San Francisco Bay Regional Water Quality Control Board

Sent via electronic mail: No hard copy to follow

January 14, 2022

City of Fremont
ATTN: Wayland Li, Principal Planner
(wli@fremont.gov)
39550 Liberty Street
Fremont, CA 94538

Subject: **San Francisco Bay Regional Water Quality Control Board Comments on the *Mitigated Negative Declaration, Sabercat Trail Extension Project***
SCH No. 2022010048

Dear Mr. Li:

San Francisco Bay Regional Water Quality Control Board (Water Board) staff appreciates the opportunity to review the *Mitigated Negative Declaration, Sabercat Trail Extension Project* (MND). The MND evaluates the potential environmental impacts associated with implementing the Sabercat Trail Extension Project (Project).

Project Summary. The Project will extend the existing Sabercat Creek Trail from Sabercat Historical Park, east of Interstate-680 (I-680), into the City's Irvington District neighborhood. The Project will construct a 1.3-mile, Class I bicycle and pedestrian trail that includes grade-separated crossings over the Union Pacific Railroad and Bay Area Rapid Transit rail corridor (UPRR/BART rail corridor), I-680, and Sabercat Creek. The Project will begin at the Blacow Road turnaround, east of Roberts Avenue and west of the UPRR/BART rail corridor. The overhead crossing of the rail corridor will have a clearance of 25 feet above the rail elevation and include ramps to meet the existing roadway grade on either side of the rail corridor. The trail will be located just outside of the Sabercat Creek riparian corridor and adjoin with the west landing of the proposed I-680 Overcrossing bridge. The I-680 Overcrossing bridge will cross the freeway to join with Sabercat Historical Park. The overcrossing landing will be at the far west edge of the park and the trail will then proceed east to connect with the existing Sabercat trail within Sabercat Historical Park. The overcrossing bridge is designed to avoid or minimize impacts to Sabercat Creek and Mammoth Creek.

Another 0.4-mile north section of the trail will extend north from I-680 overcrossing, cross Sabercat Creek, and terminate in the vicinity of a planned signalized crossing at

Osgood Road. This crossing will be part of a planned mid-block access to the future Irvington BART station.

Summary. As discussed further below, the MND does not quantify the extent of Project impacts to a permit-required, existing mitigation site or propose specific mitigation to reduce that potential impact to a less than significant level.

Comment 1. The Project should avoid impacts to the existing Caltrans Sabercat Creek Mitigation Site.

Construction access for the Project may result in impacts to the Caltrans Sabercat Mitigation Wetland (Caltrans Mitigation), which is located within Caltrans right-of-way east of I-680 and adjacent to Sabercat Historical Park. Caltrans established the Caltrans Mitigation to provide compensatory mitigation for the loss of riparian habitat and waters and wetlands of the State resulting from Caltrans' I-680 Sunol Grade southbound and northbound HOV lane projects. The Caltrans Mitigation was a requirement of the Clean Water Act Section 401 Water Quality Certification (Certification) issued for the HOV lane projects on April 16, 2008 (Site No. 02-01-C0996). Sabercat Creek and Mammoth Creek provide hydrology for the Caltrans Mitigation. The 5.6-acre Caltrans Mitigation consists of a freshwater emergent wetland, surrounded by willows and other riparian trees, that is buffered by an upland zone of mostly coyote brush, with lesser amounts of California sage and black sage, and oaks. The extent of the Caltrans Mitigation is illustrated in Figure 2 of the attached *Sabercat Creek Mitigation Project, Annual Wetland Monitoring Report, Year 6 Wetlands and Waters Restoration* (Year 6 Monitoring Report) Caltrans, District 4, December 2017. The areas identified as wetland basin, oak woodland, and riparian in Figure 2 are required for compliance with the Certification. These areas are to be preserved in perpetuity and should not be disturbed by Project activities.

The discussion of **Potential Impact BIO-8,** Impacts to the Caltrans Sabercat Creek Mitigation Site, in Section 1.4.2.b of the MND, describes potential Project impacts to the Caltrans Mitigation.

> The only identified wetland in the Project area is the Caltrans Sabercat Mitigation Wetland located within Caltrans right-of-way east of I-680 and adjacent to Sabercat Historical Park. Sabercat Creek flows into the created wetland which along with upstream enhancement of Sabercat Creek was mitigation to compensate for the loss of riparian habitat and waters and wetlands of the state resulting from Caltrans I-680 Sunol Grade southbound and northbound HOV lane projects. The site consists of a freshwater emergent wetland surrounded by willows and other riparian trees, buffered by an upland zone of mostly coyote brush with lesser amounts of California sage and black sage interspersed with mitigation oak saplings. . . .
>
> The wetland would not be directly impacted by the proposed Project, but approximately 270 square feet (0.06 acre) would be newly shaded by the I-680 Overcrossing. The overcrossing span of 850 feet combined with approximately 40 to 50 feet of vertical clearance between the underside of the overcrossing and the surface level of the mitigation wetland (measured at top of bank) would allow ample light into the area. Since the height of the bridge

> span would allow ample light to areas below, and because shading of the mitigation wetland would be transitory relative to the sun's arc both seasonally and hourly, there is likely to be no substantive change in the existing conditions. The shading impact is considered less than significant, and no mitigation is required.
>
> A portion of the upland zone within the mitigation area is proposed for construction access to build the east landing and would be temporarily impacted during Project construction. . . . Despite pursuing design alternatives that would avoid the Caltrans Sabercat Creek Mitigation Site, all other feasible alternatives to access the east landing would have a greater impact on sensitive riparian habitat along Sabercat Creek. Therefore, impacts to an upland component of the Caltrans Sabercat Creek Mitigation Site would be considered the least damaging practicable alternative. As described in the project description, the CMP developed for the proposed Project includes a measure to limit the construction footprint to the smallest area possible which would minimize and avoid impacts to the riparian habitat.

