest corner of the plot whenever possible or in the center of a circular plot.

Decimal degrees: *Use this only if your GPS unit will not record UTM coordinates.* Latitude–Longitude reading in decimal degrees. Record the information from your GPS unit. These coordinates are always the base point of the survey. Soil samples and photos are taken from this point, and exposure, steepness, topography, etc. are measured here.

For relevé plots, take the waypoint in the southwest corner of the plot whenever possible or in the center of a circular plot.

If No, cite from GPS to stand: distance (m), bearing°, inclination°: From the base GPS point, measure the distance to the projected point using a range finder. Record the compass bearing from the base point to the projected point; record the inclination if the base and projected points are not at the same elevation.
and record projected UTMs: These are the coordinates of the projected point, or the point being surveyed. They are generated in the field if the GPS units have the ability to calculate projected points. If the GPS unit does not have this capability, make a note to that effect and leave these fields blank.

Camera Name: Write the camera name.

Cardinal photos at ID point: Take four photos in the main cardinal directions (N, E, S, W) clockwise from the north, from the ID Point and record the jpeg numbers here. Try to include the horizon in at least some of these photos. If this is a distance survey to a projected point, take the four cardinal photos at the base point and at least one photo of the stand.

Other photos: This may include cardinal photos at additional corners or other relevant photos. Notes regarding photo locations or subjects can go here.

Stand Size: Estimate the size of the entire stand in which the sample is taken. As a measure, one acre is about 4000 square meters (approximately 64 x 64 m), or 208 feet by 208 feet. One acre is similar in size to a football field.

Plot Size: If this is a relevé, circle "100" for a 100m^2 plot, or record the plot size.

Plot Shape: Record the length and width of the relevé plot in meters.

RA Radius: Enter the radius of the visually estimated sample area for rapid assessments (should be a 20 meter radius minimum). For a large stand, this limits the area covered by the RA. If you can see and assess the entire stand, the length and width should be recorded. If it is a long, narrow stand, note the width of the stand at your location. If your point is on the edge of the stand, record the radius into the stand, but note your location and the direction to which the RA Radius applies in the Site History section.

Exposure: (Enter actual º and circle general category): While facing in the general downhill direction, read degrees of the compass for the aspect or the direction you are standing, using degrees from north, adjusted for declination. Average the reading over the entire stand, even if you are sampling a relevé plot, since your plot is representative of the stand. If estimating the exposure, write "N/A" for the actual degrees, and circle the general category chosen. "Variable" may be selected if the same, homogenous stand of vegetation occurs across a varied range of slope exposures. Select "all" if stand is on top of a knoll that slopes in all directions or if the same, homogenous stand of vegetation occurs across all ranges of slope.

Steepness: (Enter actual º and circle general category): Read degree slope from your compass. If estimating, write "N/A" for the actual degrees, and circle the general category chosen. Make sure to average the reading across the entire stand even if you are sampling in a relevé plot.

Topography: First assess the broad (**Macro**) topographic feature or general position of the stand in the surrounding watershed, that is, the stand is at the top, upper (1/3 of slope), middle (1/3 of slope), lower (1/3 of slope), or bottom. **Circle *all* of the positions that apply for macrotopography.**
Then assess the local (**Micro**) topographic features or the lay of the area (*e.g.,* surface is flat or concave). **Circle only *one* of the microtopographic descriptors**.

Geology code: Geological parent material of site. If exact type is unknown, use a more general category (*e.g.,* igneous, metamorphic, sedimentary). *See code list for types*.

Soil Texture code: Record soil texture that is characteristic of the site (*e.g.,* coarse loamy sand, sandy clay loam). *See soil texture key and code list for types.*

Upland or Wetland/Riparian: Indicate if the stand is in upland or a wetland/riparian. (Wetland and riparian are one category.) Note that a site need not be officially delineated as a wetland to qualify as such in this context (*e.g.,* seasonally wet meadow).

% Surface cover (abiotic substrates). The total should sum to 100%. It is helpful to imagine "mowing off" all of the live vegetation at the base of the plants and removing it – you will be estimating what is left covering the surface. Note that non-vascular cover (lichens, mosses, cryptobiotic crusts) is not estimated in this section.

% Water: Percent surface cover of running or standing water, ignoring the substrate below the water.
% BA Stems: Percent surface cover of the basal area of stems at the ground surface. For most vegetation types, BA is 1-3% cover.
% Litter: Percent surface cover of litter, duff, or wood on the ground.
% Bedrock: Percent surface cover of bedrock.
% Boulders: Percent surface cover of rocks > 60 cm in diameter.
% Stone: Percent surface cover of rocks 25-60 cm in diameter.
% Cobble: Percent surface cover of rocks 7.5 to 25 cm in diameter.
% Gravel: Percent surface cover of rocks 2 mm to 7.5 cm in diameter.
% Fines: Percent surface cover of bare ground and fine sediment (*e.g.,* dirt) < 2 mm in diameter.

% Current year bioturbation: Estimate the percent of the sample or stand exhibiting soil disturbance by any organism that lives underground. Do not include disturbance by ungulates. Note that this is a separate estimation from surface cover.

Past bioturbation present? Circle Yes if there is evidence of bioturbation from previous years.

% Hoof punch: Note the percent of the sample or stand surface that has been punched down by hooves (cattle or native grazers) in wet soil.

Fire Evidence: Circle Yes if there is visible evidence of fire, and note the type of evidence in the "Site history, stand age and comments section," for example, "charred dead stems of *Quercus berberidifolia* extending 2 feet above resprouting shrubs." If you are certain of the year of the fire, put this in the Site history section.

Site history, stand age, and comments: Briefly describe the stand age/seral stage, disturbance history, nature and extent of land use, and other site environmental and vegetation factors, such as distribution of species. Examples of disturbance history: fire, landslides, avalanching, drought, flood, animal burrowing, or pest outbreak. Also, try to estimate year or frequency of disturbance. Examples of land use: grazing, timber harvest,

or mining. Examples of other site factors: exposed rocks, soil with fine-textured sediments, high litter/duff build-up, multi-storied vegetation structure, or other stand dynamics.

Disturbance code / Intensity (L,M,H): List codes for potential or existing impacts on the stability of the plant community. See code list for impacts and definitions of levels of disturbance. Characterize each impact each as **L** (=Light), **M** (=Moderate), or **H** (=Heavy). Disturbance is evaluated on a stand basis.

II. HABITAT AND VEGETATION DESCRIPTION

California Wildlife-Habitat Relationships (CWHR)

For CWHR, identify the size/height class of the stand using the following tree, shrub, and/or herbaceous categories. These categories are based on functional life forms.

Tree DBH: Circle one of the tree size classes provided when the tree canopy closure exceeds 10 percent of the total cover, or if young tree density indicates imminent tree dominance. Size class is based on the average diameter at breast height (dbh) of each trunk (standard breast height is 4.5ft or 137cm). When marking the main size class, make sure to estimate the mean diameter of all trees over the entire stand, and weight the mean toward the larger tree dbh's. The "**T6 multi-layered**" dbh size class contains a multi-layered tree canopy (with a size class T3 and/or T4 layer growing under a T5 layer and a distinct height separation between the classes) exceeding 60% total cover. Stands in the T6 class need also to contain at least 10% cover of size class 5 (>24" dbh) trees growing over a distinct layer with at least 10% combined cover of trees in size classes 3 or 4 (>11-24" dbh).

Shrub: Circle one of the shrub size classes provided when shrub canopy closure exceeds 10 percent (except in desert types) by recording which class is predominant in the survey. Shrub size class is based on the average amount of crown decadence (dead standing vegetation on live shrubs when looking across the crowns of the shrubs).

Herb: Circle one of the herb height classes when herbaceous cover exceeds 2 percent by recording the predominant class in the survey. Note*: This height class is based on the average plant height at maturity, not necessarily at the time of observation.*

INTERPRETATION OF STAND

Field-assessed vegetation alliance name: Enter the name of alliance following the Manual of California Vegetation, 2nd Edition (Sawyer, Keeler-Wolf and Evens 2009). Please use scientific nomenclature, *e.g., Quercus agrifolia* forest. An alliance is based on the dominant or diagnostic species of the stand, and is usually of the uppermost and/or dominant height stratum. A dominant species covers the greatest area. A diagnostic species is consistently found in some vegetation types but not others.

The field-assessed alliance name may not exist in the present classification, in which case you can provide a new alliance name in this field. If this is the case, also make sure to

state that it is not in the MCV under the explanation for "Confidence in alliance identification."

Field-assessed association name (optional): Enter the name of the species in the alliance and additional dominant/diagnostic species from any strata. In following naming conventions, species in differing strata are separated with a slash, and species in the uppermost stratum are listed first (*e.g., Quercus douglasii/Toxicodendron diversilobum*). Species in the same stratum are separated with a dash (*e.g., Quercus lobata-Quercus douglasii)*.

The field-assessed association name may not exist in the present classification, in which you can provide a new association name in this field.

Phenology: Indicate early (E), peak (P) or late (L) phenology for each of the strata. For herbs, this generally indicates if species are in flower and/or fruit and are therefore identifiable. For shrubs and trees, this attribute generally refers to cover, e.g., a tree that is fully leafed out will be considered peak (P) even if it is not in flower. Phenology is useful for cover estimation and species identification issues, and should be elaborated upon in the next field.

Other identification problems or mapping issues: Discuss any further problems with the identification of the assessment or issues that may be of interest to mappers.

Overall Cover of Vegetation

Provide an estimate of cover for the life-form categories below. Record a specific number for the total aerial cover or "bird's-eye view" looking from above for each category, estimating cover for the living plants only. Litter/duff should not be included in these estimates.

The *porosity* of the vegetation should be taken into consideration when estimating percent foliar cover for all categories below: consider how much of the sky you can see when you are standing under the canopy of a tree, or how much light passes through the canopy of the shrub layer to help you estimate foliar cover.

% NonVasc cover: The total cover of all lichens, bryophytes (mosses, liverworts, hornworts), and cryptogamic crust on substrate surfaces including downed logs, rocks and soil, but not on standing or inclined trees or vertical rock surfaces.

% Vasc Veg cover: The total cover of all vascular vegetation taking into consideration the porosity, or the holes, in the vegetation, and disregarding overlap[1] of the various tree, shrub, and/or herbaceous layers and species.

% Cover by Layer

[1] Porosity reduces the total cover of the canopy. Overlapping strata should not be included in the total cover percent; for instance, if a shrub is growing under a tree, only the cover of the tree will be added into the total; the cover of the shrub will be disregarded, except for the amount by which it fills in the porosity of the tree canopy.

% Conifer Tree /Hardwood Tree: The total foliar cover (considering porosity) of all live tree species, disregarding overlap[1] of individual trees. Estimate conifer and hardwood covers separately.
Please note: These cover values should not include the coverage of regenerating tree species (i.e., tree seedlings and saplings).

% Regenerating Tree: The total foliar cover of seedlings and saplings, disregarding overlap[1] of individual recruits. See seedling and sapling definitions below.

%Shrub: The total foliar cover (considering porosity) of all live shrub species disregarding overlap[1] of individual shrubs.

%Herbaceous: The total cover (considering porosity) of all herbaceous species, disregarding overlap[1] of individual herbs.

Height Class by Layer

Modal height for conifer tree /hardwood tree, shrub, and herbaceous categories: Record an average height value per each category by estimating the mean height for each group. Please use the following height intervals to record a height class: 01 = <1/2 m, 02 = 1/2-1 m, 03 = 1-2 m, 04 = 2-5 m, 05 = 5-10 m, 06 = 10-15 m, 07 = 15-20 m, 08 = 20-35 m, 09 = 35-50 m, 10 => 50 m. Note: *For the herbaceous layer height, this height class is based on the average plant height at the time of observation, as opposed to how this is recorded in the CWHR section (at maturity).*

Species List and Coverage

For rapid assessments, list up to 20 species that are dominant or that are characteristically consistent within the assessment area. These species may or may not be abundant, but they should be constant representatives in the survey. When different layers of vegetation occur, make sure to list species from each stratum. As a general guide, make sure to list at least 1-2 of the most abundant species per stratum. *If constant, diagnostic, or interesting species occur outside the assessment area but in the stand, list the species and estimated stand cover in the Site History section.*

For relevés, list all species present in the plot, using a second species list page if necessary.

Use the lower portion of the form to record unknowns, one species per line. This allows space for the final determination to be recorded without obscuring the original information.

For both sample types, provide the stratum:
T = Tree. A woody perennial plant that has a single trunk.
S = Shrub. A perennial, woody plant, that is multi-branched and doesn't die back to the ground every year.
H = Herb. An annual or perennial that dies down to ground level every year.
E = SEedling. A tree species clearly of a very young age that is < 1" dbh or has not reached breast height. Applies only to trees propagating from seed; resprouts are not recorded here even if they meet the size requirements.

