

Santa Cruz Countywide

# PARTNERS IN RESTORATION PERMIT COORDINATION PROGRAM



## 2020 ANNUAL REPORT



Prepared by the  
Resource Conservation District of Santa Cruz County



## Acknowledgements

Many individuals and organizations have made important contributions to this report. Funding for the Permit Coordination Program was provided by the California Coastal Conservancy, State Water Resources Control Board, and individual landowners and non-profit organizations. This report and the projects outlined within were made possible by the dedicated staff and the Board of Directors of the Resource Conservation District of Santa Cruz County (RCDSCC) with support from staff at the Natural Resources Conservation Service (NRCS).

The following individuals played important roles in the Permit Coordination Program and the development of this report:

**RCDSCC:** Kelli Camara, Lisa Lurie, Sharon Corkrean, Lizzy Eichorn, Karl Fieberling, Angie Gruys, Sacha Lozano, Erin McCarthy Arianne Rettinger, and Gerry Spinelli..

**RCDSCC Board of Directors:** Kelley Bell Robert Ketley Howard Liebenberg, Mike Manfre, Jim McKenna, John Ricker, and Steve Auten

**NRCS:** Mark Barnett, Dillon Beatty, Whit Haraguchi, Drew Mather and Desi Ramirez.

Special thanks are also extended to our consultants, project partners, and those landowners whose cooperation and commitment to resource conservation made these projects possible, and to the partnering agencies which have been invaluable in making this program successful.

## Contents

<b>Program Background .....</b>	<b>4</b>
<b>Program Highlights .....</b>	<b>5</b>
<b>2020 Project Updates .....</b>	<b>6</b>
<b>2019 Project Reports .....</b>	<b>9</b>
<b>2018 Project Updates .....</b>	<b>21</b>
<b>2017 Project Updates .....</b>	<b>35</b>
<b>2016 Project Updates .....</b>	<b>48</b>
<b>2015 Project Updates .....</b>	<b>52</b>
<b>Project Photo Point Maps .....</b>	<b>56</b>

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# **Santa Cruz Countywide Permit Coordination Program**

## **Program Background**

The Santa Cruz Countywide Permit Coordination Program (Program) was developed by the Resource Conservation District of Santa Cruz County (RCD) and the Natural Resources Conservation Service (NRCS), in partnership with Sustainable Conservation, a nonprofit environmental organization. The innovative program was designed to improve water quality, enhance wildlife, and conserve agricultural resources through the implementation of small, environmentally beneficial projects, such as stream bank protection, wetland restoration, groundwater recharge, culvert repair/replacement, erosion control structures, exotic vegetation removal, and fish stream habitat improvement projects, primarily on private parcels (mostly farm and ranch lands).

The program provides “one-stop regulatory shopping” for landowners interested in implementing voluntary conservation projects on their lands, thereby removing the time, cost, and complexity of individual project review.

The Program for small, environmentally beneficial conservation projects is based on the model of coordinated, multi-agency regulatory review described above that

ensures the integrity of agency mandates, but makes permitting more accessible than the traditional process to farmers and other landowners served by the NRCS and RCD. The program facilitates implementation of many of the recommendations outlined in the watershed plans and recovery plans, as well as the particular needs of landowners in other areas of the County.

The conservation projects are relatively small in size, have demonstrated a net environmental benefit, and are usually performed for erosion control or restoration in and around waterways. The work authorized under the Program revolves around NRCS conservation practices, also known as best management practices (BMPs) or management measures. These practices, when applied in the appropriate setting, help landowners and land managers improve the productivity of their operations and protect and improve the natural functioning of adjacent and nearby natural areas. These standardized practices are selected from the NRCS’ California Field Office Technical Guide (FOTG) and mirror the BMPs promoted by the EPA to help meet CWA mandates and the BMPs included in Management Measures promoted by the California Coastal Commission and the State Water Resources Control Board in the Plan for California’s Nonpoint Source Pollution Control Program. The RCD and NRCS have selected fifteen conservation

Representative Sampling of Agency Mandates That Can Affect One Conservation Project

<b>Regulatory Mandate</b>	<b>Agency Involved</b>
Section 404 Clean Water Act	Environmental Protection Agency Army Corps of Engineers
Federal Endangered Species Act Marine Mammal Protection Act	United States Fish & Wildlife Service National Marine Fisheries Service
National Historic Preservation Act	State Historic Preservation Office
National Environmental Policy Act	Federal Agencies
Section 401 Clean Water Act Porter Cologne Act	Regional Water Quality Control Board
California Coastal Act Coastal Zone Management Act	California Coastal Commission
Fish and Game Code Section 1601 California Endangered Species Act	California Department of Fish & Wildlife
California Environmental Quality Act	State and Local Agencies
Erosion and Grading Ordinances Environmental Protection Ordinances Local Coastal Plan	County government

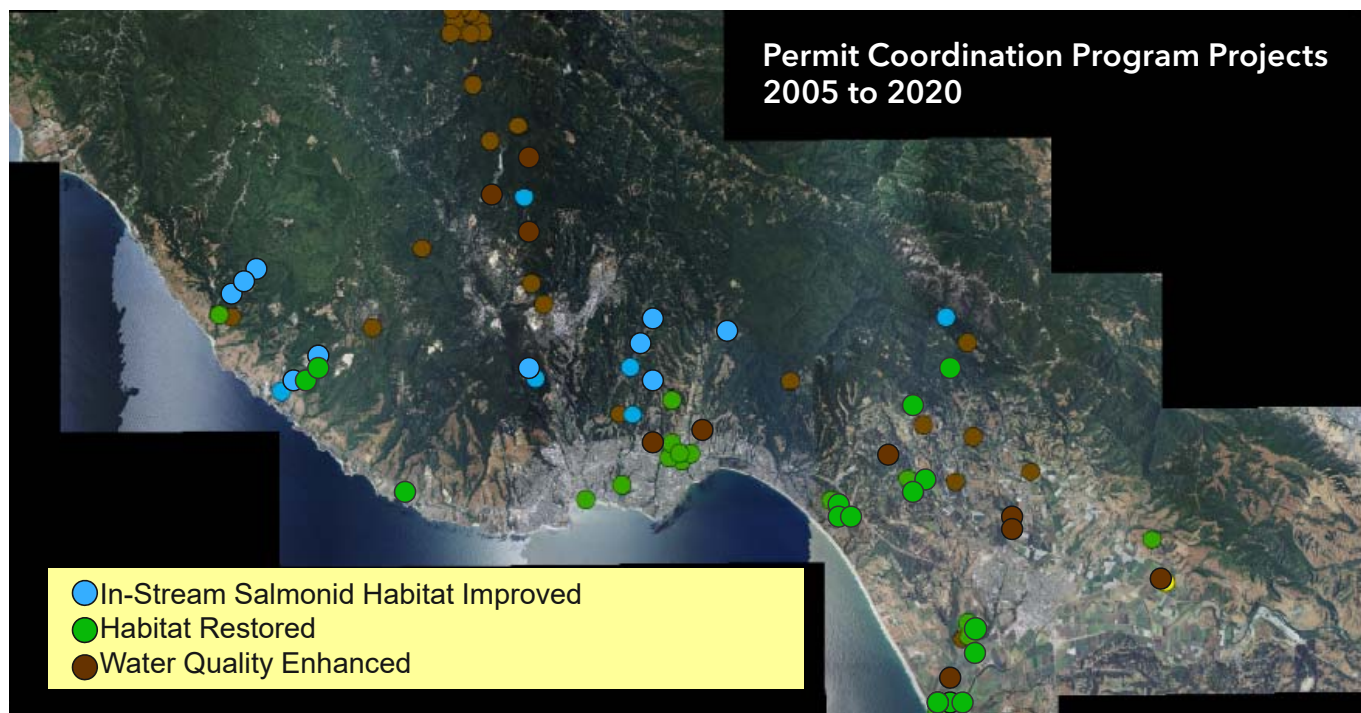
practices from the NRCS's Field Office Technical Guide (FOTG) that address local land use and resource problems in Santa Cruz County. The environmental protection measures and conditions associated with implementation of any of these practices, as negotiated with regulatory agencies, will be specific to the resource concerns present in Santa Cruz County.

Under the Program, regulatory agencies enter into programmatic agreements with the RCD that cover the fifteen specific, standardized conservation practices. The Program requires that landowners follow NRCS designs and specifications for conservation work. This results in high quality work and ensures follow up and monitoring on each conservation project completed in association with the Program. By selecting those conservation practices suitable for coordinated review, the Program facilitates implementation of successful on-the-ground projects that will collectively contribute to a net environmental benefit for the watersheds in Santa Cruz County.

### Program Highlights

Over the past 16 years of the program, we have implemented more than 116 voluntary conservation projects. This includes restoring ~200 acres of wetland, riparian and upland habitat, prevented 40,000 tons of sediment from entering our streams and wildlife habitat,

and regained and improved 40 miles of rearing and spawning habitat for our endemic salmon. The projects have been implemented throughout the county with fish improvement projects focused on Scotts, San Vicente, Soquel, and Branciforte Creeks. Habitat restoration projects occurred predominantly near the coastal areas with a strong focus on invasive species removal on Soquel Creek and within the Watsonville Slough system, as well as in the San Andreas and Larkin Valley areas where we find a high population density of native amphibians, including the California Tiger Salamander, Santa Cruz long-toed Salamander, and California red-legged Frog. Erosion control and sediment reduction projects have focused on agricultural land in the southern part of the county and rural roads in Boulder Creek, Ben Lomond and Lompico.