It is not clear from the discussion of Potential Impact BIO-8 if the impacted uplands would include the oak woodland and riparian areas identified in Figure 2 in the Year 6 Monitoring Report. Please compare the outlines of the oak woodland and riparian areas in Figure 2 to the areas that are proposed for temporary disturbance for construction access for the Project. If there is an overlap between these two areas of upland vegetation at the Caltrans Mitigation site, please attempt to relocate the construction access area out of these Certification-required mitigation areas[1]. If impacts to the oak woodland and riparian areas of the Caltrans Mitigation site cannot be avoided, then mitigation must be provided for those impacts. The MND should be revised to quantify the surface area of unavoidable impacts to the Caltrans Mitigation site and provide sufficient compensatory mitigation for that area of impacts. Since mitigation sites are to be preserved in perpetuity, the required amount of mitigation for impacts to mitigation sites is usually greater than the mitigation quantities required for other impacts.

Comment 2. Mitigation Measure BIO-7 in Section 1.4.2b, in the discussion of Biological Resources, should be revised to provide a proposed mitigation project.

After the discussion of Potential Impact BIO-8**,** Impacts to the Caltrans Sabercat Creek Mitigation Site, in Section 1.4.2.b of the MND, Mitigation Measure MM-BIO-7 is proposed to reduce potential Project impacts to the Caltrans Mitigation site to less than significant levels.

> **Develop compensatory mitigation as prescribed by Caltrans and the resource agencies for impacts to the existing mitigation site uplands.** The City of Fremont would develop compensatory mitigation in coordination with Caltrans, CDFW, and RWQCB. Compensatory mitigation would likely

[1] Although these upland buffer plantings may not be subject to Water Board jurisdiction, these buffer areas around the mitigation wetland are a component of the mitigation project that was required for the Certification. Therefore, the Water Board has jurisdiction over preserving these Certification-required buffer areas for the mitigation wetland.

> involve post-project restoration of the upland zone per the originally proposed HMMP planting plan and a pledge to provide site irrigation (and herbivory protection) sufficient to ensure oak sapling survival. Additional compensatory mitigation proposed to offset these impacts would include non-native tree removal (e.g., olive, wattle, tree-of-heaven) at other Project sections.
>
> With the implementation of the measures identified in the project description related to the construction footprint and **MM-BIO-7**, impacts on the Caltrans Sabercat Mitigation Wetland site would be less than significant with mitigation.

Mitigation Measure MM-BIO-7 lacks sufficient detail to be adequate for compliance with the requirements of the California Environmental Quality Act (CEQA). Under CEQA, proposed mitigation measures should be presented in sufficient detail for readers of the CEQA document to evaluate the likelihood that the proposed remedy will reduce impacts to a less than significant level. CEQA requires that mitigation measures for each significant environmental effect be adequate, timely, and resolved by the lead agency. In an adequate CEQA document, mitigation measures must be feasible and fully enforceable through permit conditions, agreements, or other legally binding instruments (CEQA Guidelines Section 15126.4). Mitigation measures to be identified at some future time are not acceptable. It has been determined by court ruling that such mitigation measures would be improperly exempted from the process of public and governmental scrutiny which is required under the California Environmental Quality Act.

As discussed in Comment 1, the actual extent of impacts to permit-required components of the Caltrans Mitigation site should be quantified. If construction access will impact a permit-required component of the Caltrans Mitigation site, then a compensatory mitigation plan should be developed to provide sufficient compensation for those impacts.

Summary of Comments.

In its present form, the MND lacks information necessary to support the issuance of Section 401 Water Quality Certification or Waste Discharge Requirements for the Project. Impacts to the Caltrans Mitigation site are not quantified in the MND and the development of mitigation measures has been inappropriately deferred to after the completion of the CEQA review process. The MND should be revised and re-circulated. Re-circulation is necessary to allow for full review and comment by the public and government agencies on the Project's impacts to waters of the State and proposed mitigation measures for those impacts.

Since an MND should provide both proposed impacts and proposed mitigation measures for public and government agency review, provision of this information in a Final MND is inappropriate, since this information would not have been subject to public and government agency review before the Final MND was adopted.

If you have any questions, please contact me via e-mail to brian.wines@waterboards.ca.gov.

Sincerely,

Brian K. Wines

Brian Wines
Water Resource Control Engineer
South and East Bay Watershed Section

Attachment: Year 6 Monitoring Report

cc: State Clearinghouse (state.clearinghouse@opr.ca.gov)
CDFW, Marcia Grefsrud (marcia.grefsrud@wildlife.ca.gov)

Sabercat Creek Mitigation Project

Annual Wetland Monitoring Report - Year 6
Wetlands and Waters Restoration

Caltrans District 04
04-ALA-680-PM 4.8/5.2
EA 04-253760

December 2017

Prepared for:
San Francisco Bay Region
California Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, California 94612

Prepared by:
Water Quality Program
Caltrans, District 4
111 Grand Avenue
Oakland, California 94612