A = SApling. 1" - <6" dbh and young in age, OR small trees that are <1" dbh, are clearly of appreciable age, and are kept short by repeated browsing, burning, or other disturbance. Includes trees that are re-sprouting from roots or stumps following fire, logging or other disturbance. These re-sprouts may exhibit a shrubby form, with multiple small trunks, but are species that are generally considered trees. If a majority of the trunks are >6" dbh, then the re-sprouts would be recorded under the "Tree" stratum.
N = Non-vascular. Includes moss, lichen, liverworts, hornworts, cryptogammic crust, and algae.

Be consistent and don't break up a single species into two separate strata. The only time it would be appropriate to do so is when one or more tree species are regenerating, in which case the Seedling and/or Sapling strata should be recorded for that species. These may be noted on the same line, *e.g.:*

Strata	Species	%Cover	C
T/E/A	Quercus douglasii	40/<1/<1	

If you're unsure of the strata for a species, call it what it is called in the MCV or, as a second choice, the Jepson Manual.

C: If a species collection is made, it should be indicated in the collection column with a "C" (for collected). If the species is later keyed out, cross out the species name or description and write the keyed species name in pen on the data sheet. Do not erase what was written in the field, because this information can be used if specimens get mixed up later. If the specimen is then thrown out, the "C" in the collection column should crossed out. If the specimen is kept but is still not confidently identified, add a "U" to the "C" in the collection column (CU = collected and unconfirmed). In this case the unconfirmed species epithet should be put in parentheses [*e.g., Hordeum (murinum)*]. If the specimen is kept and is confidently identified, add a "C" to the existing "C" in the collection column (CC = Collected and confirmed).

Use Jepson Manual nomenclature. Write out the genus and species of the plant. Do not abbreviate except for dominant species that do not have ambiguous codes. If you aren't sure there aren't duplicate codes, don't use a code. When uncertain of an identification (which you intend to confirm later) use parentheses to indicate what part of the determination needs to be confirmed. For example, you could write out *Brassica* (*nigra*) if you are sure it is a *Brassica* but you need further clarification on the specific epithet.

Provide the % absolute foliar cover for each species listed considering porosity. When estimating, it is often helpful to think of coverage in terms of the following cover intervals at first:

<1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%.

Keeping these classes in mind, refine your estimate to a specific percentage. All species percent covers may total over 100% because of overlap.

Include the percent cover of snags (standing dead) of trees and shrubs. Use the code "SNAG." Note their species, if known, in the "Species" column (i.e. SNAG – *Quercus wislizeni*).

For rapid assessments, make sure that the major non-native species occurring in the stand also are listed in the space provided in the species list with their strata and % cover.

For relevés, all non-native species should be included in the species list.

Also for relevés, record the <1% cover in one of two categories: “r” for trace (i.e., rare in plot, or solitary individuals) and “+” for <1% but not rare or solitary individuals.

Unusual species: List species that are locally or regionally rare, endangered, or atypical (*e.g.,* range extension or range limit) within the stand. This field will be useful to the Program for obtaining data on regionally or locally significant populations of plants.

GEOLOGY CODE

IGTU	**Igneous (type unknown)**
MIIG	Mixed igneous
ULTU	Ultramafic (type unknown)
VOLC	General volcanic extrusives
ANDE	Andesite
ASHT	Ash (of any origin)
BASA	Basalt
DIAB	Diabase
OBSI	Obsidian
PUMI	Pumice
PYFL	Pyroclastic flow
RHYO	Rhyolite
VOFL	Volcanic flow
VOMU	Volcanic mud
INTR	General igneous intrusives
DIOR	Diorite
GABB	Gabbro
GRAN	Granitic (generic)
MONZ	Monzonite
PERI	Peridotite
QUDI	Quartz diorite
METU	**Metamorphic (type unknown)**
MIME	Mixed metamorphic
GREE	Greenstone
BLUE	Blue schist
FRME	Franciscan melange
GNBG	Gneiss/biotite gneiss
HORN	Hornfels
MARB	Marble
PHYL	Phyllite
SCHI	Schist
SESC	Semi-schist
SLAT	Slate
ULTU	Ultramafic (type unknown)
SERP	Serpentine
SETU	**Sedimentary (type unknown)**
BREC	Breccia (non-volcanic)
CACO	Calcareous conglomerate
CALU	Calcareous (origin unknown)
CASA	Calcareous sandstone
CASH	Calcareous shale
CASI	Calcareous siltstone
CHER	Chert
CONG	Conglomerate
DOLO	Dolomite
FANG	Fanglomerate
LIME	Limestone
MISE	Mixed sedimentary
SAND	Sandstone
SHAL	Shale
SILT	Siltstone
CLAL	Clayey alluvium
DUNE	Sand dunes
GLTI	Glacial till, mixed origin, moraine
GRAL	Gravelly alluvium
LALA	Large landslide (unconsolidated)
LOSS	Loess
MIAL	Mixed alluvium
SAAL	Sandy alluvium
SIAL	Silty alluvium
MIRT	Mix of two or more rock types
OTHE	Other than on list

ROCK SIZE

Boulder	> 60 cm diameter
Stone	25 cm to 60 cm
Cobble	7.5 cm to 25 cm
Gravel	2 mm to 7.5 cm
Fines	< 2 mm

DISTURBANCE CODES

01 Development
02 ORV activity
03 Agriculture
04 Grazing
05 Competition from exotics
06 Logging
07 Insufficient population/stand size
08 Altered flood/tidal regime
09 Mining
10 Hybridization
11 Groundwater pumping
12 Dam/inundation
13 Other
14 Surface water diversion
15 Road/trail construction/maint.
16 Biocides
17 Pollution
18 Unknown
19 Vandalism/dumping/litter
20 Foot traffic/trampling
21 Improper burning regime
22 Over collecting/poaching
23 Erosion/runoff
24 Altered thermal regime
25 Landfill
26 Degrading water quality
27 Wood cutting
28 Military operations
29 Recreational use (non ORV)
30 Nest parasitism
31 Non-native predators
32 Rip-rap, bank protection
33 Channelization (human caused)
34 Feral pigs
35 Burros
36 Rills
37 Phytogenic mounding
38 Sudden Oak Death

Simplified Key to Soil Texture
(Adapted from Brewer and McCann 1982)

ATTACHMENT 2

Place about three teaspoons of soil in the palm of your hand. Take out any particles ≥3 mm in size.

A. Does soil remain in ball when squeezed in your hand palm? Wet Soil First

Yes, soil does remain in a ball when squeezed..... **B**

No, soil does not remain in a ball when squeezed..... **sand**

SAND Sand (class unknown)
Very coarse texture.....COSA Coarse sand
Moderately coarse texture..... MESN Medium sand
Moderately fine texture..... FISN Fine sand

B. Add a small amount of water until the soil feels like putty. Squeeze the ball between your thumb and forefinger, attempting to make a ribbon that you push up over your finger. Does soil make a ribbon?

Yes, soil makes a ribbon; though it may be very short.....**C**

No, soil does not make a ribbon.....**loamy sand**

Very gritty with coarse particles.....COLS Coarse, loamy sand
Moderately to slightly gritty with medium to fine particles.....MELS Medium to very fine, loamy sand

C. Does ribbon extend more than one inch?

Yes, soil extends > 1 inch.....**D**

No, soil does not extend > 1 inch.....Add excess water

Soil feels gritty.....**loam or sandy loam**

LOAM Loam (class unknown)
Very gritty with coarse particles.....MCSL Moderately coarse, sandy loam
Moderately gritty with medium to fine particles.....MESA Medium to very fine, sandy loam
Slightly gritty .....MELO Medium loam

Soil feels smooth.....**silt loam**

MESIL medium silt loam

D. Does ribbon extend more than 2 inches?

Yes, ribbon extends more than 2 inches, and does not crack if bent into a ring.....**E**

No, soil breaks when 1–2 inches long; cracks if bent into a ring.....Add excess water

Soil feels gritty.....**sandy clay loam or clay loam**

Very gritty.....MFSA Moderately fine sandy clay loam
Slightly gritty.....MFCL Moderately fine clay loam

Soil feels smooth.....**silty clay loam or silt**

Moderately fine texture.....MFSL Moderately fine silty clay loam
Very fine texture..... MESI Medium silt

E. Soil makes a ribbon 2+ inches long; does not crack when bent into a ring.....Add excess water

Soil feels gritty.....**sandy clay or clay**

CLAY Clay (class unknown)
Very gritty..... FISA Fine sandy clay
Slightly gritty..... FICL Fine clay

Soil feels smooth.....**silty clay**

FISC Fine silty clay

UNKN = UNKNOWN PEAT = PEAT MUCK = MUCK

Hendrys Creek Restoration
Geomorphic and Vegetation Monitoring Report
1st Year Post Construction (2019)

Los Gatos, California
RWQCB ID #830357

Meredith Manning, Senior Planner
Amanda Mills, Resource Management Specialist II
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022
650-691-1200

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1. INTRODUCTION

1.1 Background and Purpose

The Midepeninsula Regional Open Space District (Midpen) completed the Hendrys Creek Road Abandonment and Stream Restoration (Project) in 2018. This report represents results for geomorphic and vegetation monitoring conducted during the 1st year of post-construction monitoring. The Project made enhancements along ¾ miles of the watershed through removal of 14 in-stream structures (bridges, culverts and blockages) and removal of the road along Hendrys Creek and tributaries. The Project converted a road up the valley bottom to a trail for temporary access for use during the plant establishment and monitoring period. The creek and tributaries were recontoured in these impacted areas to restore the hydrologic connection of tributaries to Hendrys Creek, which had been lost or significantly altered as a result of road construction to support a former small community of homes, trailers, and other outbuildings within the canyon. These earthwork elements were intended to restore the geomorphic function of the watershed by reconnecting tributary channels to Hendrys Creek and to their own floodplains, reduce diversion potential at road/stream crossings and reduce the potential for erosion and subsequent sediment flow to Lexington Reservoir.

This 5-year monitoring program began in 2019 and will wrap up in 2023. This monitoring program may be extended for an additional five years if vegetation performance criteria are not achieved by 2023. The annual monitoring report compiles the monitoring elements identified in the regulatory permits and described in the Mitigated Negative Declaration prepared under the California Environmental Quality Act (CEQA). Th monitoring effort is also an opportunity to identify any future adaptive management actions that may be implemented under the existing regulatory permits. The program includes monitoring channel development, creek bank and channel stability, riparian and upland plantings for growth and the site for overall habitat development.

1.2 Project History

The Hendrys Creek Restoration Project is a fully discretionary effort intended to restore the geomorphic function of Hendrys Creek and tributaries and enhance the native riparian woodland and selected adjacent uplands through the removal of invasive species and installation of locally collected plant materials and seeds. The opportunity to pursue the restoration of Hendrys Creek has come about through collaboration among the Peninsula Open Space Trust (POST), Valley Water and Midpeninsula Regional Open Space District (Midpen).

The property transfer to Midpen was complicated. Since 2010, Valley Water had been interested in partnering with Midpen to protect the Hendrys Creek watershed and the streamflow that it contributes to Lexington Reservoir. In 2011, POST entered into an agreement to purchase the property from a private citizen. Midpen worked with Valley Water and three permitting agencies (U.S. Army Corps of

Engineers, California Department of Fish and Wildlife, and San Francisco Regional Water Quality Control Board) to develop the terms and conditions of a Conservation Easement and Long-term Management Plan partnership to eventually purchase the property from POST. In August 2011, Midpen entered into a Lease and Management Agreement with POST for Midpen to manage the property until the agreement with the Valley Water was finalized. The Lease and Management Agreement went into effect at the time the property was transferred to POST and the Midpen has managed the property, which is closed to public use, since that time.

Midpen owns fee title to the property and Valley Water has secured a Conservation Easement over the majority of the 117-acre property as compensatory mitigation for Valley Water's Multi-Year Stream Maintenance Program (SMP). This stream channel restoration, riparian and upland planting and invasive plant species removal actions are above and beyond the compensatory mitigation that was secured by Valley Water through the purchase of the Conservation Easement. The restoration actions were separately permitted and the monitoring required under these permits is communicated in this report.

1.3 Project Description

Hendrys Creek is a tributary to Los Gatos Creek that is impounded behind Lenihan Dam forming Lexington Reservoir located in Los Gatos, California (See Figure 1 – Regional Map). Hendrys Creek drains to the eastern side of the reservoir (See Figure 2 – Location Map). The Hendrys Creek Restoration Project made enhancements along ¾ miles of the watershed through removal of 14 in-stream structures (bridges, culverts and blockages) and removal of the road along Hendrys Creek and tributaries. The Project converted a valley-bottom vehicle road to a trail for temporary access for use during plant establishment. Unnatural sediment in the creek and tributaries were excavated in these impacted areas to restore the hydrologic connection of tributaries to Hendrys Creek (See Figure 3 – Project Overview Map).