## 2020 Project Reports

### GVC-2

**Project information/Description:** The project entailed stabilizing a 35 ft long, 10 ft high and 35 ft wide eroded streambank on Green Valley Creek. During the 2018/2019 storm events, the streambank failed, creating a nearly vertical slope. A temporary structure, approved by CDFW, County of Santa Cruz and the Regional Water Quality Control Board, was installed before WY 2019/2020, to capture continually eroded material and prevent degradation of downstream water quality. The permanent solution was installed in 2020 and focused on re-shaping the streambank to a 2:1 slope to prevent further and on-going erosion. Project steps included:

1. Install 135 lf of silt fence to capture material during construction activities;
2. Remove temporary structure of straw bales wrapped in visqueen;
3. From the top of slope, excavate 525 cyd of cut to create a 2:1 slope along 110 LF of streambank and transport cut material to on-site disposal locations;
4. Seed with common barley and cover the 3,600 sq ft re-graded slope with North American Green C125BN biodegradable fabric,
5. Install 60 LF of 16-inch diameter fiber roll at the top of slope and 4 rows of 9-inch fiber rolls across the slope;
6. Construct a willow wall at the top of slope with willow stakes planted 5 ft o.c.;
7. Remove silt fence and all accumulated material;
8. Seed all disturbed construction and the soil disposal area with 200 lbs/acre common barley (*hordeum vulgare*);
9. Install 182 LF of silt fence around the soil disposal area.

A total of 11 cottonwoods were installed to replace the 18-inch cottonwood that was removed during construction activities.

**Practice/Extent:**

- » Streambank Protection (580), 50 ft x 143 ft
- » Tree/Shrub Establishment (612), 0.16 acres
- » Critical Area Planting (342), 0.21 acres

**Purpose/Goal of project:** The goal of the project is to stabilize a portion of the streambank on Green Valley Creek to reduce erosion and sediment transport to downstream tributaries.

**Area affected:** 0.21 acres

**Conservation benefits:** This project reducing chronic soil loss from an instable streambank on Green Valley Creek reducing sediment delivery to Green Valley Creek and downstream tributaries.

**Natural biological enhancements:** The project will reduce the delivery of sediment to Green Valley Creek, which is a tributary to Salsipuedes Creek, which provides critical habitat for steelhead.

**Volume of soil moved:** 525 cyd

**Net waters/Wetland loss:** No net loss of jurisdictional waters or wetlands occurred as a result of the project.

**Net gains in wetlands and riparian areas:** No change.

**Final slope of project work (not to exceed 2:1)** 2:1

**Reports submitted to County staff:** The project was located in Flood zone A, but no material was placed in the stream channel.

**Mitigation I.(B) methods to lessen “take” of protected plants, animals and habitats, including avoidance:** On September 1, prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species potentially present in the project area, including the California red-legged frog, Western pond turtle, Santa Cruz black salamander, and Steelhead (per CDFW 1600 permit). The pre-construction meeting described the protection afforded by the Federal and California Endangered Species Acts and the specific protective measures to be followed during implementation of the project. No species were encountered during construction activities.

**Mitigation I.(C) Efforts to control non-native plant species:** The property and broader watershed hosts a number of non-native species, including cape ivy, wild radish, poison hemlock, prickly oxtongue, jubata grass, and European grasses. While eradication of these non-natives is not within the scope of this project, they will be managed to ensure adequate native vegetation is established for wildlife use and erosion control. The project will be monitored for three to five years to ensure that no new non-native species colonize the site.

**Mitigation I.(D) Revegetation efforts:** All disturbed areas were seeded with common barley (*Hordeum vulgare*) at a rate of 200 lbs/acre. To replace the 18-inch cottonwood tree, eleven (11) treepot containers of cottonwoods have been installed on the project area. Success criteria was defined as 70% survival rate of 10 cottonwoods by year three and an 80% cover of non-native seed for erosion control in year 1. The site will be monitored for a period of three to five years to ensure successful establishment of native vegetation.

**Mitigation I.(E) Monitoring:** Revegetation of the project site was completed with the goal of habitat enhancement and erosion control. Currently, the site has achieved 90% cover of barley and there has been no mortality of the planted cottonwoods.

**Mitigation II: Floodwater conveyance:** Not applicable.

Before



Photo point 1: Looking west at the eroded streambank, which has a nearly vertical slope.

After



Photo point 1: Looking west, the bank has been excavated to a 2:1 slope. Fiber rolls have been installed along the contour and common barley is providing erosion control.

Before



Photo point 2: Looking east, the eroded, scalloped edge of the streambank can be seen on the left side of the photo.

After



Photo point 2: Looking east, the bank has been sloped and well-seeded with common barley.

Before



Photo point 3: Looking north at the eroded streambank from Green Valley Creek.

After



Photo point 3: Looking north, the streambank has been sloped to a 2:1. Cottonwood trees are marked with pink flags.

Before



Photo point 4: Looking north at the soil disposal site, which is predominantly covered by non-native weedy species, such as prickly ox-tongue.

After



Photo point 4: Looking north, after spoils placement the site has been seeded with common barley and a fiber roll installed.



## 2019 Project Updates

### ZaC-1

**Project information/Description:** The project consisted of the implementation of four types of wood enhancement habitat features to enhance scour at existing pools, provide vertical roughness elements to enhance bedload deposition at upstream riffles, provide winter high flow refugia for salmonids, and encourage recruitment of additional large wood onto the features. Eighteen (18) wood structures were installed along a 1 mile reach of Zayante Creek.

**Practice/Extent:**

- » Stream Habitat Improvement and Management (395), 27 ft x 1535 ft
- » Temporary Access Road, 15 ft x 2,075 ft
- » Dewatering, 25 ft x 150 ft
- » Tree/Shrub Establishment (612), 940 sq ft

**Purpose/Goal of Project:** The goal of the project is to install habitat enhancement structures to address sediment and limiting factors for salmonid species along one mile of Zayante Creek.

**Area affected:** 0.5 acres

**Conservation benefits:** This project will create channel diversity, increasing sediment sorting, floodplain activation and the formation of deep pools in Zayante Creek.

**Natural biological enhancements:** The project will address limiting factors for salmonids in Zayante Creek, including poor rearing habitat for juvenile salmonids including lack of deep pools, lack of escape cover in vicinity of pool habitat, and lack of high flow refugia. Proposed habitat enhancement structures will retain sediment, develop riffles, create pools, and provide cover.

**Volume of soil moved:** 569 yd<sup>3</sup>

**Net Waters/Wetland Loss:**

No net loss of jurisdictional waters or wetlands occurred as a result of the project.

**Net gains in wetlands and riparian areas:** No change.

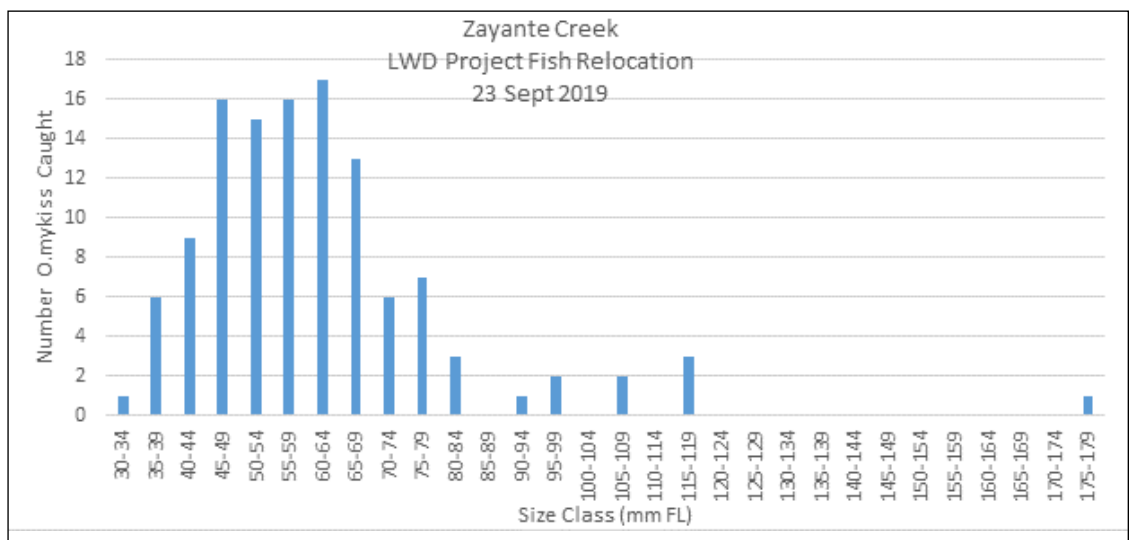
**Final slope of project work (not to exceed 2:1):**  
N/A

**Reports submitted to County staff:** A portion of the project was located in Flood zone A. A no rise letter was provided to the County on May 15, 2019.

