Memorandum

Project No. 3753-08

February 27, 2025

To: **Nathan Hale, Senior Restoration Ecologist, Santa Clara Valley Habitat Agency**

From: **Kate Drake, Project Manager, Senior Restoration Ecologist**
Max Busnardo, Principal, Restoration Ecologist

Subject: **Calero County Park Pond and Wetland Restoration Project—Year 8 (2024) Supplemental Vegetation and Hydrology Monitoring**

Introduction

The Calero County Park Pond and Wetland Restoration Project (project) was implemented by the Santa Clara Valley Habitat Agency (Habitat Agency) in partnership with the Santa Clara Parks and Recreation Department in 2016. The project is located in Calero County Park, in the eastern foothills of the Santa Cruz Mountains in the Alamitos Creek watershed (Figure 1). The purpose of the project was to restore and establish pond and wetland habitats at two locations (the pond mitigation site and wetland mitigation site; Figure 2) in order to accomplish habitat goals under the Santa Clara Valley Habitat Plan (Habitat Plan). Additional project details are available in the project's *Calero County Park Pond and Wetland Restoration Project Mitigation and Monitoring Plan* (MMP) (H. T. Harvey & Associates 2016a).

The project's MMP called for mitigation monitoring to occur for 5 years following construction of the project. However, monitoring in Year 5 (2021) found that some of the final success criteria for the project were not met (H. T. Harvey & Associates 2022). The monitoring period was then extended into Year 6 (2022) (H. T. Harvey & Associates 2023a). In Year 6, all final success criteria at the wetland mitigation site were met and the majority of the final success criteria at the pond mitigation site were met. However, some criteria at the pond mitigation site were not met. Specifically, (1) no California red-legged frogs had been observed during the monitoring period, (2) wetland vegetation cover at the pond mitigation site was below 70%, and (3) the population of Mt. Hamilton thistle (*Cirsium fontinale* var. *campylon*) was found to be in decline. In addition, four out of the six monitoring years occurred during dry water years, which limited the ability to assess whether (4) the target hydrologic regime had been met at the pond. Therefore, at the request of the regulatory agencies, the monitoring period was extended for these four metrics at the pond mitigation site. Table 1 presents a summary of the project's final success criteria and the current monitoring status as of completion of this monitoring year (Year 8 [2024]).

N:\Projects3700\3753-02\08\Reports\Yr 7 Monitoring Memo\Yr 7 Monitoring Memo.aprx

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 1. Vicinity Map

Calero County Park and Wetland Restoration Project
Year 8 (2024) Supplemental Vegetation and Hydrology Monitoring Memorandum (3753-08)
February 2025

N:\Projects3700\3753-02\08\Reports\Yr 7 Monitoring Memo\Yr 7 Monitoring Memo.aprx

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 2. Mitigation Site Locations
Calero County Park and Wetland Restoration Project
Year 8 (2024) Supplemental Vegetation and Hydrology Monitoring Memorandum (3753-08)
February 2025

The purpose of this memorandum is to document site activities during Year 8 (2024), as well as to report the results of Year 8 supplemental monitoring. During Year 7 (2023) supplemental monitoring, the final success criteria for wetland vegetation cover at the pond mitigation site was met (Table 1) (H. T. Harvey & Associates 2023b). Therefore, wetland vegetation cover at the pond was not monitored in Year 8. However, the other three outstanding metrics were monitored by cbec ecoengineering (cbec) and the Habitat Agency. H. T. Harvey & Associates then synthesized the monitoring results into this technical memorandum.

2024 Site Updates

Wetland Delineation Confirmation Site Visit

A site visit was conducted with a representative from USACE (Sarah Firestone) to confirm Year 6 delineation findings on January 23, 2024. The site visit was attended by Habitat Agency senior ecologist Nathan Hale and H. T. Harvey & Associate senior restoration ecologist Kate Drake. The USACE representative verbally confirmed in the field that the approach to the delineation and findings seemed accurate. However, further internal assessment from USACE was required to determine whether a Preliminary Jurisdictional Determination (PJD) would be sufficient for this project, or whether an Approved Jurisdictional Determination (AJD) would be more appropriate, due to a change in delineation assessment methods resulting from the May 25, 2023 Supreme Court decision in *Sackett vs. Environmental Protection Agency*. Therefore, the USACE has not yet issued a PJD or AJD for the project.

Mt. Hamilton Thistle Population Management

As described above, monitoring results at the pond mitigation site found the Mt. Hamilton thistle population to be in decline. Therefore, in 2023 and 2024, the Habitat Agency conducted the following steps to protect and reinvigorate the Mt. Hamilton thistle population:

- Coordinated with two AIR-Accredited (i.e., Accreditation to Improve Restoration and Native Plant Nursery Stock Cleanliness) nurseries to contract grow Mt. Hamilton thistle seedlings from seed collected on-site in 2023.
- Installed 70 of these seedlings in the seep at the pond mitigation site on April 9, 2024 (see area indicated as Approximate Extent of Mt. Hamilton Thistle on Figure 3).
- Prior to installing seedlings, treated dense native herbaceous vegetation in the area with a simulated "cattle grazing event", to reduce competition for the seedlings and improve conditions for recruitment and germination of Mt. Hamilton thistle seeds. Specifically, vegetation was removed in patches with hand tools—i.e., shovels, trowels, rakes, and a weed whip—to reveal bare ground throughout the area, including in areas where seedlings were to be installed. In addition, heavy trampling by crews was simulated during vegetation treatment and planting to emulate cattle footprints, creating small pockets where water can pool. Photos of the site during and after simulated disturbance and seedling installation can be found in Appendix A (Photos 19-23).

- Continued to protect the seep flow to the channel through maintenance of the springbox that collects spring inflow and conveys it to the wetland that supports the population of Mt. Hamilton thistle via steel pipe. In addition, the Habitat Agency took additional measures to protect the pipe that collects seep inflow from clogs by fencing off the upstream hillside from cattle grazing to reduce hillside erosion and therefore the potential for clogs. In addition, the Habitat Agency installed a raised grate around the pipe intake to reduce clogging from debris accumulation.
    - Five additional nursery-grown Mt. Hamilton thistle seedlings were installed in the seep on the immediate upstream hillside on April 9, 2024, to possibly increase the footprint of the population of this species. All five of these individuals were observed on September 27 and October 3, 2024; 4 of which appeared to be in excellent health and vigor.

The Habitat Agency will continue to monitor and manage the Mt. Hamilton thistle population until a clear positive trajectory is established and a management regime has been identified that benefits this species. Controlled grazing will be reintroduced to help reduce competition by other herbaceous species. However, this measure will not be taken until the population is shown to be well-established and stable, due to the potential for damage to remaining individuals from grazing or trampling.

Monitoring Methods

Monitoring efforts in Year 8 were limited to assessing success criteria that were not met or sufficiently assessed (due to drought conditions) during prior monitoring (Years 1-7). These included: target hydrologic regime, California red-legged frog surveys, and Mt. Hamilton thistle abundance. California tiger salamander and northwestern pond turtle were surveyed concurrently with California red-legged frog, although these criteria have already been met. Photodocumentation was also collected at the pond mitigation site. The methods for each of these metrics are provided below.

Year 8 Hydrologic Assessment

In 2023, site observations and hydrologic assessment performed by cbec determined that pond drawdown rates had increased progressively since construction, resulting in the site not meeting the performance criterion for target hydroperiod despite very wet conditions in the winter of 2023. Therefore, in 2024 cbec's ecohydrologists performed supplemental monitoring and analysis to investigate the possible reasons for the pond not meeting its hydrologic performance criteria. They monitored water levels in the pond and wetland, observed real time conditions following significant rainfall events, conducted flow monitoring in the creek downstream of the pond, and inspected the pond's outlet structure for leaks. The cbec team installed a temporary monitoring weir downstream of the pond outlet in May 2024 to monitor flows and water levels in the creek below the pond outlet. Ecohydrologists from cbec also conducted monthly site visits from April to November 2024. During each visit they collected manual bucket flow measurements at the weir and seep and downloaded gage data. Finally, they conducted an additional site visit in October to assess groundwater depths, and in November removed the weir and recalibrated the rain gage. Additional details on cbec's methods are available in their technical memorandum (Appendix B).

California Red-Legged Frog/California Tiger Salamander/Northwestern Pond Turtle

On April 8, 2024, Habitat Agency biologist Matthew Fogarty conducted surveys for special-status wildlife species at the pond and wetland mitigation sites to evaluate the performance standards for California red-legged frog, California tiger salamander, northwestern pond turtle, and aquatic predator abundance. Surveys were conducted in the late afternoon (4:00 to 5:30 PM). At the time of surveys, the air temperature was approximately 67 degrees Fahrenheit and cloud cover was 0%.

Visual encounter surveys were performed at each site by walking the peripheries of the pond at the pond mitigation site and of the upper pool and emergent wetland area at the wetland mitigation site. Dip net surveys for larval amphibians and aquatic predators were conducted following the visual encounter surveys. Much of the pond remained too deep for the biologist to survey safely; however, a dip net survey weas conducted where feasible. The biologist performed a total of 16 dip net sweeps of the pond. At the wetland mitigation site, the biologist performed 50 dip net sweeps.

Night surveys called for in the MMP for California red-legged frog were not conducted due to the low likelihood of occurrence, given that they have not been documented within the pond at any point during prior project surveys (including annual daytime surveys).

Mt. Hamilton Thistle Abundance

Habitat Agency senior restoration ecologist Nathan Hale conducted a survey for Mt. Hamilton thistle at the pond mitigation site on June 11, 2024 (Figure 3). The survey was conducted in accordance with the methods described in the MMP and consisted of: (1) recording the total number of Mt. Hamilton thistle individuals; (2) counting the number of thistle individuals in flower at the time of monitoring (excluding individuals solely in bud); (3) estimating the percent cover of Mt. Hamilton thistle within the area encompassed by the population using the quadrat sampling method (Bonham 1989); (4) qualitatively assessing the condition of Mt. Hamilton thistle individuals within the population; and (5) taking photographs to document onsite conditions. The spatial extent of the population was not mapped as in previous years (Years 1-6) because it was found that this metric is not helpful for tracking the health of the population.

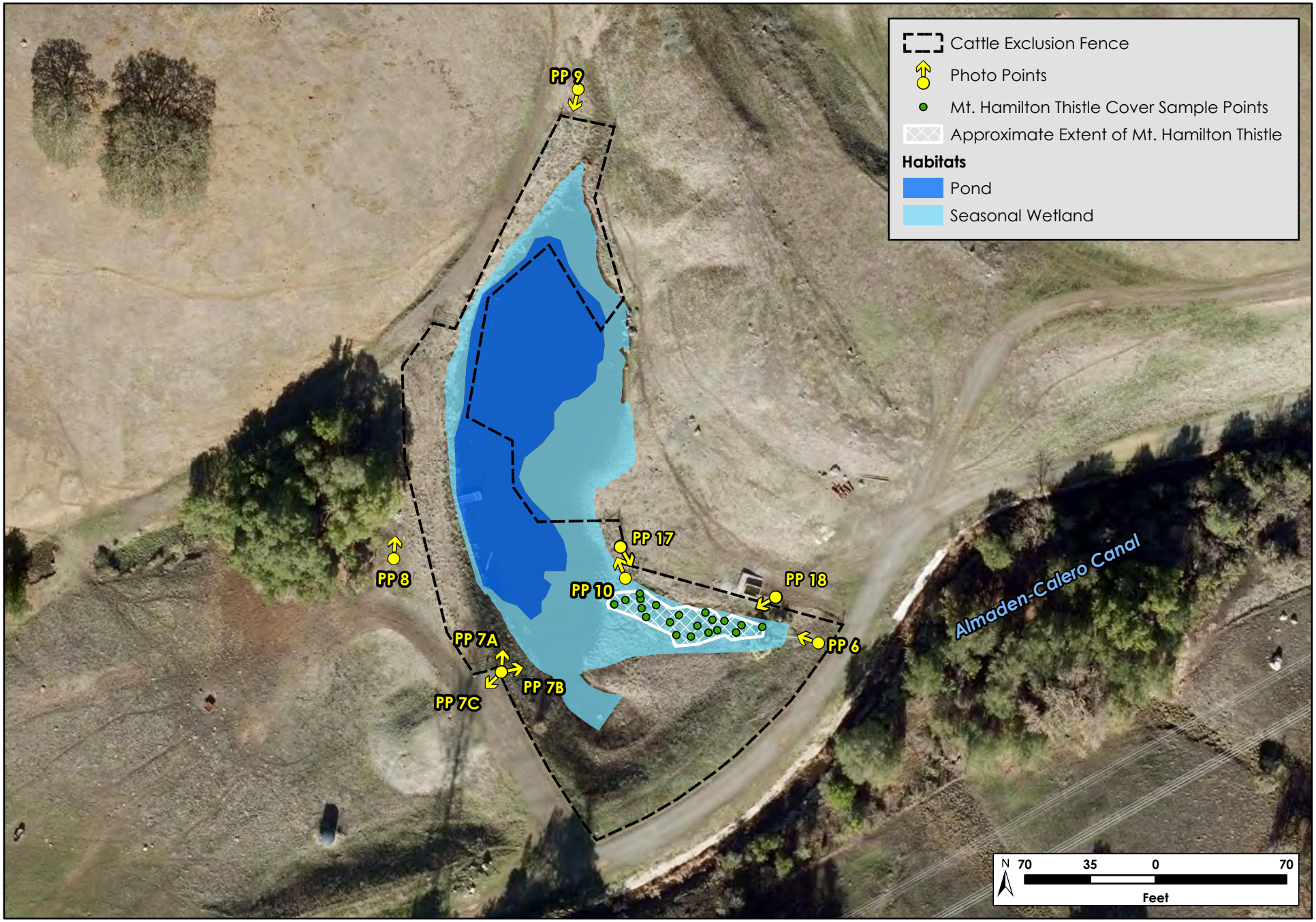
Photodocumentation

Nathan Hale collected photodocumentation of the pond mitigation site during vegetation monitoring on June 11, 2024, from permanent locations identified in the Calero County Park Pond and Wetland Restoration Project As-built Notification Report (H. T. Harvey & Associates 2017a). Mt. Hamilton thistle photodocumentation was conducted from the locations established in the Year 1 monitoring report (H. T. Harvey & Associates 2017b). Photographs are provided in Appendix A and the locations of the photodocumentation points are shown on Figure 3.

Table 1. Summary of Final Performance Standards Monitoring Status

Metric	Final Performance Standard	2024 Status
Target Hydrologic Regime	A portion of the pond mitigation site will be inundated by at least 2 feet of water through August 31, if average or above-average rainfall year. No quantifiable criteria apply for the wetland site.	Met in monitoring Years 1 and 3; N/A in monitoring Years 2, 4-6, and 8 due to dry conditions. Not met in Year 7. **Recommend continued monitoring.**
Sedimentation and Geomorphic Stability	The pond and wetland mitigation sites and springbox-seep water collection structures will demonstrate minimal sedimentation and geomorphic stability (includes cross-section surveys).	Met in monitoring years 1-6; therefore, monitoring of this metric is completed.
California Red-legged Frog/California Tiger Salamander/Northwestern pond turtle	At the pond mitigation site, successful breeding of California red-legged frog in at least one monitoring year; continued successful breeding of California tiger salamander; and continued occurrence of the northwestern pond turtle (criteria do not apply to wetland site).	Red-legged frog: Not met in any monitoring year. **Recommend continued monitoring.** Tiger salamander: Successful breeding observed in Years 1-3 and 5-6. Failure to observe in Year 4 was likely due to timing of monitoring. Therefore, monitoring of this metric is completed. Northwestern pond turtle: Observed in monitoring years 1-6, including juveniles observed in Years 1, 2, 4, and 5; therefore, monitoring of this metric is completed.
Aquatic Predator Presence/ Absence	Abundance of bullfrogs and Louisiana red swamp crayfish will be below baseline conditions at the pond mitigation site and minimal predator occurrence at the wetland mitigation site (no management is required at the wetland mitigation site).	Met in monitoring years 1-6; therefore, monitoring of this metric is completed.
Mt. Hamilton Thistle Abundance	A stable or increasing population of Mt. Hamilton thistle at the pond mitigation site (criterion does not apply to the wetland site).	Not met. Population showed evidence of decline from Year 4 (2020) through Year 7 (2023). Population size has increased in Year 8 due to supplemental planting. **Recommend continued adaptive management and monitoring.**
Wetland Vegetation Cover	70% in planting zones (separate and combined); less than 50% in open water pond habitat; at least three wetland species will be present.	Wetland vegetation cover at wetland mitigation site: met in monitoring Years 2-4 and 6; therefore, monitoring of this metric is completed. Wetland vegetation cover at pond mitigation site: not met in Years 1-6; met in Year 7. therefore, monitoring of this metric is completed. Wetland species count: Met in monitoring years 1-6 at wetland mitigation site and 1-7 at pond mitigation site. therefore, monitoring of this metric is completed.

Metric	Final Performance Standard	2024 Status
		Open water pond habitat cover: Met in Years 1-6; therefore, monitoring of this metric is completed.
Invasive Plant Cover	Less than 5%	Met in Years 1-6. Met in wetland at pond mitigation site in Year 7; not monitored elsewhere in Year 7. Therefore, monitoring of this metric is completed.
Wetland Delineation	Pond Mitigation Site:	
	Restored jurisdictional wetlands ≥ 0.27 ac	Met in Year 6; monitoring of this metric is completed.
	Created jurisdictional wetlands ≥ 0.01	Met in Year 6; monitoring of this metric is completed.
	Wetland Mitigation Site:	
	Restored jurisdictional wetlands ≥ 0.10 ac	Met in Year 6; monitoring of this metric is completed.
	Created jurisdictional wetlands ≥ 0.02 ac	Met in Year 6; monitoring of this metric is completed.
		A site visit with a representative from USACE to confirm Year 6 delineation findings was conducted on January 23, 2024. The USACE representative verbally confirmed in the field that the mapped footprint of wetlands seemed accurate. However, further internal assessment from USACE was required to determine whether a Preliminary Jurisdictional Determination (PJD) would be sufficient for this project, or whether an Approved Jurisdictional Determination (AJD) would be more appropriate. Therefore, a PJD or AJD has not yet been issued for the project.
Water for Cattle	Sufficient water to support the same grazing intensity of the Reserve lands as the existing conditions.	Water was available year-round for cattle via the spring-fed trough at the pond mitigation site in Years 1-5, although in Year 5 water was insufficient to meet the demands of the historic cattle stocking rate, in response to drought conditions in recent years. In Year 6, the cattle rancher coordinated with Santa Clara County Parks and Recreation Department to secure a municipal water source and installed four new troughs and improved one old trough to supply with municipal water.



N:\Projects3700\3753-02\08\Reports\Yr 8 Monitoring Memo\Yr 8 Monitoring Memo.aprx

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 3. Pond Mitigation Site

Calero County Park and Wetland Restoration Project
Year 8 (2024) Supplemental Vegetation and Hydrology Monitoring Memorandum (3753-08)
February 2025

Results

The results of Year 8 supplemental monitoring are presented below. These monitoring results are focused on the following metrics where the project's MMP final success criteria were not met in Year 7 as noted in Table 1:

- Hydrologic regime at pond mitigation site
- California red-legged frog habitat
- Mt. Hamilton thistle abundance

Survey results for California tiger salamander and northwestern pond turtle are also presented below, even though the MMP's final success criteria for these species was met in prior years. These species were included because surveys for these species are readily performed in tandem with surveys for California red-legged frog.

Target Hydrologic Regime

The success criterion for target hydrologic regime of at least 2 feet of water through August 31 was not met in 2024, which was a normal to dry water year (i.e., normal precipitation, but with record mean high temperatures). Although this criterion does not apply in dry water years, the failure to meet it reflects the ongoing issue with increased drawdown rates at the pond each spring. This appears to be primarily driven by increased percolation rates. Possible causes for the lack of water retention include seepage beneath the pond bottom, piping through the pond embankment, and/or the bentonite layer not performing as intended.

Actions to increase seep-driven water inputs to the pond could also help to elongate the hydroperiod. The Habitat Agency has already taken action to reduce clogging of the springbox system during high flow events by increased watershed protection and installing a new grate on the springbox. Observations made by cbec and the Habitat Agency in 2024 also indicate that the seep flow collection stream upstream of the springbox is not fully capturing flow from the various seeps. Modeling suggests that enhancing seep flow collection upstream of the springbox could extend the duration of inundation in the pond by 2 to 25 days in any given water year but is likely insufficient to overcome the underlying issue of the increasing drawdown rate.

Additional details on the water budget model improvements and hydrologic assessment made in 2024 are presented in Appendix B. Recommendations to improve the hydroperiod and for continued monitoring are presented therein and summarized in the Recommendations Section below.

California Red-Legged Frog/California Tiger Salamander/Northwestern Pond Turtle

The following species were observed at the pond mitigation site during the surveys on April 8, 2024:

- Northwestern pond turtle (*Actinemys marmorata*) adults
- California tiger salamander (*Ambystoma californiense*) larva

- California newt (*Taricha torosa*) larvae
- Sierran treefrog (*Pseudacris sierra*) larvae
- American bullfrog (*Lithobates catesbeianus*) adults

In addition, many Sierran tree frog larvae were observed at the wetland mitigation site, primarily in the emergent wetland. American bullfrogs were also observed by call at the wetland mitigation site, and one was visually observed at the emergent wetland at the wetland mitigation site. No special status species were observed at the wetland mitigation site.

Detailed survey results of special status species are provided below:

California Red-Legged Frog—No California red-legged frogs or egg masses were observed in the pond or wetland mitigation sites during Year 8 monitoring. There have been no documented observations of the California red-legged frog at the pond or wetland mitigation sites in Years 1–8. Although night surveys were not conducted, we anticipate that California red-legged frog would not have been found during night surveys. Therefore, the performance criterion of successful breeding of California red-legged frog in at least one monitoring year was not met. The closest known occurrence of the California red-legged frog at the time of project construction was approximately 1.4 miles south of the pond in Cherry Creek (H. T. Harvey & Associates 2016a).

California Tiger Salamander—Two California tiger salamander larvae were observed at the pond mitigation site in Year 8. Dip net surveys ceased after presence was detected to minimize take. California tiger salamander larvae were also observed in Years 1–3 and Year 5. Therefore, the performance criterion of continued successful breeding of the California tiger salamander was met.

Northwestern Pond Turtle—Three northwestern pond turtles were observed basking at the pond mitigation site during monitoring. In addition, two northwestern pond turtles were incidentally observed during a site visit on February 12, 2024. Therefore, the pond mitigation site continued to provide suitable northwestern pond turtle habitat, and the performance criterion of continued occurrence of northwestern pond turtle was met.

Mt. Hamilton Thistle Abundance

A summary of the results of Mt. Hamilton thistle abundance monitoring in Years 1-8 is presented in Table 2. The population abundance shows a declining trend beginning in Year 4 and continuing through Year 7, and then a sharp increase in Year 8, resulting from the supplemental planting of Mt. Hamilton thistle seedlings described in the Methods Section above. Of the 70 individuals installed in Year 8, 67 were observed to have survived. The 12 remaining individuals observed during monitoring were naturally recruited. As in Year 7, percent cover of Mt. Hamilton thistle was very low in Year 8. This was likely attributable to the small size of the individuals (i.e., planted seedlings), although most of them appeared to be in good health, and health and vigor of individuals in the population overall was good. However, natural recruitment appeared to be low; a

total of 6 recruited seedlings were observed. Moreover, reproduction in 2024 appeared to be low with only 4 individuals observed to be in flower.

As noted in the Year 6 annual report, thatch and herbaceous vegetation was cleared from around the base of flowering individuals on June 10, 2022, prior to seed set, at the recommendation of Janell Hillman (H. T. Harvey & Associates 2022). This action was chosen to increase likelihood of successful reproduction (via increasing seed-soil contact), since seeds of this species are typically deposited directly under or nearby the flowering individuals, due to the drooping growth habit and relatively heavy seeds. Population decline has occurred consistently in both wet and dry years (Table 2). We therefore hypothesize that the reason for the decline of the population is interspecific competition between Mt. Hamilton thistle individuals and co-occurring dense native vegetation. The increased density of native vegetation is due to cattle exclusion fencing limiting both browse and ground disturbance from cattle and native wildlife (e.g. deer). Therefore, additional simulated cattle grazing events should be implemented at the site prior to seed set each year, and monitoring should continue to assess the health of the population as well as recruitment rates.

Photodocumentation of the Mt. Hamilton thistle population is included in Appendix A.

Table 2. Mt. Hamilton Thistle Abundance at Calero County Park, 2017-2024

Monitoring Year	Count	Survey Dates	Count of Flowering Individuals	Percent Cover	Water Year Type
1	111	May 16th, July 14th, and August 8th, 2017	No data	19.5	Wet
2	123	May 14th, 2018	23	24.3	Very Dry
3	125	June 3rd, 2019	9	32.7	Wet
4	96	May 13th, 2020	29	37.0	Very Dry
5	69	May 20th, 2021	42	23.5	Very Dry
6	58	March 5th and May 19th, 2022	22	19.4	Dry
7	32	July 17, 2023	21	3.3	Very Wet
8	79	June 11, 2024	4	1.2	Dry

Photodocumentation

Photodocumentation is presented in Appendix A.

Recommendations

To enhance the hydroperiod in the pond, the Habitat Agency could consider the following measures:

1. Perform the following test to assess the efficacy of the bentonite layer to hold water: Temporarily extend the seep trough outlet pipe into the bentonite underlaid area of the pond to further test the efficacy of

the bentonite layer to hold water through the hydroperiod. This would help inform to what extent the bentonite layer in the deepened area is underperforming relative to its design intent, which will in turn inform the extent to which a slurry wall (see bullet 2, below) would help enhance the hydroperiod. This would require a flow split to accommodate providing adequate water supply to the Mt. Hamilton thistle. Alternatively, use a water truck to perform this test to minimize impact to the Mt. Hamilton thistle. This test should be performed in the summer after the pond has almost drawn down, and should take at least a month. The seep path should not be allowed to dry out at any point during the test in order to protect the health of the Mt. Hamilton thistle population.

2. Continue to maintain the upstream active seep collection system to promote directing flow towards the springbox and not the Almaden-Calero Canal. This may include clearing any blockages within existing manmade ditches and performing as-needed maintenance following storm events. Regular maintenance, especially after rain events, is likely necessary to ensure flows are unobstructed by debris. Alone this measure may not be sufficient to achieve the target hydroperiod; however, it may increase the effectiveness of other measures by increasing the volume of water entering the pond. Modeling suggests that if seep flows were increased by 30% either via this measure, measure 3 or a combination, water could have been held in the pond for longer into the dry season by 2 to 25 days in any given water year, but that the hydroperiod criteria for average and wetter years would still not have been met.
3. Design and install a slurry wall (or other comparable measure) at the inside (pond-ward side) toe of the dam embankment to the point of refusal (up to 10 feet below ground surface, maybe more) to limit subsurface flows from daylighting below the dam. Preferential subsurface flows through the dam at depth appear to be why the pond is not meeting its hydroperiod criterion. While this is highly likely to extend the hydroperiod in the pond, it is uncertain whether this would extend the hydroperiod to a sufficient extent to meet the performance criterion for the hydroperiod for California red-legged frog habitat. Further intensive study of subsurface groundwater would be required to definitively understand the likely effect of this action on the pond hydroperiod.

To monitor and maintain the pond site's hydroperiod, continue to consider the following activities performed in tandem with some or all of the above recommended actions:

1. Continue gage data monitoring and subsequent water budget analysis to compare yearly data trends.
2. Perform more frequent monitoring visits, especially early in the season after and during rain events to observe conditions in real-time and after the pond has filled and water levels are drawing down for the season.
3. Conduct supplemental flow monitoring in the creek below the pond throughout the water year to understand flow rates and volumes.
4. Perform more frequent maintenance of the seep collection system to minimize blockages that cut off inflow to the springbox, trough, and pond.