This Page Intentionally Left Blank

Table of Contents

Figures

Tables

Photos

Appendices

Acronyms

ac	acre
CDFW	California Department of Fish and Wildlife
Department	California Department of Transportation District 4
HOV	High Occupancy Vehicle
I-680	Interstate 680
in	inch
lf	linear feet
PM	post marker/mile
RWQCB	San Francisco Bay Regional Water Quality Control Board
SCMMP	Sabercat Creek Mitigation Project Final Habitat Mitigation and Monitoring Plan
SR	State Route
WQC	Water Quality Certification (401 permit)

1 INTRODUCTION

In accordance with the Water Quality Certification (WQC) of Site No. 02-01-C0966 (File No. 2198.11 [BT]) from the San Francisco Bay Regional Water Quality Control Board (RWQCB), the California Department of Transportation District 4 (Department) is required to provide an annual monitoring report detailing the status of compensatory mitigation required for the Southbound (Southbound Project) and Northbound (Northbound Project) Interstate 680 Sunol Grade Modified High Occupancy Vehicle (HOV) Lane Widening Project (roadway project). Construction of the Southbound Project was completed in 2010. The Northbound Project is in the planning phase, and construction has not begun. The Sabercat Creek Mitigation Project (mitigation project) is intended to provide compensatory mitigation for the loss of riparian habitat and waters of the State incurred by the combined (southbound and northbound) roadway project.

The 2011 *Sabercat Creek Mitigation Project Final Habitat Mitigation and Monitoring Plan* (SCMMP) (Caltrans 2011) provides details regarding the mitigation project and required monitoring. The RWQCB requires submittal of an annual monitoring report for the mitigation project no later than December 31. Annual qualitative and quantitative monitoring is being conducted to determine whether the wetland and riparian habitats have reestablished as proposed in the SCMMP.

Table 1 lists the mitigation project documents generated to date for each year, the document title, and date prepared.

Table 1. Sabercat Mitigation Project – Mitigation Documents List

Monitoring/ Reporting Year	Document Title	Document Date
2011	Sabercat Creek Mitigation Project: Final Habitat Mitigation and Monitoring Plan	October 2011
2012	Sabercat Creek Mitigation Project Year 1 Annual Monitoring Report	December 2012
2013	Sabercat Creek Mitigation Project Year 2 Annual Monitoring Report	December 2013
2014	Sabercat Creek Mitigation Project Year 3 – Spring Monitoring Results Memo	June 2014
2014	Sabercat Creek Mitigation Project Year 3 – Fall Qualitative Monitoring Results Memo	November 2014
2014	Sabercat Creek Mitigation Project Year 3 Annual Monitoring Report	December 2014
2015	Sabercat Creek Mitigation Project Spring Monitoring Results Memo	June 2015
2015	Sabercat Creek Mitigation Project Year 4 – Fall Qualitative Monitoring Results Memo	November 2015
2016	Sabercat Creek Mitigation Project Year 5 - Spring Monitoring Results Memo	June 2016
2017	Sabercat Creek Mitigation Project Year 6 - Spring Monitoring Results Memo	July 2017

1.1 PURPOSE

This sixth annual monitoring report provides an update on the status of compensatory mitigation for the roadway project at the Sabercat Creek Mitigation Project site. It includes a summary of mitigation work proposed and accomplished to date, the monitoring methods and results, and a comparison of the current vegetative conditions with the target success criteria.

1.2 PROJECT REQUIRING MITIGATION

The roadway Project consist of the construction of southbound and northbound HOV lanes, auxiliary lanes, ramp metering, and related improvements along a 21.7 mile stretch of I-680, beginning at the I-680/State Route 237 interchange in the city of Milpitas, Santa Clara County, and extending north through the cities of Fremont and Pleasanton, Alameda County (see Figure 1).

The Southbound Project, completed in August 2010, included improvements related to HOV lane construction consisting of widening of the outside roadway shoulders, widening of eight bridges, construction of three auxiliary lanes, installation of retaining walls and drainage systems, and application of an asphalt overlay on the southbound ramps and mainline. Three auxiliary lane segments connecting on-ramps and off-ramps were constructed between the following six freeway interchanges: Jacklin Road and Scott

Creek Road; Mission Boulevard (State Route [SR] 262) and Durham Road (Auto Mall Parkway); and Washington Boulevard and Mission Boulevard (SR 238). Bridges spanning I-680 were widened to accommodate additional traffic lanes at the following locations: Calaveras Boulevard in the city of Milpitas, East Warren Avenue in the city of Fremont, North Mission Boulevard (SR 238) in the city of Fremont, Vargas Road in unincorporated Alameda County, and the north and southbound bridges crossing a Department of Water Resources pipeline just south of East Warren Avenue in the city of Fremont.

Figure 1. Mitigation Project Location

1.2.1 Project Impacts Requiring Mitigation

The construction of the Southbound Project incurred impacts to California Department of Fish and Wildlife (CDFW) and RWQCB jurisdictional lands and waters.
The impacts that resulted from the construction of the Southbound Project included:

- Permanent fill to a vegetated roadside drainage ditch (waters of the State) located north of Auto Mall Parkway; the installation of a retaining wall required permanent fill of approximately 606-linear feet (lf) (0.17 acres [ac]) for the footing. A portion of the ditch had to be filled to match adjacent grades.
- Temporary and permanent fill in portions of seasonal ponds near a bridge that crosses over a Department of Water Resources pipeline; retrofitting of the bridge required approximately 0.006 ac permanent fill and 0.042 ac of temporary impacts related to construction access.
- Riparian habitat adjacent to an unnamed tributary to Alameda Creek just south of Andrade Road; construction activities associated with the installation of the retaining wall required the removal of 26 trees in the riparian corridor.