**Mitigation I.(B) methods to lessen “take” of protected plants, animals and habitats, including avoidance:** On September 25, 2019, prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species potentially present in the project area, including the Black Salamander, California Giant Salamander, California red-legged frog, Steelhead, Coho Salmon, and San Francisco dusky-footed woodrat. The pre-construction meeting described the protection afforded by the Federal and California Endangered Species Acts and the specific protective measures to be followed during implementation of the project. Electrofishing was completed by staff from California Department of Fish and Wildlife on September 23, 2019. One hundred and eighteen (118) steelhead were relocated downstream of the project site (please see table below for summary of size classes). One mortality occurred. A 229mm FL sucker was also relocated prior to construction activities. No other species were encountered during construction activities.

**Mitigation I.(C) Efforts to control non-native plant species:**

The property and watershed hosts a number of non-native species, including Vinca, French broom, Cape ivy, poison hemlock, and non-native grasses. While broad-scale removal is not feasible as part of this project, these species will be managed to allow successful native plant establishment of container plants. The project will be monitored for three to five years to ensure that no new non-native species colonize the site and that adequate native vegetation is established for habitat enhancement and erosion control.



**Mitigation I.(D) Revegetation efforts:** Disturbed areas were covered in slash and access roads with open canopy were planted with a total of 48 trees species. Please see the following list of plants to replace species impacted by the use of the access roads.

- » 4 x *Sequoia sempervirens*, Coast Redwood
- » 8 x *Quercus wislizeni*, Interior Live Oak
- » 9 x *Notholithocarpus densiflorus*, Tan Oak
- » 11 x *Laurus nobilis*, Bay Laurels
- » 1 x *Heteromeles arbutifolia*, Toyon,
- » 15 x *Acer macrophyllum*, Big Leaf Maple

**Mitigation I.(E) Monitoring:** Revegetation of the project site was completed with the goal of habitat enhancement and erosion control. Due to the challenge of establishing vegetation under a mature canopy in the riparian area, the success criteria for revegetation at this site is that 30% of the plantings will survive, and if any plants are lost they will be replaced unless a qualified biologist determines that natural recruitment will occur.

Mitigation II: Floodwater conveyance: The project is located in a FEMA flood zone A. The written analysis of a Registered Civil Engineer (RCE) or hydrologist indicating that the project will not decrease floodwater storage, modify floodwater conveyance, increase base flood elevation, or otherwise create an adverse impact either on the site, or upstream or downstream of the site, has been provided to the County.

### 2020 Observations for Project (BMPs)

The project is functioning as expected. Monitoring suggests that only minor structural changes have occurred at the site between the baseline, or pre-project condition, and the post-project condition, which reflects changes after a single high flow season. This is not an unexpected result given the fact that the annual peak, as measured at the Big Trees gage on the mainstem San Lorenzo River was the 16th lowest annual peak in a gage record that includes 84 years. The 2-year event, which is typically identified as the flow where a significant amount of bedload begins to mobilize and is characterized as the channel forming flow, was estimated as 5,931 cfs at Big Trees. The annual peak for the 2019-2020 high flow season at Big Trees was 2,170 cfs, which is approximately 37% of the 2-year event. Other specific changes documented at some of structures including the sprouting of redwood rootwads, slight gravel bar build up and collection of cobbles, small wood wrack up, and pooling at downstream end.

### 2020 Observations for Mitigation Measures

**Mitigation I. (B)** Not applicable.

**Mitigation I. (C)** The property and watershed host a number of non-native species, including Vinca, French broom, Cape ivy, poison hemlock, and non-native grasses. While broad-scale removal is not feasible as part of this

project, these species were managed to allow successful native plant establishment of container plants. No new non-native species have colonized the project site.

**Mitigation I. (D)** Revegetation of the project site was completed with the goal of habitat enhancement and erosion control. Disturbed areas were covered in slash and access roads with open canopy were planted with a total of 47 tree species, including:

- » 4 *Sequoia sempervirens*, Coast Redwood
- » 8 x *Quercus wislizeni*, Interior Live Oak
- » 9 x *Notholithocarpus densiflorus*, Tan Oak
- » 11 x *Laurus nobilis*, Bay Laurels
- » 1 x *Heteromeles arbutifolia*, Toyon,
- » 15 x *Acer macrophyllum*, Big Leaf Maple

Forty- one trees are alive and one tree is questionable, as of January 13, 2021. Five trees are dead or missing. Three of the dead or missing trees were the result of vandalism. The plantings survival rate is 87%.

**Mitigation I. (E)** The project has exceeded its success criteria for revegetation at this site of 30%, with a mortality of 6 plants. The site will continue to be monitored.

Before



Photo point 20: Looking downstream at future location of structure.

After



Photo point 20: Looking downstream at Type 1 structure. Rootwads visible.

2020



Photo point 20: Type 1. Looking downstream at Type 1 structure. Rootwads visible and are sprouting. No significant wrack up visible due to low flow events in 19-20 wet

Before



Photo point 23: Looking upstream at future location of structure. Historic landslide visible as well as bedrock.

After



Photo point 23: Looking upstream at Type 3 structure. Historic landslide visible still slightly visible in background, bedrock hidden by branches

2020



Photo point 23: Type 3. Looking downstream at Type 3 structure. Historic landslide visible still slightly visible in background, bedrock hidden by branches. Pooling on downstream end of structure. Significant wrack up occurring of small branches at upstream end. Bank vegetation grown in significantly.

Before



Photo point 25 - Flow of water from right to left. Rocky bank visible in foreground. Some bank undercutting visible across the creek.

After



Photo point 25 - Type 2 structure. Looking upstream. Structure ultimately built slightly upstream of where pre-photo taken. Rocky bank visible in lower right of the photo. Rootwads visible.

2020



Photo point 25: Type 2. Looking upstream. Structure ultimately built slightly upstream of where pre-photo taken. Rocky bank visible in lower right of the photo. Rootwads visible, and sprouting in creek. No significant pooling present or changes in morphology.

Before



Photo point 34 - Looking upstream. Rise of hill visible at top of photo.

After



Photo point 34 - Type 4 Structure. Looking upstream. Rise of hill visible at top of photo.

2020



Photo point 34: Type 4. Looking upstream. Small woody debris wracking. Rootwad in creek sprouting.

## ZaC-2

**Project information/Description:** The project stabilized the embankment of an in-stream basin through the removal and replacement of a degraded 12-inch diameter CMP culvert with a rock lined open channel to prevent mass failure of an earthen embankment that was being overtopped during flow events. The 8-ft wide channel base was lined with > 3 ft pf engineered streambed material for ~85 ft, with 2:1 side slopes transitioning into 3:1 side slopes. The other 12-inch diameter CMP culvert, located outside of the riparian corridor, was plugged to prevent further flow and erosion. Live willow stakes were planted amongst the streambed materials and on all disturbed areas that do not support sandhills species at 5-ft o.c. spacing. Seven (7) of the ten (10) willows shown for relocation turned out to be suckers/sprouts from other root masses. As such, only three (3) willow rootballs were excavated and relocated. A total of fifty-six (56) willow stakes were installed to account for the reduced number of willow relocations. Seven (7) redwood trees were planted to replace the 1 (14-inch) redwood removed from the project site.

### Practice/Extent:

- » Obstruction Removal (500), 10 ft x 45 ft
- » Channel Stabilization (584), 39 ft x 87 ft
- » Tree/Shrub Establishment (612), 0.3 acres
- » Critical Area Planting), 0.3 acres

**Purpose/Goal of Project:** The goal of this project is to protect downstream steelhead habitat by preventing the delivery of sediment to Zayante Creek due to an in-stream basin embankment failure. The project will also protect wetland habitat that has established both upstream and downstream of the embankment structure.

**Area affected:** 0.5 acres

**Conservation benefits:** This project prevents mass failure of an instream embankment on No Name Creek, reducing the risk sediment delivery to Zayante Creek.

**Natural biological enhancements:** The project will reduce the delivery of sediment to No Name Creek, which is a tributary to Zayante Creek that provides critical habitat for steelhead.

**Volume of soil moved:** 125 yd<sup>3</sup>

**Net Waters/Wetland Loss:** No net loss of jurisdictional waters or wetlands occurred as a result of the project.

**Net gains in wetlands and riparian areas:** No change.

**Final slope of project work (not to exceed 2:1):**  
2:1 to 3:1

**Reports submitted to County staff:** The project was located in Flood zone C, so no report was required for submittal.

**Mitigation I.(B) methods to lessen “take” of protected plants, animals and habitats, including avoidance:** On August 27, August 30, and September 8, prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species potentially present in the project area, including the California red-legged frog, San Francisco dusky-footed woodrat, Mount Hermon June Beetle, Zayante Band-winged grasshopper, Steelhead, and Santa Cruz wallflower. The pre-construction meeting described the protection afforded by the Federal and California Endangered Species Acts and the specific protective measures to be followed during implementation of the project. On September 8 and 9, four (4) 12-inch Sherman live catch traps were set around the entrances of each woodrat house located within the project area. The traps were baited with rolled oats and 2-4 cotton balls were placed inside. The traps were left open overnight and the following morning two (2) traps had captured SFDFW. Any non-target species captured, such as deer mice, were immediately released. In consultation with CDFW, houses that could be avoided by construction activities despite buffer distance were intact. Of the 13 houses detected on the site, three, were dismantled and replaced with artificial shelters. Houses were dismantled using pitchforks and rakes. All sticks and other materials associated with the house were set aside for use in the artificial house, which consisted of a bottomless 12x12 pine box with two chambers and an access opening in the front. Any nesting material recovered from dismantled houses was placed in the shelter and the sticks comprising the shelter were placed to cover the box. No other species were encountered during construction activities.