The Project removed invasive non-native plants from approximately 4.44 acres of the canyon. Approximately 0.33 acres of watershed specific, contract grown container riparian and upland plants and oak acorns and buckeye seeds were planted in areas where structures were removed. The Project installed erosion control measures and native grass seed over approximately 3.20 acres, including the former road and home site building pads (See Figure 4 – Revegetation Areas).

The Hendrys Creek Restoration Project included the following actions:

- ➢ Implemented habitat enhancements along approximately ¾ miles (3,960 feet) of Hendrys Creek and tributaries within the 8.3 acres of freshwater wetland mitigation easement held by SCVWD.
- ➢ Permanently removed one (1) double culvert, three (3) bridges and one (1) sediment/debris jam within Hendrys Creek.

➢ Permanently removed three (3) failing ford crossings and three (3) culverts along the tributaries to Hendrys Creek and restore stream channels as close to its original configuration where feasible.

➢ Replaced one (1) bridge along Hendrys Creek and four (4) culverts along the tributaries to Hendrys Creek with seasonal rock fords. The seasonal fords will provide ATV access for native plant establishment, watering, weeding and project monitoring.

➢ Restored the hydrologic connection of the tributaries to Hendrys Creek using heavy equipment to remove fill material, or "daylight" the original stream channels. This action will restore the geomorphic function of the watershed because it will: a) reduce storm flow diversion potential at these locations where the road currently crosses the stream, b) reduce sediment discharge to the aquatic environment, c) reduce hydrologic connectivity of roads to streams by allowing tributary runoff to freely flow to Hendrys Creek instead of being diverted by the road network.

➢ Abandoned, ripped and restored the roadbed and the former buildings pads. Installed approximately 29 drainage dips every 75 to 100 feet along former road to reduce erosion to the creek. Installed erosion control measures and seeded approximately approximately 3.2 ripped acres with a native grass mix and oak acorns and buckeye seeds.

➢ Installed approximately 0.33 acres of riparian and upland native vegetation to reduce erosion, buffer the creek and increase the complexity of the habitat structure.

➢ Conducted an invasive plant species survey to map invasive plant species and plan removal that will be conducted prior to, during and after project implementation.

➢ Removed invasive French broom *(Genista monspessulana),* periwinkle *(Vinca major),* Himalayan blackberry *(Rubus armeniacus),* Robert's geranium *(Geranium robertianum)* and other small patches of invasive vegetation from the road, former building sites and the creek bank locations where structures will be excavated and removed within the approximately 4.44-acre construction area.

➢ Maintained (weed and water, as necessary) and monitored the installed native plants and invasive species removal areas for three (3) years, replanting as needed to meet the minimum requirements identified in the individual resource agency permits (potentially up to ten years for the CDFW Section 1600 permit). Vegetation work in subsequent years will be completed under the District's Integrated Pest Management Program.

➢ Monitored and implemented adaptive management measures to ensure the integrity of the stream channel work and water quality of the aquatic ecosystem.

1.4 Data Collected

The monitoring team presents the following data in Chapter 2 of this report:

- Qualitative assessments for channel development and bed and bank stability; and

- Percent survival of planted native vegetation at monitoring locations; and
- Photographic documentation of vegetation growth at established photo monitoring locations; and
- Photographic documentation of invasive plant removal sites at established photo monitoring locations.

1.5 Monitoring Team

Construction inspection vegetation monitoring (baseline sampling) was performed by Grassroots Ecology's Habitat Restoration Director Kristen Williams, Ecologist II Sara Witt, Project Lead Claire Grist, along with California Conservation Corps Watershed Stewards Program members Nina Orellana and Rebecca Cosmero on January 30, 2019 and February 6, 2019. Year 1 (Spring 2019) vegetation performance monitoring was performed by Ecologist II Sara Witt, Project Lead Claire Grist, along with California Conservation Corps Watershed Stewards Program members Nina Orellana, Rebecca Cosmero, Emma Lewis, and Gabe Elliott on June 10, 2019 and June 15, 2019.

Geomorphic monitoring was conducted by Engineering Geologist Timothy Best throughout 2018. Midpen staff members Meredith Manning, Senior Planner; Bryan Apple, Capital Fields Project Manager; Michael Gorman, Capital Fields Project Manager; Amanda Mills, Resource Management Specialist II; and Aaron Peth, Planner III have conducted monitoring visits throughout 2019.

2. DATA SUMMARY FOR 1ST YEAR POST-CONSTRUCTION

Chapter 2 presents results from monitoring conducted during the 1st year of the projected 5-year post-construction monitoring period. Prior to discussion of results we provide a brief review of the hydrologic conditions observed during water year 2019 (WY2019[1]). The organization of Chapter 2 reflects Midpen's Hendrys Creek Adaptive Management, Monitoring and Reporting Program (2018).

2.1 Rainfall

Hendrys Creek is a spring-fed perennial stream that drains an approximately 710-acre watershed. Hendrys Creek flows into Lexington Reservoir. WY2019 was notable as an average year following a dry year in WY2018 (California Department of Water Resources, 2019). The precipitation record at the Santa Clara Valley Water Districts' ALERT[2] system station #6138 Banjo Point on the eastern side of Lexington Reservoir indicates that cumulative rainfall for WY2019 was 46.96 inches which is average rainfall for the valley. However, it was 223% of rainfall recorded in WY2018. There were several significant rainfall events in January and February 2019 that resulted in notable runoff events.

2.2 Stream Geomorphology Monitoring

2.2.1 Creek and Tributary Realignments and Structure Removals

Hendrys Creek as-built conditions were documented in November 2018 (See Table 1- Geomorphic As-built Conditions). Only two notable changes resulted during construction. Tributary 7 was excavated approximately 15 feet upstream of the plans as a result of erosion that occurred in a prior storm year. The most downstream bridge crossing of Hendrys Creek (H5) was left in place to minimize impacts to the channel. It is anticipated that this wooden bridge will degrade and fail in the future.

[1] A water year is defined by the period October 1st of the prior year through September 30th of the named year. For example, water year 2019 is defined by the period October 1, 2018 through September 30, 2019.
[2] The historical precipitation record can be accessed at:
http://alert.valleywater.org/historicdata/pgi_historicdata_setup.php

Table 1 – Geomorphic As-built Conditions

SITE	COMMENTS
H1	Upstream excavation of fill material modified to avoid damaging in channel vegetation. Crib log placed against left channel bank upstream from where culverts were installed to stabilize bank One instream rock grade check installed to stabilize channel bed.
T4	Crossing excavated to plan specifications
T5	Crossing excavated to plan specifications. Small amount of perched fill on right bank and proposed for removal was retained since its removal was found to provide little benefit.
T6	Crossing excavated to plan specifications Earth berms constructed to plan specifications A couple of instream rock grade check installed to stabilize channel bed.
T7	Majority of the crossing excavated per plans. At the confluence with Hendrys Creek, the tributary channel needed to be excavated about 15 feet upstream of where shown on the plans to the location of the undersized 12 inch diameter culvert. This was done due to 1) recent erosion which made the original location of the excavated channel infeasible and 2) to minimize the removal of several trees located on the right bank of the channel. Four rock grade checks installed per plans.
H2	Bridge removed per plans
H3	Bridge and associated fill removed per plans. Small amounts of perched fill on left bank and proposed for removal was retained since its removal was found to provide little benefit.
T8-1	The majority of the crossing removed. A small amount of residual fill material retained within the excavated channel (< 5 cy). Minor stream downcutting through the thin residual fill may occur but is not expected to be significant. No treatment required.
T8-2	The majority of the crossing removed. Earthen berms constructed per plans A small amount of residual fill material retained within the excavated channel (< 5 cy). Minor stream downcutting through the thin residual fill may occur but is not expected to be significant. No treatment required.
T-9	Smaller than specified berm constructed but based on field observations appears functional. No additional treatment required.
H4	Bridge removed per plans
H5	Crossing not removed per District. It is my understanding that the bridge was retained to minimize impacts to the stream channel. Failure of this crossing will likely occur sometime in the future.
T12	Culvert removed and partial excavation of fill material. Based on discussions with District Crew, not all of the fill was removed to allow for continued site access for future restoration purposes. We recommend that a rock ford be installed by armoring the residual fill material with 8" to 12" diameter rock. Refer to Districts standard specifications for rock fords.

2.2.2 Channel and Bank Stability Observations

There were modest changes to the channel bed and banks from erosive flows over the course of WY2019. During an April 15 site visit it was noted that channel bed of Tributaries 7 and 8 had experienced some erosion and downcutting in a few small locations along the channel banks. In Tributary 7 the rock grade checks worked to reduce the erosion forces of the runoff but were slightly exposed as a result (See Photos 1 and 2 – Geomorphic Observations). The channel bank erosion caused resulted in the loss of plants installed along the edge of the channel.

The realigned Tributary 8 collects flows from both the short Tributary 9, which crosses a former building pad, and the larger Tributary 8 drainage also showed modest downcutting as flows drop off the former building pad and access driveway and some minor channel bed erosion toward the confluence with Hendrys Creek (See Photos 3 and 4 – Geomorphic Observations). These changes were not unexpected given the winter storm events and recently realigned tributary channels. As the new riparian plantings

grow, the root systems will help to anchor these realigned channels. The annuals and perennials that sprout from the installed native seed mixes and the on-site seed bank will help to minimize the impact of rain on freshly realigned channel beds and banks.

Photos 1 and 2 – Tributary 7 upstream the drainage flows along a former building site (left) and downstream it cross the former road and flows to the confluence with Hendrys Creek. Some minor erosion and down cutting is noted after the first winter.

Photos 3 and 4 – Tributary 8 and 9 flows combine above the rock grade check (left) and then flow to Hendrys Creek (right). Modest erosion is noted along the banks of the tributary.

2.3 Vegetation Monitoring

2.3.1 Restoration and Mitigation Plantings

Midpen planned to install 950 contract-grown trees, shrubs and perennials throughout the project site and contract-grew an additional 20% of the riparian and upland plants to ensure sufficient plant material in the event of poor germination, changes in plans, plant loss prior to installation and replanting during the monitoring period (See Table 2 – Native Plant Species List). Midpen opted to install the majority of the excess plant material to assist with the revegetation efforts and to minimize the need to replace plants during the monitoring period. Midpen installed 1,141 or 20% more contract-grown, watershed specific trees, shrubs and perennials than identified in the project permits. Nineteen species were contract grown container plants and three additional species were installed from nuts and acorns totally 22 different restoration plant species.

Midpen installed 154 planting basins containing buckeye nuts and oak acorns throughout the upland sites disturbed by the demolition and removal of buildings and roads. All of these basins were installed with tree shelters to minimize herbivory. The entire roadbed was ripped in a single direction to a depth of 8 inches to facilitate the restoration of the land. Midpen also seeded approximately two acres of the ripped road and disturbed upland areas with 80 pounds of native, local "sunny" seed mix and approximately one acre of the disturbed shady and riparian areas with 40 pounds of native, local "riparian" seed mix (See Figure 4 – Revegetation Areas). The quantity of container plants and acorn/nut planting basins is provided in Table 3.

The vegetation monitoring program evaluates the constructed conditions compared to subsequent growth of the vegetation and development of the habitat at ten photo points and vegetation monitoring areas at the end of the spring each growing season. Conditions at completion of construction activities were documented in winter 2019. Monitoring will be conducted for five years. This report covers Year 1 of the monitoring period.

This vegetation monitoring program includes data on qualitative health and vigor of the installed plant material and observations of native species recruitment and invasive species incursions into the restored habitats. This monitoring report notes past year maintenance activities, recommended future maintenance actions and other pertinent information related to the establishment of the habitats.