The anticipated impacts of the proposed Northbound Project are described in the SCMMP. Projected impacts from the construction of the Northbound Project include the removal of an additional 16 trees from the same riparian corridor, as well as fill of 0.025 ac of wetland. See Table 2 for Project impacts to jurisdictional features for roadway project.

Table 2. Project Impacts to Jurisdictional Features

Southbound Project (Actual)			
Feature Type	**Permanent Impacts**	**Temporary Impacts**	**Total Impacts**
WS[1]	0.17 ac; 606 lf[3]	-	0.17 ac; 606 lf
WUS[2] and WS	0.006 ac	0.042 ac	0.048 ac
Riparian trees	26 removed	-	26
Northbound Project (Projected)			
Feature Type	**Permanent Impacts**	**Temporary Impacts**	**Total Impacts**
WUS and WS	0.025 ac	-	0.025 ac
Riparian trees	16 to be removed	-	16
Total Roadway Project Impacts			
WS and WUS	0.073 ac	0.042	-
Riparian trees	42 trees	-	-
Definitions: [1]Water of the State of California (WS) [2]Waters of the United States (WUS) [3]Linear feet (lf)			

The total permanent impacts to WS and WUS by the roadway project are expected to be 0.073 ac; this includes the filling of 606 lf of roadside ditch (WS) and 0.031 ac of seasonal wetlands (WS and WUS). Temporary impacts to 0.042 ac of seasonal wetlands occurred due to construction access during a bridge retrofit; this area will be restored after construction is complete.

1.3 MITIGATION PROJECT DESCRIPTION

The Mitigation Project is located between PM 4.8 and PM 5.2, adjacent to the northbound lanes of I-680, just south of Washington Boulevard in the City of Fremont, Alameda County. Sabercat Creek and an unnamed tributary are perennial drainages in the Coyote hydrologic unit. The Department of Water Resources hydrologic area name is Fremont Bayside. The following sections describe the scope of work accomplished at the mitigation site. Construction of the various elements began in June 2011 and was completed in October 2011. The Department implemented plantings and post-construction erosion control practices after completion of the ground disturbing activities. Plantings were completed in December 2011.

The mitigation project includes the following components:

- Restoration of 660 lf (0.72 ac) of riparian habitat
- Creation of 0.42 ac of wetland habitat
- Restoration of 5.14 acres of oak woodland habitat

See Table 3 for the mitigation summary. Appendix A provides pre- and post-construction photo-documentation of the restored areas. See Figure 2 for the habitat boundary map.

Table 3. Sabercat Mitigation

Habitat Type	Acreage	Linear Feet
Wetland Creation	0.42	N/A
Riparian Habitat Restoration	0.72	660 lf
Oak Woodland Restoration	5.14	N/A