**Mitigation I.(C) Efforts to control non-native plant species:** The property provides critical habitat for endemic sandhills species and thus is actively managed to reduce critical non-invasive species. Three areas were disturbed as part of project activities: drainage channel (wetland habitat), staging area (sandhills chaparral), and access road (riparian scrub/woodland). Both the drainage channel and staging area were predominantly native vegetation prior to project activities and non-native plant species will be removed from this area while native overstory is re-established and returned to sandhills habitat, respectively. The access road hosted a number of non-native species prior to construction activities and thus will only be managed to allow successful revegetation as described below. The project will be monitored for three to five years to ensure that no new non-native species colonize the site and that adequate native vegetation is established for wildlife use and erosion control.

**Mitigation I.(D) Revegetation efforts:** All disturbed areas have been seeded with a mix of site-collected seed from a suite of native herbs, subshrubs, and shrubs that are found in and around the project area. These seed mix will include species found in the sand chaparral community

in the intact sandhills habitat on site, and include several known host plants for the Mount Hermon June beetle, which is a generalist (or at least polyphagous). The following table lists species that will be targeted for collection in spring and summer 2019 and included in the seed mix, as available.

Species	Sandhills Chaparral	Wetland	Riparian
<i>Achillea millefolium</i>	X		X
<i>Acmispon glaber</i>	X		
<i>Adenostoma fasciculatum</i>	X		
<i>Arctostaphylos silvicola</i>	X		
<i>Baccharis pilularis</i>	X		X
<i>Camissonia contorta</i>	X		
<i>Camissoniopsis micrantha</i>	X		
<i>Carex globosa</i>	X		
<i>Castilleja exserta</i>	X		
<i>Ceanothus cuneatus</i>	X		
<i>Ceanothus incanus</i>	X		X
<i>Chorizanthe pungens var. hartwegiana</i>	X		
<i>Corethrogyne filaginifolia</i>	X		
<i>Ericameria ericoides</i>	X		
<i>Eriodictyon californicum</i>	X		
<i>Eriogonum nudum var. decurrens</i>	X		
<i>Eriophyllum confertiflorum</i>	X		
<i>Eschscholzia californica</i>	X		
<i>Frangula californica</i>	X		
<i>Heterotheca sessiliflora ssp. echinoides</i>	X		
<i>Juncus effusus ssp. pacificus</i>		X	X
<i>Juncus patens</i>		X	X
<i>Lupinus albifrons var. albifrons</i>	X		
<i>Mimulus aurantiacus</i>	X		
<i>Navarretia hamata ssp. parviloba</i>	X		
<i>Pseudognaphalium beneolens</i>	X		X
<i>Salvia mellifera</i>	X		
<i>Scirpus microcarpus</i>		X	
<i>Stylocline gnaphaloides</i>	X		

**Mitigation I.(E) Monitoring:** Revegetation of the project site was completed with the goal of habitat enhancement. A 70% success rate of all planted species will be measured through annual monitoring as part of the Permit Coordination Program protocol.

**Mitigation II: Floodwater conveyance:** Not applicable.

**2020 Observations for Project (BMPs)**

Currently the project is functioning as intended. However, storm events since implementation have been relatively

insignificant, so further evaluation is needed to ensure that it performs as designed. Vegetation is becoming well established.

**2020 Observations for Mitigation Measures**

**Mitigation I. (B)** Not applicable.

**Mitigation I. (C)** The property provides critical habitat for endemic sandhills species and thus is actively managed to reduce critical non-invasive species. Three areas were disturbed as part of project activities: drainage channel (wetland habitat), staging area (sandhills chaparral), and access road (riparian scrub/woodland). Both the drainage channel and staging area were predominantly native vegetation prior to project activities and non-native plant species have been removed from this area while native overstory is re-established and returned to sandhills habitat, respectively. The access road hosted a number of non-native species prior to construction activities and has been managed to allow successful revegetation. No new non-natives have colonized the project site.

**Mitigation I. (D)** Revegetation was completed with the goal of erosion control and habitat enhancement. In the **drainage channel**, 50 of the 62 willow stakes have survived and are thriving, all 9 of the redwood trees are alive and in good condition, featuring lateral growth. Their cages will be removed this winter to accommodate increasing canopy. In addition to the willow stakes and redwoods, and sedges (*Carex sp.*), California blackberry (*Rubus ursinus*), coyote brush (*Baccharis pilularis*), cudweed (*Pseudognaphalium californicum*), mock heather (*Ericameria ericoides*), and silver bush lupine (*Lupinus albifrons var. albifrons*), have become well established. In the **staging area**, 35% cover of native plants has been achieved, including deer weed (*Acmispon glaber*), Ben Lomond buckwheat (*Eriogonum nudum var. decurrens*), golden yarrow (*Eriophyllum confertiflorum*), black sage (*Salvia mellifera*), mock heather (*Ericameria ericoides*), everlasting (*Pseudognaphalium beneolens*), silver bush lupine (*Lupinus albifrons var. albifrons*), and holly-leaf navarretia (*Navarretia hamata*), with the last species being most abundant.

Exotic species constitute 5% cover and primarily consist of species that are ubiquitous in the sandhills including rattail fescue (*Festuca myuros*) and rip-gut brome (*Bromus di-andrus*).

The **access road** features ~35% cover of plants: ~30% cover of exotic plants and 5% cover of native natives. Exotic plants include velvet grass (*Holcus lanatus*), sheep sorrel (*Rumex acetosella*), Geranium sp., and vetch (*Vicia sativa*). Native plants include coyote brush (*Baccharis pilularis*), California blackberry (*Rubus ursinus*), and tall cyperus (*Cyperus eragrostis*).

No new non-native species have colonized the project site.

**Mitigation I. (E)** An 80% success rate of all planted species has been achieved in the drainage area, exceeding the 70% survival rate criteria. The site will continue to be monitored.



Before



Photo point 1: Looking upstream, the inlet to the undersized culvert to be removed is visible.

After



Photo point 1: Looking upstream, the culvert has been removed and replaced with a rock-lined open channel.

2020



Photo point 1: Looking upstream, the rock-lined open channel that replaced the undersized culvert has become revegetated with willows and herbaceous vegetation.

Before



Photo point 3: Standing on and looking north across the failing embankment.

After



Photo point 3: Standing on the remaining embankment and looking north, the rock lined channel and willow stakes are visible.

2020



Photo point 3: Standing on the embankment and looking north, the rock lined channel is stable and the project area is becoming revegetated with willows and herbaceous vegetation.

Before



Photo point 4: Looking downstream, the inlet to the undersized culvert to be removed is visible.

After



Photo point 4: Looking downstream, the culvert has been removed and replaced with a rock-lined open channel.

2020



Photo point 4: Looking downstream, the rock-lined open channel that replaced the undersized culvert is becoming revegetated with willows and herbaceous vegetation.



Photo point 5: Standing on and looking south across the failing embankment. The low spot/scour area is visible just before the stake on the downstream side of the embankment.



Photo point 5: Standing on the remaining embankment and looking south the culvert has been removed and replaced with a rock-lined open channel.



Photo point 5: Standing on the embankment and looking south. the rock lined channel is stable and the project area is becoming revegetated with willows and herbaceous vegetation.

## 2018 Project Updates

### BrC-2

**Project information/Description:** The project reduces sediment delivery using rock rip-rap and vegetation to stabilize the bank and prevent further degradation. The project repaired approximately 40 linear feet of non-contiguous streambank that had been scoured and lost. Caltrans 1/4 ton rock slope protection (RSP) was placed at the toe of the slope up to fifteen feet. Engineered fill material, wrapped in a double layer of Miragrid 3XT fabric to create geogrids, was not installed per the requirement of and approval by regulatory agencies. Live willow stakes, harvested from on-site, were installed every 5-7 ft. All disturbed areas were seeded and mulched for erosion control. All work was conducted from the top of bank and no diversion was needed.

**Practice/Extent:**

- » Streambank and Shoreline Protection (580), 0.02 acres
- » Tree/Shrub Establishment (612), 0.02 acres
- » Critical Area Planting, 0.02 acres

**Purpose/Goal of Project:** The goal of this project is to improve steelhead habitat by reducing the delivery of sediment to Branciforte Creek due to bank failure.

**Area affected:** 0.02 acres

**Conservation benefits:** This project reduces erosion on the outside bend of Branciforte Creek, reducing sediment delivery and improving wildlife habitat through the re-establishment of vegetative cover.

**Natural biological enhancements:** The project will reduce the delivery of sediment to Branciforte Creek, which is an important tributary to the San Lorenzo River and provides critical habitat for steelhead, particularly during drought years.