Table 2 – Native Plant Species List

Contract Grown Native Plant Species	
Acer macrophyllum	Big Leaf Maple
Acmisphon glaber var. glaber	Deerweed
*Aesculus californica**	Buckeye
Alnus rhombifolia	White Alder
Artemisia douglasiana	Sagebush
Artemesia californica	Mugwort
Baccharis pilularis	Coyote Bush
Ceanothus thyrsiflorua	Blue Blossom
Corylus cornuta var. californica	Hazelnut
Frangula californica	Coffeeberry
Heteromeles arbutifolia	Toyon
Juncus patens	Gray Rush
Lonicera hispidula	Hairy Honeysuckle
*Quercus agrifolia**	Coast Live Oak
*Quercus chrysolepis**	Canyon Live Oak
Rubus leucodermis	Western Raspberry
Rubus parviflorus	Thimbleberry
Rubus ursinus	Pacific Blackberry
Sanicula crassicaulis	Snakeroot
Scrophularia californica	Beeplant
Stachys bullata	Hedgenettle
Symphoricarpos albus	Snowberry

** Planted from acorn or nut.*

Table 3 – Installed Quantities of Planting Materials by Location

Planting Locations		
Location	***Quantity of Container Plants***	***Quantity of Acorn/Nut Planting Basins***
Hendry Creek 1	*168*	
Tributary 6	*225*	
Tributary 7	*410*	
Tributary 8	*169*	
Riparian 'Amanda's Spot'	*125*	
Hendrys Creek 4	*44*	
Upper Bat Boxes – Former Building Pad		*21*
Former 'Golf Course'		*72*
Former Building Pan on Tributary 4		*11*
Lower Bat Boxes – Former Building Pad		*50*
Total Installed Vegetation	***1,141***	***154***

Midpen made every effort to retain trees and, as a result, the actual tree removals were fewer than those originally included with the DFW Streambed Alteration Agreement application. Of the trees and shrubs installed with the restoration, 76 of the trees are identified as mitigation plantings under the conditions of the Department of Fish and Wildlife (DFW) Streambed Alteration Agreement. Native trees were replaced at 3:1 for trees 3-6 inches dbh and 6:1 for trees greater than 6 inches dbh. A single 4-inch coast live (*Quercus agrifolia*) was removed and mitigated at 3:1 and is included in the tree total. Non-native trees greater than 3 inches dbh were replaced at 1:1 with native trees.

Replacement mitigation tree quantities were calculated based upon the actual tree removals. Tree mitigation ratios are applied to the tree removals listed in Table 3. Seventeen native trees and 4 non-native trees were removed during the Hendrys Creek Restoration project resulting in 76 mitigation trees using DFW mitigation ratios. The native tree species removed include a single live oak, 6 big leaf maple and 10 California bay (See Table 4 – Tree Removals and Replacement Ratios). Replacement trees will include big leaf maple and white alder container plants and live oak acorn and buckeye nut basins.

Table 4 – Tree Removals and Replacement Ratios

Site	Native Tree Species	# Trees Removed	Trunk Diameter	Replacement Ratio	Mitigation Trees
H1	*Umbellularia californica*	7	3”, 4”, 4”, 5”, 6”, 6”, 6”	3:1	21
	Quercus agrifolia	1	4”	3:1	3
H2	*Lingustrum sp.* Privet	1	Multi-trunk 3”+2”	1:1	1
H4	*Acer macrophyllum*	1	4”	3:1	3
	Umbellularia californica	1	5”	3:1	3
T4	*Ficus microcarpa,* Fig	1	Multi-trunk 3”+3”+2”+2”+ 2”+2”+2”+1”+ 1”+1”+1”+1”	1:1	1
T6	*Acer macrophyllum*	1	22”	6:1	6
T7A	*Acer macrophyllum*	1	Multi-trunk 6”+7”+7”+9”	6:1	6
	Prunus sp.	1	3”	1:1	1
T7-1 and T7-2	*Acer macrophyllum*	1	Multi-trunk 6”+8”+10”	6:1	6
	Prunus sp.	1	6”	1:1	1
T8	*Umbellularia californica*	1	Multi-trunk 4”+6”+6”+7”+9”+12”	6:1	6
T12	*Acer macrophyllum*	2	6”, 9”	6:1	12
	Umbellularia californica	1	Multi-trunk 6”+7”+8”	6:1	6
	TREE MITGATION TALLIES	**17**	**Total Native Trees Removed**	**Replacement Quantity**	**72**
		4	**Total Non-Native Trees Removed**	**Replacement Quantity**	**4**

Of the 1,141 trees and shrubs installed with the restoration, 63 of the shrubs will be identified as mitigation shrubs under the conditions of the Department of Fish and Wildlife (DFW) Streambed Alteration Agreement. Native shrub species are to be replaced at a 3:1 ratio per the DFW Streambed Alteration Agreement.

Replacement mitigation shrub quantities were calculated based upon the actual shrub removals. Shrub mitigation ratios were applied to the shrub species listed in Table 4. Eighteen native shrubs were removed during the Hendrys Creek Restoration project resulting in 63 mitigation shrubs using DFW

mitigation ratios. The native shrub species removed include thimbleberry, Pacific blackberry, poison oak, California sage and stinging nettle (See Table 5 – Shrub Removals and Replacement Ratios). Replacement shrubs included a variety of species as indicated in Table 2.

Table 5 – Shrub Removals and Replacement Ratios

Site	Native Shrub Species	# Shrubs Removed	Shrub Area	Replacement Ratio	Mitigation Shrubs
H1	*Rubus parviflorus*	1 stand counted as 3 plants	5' x 10' stand	3:1	9
H3	*Rubus parviflorus*	1 stand counted as 2 plants	4' x 8' stand	3:1	6
T4	*Rubus ursinus*	1		3:1	3
T5	*Rubus ursinus*	1		3:1	3
T6	*Rubus ursinus*	1		3:1	3
	Toxicodendron diversilobum	1		3:1	3
T7	*Artemisia californica*	5	1' x 2'	3:1	15
	Rubus ursinus	2		3:1	6
T8	*Rubus ursinus*	4		3:1	12
	Urtica dioica	1		3:1	3
	Shrub Tally	**18**	**Total Native Shrubs Removed**	**Replacement Quantity**	**63**

2.3.2 Methodology

The vegetation monitoring protocols for this project is outlined in Section 3.2.3. of the *Hendrys Creek Adaptive Management, Monitoring, and Reporting Program* (November 2018). As-built vegetation monitoring for baseline conditions was performed on January 30, 2019 and February 6, 2019. Year 1 monitoring was performed at the end of the spring season on June 10, 2019 and June 15, 2019. Future monitoring will be conducted annually in the spring. The vegetation monitoring included the following steps:

- Sampling areas were selected by placing ten 25-foot transects in the project area. The transects were selected to capture a representation of each planting area and included both riparian and upland habitats. Some larger planting areas contain multiple transects. T-posts were placed to mark the start and end of each transect and left in place for use in future monitoring years.

Transect locations are documented in a Google map, linked here (See Figure 5 – Vegetation Monitoring Transect Locations).

- A single, random point along each transect was selected to use as the center point for a 10-foot diameter sampling circle. This number was selected using a random number generator between 5 and 20, so that the extent of the circle would not extend past the 25-foot long transect line.
- Woody plants within the 10-foot diameter circle plot around the selected point were assessed for plant health and vigor and measured for height. Plant health and vigor ratings were assigned based on the condition of the foliage, wood, and root crown (See Table 6 – Plant Vigor Rating Scale).
    - Note that all woody plants, including plants that were installed by the project and those that naturally recruited into the project area, were counted in the assessment. If the woody plants were very small (under 0.5 inches tall), health and vigor score was not given and height was not measured.
- The health and vigor score was used to calculate percent survival for each species. Plants scoring ≥3 were counted as surviving.
- Other native and non-native species observed in each plot were also recorded and counted, but not given health and vigor or height measurements.
- The Year 1 performance monitoring used the same transects as the construction inspection (baseline) monitoring. However, new 10-foot diameter circles along the transects were selected at random.

Table 6 – Plant Vigor Rating Scale

Health & Vigor Numerical Rating	General Plant Condition	Specific Criteria
0	Dead	
1	Poor	>75% of plant affected by cumulative symptoms
2	Fair	25-75% of plant affected by cumulative symptoms
3	Good	<25% of plant affected by cumulative symptoms
4	Excellent	<5% of plant affected by cumulative symptoms

2.3.3 Vegetation Monitoring Results

Plant vigor and height were recorded for trees, shrubs and woody perennial plants within the sampled areas. At the time of baseline sampling, plant vigor within sampled areas was strong with an overall average of 3.84 on a scale of 0-4, with 4 being the healthiest score. Survival rate, defined as plants scoring ≥3 on the vigor scale, at baseline sampling was 98.78%. Year 1 sampling found overall survival of 97.02% and an overall average plant vigor score of 3.82. Due to the short period of time between the two monitoring sessions, not much change was expected. Spring of 2019 was a good rainfall year, with

storms providing measurable rain at least once a month through May (See Table 7 – Baseline and June 2019 Vegetation Monitoring Summary).

Table 7 – Baseline and June 2019 Vegetation Monitoring Summary

Baseline Monitoring - Jan./Feb. 2019			**Year 1 Monitoring - June 2019**		
Total # Plants	*Mean Plant Survival*	*Mean Plant Vigor*	*Total # Plants*	*Mean Plant Survival*	*Mean Plant Vigor*
82	98.78%	3.84	127	98.78%	3.82

Table 8 below summarizes the data collected for all woody plant species observed in the sampling areas for the baseline monitoring session (Jan./Feb. 2019) and for the Year 1 monitoring session (June 2019). For each species, the total number of individual plants observed, the percent surviving (vigor rating of 3 or greater), mean plant vigor score, and mean plant height (in inches) are shown.

Table 8 – Baseline and June 2019 Vegetation Monitoring by Species

Scientific Name	Common Name	Baseline Monitoring - Jan./Feb. 2019				Year 1 Monitoring - June 2019			
		# Plants found in Transects 1-10	*% of Plants with Vigor ≥3*	*Mean Plant Vigor*	*Mean Plant Height (inches)*	*# Plants found in Transects 1-10*	*% of Plants with Vigor ≥3*	*Mean Plant Vigor*	*Mean Plant Height (inches)*
Acer macrophyllum	Big leaf maple	7	86%	3.43	0.42 in.	47*	100%	3.95	2.27 in.
Acmispon glaber	Deerweed	2	100%	4	3.0 in.	2	100%	4	11.04 in.
Alnus rhombifolia	White alder	3	100%	4	3.32 in.	0	0	0	0
Artemisia californica	California sagebrush	5	100%	4	11.04 in.	5	100%	4	8.92 in.
Artemisia douglasiana	California mugwort	6	100%	4	3.48 in.	1	100%	4	9.96 in.
Baccharis pilularis	Coyote brush	0	0	0	0	1	100%	4	2.4 in.
Corylus cornuta	Beaked hazelnut	0	0	0	0	4	100%	4	6.87 in.
Diplacus aurantiacus	Sticky monkeyflower	9	100%	3.78	7.11 in.	9	100%	3.33	6.52 in.
Frangula californica	California coffeeberry	4	100%	4	2.94 in.	1	100%	4	5.0 in.
Heteromeles arbutifolia	Toyon	4	100%	3.75	9.78 in.	4	50%	2.75	10.73 in.
Holodiscus discolor	Oceanspray	1	100%	4	12.24 in.	4	100%	4	6.27 in.
Lonicera hispidula	Pink honeysuckle	0	0	0	0	4	100%	4	5.86 in.
Monardella villosa	Coyote mint	3	100%	4	2.52 in.	7	100%	3.43	6.0 in.
Phacelia imbricata	Imbricate phacelia	5	100%	3.6	3.79 in.	4	100%	3.5	7.29 in.
Physocarpus capitatus	Ninebark	2	100%	4	2.76 in.	1	100%	4	9.0 in.
Quercus agrifolia	Coast live oak	0	0	0	0	3**	100%	4	6.0 in.
Rubus ursinus	California blackberry	13	100%	4	2.04 in.	17	100%	4	3.0 in.
Sambucus nigra ssp. *caerulea*	Blue elderberry	4	100%	3.33	1.70 in.	1	100%	4	27.6 in.
Scrophularia californica	California bee plant	2	100%	4	3.96 in.	2	100%	3.5	25.02 in.
Stachys bullata	California hedgenettle	4	100%	4	2.23 in.	5	100%	4	7.64 in.
Symphoricarpos albus	Common snowberry	7	100%	4	0.51 in	5	75%	3.75	10.74 in.
Umbellularia californica	California bay	1**	100%	4	2.5 in.	0	0	0	0

*Many of the big leaf maples appear to be volunteering into the site. Of the 47 plants counted, 3 were 15-18 inches in height, 4 were between 3-7 inches tall, and 40 were under 3 inches tall.

**Coast live oak and California bay were not installed as container plants; counted plants are volunteers.

2.3.4 Qualitative Vegetation Observations

Overall, the plants installed in the planting zones are healthy, with some losses incurred due to high flows in the winter. Natural recruitment of both native and non-native vegetation is also occurring throughout the project site.

2.3.5 Native Species Colonization

Sixteen native species were observed colonizing the project site as in Year 1. These plants were observed within the 10-foot diameter circles sampled at each transect. Two California native seed mixes (sunny and shady mixes) were installed in the area as erosion control. The California brome (*Bromus carinatus*) germinating in the transects is likely from this seeding effort. All other species are believed to be colonizing the site from the native seed bank in Hendrys Creek canyon (See Table 9 – Native Species Observed within the Transects).