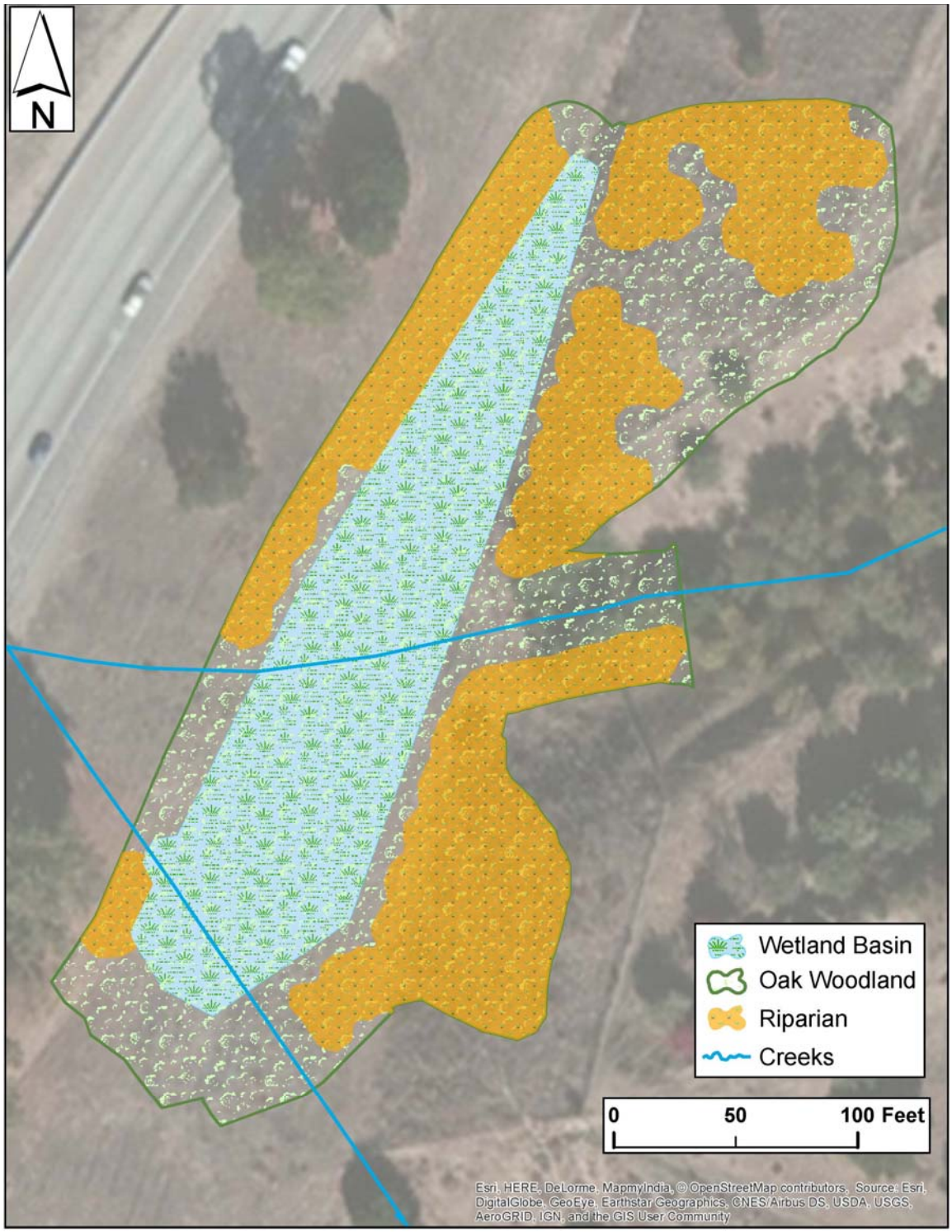

Figure 2. Habitat Boundary Map

1.3.1 Restoration of Sabercat Creek and Unnamed Tributary

Prior to restoration, Sabercat Creek and an unnamed tributary were diverted into separate underground culverts on the east side of the mitigation site. The two culverts connected beneath the site, which daylighted as a single drainage on the southbound side of I-680. As part of the mitigation project, failed sacked concrete bank protection and a damaged headwall were removed from Sabercat Creek. The culverts conveying flows from a 70-lf section of Sabercat Creek and a 130-lf section of the unnamed drainage were removed. The daylighted sections of the creeks were realigned to flow into a single wetland basin..

A series of four boulder step-pools were constructed to reduce the velocity and energy of high flow discharges from Sabercat Creek into the wetland basin. The boulder step-pools consist of 1-ton, ½-ton, and ¼-ton rock keyed into the channel. A rock blanket was also installed to provide source material for the distribution of rocks downstream. Over time, the boulder step-pool design will mimic the natural distribution of rock and cobble within the creek, allowing stream patterns to change with varying flow regimes. The boulder step-pool reach was planted with willows to improve geomorphic stability. Willow stakes were placed between the rock blankets at the toe of the channel slope. The willows were planted in two staggered rows and were spaced from 3 to 5 ft apart.

1.3.2 Establishment of a Wetland Basin

In order to retain adequate water to sustain the created wetland, the contractor excavated the basin area and installed a clay geo-membrane. The bottom of the wetland is flat with sides sloping up at 10:1 (H:V) to the edge of the wetland. Meanders, graded at approximately 0.5% to 1%, were constructed within the wetland to receive flow as it enters the basin. The basin shape of the wetland encourages pooling of water. At the down-grade end of the basin, excess water in the wetland returns to the existing culverts through a new headwall and through an aperture cut into the top of the existing reinforced box culvert.

1.3.3 Enhancement of Riparian Habitat

The wetland basin was graded and contoured to create habitat suitable for coast live oak riparian forest species, and soil was amended to increase water retention. The area was hydro-seeded with understory plants appropriate for the habitat type. Coir netting was installed to prevent erosion and stabilize slopes. Trees were planted from tree pots (4 in. diameter by 14 in. deep), and shrubs were planted from deep pots (2.5 in. by 10 in.).

1.3.4 Establishment and Enhancement of Oak Woodlands

The area surrounding the wetland/riparian basin was cleared and grubbed to prepare for planting; existing native trees were preserved as appropriate. Native oak woodland habitat was established along the periphery of the riparian area and throughout the remaining Caltrans right-of-way. Plant materials are characteristic of plant communities with similar elevations, climate, and geographic distribution as the site. The area was hydro-seeded with understory plants appropriate for the habitat type. A total of 478 trees were planted from tree pots (4 in. diameter by 14 in. deep).

1.4 SUCCESS CRITERIA

The success criteria are included in the SCMMP and listed in the following section. Riparian tree mitigation ratios and success criteria are presented in Table 4.

Table 4. Riparian Tree Mitigation Ratios

Species	Number Removed	Project	Mitigation Ratio[1]	Mitigation Required		
				Total	On site	Sabercat[1]
Coast live oak (*Quercus agrifolia*)	16	SB	5:1	80	---	80
California bay (*Umbellularia californica*)	9	SB	3:1	27	---	27
California buckeye (*Aesculus californica*)	1	SB	3:1	3	---	5
Coast live oak (*Quercus agrifolia*)	1	NB	3:1	3	---	3
Black walnut (*Juglans nigra*)	3	NB	2:1	6	---	6
Olive (*Olea europa*)[2]	12	NB	1:1	12	12	0
					Total	**121**

1. Ratios for proposed Northbound Project replacements are reduced because mitigation will occur before impacts are incurred, reducing the temporal effect from losses.
2. Non-native olive trees to be replaced with native species.

Oak Woodland – survivorship of planted species is used to gauge success and should meet the following criteria:

- Year 1 – 90% survivorship
- Year 3 – 80% survivorship
- Year 5 – 70% survivorship

Wetland Basin – willow cover will be used to gauge success and should meet or exceed the following criteria:

- Years 1 and 2 – demonstrate a positive increase from the baseline
- Year 3 – 70% willow cover
- Year 5 – 80% willow cover

1.5 MITIGATION STATUS

Implementation of the mitigation project is complete. Plantings are now in the sixth year and are only monitored once per year in the spring. A conference call was conducted on March 4, 2016 with Melissa Escaron of CDFW, Robert Atanasio of the Department Samira Abubekr of the Department and Constance Ganong of Garcia and Associates (GANDA) to discuss the status of the Mitigation Site and possible remedial actions to meet success criteria. Below is a summary of the agreed upon remedial actions that will be conducted by Caltrans to meet the success criteria as outlined in the 2011 Sabercat Creek Mitigation Project Final Habitat Mitigation and Monitoring Plan.