**Volume of soil moved:** 110 yd<sup>3</sup>

**Net waters/Wetland loss:** No net loss of jurisdictional waters or wetlands occurred as a result of this project.

**Net gains in wetlands and riparian areas:** No change.

**Final slope of project work (not to exceed 2:1)**  
1.5 : 1 (rocked slopes may exceed 2:1).

**Reports submitted to County staff:** Written analysis from a Registered Civil Engineer (RCE) was submitted indicating that the project will not decrease floodwater storage, modify floodwater conveyance, increase base flood elevation, or otherwise create an adverse impact either on the site, or upstream or downstream of the site.

**Mitigation I.(B) Methods to lessen “take” of protected plants, animals and habitats, including avoidance:** On September 26, 2018, prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species potentially present in the project area, including the Black Salamander, California Giant Salamander, California red-legged frog, and Steelhead. The pre-construction meeting described the protection afforded by the Federal and California Endangered Species Acts and the specific protective measures to be followed during implementation of the project. No species were encountered during construction activities.

**Mitigation I.(C) Efforts to control non-native plant species:** The property and watershed hosts a number of non-native species, including Vinca, French broom, English ivy, Himalayan blackberry, and non-native grasses. While broad-scale removal is not feasible as part of this project, these species will be managed to allow successful native plant establishment and will consist of less than 15% for two growing seasons after planting to ensure plantings have become established. The project will be monitored for three to five years to ensure that no new non-native species colonize the site and that adequate native vegetation is established for wildlife use.

**Mitigation I.(D) Revegetation efforts:** Disturbed areas were seeded with *Hordeum vulgare* (common barley) at a rate of 200 lbs/acre and *Festuca rubra* (red fescue) at a rate of 18 lbs/acre and mulched with weed-free straw at a rate of 2 bales per 1,000 sq ft. Live willow stakes, harvested from on-site were installed every 5 ft. Native blackberry have been planted at the top of slope.

**Mitigation I.(E) Monitoring:** Revegetation was completed with the goal of erosion control and habitat enhancement. An 80% success rate of all planted species will be measured through annual monitoring as part of the Permit Coordination Program protocol.

**Mitigation II: Floodwater conveyance:** The project is located in a FEMA flood zone A. The written analysis of a Registered Civil Engineer (RCE) or hydrologist indicating that the project will not decrease floodwater storage, modify floodwater conveyance, increase base flood elevation, or otherwise create an adverse impact either on the site, or upstream or downstream of the site, has been provided to the County.

### **2020 Observations for Project (BMPs)**

The streambank is well stabilized with no signs of bank erosion and sediment delivery to Branciforte Creek. Willow stake have sprouted and become well established and native blackberry plantings are thriving.

**2020 Observations for Mitigation Measures**

**Mitigation I. (B)** Not applicable.

**Mitigation I. (C)** The property and watershed host a number of non-native species, including Vinca, French broom, English ivy, Himalayan blackberry, and non-native grasses. While broad-scale removal was not feasible as part of this project, these species have been managed to allow successful native plant establishment and currently consist of less than 2% of the vegetation cover.

**Mitigation I. (D)** Revegetation was completed with the goal of erosion control and habitat enhancement. The California blackberry has reached the 80% success rate, and the willow stakes have achieved a 65% survival rate with the additional plantings installed in 2020.

**Mitigation I. (E)** The site is meeting its intended goals with the installation of additional willow stakes. The site will continue to be monitored to ensure an 80% success criteria is met.



Photo point 2: The eroded streambank covered in plastic can be seen on the right. Branciforte Creek is visible on the left.



Photo point 2: Looking at the top of the bank failure. The site has been seeded and mulched.



Photo point 2: Looking south at the top of the bank failure. The site is stabilized and revegetated.



Photo point 2: The site is stabilized and revegetated with CA blackberry and miner's lettuce.

Before



Photo point 3: Looking at the project site from across Branciforte Drive before project completion.

After



Photo point 3: Looking at the project site from across Branciforte Drive after project completion.

2019



Photo point 3: The site has become well established with grasses.

2020



Photo point 3: The site has become well established with CA blackberry.

Before



Photo point 5: Looking north. The plastic can be observed on the far bank with Branciforte Creek in the foreground.

After



Photo point 5: Looking north. The plastic has been replaced and the bank repaired.

2019



Photo point 5: The plastic has been replaced and the bank repaired observed on the far bank of Branciforte Creek.

2020



Photo point 5: The bank repaired has been repaired with the rock barely visible due to duff and native plantings.



## **FTC-1**

**Project information/Description:** The RCD has been working to improve stream habitat and remove fish passes barriers on Branciforte Creek (a tributary of the San Lorenzo River) for many years. The project replaced two undersized and degraded culverts that failed during significant rain storms in the winter of 2016 on Fitch Creek, a tributary of Branciforte creek. The failed culverts also washed out the driveways that provided access across the creek to three homes. The new culverts will be significantly larger than the previous culverts and are designed to reduce stream velocities that previously may have 1) exceeded fish swimming abilities and 2) initiated outlet scour that created too large of a jump for fish migration during certain stream flows. During low flows, the degraded steel culverts with rusted bottoms created sharp obstacles that also proved dangerous for passing fish. NMFS has identified the project as high priority.

### **Practice/Extent:**

- » Stream Habitat Improvement and Management (395) – Culverts and Fill = 14 ft x 40 ft, 12 ft x 44 ft
- » Stream Habitat Improvement and Management (395) – Streambank Protection = 39 ft by 72 ft, 27 ft x 73 ft
- » Access Road (560) = 12 ft x 72 ft, 12 ft x 64 ft
- » Critical Area Planting (342) = 2114 ft<sup>2</sup>

**Purpose/Goal of Project:** The overall goal of the project is to improve fish passage and stream habitat for salmonids at two failed culverts.

**Area affected:** 7,187 ft<sup>2</sup>

**Conservation benefits:** The project will open up 0.1 mile of spawning habitat to salmonids by removing a passage impediment.

**Natural biological enhancements:** Removal of barriers will provide safer passage for fish moving upstream and open up additional spawning habitat.

**Volume of soil moved:** 1018 yd<sup>3</sup>

**Net waters/Wetland loss:** No net loss of jurisdictional waters or wetlands occurred as a result of this project.

**Net gains in wetlands and riparian areas:** No change.

**Final slope of project work (not to exceed 2:1)**  
1:1 (rocked slopes may exceed 2:1)

**Reports submitted to County staff:** Not applicable

**Mitigation I.(B) Methods to lessen “take” of protected plants, animals and habitats, including avoidance:** Prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species potentially present in the project area, including steelhead, California giant

salamander and the Santa Cruz black salamander. The pre-construction meetings described the protection afforded by the Federal and California Endangered Species Acts and the specific protective measures to be followed during implementation of practices.

A pre-construction survey was conducted by an approved qualified biologist on August 30, 2018 during clear weather conditions. Juvenile central California coast (CCC) steelhead (*Oncorhynchus mykiss*) were observed within deeper portions of the project area (e.g., scour pool below the failed 91 Mountain View Road culvert) and larval California giant salamanders (*Dicamptodon ensatus*) were observed in shallow reaches of the project sites. Giant salamander larvae observed during the pre-construction survey were captured by hand and/or small dip net, transferred to a bucket containing stream water, and relocated to suitable habitat upstream or downstream of the construction areas. No Santa Cruz black salamanders (*Aneides flavipunctatus niger*) were observed within the project area or vicinity.

Fish relocation activities were conducted in accordance with permit conditions outlined in the National Marine Fisheries Service (NMFS) Programmatic Biological Opinion for the Resource Conservation District of Santa Cruz County’s Partners in Restoration permit coordination program. Per permit requirements, the total distance of dewatered stream channel was kept to a feasible minimum in that the designs for each of the two construction sites included separate dewatering plans that were independent of each other and maintained an active (flowing) channel between the two. Therefore, separate fish exclusion and relocation reaches were established for the 91 and 95 Mountain View Road sites, as described further below. Block nets with a 1/4” mesh size was installed upstream and downstream of each construction site. Subsequent to net installation, fish present within the exclusion areas were captured using standard electrofishing techniques. Repeated electrofishing passes were made with a Smith-Root Model LR-24 backpack electrofisher, moving upstream from the downstream-most block net and ending at the upstream-most block net. A frequency of 60 Hz and a voltage of 150-200 V were used throughout the relocation effort. Captured fish were placed in a 5-gallon bucket containing stream water and a battery-powered aerator, given ample time to recover, and released into suitable habitat (pools with cover) upstream or downstream of the exclusion areas. Water in the bucket was changed often to ensure ample oxygen availability and avoid waste product (urea and CO<sub>2</sub>) buildup. Site-specific relocation data are presented below.

A total of 40 CCC steelhead (29 YOY and 11 yearling-or-older) and 14 larval California giant salamanders were captured and relocated from a combined exclusion area of approximately 350 ft at the two construction sites. One YOY steelhead mortality was noted, representing 2.5% of the total number of steelhead relocated.

After the completion of construction activities at both sites, the dewatering systems were removed and natural flow was restored on October 12, 2018.

**Mitigation I.(C) Efforts to control non-native**

**plant species:** The property hosts a number of invasive species, including English Ivy (*Hedera helix*), Forget-me-nots (*Myosotis latifolia*), Himalayan blackberry (*Rubus ameniacus*), Canary Ivy (*Hedera canariensis*), Veldtgrass (*Ehrharta erecta*), and English Holly (*Ilex aquifolium*). There are also other non-California native species including spiderwart, periwinkle, and crimson wood sorrel.