Table 9 – Native Species Observed within the Transects

Scientific Name	**Common Name**
Acer macrophyllum	Big leaf maple
Acmispon americanus	American bird's foot trefoil
Acmispon glaber	Deerweed
Bromus carinatus	California brome
Claytonia perfoliata	Miner's lettuce
Clarkia unguiculata	Elegant clarkia
Elymus glaucus	Blue wild rye
Galium aparine	Common bedstraw
Lupinus bicolor	Bicolored lupine
Madia sp.	Madia
Madia elegans	Common madia
Nemophila sp.	Nemophila
Osmorhiza brachypoda	California sweet cicely
Quercus agrifolia	Coast live oak
Sanicula crassicaulis	Pacific sanicle
Umbellularia californica	California bay

2.3.6 Invasive Nonnative Species Observations

A total of 30 nonnative invasive species were observed within Hendrys Creek canyon during the Year 1 monitoring period (See Table 10 – Invasive Species Observed within the Transects). Of the observed species three are rated as high, ten as moderate, eight as limited and nine of the nonnative species are not rated species according to the California Invasive Plant Council (Cal-IPC). Significant effort has been made to eradicate invasive nonnative species from the canyon (See Figure 6 – Invasive Weeds Map). See Section 2.3.8 for invasive plant removal monitoring summary. The definitions of the Cal-IPC rating are provided below:

- **High** – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
- **Moderate** – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
- **Limited** – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Table 10 – Invasive Species Observed within the Transects

Scientific Name	Common Name	California Invasive Plant Council (Cal-IPC) Rating
Anthriscus caucalis	Bur chervil	
Avena fatua	Wild oat	Moderate
Bromus diandrus	Ripgut brome	Moderate
Bromus hordeaceus	Soft chess	Limited
Carduus pycnocephalus	Italian thistle	Moderate
Centaurea solstitialis	Yellow starthistle	High
Cynosurus echinatus	Hedgehog dogtail grass	Moderate
Festuca myuros	Rattail fescue	Moderate
Festuca perennis	Italian ryegrass	Moderate
Genista monspessulana	French broom	High
Geranium dissectum	Cutleaf geranium	Limited
Geranium molle	Crane's bill geranium	
Geranium robertianum	Robert's geranium	
Hordeum murinum	Foxtail barley	Moderate
Hypochaeris glabra	Smooth cat's-ear	Limited
Lysimachia arvensis	Scarlet pimpernel	
Malva sp.	Non-native mallow	
Medicago polymorpha	Burclover	Limited
Melilotus indica	Yellow sweet clover	
Melissa officianalis	Lemon balm	
Oxalis pes-caprae	Bermuda buttercup	Moderate
Polypogon monspeliensis	Rabbitsfoot grass	Limited
Rubus armeniacus	Himalayan blackberry	High
Rumex crispus	Curly dock	Limited
Stellaria media	Chickweed	
Stipa miliacea var. miliacea	Smilo grass	Limited
Torilis arvensis	Field hedge parsley	Moderate
Tradescantia fluminensis	Small leaf spiderwort	
Trifolium hirtum	Rose clover	Limited
Vinca major	Big leaf periwinkle	Moderate

2.3.7 Photo Monitoring and Qualitative Assessment at Planting Sites

Photo monitoring of riparian and upland planting areas was conducted for the Year 1 monitoring period. Ten locations were identified in April 2019 as native revegetation photo monitoring points to assess changes in habitat over time. Photos will be taken at these ten points annually in the spring. The photo monitoring points correspond with the ten vegetation monitoring transects and include a full range of habitat characteristics seen throughout the project area including: riparian plantings at culvert and bridge removal locations, riparian plantings at tributary realignment locations, upland plantings adjacent to tributary realignments, seeded areas of abandoned and ripped roadbed and/or former building pads, seeded riparian areas, and sites treated for the removal of invasive plants.

Photo 5	Transect 1: Confluence of Tributary 9/Hendrys Creek 3 – Riparian plantings
Photo 6	Transect 2: Tributary 8 – Riparian plantings
Photo 7	Transect 3: Tributary 7 – Riparian plantings
Photo 8	Transect 4: Former Building Pad – Bat Boxes A upland plantings adjacent to Tributary 7
Photo 9	Transect 5: Former Building Pad – Bat Boxes B upland plantings adjacent to Tributary 7
Photo 10	Transect 6: Former Building Pad – Bat Boxes C upland plantings adjacent to Tributary 7
Photo 11	Transect 7: Tributary 6A – Upland and riparian plantings
Photo 12	Transect 8: Tributary 6B – Upland and riparian plantings
Photo 13	Transect 9: Tributary 6C – Upland and riparian plantings
Photo 14	Transect 10: Hendrys Creek 1 – Riparian plantings

Photo 5 - Transect 1: Confluence of Tributary 9/Hendrys Creek 3 – Riparian Plantings (37.17182, -121.96909)

(Photo May 2019)

Photopoint 1 was taken at the confluence of Tributary 9/Hendrys Creek 3. It is a riparian planting area and is the most downstream planting site. As of May 2019, California blackberry (*Rubus ursinus*) and ninebark (*Physocarpus capitatus*) are alive but not showing much growth. Thimbleberry (*Rubus parviflorus)* and white bark raspberry (*Rubus leucodermis*) are vigorous and large. Tubed big leaf maples (*Acer macrophyllum*) are 12+ inches tall. Trees planted and tubed at the bottom of the bank, closest to the creek such as white alders (*Alnus rhombifolia*) appear to be dead. Invasive big leaf periwinkle (*Vinca major)* is encroaching in the planting area. This planting area is composed of gravel soil and the bank has a steep incline. Additionally, this planting area is the entry point to access all upstream project sites, and therefore experiences higher levels of disturbance than any other planting areas.

Photo 6 - Transect 2: Tributary 8 – Riparian Plantings (37.1719, -121.96868)

(Photo May 2019)

Photopoint 2 was taken at Tributary 8, where, as of May 2019, installed native plantings are large and vigorous. Thimbleberry (*Rubus parviflorus*) and ninebark (*Physocarpus capitatus*) are the species that are doing the best at this location. California bee plant (*Scrophularia californica)* is large but getting eaten by insects. Natural recruitment of white bark raspberry (*Rubus leucodermis*) and deerweed (*Acmispon glaber*) is occuring in the riparian and upland habitats. Seeded native grasses are beginning to germinate. Top of bank plants such as California mugwort (*Artemisia douglasiana*), coyote brush (*Baccharis pilularis*), and common snowberry (*Symphoricarpos albus*) are looking healthy. Invasive Robert's geranium (*Geranium robertianum*) and lemon balm (*Melissa officinalis*) exist along the shaded edges and may begin to encroach into the planting area if not removed.

Photo 7 - Transect 3: Tributary 7 – Riparian Plantings (37.17205, -121.96855)

(Photo May 2019)

Photopoint 3 was taken at Tributary 7, which is a large riparian planting area. Winter storms from 2019 washed out nearly all plants that were planted in the bottom of the creek bed and cut a channel in the tributary exposing some buried trash. Only one white alder (*Alnus rhombifolia*), pictured to the left, survived the storm event, but planted gray rush (*Juncus patens)* along the tributary bank were observed to be healthy. Most plants installed in the lower bank were observed to be healthy but a few have died. Natural recruitment of California mugwort (*Artemisia douglasiana*) was occurring mostly in the shaded areas on the edges of the planting site, and in general, plants under the shade of the existing mature big leaf maple were vigorous. Native grasses have been coming up from seed. Invasive plants observed in this area were dominated by Italian thistle (*Carduus pycnocephalus*) in the shaded areas and rose clover (*Trifolium hirtum)* in the sunny areas.

Photo 8 - Transect 4: Former Building Pad - Bat Boxes A upland adjacent to Tributary 7 (37.17245, -121.96859)

(Photo May 2019)

Photopoint 4 was taken in a large upland planting area adjacent to Tributary 7. Sticky monkeyflower (*Diplacus aurantiacus*), California sagebrush (*Artemisia californica*), and coyote brush (*Baccharis pilularis*) were observed to be healthy and vigorous. Thick straw mulch rings around the plants seem to be helping to retain moisture. Natural recruitment of deerweed (*Acmispon glaber),* American bird's foot trefoil (*Acmispon americanus)* and Nemophila (*Nemophila* sp.) was present. Toyon (*Heteromeles arbutifolia)* did not appear to be very healthy, with leaves that have turned brown and crispy. French broom (*Genista monspessulana*) seedlings (under 1" tall) were coming up in abundance as well as rose clover (*Trifolium hirtum*) and some Italian thistle (*Carduus pycnocephalus*). California live oak acorn planting basins in this area have not had success sprouting.

Photo 9 - Transect 5: Former Building Pad - Bat Boxes B upland adjacent to Tributary 7 (37.17244, -121.96846)

(Photo May 2019)

Photopoint 5 was also taken in the large upland planting area. Qualitative assessment is the same as Photopoint 4.

Photo 10 - Transect 6: Former Building Pad – Bat Boxes C upland plantings adjacent to Tributary 7 (37.1724, -121.96834)

(May 2019)

Photopoint 6 was also taken in the large upland planting area. Qualitative assessment is the same as Photopoint 4.

Photo 11 - Transect 7: Tributary 6A – Upland and riparian plantings (37.17223, -121.96781)

(May 2019)

Photopoint 7 was taken on Tributary 6A, which is a mixed riparian and upland planting area. Upland species coyote mint (*Monardella villosa*), imbricate phacelia (*Phacelia imbricata*), California sagebrush (*Artemisia californica*) and coyote brush (*Baccharis pilularis*) were observed to be thriving. Blue elderberry (*Sambucus nigra* ssp. *caerulea*) were also healthy in this planting area. Riparian plantings above the wattles appeared healthy, but plants installed below the wattles in the rocky gravel creek bed were not thriving. Additionally, winter storm events washed out many of the plants installed within the streambed. Natural recruitment of oak saplings just above the wattles was present, as well as germination of seeded grasses.

Photo 12 - Transect 8: Tributary 6B – Upland and riparian plantings (37.17238, -121.9676)

Photopoint 8 was also taken at Tributary 6B. Qualitative assessment is the same as Photopoint 7. (May 2019)

Blue elderberry showing rapid growth at Tributary 6B.

Photo 13 - Transect 9: Tributary 6C – Upland and riparian plantings (37.17229, -121.96749)

(May 2019)

Photopoint 9 was also taken at Tributary 6C. Qualitative assessment is the same as Photopoint 7.

Photo 14 - Transect 10: Hendrys Creek H1 – Riparian plantings (37.17221, -121.96349)

(May 2019)

Photopoint 10 was taken at the riparian planting area furthest upstream where two culverts were removed. Installed plants in this area were alive and healthy. Blue elderberry (*Sambucus nigra* ssp. *caerulea*), white bark raspberry (*Rubus leucodermis*), and thimbleberry (*Rubus parviflorus*) appeared tall and vigorous. Gray rush (*Juncus patens*) along the creek edge were thriving. Some native grasses came up from seed, and natural recruitment of common snowberry (*Symphoricarpos albus*) and thimbleberry (*Rubus parviflorus*) were present.

2.3.8 Photo Monitoring at Invasive Plant Removal Sites

In addition to the ten native plant revegetation photo monitoring locations, ten photo points were identified to monitor invasive plant removal within the project area. Monitoring of the ten invasive plant points began in 2017 (See Figure 7 – Invasive Plant Removal Photo Point Monitoring Locations). The ten locations were chosen based on the presence of the four priority invasive plants of the project: French broom (*Genista monspessulana),* Himalayan blackberry *(Rubus armeniacus)*, big leaf periwinkle *(Vinca major)*, and Robert's geranium *(Geranium robertianum).* Manual removal of these species, plus other identified species as part of the adaptive management plan, have been ongoing since 2017 across approximately 4.4 acres. French broom was a primary focus of the 2017 efforts; many of the abandoned building pads and roads were highly impacted by this invasive plant.

Following is a list of invasive plant species observed during the monitoring periods in the project area and corrective actions that are ongoing or planned (See Table 11 – Priority Invasive Species and Corrective Actions).

Table 11 – Priority Invasive Species and Corrective Actions

Scientific Name	Common Name	Actions
Carduus pycnocephalus	Italian thistle	Hand removal
Centaurea solstitialis	Yellow starthistle	Hand removal; existing stand is still limited in extent
*Genista monspessulana**	French broom	Manual removal of mature plants with weed wrenches prior to seed set (Feb-Apr)
*Geranium robertianum**	Robert's geranium	Covered in straw; grubbing in spring prior to seed set
Melissa officinalis	Lemon balm	Hand removal
*Rubus armeniacus**	Himalayan blackberry	Hand removal
Stipa miliacea	Smilo grass	Hand removal
Tradescantia fluminensis	Small leaf spiderwort	Hand removal, dispose off-site
*Vinca major**	Big leaf periwinkle	Hand removal

*Invasive species targeted in Long-term Management Plan (2015).