Willow tree mitigation

Caltrans will monitor willow cover in 2017 (six years total) before the Northbound Project begins.

Riparian tree mitigation

Caltrans replanted 22 riparian trees in the summer of 2016, including California bay, California buckeye, and black walnut, within the riparian area around Sabercat Creek and the wetland to achieve the required 121 riparian trees needed for restoration. Caltrans will also monitor the riparian trees in 2017 (six years total) to ensure survivorship before the Northbound Project begins.

Oak woodland tree mitigation

The oak woodland tree survivorship as of the 2016 survey was 67%, which is 3% (10 trees short) of the required 70% survivorship after 5 years. Caltrans will not be required to replant 10 trees because there are 244 oak woodland trees alive on the mitigation site. Caltrans will also monitor the oak woodland trees in 2017 (six years total) to ensure survivorship before the Northbound Project begins.

2 METHODS

The SCMMP was developed from past results of Caltrans mitigation projects, pre-construction conditions of the impacted waters, and conditions in both the CDFW Lake and Streambed Alteration Agreement and the RWQCB Water Quality Certification. This section describes the methods for monitoring each component of the Sabercat Creek mitigation site. Monitoring of vegetation requires both qualitative monitoring and quantitative data collection of the oak woodlands restoration and the wetlands vegetation that was planted at the created wetlands.

2.1 VEGETATION MONITORING METHODS

Qualitative and quantitative monitoring has been performed over the past six-year establishment and monitoring period.

2.1.1 Qualitative Monitoring Methods

Qualitative methods involve visual inspection to evaluate plant health and vigor, determine watering or maintenance needs, and identify problems. Failed plantings are noted for future analysis of mortality patterns relating to species or location.

Surveys assess the status of the site, and observations include:

1. Status of planted vegetation by species;
2. Presence/absence of native plant recruitment by species;
3. Replanting efforts required;
4. Presence and extent of non-native plant species, particularly invasive species;
5. Erosional features;
6. Diseases affecting native vegetation;
7. Status and effectiveness of the irrigation system if applicable;
8. Trash/refuse/construction materials requiring removal;
9. Indications of problematic areas (bare ground, for example), analysis of potential causes, and recommendations for remediation; and
10. Indicators of wetland hydrology (wetlands creation site only).

2.2 QUANTITATIVE MONITORING METHODS

Quantitative monitoring has occurred throughout the six-year period. The percent cover of willows will be collected along transect lines set up as described in the qualitative monitoring methods. To collect quantitative data at the oak woodland restoration site, a plant count will be conducted every spring. Numbers of live plants of each species will be compared to the success criteria to measure whether the restoration effort is on track.

2.2.1 Riparian Tree and Oak Woodlands Tree Survivorship

A survivorship survey of riparian trees was conducted on September 7, 2017. The previous survey in 2016 had not demonstrated compliance with the riparian tree mitigation success criterion requiring 121 surviving trees. In response, an additional 22 riparian trees were replanted in July and August of 2016. These trees consisted of four

black walnut, five coast live oak, five California sycamore, four California buckeye, and four western redbuds.

2.2.2 Willow Cover

Quantitative monitoring of willow cover is being assessed using the Line Intercept Method. This is being performed through placement of a 100-foot tape measure (transect) in the willow planting zone and tallying up the length of willow that intersects the transect from the distance of first contact to the last contact along the line. Cover is calculated as the percent of transect line covered by each species as follows:

% cover willow = (total distance willow/total distance of line) x 100

Four transect locations were marked in the field and are mapped on Figure 3.

2.3 PHOTO-DOCUMENTATION

A total of 14 permanent photo points for photo-documentation were established during construction. The photo points provide views from within the restored stream channel along the center line. Additional photo points provide an overview of the restoration site including the wetland area and upland plants.

The method of developing photo-monitoring points and photo-protocols is summarized in the *Sabercat Creek Mitigation Project Annual Monitoring Report: Wetlands and Waters Impact and Restoration* (Caltrans 2012). A map showing all photo points is provided in Figure 3. To document conditions of the Sabercat Creek restoration, wetland area, and upland plantings from photo points:

a. A series of photos of the subject feature are taken each year from each photo point.
    i. Along the step-pool feature, two photos are taken from each point: one looking upstream and the second looking downstream.
    ii. For overview photos, a panoramic series of photos are taken at each point.
b. Compass bearing is recorded to indicate the direction the photographer was facing when each photo is taken.

Figure 3. Transect and Photo Point Locations

3 RESULTS

Monitoring occurred two times during the 2017 season, including spring vegetation monitoring and oak woodlands monitoring. The following list summarizes all monitoring visits made during the 2017 season:

- May 26, 2017 – Willow transect monitoring, photo-documentation, and qualitative monitoring
- September 7, 2017 – Riparian tree survivorship and qualitative monitoring for oak woodland trees

3.1 QUALITATIVE MONITORING

Annual qualitative assessment of tree health was conducted on May 26, 2017. The three-year plant establishment period (PEP) ended in 2014; therefore, irrigation and weeding were also stopped.