Conclusions

Post-construction monitoring and reporting to regulatory agencies for project-specific permit requirements is largely complete, based on the criteria set out in the MMP (see Table 1). Therefore, the Habitat Agency intends to transition the project site to the long term monitoring methods, consistent with the project's Long-Term Management Plan (LTMP) (H. T. Harvey 2016b). LTMP monitoring includes regular but less frequent monitoring of all areas of the pond and wetland mitigation site, as well as long-term maintenance of key infrastructure. Included in these are ongoing monitoring of outstanding items, including pond hydroperiod, annual surveys for California red-legged frog, and annual mapping of the Mt. Hamilton thistle population for at least the first 5 years. In response to un-met MMP criteria, additional and modified monitoring approaches to the methods in the LTMP are proposed, as follows:

- Supplemental management, monitoring, and reporting on the Mt. Hamilton thistle population will be continued. Specifically, vegetation disturbance events will continue to be implemented annually in late winter/early spring, prior to seed drop, for at least the first 5 years of the LTMP period. Disturbance may consist of manual events such as those implemented in 2024 or managed flash grazing events.
- The presence or absence of Mt. Hamilton thistle seedlings and their survival rate will be tracked annually for the first 5 years, with particular attention paid to the effectiveness of management actions that are being taken to support the population.
- The LTMP calls for transition to monitoring the Mt. Hamilton thistle population every 5 years after the first 5 years. Whether the population has recovered enough to allow for this transition, as well as the suitable long-term management regime, will be determined at that time.
- The LTMP calls for continued monitoring of the pond hydroperiod. Based on the observed increasing rate of percolation at the pond, as well as the absence of California red-legged frog, the Habitat Agency proposes to modify the target hydrologic regime to solely maintain suitable conditions for California tiger salamander breeding. See attached letter for more details.
    - The revised target hydrologic regime for the pond at the pond mitigation site will be to have at least 1 foot of water through the end of May in average or wetter water years. This is suitable to support California tiger salamander breeding. In addition, this criterion has been met in all monitoring years (2017 through 2024) except 2021 and 2022 (very dry and dry years, respectively).
    - Accordingly, the Habitat Agency will not seek credit under the Habitat Plan for California red-legged frog at this site, because suitable conditions for breeding for this species were not established. However, habitat enhancement credits for California tiger salamander and northwestern pond turtle will still be applied, due to increased wetland area and wetland vegetation cover, as well as installation of basking structures. However, regular surveys will continue, and if CRLF are detected and/or if the pond fails to fulfill the revised hydrologic regime, the Habitat Agency will reevaluate resolving the pond's hydroperiod to accommodate the life histories of covered herpetofauna.

- This hydroperiod may not be suitable to sustain the presence of northwestern pond turtle, which typically prefer consistent access to at least 1-2 feet of clear water. However, northwestern pond turtles have been consistently observed at the site in all monitoring years (2017-2024) as well as prior to construction; therefore, they likely have alternate nearby shelter and forage available when the pond is dry. Ongoing monitoring, consistent with the LTMP, will be used to determine whether northwestern pond turtle will abandon the pond. The Habitat Agency will also add a later season monitoring event, as the pond is drawing down, to better understand northwestern pond turtle activity.

References

H. T. Harvey & Associates. 2016a. Calero County Park Pond and Wetland Restoration Project Mitigation and Monitoring Plan. Prepared for the Santa Clara Valley Habitat Agency. September 6.

H. T. Harvey & Associates. 2016b. Calero County Park Pond and Wetland Restoration Project Long-Term Management Plan. Prepared for the Santa Clara Valley Habitat Agency. July 22.

H. T. Harvey & Associates. 2017a. Calero County Park Pond and Wetland Restoration Project As-Built Notification Report. February 9.

H. T. Harvey & Associates. 2017b. Calero County Park Pond and Wetland Restoration Project Year 1 Monitoring Report. Prepared for the Santa Clara Valley Habitat Agency. December 22.

H. T. Harvey & Associates. 2022. Calero County Park Pond and Wetland Restoration Project Year 5 Monitoring Report. Prepared for the Santa Clara Valley Habitat Agency. January 3.

H. T. Harvey & Associates. 2023a. Calero County Park Pond and Wetland Restoration Project Year 6 Monitoring Report. Prepared for the Santa Clara Valley Habitat Agency. January 13.

H. T. Harvey & Associates. 2023b. Calero County Park and Wetland Restoration Project—Year 7 (2023) Supplemental Vegetation and Hydrology Monitoring [memorandum]. Los Gatos, California. Prepared by Kate Drake and Max Busnardo. Prepared for the Santa Clara Valley Habitat Agency. December 15.

Appendix D. Photodocumentation

Photo 1. Year 1 Conditions at Photo Point 6 during Mt. Hamilton Thistle Abundance Monitoring at the Pond Mitigation Site (August 8, 2017)

Photo 2. Year 8 Conditions at Photo Point 6 during Mt. Hamilton Thistle Abundance Monitoring at the Pond Mitigation Site (June 11, 2024)

Photo 3. Year 1 Conditions at Photo Point 7a during Vegetation Monitoring at the Pond Mitigation Site (August 8, 2017)

Photo 4. Year 8 Conditions at Photo Point 7a during Vegetation Monitoring at the Pond Mitigation Site (June 11, 2024)

Photo 5. Year 1 Conditions at Photo Point 7b during Vegetation Monitoring, Showing the Wetland Establishment Area at the Pond Mitigation Site (August 8, 2017)

Photo 6. Year 8 Conditions at Photo Point 7b during Vegetation Monitoring, Showing the Wetland Establishment Area at the Pond Mitigation Site (June 11, 2024)

Photo 7. Year 1 Conditions at Photo Point 7c during Vegetation Monitoring at the Pond Mitigation Site (August 8, 2017)

Photo 8. Year 8 Conditions at Photo Point 7c during Vegetation Monitoring at the Pond Mitigation Site (June 11, 2024)

Photo 9. Year 1 Conditions at Photo Point 8 during Vegetation Monitoring at the Pond Mitigation Site (August 8, 2017)

Photo 10. Year 8 Conditions at Photo Point 8 during Vegetation Monitoring at the Pond Mitigation Site (June 11, 2024)

Photo 11. Year 1 Conditions at Photo Point 9 during Vegetation Monitoring at the Pond Mitigation Site (August 8, 2017)

Photo 12. Year 8 Conditions at Photo Point 9 during Vegetation Monitoring at the Pond Mitigation Site (June 11, 2024)

Photo 131. Year 1 Conditions at Photo Point 10 during Vegetation Monitoring at the Pond Mitigation Site (August 8, 2017)

Photo 14. Year 8 Conditions at Photo Point 10 during Vegetation Monitoring at the Pond Mitigation Site (June 11, 2024)

Photo 15. Year 1 Conditions at Photo Point 17 during Mt. Hamilton Thistle Abundance Monitoring at the Pond Mitigation Site (August 8, 2017)

Photo 16. Year 8 Conditions at Photo Point 17 during Mt. Hamilton Thistle Abundance Monitoring at the Pond Mitigation Site (June 11, 2024)

Photo 17. Year 1 Conditions at Photo Point 18 during Mt. Hamilton Thistle Abundance Monitoring at the Pond Mitigation Site (August 8, 2017)

Photo 18. Year 8 Conditions at Photo Point 18 during Mt. Hamilton Thistle Abundance Monitoring at the Pond Mitigation Site (June 11, 2024)

Photo 192. Plant Installation During Year 8 Mt. Hamilton Thistle Planting at the Pond Mitigation Site (April 9, 2024)

Photo 20. Seep at Pond Mitigation Site Following Vegetation Removal, Ground Disturbance, and Plant Installation During Year 8 Mt. Hamilton Thistle Planting (Flags Indicate Seedlings) (April 9, 2024)

Photo 21. Seep at Pond Mitigation Site Following Vegetation Removal, Ground Disturbance, and Plant Installation During Year 8 Mt. Hamilton Thistle Planting (Flags Indicate Seedlings) (April 9, 2024)

Photo 22. Year 8 Mt. Hamilton Thistle Seedlings at the Pond Mitigation Site (April 9, 2024)

Photo 23. Year 8 Mt. Hamilton Thistle Seedlings at the Pond Mitigation Site (April 9, 2024)

Appendix B. Year 8 Hydrologic Analysis

TECHNICAL MEMORANDUM

Date:	December 09, 2024
To:	Kate Drake (H. T. Harvey & Associates)
From:	Anna Hamilton, Chris Campbell, Sam Diaz
Project:	15-1030-5 – Calero Mitigation Site Monitoring
Subject:	Year 8 Hydrologic Analysis

1 INTRODUCTION

To support H. T. Harvey & Associates (H. T. Harvey) during the long-term maintenance and monitoring of the Calero County Park Pond and Wetland Restoration Project, cbec eco-engineering (cbec) provided ongoing hydrologic monitoring at the pond and wetland mitigation sites since 2017. cbec continuously measured pond and wetland water levels, direct rainfall, and seep inflows to the pond to monitor the hydrologic regime at the pond and wetland mitigation sites. For each monitoring year, the hydrologic regime at both sites was monitored with the goal of observing water levels and inflows to understand if the hydrologic performance standards were being met. Those standards are: (1) at least two feet of water in the pond through August 31 in years with average to above average precipitation to support California red-legged frog (CRLF) and California tiger salamander (CTS) breeding; and (2) minimal sedimentation at both mitigation sites documented through observational sedimentation and geomorphic stability monitoring (i.e., no repeat topographic cross section surveys). Following Year 6 monitoring (Water Year 2022), the project was to transition to its long-term monitoring phase. However, field visits from June 2023 indicated that the pond had not met its hydrologic performance standard for Water Year 2023 even though the expectation was that it would, given the wet winter.

Based on recommendations from Year 7 monitoring (Water Year 2023), cbec performed a second round of supplemental monitoring and analysis for the remainder of Year 8 (Water Year 2024) to further investigate the possible reasons for the pond not meeting its hydrologic performance criteria. Observational data and water budget model findings from Year 7 confirmed that there has been a progressive increase in the pond drawdown rate since the start of post-construction monitoring in 2017, demonstrating a progressive decline in the ability of the pond to meet its hydrologic performance criteria. Part of the Year 7 explanation for the increased drawdown rate was the significant increase in losses, assumed to be percolation losses through the bottom of the pond. cbec was tasked with conducting additional site monitoring to further assess the recommended actions from the 2023 supplemental monitoring report to monitor water levels in the pond and wetland, observe real time conditions following

significant rainfall events, conduct supplemental flow monitoring in the creek downstream of the pond, and inspect the pond's outlet structure for leaks.

1.1 STUDY OBJECTIVES

To understand why the pond has not met its hydrologic performance criteria to support suitable habitat for the CRLF and CTS breeding during wet years (2019 and 2023), additional monitoring and data analysis by cbec included:

Task 7.1 – Perform quarterly site visits to download gage data, assess site conditions, and consider maintenance items necessary for the upkeep of the monitoring station and gages at both the pond and wetland sites.
Task 7.2 – Perform monthly site visits to conduct supplemental flow monitoring using bucket measurements to support Task 7.3. Groundwater levels were also measured during the dry season.
Task 7.3 – Install a weir, to include water level gage and staff plate, in the creek below the pond outlet to compare flows below the dam with incoming seep flows and monitor water levels at the outlet. Bucket measurements at both the new weir and seep trough were conducted during each site visit.
Task 7.4 – Conduct an analysis of gage data from the pond, wetland, and seep trough to identify data trends. This included calculating the water year type, evaluating data from the weir data logger and bucket measurements to gain a better understanding of flows in the creek below the pond, and updating the water budget model to help identify what parameters may be responsible for the pond not meeting its performance standards.
Task 7.5 – Prepare a technical memorandum summarizing findings from analysis of weir and seep flow data, gage analysis, and water budget analysis. Provide recommendations based on the analysis.

2 DATA COLLECTION

Site visits in Year 8 were made on a monthly basis from April to November 2024. Weir and seep bucket measurements were taken during each visit, and gage data was downloaded as well. Additional site visits were made in May to install a weir downstream of the pond outlet, in October to measure groundwater depths in the pond, and in November to remove the weir and re-calibrate the rain gage.

2.1 GAGE DATA

Gage data (water level, temperature, and precipitation) was collected monthly from April through November 2024. The data was processed and compared to previous years, then used to inform the water budget model.

2.2 WEIR INSTALLATION

On May 3, 2024, a V-notch weir was installed approximately 100 ft downstream of the pond outlet structure (Figure 1). The purpose of the weir was to monitor flows and water levels in the creek below the pond outlet during a period when the pond outlet was no longer spilling. A water level gage and staff plate

were also installed to allow for continuous monitoring. A debris screen was installed on May 8, 2024 to prevent debris (i.e., leaf litter) from clogging the weir.

2.3 WEIR AND SEEP BUCKET MEASUREMENTS

Seep and weir flow bucket measurements were taken on a monthly basis from May 2024 until November 2024 (Table 1) to allow comparison of incoming seep flows to flows in the creek below the pond. Measurements were taken by placing a bucket (typically 1 gallon) under the flow and recording the time it takes to fill the bucket. Measurements were recorded and averaged. Weir flow was higher than the seep flow between May and September 2024, with outflow rates oftentimes more than double the incoming seep flow. The seep and weir flow equalized in October; however, weir flow was again higher in November 2024.

Table 1: Seep and Weir Bucket Measurements

Month of site visit (2024)	Average seep flow 2017-2023 (gal/day)	Average seep flow 2024 (gal/day)	Average outflow at weir (gal/day)
May	5407	5184	16416[1]
June	-	3456	5207
July	1160	1728	4870
August	1804	1210	3593
September[2]	789	1210	3087
October	1201	1728	1728
November	-	1555	3456

Notes:
[1] Value represents flow from artificially raised stage to establish rating curve for higher flows. Actual weir flows were lower.
[2] 2024 September measurement was made on October 1

2.4 GROUNDWATER MEASUREMENTS

In consideration that weir flows below the pond were higher than seep flows into the pond, a site visit was made on October 17, 2024 to take groundwater depth measurements to better understand subsurface conditions. A hand auger was used to drill holes at points along the length of the pond. Data collected were used to create a groundwater surface elevation profile from the seep trough to the pond outlet and through the remainder of the pond.

2.5 WATERSHED INVESTIGATION

The two primary sources of water to the pond include runoff from the northern 11.5-acre watershed directly tributary to the pond as well as seep flow collected at the springbox on the south side of the Almaden-Calero Canal (Figure 2). While the 26.5-acre watershed tributary to the springbox does convey runoff to the springbox, it is assumed that the runoff volume typically exceeds the conveyance capacity

of the pipe crossing the Almaden-Calero Canal. At present, three seeps (i.e., Seeps 2, 3 and 4, Figure 2) in the watershed tributary to the springbox provide inflows to the pond via a ditch collection system. However, historically this ditch collection system may have been more extensive.

A site visit was made on November 14, 2024 by the Habitat Agency to investigate the upstream watershed and identify any potential contributing factors to losses in the ditch collection system. An additional site visit was made by cbec on November 27, 2024 to further investigate the upstream watershed, the seeps, and the ditch collection system. During both of these visits, a diversion of flows of one of the upstream seeps (i.e., Seep 4) was noted. Debris blocking the original flow path likely caused the diversion.

2.6 WATER YEAR CLASSIFICATION

Local precipitation data was compiled to classify the WY type. As in previous monitoring reports (cbec, 2023), data from the nearby Gilroy gage was collected and scaled to the project site for comparison. Year 8 (WY 2024) was classified as Dry. Total rainfall at the project site was 7.95 inches.

Table 2: Annual Precipitation Totals by Water Year

Water Year	Gilroy COOP (inch)[1]	Gilroy Scaled (inch)[2]	Project Rain Gage (in)	Water Year Type[3]
2010	25.60	30.32	---	Wet
2011	22.08	26.15	---	Normal
2012	11.25	13.32	---	Dry
2013	14.69	17.40	---	Dry[11]
2014	9.16	10.85	---	Very Dry
2015	14.69	17.40	---	Normal[8]
2016	17.96	21.27	---	Normal
2017	22.24	26.34	13.52[4]	Wet
2018	9.41	11.14	8.53[5]	Very Dry
2019	23.41[6]	27.72	29.67[7]	Wet
2020	8.21	9.72	NA[9]	Very Dry
2021	6.44[10]	7.63	7.77	Very Dry
2022	12.81	15.17	15.28	Dry
2023	28.93	34.26	40.54	Very Wet
2024	12.04	14.26	7.95	Dry
30-Minimum	6.44	7.63	7.77	
30-Maximum	42.53	50.36	40.54	
30-Average	18.11	21.45	17.61	

Notes:
[1] Gilroy Cooperative Observer Program (COOP, 043417-4) precipitation for WYs 1958 through 2021 (i.e., 64 years)

[2] Gilroy precipitation scaled to project site based on PRISM (OSC, 2012) 30-year rainfall normal using a scaling factor of 1.1842
[3] WY type (very wet, wet, normal (average), dry, very dry) designated based on reasonable exceedance probabilities (<0.10, ≥0.10, ≥0.33, ≥0.67, ≥0.90) based on the scaled Gilroy data
[4] Precipitation for WY 2017 is under reported as project rain gage was installed on 1/27/2017
[5] Project rain gage failed on 5/26/2018 and was not fixed until 11/7/2018; rain gage was recalibrated upon redeployment
[6] Rainfall data was missing for the Gilroy COOP gage for the months of November, December, March, April, and May for WY 2019. To estimate the missing data, monthly values for prior years (2008 to 2018) were correlated to San Jose COOP (047821).
[7] Rainfall data was under reported as project rain gage failed 3/22/2019 and not fixed until 11/26/2019
[8] By addition of WY 2020 data, the WY type for WY 2015 was reclassified as this WY is within 0.01 inches of being classified as Dry.
[9] Project rain gage fully failed and data was not recoverable.
[10] Gilroy recorded an erroneous precipitation depth for the month of September. The value was confirmed erroneous by nearby gages and removed from the analysis.
[11] By addition of WY 2024 data, the WY type for WY 2013 was reclassified from normal to dry.

3 WATER BUDGET MODEL

A water budget model was originally developed and calibrated to support the design for the pond, which is described in detail in the Mitigation and Monitoring Plan (H.T. Harvey & Associates and cbec, 2016). The model was updated to investigate the potential parameters affecting the hydrologic performance of the pond. Inputs to the water model include direct rainfall, input from the upslope watershed, and spring box inflow. Losses include percolation through the pond bottom, evapotranspiration, cattle consumption, and excess water conveyed through the outlet culvert. The model was previously updated in Year 7 (WY 2023) to reflect the as-built geometry of the pond and recently updated to include data from Year 8 (WY 2024).

Daily water budget calculations were prepared using rainfall data from the project site, and evapotranspiration data for CIMIS Station 211 (Gilroy) from 1/27/2017 through 10/30/2024. To account for increased evapotranspiration from open water and seasonal wetlands, the evapotranspiration data was multiplied by a microclimate factor of 1.1. Runoff was computed using the TR-55 Curve Number (CN) runoff method (USDA, 1986). A CN value of 85 for a rangeland in fair condition with an initial abstraction (I_a) value of 0.3 inches was assumed; however, this was modified to account for dry antecedent conditions (as described in Section 4.5.1). Cattle consumption was assumed to be 800 gal/day from May until the first rains of the following water year. This assumption was made for all water years. Outflow from the pond occurred only when the storage capacity of the pond exceeded the spill elevation of the outlet structure (i.e., 508.5 ft) or was manually drawn down in late summer. These are all the same parameter values used in the original modeling effort (H.T. Harvey & Associates and cbec, 2016), and while other values were evaluated, they did not have a significant impact on pond drawdown rates.

Seep flow and percolation were the primary water budget calibration parameters for the model that affected pond drawdown rates. Field measurements taken during the project monitoring period were compared against the original rating curve to inform revisions to seep flow data in the model. Seep flow and percolation losses were originally calibrated to the first year of the project, and then the same values were evaluated on subsequent project years. However, notable differences in the water budget model results over varying WY types necessitated a separate calibration of wet and dry water years in the Year 7 analysis. The model seep and percolation values were further updated in the Year 8 analysis and were determined by the number of storm occurrences for that water year which is further detailed below. Calibration results are further discussed in the following sections. Additional model sensitivity tests were also made and are detailed below.

4 RESULTS

The findings from the monthly site visits, flow monitoring, and results from the water budget analysis are further discussed below.

4.1 GAGE DATA

Water level gage data was compiled and processed to determine trends in the data. Pond water level recessions were compared for each year. Figure 3 shows the pond water level change from the date the water level dropped below the weir elevation to the date the pond went dry, in number of days. Figure 3 highlights a trend: that there has been a progressive increase in the pond drawdown rate since the start of post-construction monitoring in 2017, indicating a fundamental change in the hydrologic performance of the pond. WY 2024 held onto water later in the year than WY 2023, likely due to late season rains. The pond outlet structure gate seals and grout were inspected for possible leaks that may be contributing to these unexpected losses in August 2023, and again in April 2024. No leaks were found during either site visit.

4.2 WEIR AND SEEP FLOW

Weir and seep flow measurements (see Table 1) were compared on a monthly basis between May and November, 2024. Weir flows were typically higher than seep flows, except for in October, 2024 when flows equalized. These results indicate that water in excess of incoming seep flow is generally moving subsurface through the pond and exiting through the creek. This additional source of flow to the pond was previously unknown and not accounted for in prior water budgeting.

4.3 GROUNDWATER DEPTH MEASUREMENTS

Groundwater depths were recorded along the length of the pond on 10/17/2024 after it became apparent that there were supplemental flows to the pond daylighting downstream of the pond rather than sustaining water levels within the pond. Figure 4 shows the sampling locations and associated groundwater depths collected along alignments A and B. At some points, hand auguring was stopped due to contact with rock, and the dry depth was recorded instead. The extent of the bentonite layer is also

shown in the figure. During the site visit, it was noted that the area of the pond lined with bentonite was moist to touch on the surface, though no pooling water was seen.

Two sets of depth measurements were taken, the first upon initial contact with groundwater, and the second at the end of the site visit before the holes were filled. Most of the sample locations experienced a small rise in the groundwater level during the short duration (i.e., hours) before the holes were filled prior to leaving the site, indicating that pressure from below is forcing water upwards.

Figure 5 shows the groundwater surface elevation profile A that runs from the north end of the pond to the seep trough in the south, while figure 6 shows the water profile B running west to east, from the staff plate west of the dam to the center of the pond near the outlet structure, generally indicating the gradient of the water level between the pond and the creek when the pond is dry. Profile A shows groundwater elevations relatively deep north of the outlet structure (i.e., 4 to 7 feet below ground surface) and shallow south of the outlet structure on approach to the seep trough (i.e., < 4 feet below ground surface)**.** While the groundwater level at approximately station 140 feet is near the surface and coinciding with the edge of the bentonite layer in the deepest part of the pond, it is assumed that the bentonite layer is not restricting daylighting of groundwater given the sharp inflection point in the profile bounding station 140 feet. Rather, the decline in the groundwater level, the discovery that there is potentially more water flowing sub-surface beneath the pond than the incoming seep flow, and the increase of the pond drawdown rate over time all suggest that there is potentially a preferential flow path underneath the dam that is becoming more pronounced with time.

4.4 WATERSHED INVESTIGATION

A site visit was made on 11/14/2024 by the Habitat Agency to observe the adjacent upstream watershed and contributing seeps. It was noted that Seep 4 (Figure 2) was partially blocked by debris and partially redirected to the Almaden-Calero Canal. It is unknown when this blockage and flow split may have occurred, but it has likely contributed to loss in seep flows to the pond via the existing ditch. An additional investigation was made by cbec on 11/27/2024 to further investigate the seep collection system as partially informed by historical imagery. Based on review of 1968 aerial imagery (Figure 7), additional features that were investigated included a relic ditch running adjacent to the existing fence line east of Seep 1, and a relic ditch connecting Seeps 4 and 5. The flow split at Seep 4, near the fence line, was confirmed (Figure 8). The relic and defunct surface ditch connecting Seeps 4 and 5 was also identified (Figure 9). The relic and defunct surface drainage east of Seep 1 (Figure 10) was also investigated and is largely defunct due to multiple headcuts redirecting flows to the Almaden-Calero Canal.

To understand the potential to re-establish these relic features, elevation profiles were extracted from LiDAR (Figure 11) to visualize the existing grade of the relic ditches (Figure 12). Based on the analysis, the existing grade could support re-establishing the function of the relic drainage features to the east of Seep 1 and between Seeps 4 and 5. This could increase the amount of water delivered to the springbox and the pond. This option is examined further in Section 4.5.5. Specific to the eastern drainage feature, fixing four (4) existing headcuts to maintain ditch flow to the springbox would also minimize erosion and sediment

delivery to the Almaden-Calero Canal. Consideration should be made for other water-dependent habitats in the area that may be impacted by re-establishing historic drainage patterns.

4.5 WATER BUDGET MODEL RESULTS

Per the Year 7 analysis, seep flow and percolation rates were found to be the most important parameters in calibrating predicted drawdown rates at the pond. Additionally, the seasonal changes in both seep flow and percolation rates due to precipitation class were crucial for modeling the correct timing and shape of the water level regime in the pond. Improvements were made to the water budget model predictions as part of the Year 8 analysis to include 1) better predictions of filling the pond by accounting for runoff during dry antecedent conditions, 2) applying water year specific seep inflow rates, and 3) and applying water year specific percolation rates.

4.5.1 RUNOFF CALIBRATION

The water budget model previously over-predicted runoff during significant rain events (>1 inch/day) at the beginning of the rainy season. Sensitivity tests revealed that the runoff curve number (CN) had a significant impact on over-predicting modeled water levels during pond filling.

The model's predicted overfilling of the pond due to large rain events following dry antecedent conditions was corrected by setting the curve number value to a lower value to account for drier antecedent conditions preceding a storm. This was done specific to events occurring on 11/29/2018 (>1 in/day), 1/7/2019 (>2 in/day), 3/17/2020 (>1/5 in/day), 10/24/2021 (>2.5 in/day), 10/25/2021 (>2.5 in/day), 9/16/2022 (>2.5 in/day), and on 11/08/2022 (>1.5 in/day).

4.5.2 SEEP FLOW CALIBRATION

The seep flow rating curve established prior to project construction was compared to field measurements taken during the performance monitoring period. Primarily low flow measurements were taken, leaving a gap in data for higher flows. Table 3 summarizes the field observations. Figure 13 compares the previously established rating curve to post-construction monitoring field measurements. Outlier data may be due to a sediment blockage or excess cattle consumption as this is difficult to verify. Dry years (2018, 2020-2022, 2024) and wet years (2017, 2019, and 2023) were compared to one another to determine differences in seep flow averages. Seep flow measurements were generally larger for wetter years (mean = 7384 gal/day) and smaller for drier (mean = 2002 gal/day) years. Previous modeling efforts assumed springbox inflow to be 704 gal/day following the first 2 storms of the water year and 2371 gal/day starting with the third storm of the water year through the end of April, and 0 gal/day during the low flow period (May 1st until the first storm event). These values were found to be too low during the low flow period and therefore were updated in the Year 7 analysis to reflect observed averages for wet and dry years respectively.

In Year 8, the seep flow calibration was further refined to specify water year specific values as informed by average seep inflow observations listed in Table 3. A summary of seep flow values used in the model can be found in Table 4.

Table 3. Average seep inflow observations

Date	WSE (ft)	Depth(ft)[1]	Time (s)	Volume (ml)	Flow rate (gpd)
4/13/2017	518.93	0.37	3.00	1703.44	12990.97
10/4/2017	NA[2]	NA[1]	4.50	369.67	1874.32
3/20/2018	518.70	0.60	7.64	500.00	1486.53
5/14/2018	518.75	0.55	5.13	320.00	1421.90
10/3/2018	NA[1]	NA[1]	22.63	500.00	517.05
3/22/2019	NA[1]	NA[1]	12.73	13248.90	23784.47
7/30/2019	518.78	0.52	7.17	473.18	1486.53
4/14/2020	519.00	0.30	4.53	473.18	2391.37
10/9/2020	518.17	1.13	12.43	500.00	904.84
3/15/2021	518.90	0.40	7.80	500.00	1486.53
5/11/2021	518.75	0.55	11.99	561.00	1098.74
9/30/2021	518.95	0.35	15.66	473.18	710.95
3/23/2022	518.78	0.52	4.28	473.18	2520.64
7/14/2022	518.74	0.56	14.86	500.00	775.58
9/16/2022	518.78	0.52	14.24	500.00	775.58
5/4/2023	518.74	0.56	0.86	500.00	13249.50
8/16/2023	518.69	0.61	6.30	500.00	1809.69
04/17/2024	518.85	0.45	1.78	500.00	6433.37
05/04/2024	518.80	0.50	2.32	500.00	4987.53
06/17/2024	518.78	0.52	3.46	500.00	3333.53
07/28/2024	518.75	0.55	7.38	500.00	1553.28
08/28/2024	518.76	0.54	9.76	500.00	1171.68
10/01/2024	518.80	0.50	72.5	3785.41	1191.78
10/17/2024	518.78	0.52	82.02	7570.82	2106.90
10/30/2024	518.78	0.52	102.30	7570.82	1689.34

[1] Depth is measured from the top of the gage housing to the water surface, and is therefore inversely related to WSE

[2]Indicates missing data not used in seep flow averages

Table 4: Water budget model seep flow values

Storm Value	1	2	3	> 4	Dry Season
Description	First storm[1]	Second storm	Third storm	Fourth storm	Dry Season[2]
WY 2017 Seep (gal/day)	3259	8146	8146	3259	81
WY 2018 Seep (gal/day)	3259	8146	3259	3259	1955
WY 2019-2020 Seep (gal/day)	1955	1955	6517	3259	81
WY 2021 Seep (gal/day)	326	326	326	326	81
WY 2022 Seep (gal/day)	326	326	3259	326	81
WY 2023-2024 Seep (gal/day)	326	326	8146	16292	81
Original Assumptions (gal/day)	619	619	2346	2346	0

[1]Rain event classified as 0.25 in/day or greater
[2]Dry season is from May 1st- first storm of the WY . An exception has been made for 2017 and 2023 where the rainy season extends into May due to rain occurring throughout the month of May.