Photo 15 – Invasive Species Removal Site 1: Mixed invasive species

(left April 2017, right July 2019)

Site 1 is the most downstream invasive plant removal area and is located at an old building pad across the first bridge. Lemon balm (*Melissa officinalis*), Himalayan blackberry (*Rubus armeniacus*), bull thistle (*Cirsium vulgare*), big leaf periwinkle (*Vinca major*), and French broom (*Genista monspessulana*) were all present at the site. Native plant recruitment was limited in this area, but mature native trees and poison oak (*Toxicodendron diversilobum*) were present.

Photo 16 – Invasive Species Removal Site 2: Big leaf periwinkle (*Vinca major*)

(left April 2017, right May 2019)

Site 2 was composed of large dense patches of big leaf periwinkle along the roadside and down to the creek. Annual invasive species Robert's geranium was present during the spring. Big leaf periwinkle was hand pulled from site 2 and native grasses were seeded and mulched with straw where the road was ripped.

Photo 17 – Invasive Species Removal Site 3: Robert's geranium (*Geranium robertianum*)

(left April 2017, right May 2019)

Site 3 was primarily comprised of Robert's geranium. The area was seeded with native grass and mulched with straw after construction. The native grasses have been competing with the Robert's geranium, but Robert's geranium was still dominant at this site.

Photo 18 – Invasive Species Removal Site 4: French broom (*Genista monspessulana*)

(left June 2017, right May 2019)

Site 4 is an old roadway that was previously infested with French broom. Mature French broom has been removed, but new seedlings has since begun to germinate within the ripped roadway. This area was also seeded with native grasses and mulched with straw post construction.

Photo 19 – Invasive Species Removal Site 5: French broom (*Genista monspessulana*)

(left June 2017, right May 2019)

Site 5 is another roadway that was previously infested with French broom. Mature French broom has been removed from the site with the exception of a few plants inaccessible to SJCC crews due to steep slopes. With the removal of the French broom, Italian thistle (*Carduus pycnocephalus*) has begun to colonize the area. Seeded native grasses were also present.

Photo 20 – Invasive Species Removal Site 6: French Broom (*Genista monspessulana)*

(left June 2017, right July 2019)

Site 6 is a roadway that was previously infested with French broom. Mature plants were removed in 2017 and 2018. Some young French broom was present, but the sunny, dry area has kept germination to a minimum.

Photo 21 – Invasive Species Removal Site 7: French broom (*Genista monspessulana)*

(left February 2017, right May 2019)

Site 7 is a mixed sunny and shaded area that was once a building pad. All mature French broom (*Genista monspessulana*) has been removed, but a flush of seedlings germinated in newly opened space. Additionally, large dense patches of Italian thistle (*Carduus pycnocephalus*) were present as well as scattered individuals of yellow starthistle (*Centaurea solstitialis*) in the sunny section.

Photo 22 – Invasive Species Removal Site 8: French broom (*Genista monspessulana)*

(left February 2017, right May 2019)

Site 8 is an old roadway where mature French broom was removed. Italian thistle (*Carduus pycnocephalus*) and French broom seedlings were observed germinating where large French broom was removed. Native grasses started to establish and a large stand of poison oak (*Toxicodendron diversilobum*) was present at the site.

Photo 23 – Invasive Species Removal Site 9: French broom (*Genista monspessulana)*

(left February 2017, right May 2019)

Site 9, also called the "golf course," is an expansive open area with compacted soil. Large French broom that lined the perimeter has been removed, but thick patches of young French broom were found along the edges. This area was dense with non-native and invasive species including Italian thistle (*Carduus pycnocephalus*), bur clover (*Medicago polymorpha)*, rose clover (*Trifolium hirtum)* and annual grasses. Acorn and buckeye basins were installed in fall 2018. The young oak and buckeye trees growing from seed were found to be alive and healthy with many 5" to 7" tall.

Photo 24 – Invasive Species Removal Site 10: French broom (*Genista monspessulana)*

(left February 2017, right May 2019)

Site 10 is a wooded roadway where French broom was previously removed 2017 and 2018. Individual mature French broom plants were still present in inaccessible areas off the road, and seedlings, approximately 3" tall have germinated where French broom was removed.

California buckeye sapling inside a tree tube at the "golf course." The majority of tree tubes, where buckeye nuts were planted in fall 2018, contained healthy saplings between 6" to 12" tall.

2.3.9 Wildlife Observations

In Year 1 the following animal species were observed during the monitoring site visits conducted from January 2019 through July 2019 (See Table 12 – Wildlife Species Observed between January 2019 and July 2019).

Table 12 – Wildlife Species Observed between January 2019 and July 2019

Invertebrates	
Apis mellifera	Western honeybee
Boisea rubrolineata	Western boxelder bug
Bombus vosnesenskii	Yellow-faced bumblebee
Ceratina sp.	Small carpenter bee
Coenonympha tullia	Common ringlet
Euphydryas chalcedona	Variable checkerspot
Glaucopsyche lygdamus	Silvery blue
Hippodamia convergens	Convergent lady beetle
Hylephila phyleus	Fiery skipper
Limenitis lorquini	Lorquin's admiral
Papilio rutulus	Western tiger swallowtail
Plebejus acmon	Acmon blue
Rhaphidophoridae	Camel cricket
Vertebrates	
Batrachoseps attenuatus	Slender salamander
Lampropeltis californiae	California king snake
Meleagris gallopavo	Wild turkey
Memphitis memphitis	Striped skunk
Taricha torosa	California newt

2.3.10 Year 1 Maintenance Activities

The restoration plantings and invasive species removal sites continued to be maintained by Grassroots Ecology, contract native plant specialists working under the direction of the Midpen staff. Grassroots Ecology has been assisted by the San Jose Conservation Corps (SJCC). Maintenance activities included weeding, mulching and pruning and continued invasive species removal. Grassroots Ecology began invasive species removal in 2017, native seed collection, contract growing and plant installation occurred in 2018 and maintenance activities continue through this monitoring period. The details of their work are identified below in chronological order.

Dec 13, 2018

Staff inspected and completed all caging of plants at planting sites.

January 7, 2019

Staff assessed the site after a recent storm event. Cages located within the tributary were cleared because they were filling with leaves and sediment. Several California newts *(Taricha torosa)* were spotted across the project site.

January 17, 2019

Staff assessed the planting sites after another heavy storm event. Caging located within tributaries 6-8 were removed as most were filled or toppled with sediment and debris. Slender salamanders *(Batrachoseps attenuatus)* were spotted amongst straw bales and California newts were present throughout the project area.

March 15, 2019

Staff assessed the work site for invasive species and prioritized areas for targeted removal by SJCC. Large numbers of western boxelder bugs *(Boisea rubrolineata)* were spotted in the tree tubes, especially at the golf course and secondarily at the lower bat box area with buckeyes.

April 4, 2019

Staff conducted routine maintenance and invasive removal at the site.

April 15, 2019

Grassroots Ecology led SJCC crews to remove non-native invasive species across the project site. Teams targeted the removal of French broom (*Genista monspessulana),* big leaf periwinkle (*Vinca major)*, and Robert's geranium (*Geranium robertianum)*. Scattered patches of seedlings and flowering French broom were removed across the "golf course". Dense stands of big leaf periwinkle (*Vinca major)* along creek and tributary banks were removed. Large patches of Robert's geranium along the upper banks of

Hendrys Creek were covered with remaining bales of straw to suppress further growth. Removal of non-native invasive species was documented and mapped using CalFlora Pro.

May 1, 2019

Staff performed routine maintenance across the project site and conducted an assessment of site conditions. A dead California king snake about two feet in length was observed near the bat boxes located west of tributary 7. Staff removed French broom (*Genista monspessulana)* and big leaf periwinkle *(Vinca major)* along ripped roadbeds past the golf course and near H2.

May 9, 2019

Grassroots Ecology staff led teams of SJCC members to remove French broom *(Genista monspessulana)* at the most downstream building pad, and big leaf periwinkle *(Vinca major)* along creek. Italian thistle *(Carduus pycnocephalus)* was removed from around the acorn and buckeye basins near the bat boxes. Teams distributed remaining straw bales along ripped roads throughout site, targeting stands of Robert's geranium for suppression. A small snake approximately 4" in length, possibly a striped racer, was spotted at the end of site.

May 16, 2019

Staff visited the site to conduct photomonitoring of habitat conditions at the ten points established in 2019. During this site visit, staff installed two-foot-long PVC pipe into the ground to mark photo monitoring locations across the project site. A female striped skunk with her litter of five kits was spotted near H4. A wild turkey hen and her flock of poults were also observed seeking shelter next to the bat boxes near Tributary 7.

Photo to right: A skunk family was seen near the bottom of the creek restoration site with 1 female and 5 kits.

May 30, 2019

Grassroots Ecology staff and SJCC members continued to remove invasive species focusing on the riparian and upland planting areas.

July 29, 2019

Staff visited the site to conduct summer photomonitoring and observe plant growth, wildlife, and invasive/native plant recruitment among planting areas. Acmon blue butterflies were nectaring on imbricate phacelia (*Phacelia imbricata)* and coyote mint (*Monardella villosa),* which were blooming near tributary 6.

2.3.11 Recommended Future Actions

The following adaptive management and maintenance actions are recommended as a result of observations made during the course of monitoring the corridor:

- **Monitor Invasive Plant Species** – Invasive plant removal areas should continue to be monitored to address resprouting French broom (*Genista monspessulana)* as well as other target species (Table 10).
- **General Recommended Actions Task List Identified in Year 1**
    - Hand water as needed for plantings.
    - Continue to remove other invasive plant species listed in Table 10.
    - Weed plant basins and maintain protective cages.

3. REFERENCES

2018. Adaptive Management, Monitoring, and Reporting Program: Hendrys Creek Restoration Project. Prepared by Meredith Manning, Midpeninsula Regional Open Space District. Los Altos, CA.

California Department of Fish and Wildlife Streambed Alteration Agreement, Notification No. 1600-2016-0381-R3, Hendrys Creek Restoration, Valid through December 31, 2021.

California Regional Water Quality Control Board Water Quality Certification for the Hendrys Creek Restoration Project pursuant to Section 401 of the Clean Water Act, Corps File Number 2016-00390S, Valid through February 7, 2022.

Hendrys Creek Restoration Project, Initial Study/Mitigated Negative Declaration and Mitigation Monitoring Program adopted May 13, 2015 (Clearinghouse #2105032064) and NOD filed May 15, 2015.

Long-term Management Plan for Hendrys Creek Property, Sierra Azul Open Space Preserve. April 2015.

MROSD Best Management Practices and Standard Operating Procedures for Routine Maintenance Activities in Water Courses.

MROSD Integrated Pest Management Program.

US Army Corps of Engineers Nationwide Permit 27 – Aquatic Habitat Restoration, Enhancement and Establishment Activities with Biological Opinion by USFWS Appending the Programmatic Biological Opinion for 22 Nationwide Permits for Projects that may affect the threatened California Red-Legged Frog pursuant to Section 404 of the Clean Water Act, File Number 2016-00390S, Valid through March 18, 2022.