3.1.1 Riparian

Without irrigation, the unusually low precipitation for five growing seasons has caused water stress to trees at the mitigation site. The riparian vegetation did not appear in good health or vigor, with numerous trees including California bay, California buckeye, and black walnut not meeting the success criteria.

Due to the amount of riparian tree loss, Caltrans replanted 22 trees in July and August of 2016. These trees consisted of 4 black walnut, 5 coast live oak, 5 California sycamore, 4 California buckeye, and 4 western redbuds. See Appendix B for replacement planting location and planting palette.

3.1.2 Oak Woodland

Similar to the results from Year 5, oak woodland trees demonstrating vigorous growth, primarily coast live oak and blue elderberry plants above 3 feet tall, were in good health and have continued to grow in height. The trees on the eastern hillside, adjacent to the wetlands, are growing well and have appeared to have increased in number significantly. Recent rainy winters of 2015/2016 and 2016/2017 have benefited these trees in terms of survivorship and growth, and have resulted in additional recruitment to the site. Many trees are above 3 feet tall, when, in the previous years, these trees had remained below that height. The planted vegetation was easily observable. In addition, the shrubs (California lilac, California sage, hummingbird sage, and coyote brush) planted between the oak woodland trees have also grown significantly and very densely.

At the time of the survey, the noxious weed cover on the hillsides east of the wetlands was low. Invasive weed control measures are no longer conducted at the site, and irrigation has stopped, which may have contributed to an area of higher mortality and growth stress at the southern-most portion of mitigation site. The hillside here is very steep (greater than 20 percent) and the noxious weed cover at the time of the survey was quite extensive and dense, particularly black mustard (*Brassica nigra*), Italian thistle (*Carduus pycnocephalus*), and bull thistle (*Cirsium vulgare*). It was very difficult to

observe tree species in this area, but some types are doing better in that area, including many coast live oak and blue elderberry that are over 6 feet tall.

3.1.3 Created Wetlands Habitat

During the May 26, 2017 spring monitoring event, the created wetland appeared to be dry, with a large amount of sediment that washed downstream and filled the eastern portion of the wetland. Due to recent storm events, Sabercat Creek has created a side channel to the east of the existing channel, transporting silt and sand deposits within the eastern part of the wetland. Emergent vegetation was observed within the entire wetland area, even with an increase in sediment deposition. At the time of the survey, Sabercat Creek had flowing water approximately 3 to 6 inches deep, with deeper pools holding approximately 12 inches of water. Qualitative data sheets are included in Appendix C.

Plant establishment and recruitment in the created wetland were excellent (Photos 1 through 3). Narrowleaf cattail (*Typha latifolia*) was dominant throughout the wetland area, with alkali bulrush (*Bolboschoenus maritimus*) intermixed. Other species present along the edges of the wetlands included gray rush (*Juncus patens*), common rush (*Juncus effusus*), tall flatsedge (*Cyperus eragrostis*), mugwort (*Artemesia douglasiana*), and arroyo willow (*Salix lasiolepis*). Cattails were the dominant species in the Sabercat Creek channel step-pool reach, with mugwort (*Artemisia douglasiana*) intermixed. Recent high flows within Sabercat Creek have flushed aquatic vegetation from the channel, and no watercress was observed. No bare areas or erosion were observed. All vegetation appeared to be vigorous and disease-free, exhibiting new leafy growth, flowers, and viable buds. See Table 5 for vegetation observed.

Non-native, invasive plants were present in moderate numbers and included wild mustard (*Hirschfeldia incana*), yellow star thistle (*Centaurea solstitialis*), Italian thistle (*Carduus pycnocephalus*), plantain (*Plantago* spp.), and numerous non-native grasses. Table 5 below lists all observed vegetation during the May site visit and includes the Cal-IPC weed ranking. This table is provided to show the Cal-IPC weeds present within the mitigation site.

Table 5. Vegetation Observed

Common Name	Scientific Name	Cal-IPC weed ranking
Sage brush	*Artemisia californica*	N/A
Mugwort	*Artemisia douglasiana*	N/A
Oat spp.	*Avena* spp.	Moderate
Alkali bulrush	*Bolboschoenus maritimus*	N/A
Italian thistle	*Carduus pycnocephalus*	Moderate
Yellow star thistle	*Centaurea solstitialis*	High
Poison hemlock	*Conium maculatum*	Moderate
Pampas grass	*Cortaderia jubata*	High
Tall flatsedge	*Cyperus eragrostis*	N/A
Wild mustard	*Hirschfeldia incana*	Moderate
Common rush	*Juncus effusus*	N/A

Common Name	Scientific Name	Cal-IPC weed ranking
Gray rush	*Juncus patens*	N/A
Burclover	*Medicago polymorpha*	Limited
Canary grass	*Phalaris* spp.	Moderate
Plantain	*Plantago* spp.	Limited
Rabbit's foot grass	*Polypogon* spp.	Limited
Wild radish	*Raphanus sativus*	Limited
Arroyo willow	*Salix lasiolepis*	N/A
Milk thistle	*Silybum marianum*	Limited
Clover	*Trifolium* spp.	Limited
Narrow leaf cattail	*Typha latifolia*	N/A
Vetch	*Vicia spp.*	N/A

Photo 1. Emergent Vegetation in Created Wetland, Facing East

Photo 2. Plantings Along Step-pool Reach in May 2017.

Photo 3. Newly Formed Side Channel in the Eastern Wetland Basin, Facing North.