4.5.3 PERCOLATION CALIBRATION

Percolation is a key calibration parameter that depends on ongoing precipitation as well as soil moisture conditions, and other factors. Percolation directly impacts the pond water levels by affecting how quickly water infiltrates through the soil. A higher percolation rate means water will move through the soil faster, which can lead to a quicker drop in water levels. Lower values mean water moves through the soil more slowly, allowing water to be retained in the pond. During construction, a portion of the pond bottom adjacent to the outlet structure was deepened via excavation and a bentonite layer was installed in that deepened area to assist in reducing percolation rates. However, the performance of this layer and associated percolation losses are largely uncertain. The original model used a percolation value of 0.25 in/day after the first storm event of the water year, 0.15 in/day after the second and third storms, and 0.3 in/day after the fourth storm. Percolation values were calibrated for each individual water year and were generally larger than the original model assumptions. Percolation rates were set to the same value for the entire pond within each water year despite there being a bentonite layer in the deepest part of the pond that should theoretically hold onto water longer. Sensitivity tests were conducted to test a unique percolation value for the bentonite layer; however, the model performed better when assuming the same percolation rate for the entire pond surface. This may indicate an underperformance of the bentonite

layer (e.g., seepage through the sidewalls of the deepened area), and/or preferential subsurface flow underneath the dam.

The percolation values used for water budget model calibration are outlined in Table 5.

Table 5: Water budget model percolation loss values

Storm Value	1	2	3	> 4
Description	First storm[1]	Second storm	Third storm	Fourth storm
WY 2017 Percolation (in/day)	0.5	0.5	0.5	0.2
WY 2018 Percolation (in/day)	0.5	0.5	0.5	0.3
WY 2019 Percolation (in/day)	0.6	0.5	0.5	0.4
WY 2020 Percolation (in/day)	0.3	0.5	0.5	0.4
WY 2021 Percolation (in/day)	0.5	0.5	0.5	0.8
WY 2022 Percolation (in/day)	0.6	0.4	0.4	0.6
WY 2023/2024 Percolation (in/day)	0.5	0.5	0.5	0.75
Original Assumption (in/day)	0.25	0.15	0.15	0.3
[1]Rain event classified as 0.25 in/day or greater				

All storm values were assumed to have the same percolation rates between the second and third storm event (0.5 in/day), with different percolation rates after the first and third storm events. Water year 2022 was an exception, with a lower percolation rate for the second and third storm event (0.4 in/day). Percolation rates after the fourth storm event generally increased since 2017, indicating that percolation losses in the pond have increased since construction.

4.5.4 MODEL CALIBRATION SUMMARY

The final water budget model results and observed pond water levels are shown in Figure 14.

The first project year (WY 2017) was a wet year that followed two normal precipitation years (2015 and 2016). During the monitoring period, there were no other consecutive instances of normal/normal/very wet years. WY 2017 also included a manual drawdown of the pond on 09/19/2017 for invasive species control. WY 2017 is unique in this sense and was calibrated using a low percolation (loss) value after the fourth storm (0.2 in/day) compared to other years to account for the particularly wet conditions. The seep

inflow was diverted from the pond on 9/12/2018 and the pond drained on 10/16/2018, both of which have been adjusted for in the model. Seep flows were also completely diverted from the pond from 9/9/2019, until 11/25/2019, and the pond was emptied to manage for invasive species on 10/30/2019. Additionally, there was an increased drawdown rate due to pumping by the rancher at the end of WY 2019. This caused a slightly sharper decrease in pond water levels during this time compared to WY 2017.

WY 2021 was also a very dry year, leading to lower water levels and quicker drawdown rates than previous years. Seep values for WY 2021 remained consistent (326 gal/day) throughout the wet season, and percolation was greatest this year after the fourth storm. Percolation was likely relatively higher later in the season for WY 2021 due to back-to-back very dry years causing more porous soil. Seep flows were diverted between 11/3/2020 and 12/9/2020, and the pond was drained on 06/11/2021 for invasive species control. The seep was also cleared on 11/3/2020, and then again on 02/09/2021. In WY 2022, the seep springbox was cleared on 09/22/2021, 10/29/2021, 1/27/2022, 08/04/2022, and again on 10/13/2022. Seep blockages may contribute to lower seep inflows and prevent water from making it to the pond.

Percolation rates in the model increased every year until WY 2022 when percolation after the fourth storm decreased slightly (0.6 in/day), and then increased again in the subsequent years (0.75 in/day). However, the loss in the pond has generally increased over time since construction in 2017.

Despite having different water year type classifications and corresponding seep flow rates, WY 2023 and 2024 were calibrated using the same seep and percolation values. Calibrated seep flow values were also notably higher for WY 2023 and 2024 after the fourth storm compared to other years, potentially due to better maintenance at the spring box in the winter and spring following rain events (i.e., the seep springbox was cleared on 1/6/2023, 8/29/2023, and 4/17/2024).

4.5.5 MODEL SENSITIVITY ANALYSIS

To further evaluate the impact of seep flows on the pond water level recession, and to test the outcome of directing more flow to the springbox, a test was conducted by increasing the seep flows by 30% after the rainy season (mid-March through September) for all years. The results from this analysis, shown in Figure 15, suggest that if seep flows were increased by 30%, water could have been held in the pond for longer into the dry season by 2 to 25 days in any given water year, but that the hydroperiod criteria for average and wetter years would still not have been met. Based on this analysis, redirecting supplemental seep flows towards the springbox would likely help the pond hold onto water longer, but not in a significant way to overcome percolation losses.

5 CONCLUSIONS AND RECOMMENDATIONS

Based on the observed data, the pond did not meet its hydroperiod criteria for normal (average) and wetter water years in 2019 (wet) and 2023 (very wet). While the pond was not expected to meet the hydroperiod criteria in drier years, it in fact did not meet the minimum 2 feet of depth through August 31 in water years 2018 (very dry), 2020 (very dry), 2021 (very dry), 2022 (dry), and 2024 (dry). The water

budget model performed satisfactorily in replicating the recession limb in each water year and approximating the time of non-compliance with the hydroperiod criteria across the extreme of water year conditions. However, the concerning issue based upon the observed data and the water budget findings is the increasing rate of drawdown in the pond during the spring in each subsequent water year following construction (see Figure 3), which is assumed in large part to be driven by increasing percolation (loss) rates (see Table 5). Potential causes for the lack of water retention at the pond include increased seepage beneath the pond bottom, piping through the pond embankment, and/or the bentonite layer not performing as intended. The lack of water retention is further supported by measured flows immediately downstream of the pond in excess of the known seep inflow to the pond (see Sections 4.2 and 4.3), suggesting that inflow that was previously unknown and unaccounted for is also not being retained by the pond.

Potential causes for the lack of water inputs to the pond include lack of maintenance at the springbox coinciding with storm events clogging the debris grate, and changes in the seep flow collection system upstream of the springbox not fully capturing the flow from the various seeps. These issues at the pond have been only somewhat offset by improved springbox maintenance in recent years to enhance seep flow capture and conveyance to the pond (i.e., more frequent cleaning and new debris grate). Further, based on the seep flow sensitivity analysis (see Figure 15), enhancing the relic seep flow collection system upstream of the springbox (i.e., east of Seep 1 and between Seeps 4 and 5) could extend the duration of inundation by 2 to 25 days in any given water year, but it too appears unlikely to overcome the underlying issue that the drawdown rate of the pond is ever increasing with passing time.

To enhance the hydroperiod in the pond, the Habitat Agency should consider the following measures in order of decreasing impact:

1. Design and install a slurry wall (or other restrictive measure) at the inside toe of the dam embankment to the point of refusal (up to 10 feet below ground surface, maybe more) to limit subsurface flows from daylighting below the dam. Preferential subsurface flows through the dam at depth appear to be why the pond is not meeting its hydroperiod criteria.
2. Maintain the active seep collection system (i.e., Seeps 2, 3, and 4 and manmade ditches) to promote directing flow towards the springbox and not the Almaden-Calero Canal. This may include clearing any blockages within existing manmade ditches and performing as-needed maintenance following storm events. Regular maintenance, especially after rain events, is likely necessary to ensure flows are unobstructed by debris.
3. Expand the seep collection system to the east of Seep 1 and between Seeps 4 and 5 in a manner consistent with historical practices by re-establishing relic ditches; this measure should be designed in a manner that would not substantially dewater existing jurisdictional seasonal wetlands.
4. Temporarily extend the seep trough outlet pipe into the bentonite covered area of the pond to further test the efficacy of the bentonite layer to hold water through the hydroperiod. This would help inform to what extent the bentonite layer in the deepened area is underperforming relative to its design intent. This would require a flow split to accommodate providing adequate water

supply to the Mt. Hamilton thistle. Alternatively, use a water truck to perform this test to minimize impact to the Mt. Hamilton thistle.

To monitor and maintain the system, continue to consider the following activities:

1. Continue gage data monitoring and subsequent water budget analysis to compare yearly data trends.
2. Perform more frequent monitoring visits, especially early in the season after and during rain events to observe conditions in real-time, and also after the pond has filled and water levels are drawing down for the season.
3. Conduct supplemental flow monitoring in the creek below the pond throughout the water year to understand flow rates and volumes.
4. Perform more frequent maintenance of the seep trough and seep collection system to minimize blockages that cut off inflow to the pond.
5. Inspect the pond outlet structure gate seals and grout for possible leaks.

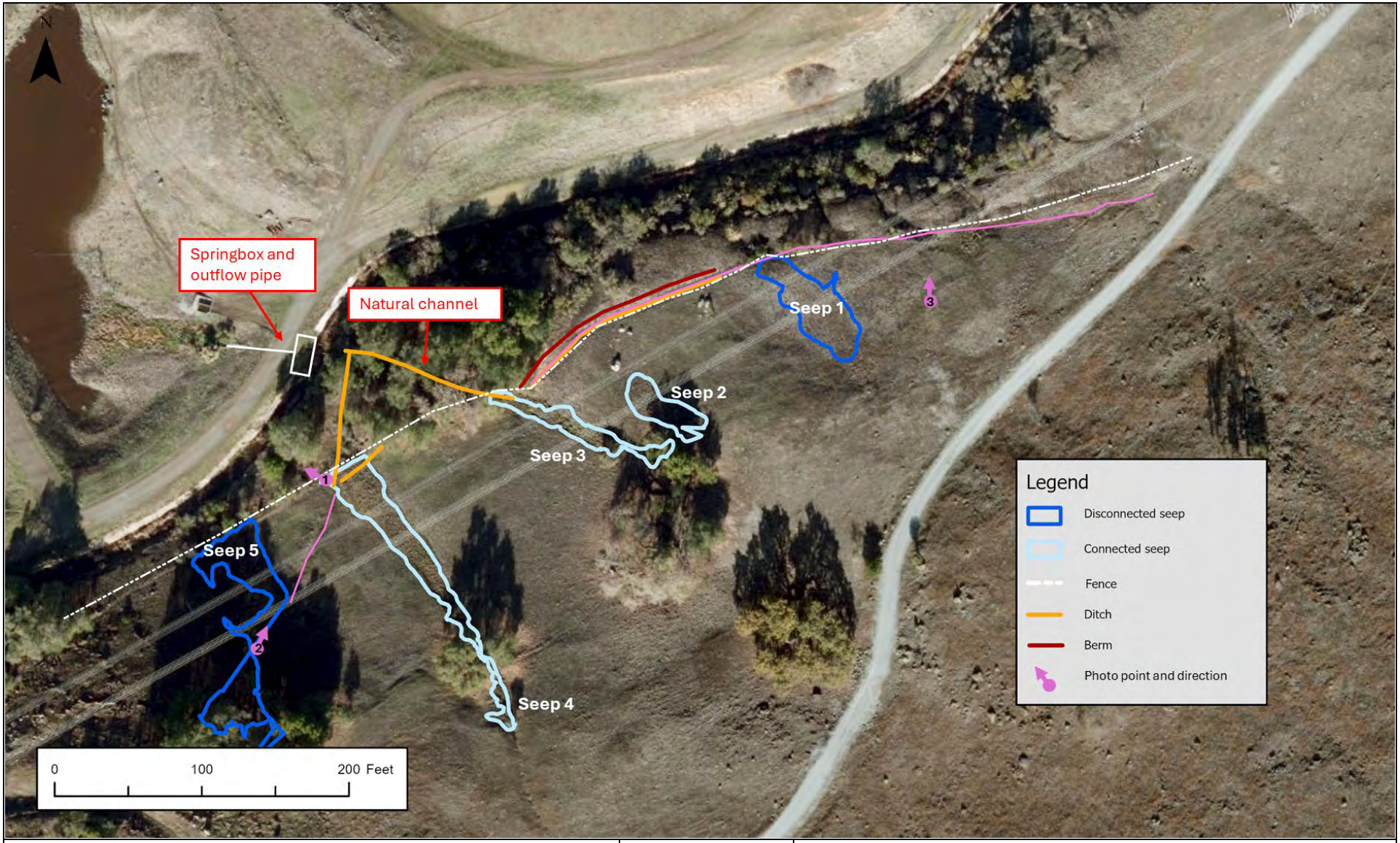
Notes: Photo taken on 05/03/2024 during weir install. Staff plate and gage housing is seen in the background.

cbec eco engineering
A Verdantas Company

Calero Mitigation Site Monitoring

Weir installation

Project No. 15-1030-5	Created By: AH	**Figure 1**



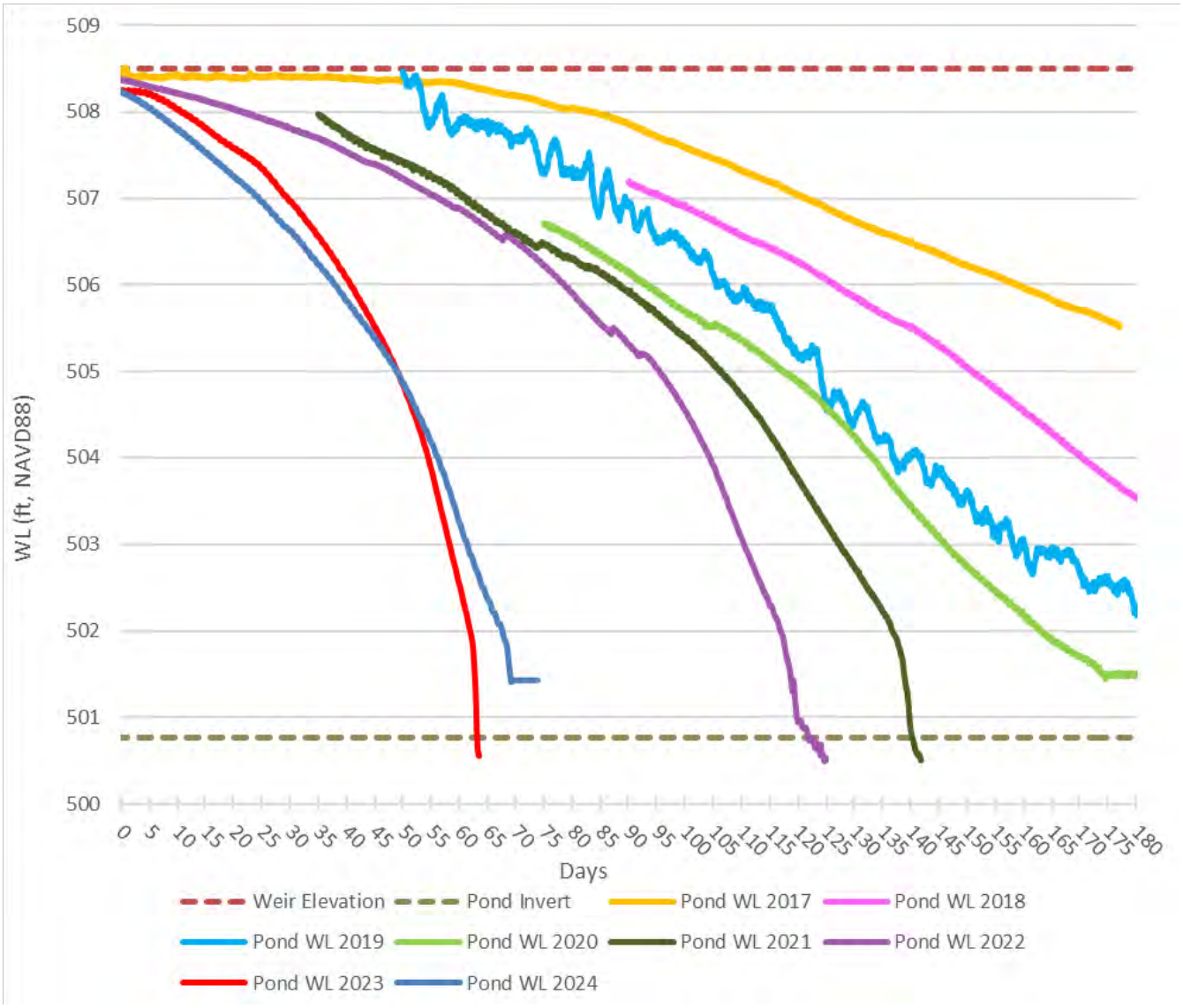
Notes:

cbec eco engineering
A Verdantas Company

Calero Mitigation Site Monitoring

Pond site upstream seeps

Project No. 15-1030-5	Created By: AH	**Figure 2**



WY	Date WL dropped below weir elevation	Dry date	Precipitation Class
2017	03/21/2017	9/19/2017	Wet
2018	04/07/2018 (highest WL 507.19)	8/26/2018	Very Dry
2019	4/12/2019	8/30/2019	Wet
2020	04/17/2020 (highest WL 506.73 ft)	7/26/2020	Very Dry
2021	01/20/2021 (highest WL 508.09 ft)	5/15/2021	Very Dry
2022	01/19/2022	5/25/2022	Dry
2023	04/12/2023	7/10/2023	Very Wet
2024	05/04/2024	7/16/2024	Dry

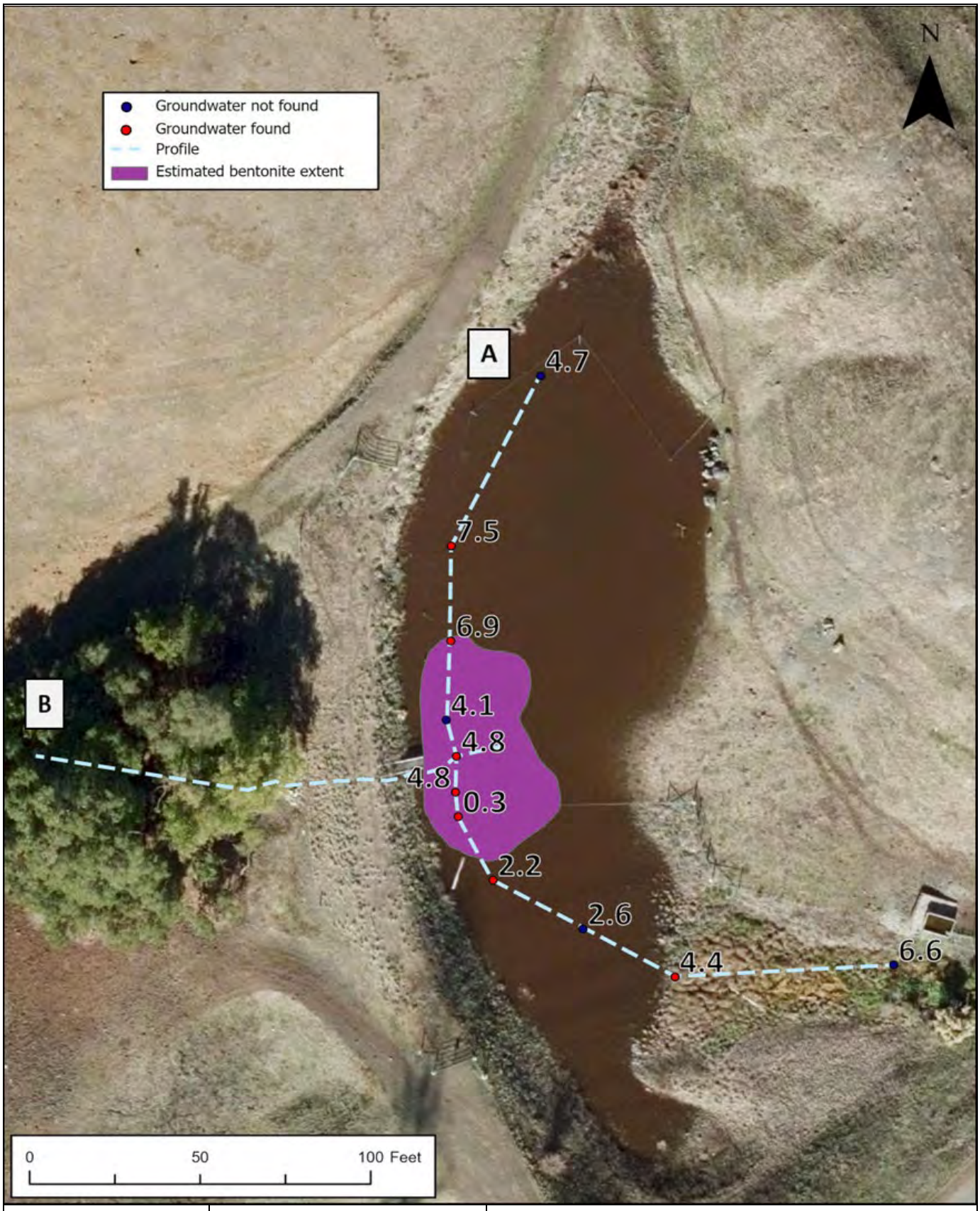
Notes:

cbec eco engineering
A Verdantas Company

Calero Mitigation Site Monitoring

Pond water level recession

Project No. 15-1030-5 | Created By: AH | **Figure 3**



Notes:
Depths are reported in feet

cbec eco engineering
A Verdantas Company

Calero Mitigation Site Monitoring

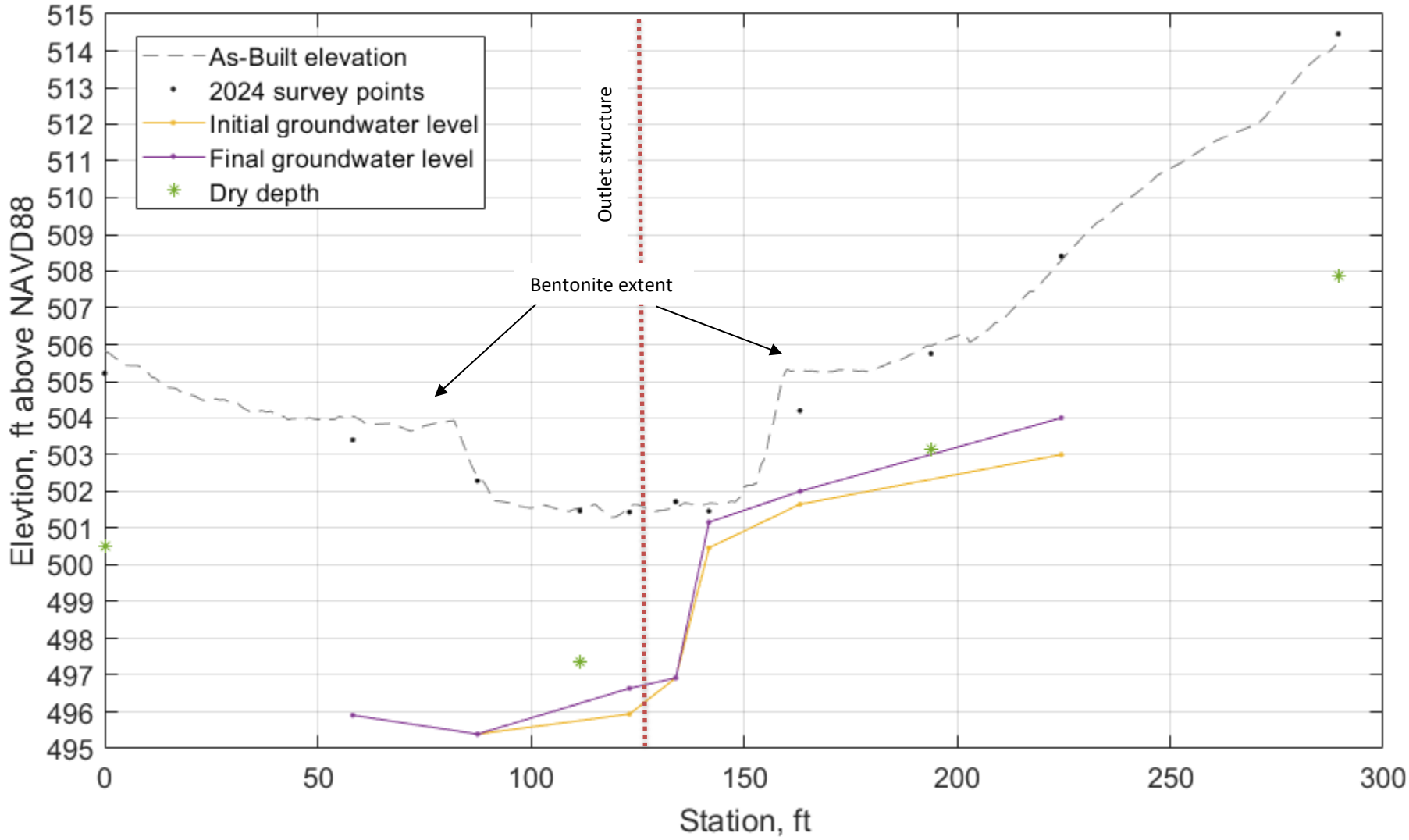
Groundwater sample points

Project No. 15-1030-5

Created By: AH

Figure 4

Profile A



Notes:

cbec eco engineering
A Verdantas Company

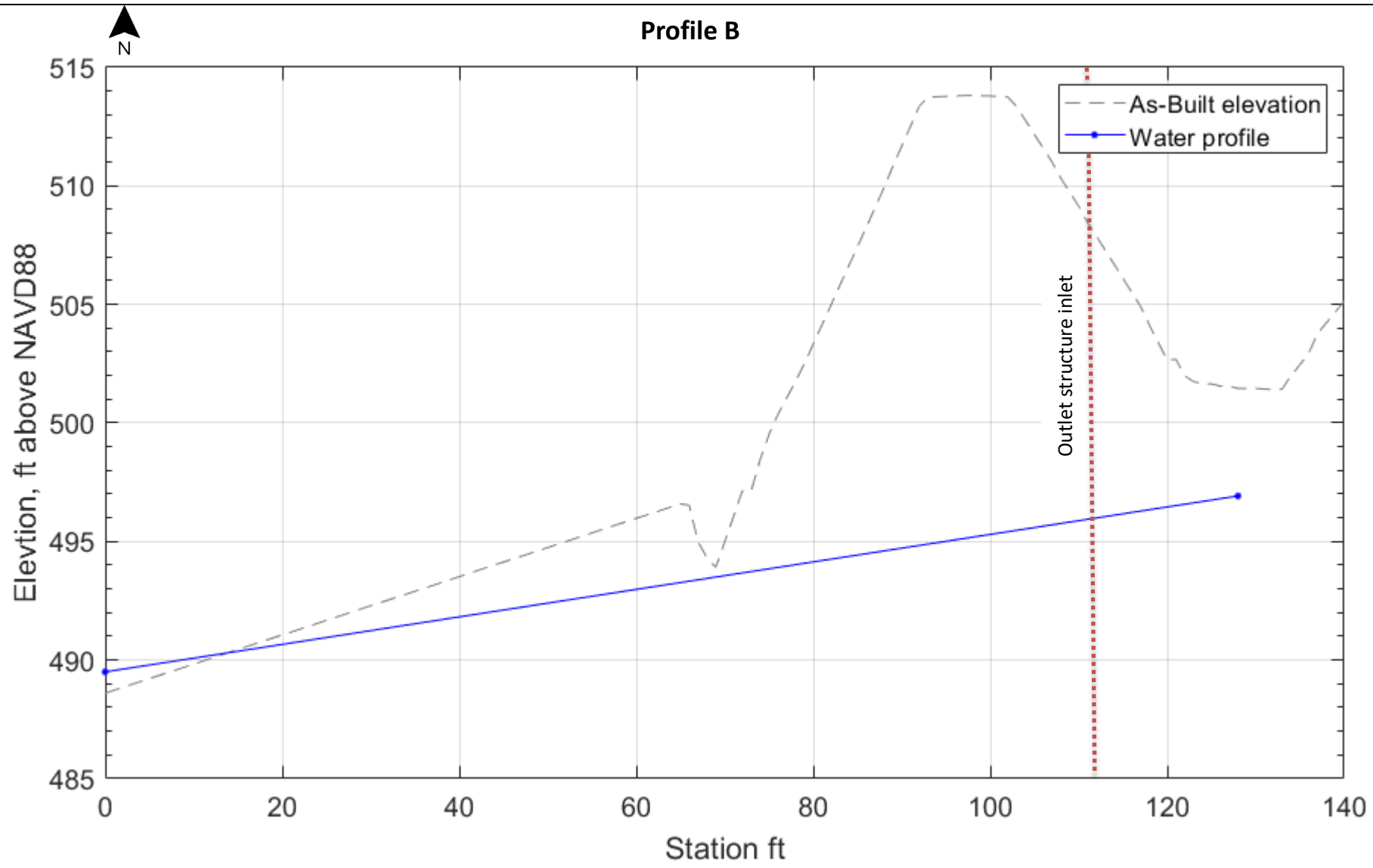
Calero Mitigation Site Monitoring

Groundwater Profile A

Project No. 15-1030-5	Created By: AH	**Figure 5**

12/19/2024

Profile B



Notes:

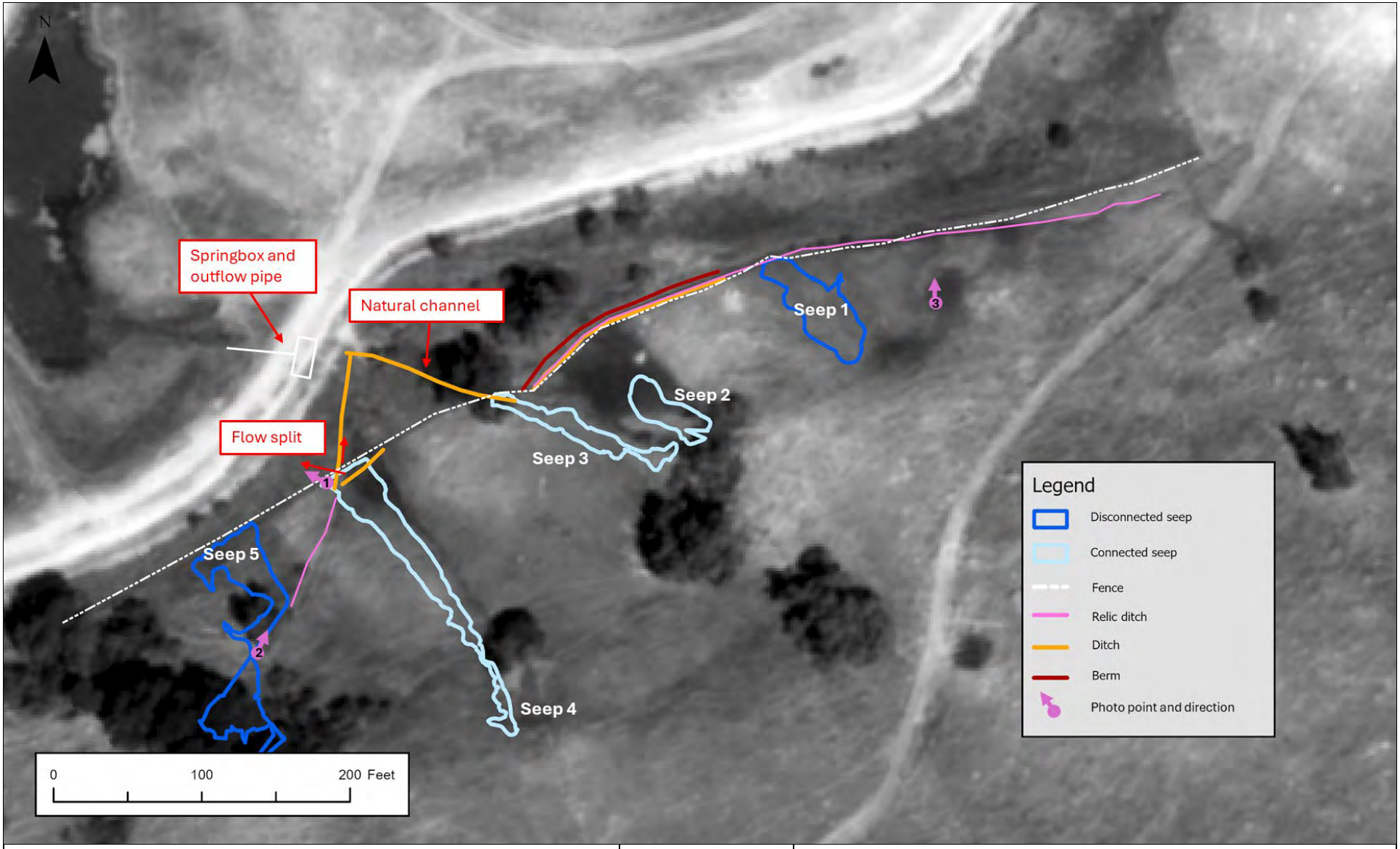
cbec eco engineering
A Verdantas Company

Calero Mitigation Site Monitoring

Groundwater Profile B

Project No. 15-1030-5	Created By: AH	**Figure 6**

12/19/2024



Notes:

cbec eco engineering
A Verdantas Company

Calero Mitigation Site Monitoring

1968 pond site imagery

Project No. 15-1030-5 | Created By: AH | **Figure 7**

12/19/2024

Notes: See photo point #1 in Figure 2 for location and direction	cbec eco engineering A Verdantas Company	*Calero Mitigation Site Monitoring* **Seep 4 flow split**		
		Project No. 15-1030-5	Created By: AH	**Figure 8**

Notes:
See photo point #3 in Figure 2 for location and direction

cbec eco engineering
A Verdantas Company

Calero Mitigation Site Monitoring

Relic surface ditch

Project No. 15-1030-5

Created By: AH

Figure 9

Notes:
See photo point #3 in Figure 2 for location and direction

cbec eco engineering
A Verdantas Company

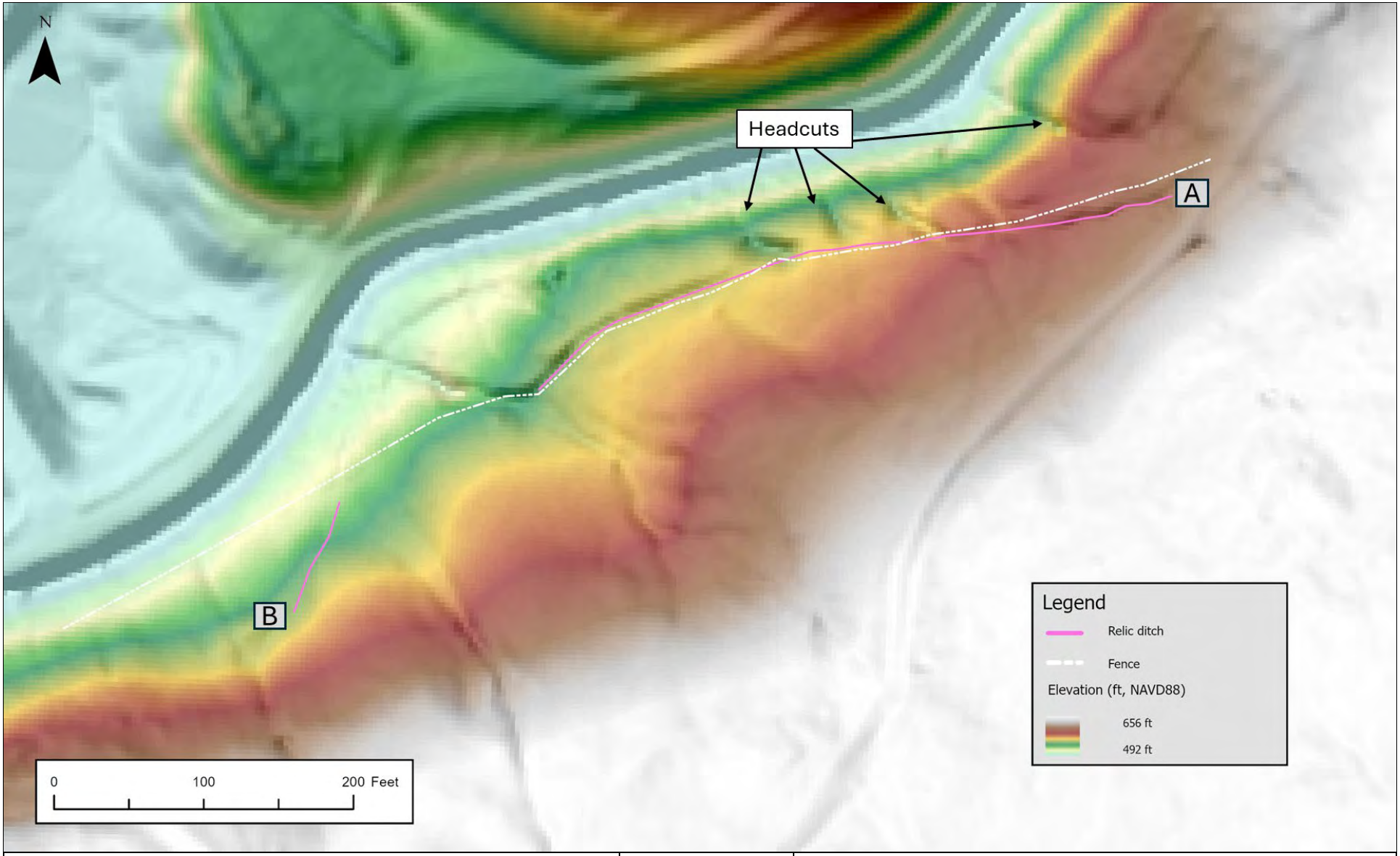
Calero Mitigation Site Monitoring

Relic surface drainage feature

Project No. 15-1030-5

Created By: AH

Figure 10



Notes:

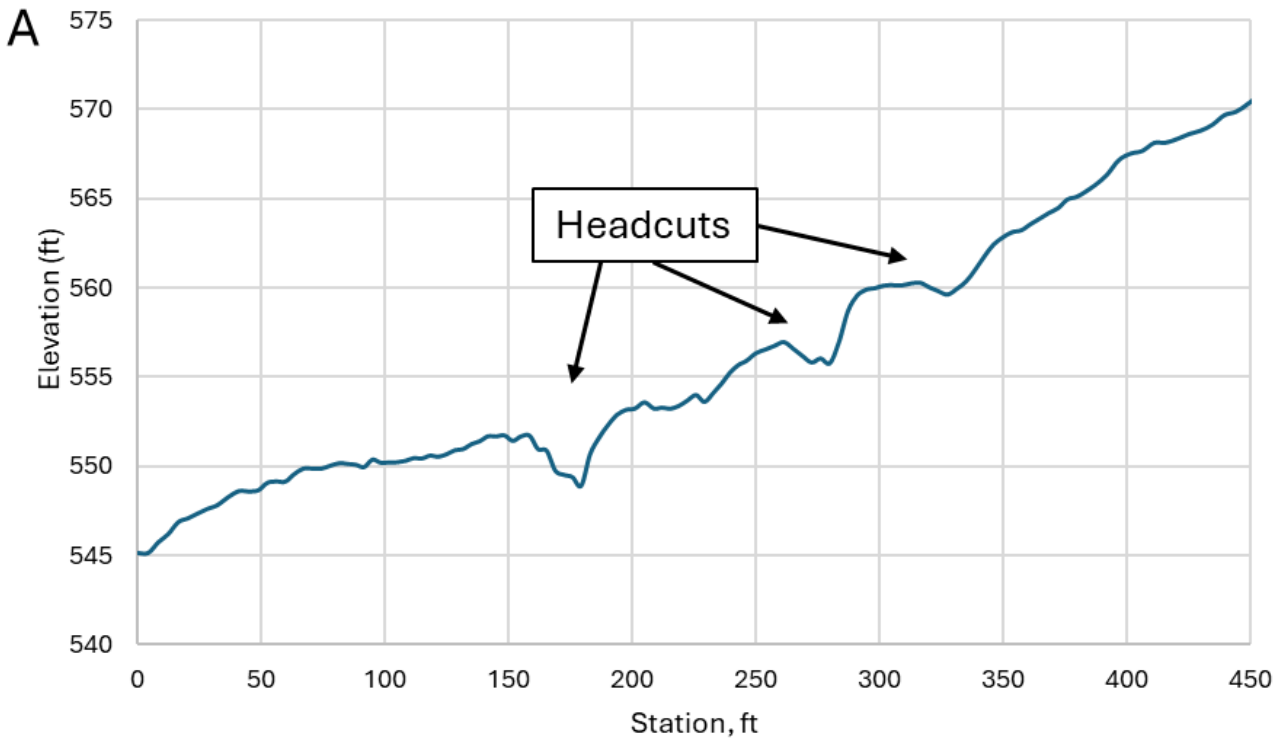
cbec eco engineering
A Verdantas Company

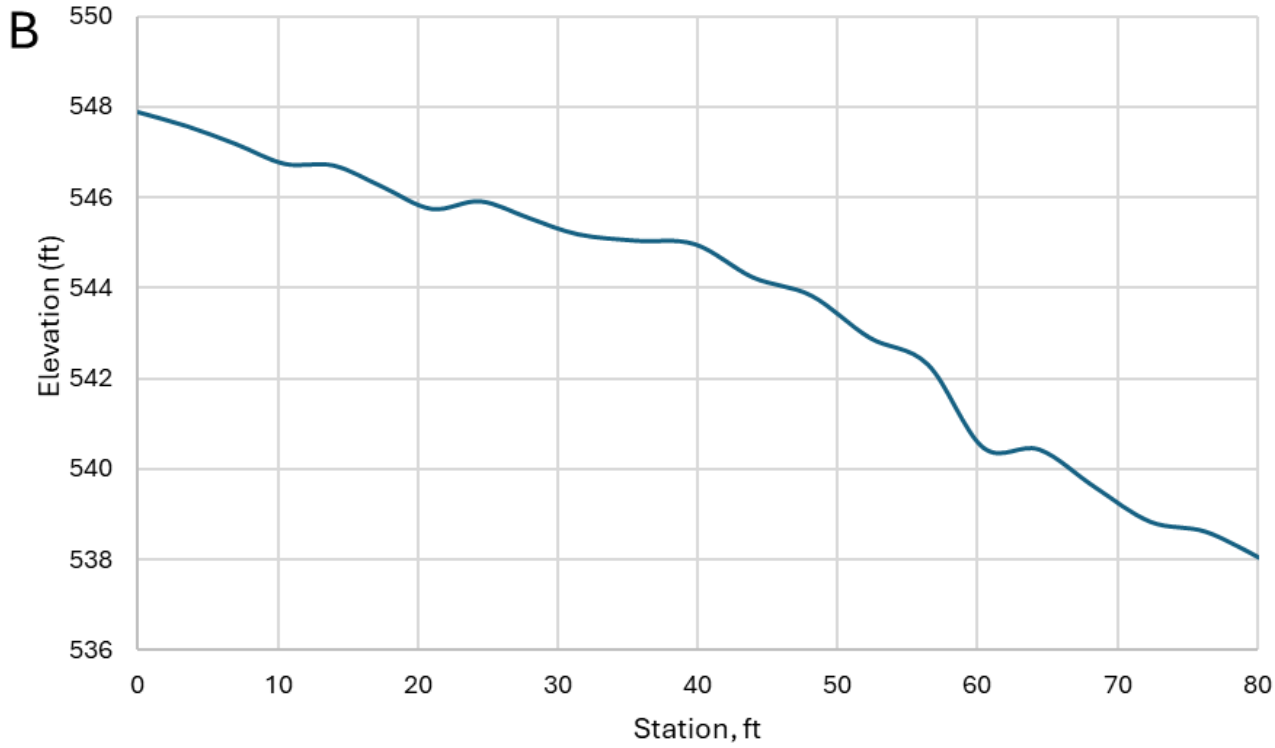
Calero Mitigation Site Monitoring

LiDAR imagery

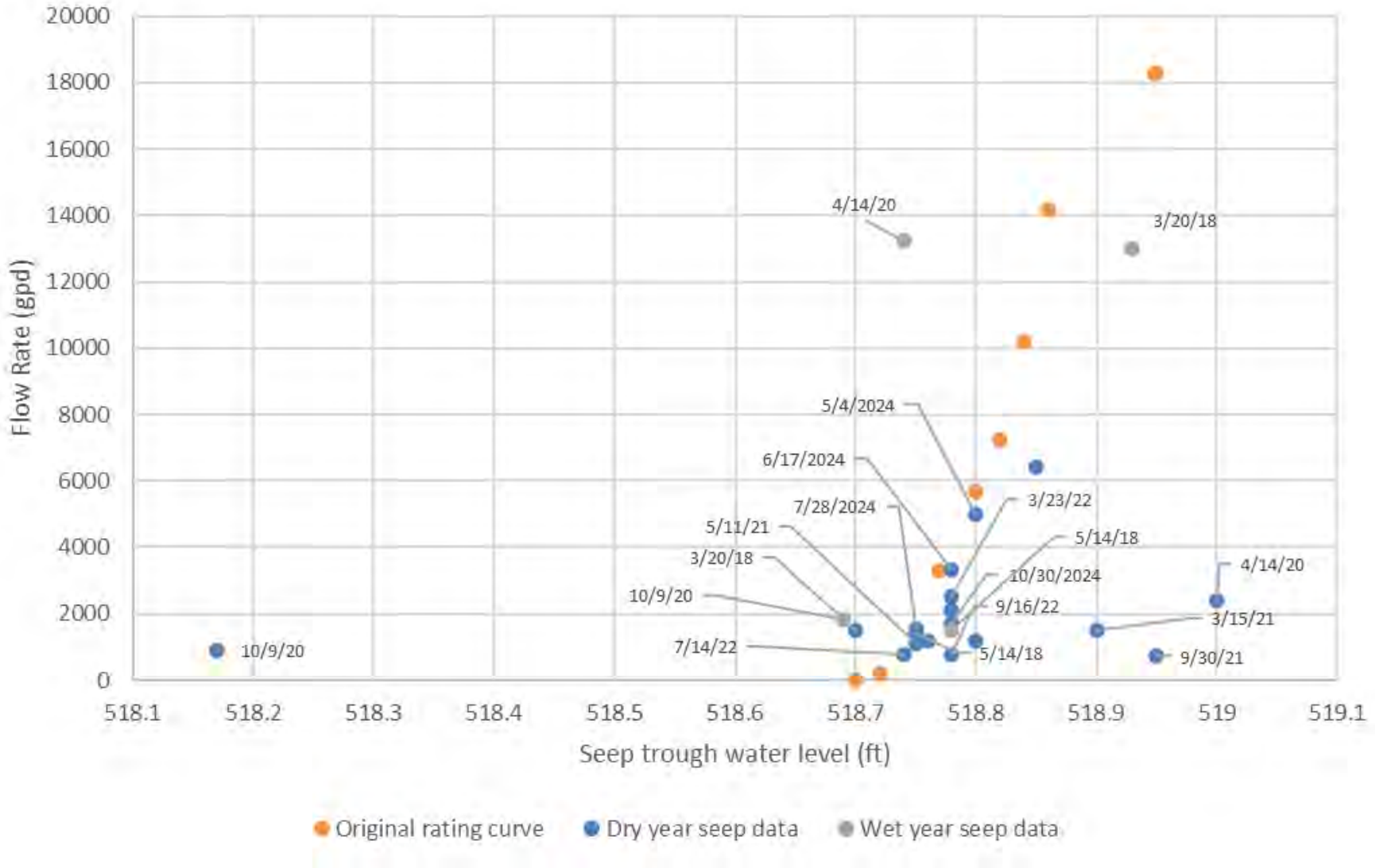
Project No. 15-1030-5	Created By: AH	**Figure 11**

12/19/2024





Notes:	cbec eco engineering A Verdantas Company	*Calero Mitigation Site Monitoring* **Relic ditch profiles**		
		Project No. 15-1030-5	Created By: AH	**Figure 12**



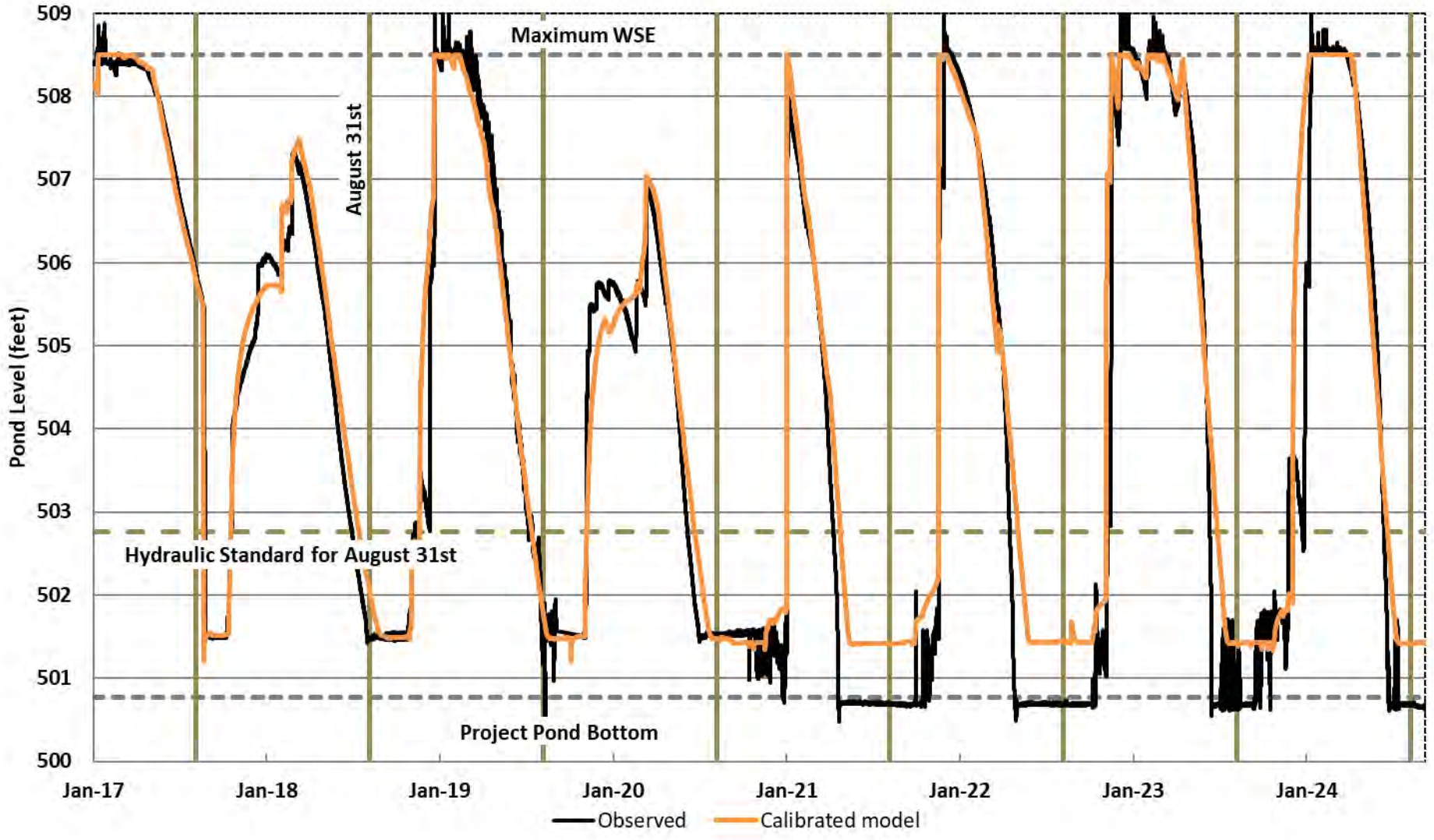
Notes:

cbec eco engineering
A Verdantas Company

Calero Mitigation Site Monitoring

Seep flow rating curve comparison

Project No. 15-1030-5	Created By: AH	**Figure 13**



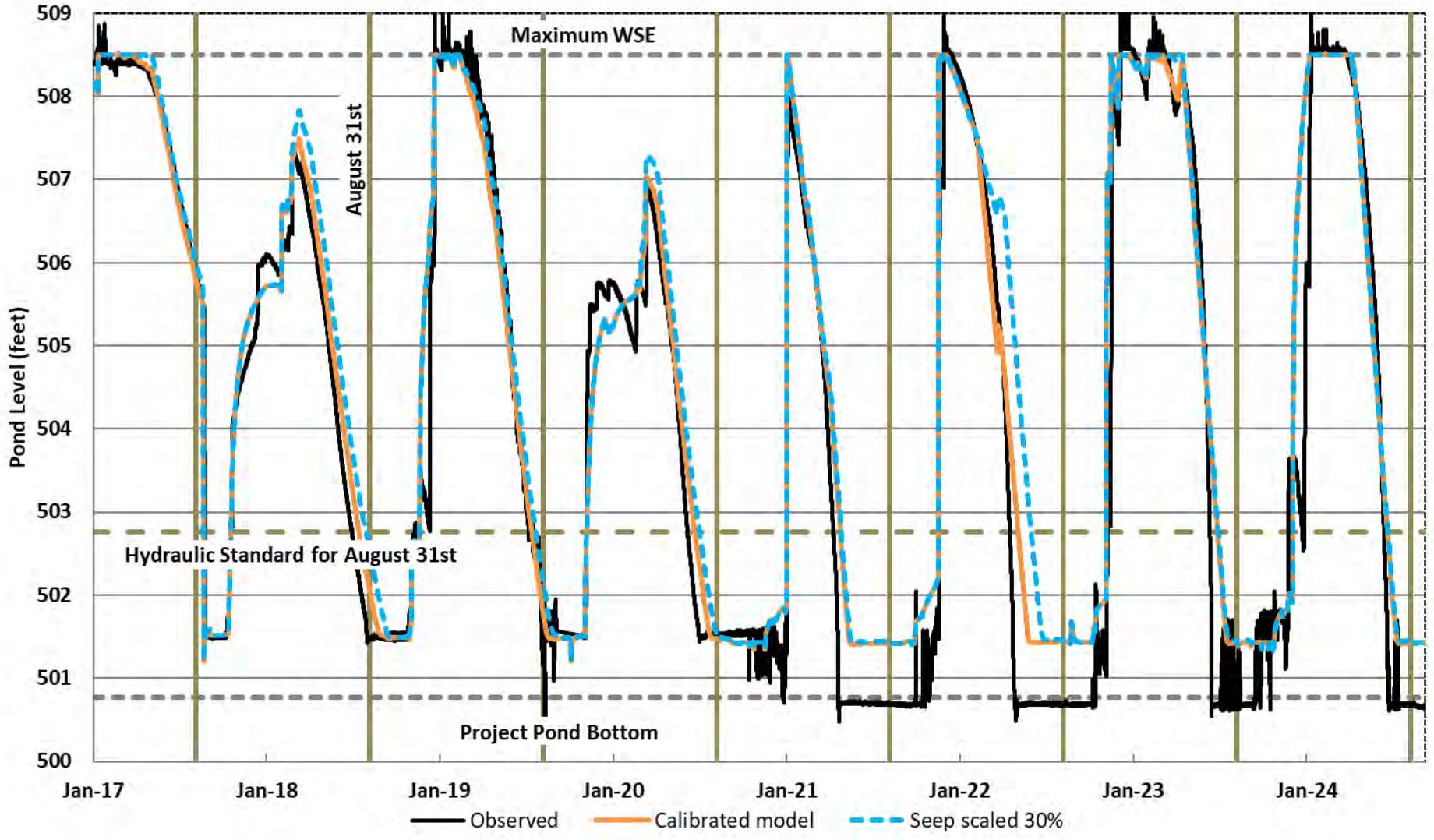
Notes:
The pressure transducer was originally set at 501.5 ft. This was changed to 500.77 ft in December 2020 when a telemetered station was installed.

cbec eco engineering
A Verdantas Company

Calero Mitigation Site Monitoring

Water budget model

Project No. 15-1030-5	Created By: AH	**Figure 14**



Notes:

cbec eco engineering
A Verdantas Company

Calero Mitigation Site Monitoring

Water budget model sensitivity

Project No. 15-1030-5	Created By: AH	**Figure 15**

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Long-term Management Plan for Permittee-responsible Mitigation for the Calero County Park Pond and Wetland Restoration Project

Project #3753-02

Prepared for:

Edmund Sullivan, Executive Officer
Santa Clara Valley Habitat Agency
535 Alkire Avenue, Suite 100
Morgan Hill, CA 95037

Prepared by:

H. T. Harvey & Associates

July 22, 2016

983 University Avenue, Building D • Los Gatos, CA 95032 • Ph: 408.458.3200 • F: 408.458.3210

Table of Contents

Figures

Tables

Section 1. Introduction

1.1 Purpose of Establishment

The Santa Clara Valley Habitat Agency (Habitat Agency) identified a pond and wetland restoration project at Calero County Park as a priority project for the implementation of the Conservation Strategy of the Santa Clara Valley Habitat Plan (Habitat Plan) (ICF International 2012). The project site was selected in partnership with the Resource Conservation District of Santa Cruz County, Santa Clara County Parks and Recreation Department, U.S. Fish and Wildlife Service (USFWS), and California Department of Fish and Wildlife (CDFW). The Calero County Park Pond and Wetland Restoration project will establish and restore pond and wetland habitat at two locations (an existing pond site and an existing wetland site) in Calero Country Park, located in the eastern foothills of the Santa Cruz Mountains in the Alamitos Creek watershed. The project site is located within a portion of Calero County Park called the Calero Reserve that will be enrolled in the Habitat Plan Reserve System.