ATTACHMENT 3

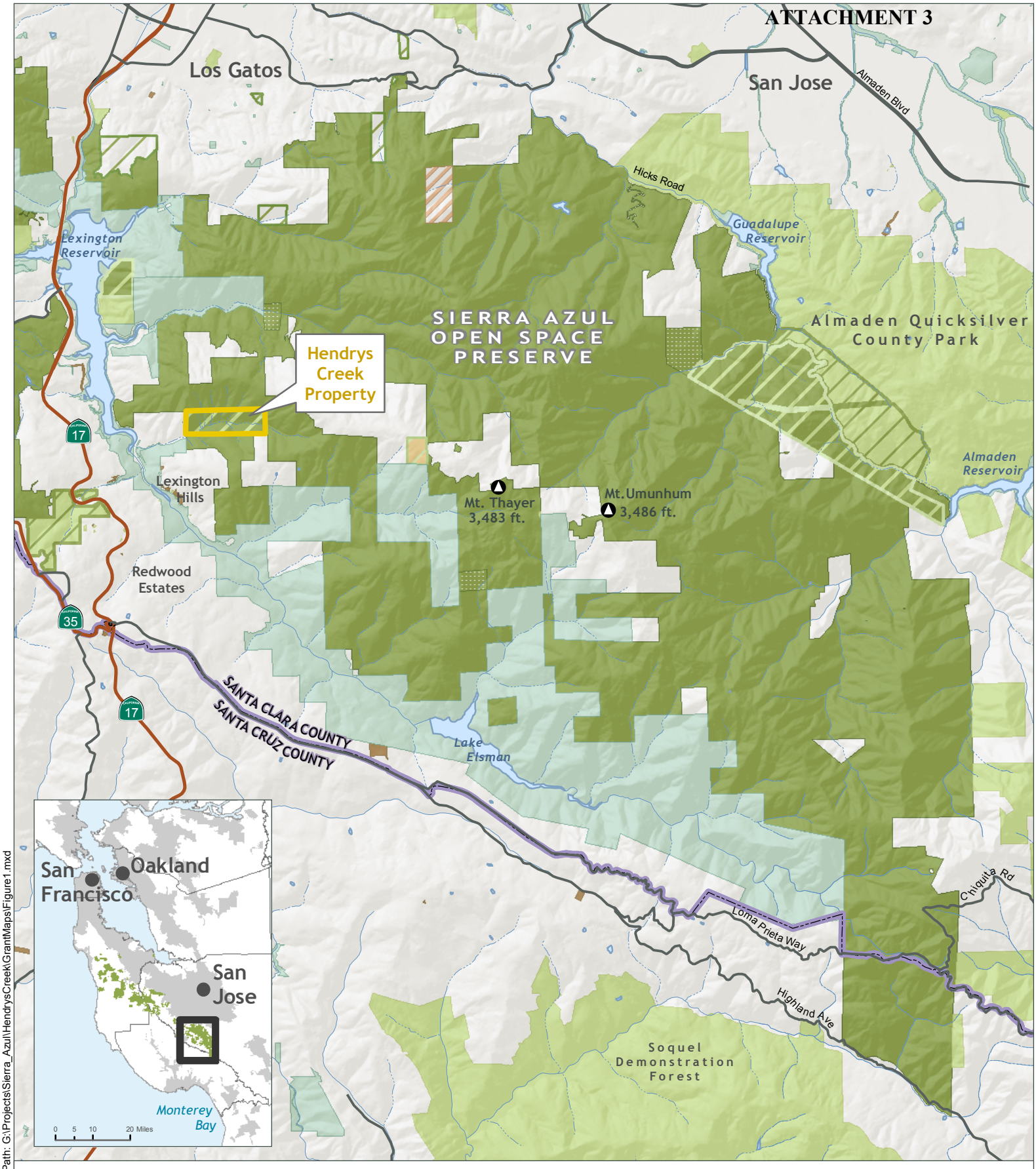

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Figure 1: Regional Map

- Hendrys Creek Property
- MROSD Preserves
- Other Protected Open Space Or Park Lands
- Watershed Land
- Private Property
- Land Trust
- Non MROSD Conservation Easement
- MROSD Conservation Easement

Midpeninsula Regional Open Space District

August 2015

0 0.5 1 Miles

While the District strives to use the best available digital data, this data does not represent a legal survey and is merely a graphic illustration of geographic features.

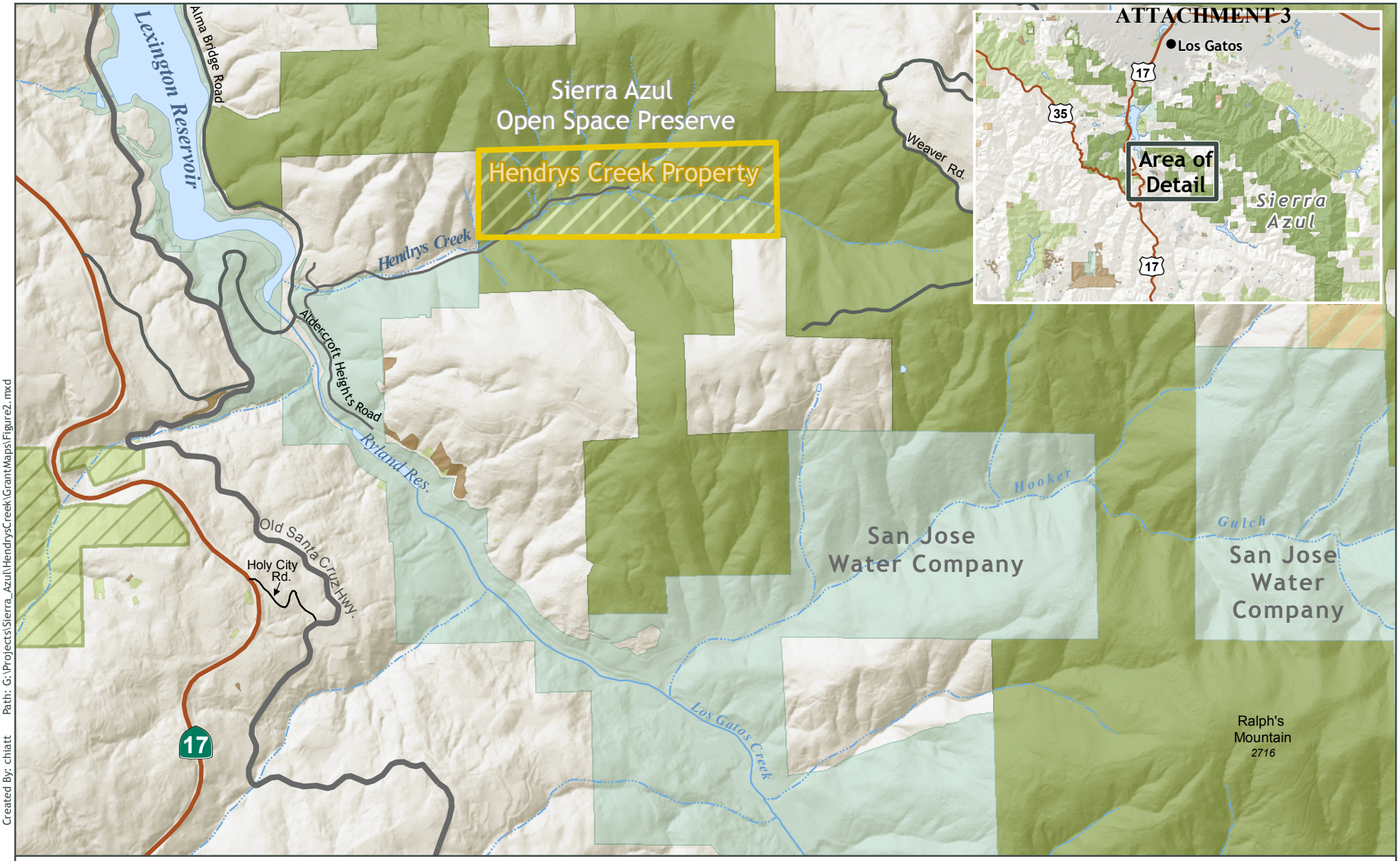

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Figure 2: Location Map

- Hendrys Creek Property
- MROSD Open Space Preserves
- Watershed Land
- Other Protected Open Space or Park Lands
- MROSD Conservation Easement
- Non MROSD Conservation Easement
- Land Trust
- Other Public Agency
- Private Property

Midpeninsula Regional Open Space District *(MROSD)*

August, 2015

Miles 0 0.25 0.5

While the District strives to use the best available digital data, this data does not represent a legal survey and is merely a graphic illustration of geographic features.

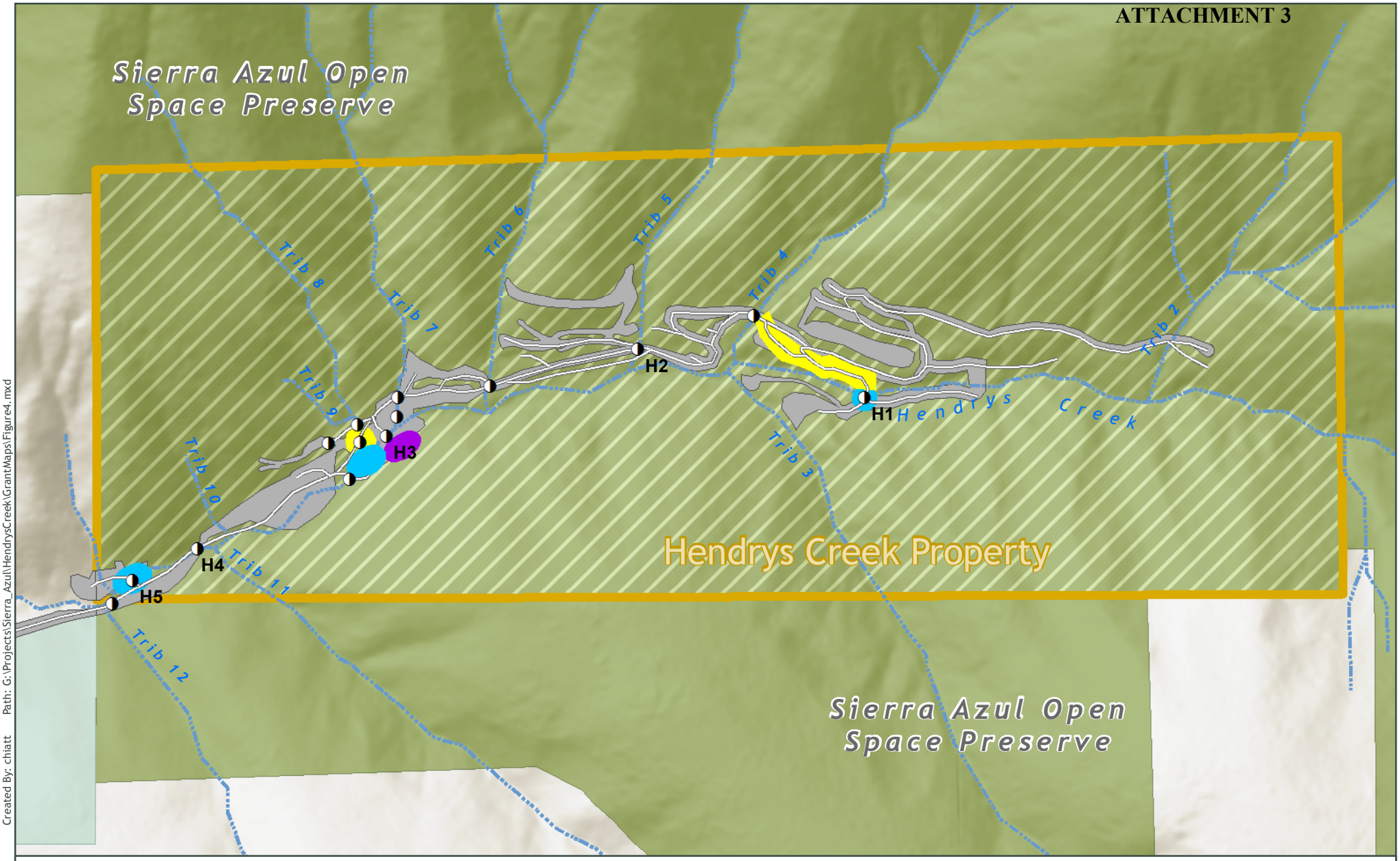

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Figure 4: Project Overview Map

- Riparian planting
- Upland planting
- Riparian and Upland planting
- Stream Crossing Restoration Site
- Invasive Plant Species Survey Area
- Hendrys Creek Property
- MROSD Open Space Preserves
- SCVWD Easement
- Private Property
- Watershed Land

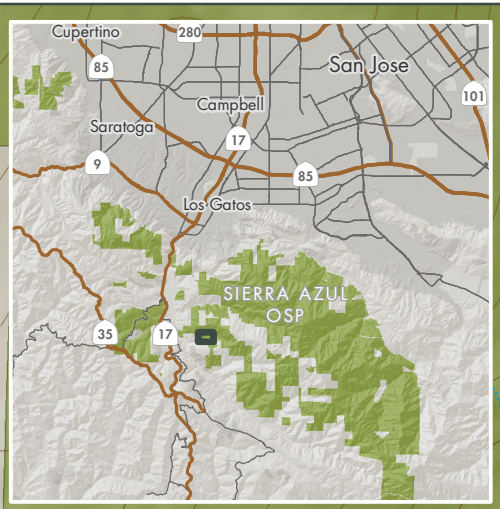
Feet
0 500 1,000

Midpeninsula Regional Open Space District *(MROSD)*

August, 2015

While the District strives to use the best available digital data, this data does not represent a legal survey and is merely a graphic illustration of geographic features.