The focus of this project is fish passage improvement and broad-scale invasive removal is not feasible. The project will be monitored for three to five years to ensure no new non-native invasive species colonize the site and that non-native species are managed to allow for native vegetation establishment.

**Mitigation I.(D) Revegetation efforts:** Revegetation occurred with the goal of erosion control due to site disturbance. Common barley and straw were hand broadcast on all disturbed areas.

In addition, the following California native plants were planted on the limited disturbed areas of the project. Plants will be hand-watered until established. Due to the current density of tree cover and safety issues related to traffic visibility that would incur once trees were mature, the tree planting at the site was reduced from 12 to 5. Seven other trees will be planted at another to be determined location off-site. All vegetation is flagged to assist in monitoring efforts to ensure success criteria are met.

**Mitigation I.(E) Monitoring:** Revegetation of the project site was completed with the goal of erosion control and improving wildlife habitat. An 90 % success rate of erosion control seed will be monitored during year 1. An 80% success rate will be monitored for native potted plants. Due to fewer trees being planted, a 100% success criteria

No.	Size	Scientific Name	Common Name
2	TD4	<i>Acer macrophylla</i>	Big leaf maple
3	TP	<i>Acer negundo</i>	Box elder
2	1G	<i>Juncus patens</i>	Blue green rush
1	LT8	<i>Cornus sericea</i>	Red Osier dogwood
9	4"	<i>Asarum caudatum</i>	Western wild ginger
4	4"	<i>Blechnum spicant</i>	Deer fern
5	4"	<i>Polystichum munitum</i>	Western sword fern
1	1G	<i>Woodwardia fimbriata</i>	Giant chain fern
1	1G	<i>Mimulus guttatus</i>	Seep monkeyflower
1	1G	<i>Dicentra formosa</i>	Western bleeding heart

will be used for the five trees planted. The success criteria will be monitored for a period of three to five years to ensure successful establishment of native vegetation.

**Mitigation II: Floodwater conveyance:** Not applicable.

**2020 Observations for Project (BMPs)**

Both culverts continue to function as intended and with no signs of erosion and the inlets or outlets. Surrounding banks are stable.

**2020 Observations for Mitigation Measures**

**Mitigation I. (B)** Not applicable.

**Mitigation I. (C)** The property has a number of invasive species and other non-California native species. Management of these species was not within the scope of the project. No new invasive species have colonized the project area.

**Mitigation I. (D)** Revegetation occurred immediately following construction with the goal of erosion control due to site disturbance and for replacement of trees removed. All five trees planted on site are still thriving at 100% success. Off-site planting is still pending.

**Mitigation I. (E)** The Big leaf maple and Box elder trees have achieved 100% success. The native potted plants have achieved a 61% success criteria. A summer survey was not able to be conducted to observe winter dormant\* plants. While the replanting has not yet achieved the 80% success criteria, native recruitment of additional sword ferns and California native blackberry have achieved plant cover to pre-construction conditions. The site will continued to be monitored.

Area 91	Success %	Area 95	Success %	Scientific Name	Common Name
2	100%			<i>Acer macrophylla</i>	Big leaf maple
		3	100%	<i>Acer negundo</i>	Box elder
2	100%			<i>Juncus Patens</i>	Blue green rush
1	100%			<i>Cornus Sericea</i>	Red Osier Dogwood
6	50%*	3	66%*	<i>Asarum caudatum</i>	Western wild ginger
1	100%	3	66%*	<i>Blechnum spicant</i>	Deer fern
1	100%	3	33%	<i>Polystichium munitum</i>	Western sword fern
1	100%			<i>Woodwardia fimbriata</i>	Giant chain fern
		1	0%*	<i>Mimulus guttatus</i>	seep monkeyflower
		1	0%	<i>Dicentra formosa</i>	Western bleeding heart

Before



Photo point 1A: Looking upstream at the failed upper crossing from Mountain View Drive.

After



Photo point 1A: Looking upstream at the new, fish friendly crossing and repaved road.

2019



Photo point 1A: The engineered stream materials in the culvert has stayed in place and there is no erosion present around the culvert.

2020



Photo point 1A: The engineered stream materials in the culvert have stayed in place and there is still no erosion present around the culvert.

Before



Photo point 3A: Looking downstream at the upper crossing failure.

After



Photo point 3A: Looking downstream at the repaired crossing.

2019



Photo point 3A: The culvert is functioning well and no erosion is present. Note the tree that fell on the right that was partially cut to unblock the road but the trunk was left in place.

2020



Photo point 3A: Looking downstream. The culvert is functioning well and no erosion is present.

Before



Photo point 1B: Looking upstream at the lower failed crossing.

After



Photo point 1B: Looking upstream at the lower crossing with the new culvert and repaved road.

2019



Photo point 1B: Banks are stable and the culvert is functioning as intended.

2020



Photo point 1B: Looking upstream. Banks are stable and the culvert is functioning as intended.



Photo point 3B: Looking downstream at the failed crossing.



Photo point 3B: Looking downstream at the new crossing sized and placed for improved fish passage.



Photo point 3B: There is no erosion present at the culvert inlet. Banks are stable.



Photo point 3B: There is still no erosion present at the culvert inlet. Banks are stable with a good cover of native duff.

**KC-1**

**Project information/Description:** This project reduces sediment input to Kings Creek by decommissioning 1803 lineal feet of old logging road. The road was graded to prevent cut and fill slope failures typical of unpaved rural roads. Approximately 1410 feet of road was regraded with outsloping and rolling dips. 393 feet was treated with slash, seeding, and duff only. The road was shaped so that it is no longer available for vehicle traffic. Disturbed areas were limited to the minimal amount needed to conduct project activities, demarcated by the engineer before the start of construction. Native duff was salvaged from the work area prior to disturbance and redistributed over the work areas at the completion of grading.

**Practice/Extent:**

- » Access Road Improvement (560) - Road Decommission and Recontour = 22 ft x 1410 ft
- » Tree/Shrub Establishment = 240 ft x 120 ft
- » Critical Area Planting (342) = 2114 ft<sup>2</sup>

**Purpose/Goal of Project:** The goal of the project is to improve salmonid habitat and water quality in the San Lorenzo River by reducing sediment inputs.

**Area affected:** 0.91 acres

**Conservation benefits:** The project reduced sediment input into King Creek, improving spawning habitat for salmonids.

**Natural biological enhancements:** Decommissioning the road relieves impacts from concentrated stormwater runoff thus improving water quality and returns natural landscape contours that existed prior to the road being built.

**Volume of soil moved:** 1018 yd<sup>3</sup>

**Net waters/Wetland loss:** No net loss of jurisdictional waters or wetlands occurred as a result of this project.

**Net gains in wetlands and riparian areas:** No change

**Final slope of project work (not to exceed 2:1):** 2:1

**Reports submitted to County staff:** Not applicable

**Mitigation I.(B) Methods to lessen “take” of protected plants, animals and habitats, including avoidance:** On September 11, 2018, prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species potentially present in the project area, including Coho and Steelhead salmon, California Giant Salamander and the Santa Cruz Black Salamander. The pre-construction meetings described the protection afforded by the Federal and California Endangered Species Acts and the specific protective measures to be followed during implementation of practices.

A survey for Marbled Murrelets (MAMU) was conducted by a State Parks qualified biologist on May 4, 2018. MAMU have never been documented nesting, or present, in the project area. The survey concluded that the current site conditions were not conducive to MAMU.

**Mitigation I.(C) Efforts to control non-native**

**plant species:** The property hosts a limited number of non-native species, including about 2% Forget-me-nots (*Myosotis sp.*), 1% French Boom (*Genista monspessulana*), 5% of various European grasses.

The focus of this is sediment reduction for water quality and eradication of non-native species is not within the scope of this project. However, the landowner actively manages for invasive species throughout the property and does removal when feasible. The project will be monitored for three to five years to ensure no new non-native invasive species colonize the site and that non-native species are managed to allow for native vegetation establishment.

**Mitigation I.(D) Revegetation efforts:**

Due to the challenge of establishing vegetation under a mature tree canopy and access and feasibility for irrigation, revegetation took place off-site approximately 750-1000 feet from the project area. Black Oaks (*Quercus kelloggii*) were planted at a 4:1 ratio in an upland area of the property on a portion of the property that was an old Christmas tree farm. The landowner contracted with a local nursery to grow oaks from seed collected on-site resulting in 32 4 inch by 14 inch tree pots planted. Trees were placed 20-30' apart with browsing cages and irrigation installed. The trees will be monitored for three to five years with a 75% success criteria.

Additionally, for the two trees removed in the riparian area of the project, five maples were planted where the 8 inch maple was removed and acorns were collected and planted in the area where the 8 inch oak was being removed. The maples were planted in mid October and will get limited hand-watering. The oak acorns were collected during construction and placed immediately after work was completed. No additional irrigation will be provided for these plantings. There is no success criteria. However they will be monitored for three to five years. The project site is expected to return to preconstruction conditions through natural recruitment of trees, shrubs, and forb species.