The Calero County Park Pond and Wetland Restoration project was established to conserve and protect waters of the U.S., covered species, and covered habitat. The property (hereafter referring to the project site) includes 0.64 acre of existing waters of the U.S. (including 0.22 acre of pond, 0.17 acre of coastal and valley freshwater marsh, and 0.28 acre of existing seasonal wetlands); 0.03 acre of new waters of the U.S. (all seasonal wetlands) are proposed to be created on the site. The property also contains 3.85 acres of covered habitat for the California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), and western pond turtle (*Actinemys marmorata*), and 0.42 acre of existing covered habitat for the Mt. Hamilton thistle (*Cirsium fontinale* var. *campylon*); an additional 0.03 acre of wetland habitat for the Mt. Hamilton thistle will be created. In addition, approximately 0.09 acre of existing covered habitat for the most beautiful jewelflower (*Streptanthus albidus* ssp. *peramoenus*) is present, although aside from the wetland-associated Mt. Hamilton thistle, serpentine species/communities are not the focus of this project. The Signatory Agencies are the San Francisco District of the U.S. Army Corps of Engineers, Region 9 of the U.S. Environmental Protection Agency, the Sacramento Office of the USFWS, and the CDFW Bay Delta Region. Terms used in this management plan have the same meaning as defined in the project's Mitigation and Monitoring Plan (MMP).

1.2 Purpose of this Long-term Management Plan

The purpose of this long-term management plan is to ensure the property is managed, monitored, and maintained in perpetuity. This management plan establishes objectives, priorities, and tasks to monitor, manage, maintain, and report on the waters of the U.S., covered species and covered habitat on the property. This management plan is a binding and enforceable instrument, implemented by the conservation easement covering the property. This long-term management plan is intended to guide management in perpetuity at the pond and wetland mitigation sites and provide details to support the Regional General Permit's (RGP) Interim Mitigation

Strategy (IMS). Conservation parcels such as this are intended to fit within the overall landscape and ecological conservation goals envisioned in the Habitat Plan.

1.3 Land Manager and Responsibilities

The land manager is the Habitat Agency. The land manager, and subsequent land managers upon transfer, shall implement this long-term management plan, managing and monitoring the property in perpetuity to preserve its habitat and conservation values in accordance with the MMP, the conservation easement, and the long-term management plan. Long-term management tasks shall be funded through the Endowment Fund established for the Habitat Plan; project specific assurances of funding will also be provided annually under the IMS until the long-term mitigation strategy is finalized. The land manager shall be responsible for providing an annual report to the regulatory agencies detailing the time period covered, an itemized account of the management tasks and total amount expended. Ultimately, when the Calero Reserve is enrolled into the Habitat Plan Reserve System, monitoring and reporting for the Calero County Park Pond and Wetland Restoration project will likely be performed in the context of the broader monitoring and reporting conducted per the Calero Reserve Management and Monitoring Plan (which has not yet been prepared). Any subsequent grading, or alteration of the site's hydrology and/or topography by the land manager or its representatives must be approved by the regulatory agencies and the necessary permits, such as a Section 404 permit, must be obtained if required.

Section 2. Property Description

2.1 Setting and Location

The Property is located at Calero County Park at 23205 McKean Road in Santa Clara County, California, designated Assessor's Parcel Nos. 74209049 and 74209050. The Property is shown on the general vicinity map (Figure 1) and the site-specific property maps (Figures 2 and 3). The general vicinity map shows the property location in relation to cities, towns, or major roads, and other distinguishable landmarks. The site-specific property maps show the property boundaries on a topographic map.

2.2 History and Land Use

The property is located within former Rancho San Vicente, a 966-acre area that was originally part of a 4,400-acre land grant given to José de los Reyes Berryessa in 1842 (Santa Clara County Parks and Recreation Department 2013). These lands have been continuously grazed since the early days of Mexican colonization. Rancho San Vicente was purchased by Santa Clara County from the Peninsula Open Space Trust in 2009. Rancho San Vicente is considered part of Calero County Park, but is not yet open to the public. Currently, these lands are leased for grazing to a private operator. The wetland site is within a small former rock quarry.

The land in the general area of the site is currently composed primarily of parklands. The 4,442-acre Calero County Park, which includes Rancho San Vicente, extends to the southeast and includes Calero Reservoir and large areas of annual grasslands, oak woodlands, serpentine grasslands, and other native habitats. The 3,997-acre Almaden Quicksilver County Park is located to the west.

2.3 Cultural Resources

Few existing structures are present on the property. At the pond mitigation site, a small metal pipe extends from a springbox west across the Almaden-Calero Canal and empties water into two livestock water troughs near the pond. A large corrugated metal culvert on the pond's west side allows water to be discharged into an existing drainage, an automated water depth gauge is present in the middle of the pond, and a rain gauge is present approximately 22 feet east of the pond. A dirt ranch road skirts the length of the pond along its west side.

A new drain pipe will be placed in the deepest area of the pond, extending to the pond's discharge pipe, to allow the pond to be drained as needed for management purposes. The existing discharge pipe will be replaced, but there will be no other changes to the existing berm or levee road. The existing livestock troughs that receive water from the springbox will be removed and replaced with an 800-gallon cattle trough. The existing pipe that runs from the springbox to the troughs will remain, but its new outlet will have a valve.

N:\Projects3700\3753-02\Reports\Figure 1 Vicinity Map.mxd mchilds

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 1. Vicinity Map
Long-term Management Plan for Permittee-Responsible Mitigation (3753-02)
Calero County Park Pond and Wetland Restoration Project
July 2016

N:\Projects3700\3753-02\Reports\Figure 2 Mitigation Property Map for the Pond Restoration Site.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 2. Mitigation Property Map for the Pond Mitigation Site
Long-term Management Plan for Permittee-Responsible Mitigation (3753-02)
Calero County Park Pond and Wetland Restoration Project
July 2016

N:\Projects3700\3753-02\Reports\Figure 3 Mitigation Property Map for the Wetland Restoration Site.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 3. Mitigation Property Map for the Wetland Mitigation Site
Long-term Management Plan for Permittee-Responsible Mitigation (3753-02)
Calero County Park Pond and Wetland Restoration Project
July 2016

This valve will control whether water that is discharged to the cattle trough or to a new, 3000-gallon water tank to be placed to the east. There will be no changes to the existing springbox. All monitoring equipment (i.e., the rain gauge and depth gauge) on the site will remain, but will be relocated once the project is complete.

At the wetland mitigation site, a pipe flows northwards from an on-site springbox that is buried underground, and turns to the northwest before leaving the site. This pipe is not currently functional. An automated water depth gauge is present in the wetland. A dirt ranch road skirts the northern boundary of the site.

The existing pipe at the wetland site will be removed, and there will be no change to the existing springbox. A water control structure will be added to allow the water level in the wetland to be raised, and a pipe will be installed that runs from the water control structure to a new cattle trough, located to the east along the road. All monitoring equipment (i.e., the depth gauge) on the site will remain, but will be relocated once the project is complete. None of the structures present at either site are thought to be historically significant.

Native American archaeological sites are known to be present within Calero County Park and in the surrounding vicinity (Santa Clara County Parks and Recreation Department 2013). However, no such sites are known at the pond or wetland mitigation sites.

2.4 Hydrology and Topography

The pond mitigation site is located on gently sloping topography that is generally steeper upstream of the pond (Figure 2). A large berm along the pond's western edge retains surface runoff and seep water in the pond. Depending on annual rainfall, the existing pond typically fills to its maximum depth of approximately 4.5 feet between December and January, and typically dries in early July (H. T. Harvey & Associates 2016). The pond is primarily fed by water that flows from a springbox located on the opposite side of the Almaden-Calero Canal, but it is also fed by water that flows along a drainage. Overflow from the pond discharges through a corrugated pipe that flows under the berm and into an adjacent drainage that is tributary to Alamitos Creek.

The wetland mitigation site encompasses a slightly depressional wetland area, a steep quarried rock slope cut into the hillside that surrounds all but the northwestern side of the wetland, and a narrow area of grassland above the quarried slope. A ranch road adjacent to the wetland forms an informal berm that retains seep water in the wetland. The wetland is filled by several seeps that flow out of the hillside. A springbox is buried at the site, and a pipe flows out of the wetland to the north. However, this springbox and pipe do not function currently.

Mean annual precipitation at the site (1981-2010) is 21.88 inches, with the majority of rain falling between November and April (PRISM Climate Group 2016). Mean annual precipitation in the larger Santa Clara County region is 21.45 inches, with the majority of rain falling between October and April (PRISM Climate Group 2016).

2.5 Soils

Soils at the pond mitigation site north of the Almaden-Calero Canal are mapped as Alumrock-Zepplin complex, 9–15% slopes (Natural Resource Conservation Service 2016). This series consists of moderately deep and well-drained soils that formed in residuum from weathered sandstone and are primarily found on hills. These soils generally consist of sandy loam, with fine sandy loam atop layers of sandy clay loam and gravelly clay loam. The soil surface generally contains a layer of slightly decomposed plant material. Clay content in these soils can range from 18–45%. Sediment from adjacent slopes has accumulated in the pond bottom.

The wetland mitigation site, located in a former quarry and features exposed serpentinite bedrock and sediment that has accumulated in the wetland from an adjacent barren quarry slope. Soils at this site and at the portion of the pond mitigation site located south of the Almaden-Calero canal are mapped as Montara-Santerhill complex, 15–30% slopes (Natural Resource Conservation Service 2016). This series consists of shallow, somewhat excessively drained soils that formed in residuum from weathered serpentinite with components of deep, well-drained soils that formed in colluvium from serpentinite and serpentinite rock outcrops. These soils are primarily found on hills, and generally consist of sandy loam and clay atop gravelly sandy loam, cobbly sandy loam, and gravelly clay loam. They also typically feature increasing rock fragment content with depth.

2.6 Existing Easements

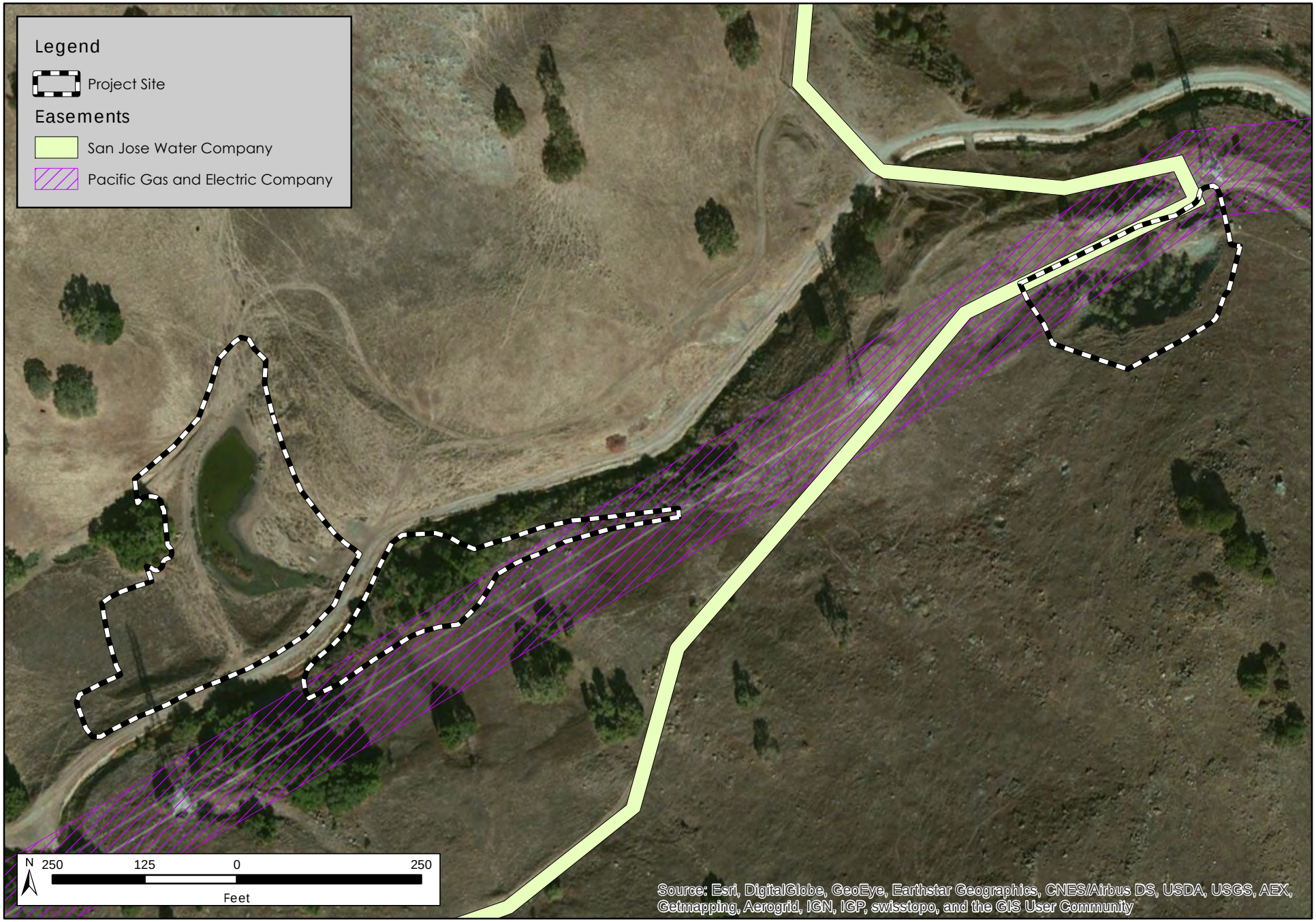
A PG&E utility easement for overhead utility lines is present adjacent to the wetland mitigation site (Figure 4). Powerline towers are present in the site vicinity, but are not present on the pond or wetland mitigation sites themselves. However, the overhead lines pass directly over the northernmost portion of the wetland mitigation site, and PG&E has an easement to access these lines and drive along the adjacent road.

The San Jose Water Company also has an easement located adjacent to, but not overlapping with, the wetland mitigation site (Figure 4).

2.7 Adjacent Land Uses

The surrounding 966-acre Rancho San Vicente lands are part of Calero County Park, and are managed by the Santa Clara County Parks and Recreation Department. These lands will be protected as part of the Calero Reserve. They are not currently open to the public, but they are leased for grazing to a private operator. The current grazing operations include equipment storage areas and cattle loading/unloading pens which are located to the north of the property. Proposed improvements to Rancho San Vicente lands in the near future include a new park entrance, picnic area, restrooms, public access along designated trails, and continued grazing operations (Santa Clara County Parks and Recreation Department 2013). The existing grazing facilities may be relocated in the near future to accommodate public trail use, and additional gates and fencing may be installed in this portion of the park to adjust grazing practices to accommodate public trails (Santa Clara County Parks and Recreation Department 2013).

Rural residential development occurs in the lower watershed downstream from the property. The Almaden-Calero Canal is adjacent to both the pond and wetland mitigation sites and periodically conveys water from Almaden Reservoir to Calero Reservoir. This concrete-lined canal is the nearest adjacent aquatic resource to the pond and wetland sites, although it is not always flowing.



N:\Projects3700\3753-02\Reports\Figure 4 Easements.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 4. Existing Easements
Long-term Management Plan for Permittee-Responsible Mitigation (3753-02)
Calero County Park Pond and Wetland Restoration Project
July 2016

Section 3. Habitat and Species Descriptions

3.1 Biological Resources Survey of the Property

The approximately 3.85-acre property is located in Calero County Park, approximately 0.8 mile northwest of Calero Main Dam along the Almaden-Calero Canal in San José, California. The 2.89-acre pond mitigation site consists of two separate areas located north and south of the Almaden-Calero Canal (Figure 2). The 0.96-acre wetland mitigation site is located approximately 0.2 mile to the east of the pond mitigation site and south of the Almaden-Calero Canal (Figure 3). All areas of the property are located on the *Santa Teresa Hills, California* U.S. Geological Survey quadrangle map, Section 36 of Township 8 South, Range 1 East.

The property is located in the eastern foothills of the Santa Cruz Mountains at an elevation of approximately 550 feet. The pond mitigation site is located at the headwaters of a drainage that is tributary to Alamitos Creek. The gently sloping topography of the portion of the pond mitigation site located north of the Almaden-Calero Canal is generally steeper upstream of the pond, and a large berm retains surface runoff and seep water in the pond. South of the Almaden-Calero Canal, the topography of the site slopes steeply upward from the canal up the hillside to the south. The wetland mitigation site is located in a slight depression below a steep quarried rock slope cut into the hillside. A ranch road adjacent to the wetland forms an informal berm that retains seep water in the wetland.

The Natural Resource Conservation Service has mapped two soil units on the property: Montara-Santerhill, 15–30% slopes; and (2) Alumrock-Zeppelin, 2–9% slopes (Natural Resource Conservation Service 2016). These soil types and their locations are described in detail in Section II.E *Soils*, above.

The vegetation at the pond mitigation site is heavily grazed by cattle throughout the year, which likely affects the height, distribution, and composition of the plant species present. The pond itself supports minimal vegetation. Vegetation in the freshwater marsh habitat between the existing livestock troughs and the pond includes seep monkeyflower (*Mimulus guttatus*), spreading rush (*Juncus patens*), sow thistle (*Sonchus asper*), and a small population of Mt. Hamilton thistle. The vegetation in the freshwater marsh habitat located along seeps south of the Almaden-Calero Canal (across the canal from the pond) is similar, but Mt. Hamilton thistle does not occur there. Vegetation in the seasonal wetland surrounding the pond includes common spikerush (*Eleocharis macrostachya*) and spreading rush. Himalayan blackberry (*Rubus armeniacus*) is present on the berm slope west of the pond. Vegetation in the California annual grassland habitat around the pond, north of the Almaden-Calero Canal, is dominated by nonnative annual grasses including ripgut brome (*Bromus diandrus*) and wild oats (*Avena fatua*), as well as annual forbs including bur clover (*Medicago polymorpha*), red stemmed filaree (*Erodium cicutarium*), and tarweed (*Madia* sp.). Coast live oak (*Quercus agrifolia*) and California bay laurel (*Umbellaria californica*) trees are present along the drainage downstream of the pond and along the Almaden-Calero Canal, with an understory of toyon (*Heteromeles arbutifolia*), poison oak (*Toxicodendron diversilobum*), and annual grasses. Vegetation in the serpentine bunchgrass grassland that occurs south of the Almaden-Calero Canal includes

purple needlegrass (*Stipa pulchra*), wild hyacinth (*Dichelostemma capitatum*), California plantain (*Plantago erecta*), and other native species commonly found on serpentine soils.

The vegetation at the wetland mitigation site is also heavily grazed by cattle throughout the year, with the exception of the sparse vegetation that grows on the extremely steep, mostly barren slopes of the quarry that surrounds the wetland. The wetland supports plant species such as seep monkeyflower, Baltic rush (*Juncus balticus*), and Mexican lovegrass (*Eragrostis mexicana*). The seasonal wetland habitat surrounding the wetland supports iris-leaved rush (*Juncus xiphioides*) and toad rush (*Juncus bufonius*). Degraded areas of serpentine grassland along the road are dominated by nonnative annual grasses including ripgut brome, wild oats, and annual blue grass (*Poa annua*), as well as annual forbs such as nonnative bur clover and native shining peppergrass (*Lepidium nitidum*). Coffeeberry (*Frangula californica*) grows as a thicket adjacent to the wetland at the toe of the barren rock slope. Most beautiful jewelflower occurs in a relatively limited area on the east side of the quarry, on the steeper, rocky slopes. Higher-quality serpentine grassland habitat occurs on the hillside above the quarry, and supports native serpentine-associated species such as purple needlegrass, California melic grass (*Melica californica*), spring beauty (*Claytonia exigua*), wild hyacinth, California plantain, and others.

An inventory list of all plant and wildlife species which are known to occur on the property is provided as Attachment A.

Plant and wildlife species covered under the Habitat Plan and previously reported from the property are the Mt. Hamilton thistle, most beautiful jewelflower, Bay checkerspot butterfly (*Euphydryas editha bayensis*), California tiger salamander, and western pond turtle (*Actinemys marmorata*) (ICF International 2012, California Natural Diversity Database [CNDDB] 2016, Camara 2016). We identified seven additional covered plant species that could potentially occur on the site: the Santa Clara Valley dudleya (*Dudleya abramsii* ssp. *setchellii*), fragrant fritillary (*Fritillaria liliacea*), Loma Prieta hoita (*Hoita strobilina*), smooth lessingia (*Lessingia tenuis*), and Metcalf Canyon jewelflower (*Streptanthus albidus* ssp. *albidus*). Protocol-level plant surveys in 2016 confirmed the presence of Mt. Hamilton thistle at the pond mitigation site and most beautiful jewelflower at the wetland mitigation site and determined that all other covered plants except smooth lessingia are absent from both sites; additional surveys to determine whether smooth lessingia is present will be conducted in summer. Additional covered wildlife species that potentially occur on the property are the California red-legged frog and tricolored blackbird (*Agelaius tricolor*).

Because the focus of the project is to restore ecological functions of pond and wetland habitats to benefit covered species associated with aquatic/wetland habitats, and because the project will have a minimal effect on most serpentine species, this plan focuses on wetland habitats and associated covered species, and does not consider serpentine species other than Mt. Hamilton thistle. Serpentine species will be addressed by the broader Reserve Unit Management Plan that will be prepared in the future for the Calero Reserve. Nevertheless, many of the covered plant and wildlife species that are known to occur or could potentially occur on the property are associated with serpentine grasslands. Although the larger Calero Reserve that surrounds the site supports extensive serpentine grasslands, the areas of serpentine at the pond and wetland sites are extremely small, and most are degraded due to historical disturbance from grazing. The only area of high-quality serpentine habitat

on the site is present on the periphery of the wetland mitigation site on the hillside above the barren quarry slope. The only project activity associated with this high-quality serpentine area will be the installation of a livestock fence. An occurrence of approximately 100 most beautiful jewelflower plants, which are also associated with serpentine habitat, is located on the steep, rocky slopes of the quarry at the wetland restoration site within this livestock fence. The livestock fence will exclude this occurrence from grazing in the future; however, the steep, rocky slopes on which these plants occur are not heavily grazed currently, and are not expected to be susceptible to infestations of invasive plants due to their steep nature. The livestock fence will also be sited to avoid the most beautiful jewelflower occurrence, which will be delineated with environmentally sensitive area fencing during project construction. No other high-quality serpentine habitat or known occurrences of serpentine plants are present on the site. As a result, the project is expected to have negligible effects, either adverse or beneficial, on serpentine habitat and serpentine-associated species other than Mt. Hamilton thistle (which will benefit from the project, as described below).

Mt. Hamilton Thistle (*Cirsium fontinale* var. *campylon*). Federal Listing Status: None; State Listing Status: None; CRPR: 1B.2; Habitat Plan Status: Covered. Mt. Hamilton thistle is an erect, pale green, woolly perennial plant in the sunflower family (Asteraceae) that blooms from April to October, producing nodding white to pinkish flowering heads with spiny, reflexed flower bracts. Mt. Hamilton thistle is associated with seeps and streams, within chaparral, cismontane woodland, and valley and foothill grassland habitats on serpentine soils from 328 to 2,920 feet in elevation. Mt. Hamilton thistle occurs in stands of a few plants to several thousand plants, almost always in seasonal or perennial wetlands, seeps, or drainages.

The range of Mt. Hamilton thistle includes nine U.S. Geological Survey 7.5-minute quadrangles in Santa Clara, Alameda, and Stanislaus Counties. Suitable habitat for Mt. Hamilton thistle is present at both the pond and wetland mitigation sites. The species is present at the pond mitigation site, where several individuals were detected in the area of coastal and valley freshwater marsh habitat located north of the Almaden-Calero Canal during surveys in 2016. Mt. Hamilton thistle is not known to occur at the wetland mitigation site, and was not detected at this site during the 2016 surveys. Additional records of Mt. Hamilton thistle are known from the immediate vicinity (ICF International 2012, CNDDB 2016).

Most Beautiful Jewelflower (*Streptanthus albidus* ssp. *peramoenus*). Federal Listing Status: None; State Listing Status: None; CRPR: 1B.2; Habitat Plan Status: Covered. Most beautiful jewel-flower is an annual herb in the mustard family (Brassicaceae) that can bloom from March to October, but usually blooms between April and September. This subspecies is indigenous to thin, rocky serpentine (often Montara series) soils and serpentinite rock outcrops. Its germination and growth is greatly enhanced by disturbances such as wildfire and exposure of bare soil/bedrock resulting from road cuts. It occurs in chaparral, cismontane woodland, and valley and foothill grassland habitats at elevations from approximately 308 to 3,281 feet. Associated species include purple needlegrass and dwarf plantain. This subspecies also occurs with the Santa Clara Valley dudleya and smooth lessingia.

The known range of this California endemic is restricted to 29 USGS 7.5-minute quadrangles in Alameda, Contra Costa, Monterey, Santa Clara, and San Luis Obispo counties. The range of the species is disjunct, with

one range centered at the inner coast along San Francisco Bay, and the other in the outer coast in San Luis Obispo County. This species is present at the wetland mitigation site, where approximately 100 most beautiful jewelflower plants are present on the steep, rocky slope on the east side of the old quarry area. These plants are located outside of the area to be disturbed for wetland creation, and future management and monitoring in accordance with this LTMP will focus on wetland/pond-associated species, rather than upland serpentine species such as most beautiful jewelflower.