ATTACHMENT 3



SIERRA AZUL OPEN SPACE PRESERVE

Hendrys Creek

SA43

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Created By: flopez

Hendrys Creek Revegetation Areas

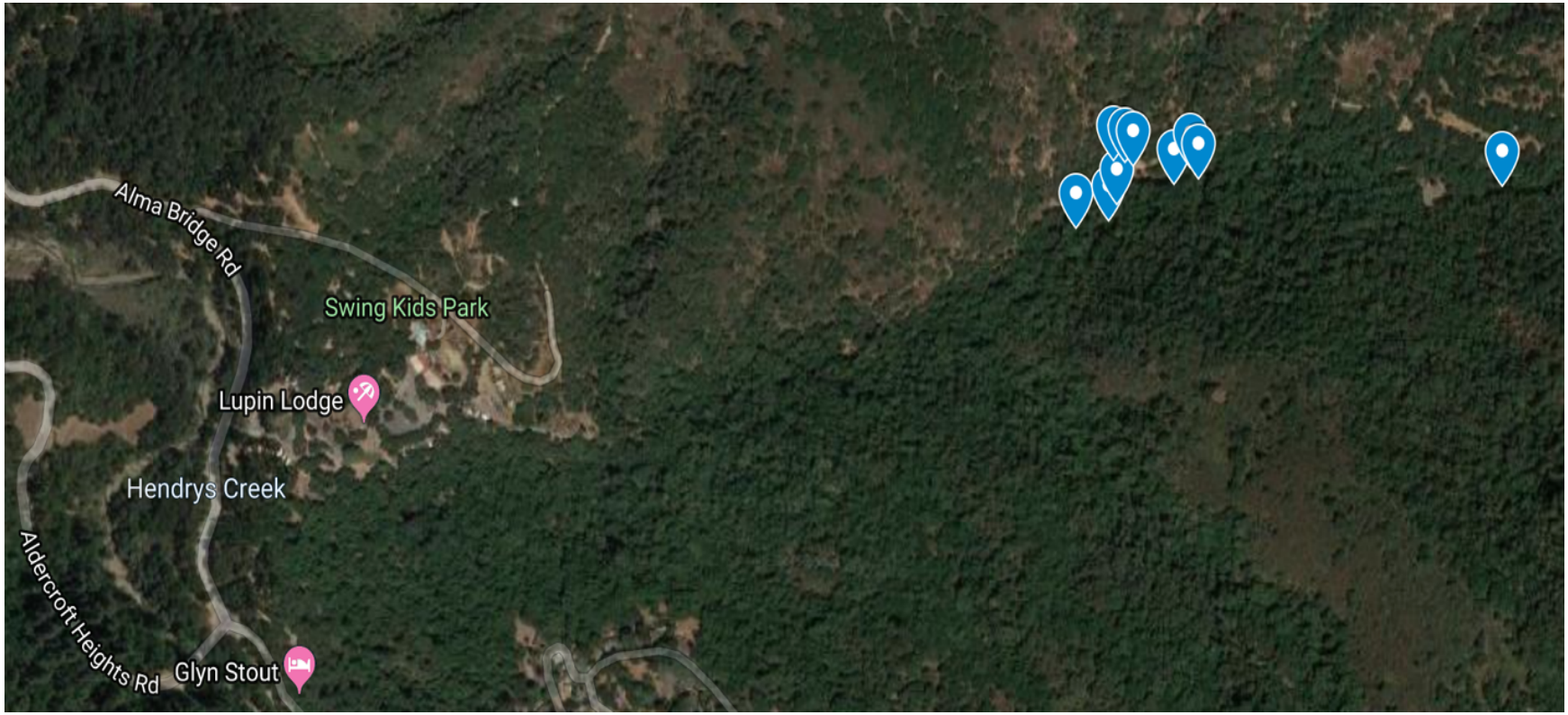
- MROSD Preserve
- Gate
- Unpaved Seasonal Road
- Unmaintained Road
- Restored Road
- Existing Bridge
- Removed Bridge/Ford
- Removed Culvert
- Upland Plantings
- Riparian Plantings
- Oak Acorn and Buckeye Seed Basins

Midpeninsula Regional
Open Space District
(MROSD)
March 2020

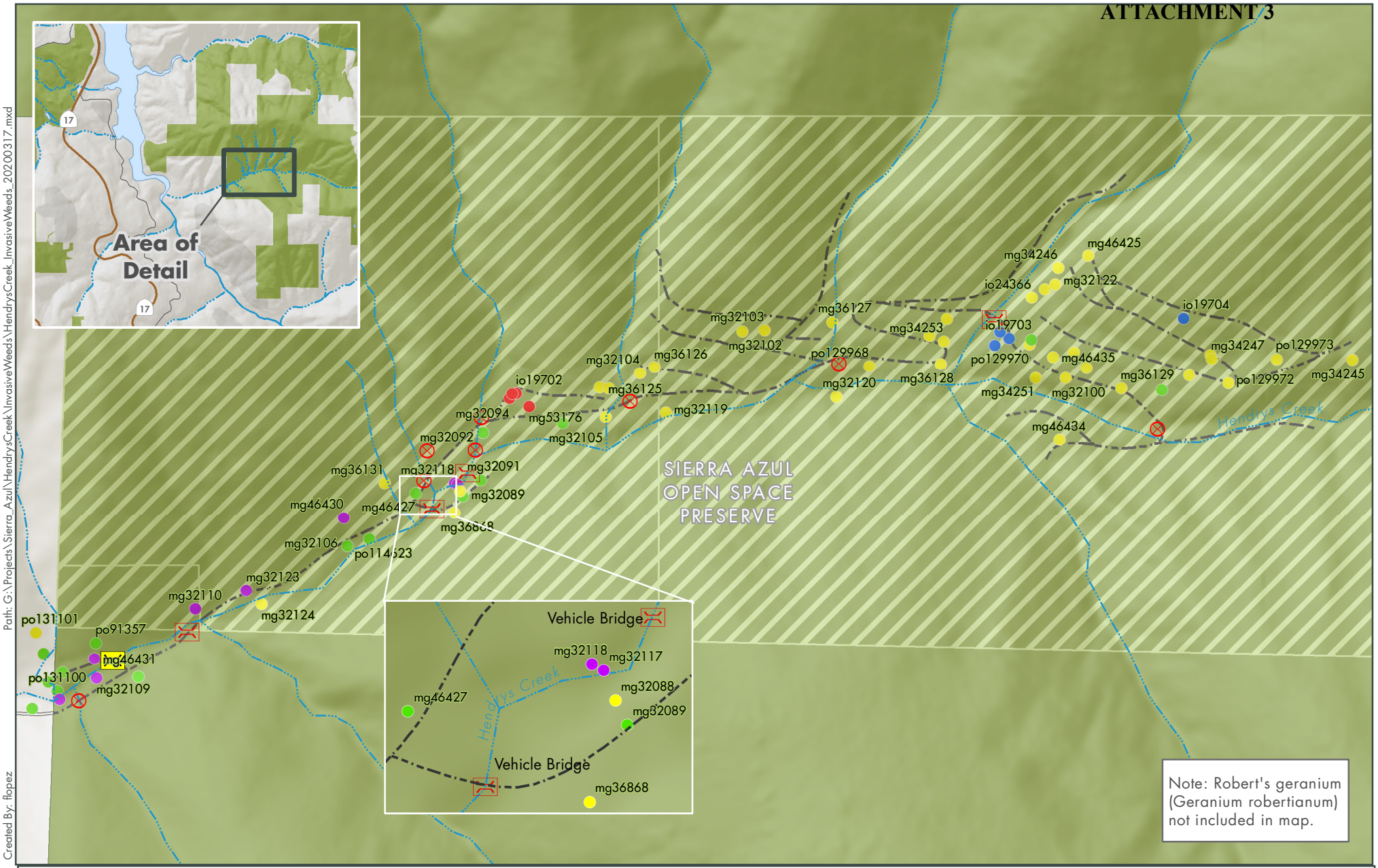
Feet
0 100 200 300 400

While the District strives to use the best available digital data, these data do not represent a legal survey and are merely a graphic illustration of geographic features.

Figure 5 – Vegetation Monitoring Transect Locations



ATTACHMENT 3



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Created By: flopez

Hendrys Creek Invasive Weeds Map

- MROSD Preserves
- Private Property
- Easement Over MROSD Fee
- Removed Culvert
- Bridge (Present/Removed)
- Unmaintained Road Width

CalWeed Manager - Invasive Species

- Centaurea solstitialis
- Dittrichia graveolens
- Genista monspessulana
- Rubus armeniacus
- Vinca major

Midpeninsula Regional Open Space District
(Midpen)
3/20/2020

Feet
0 200 400

While the District strives to use the best available digital data, these data do not represent a legal survey and are merely a graphic illustration of geographic features.

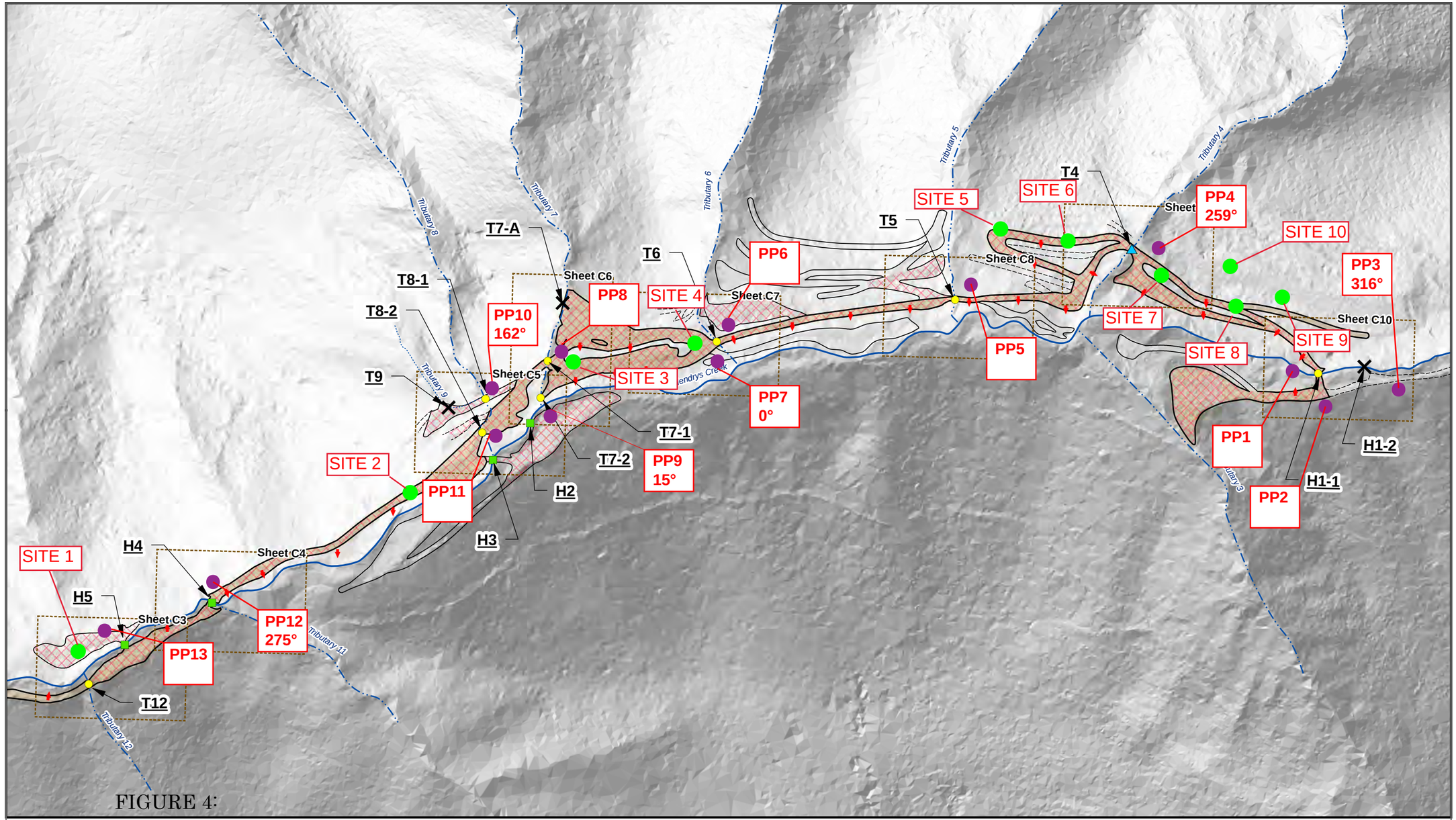

FIGURE 4:

N

0 100 200
Feet

HENDRYS CREEK - PHOTO POINT MONITORING LOCATIONS

Hendry's Creek Road
Spur Road
Tractor road

Perennial Stream
Intermittent Stream
Ephemeral Stream

STREAM CROSSING

(E) Bridge
(E) Culvert
(E) Ford
(E) Other

Rip road surface and treat per specifications
(N) Drainage Dip

PHOTO POINT - CROSSING REMOVAL
PHOTO POINT - INVASIVE PLANT REMOVAL

Note:
Topographic data shown on accompanying sheets are modified from contours derived from Santa Clara County LiDAR Data.

TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY
1002 Columbia Street, Santa Cruz, CA 95060
(831) 425 5832 (831) 425 5830 (fax)

DRAFT
NOT FOR CONSTRUCTION

PROJECT

HENDRY'S CREEK ROAD AND STREAM CHANNEL ASSESSMENT

SIERRA AZUL OPEN SPACE PRESERVE
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

SHEET TITLE

SITE MAP

DRAFT

Date	Description
10/6/2013	Draft

DRAWN
TCB

PROJECT
MPEN-HENDRYS-568

SHEET NUMBER
C2