**Mitigation I.(E) Monitoring:** Maple and oak seeds were planted with the goal of comparing natural recruitment versus intentional planting. Seed sites were flagged for monitoring, but with no success criteria required. Black oaks planting off-site are being monitored with a 75% success criteria. The site will be monitored for a period of three to five years.

**Mitigation II: Floodwater conveyance:** Not applicable.

**2020 Observations for Project (BMPs)**

The decommissioned road has done very well, with ample native recruitment in the footprint and drainage working as anticipated. As noted last year, the site of the original scarp failure where a natural seep appeared to create some slumping has not changed, and as such has not needed additional management at this time. The landowner will continue to monitor the slip and implement an adaptive management plan if necessary.

**2020 Observations for Mitigation Measures**

**Mitigation I. (B)** Not applicable.

**Mitigation I. (C)** The project site continues to have no new invasive species present, and the landowner actively manages the invasive species that occur elsewhere on the property.

**Mitigation I. (D)** The black oaks planted at a nearby location to the project site have been faring well with the

browsing cages upgraded to mirror their growth and irrigation still fully online. The oaks have shown a roughly 81% survival rate to date. The maple and oak seeds that were planted in the riparian area at the site of the tree removals have still only shown a single oak sprouting, but with minimal growth. Native recruitment of both of these species has been abundant however throughout the project site and adjacent to the planting area along with numerous other species.

**Mitigation I. (E)**

Native species recruitment has been abundant, including blackberry, poison oak, drops of gold, sword fern, blue elderberry, thimbleberry, big leaf maple, tanoak, canyon oak, hedge nettle, madrone, and native grasses. Ground cover now mirrors other undisturbed areas nearby.

The oaks have exceeded the success criteria of 75%.



Photo point 2: Looking down the old access road that was decommissioned.



Photo point 2: The road was outslopped to closer mimic the natural slope of the land. Wood debris and understory duff removed during construction was spread back over the area.



Photo point 2: Looking south along the road that was removed. Decommission was effectively reducing runoff and natural recruitment of vegetation is occurring.



Photo point 2: Decommission is still effectively reducing runoff and natural recruitment of vegetation continues to occur at a high rate.



Before



Photo point 5: Looking up the old access road that was decommissioned. Notice the road failure from concentrated runoff and a fallen tree.

After



Photo point 5: The road recontoured to more closely match the natural slope on the left and prevent ponding or concentrated runoff. Understory duff was stockpiled during construction and spread back over the area post-construction.

2019



Photo point 5: Looking north at scarp failure. There is some slumping due to a natural seep. Landowner is monitoring.

2020



Photo point 5: Looking north at scarp failure. The natural slumping due to a natural seep has stabilized and the landowner is monitoring.

Before



Photo point 9: Looking uphill long the upland portion of the road. The road is insloped the whole stretch above this point with no ditch relief thus contributing to runoff created erosion,

After



Photo point 9: The road was outsloped to reduce runoff and covered in duff and wood debris from onsite.

2019



Photo point 9: Looking east uphill at former road junction. Decommission is effectively reducing runoff.

2020



Photo point 9. Decommission is effectively reducing runoff and sediment

## 2017 Projects Updates

### CoC-3

**Project information/Description:** This project includes the capture of sediment through the creation of a 0.6-acre basin. Construction consisted of clearing vegetation from the project site, excavation, berm construction, erosion control and revegetation. The basin is dual-chambered, excavated to a depth of 14 feet in the upper section and 9 feet in the lower area, with a spreader/basin divider in between. A 24-inch dual walled HDPE riser pipe and 8-inch HDPE outlet pipe were installed on the southwest end of the basin to safely convey flow to an existing drainage channel. A 50 square foot energy dissipater with 12-inch minimum thickness of rock riprap, underlain with non-woven geotextile fabric, was installed at the pipe outlet (D50=6”). In addition, a turf reinforced mat lined inlet channel was installed on the north side of the basin to safely convey surface flow from the neighboring property into the basin. Spoils were disposed of on-site, placed with stabilization measures above and below the basin.

**Practice/Extent:**

- » Water and Sediment Control Basin (638)=100 ft x 285 ft
- » Structure for Water Control (587), N/A
- » Critical Area Planting (342)=1.6 acres

**Purpose/Goal of Project:** The goal of the project was to reduce erosion through the management of storm runoff.

**Area affected:** 2.25 acres

**Conservation benefits:** The project will improve water quality in the Corralitos Creek watershed by reducing transport of sediment and sediment-bound nutrients.

**Natural biological enhancements:** Reduction of sediment transport will enhance downstream water quality.

**Volume of soil moved:** 6,520 yd<sup>3</sup>

**Net waters/Wetland loss:** No net loss of jurisdictional waters or wetlands occurred as a result of this project.

**Net gains in wetlands and riparian areas:** No change

**Final slope of project work (not to exceed 2:1)**  
2:1 to 3:1

**Reports submitted to County staff:** Not applicable

**Mitigation I.(B) Methods to lessen “take” of protected plants, animals and habitats, including avoidance:** Prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species potentially present in the project area, including California red-legged Frog (CRLF). The pre-construction meetings described the protection afforded by the Federal and California Endangered Species Acts and the specific protective

measures to be followed during implementation of practices. No species were encountered during construction activities.

**Mitigation I.(C) Efforts to control non-native plant species:** The property hosts a number of invasive species, including Eucalyptus (*Eucalyptus sp.*), jubata grass (*Cortaderia jubata*), and Italian thistle (*Carduus pycnocephalus*), as well as a plethora of non-native grass species. The focus of this project is sediment capture and water quality improvement and broad-scale invasive removal is not feasible. The project will be monitored for three to five years to ensure no new non-native invasive species colonize the site and that non-native species are managed to allow for native vegetation establishment.

**Mitigation I.(D) Revegetation efforts:** Revegetation occurred with the goal of erosion control due to site disturbance. Common barley and a soil builder mix was hand broadcast on steeper areas and drill seeded on flatter portions of the existing access road and soil disposal areas. A native seed mix, including yarrow (*Achillea millefolium*), blue wild-rye (*Elymus glaucus*), red fescue (*Festuca rubra*), and meadow barley (*Hordeum brachyantherum*), with common barley (*Hordeum vulgare*), was hand broadcast inside the basin. Weed-free straw mulch was applied for erosion control at a rate of ~1 bale per 1,000 square feet. In addition, over 500 native container plants were installed along the top edges of the basin to create wildlife habitat and provide aesthetic value.

#### Native Container Plant List

Species	Common Name
<i>Aesculus californica</i>	Buckeye
<i>Aesclepius californica</i>	Narrow-leafed milkweed
<i>Arctostaphylos hookeri</i>	Hookers manzanita
<i>Carex barbarae</i>	Santa Barbara sedge
<i>Carex tumulicola</i>	Hilldweller sedge
<i>Elymus triticoides</i>	Creeping Wildrye
<i>Eschscholzia californica</i>	California poppy
<i>Euthamia occidentalis</i>	Marsh goldenrod
<i>Fragaria vesca</i>	Woodland strawberry
<i>Frangula californica</i>	Coffeeberry
<i>Heteromeles arbutifolia</i>	Toyon
<i>Iris douglasiana</i>	Douglas Iris
<i>Juncus effusus</i>	Bog rush
<i>Juncus patens</i>	Spreading rush
<i>Oenothera hookeri</i>	Evening primrose
<i>Ribes divaricatum</i>	Spreading gooseberry
<i>Ribes sanguineum</i>	Fuscia flowered gooseberry
<i>Rosa californica</i>	California wildrose
<i>Rubus parviflorus</i>	Thimble berry
<i>Salvia mellifera</i>	Black sage
<i>Scrophularia californica</i>	California beeplant
<i>Sisyrinchium bellum</i>	Blue-eyed grass
<i>Stachys ajugoides</i>	Wood mint
<i>Symphocarpos albus</i>	Creeping snowberry
<i>Symphyotrichum chilense</i>	California aster
<i>Verbena lasiostachys</i>	Verbena

**Mitigation I.(E) Monitoring:** Revegetation of the project site was completed with the goal of erosion control and improving wildlife habitat. A 90 % success rate of non-native seed on erosion control protection areas will be monitored during year 1. A 65% success rate will be monitored for native seeding and planting areas. The success criteria will be monitored for a period of three to five years to ensure successful establishment of native vegetation.

**Mitigation II: Floodwater conveyance:** Not applicable.

### **2020 Observations for Project (BMPs)**

Adaptive management actions have addressed the minor damage to the basin which occurred from an early storm in 2017. The structure is capturing storm runoff and reducing down stream water quality impacts successfully.

### **2020 Observations for Mitigation Measures**

**Mitigation I. (B)** Not applicable.

**Mitigation I. (C)** The property has a number of invasive species, particularly non-native grasses at the project site. Management of these grasses was not within the scope of the project. No new invasive species have colonized the project area.

**Mitigation I. (D)** Revegetation occurred with the goal of erosion control due to site disturbance. The site has been stabilized and is functioning as planned.

**Mitigation I. (E)** The site is meeting its intended goals and has established adequate vegetative cover that exceeds preconstruction conditions.

***This will be the final update for this project.***

Before



After



2018



2019



Photo point 5: From the culvert crossing, looking northwest at the basin location (left side of photo) and spoils disposal area (right side of photo). Vegetation has been slow to established on this access road. UCSC instrumentation used to monitor the basin can be seen on the right.