California Tiger Salamander (*Ambystoma californiense*). Federal Listing Status: Threatened (Central Population); State Listing Status: Threatened; Habitat Plan Status: Covered. Suitable breeding habitat for California tiger salamanders consists of temporarily ponded environments (e.g., vernal pool, ephemeral pool, or human-made pond) that hold water for a minimum of 3–4 months and are surrounded by uplands that support small mammal burrows. California tiger salamanders will also utilize permanent ponds if aquatic vertebrate predators are not present. Suitable ponds provide breeding and larval habitat, while burrows of small mammals such as California ground squirrels (*Spermophilus beecheyi*) and Botta's pocket gophers (*Thomomys bottae*) in upland habitats provide refugia for juvenile and adult salamanders during the dry season.

The range of the California tiger salamander is restricted to the Central Valley and the South Coast Range of California, from Butte County south to Santa Barbara County. The California tiger salamander has disappeared from a significant portion of its range due to habitat loss from agriculture and urbanization and the introduction of nonnative aquatic predators. This species was listed as threatened in August 2004 (USFWS 2004), and critical habitat was designated in August 2005 (USFWS 2005a). Critical habitat for this species overlaps the site at the pond and wetland mitigation sites (East Bay Unit 8, also known as the Laurel Hill Unit; USFWS 2005a).

Suitable breeding habitat for the California tiger salamander consists of seasonal pools or ponds that hold water for at least 10 weeks (typically into mid or late May in Santa Clara County) and that lack high numbers of aquatic predators such as American bullfrogs (*Lithobates catesbeianus*), crayfish, and fish. The hydroperiod of the pond mitigation site is currently suitable for breeding by California tiger salamanders in most years because it typically ponds into July, and the Habitat Plan maps this pond as potentially suitable breeding habitat (ICF International 2012). The wetland mitigation site does not provide high-quality breeding habitat for California tiger salamanders due to its very shallow ponding depth. This species was detected breeding in a pond located approximately 600 feet north of the wetland mitigation site and 0.24 mile northeast of the pond mitigation site in 1998 (CNDDB 2016). A focused survey conducted at the pond and wetland restoration sites in 2016 detected breeding California tiger salamanders at both locations, although only one larva was detected at the wetland mitigation site (Camara 2016). Nonnative predators currently present in the on-site pond likely limit breeding success for California tiger salamanders under current conditions. Approximately 20 adult bullfrogs, which are known to prey upon tiger salamanders, were observed at the pond mitigation site during March 2016 surveys. These bullfrogs are not currently breeding, at least successfully, on the site, as the pond is not perennial and this species' larvae require more than one year of aquatic development. Louisiana red swamp crayfish (*Procambarus clarkii*) were also observed in the pond during a site survey in October 2015. At the wetland restoration site, the small size and clear conditions of the ponded habitat likely also limit breeding success of this species, increasing the vulnerability of larvae to predation.

Burrows of California ground squirrels and Botta's pocket gophers are present at the pond mitigation site, as well as in adjacent grasslands that surround both the pond and wetland sites. These burrows provide upland refugia for tiger salamanders that may breed either in the on-site pond or in the pond to the northeast. During the wet season, California tiger salamanders could potentially disperse across the property in any upland or wetland habitats.

California Red-legged Frog (*Rana draytonii*). Federal Listing Status: Threatened; State Listing Status: Species of Special Concern; Habitat Plan Status: Covered. California red-legged frogs inhabit perennial freshwater pools, streams, and ponds throughout the Central California Coast Range as well as isolated portions of the western slopes of the Sierra Nevada (Fellers 2005). Their preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters (Fellers 2005), as well as shallow benches to act as nurseries for juveniles (Jennings and Hayes 1994). Nonbreeding frogs may be found adjacent to streams and ponds in grasslands and woodlands, and may travel up to 2 miles from their breeding locations across a variety of upland habitats (Bulger et al. 2003, Fellers and Kleeman 2007).

The historical distribution of California red-legged frogs extended from the city of Redding in the Central Valley and the Point Reyes National Seashore along the coast, south to Baja California, Mexico. The species' current distribution includes isolated locations in the Sierra Nevada and the San Francisco Bay area, and along the central coast (USFWS 2002). The California red-legged frog was listed as threatened in June 1996 (USFWS 1996) based largely on a significant range reduction and continued threats to surviving populations (Miller 1994). Revised critical habitat was designated in March 2010 (USFWS 2010). However, no critical habitat for red-legged frogs is located in the site vicinity (USFWS 2010).

California red-legged frogs are not known to breed or occur at the pond or wetland mitigation sites, and a focused survey in 2016 did not detect breeding individuals of this species at either the pond or wetland restoration site (Camara 2016). The nearest record of red-legged frogs is approximately 1.4 mile to the south, along Cherry Creek (CNDDB 2016). Cherry Creek is tributary to Calero Reservoir, and California red-legged frogs within this creek could potentially disperse to the property.

Suitable breeding habitat for the California red-legged frog consists of pools within drainages or ponds that hold water through July, provide robust emergent vegetation used for egg mass attachment, and lack high numbers of aquatic predators. The hydroperiod of the pond mitigation site is currently suitable for breeding by California red-legged frogs only in very wet years because it typically dries in early July. The only emergent vegetation within the pond (i.e., spreading rush and common spikerush) is relatively short-statured and flimsy, and occurs only in the shallowest areas around the pond; as a result, this vegetation is unsuitable for egg mass attachment by California red-legged frogs. In addition, nonnative aquatic predators are relatively abundant in the pond under current conditions. The bullfrogs present in this pond will prey upon California red-legged frog adults and larvae, reducing the quality of this habitat for breeding. Thus, the pond is not expected to support successful breeding by California red-legged frogs in its current condition. The wetland at the wetland mitigation site does not support sufficient depth for breeding by this red-legged frogs, but does provide suitable foraging habitat for this species year-round. During the wet season, California red-legged frogs could potentially disperse

across the property in upland or wetland habitats, and they could potentially use ground squirrel burrows in surrounding upland areas as refugia.

Western Pond Turtle (*Actinemys marmorata*). Federal Listing Status: None; State Listing Status: Species of Special Concern; Habitat Plan Status: Covered. Western pond turtles occur in ponds, streams, and other wetland habitats in the Pacific slope drainages of California and northern Baja California, Mexico (Bury and Germano 2008). The central California population was historically present in most drainages on the Pacific slope (Jennings and Hayes 1994), but streambed alterations and other sources of habitat destruction, exacerbated by frequent drought events, have caused substantial population declines throughout most of the species' range (Stebbins 2003). Ponds or slack-water pools with suitable basking sites (such as logs) are an important habitat component for this species, and western pond turtles do not occur commonly along high-gradient streams. Females lay eggs in upland habitats in clay or silty soils in unshaded (often south-facing) areas up to 0.25 mile from aquatic habitats (Jennings and Hayes 1994). Juveniles feed and grow in shallow aquatic habitats (often creeks) with emergent vegetation and ample invertebrate prey. Nesting habitat is typically found within 600 feet of aquatic habitat (Jennings and Hayes 1994), but if no suitable nesting habitat can be found close by adults may travel overland considerable distances to nest.

Western pond turtles are known to be present at the pond mitigation site. Three individuals were observed in the pond during surveys for this species in 2012 (H. T. Harvey & Associates 2012), up to two individuals were observed by H. T. Harvey & Associates ecologists during February and March 2016 site visits, and one individual was observed during a survey for special-status amphibians in 2016 (Camara 2016). The Habitat Plan maps the on-site seasonal pond as primary habitat for western pond turtles (ICF International 2012). This pond provides basking and foraging habitat for turtles during months when it contains water, and surrounding upland grasslands provide suitable nesting and dispersal habitat for this species. Although this pond does not support perennial water, repeated observations of the species in the pond since 2012 indicate that they continue to use the pond even though it typically dries for at least three months each year. The wetland mitigation site provides potential foraging habitat for pond turtles, but it is not expected to support a population of the species due to its small size and limited depth.

Tricolored Blackbird (*Agelaius tricolor*). Federal Listing Status: None; State Listing Status: Candidate; Habitat Plan Status: Covered. Tricolored blackbirds are found primarily in the Central Valley and in central and southern coastal areas of California. This species is now considered a candidate for listing as endangered in California due to concerns over the loss of wetland habitats in the state and observed population declines. The tricolored blackbird is highly colonial in its nesting habits, and forms dense nesting colonies that, in some parts of the Central Valley, may consist of up to tens of thousands of pairs. This species typically nests in tall, dense, stands of cattails (*Typha* spp.) or tules (*Schoenoplectus* spp.), but also nests in blackberry (*Rubus ursinus*), wild rose (*Rosa californica*) bushes, and tall herbs. Nesting colonies are usually located near fresh water. Tricolored blackbirds form large, often multi-species flocks during the nonbreeding period and range more widely than during the nesting season.

The Habitat Plan maps potentially suitable nesting habitat for tricolored blackbirds in the on-site pond (ICF International 2012). Tricolored blackbirds attempted unsuccessfully to nest at the Calero Dam Pond in 1989 (Rottenborn 2007), and a colony of tricolored blackbirds nested in cattails at the easternmost end of Calero Reservoir in 2014 and 2015 (S. Rottenborn, pers. obs.). However, no suitable nesting habitat for tricolored blackbirds is present at the pond mitigation site or the wetland mitigation site due to the lack of extensive, tall emergent vegetation, and because the blackberry scrub on the pond mitigation site is not sufficiently extensive to support a colony. Individual tricolored blackbirds could potentially forage throughout the site year-round, though there is no particularly high-quality foraging habitat (relative to surrounding areas) on the site.

3.2 Summary of Property Development Plan

3.2.1 Pond Mitigation Site

Project objectives at the pond mitigation site are:

- Restore breeding habitat for the California red-legged frog and California tiger salamander by deepening a 1,500 square foot portion of the pond, planting wetland vegetation, managing populations of aquatic predators, and excluding cattle from a portion of the pond. The deepened pond will also restore breeding habitat for common amphibians such as the Sierran chorus frog (*Pseudacris sierra*) and western toad (*Anaxyrus boreas*).
- Restore seasonal wetland and freshwater marsh habitats by excluding cattle from a portion of the pond and planting native wetland vegetation. These actions will restore multiple ecological functions including sediment filtration, nutrient filtration, and erosion protection. In addition, this restoration will provide habitat for Mt. Hamilton thistle, foraging and dispersal habitat for the California red-legged frog, and foraging habitat for seasonal wetland associated birds.
- Establish seasonal wetland habitat by converting upland habitat to wetlands to establish multiple wetland functions, including sediment filtration, nutrient filtration, and erosion protection. In addition, this will provide habitat for Mt. Hamilton thistle, foraging and dispersal habitat for the California red-legged frog, and foraging habitat for seasonal wetland associated birds.
- Establish functional basking habitat for the western pond turtle by installing anchored basking logs in the deepened open water portion of the pond.
- Improve climate change resiliency of pond habitat by increasing the water storage capacity of the pond and by increasing the springbox/seep inflow rate to the pond.
- Continue to provide water for cattle that graze the surrounding Calero Reserve.

The deepened 1,500 square foot portion of the pond will provide water at least two feet deep through August in years of average or above-average rainfall, and may be perennial in years when it is not drained. This will increase the duration of inundation, allowing California tiger salamanders breeding in the pond to grow longer and reach a larger size before dispersing. In addition, this increased duration of inundation will provide

sufficient hydroperiod for successful breeding by California red-legged frogs in years of average or above-average rainfall. In addition, in years when the pond is perennial, this will provide year-round aquatic habitat for western pond turtles.

Adding depth to the pond will also increase the volume of water held by the pond. In drought years, the increased depth and hydroperiod (relative to existing conditions) will increase the likelihood that the pond will provide sufficient water, and for a sufficient period, to allow successful breeding by these covered species. In all years, the increased volume of water provided by deepening a portion of the pond will provide higher abundance of prey for California red-legged frogs and California tiger salamanders than is currently present.

Controlling aquatic predators will be achieved by draining the pond as needed to prevent successful breeding by bullfrogs and minimize crayfish abundance. Although the pond currently dries each year, more focused management of hydrologic conditions will help to minimize populations of these nonnative predators.

Fencing off a portion of the pond from cattle will increase the extent of emergent wetland vegetation that can serve as egg mass attachment sites for California red-legged frogs and provide cover for California red-legged frogs, California tiger salamanders, and their larvae. At the same time, allowing cattle access to much of the pond will provide some pond turbidity that may make these species' larvae less visible to predators (especially avian predators). Allowing cattle access to much of the pond will also facilitate access to the pond by California tiger salamanders and California red-legged frogs by grazing a portion of the vegetation around the pond. In addition, construction of the following project elements will help to sustain suitable aquatic habitat conditions at the pond: lining of the excavation area with bentonite to reduce water infiltration, replacement of the culvert that controls the pond water level, installation of a new outlet drain to fully drain the pond, installation of a new trough and tank and seep diversion system to provide water for both the pond and cattle use, and improvement of upstream seep water collection to supply the pond. Control of invasive weeds at the pond, and installation of container stock of native wetland plants, will likewise help to restore high-quality wetland habitat. Additional details of the project's restoration plan and construction methods are provided in the MMP.

A total of 0.54 acre of waters of the U.S. is currently present at the pond mitigation site (Figure 5). Restoration activities will result in the establishment of an additional 0.01 acre of waters of the U.S. and the restoration of higher-quality aquatic habitat function to 0.16 acre of currently degraded waters of the U.S. Following construction, 0.55 acre of waters of the U.S. will be present at the pond mitigation site (Figure 6).

Plant species that occur in the pond and wetland habitats at the pond mitigation site are described in section *III. A. Biological Resources Survey of the Property*, above, and include Mt. Hamilton thistle. Animal species that occur at the pond mitigation site are the native Sierran chorus frog (*Pseudacris sierra*), western toad (*Anaxyrus boreas*), California newt (*Taricha torosa*), and western pond turtle, as well as the nonnative bullfrog and red swamp crayfish.

3.2.2 Wetland Mitigation Site

Project objectives at the wetland mitigation site are:

- Restore seasonal wetland and freshwater marsh habitats by grading, planting native wetland vegetation, and excluding cattle. These actions will restore multiple wetland functions, including sediment filtration and nutrient filtration, and will provide foraging and dispersal habitat for the California red-legged frog as well as foraging habitat for seasonal wetland associated birds.
- Establish seasonal wetland habitat by converting upland habitat to wetlands to establish multiple wetland functions including sediment filtration and nutrient filtration. In addition, the establishment of this habitat will provide foraging and dispersal habitat for the California red-legged frog and foraging habitat for seasonal wetland associated birds.
- Improve climate change resiliency of wetland habitat by increasing the water storage capacity of the wetland.
- Continue to provide water for cattle that graze the surrounding Calero Reserve.

Construction activities at the wetland mitigation site will include excavation to convert uplands to seasonal wetlands; lining of the seasonal wetland excavation area with 6-12 inches of soil (salvaged from excavation of the deeper pool at the pond site) to cover exposed subsoil, facilitate establishment of target vegetation, and promote wetland habitat functions; excavation to remove sediment in a small deeper pool;; installation of a wetland water level control structure; installation of a new trough to provide water for cattle outside of the wetland; installation of fencing to exclude cattle; control of invasive weeds; and installation of container stock of native wetland plants. Additional details of the project's restoration plan and construction methods are provided in the MMP.

A total of 0.10 acre of waters of the U.S. is currently present at the wetland mitigation site (Figure 7). Construction will result in the establishment of an additional 0.02 acre of waters of the U.S., and the enhancement of <0.01 acre of waters of the U.S. Following construction, 0.12 acre of waters of the U.S. will be present on the site (Figure 8).

Plant species that occur in the wetland habitat at the wetland mitigation site are described in section *III. A. Biological Resources Survey of the Property*, above. Most beautiful jewelflower, a Habitat Plan-covered species, occurs on steep, rocky slopes in the eastern portion of the wetland mitigation site outside the wetland areas. The wetland restoration project will not adversely affect jewelflower or its habitat on those slopes. Adult California newts and larvae of western toads, Sierran chorus frogs, and California tiger salamanders were captured during a focused survey of this habitat in 2016 (Camara 2016). Bullfrogs and California red-legged frogs can potentially forage in the wetland, but the wetland is too shallow to support breeding by these species.

3.3 Endangered and Threatened Species

Endangered and threatened species that occur, or could potentially occur, on the property include Habitat Plan-covered species such as the California red-legged frog, California tiger salamander, Bay checkerspot butterfly, Santa Clara Valley dudleya, and Metcalf Canyon jewelflower. No state or federally endangered, threatened, or candidate wildlife species that are not covered under the Habitat Plan are expected to occur on the property. The San Francisco popcorn-flower (*Plagiobothrys diffusus*), a state candidate for listing, and the rock sanicle (*Sanicula saxatilis*), a state rare species, may occur on the property, but no additional state or federally endangered, threatened, candidate, or rare plant species that are not covered under the Habitat Plan could potentially occur on the property. No records of the San Francisco popcorn-flower or rock sanicle are known from the site vicinity (CNDDB 2016), but 2016 rare plant surveys will determine whether these species are present on the site.

3.4 Rare Species and Species of Special Concern

Rare species and California species of special concern that occur, or could potentially occur, on the property include Habitat Plan-covered species such as the western pond turtle, Mt. Hamilton thistle, most beautiful jewelflower, fragrant fritillary, Loma Prieta hoita, and smooth lessingia. We identified 37 additional plant species that are ranked by the California Native Plant Society as rare or endangered in Ranks 1B, 2B, 3, or 4 that could potentially occur on the property. These species are listed in Table 1. Of these species, the San Francisco collinsia (*Collinsia multicolor*) is the only species known to occur in the site vicinity (CNDDB 2016). The 2016 rare plant surveys will determine whether any of these species are present or absent from the site.

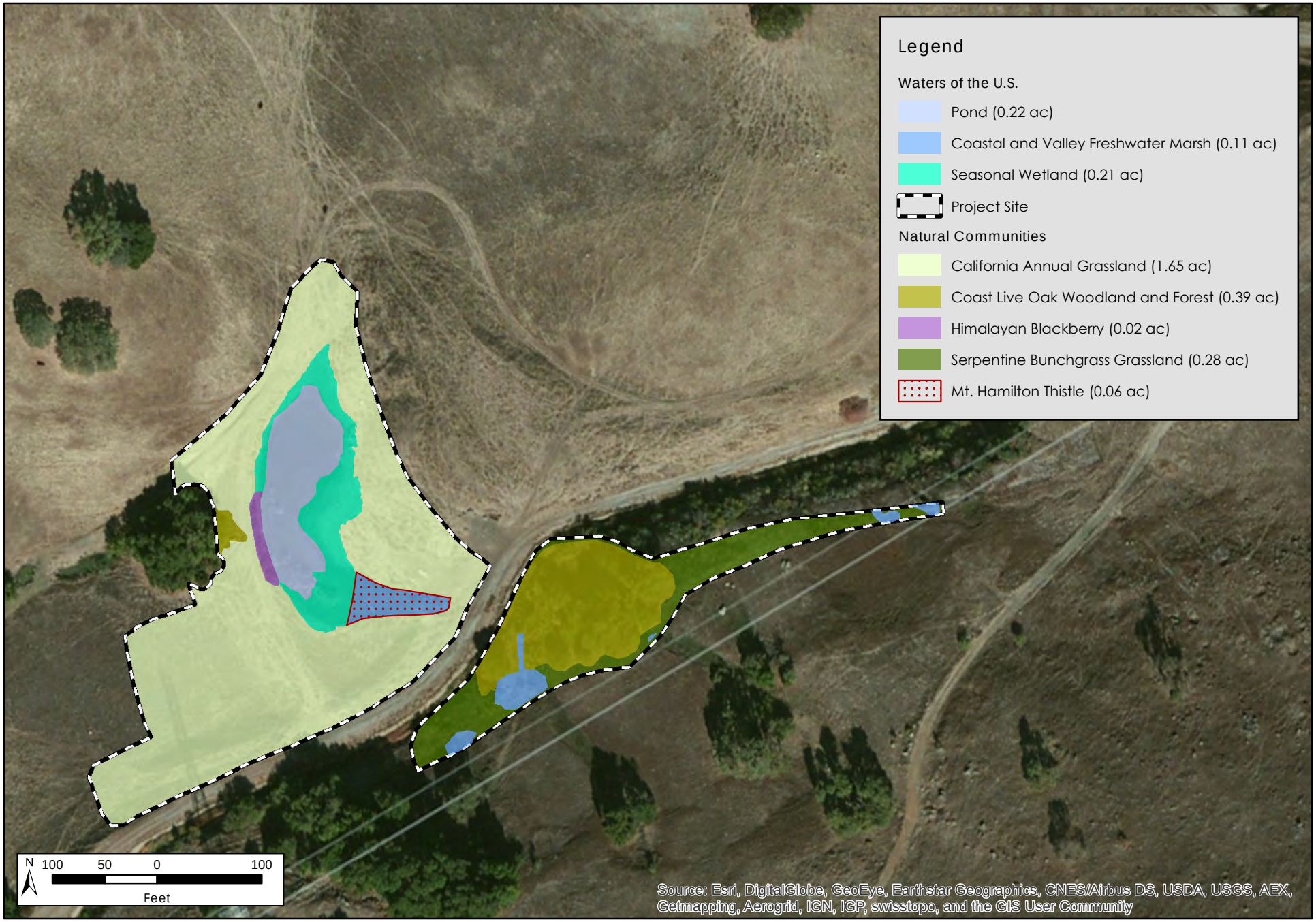
Table 1. Additional Rare Plant Species with Potential to Occur on the Property.

Scientific Name	Common Name	CRPR1
Acanthomintha lanceolata	Santa Clara thorn-mint	4.2
Amsinckia lunaris	bent-flowered fiddleneck	1B.2
Androsace elongata ssp. acuta	California androsace	4.2
Arctostaphylos andersonii	Anderson's manzanita	1B.2
Azolla mexicana	Mexican mosquito fern	4.2
Balsamorhiza macrolepis	big-scale balsamroot	1B.2
Calandrinia breweri	Brewer's calandrinia	4.2
Calochortus umbellatus	Oakland star-tulip	4.2
Carex comosa	bristly sedge	2B.1
Carex saliniformis	deceiving sedge	1B.2
Castilleja rubicundula var. rubicundula	pink creamsacs	1B.2
Clarkia breweri	Brewer's clarkia	4.2
Clarkia lewisii	Lewis' clarkia	4.3
Clarkia concinna ssp. automixa	Santa Clara red ribbons	4.3
Collinsia multicolor	San Francisco collinsia	1B.2
Eriophyllum jepsonii	Jepson's woolly sunflower	4.3
Fritillaria agrestis	Stinkbells	4.2

Scientific Name	Common Name	CRPR1
Helianthus exilis	serpentine sunflower	4.2
Iris longipetala	coast iris	4.2
Isocoma menziesii var. diabolica	Satan's goldenbush	4.2
Leptosiphon acicularis	bristly leptosiphon	4.2
Leptosiphon ambiguus	serpentine leptosiphon	4.2
Leptosiphon grandiflorus	large-flowered leptosiphon	4.2
Lessingia arachnoidea	Spring lessingia	1B.2
Lessingia hololeuca	woolly-headed lessingia	3
Madia radiata	showy golden madia	1B.1
Malacothamnus arcuatus	arcuate bush-mallow	1B.2
Malacothamnus hallii	Hall's bush-mallow	1B.2
Malacothrix phaeocarpa	Dusky-fruited malacothrix	4.3
Micropus amphibolus	Mt. Diablo cottonweed	3.2
Microseris sylvatica	Sylvan microseris	4.2
Monolopia gracilens	woodland woolythreads	1B.2
Perideridia gairdneri ssp. gairdneri	Gairdner's yampah	4.2
Piperia michaelii	Michael's rein orchid	4.2
Plagiobothrys chorisianus var. hickmanii	Hickman's popcornflower	4.2
Senecio aphanactis	chaparral ragwort	2B.2
Sidalcea malachroides	maple-leaved checkerbloom	4.2

[1]Key to Status Abbreviations: California Rare Plant Rank (CRPR).
CRPR 1B = Plants rare, threatened, or endangered in California and elsewhere
CRPR 2B = Plants rare, threatened, or endangered in California, but more common elsewhere
CRPR 3 = Plants about which information is needed-a review list
CRPR 4 = Plants of limited distribution-a watch list
0.1 = seriously threatened in California
0.2 = moderately threatened in California
0.3 = not very threatened in California

Several additional animal species that are listed as California species of special concern could also occur on the property. The California horned lizard (*Phrynosoma blainvillii*), loggerhead shrike (*Lanius ludovicianus*), Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*), grasshopper sparrow (*Ammodramus savannarum*), and American badger (*Taxidea taxus*) have been recorded in the general site vicinity and could potentially occur on the property year-round. The golden eagle (*Aquila chrysaetos*), a state fully protected species, also occurs in the site vicinity year-round, and a pair of this species previously nested on PG&E powerline towers near the wetland mitigation site. Golden eagles are not nesting on these towers in 2016, but one was observed foraging in the area during March 2016 surveys. The white-tailed kite (*Elanus leucurus*), also a state fully protected species, may also nest in the site vicinity and forage on the site year-round.



N:\Projects3700\3753-02\Reports\Figure 5 Existing Waters Pond.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 5. Existing Waters of the U.S. at the Pond Mitigation Site
Long-term Management Plan for Permittee-Responsible Mitigation (3753-02)
Calero County Park Pond and Wetland Restoration Project
July 2016

N:\Projects3700\3753-02\Reports\Figure 6 Proposed Waters Pond.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 6. Proposed Waters of the U.S. at the Pond Mitigation Site
Long-term Management Plan for Permittee-Responsible Mitigation (3753-02)
Calero County Park Pond and Wetland Restoration Project
July 2016

N:\Projects3700\3753-02\Reports\Figure 7 Existing Waters Wetland.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 7. Existing Waters of the U.S. at the Wetland Mitigation Site
Long-term Management Plan for Permittee-Responsible Mitigation (3753-02)
Calero County Park Pond and Wetland Restoration Project
July 2016

N:\Projects3700\3753-02\Reports\Figure 8 Proposed Waters Wetland.mxd

H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 8. Proposed Waters of the U.S. at the Wetland Mitigation Site
Long-term Management Plan for Permittee-Responsible Mitigation (3753-02)
Calero County Park Pond and Wetland Restoration Project
July 2016

Section 4. Management and Monitoring

The overall goal of long-term management is to foster the long-term viability of the site's waters of the U.S., covered species, and covered habitat. Routine monitoring and minor maintenance tasks are intended to assure the viability of the site in perpetuity.

Management and monitoring activities on the site focus on the pond, seasonal wetland, and coastal and valley freshwater marsh natural communities and the plant and wildlife species that occur there. Although areas of upland natural communities (i.e., coast live oak woodland, California annual grassland, Himalayan blackberry scrub, serpentine bunchgrass grassland, coffeeberry scrub, barren, and developed) also occur within the project boundaries, these areas are peripheral to the pond and wetlands that are the focus of the restoration and the project's long-term goals. Large areas of serpentine bunchgrass grassland and other covered upland natural communities in the site vicinity, communities that comprise only a small proportion of the property, will be managed and monitored as part of the larger Calero Reserve. Thus, this long-term management plan does not focus on upland habitats. Nevertheless, management and monitoring tasks (e.g., those addressing invasive weeds) are included herein to prevent upland habitats within the pond and wetland restoration project area from degrading to the point that they could adversely affect habitats in the larger Calero Reserve.

The property includes pond, coastal and valley freshwater marsh, and seasonal wetland habitats (Figures 5–8). Management and monitoring protocols for these natural communities are described in the following sections. It is assumed that management and monitoring will occur simultaneously for multiple natural communities (e.g., grazing in pond, wetland, and upland habitats); consequently, the monitoring protocols are designed to be coordinated across natural communities.

4.1 Biological Resources

The approach to the long-term management of the site's biological resources is to conduct annual site examinations and monitoring of selected characteristics to determine stability and ongoing trends of the preserved and created waters of the U.S., including wetlands (pond, seasonal wetland, and coastal and valley freshwater marsh), as well as covered species (Mt. Hamilton thistle, California tiger salamander, California red-legged frog, and western pond turtle). Annual monitoring will assess the property's condition, degree of erosion, invasion of exotic or deleterious (e.g., thatch producing) species, water quality, fire hazard, and/or other aspects that may warrant management actions. While it is not anticipated that major management actions will be needed, this long-term management plan includes monitoring to identify any issues that arise, and using adaptive management to determine what actions might be appropriate. Personnel chosen to accomplish monitoring responsibilities will have the appropriate knowledge, training, and experience to perform these tasks.