3.2 QUANTITATIVE MONITORING RESULTS

Quantitative assessment results for each restoration component are described below.

3.2.1 Riparian

The survey conducted on September 7, 2017, resulted in confirmation of 118 surviving riparian trees. Table 6 lists the riparian tree survivorship count. Based on the 2016 planting plan for additional riparian trees and the 2016 mapping of riparian and oak woodland trees, three of the new plantings had died, including two coast live oaks and one black walnut.

Table 6. Riparian Tree Mitigation Requirement and 2016 Riparian Tree Count

Tree Species	Number Required	Number Living
Coast live oak	83	86
California bay	27	9
California buckeye	5	6
Black walnut	6	8
Western redbud (added in 2016)		4
California sycamore (added in 2016)		5
Total	**121**	**118**

3.2.2 Oak Woodland

Overall tree health was good for both riparian and oak woodland trees. The increased rainfall between 2015-2017 has improved growth of trees, especially those trees east of the wetland. The dense establishment of Italian thistle, bull thistle, and black mustard on the southern slopes of the mitigation site continue to be a problem, and will continue to be a problem in the future for smaller trees (less than 6 feet tall). In addition, ground squirrels and ground squirrel holes were observed in these south slopes near plantings, which may pose a problem for tree health.

Of the 22 additional riparian tree plantings, three saplings had died: two coast live oak and one black walnut. This was probably due to insufficient watering at the time of planting because the three tree saplings observed dead were very small. The other 18 plantings were alive and doing well. If there is continued good rains next year, it is expected that these 18 riparian trees will continue to grow.

3.2.3 Willow Habitat

The establishment of willow habitat along the margin of the wetland basin is used to gauge the success of the created wetland. Quantitative monitoring for the willow planting area was conducted on June 1, 2016, along four transects (Figure 3). Willow percent cover was calculated and is shown in Table 7. Transect 1 was placed in an area where no willows were planted. This transect was used as a baseline sample to calculate native recruitment. Transect 2 had a willow cover of 60.3%, transect 3 had a willow cover of 100%, and transect 4 had a willow cover of 81.5%. The average willow cover for the site is 80.6%.

Table 7. Willow Percent Cover 2017

Willow Cover Along Transect (ft)	Total Length (ft) and Percent Cover
Transect 1	
N/A	0
Total Length/Percent Cover	**0**
Transect 2	
3.8 - 14.1	10.3
19.7 - 24.5	4.8
30.6 - 38.9	8.3
43.8-53.7	9.9
60.1-87.1	27
Total Length/Percent Cover	**60.3**
Transect 3	
0-100	100
Total Length/Percent Cover	**100**
Transect 4	
0 - 29.3	29.3
36.3 - 54.4	18.1
57.1 - 91.2	34.1
Total Length/Percent Cover	**81.5**
AVERAGE PERCENT COVER	***80.6***

A comparison of willow percent cover from 2016 to 2017 is shown in Table 8. This table indicates there has been an increase in willow percent cover of 9.2 percent from 2016 to 2017. The total average willow percent cover has also increased to 80.6, indicating that the site has met the success criteria of 80% willow cover.

Table 8. Willow Percent Cover Comparison 2016-2017

Transect	Percent Cover in 2016	Percent Cover in 2017	Change in Percent
Transect 1	n/a	n/a	n/a
Transect 2	53.1	60.3	+7.2
Transect 3	93.5	100	+6.5
Transect 4	67.6	81.5	+13.9
Average Percent Cover	**71.4**	**80.6**	**+9.2**

3.3 WILDLIFE OBSERVED

The use of restoration areas by wildlife is a valuable indicator of the success of a mitigation site. Table 9 provides a list of wildlife observed during the 2017 spring monitoring survey. No nesting bird activity was observed during the May 26, 2017, site visit; however, several bird species were observed.

Table 9. Observed Wildlife Species during 2017 Spring Monitoring

Common Name	Scientific Name
Invertebrates	
Water striders	*Gerridae*
Reptile	
Western fence lizard	*Sceloporus occidentalis*
Birds	
Bewick's wren	*Thryomanes bewickii*
Song sparrow	*Melospiza melodia*
Chestnut-backed chickadee	*Poecile rufescens*
Mammals	
mouse	*Mus* ssp.
Columbian black-tailed deer	*Odocoileus hemionus columbianus*

4 CONCLUSION

The created wetland at the Mitigation Project site is continuing to establish riparian and wetland vegetation, with increased recruitment of vegetation. With the increase in rainfall during the winter of 2016/2017, vegetation growth was observed throughout the site. Willows within the riparian corridor are doing very well, with each transect having over 50 percent willow canopy cover. Each transect shows an increase in the percent coverage when compared to last year's results, with the average percent cover increasing by 9.2 percent. The average willow percent coverage is 80.6 percent, which meets the Year 5 requirement of 80 percent coverage. Because the site has met the success criteria and monitored beyond the Year 5 requirement, Caltrans is requesting the RWQCB deem the site successful, and no future monitoring is needed.

5 REFERENCES

Caltrans. 2011. *Sabercat Creek Mitigation Project – Final Habitat Mitigation and Monitoring Plan*. January 2009. Revised September 2011.

Caltrans. 2012. *Sabercat Creek Mitigation Project: Annual Monitoring Report: Wetlands and Waters Impact and Restoration*.

State of California. 2015. *California Drought*. Available online at http://ca.gov/drought/

Appendix A Photo-Documentation

Appendix B Replacement Planting Plan and Planting Palette

Appendix C Qualitative Data Field Sheets