Adaptive management entails an approach to natural resource management which incorporates changes to management practices, including corrective actions as determined to be appropriate by the regulatory agencies

in discussion with the land manager, that are selected based on monitoring results. Adaptive management includes those activities necessary to address the effects of climate change, fire, flood, or other natural events, force majeure, and other factors. Before considering any adaptive management changes to the long-term management plan, the regulatory agencies will consider whether such actions will help ensure the continued viability of property's biological resources.

The land manager for the site shall implement the following management and monitoring activities.

Element A.1 Waters of the U.S., Including Wetlands

Applicable Habitat Plan Goals, Objectives, and Management Actions

Maintain, enhance, and create or restore functional pond, freshwater perennial wetlands, and seasonal wetland habitats that benefit covered species and promote native biological diversity (Goal 10). This goal includes objectives of enhancing wetlands and ponds by increasing native vegetation cover, reducing the density of exotic species, and increasing the number of ponds and wetlands occupied by covered species (Objectives 10.3, 10.4, 10.5, 10.6, and 10.7). For ponds, objectives also include installing fencing to reduce grazing pressure and installing woody debris (Objectives POND-1, POND-2, POND-3, POND-4, and POND-5).

Baseline Conditions

The on-site pond at the pond mitigation site is approximately 4.5 feet deep, which is shallower than its original depth due in part to the accumulation of silt. Ponding begins to occur between December and February, and the pond typically holds water into early July in years of average rainfall. Minimal vegetation is present within the pond, but freshwater wetland species that occur around the pond margins include common spikerush and spreading rush. This pond provides suitable hydroperiod for breeding California tiger salamanders in most years but only provides suitable hydroperiod for breeding California red-legged frogs in wetter years. However, California tiger salamanders likely experience low breeding success due to the abundance of nonnative aquatic predators (i.e., bullfrogs and crayfish), and California red-legged frogs are likely unable to breed in the pond due to the absence of suitable egg mass attachment sites. Western pond turtles are present in the pond, which provides suitable foraging habitat for this species when it contains water, although high-quality basking habitat is absent.

The coastal and valley freshwater marsh habitat that occurs adjacent to the pond at the pond mitigation site supports seep monkeyflower, spreading rush, sow thistle, and Mt. Hamilton thistle. The seasonal wetland habitat around the pond margins also provides suitable habitat for the Mt. Hamilton thistle.

At the wetland mitigation site, coastal and valley freshwater marsh and adjacent seasonal wetland habitat support seep monkeyflower, Baltic rush, Mexican lovegrass, iris-leaved rush, and toad rush. California tiger salamanders are known to breed in this wetland, and most beautiful jewelflower occurs on the eastern slope of the quarry above the wetland. This site also provides suitable habitat for Mt. Hamilton thistle and suitable dispersal and foraging habitat for California red-legged frogs, California tiger salamanders, and possibly western

pond turtles. Although this wetland is perennial, it is too shallow to provide breeding habitat for California red-legged frogs, and it provides low-quality breeding habitat for California tiger salamanders due to its small size, very shallow nature, and clear conditions.

At the pond mitigation site, fencing will be installed to exclude cattle from the pond and wetland habitats north of the Almaden-Calero Canal, while allowing cattle to continue to access approximately 25% of the pond perimeter and 50% of the deeper pool perimeter. At the wetland mitigation site, cattle exclusion fencing will exclude cattle from all wetland habitats. A gate will be installed in the fencing at each site to allow managers to pulse graze the vegetation within the fence when needed. All fencing will consist of "no-climb" field fence mounted on hand-driven T-posts. Corners and gate locations will be installed in poured concrete in a pre-drilled hole.

5-Year Conditions

At 5-year intervals, the description of site conditions will be updated as needed to inform ongoing management.

Property Management Objectives

- Monitor, conserve, and maintain the site's waters of the U.S., including wetlands. Limit any impacts to waters of the U.S. from vehicular travel or other adverse impacts.
- Maintain infrastructure (e.g., fencing, gates, and inflow/outflow structures) at the pond and wetland mitigation sites.
- Maintain seep inflow to the pond.
- Continue to provide water to cattle, and maintain cattle troughs, tanks, and associated pipes sufficiently that there can be flexibility in how and when cattle access ponds and wetlands without compromising the grazing operation.
- Ensure that California tiger salamanders, California red-legged frogs, and western pond turtles can continue to access the pond.
- Control populations of Louisiana red swamp crayfish and bullfrogs in the pond.

Management Actions

- Monitor water levels in the pond and wetland by conducting visual inspections of existing depth gauges and/or using automated water level recorders in these areas and recording water levels during all site visits for prescribed monitoring activities, as well as in late August or early September to confirm that the deepened portion of the pond is retaining at least two feet of water through August 31. In the future, as more information is gained regarding the relationship between pond levels and precipitation amounts and patterns, water level monitoring may become more automated and field effort may be reduced as feasible.

- Conduct an annual visual inspection by walking the perimeter of all fencing on the site in the spring (March–May), when cattle pressure on fences will be highest, to monitor the condition of cattle exclusion fencing and gates, and repair fences and gates as needed.
- Seep inflow to the pond is be provided through a collection ditch that leads to a springbox. Conduct an annual visual inspection of the ditch in fall (September–October, prior to winter rains), by walking the length of the ditch and clearing it of debris and sediment manually using a shovel and casting the debris and sediment aside. The springbox will be inspected concurrently and manually cleared of debris and sediment if needed.
- The pipe from the springbox to the pond restoration area will be cleaned annually in fall (September–October, prior to winter rains) to remove flow impediments. The inlet to the pipe will have a grate to limit debris from entering the pipe. The grate will be inspected and repaired/replaced, as necessary, in conjunction with springbox inspection. In addition, the springbox will be inspected annually in the spring, after the rainy season (April–May) and cleared of debris manually using a shovel and casting the debris aside.
- The pond outlet will consist of an overflow structure with a gate at the invert that is operated as needed to drain the pond for predator control. During years when the pond is drained, the outlet structure will be inspected in the fall (September–October, prior to winter rains) and manually cleared of debris and sediment after the pond has been drained. In years when the pond is drained, loose sediment will likely be flushed out. Any remaining sediment accumulation in the vicinity of the outlet will be cleaned manually with a shovel after the pond is drained, placed in the spoils pile area and covered with weed-free straw mulch.
- The wetland site outlet structure will include an overflow weir to regulate the water level in the pond. An annual visual inspection of the outlet structure will occur in fall (September–October, prior to winter rains), and the structure will be manually cleared of debris using a shovel. The overflow weir will be inspected concurrently for damage and replaced when needed to maintain design water level in the wetland.
- Cattle water availability infrastructure consists of pipes that convey seep water to troughs and a storage tank. The pipes will be cleaned annually in the spring (March–May) to ensure that water is available to cattle during the summer. The troughs will be cleared of sediment as needed.
- Degraded fencing and gates, or any fencing and gates that have been damaged by cattle, will be repaired and replaced as needed.
- Monitor the density of vegetation around the on-site pond annually in spring (March–May) to assess whether California tiger salamanders, California red-legged frogs, and western pond turtles can continue to move to and from the pond. If dense vegetation becomes established that would potentially prevent individuals from accessing the pond, use pulse grazing, mowing, or hand removal in the fall to control the vegetation.
- Monitor the percent cover of vegetation in the open water pond habitat annually in spring (March–May). If vegetation cover exceeds 50% in the open water pond habitat during any monitoring year, pulse grazing,

mowing, or hand removal of vegetation in the fall (i.e., after mid-September) will be used to control the vegetation. However, emergent vegetation suitable for California red-legged frog egg mass attachment will be managed for and maintained.

- If annual monitoring (discussed under Elements *A.2 California Tiger Salamander*, *A.3 California Red-legged Frog*, and *A.4 Western Pond Turtle* below) determines that the numbers of bullfrogs or crayfish in the pond have increased since the previous year, the pond and adjacent wetland will be drained in in August, September, or October of the current year and allowed to dry completely until winter rains refill the pond (i.e., in most years, in December or January).

Because bullfrogs and crayfish are not expected to breed at the wetland mitigation site, no management actions related to these species will occur at this site. Management actions related to invasive plant species are discussed under *Element A.6 Invasive Plant Management*, below.

Success Criteria

- The on-site pond will provide water of sufficient depth and duration to support breeding by covered amphibians, defined as retaining 2 feet of water through August 31 in years of average or above-average rainfall.
- Sufficient water will continue to be provided to cattle, as needed, while maintaining target aquatic conditions in the pond and wetland.
- The vegetation surrounding the on-site pond will continue to allow the passage of California tiger salamanders, California red-legged frogs, and western pond turtles to and from the pond.
- Vegetation within the pond will be managed when it exceeds 50% cover, but some emergent vegetation will be maintained to provide suitable egg mass attachment sites for California red-legged frogs.
- Numbers of bullfrogs and crayfish in the pond will be managed at levels below current conditions.

Monitoring Protocol

Compliance Monitoring

Monitoring described in the MMP will ensure compliance with the ecological performance standards described in that document. In Years 1–5, the Reserve Manager will summarize in annual reports the results of monitoring prescribed in the MMP.

Effectiveness Monitoring

After all MMP-related monitoring and success criteria have been met, monitoring will focus primarily on long-term effectiveness of the site in continuing to provide the target functions and values.

- At least one annual walk-through survey will be conducted in the spring (March–May) to qualitatively monitor the general condition of these habitats. General topographic conditions, hydrology, general

vegetation cover and composition, invasive species, and erosion will be noted, evaluated, and mapped during a site examination in the spring. Notes to be made will include observations of species encountered, water quality, general extent of wetlands, and any occurrences of erosion and weed invasion.

- In Year 1, visually document the baseline quality and function of the pond and wetlands at the pond and wetland mitigation sites. This includes an assessment of the following:
  - Extent and relative cover of native emergent vegetation.
  - Capacity and ponding duration.
  - Abundance of aquatic invasive plants and animals in the aquatic feature.
- Utilize photographic reference sites developed during the interim (5-year) management period and conduct visual monitoring and photodocumentation at the pond and wetland mitigation sites annually in spring to track the variability in water levels and changes in vegetation in the pond and around the pond perimeter over time.

Adaptive Management

If success criteria are not being met, the Habitat Agency will work with the Reserve Manager to modify management techniques, or the Habitat Agency will implement site-specific projects. Management modifications could include a combination of changes such as temporary grazing exclusion, sediment removal, and/or predator control. All remedial removal of vegetation on the property, including grazing of areas from which cattle are to normally excluded, will avoid the bird nesting season (February 1–August 31) to avoid potential impacts on native nesting birds. If vegetation removal will occur within pond or wetland areas at the pond mitigation site, these activities will occur in the fall (i.e., after mid-September), after the pond has been drained, to avoid potential impacts on covered amphibians. In the future, as more information is gained regarding the relationship between pond levels and precipitation amounts and patterns, water level monitoring may become more automated and field effort may be reduced as feasible.

Element A.2 California Tiger Salamander

Applicable Habitat Plan Goals, Objectives, and Management Actions

Conserve existing populations of California tiger salamanders, and increase the number of individuals and expand the overall distribution of populations of this species in biologically appropriate locations to maintain viable populations and contribute to the regional recovery of this species (Goal 17). This goal includes objectives to reduce predators and competitor species, and graze around or mechanically thin around pond perimeters (Objectives 17.3, 17.4, POND-1, POND-2, POND-3, POND-4, POND-5, LM-11, and LM-13).

Baseline Conditions

A focused survey of the pond restoration site determined that California tiger salamanders bred at this location in 2016 (Camara 2016). Thus, the baseline condition for California tiger salamanders is that this species is present and breeding at the pond restoration site.

Although California tiger salamanders were also determined to be present and breeding at the wetland restoration site, only a single larva was detected, and it is unlikely that this small wetland supports successful breeding (i.e., larval development and metamorphosis) by California tiger salamanders even though the species may breed there in small numbers. Thus, breeding by California tiger salamanders in the on-site wetland is not the focus of the long-term monitoring, and no future surveys for California tiger salamanders at the wetland restoration site are proposed.

5-Year Conditions

At 5-year intervals, the description of site conditions will be updated as needed to inform ongoing management.

Property Management Objectives

Property management objectives for the California tiger salamander are to maintain high-quality habitat conditions at the on-site pond by maintaining a deeper pond, managing populations of aquatic predators, and managing the extent of vegetation within and around the pond.

Management Actions

Management actions that specifically benefit the California tiger salamander are a subset of those described in detail under *Element A.1 Waters of the U.S., Including Wetlands*, above. In brief, those that are most beneficial to California tiger salamanders are:

- Monitoring the density of vegetation within and around the pond, and managing this vegetation if it becomes too dense.
- Draining the pond and adjacent wetland annually as needed to manage populations of bullfrogs and crayfish in the pond.

Success Criterion

Success criteria related to habitat conditions are provided under *Element A.1 Waters of the U.S.*, above. The success criterion specific to California tiger salamander use of the site is:

- Continued successful breeding by California tiger salamanders in the on-site pond.

Monitoring Actions

Compliance Monitoring

Monitoring described in the MMP will ensure compliance with the ecological performance standards described in that document. In Years 1–5, the Reserve Manager will summarize in annual reports the results of monitoring prescribed in the MMP.

Effectiveness Monitoring

After all MMP-related monitoring and success criteria have been met, monitoring will focus primarily on long-term effectiveness of the site in continuing to provide the target functions and values.

- A qualified biologist, approved by the Habitat Agency according to the terms of the Habitat Plan, will conduct dipnet larval surveys for California tiger salamanders in the pond in April-May once a year for the first 5 years, and one out of every 3-5 years in subsequent years. Survey methods will follow those described in the most recent Wildlife Agency protocol (currently USFWS and California Department of Fish and Game [2003]), except that the first survey will be performed in April, and if no California tiger salamanders are detected during that survey, a second survey will be performed in May.
- If tiger salamanders are detected, record the number of adults, larvae, and egg masses observed, as well as the total number of dipnet samples (to enable relative abundance estimates, i.e., number of animals per sample).
- Assess general condition of plant species or other features being used for egg attachment, depth, turbidity, and pond temperature.
- Record the presence and numbers of nonnative predators and suspected nonnative hybrid (California x barred) tiger salamanders observed during all aquatic surveys.
- If the pond is unoccupied, identify potential factors hindering successful breeding at that location.
- In addition to the focused monitoring for California tiger salamanders described above, presence, abundance, evidence of reproduction or mortality, and other evidence of California tiger salamander use of (and success in) the on-site pond will be collected incidentally if observed during other site monitoring activities.

Adaptive Management

If the pond later becomes unoccupied by breeding California tiger salamanders, the Habitat Agency will consider the potential causes, both natural and anthropogenic, of absence of the species, discuss the potential causes with the Wildlife Agencies, and decide on future management actions that may reestablish species presence.

If monitoring indicates that chytrid fungus, other diseases, and/or nonnative hybrid salamanders may pose a threat to California tiger salamanders on the site, the Habitat Agency will notify and coordinate with the Wildlife Agencies regarding management actions and/or targeted studies to be implemented to prevent population decline. For example, drawdown of the pond earlier in summer may reduce the pond's suitability for use by nonnative tiger salamanders (although this measure may not be implemented if it reduces successful breeding by red-legged frogs).

If dipnet surveys prove insufficient to track the California tiger salamander presence over time, more intensive field surveys (e.g., seine surveys) and/or statistical (e.g., occupancy modeling) methods may be explored as part of the targeted studies phase of Habitat Plan implementation.

Element A.3 California Red-legged Frog

Applicable Habitat Plan Goals, Objectives, and Management Actions

Conserve existing populations of California red-legged frogs, and increase the number of individuals and expand the overall distribution of populations of this species in biologically appropriate locations within the study area to maintain viable populations and contribute to the regional recovery of this species (Goal 17). This goal includes objectives to reduce nonnative predators, restore perennial wetlands, install fencing to reduce grazing pressure on ponds, install woody debris around pond perimeters, and plant native vegetation around pond perimeters (Objectives 17.3, 17.4, POND-1, POND-2, POND-3, POND-4, POND-5, LM-11, and LM-13).

Baseline Conditions

California red-legged frogs are not known to breed or occur on the property. A focused survey for this species in 2016 did not detect larvae at the pond or wetland restoration sites (Camara 2016). The nearest record is an individual observed in a pool approximately 1.4 mile to the south in Cherry Creek in 1998 (CNDDB 2016). Because the pond currently provides suitable hydroperiod for successful breeding only in wet years, inadequate emergent vegetation for egg mass attachment is present, and nonnative aquatic predators are fairly abundant, the pond is not expected to provide suitable breeding habitat for California red-legged frogs in its existing condition. Thus, the baseline condition for California red-legged frogs on the property is that the species is considered absent due to the low quality of the habitat, the lack of nearby records, and because the species was not detected during the 2016 focused survey.

5-Year Conditions

At 5-year intervals, the description of site conditions will be updated as needed to inform ongoing management.

Property Management Objectives

Property management objectives for the California red-legged frog are to maintain high-quality habitat conditions at the on-site pond by maintaining a deeper pond, maintaining native wetland vegetation, managing the extent of vegetation within and surrounding the pond while providing emergent vegetation that is suitable for egg mass attachment, and managing populations of aquatic predators.

Management Actions

Management actions that specifically benefit the California red-legged frog are a subset of those described in detail under *Element A.1 Waters of the U.S., Including Wetlands*, above. In brief, those that are most beneficial to California red-legged frogs are:

- Monitoring and maintaining water levels in the pond to ensure that the deepened portion of the pond retains at least two feet of water through August.
- Monitoring cattle exclusion fencing, and maintaining it as necessary, to protect native vegetation in and around the pond.
- Monitoring the density of vegetation within and around the pond, and managing this vegetation if it becomes too dense while providing emergent vegetation that is suitable for egg mass attachment.
- Draining the pond and adjacent wetland as needed to manage populations of bullfrogs and crayfish in the pond.

Success Criterion

Success criteria related to habitat conditions are provided under *Element A.1 Waters of the U.S.*, above. The success criterion specific to California red-legged frog use of the site is:

- Successful breeding by California red-legged frogs in the on-site pond.

Monitoring Actions

Compliance Monitoring

Monitoring described in the MMP will ensure compliance with the ecological performance standards described in that document. In Years 1–5, the Reserve Manager will summarize in annual reports the results of monitoring prescribed in the MMP.

Effectiveness Monitoring

After all MMP-related monitoring and success criteria have been met, monitoring will focus primarily on long-term effectiveness of the site in continuing to provide the target functions and values.

- A qualified biologist, approved by the Habitat Agency according to the terms of the Habitat Plan, will conduct nighttime visual encounter surveys for California red-legged frogs in the pond and wetland in March–April once a year for the first 5 years, and one out of every 3-5 years in subsequent years. The general survey methods will follow those in the most recent Wildlife Agency protocol (currently USFWS [2005b]), except that only a single nighttime survey will be performed in March–April, and if no California red-legged frogs are detected during that survey, a second nighttime survey will be performed in May.
- If red-legged frogs are detected, record the number of adults, larvae, and egg masses observed, as well as the amount of time spent surveying (to enable relative abundance estimates, i.e., number of animals per sample or per unit time).
- Assess general condition of plant species or other features being used for egg attachment, depth, turbidity, and pond temperature.

- Record the presence and numbers of nonnative predators observed during all aquatic surveys.
- If the pond and/or wetland is unoccupied, identify potential factors hindering successful breeding at the pond and/or presence at the wetland.
- In addition to the focused monitoring for California red-legged frogs described above, presence, abundance, evidence of reproduction or mortality, and other evidence of California red-legged frog use of (and success in) the on-site pond will be collected incidentally if observed during other site monitoring activities.

Adaptive Management

If the baseline conditions surveys or subsequent annual surveys determine that the pond is occupied by breeding and foraging California red-legged frogs and/or that the wetland is occupied by foraging California red-legged frogs and the pond and/or wetland later become unoccupied, the Habitat Agency will consider the potential causes, both natural and anthropogenic, of absence of the species, discuss the potential causes with the Wildlife Agencies, and decide on future management actions that may reestablish species presence.

If monitoring indicates that chytrid fungus or other diseases may pose a threat to California red-legged frogs on the site, the Habitat Agency will notify and coordinate with the Wildlife Agencies regarding management actions and/or targeted studies to be implemented to prevent population decline.

If visual encounter surveys prove insufficient to track California red-legged frog presence over time, more intensive field (e.g., hand capture, seine, dipnetting) and/or statistical (e.g., occupancy modeling) methods may be explored as part of the targeted studies phase of Habitat Plan implementation.

Element A.4 Western Pond Turtle

Applicable Habitat Plan Goals, Objectives, and Management Actions

Conserve existing populations of the western pond turtle, and increase the number of individuals and expand the overall distribution of populations of this species in biologically appropriate locations within the study area to maintain viable populations and contribute to the regional recovery of the species (Goal 17). This goal includes objectives to restore perennial wetlands, install fencing to reduce grazing pressure on ponds and wetlands, install woody debris around ponds, and plant native vegetation around ponds (Objectives 17.3, 17.4, POND-1, POND-2, POND-3, POND-4, POND5, LM-11, and LM-13).

Baseline Conditions

Three western pond turtles were observed in the pond during surveys for this species in 2012 (H. T. Harvey & Associates 2012), one individual was observed by an H. T. Harvey & Associates restoration ecologist during a site visit on February 10, 2016, two individuals were observed by an H. T. Harvey & Associates wildlife ecologist Steve Rottenborn during a site visit on March 23, 2016, and one individual was observed during a focused survey for special-status amphibians on May 23, 2016 (Camara 2016), indicating that this species is currently

using the pond. Pond turtles have not been observed at the wetland mitigation site, but this habitat is too small to provide more than opportunistic foraging and dispersal habitat for the species.

5-Year Conditions

At 5-year intervals, the description of site conditions will be updated as needed to inform ongoing management.

Property Management Objectives

Property management objectives for the western pond turtle are to maintain high-quality habitat conditions at the on-site pond by maintaining a deeper pond, excluding cattle grazing, and installing coarse woody debris as basking habitat.

Management Actions

Management actions that specifically benefit the western pond turtle are a subset of those described in detail under *Element A.1 Waters of the U.S., Including Wetlands*, above. In brief, those that are most beneficial to western pond turtles are:

- Monitoring and maintaining water levels in the pond to ensure that the deepened portion of the pond retains at least two feet of water through August.
- Monitoring cattle exclusion fencing, and maintaining it as necessary, to protect native vegetation in and around the pond.
- Monitoring the density of vegetation within and around the pond, and managing this vegetation if it becomes too dense.

Success Criterion

Success criteria related to habitat conditions are provided under *Element A.1 Waters of the U.S.*, above. The success criterion specific to western pond turtle use of the site is:

- Continued presence of western pond turtles in the on-site pond.

Monitoring Actions

Compliance Monitoring

Monitoring described in the MMP will ensure compliance with the ecological performance standards described in that document. In Years 1–5, the Reserve Manager will summarize in annual reports the results of monitoring prescribed in the MMP.

Effectiveness Monitoring

After all MMP-related monitoring and success criteria have been met, monitoring will focus primarily on long-term effectiveness of the site in continuing to provide the target functions and values.

- A qualified biologist, approved by the Habitat Agency according to the terms of the Habitat Plan, will conduct visual encounter surveys for western pond turtles in the pond in March–April once a year for the first 5 years, and one out of every 3-5 years in subsequent years. Surveys will occur on sunny days (not overcast or during rain events) during daylight hours, when sustained winds are less than 10 miles per hour and temperatures are between 60°F and 95°F. These conditions are most conducive for basking by western pond turtles. These surveys will be conducted concurrently with site visits for California tiger salamander surveys to the extent feasible.
- If western pond turtles are detected, record the number of adults and juveniles observed, as well as the sex of each individual.
- Assess general condition of the pond for western pond turtles (i.e., extent of open water and availability of basking habitat).
- If the pond is unoccupied, identify potential factors contributing to the absence of pond turtles.
- In addition to the focused monitoring for western pond turtles described above, presence, abundance, evidence of reproduction or mortality, and other evidence of western pond turtle use of the on-site pond will be collected incidentally if observed during other site monitoring activities.

Adaptive Management

If pond turtles are determined to be absent in a given year, the Habitat Agency will consider the potential causes, both natural and anthropogenic, of absence of the species, discuss the potential causes with the Wildlife Agencies, and decide on future management actions that may reestablish species presence.

Element A.5. Mt. Hamilton Thistle

Requirements for All Covered Plant Species

To ensure that the Habitat Plan adequately protects covered plant species, the Habitat Plan requires an evaluation of the "condition" of each plant occurrence. For the purposes of the Habitat Plan, "good condition" of a covered plant occurrence is defined as having a high potential to increase in size with improved management. The condition of a plant occurrence will be assessed in the field by a qualified botanist on the basis of physical health, age structure, reproductive success, availability and diversity of suitable habitat, and threats, as described in the Habitat Plan.

Additionally, a permanent conservation seed bank will be established in the National Collection of Endangered Plants operated by the Center for Plant Conservation as a national repository of endangered plant seed stock. Seeds will be deposited at a local custodial institution (e.g., a botanical garden) designated by the Center for

Plant Conservation. The occurrence of the Mt. Hamilton thistle on the site will be represented in the conservation seed bank unless collection would pose a threat to the occurrence's continued existence. The seed bank will be replenished as necessary to maintain the genetic integrity of the stock. The conservation seed bank will serve as a repository of the species to guard against extinction of the species from chance catastrophic events and to provide potential material for enhancement efforts in existing occurrences, repatriations, or introductions to new sites.

Applicable Habitat Plan Goals, Objectives, and Management Actions

Maintain viability, protect, and increase the size and number of populations of Mt. Hamilton thistle (Goal 20). This goal includes an objective to increase the size of Mt. Hamilton thistle occurrences (Objective 20.10).

Baseline Conditions

There is one known occurrence of Mt. Hamilton thistle in the coastal and valley freshwater marsh habitat located north of the Almaden-Calero Canal at the pond mitigation site. All individual Mt. Hamilton thistle plants within the on-site occurrence will be mapped. The number of individuals, percent cover, condition of the occurrence, threats and adjacent land uses, and location (polygon data) of the occurrence using a GPS will be recorded. One photo of the occurrence location (to show habitat conditions, and the thistle plants to the extent feasible) will be taken. The location (point data) where the photo is taken will be documented using a GPS unit so that photos can be captured at the same location during subsequent visits.

5-Year Conditions

At 5-year intervals, the description of site conditions will be updated as needed to inform ongoing management.

Property Management Objectives

Property management objectives for Mt. Hamilton thistle are to restore seasonal wetland habitat by excluding cattle, and to establish new seasonal wetland habitat by converting uplands to wetlands. Mt. Hamilton thistle seed may be applied at the wetland mitigation site as a voluntary enhancement measure to attempt to establish a population at this site, but establishment of the species at the wetland mitigation site is not a formal mitigation objective.

Management Actions

Management actions that specifically benefit Mt. Hamilton thistle are a subset of those described in detail under Element A.1 *Waters of the U.S., Including Wetlands*, above, and *Element A.6 Invasive Plant Management*, below. In brief, those that are most beneficial to Mt. Hamilton thistle are:

- Maintain cattle exclusion fencing around wetland areas, and graze these areas only as needed to control vegetation.

- Manage the spread of invasive plant species, which may compete with Mt. Hamilton thistle.
- Maintain seep inflow to the pond.

Success Criterion

Success criteria related to habitat conditions are provided under *Element A.1 Waters of the U.S.*, above. The success criterion specific to Mt. Hamilton thistle occurrence on the site is:

- Maintain a stable or increasing population of Mt. Hamilton thistle at the pond mitigation site.

Monitoring Actions

Compliance Monitoring

Monitoring described in the MMP will ensure compliance with the ecological performance standards described in that document. In Years 1–5, the Reserve Manager will summarize in annual reports the results of monitoring prescribed in the MMP.

Effectiveness Monitoring

After all MMP-related monitoring and success criteria have been met, monitoring will focus primarily on long-term effectiveness of the site in continuing to provide the target functions and values.

- Monitoring of Mt. Hamilton thistle will occur annually during the first 5 years and in one out of every 3-5 years at the pond and wetland mitigation sites[1] (USFWS 1998). Data collection will follow the methodology described under *Baseline Conditions*, above; however, monitors will also look for any new threats and/or management issues and determine (if possible) if any individuals have been removed or damaged. Surveys for this species will occur when this species is in bloom (between February and October), which can be identified incidentally during other site monitoring activities.
- At the permanent photo documentation station established during baseline surveys of the pond site, take a photograph to document habitat conditions, and the thistle plants to the extent feasible, during each year in which monitoring occurs. Identify nearby invasive plant infestations that may require management. Update the GIS database on an annual basis. This same procedure will be followed at the wetland mitigation site if Mt. Hamilton thistle seeding is implemented there.
- Baseline data will serve as the standard against which future changes are measured. After each Mt. Hamilton thistle monitoring effort, compare the monitoring results to the baseline and look for trends to indicate if the success criteria are being met and management is successful.

[1] Although Mt. Hamilton thistle is currently present only at the pond mitigation site, suitable habitat for this species is present at the wetland mitigation site and the MMP includes possible (optional) seeding of the wetland mitigation site with Mt. Hamilton thistle seed. Thus, future surveys for this species will include both the pond and wetland mitigation sites.

- In addition to the focused monitoring for Mt. Hamilton thistle described above, presence, abundance, evidence of reproduction or mortality, and other observations relevant to Mt. Hamilton thistle management will be collected incidentally if observed during other site monitoring activities.
- One out of every 5 years (to allow for a good rainfall year), during the Mt. Hamilton thistle monitoring site visit, a survey of the entirety of the pond and wetland mitigation sites will be conducted for covered plant species to identify any new locations or new species in the project area.

Adaptive Management

If the number of individuals, percent cover, or condition of the Mt. Hamilton thistle occurrence at the pond site declines, the Habitat Agency will consider the potential causes, both natural and anthropogenic, of the decline, discuss the potential causes with the Wildlife Agencies, and decide on future management actions that may help to maintain a stable or increasing population.

Element A.6 Invasive Plant Management

Applicable Habitat Plan Goals, Objectives, and Management Actions

Maintain, enhance, and create or restore functional pond, freshwater perennial wetland, and seasonal wetland habitats that benefit covered species and promote native biodiversity (Goal 10). This goal includes objectives to eradicate or reduce the cover of nonnative invasive plants (Objectives 3.1, 3.3, and LM-11).

Baseline Conditions

Long-term management of invasive plants will focus on control of plant species with a Cal-IPC "Impact" or "Invasiveness" rating of Moderate or High (referred to below as "target invasive plants"). Therefore, baseline invasive plant surveys will focus on characterizing the distribution and abundance of invasive species with these Cal-IPC ratings. To establish baseline conditions with respect to invasive plants, a qualified plant ecologist will conduct a single focused visual survey of the pond and wetland mitigation sites annually in late June or early July during the first 3 years of management. Using these data, a baseline map will be developed that depicts the extent and severity (high density: 51–100% of area; medium: 26–50%; low density: 6–25%) of the target invasive plants.

Nonnative, invasive plant species that are known to be present at the pond mitigation site are the Himalayan blackberry (Cal-IPC rating "High"), black mustard (*Brassica nigra*) (Cal-IPC rating "Moderate"), and yellow star-thistle (*Centaurea solstitialis*) (Cal-IPC rating "High"). No nonnative, invasive plant species are known to be present at the wetland mitigation site. However, pampas grass (*Cortaderia selloana*) (Cal-IPC rating "High") occurs in the site vicinity along the Almaden-Calero Canal. Other invasive species, such as purple star-thistle (*Centaurea calcitrapa*) (Cal-IPC rating "Moderate") and barbed goatgrass (*Aegilops triuncialis*) (Cal-IPC rating "High"), are known to occur in the region, and they will be looked for as well.

5-Year Conditions

At 5-year intervals, the description of site conditions will be updated as needed to inform ongoing management.

Property Management Objectives

Monitor and maintain control over invasive plant species, including but not limited to noxious weeds that diminish site quality for which the conservation site was established. The land manager shall consult the following sources for guidance on what species may threaten the site and on management of those species: The California Department of Food and Agriculture list of "noxious weeds" that are subject to regulation or quarantine by county agricultural departments, the California Department of Food and Agriculture's Integrated Pest Control Branch, and the University of California State Integrated Pest Management Program list of "Exotic and invasive pests and diseases that threaten California's agricultural, urban, or natural areas".

Control infestations of target invasive plant species, including Himalayan blackberry, black mustard, yellow star-thistle, pampas grass, and any others that may be present, throughout the property (i.e., within all wetland and upland habitats on the site).

Management Actions

- Monitor occurrences of target invasive plants at the pond and wetland mitigation sites in late June or early July, when they are most easily detected. Monitoring will be performed annually in Years 1–3 to establish a baseline, and every 5 years thereafter to maintain site conditions. If occurrences of invasive plants are determined to be increasing in extent, or if they are threatening the quality of the most beautiful jewelflower or Mt. Hamilton thistle occurrences on the property, use pulse grazing, mowing, or hand removal (as appropriate) to control the vegetation.

Success Criterion

Success criteria related to habitat conditions are provided under *Element A.1 Waters of the U.S.*, above. The success criterion specific to nonnative invasive plants on the site is:

- The extent and abundance of target invasive plant species does not increase over time.

Monitoring Actions

Compliance Monitoring

Monitoring described in the MMP will ensure compliance with the ecological performance standards described in that document. In Years 1–5, the Reserve Manager will summarize in annual reports the results of monitoring prescribed in the MMP.

Effectiveness Monitoring

After all MMP-related monitoring and success criteria have been met, monitoring will focus primarily on long-term effectiveness of the site in continuing to provide the target functions and values.

- A walk-through survey will be conducted in late June or early July, when the target invasive plants are flowering, annually in Years 1–5 and every 5 years thereafter to identify the locations of invasive plants.
- The extent and severity of target invasive plant species (listed above) will be mapped throughout the property using GPS polygon mapping. This task will entail developing maps and descriptions of the distribution and abundance of target invasive plant species, their known or potential effects on ecosystem function, native biological diversity, sensitive natural communities, covered species, and the means and risk of the spread of invasive species to other areas within and outside the property. New sites will be identified for invasive plant management on an eradication map where invasive plant treatment will occur. Multiple sites may be selected for the application of different treatment methods.
- Pulse grazing, mowing, weed-whacking, or hand removal will be used as needed to reduce the extent and severity of invasive plants on the property. Weed-whacking or hand removal would be appropriate control methods on the steep quarry slopes at the wetland mitigation site, while grazing is appropriate for other areas of the property. This will be done four times a year in Years 1–5 and annually thereafter.

Adaptive Management

Every 5 years, the Reserve Manager will compare the invasive species survey/eradication maps and adjust management activities accordingly. If the extent and abundance of any of the target invasive plant species increases, the effectiveness monitoring and adaptive management may need to occur more frequently than every 5 years. In addition, the Reserve Manager will work with the grazing tenant to modify grazing management on the site, if that is determined to be an appropriate management action. The Reserve Manager may also discuss alternative invasive plant management strategies or modifications to existing strategies with invasive plant species control specialists, other land managers in the region, and the Wildlife Agencies to ensure that best management techniques are being utilized.

4.2 Security, Safety, and Public Access

Element B.1 Mosquito Abatement and Fire Hazard Reduction

Baseline Conditions

The extent to which the pond and wetland support mosquitos is currently unknown. No known fire hazards (e.g., ignition sources) are currently present at either site. The pond and wetland have no general public access. Ongoing uses include grazing by cattle outside of fenced areas, and livestock access to the unfenced portion of the pond and to water troughs.

5-Year Conditions

At 5-year intervals, the description of site conditions will be updated as needed to inform ongoing management.

Property Management Objectives

Minimize potential hazards associated with fire risk and mosquitos.

Management Actions

- Potential mosquito abatement issues will be addressed through the development of a plan by the land manager and the mosquito and vector control district in coordination with and approved by the regulatory agencies.
- If wildlife fuels are determined to present a hazard, they will be reduced as needed in early summer (i.e., May–June) by mowing or grazing in areas where approved by the regulatory agencies.

Success Criterion

- The site will be maintained so as not to provide a substantial source of mosquitos or fire hazard

Monitoring Protocol

- At least one annual walk-through survey will be conducted in spring (i.e., March-May) to qualitatively monitor potential wildfire fuels and determine whether the site poses a substantial risk with respect to mosquito production or fire hazard. Notes will be made to assess any hazards observed.

Adaptive Management

If success criteria are not being met, the Habitat Agency will work with the Reserve Manager to modify management techniques, or the Habitat Agency will implement site-specific projects. Management modifications could include draining the pond more frequently (e.g., annually, if draining the pond is not already occurring that frequently for management of nonnative aquatic predators) to reduce mosquitos or increasing grazing pressure on the site to reduce fuel levels.

Element B.1 Trash and Trespass

Baseline Conditions

The site is not currently accessible to the public, and is maintained by the Santa Clara County Parks and Recreation Department. No trash was noted on the site during the site visits, and no instances of trespass or vandalism on the site are known.

5-Year Conditions

At 5-year intervals, the description of site conditions will be updated as needed to inform ongoing management.

Property Management Objectives

- Monitor sources of trash and trespass.
- Collect and remove trash, repair vandalized structures, and rectify trespass impacts.

Management Actions

- During each site visit, monitoring personnel will remove trash from the site and record instances of trash and/or trespass.
- At least once annually, repair or replace vandalized structures (e.g., gates and fencing) as needed.

Success Criterion

- Prevent degradation of habitats or infrastructure on the property due to unauthorized human use.

Monitoring Protocol

- During each site visit, record occurrences of trash and/or trespass. Record type, location, and management recommendations to avoid, minimize, or rectify a trash and/or trespass impact.

Adaptive Management

If success criteria are not being met, the Habitat Agency will work with the Reserve Manager to modify management techniques, or the Habitat Agency will implement site-specific projects. Management modifications could include adding "No Trespassing" signs or other informational signage to discourage unauthorized public access, littering, and/or vandalism.

4.3 Reporting and Administration

Element C.1 Annual Report

Property Management Objective

Provide an annual report describing all management and monitoring tasks conducted as well as general site conditions to the Wildlife Agencies and any other appropriate parties.

Reporting Actions

- Prepare annual report and any other additional documentation. Include a summary. Complete and circulate to the Wildlife Agencies and other parties by December 31 of each year. Ultimately, when the Calero Reserve is enrolled into the Habitat Plan Reserve System, reporting for the Calero County Park Pond and Wetland Restoration project will likely be performed in the context of the broader reporting conducted per the Calero Reserve Management and Monitoring Plan (which has not yet been prepared).

- Make recommendations with regard to (1) any habitat enhancement measures deemed to be warranted, (2) any problems that need short and long-term attention (e.g., weed removal, fence repair, erosion control), and (3) any changes in the monitoring or management program that appear to be warranted based on monitoring results to date.

Section 5. Transfer, Replacement, Amendments, and Notices

5.1 Transfer

Any subsequent transfer of responsibilities under this long-term management plan to a different land manager shall be requested by the land manager in writing to the regulatory agencies, shall require written approval by the regulatory agencies, and shall be incorporated into this long-term management plan by amendment. Any subsequent Property Owner assumes land manager responsibilities described in this long-term management plan and as required in the Conservation Easement, unless otherwise amended in writing by the regulatory agencies.

5.2 Replacement

If the land manager fails to implement the tasks described in this long-term management plan and is notified of such failure in writing by any of the regulatory agencies, land manager shall have 90 days to cure such failure. If failure is not cured within 90 days, land manager may request a meeting with the regulatory agencies to resolve the failure. Such meeting shall occur within 30 days or a longer period if approved by the regulatory agencies. Based on the outcome of the meeting, or if no meeting is requested, the regulatory agencies may designate a replacement land manager in writing by amendment of this long-term management plan. If land manager fails to designate a replacement land manager, then such public or private land or resource management organization acceptable to and as directed by the regulatory agencies may enter onto the Bank property in order to fulfill the purposes of this long-term management plan.

5.3 Amendments

The land manager**,** property owner**,** and the regulatory agencies may meet and confer from time to time, upon the request of any one of them, to revise the long-term management plan to better meet management objectives and preserve the habitat and conservation values of the property. Any proposed changes to the long-term management plan shall be discussed with the regulatory agencies and the land manager. Any proposed changes will be designed with input from all parties. Amendments to the long-term management plan shall be approved by the regulatory agencies in writing shall be required management components and shall be implemented by the land manager.

If the CDFW or USFWS determine, in writing, that continued implementation of the long-term management plan would jeopardize the continued existence of a state or federally listed species, any written amendment to this long-term management plan, determined by either the CDFW or USFWS as necessary to avoid jeopardy, shall be a required management component and shall be implemented by the land manager.

5.4 Notices

Any notices regarding this long-term management plan shall be directed as follows:

Land Manager (name, address, telephone and FAX)

Santa Clara Valley Habitat Agency
535 Alkire Avenue
Morgan Hill, CA 95037
Telephone: (408) 779-7261

Property Owner (name, address, telephone and FAX)

Santa Clara County Parks and Recreation Department
298 Garden Hill Drive
Los Gatos, CA 95032
Telephone: (408) 355-2290
Fax: (408) 355-2290

Regulatory Agencies, Signatory Agencies:

U.S. Army Corps of Engineers
San Francisco District
1455 Market Street, San Francisco, CA 95814
Attn: Chief, Regulatory Branch
Telephone: (415) 503-6804
Fax: (408) 503-6690

U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Attn: Field Supervisor
Telephone: (916) 414-6600
Fax: (916) 414-6713

U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105

Attn: Director, Water Division
Telephone: 415-947-8707
Fax: 415-947-3549

California Department of Fish and Wildlife
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
Attn: Regional Manager
Telephone: (707) 944-5500
Fax: (707) 944-5563

California Department of Fish and Wildlife
Habitat Conservation Branch
1416 Ninth Street, 12th Floor
Sacramento, CA 95814
Attn: Branch Chief
Telephone: 916-653-4875
Fax: 916-653-2588

Section 6. Funding and Task Prioritization

6.1 Funding

Table 1 summarizes the anticipated costs of long-term management for the property. These costs include estimates of time and funding needed to conduct the monitoring site visits described in this LTMP and reporting, weed management, trash removal, fence repair, and a prorated calculation of funding needed to fully replace the fences every 30 years. The total annual funding anticipated is approximately $**21,925**, therefore, with the current annual estimated capitalization rate of 3.5% the total endowment amount required will be $**626,429**. The Habitat Agency will provide an annual assurance in its budget that these funds are available to address LTMP costs.

These interest monies will fund the long-term management, enhancement, and monitoring activities on habitat lands in a manner consistent with this long-term management plan.

6.2 Task Prioritization

Due to unforeseen circumstances, prioritization of tasks, including tasks resulting from new requirements, may be necessary if insufficient funding is available to accomplish all tasks. The land manager and the regulatory agencies shall discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order: 1) required by a local, state, or federal agency; 2) tasks necessary to maintain or remediate habitat quality; and 3) tasks that monitor resources, particularly if past monitoring has not shown downward trends. Equipment and materials necessary to implement priority tasks will also be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the regulatory agencies and as authorized by the regulatory agencies in writing.

Table 2. Property Management and Monitoring Activities, Level of Effort, Frequency, and Cost.*

General Management and Monitoring Activities	Description	Level of Effort	Cost per Unit	Cost	Frequency	Schedule	Annual Cost
A. Biological Resources							
Element A.1 Waters of the U.S., Including Wetlands							
Monitor waters of the U.S.	Visually inspect depth gauges and/or use automated water level recorders.	Concurrent with other tasks.	$167/hour	N/A	Concurrent with other site visits, including once in late August–early September.	Concurrent with other site visits, including once in late August–early September.	N/A
Qualitatively monitor habitat conditions.	Conduct a walk-through survey to visually assess topographic conditions, hydrology, general vegetation cover and composition, invasive species, and erosion. Photograph the pond vegetation from established points.	10 hours	$167/hour	$1,670	Annually	March–May	$1,670
Ensure that California tiger salamanders, California red-legged frogs, and western pond turtles can continue to access the pond.	Visually inspect the density of vegetation around the on-site pond to assess whether California tiger salamanders, California red-legged frogs, and western pond turtles can continue to move to and from the pond. Visually inspect the percent cover of vegetation in the open water pond habitat.	Concurrent with other tasks.	$167/hour	N/A	Annually	March–May	N/A
Monitor fence infrastructure.	Conduct a visual inspection by walking the perimeter of all fencing.	Concurrent with other tasks.	$167/hour	N/A	Annually	March–May	N/A

General Management and Monitoring Activities	Description	Level of Effort	Cost per Unit	Cost	Frequency	Schedule	Annual Cost
Maintain seep inflow into the pond.	Visually inspect the springbox at the pond restoration site and clear it of debris manually using a shovel. Visually inspect the collection ditch and clear it of debris manually using a shovel. Clean the pipe from the springbox to the pond restoration area. Inspect the grate at the pipe inlet and repair as needed. Visually inspect the outlet structure at the pond restoration site and manually clear it of debris and sediment with a shovel.	12 hours for two staff	$70/hour + $50/vehicle/day	$1,780	Three times annually	April–May after the rainy season, and up to 2 times during the winter after significant rain events	$5,340
Continue to provide water to cattle at the pond, and maintain associated infrastructure.	Clear sediment from trap and splitter valve, replace infrastructure as needed (assume annually), flush 4-inch pipes, and remove sediment from troughs.	12 hours	$70/hour + $50/vehicle/day + $200 parts	$1,140	Annually	April–May, after the rainy season	$1,140
Continue to provide water to cattle at the wetland, and maintain associated infrastructure.	Clean the pipes that convey water to troughs and a storage tank at the wetland restoration site, and clear the troughs of sediment.	5 hours	$70/hour + $50/vehicle/day + $100 parts	$500	Annually	March–May	$500
Continue to provide water to cattle and maintain associated	Visually inspect the outlet structure at the pond restoration site, and manually clear it of debris	8 hours	$70/hour + $50/vehicle/day	$610	Annually in years when the pond is drained	September–October, prior to winter rains.	$305

General Management and Monitoring Activities	Description	Level of Effort	Cost per Unit	Cost	Frequency	Schedule	Annual Cost
infrastructure at the pond.	using a shovel. Also clear any remaining sediment in the vicinity of the outlet structure. Place the sediment in the spoils pile area and cover with weed-free straw mulch.				(assume every other year)		
Continue to provide water to cattle and maintain associated infrastructure at the wetland.	Visually inspect the exposed portion of the outlet structure at the pond restoration site and manually clear it of debris.	1 hour	$70/hour	$70	Up to twice annually in conjunction with seep collection system and maintenance	During the winter after significant rain events.	$140
Continue to provide water to cattle and maintain associated infrastructure at the wetland.	Visually inspect the outlet structure at the wetland restoration site, and manually clear it of debris using a shovel. Concurrently inspect the overflow weir for damage and replace this weir as needed.	3 hours	$70/hour + $50/vehicle/day	$260	Three times annually	April–May after the rainy season, and up to 2 times during the winter after significant rain events	$260
Control populations of Louisiana red swamp crayfish and bullfrogs in the pond.	Drain the pond and adjacent wetland at the pond restoration site.	1	$560	$560	Annually as needed (assume every other year)	August–October	$560
Ensure that California tiger salamanders, California red-legged frogs, and western pond turtles can continue to access the pond.	If dense vegetation becomes established around the pond that would potentially prevent covered species from accessing the pond (as determined by the spring assessment), use pulse grazing, mowing, or hand removal to control the vegetation.	4 hours	$70/hour	$260	Annually as needed (assume every 5 years)	After mid-September	$52

General Management and Monitoring Activities	Description	Level of Effort	Cost per Unit	Cost	Frequency	Schedule	Annual Cost
	If vegetation cover in the open water area of the pond exceeds 50%, use pulse grazing, mowing, or hand removal to control the vegetation.						
Ensure that the deepened portion of the pond maintains at least two feet of water through August 31.	Remove build-up of organic material in the pond as needed.	1	$10,500	$10,500	As needed (assume every 10 years)	As needed, after the pond is drained, in September–October prior to winter rains	$1,050
Replace cattle water piping at the pond and wetland sites.	Materials and labor to replace degraded cattle water piping.	1	$32,593	$32,593	As needed (assume every 20 years)	April–May, after the rainy season	$1,630
Replace fencing at the pond and wetland sites.	Replace damaged or degraded fencing.	1850	$7	$12,950	As needed (assume every 35 years)	As needed	$370
Replace gates at the pond and wetland sites.	Replace damaged or degraded gates.	5	$2,100	$10,500	As needed (assume every 35 years)	As needed	$300
Repair fencing due to cattle damage.	Repair existing fencing due to cattle damage.	6 hours	$70/hour	$420	As needed (assume annually)	April–May, after the rainy season	$420
Element A.2 California Tiger Salamander							
Monitor species presence and habitat conditions.	Conduct dipnet larval surveys and record data on species observed and pond conditions.	10 hours	$119/hour		Once every 3-5 years	April–May	$397
Element A.3 California Red-legged Frog							
Monitor species presence and habitat conditions.	Conduct 1–2 nighttime visual encounter surveys and record data on species observed and habitat conditions.	8 hours per survey, assume two surveys will be needed. Nighttime	$119/hour per biologist	$3,808	Once every 3-5 years	First survey in March–April, second survey in May	$1,270

General Management and Monitoring Activities	Description	Level of Effort	Cost per Unit	Cost	Frequency	Schedule	Annual Cost
		surveys require two biologists for safety.					
Element A.4 Western Pond Turtle							
Monitor species presence and habitat conditions.	Conduct 1–2 daytime visual encounter surveys and record data on species observed and habitat conditions.	First visit will be concurrent with site visit to survey for the California tiger salamander. Cost is for second visit only (6 hours).	$119/hour	N/A	Once every 3-5 years concurrent with surveys for California tiger salamanders	March–April	N/A
Element A.5 Mt. Hamilton Thistle							
Monitor species presence and habitat conditions.	Map all individual plants and occurrence information, photograph the occurrence, and map the occurrence using GPS.	10 hours	$167/hour	$1,670	Once every 3-5 years	February–October	$557
Element A.6 Invasive Plants							
Monitor occurrences of invasive plants.	Conduct a walk-through survey to identify and map occurrences of invasive plants.	10 hours	$167/hour	$1,670	Once every 5 years	Late June or early July	$334
Control invasive plants.	Use pulse grazing, mowing, weed-whacking, or hand removal as needed (hand removal is assumed for the cost estimate) to reduce the extent and severity of invasive plants on the site.	10 hours	$74/hour	$740	Annually	July–October (before the rainy season)	$740
B. Security, Safety, and Public Access							
Element B.1 Mosquito Abatement and Fire Hazard Reduction							

General Management and Monitoring Activities	Description	Level of Effort	Cost per Unit	Cost	Frequency	Schedule	Annual Cost
Assess fire hazards.	Conduct a visual inspection to assess fuel levels on the property.	Concurrent with other tasks.	$167/hour	N/A	Annually	March–May	N/A
Manage fuel levels.	If wildfire fuels are determined to present a hazard, use mowing or grazing to reduce fuels (grazing is assumed for the cost estimate).	4 hours	$90/hour	$360	Annually as needed (assume every 10 years)	May–June	$36
Element B.2 Trash and Trespass							
Monitor sources of trash and trespass and remove trash from the site.	Record instances of trash and trespass and remove trash from the site.	Concurrent with other tasks.	$167/hour	N/A	Concurrent with other site visits.	Concurrent with other site visits.	N/A
Repair vandalized fencing at the pond and wetland restoration sites.	Repair fencing.	16 hours	$70/hour	$1,120	As needed (assume every other year)	April–May, after the rainy season	$560
Replace vandalized fencing at the pond and wetland restoration sites.	Replace fencing.	1850	$7	$12,950	As needed (assume every 35 years)	April–May, after the rainy season	$370
Replace vandalized gates at the pond and wetland restoration sites.	Replace gates.	5	$2,100	$10,500	As needed (assume every 35 years)	April–May, after the rainy season	$300
C. Reporting and Administration							
Element C.1 Annual Report							
Prepare annual report	Prepare an annual report and other documentation of management and monitoring tasks, and include recommendations.	24 hours	$151/hour	$3,624	Annually	by December 31	$3,624
						Annual Total	$21,925
						Current annual capitalization rate	3.5%
						TOTAL ENDOWMENT	**$626,429**

*Mileage, GIS work, supplies, and administrative fees are included in Table 2 costs.

Section 7. Literature Cited

Bulger, J.D., N.J. Scott, Jr., and R.B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora draytonii* in coastal forests and grasslands. Biological Conservation 110:85-95.

Bury, R.B. and D.J. Germano. 2008. *Actinemys marmorata* (Baird and Girard 1852) - western pond turtle, Pacific pond turtle in G.J. Rhodin, C.H. Pritchard, P.P. van Dijk, R.A. Saumure, K.A. Buhlmann, and J.B. Iverson, editors. Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. Chelonian Research Monographs.

Camara, K. 2016. Biological Resources Survey Memo for the Calero County Park Pond and Wetland Restoration Project. Prepared for the Santa Clara Valley Habitat Agency. May 23, 2016.

[CNDDB] California Natural Diversity Data Base. 2016. Rarefind 5. California Department of Fish and Wildlife, Biogeographic Data Branch. http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp. Accessed through March 2016.

Fellers, G.M. 2005. *Rana draytonii* California red-legged frog. Pages 552-554 in M. Lannoo, editor. Amphibian declines: The Conservation Status of United States species. University of California Press, Berkeley, California.

Fellers, G.M., and P.M. Kleeman. 2007. California red-legged frog (*Rana draytonii*) movement and habitat use: Implications for conservation. Journal of Herpetology 41:276-286.

H. T. Harvey & Associates. 2012. Santa Clara Valley Water District Western Pond Turtle Site Assessments and Surveys at Selected Santa Clara County Locations. October 2012.

H. T. Harvey & Associates. 2016. Calero County Park Pond and Wetland Restoration Project Mitigation and Monitoring Plan. March 2016.

ICF International. 2012. Final Santa Clara Valley Habitat Plan. Santa Clara County, California. Prepared by the City of Gilroy, City of Morgan Hill, City of San Jose, County of Santa Clara, Santa Clara Valley Transportation Authority, and Santa Clara Valley Water District. August. http://www.scv-habitatplan.org.

Jennings, M.R., and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. California Department of Fish and Game, Inland Fisheries Division.

Miller, K.J. 1994. Endangered and threatened wildlife and plants; Proposed endangered status for the California red-legged frog. Federal Register 59:4888-4895.

Natural Resources Conservation Service. 2016. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed through March 2016.

PRISM Climate Group. 2016. Online PRISM Data Explorer. Oregon State University, Corvallis, OR. Accessed from http://oldprismmap.nacse.org/. Accessed through March 2016.

Rottenborn, S.C. 2007. Tricolored Blackbird, *Agelaius tricolor*. Pages 426-427 in W. G. Bousman, editor. Breeding Bird Atlas of Santa Clara County. Santa Clara Valley Audubon Society, Cupertino, California.

Santa Clara County Parks and Recreation Department. 2013. Calero County Park Trails Master Plan. 128 pp.

Stebbins, R.C. 2003. A Field Guide to Western Reptiles and Amphibians. Boston, Massachusetts.

[USFWS] U.S. Fish and Wildlife Service. 1996. Endangered and threatened wildlife and plants: Determination of threatened status for the California red-legged frog. Federal Register 61:25813-25833.

[USFWS] U.S. Fish and Wildlife Service. 1998. Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area.

[USFWS] U.S. Fish and Wildlife Service. 2002. Recovery plan for the California red-legged frog (Rana aurora draytonii). U.S. Fish and Wildlife Service, Region 1.

[USFWS] U.S. Fish and Wildlife Service. 2004. Endangered and threatened wildlife and plants: Determination of endangered status for the Sonoma County Distinct Population Segment of the California tiger salamander. Final rule. Federal Register 68:13498-13520.

[USFWS] U.S. Fish and Wildlife Service. 2005a. Endangered and threatened wildlife and plants: Designation of critical habitat for the California tiger salamander, Central Population. Final rule. Federal Register 70:49380-49458.

[USFWS] U.S. Fish and Wildlife Service. 2005b. Revised guidance on site assessments and field surveys for the California red-legged frog. August 2005.

[USFWS] U.S. Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants: Revised designation of critical habitat for California red-legged frog; Final rule. Federal Register 75:12816-12959.

[USFWS and California Department of Fish and Game] U.S. Fish and Wildlife Service and California Department of Fish and Game. 2003. Interim guidance on conducting site assessments and field surveys for determining presence or a negative finding of the California tiger salamander.