2020



Photo point 5: Vegetation is slow to become established on this access road due to continued use. However, the site is flat without concentrated flow and vegetation has become well established surrounding this area.



Photo point 7: Looking northeast at the basin. Revegetation occurred prior to the winter rains. In 2018 the basin was full of water after the initial winter rains. Vegetation is becoming established. In 2019 the basin was excavated to remove trap sediment prior to the winter rains.



Photo point 7: Looking northeast, accumulated sediment has been removed from the basin and the weir repaired. Vegetation has become well established on the slopes.

## **ScC-3**

**Project information/Description:** This project enhanced instream and floodplain habitat and restored natural hydro-geomorphic function for steelhead and coho salmon in Scotts Creek through the implementation of a number of specific components, including the construction of eleven instream wood complexes, enhancing two existing debris jams, and grading two connections with the floodplain adjacent to the stream channel.

**Practice/Extent:**

- » Stream Habitat Improvement and Management (395) = 32 ft x 500 ft
- » Streambank and Shoreline Protection (580), Floodplain Connections = 1700 ft<sup>2</sup>
- » Streambank and Shoreline Protection (580) = 23 ft x 865 ft
- » Critical Area Planting (342) = 9200 ft<sup>2</sup>
- » Temporary Access = 10 ft x 800 ft

**Purpose/Goal of Project:** The goal of the project is to enhance instream and floodplain habitat and to restore natural hydro-geomorphic function. Strategic levee breaching, placement of large woody debris (LWD), and confluence enhancement will collectively: improve hydrologic connection between the main channel and floodplain; increase duration and frequency of floodplain inundation, while reducing floodplain flow velocities; improve floodplain circulation and nutrient cycling through longer inundation periods and creation of multiple paths for access and egress of floodwaters; enhance riparian, floodplain and instream habitat via reestablishment of more natural geomorphic features; and installation of backwatering elements such as LWD.

**Area affected:** 1.2 acres

**Conservation benefits:** Enhancing instream habitat and restoring natural hydro-geomorphic function will improve the creek's capacity as a spawning and rearing ground for coho salmon, steelhead trout, and the California Red-legged Frog.

**Natural biological enhancements:** This project involves stream-channel enhancement for purposes of habitat restoration in Scotts Creek.

**Volume of soil moved:** 235 yd<sup>3</sup>

**Net waters/Wetland loss:** No net loss of jurisdictional waters or wetlands occurred as a result of this project.

**Net gains in wetlands and riparian areas:** No change

**Final slope of project work (not to exceed 2:1) 2:1**

**Reports submitted to County staff:** Written analysis

by a Registered Civil Engineer (RCE) indicating that the project will not decrease floodwater storage, modify floodwater conveyance, increase base flood elevation, or otherwise create an adverse impact either on the site, or upstream or downstream of the site.

**Mitigation I.(B) methods to lessen “take” of protected plants, animals and habitats, including avoidance:**

On August 14, 2017, prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species in the project area, including Steelhead, Coho, and California red-legged Frog. The pre-construction meetings described the protection afforded by the Federal and California Endangered Species Acts and the specific protective measures to be followed during implementation of practices.

The RCD coordinated with the National Marine Fisheries Service, California Department of Fish and Wildlife, and NOAA Southwest Fisheries Science Center to decrease impacts to salmonids through restoration activities. It was determined that large wood would be placed in the stream with a biologist on site, but without dewatering the reach. In addition, the RCD coordinated with a local biologist and United States Fish and Wildlife on the protection of Tidewater goby during phase II (ScC2). A site visit occurred by the biologist to confirm that goby would not be in the project area. A qualified individual was on-site daily to monitor for California red-legged frog. No species were encountered.

**Mitigation I.(C) Efforts to control non-native plant species:**

The project site is infested by a number of non-native species, including Cape ivy (*Delairea odorata*), Rescue grass (*Bromus catharticus*), Veldt grass (*Ehrharta erecta*), Forget me not (*Myosotis discolor*), Italian thistle (*Carduus pycnocephalus*), Periwinkle (*Vinca major*), Wild radish (*Raphanus sativus*), Poison hemlock (*Conium maculatum*), and Clustered dock (*Rumex conglomeratus*). Eradication or control of these non-native species was not within the scope of the project, although they will be managed to ensure successful revegetation. The site will be monitored for three to five years to ensure no new non-native invasive species colonize the site.

**Mitigation I.(D) Revegetation efforts:** As the goal of this project was habitat enhancement and erosion control, a diverse array of native trees and shrub species were planted based on location, including Box elder (*Acer negundo*), Red alder (*Alnus rubra*), Red elderberry (*Sambucus racemosa var racemosa*), Blue elderberry (*Sambucus nigra ssp. caerulea*), shining willow (*Salix lasiandra var. lasiandra*), Arroyo willow (*Salix lasiolepis*), Creek dogwood (*Cornus sericea*), Brown rush (*Juncus hesperius*), Spreading rush (*Juncus patens*), Pacific rush (*Juncus effusus subsp. Pacificus*), Bingleaf sedge (*Carex amplifolia*), Barberpole sedge (*Scirpus microcarpus*), Cyperus (*Cyperus eragrostis*), Slough sedge (*Carex obtusata*), Salmonberry (*Rubus*

*spectabilis*), Blackberry (*Rubus ursinus*), Thimbleberry (*Rubus parviflorus*), Woodland strawberry (*Fragaria vesca*), Straggly gooseberry (*Ribes divaricatum* var. *pubiflorum*), California rose (*Rosa californica*), California hedge-nettle (*Stachys bullata*), American stinging nettle (*Urtica dioica* subsp.), California figwort (*Scrophularia californica*), Douglas' nightshade (*Solanum douglasii*), Golden yarrow (*Eriophyllum confertiflorum*), Lady fern (*Athyrium felix-femina* var. *cyclosorum*), Giant chain fern (*Woodwardia fimbriata*), Western swordfern (*Polystichum munitum*), Woodfern (*Dryopteris arguta*), and Common yarrow (*Achillea millefolium*).

**For this large wood project, the following trees were removed and replaced at a 3:1 ratio:**

- » Red Alder (*Alnus Rubra*): four 6-8.5-inch dbh; five 9.5-13-in dbh and three 15-21-inch dbh. These alders were likely dead.
- » Redwood (*Sequoia Sempervirens*): nine 8-12-inch dbh; one 31-inch dbh. The large redwood was dead. The other redwoods have re-sprouted.
- » Eucalyptus (*Eucalyptus sp*): one 27-inch dbh; removed from another project and imported
- » Shining Willow (*Salix Lasiantra*): Two 12-13-inch dbh; resprouted.
- » Monterey Cypress (*Cupressus macrocarpa*): One 27-inch dbh; removed from another project and imported.

**Mitigation I.(E) Monitoring:** Revegetation of the project area occurred with the primary goal of habitat enhancement and erosion control. Due to the challenge of establishing vegetation under a mature canopy in the riparian area, the success criteria for revegetation at this site are 30% plant survival. The success criteria will be monitored for a period of three to five years to ensure successful establishment of native vegetation and to ensure that no new invasive species colonize the project site.

**Mitigation II: Floodwater conveyance:** The project is located in a FEMA flood zone A and floodway. The written analysis of a Registered Civil Engineer (RCE) or hydrologist indicating that the project will not decrease floodwater storage, modify floodwater conveyance, increase base flood elevation, or otherwise create an adverse impact either on the site, or upstream or downstream of the site, has been provided to the County.

**2020 Observations for Project (BMPs)**

The project is meeting its intended goals to increase surface roughness, pool habitat, and sediment sorting. While some of the riparian corridor was affected by the CZU fire, vegetative cover is adequate to provide erosion control. Floodplain activation in a number of locations was observed.

**2020 Observations for Mitigation Measures**

**Mitigation I. (B)** Not applicable.

**Mitigation I. (C)** The property and the watershed hosts a number of non-native species, including Cape ivy, rescue

grass, veldt grass, Forget-me-not, periwinkle, wild radish, clustered dock and poison hemlock. Eradication of these species is beyond the scope of the project and their control was limited during 2020 due to both covid and the CZU fire. No new invasive species have colonized the project area.

**Mitigation I. (D)** Revegetation activities targeted areas where access was cleared prior to construction in the riparian area and unstable banks in the floodplain. These areas have become well vegetated with a mix of native and non-native cover through active revegetation and natural colonization. The vegetation is providing habitat for wildlife within the riparian corridor.

**Mitigation I. (E)** Native species have achieved a 65% success criteria and the project is functioning as intended.

***This will be the final update for this project.***



Before



After



2018



2019



Photo point 2: Photo taken from the left bank of Scotts Creek looking towards a wood feature composed of red alder taken from the streambank, an redwood in the stream, and an imported eucalyptus log. The structure, comprised of alder, redwood and eucalyptus can be seen to the right of the photo and in 2018-19 was catching wood and creating nice scour habitat.

2020



Photo point 2: The log wood structure, comprised of alder, redwood and eucalyptus can be seen to the right of the photo, is continuing to catch wood and cause scour benefitting habitat.

Before



After



2018



2019



Photo point 4: Photo taken from the left bank of Scotts Creek looking toward a large wood feature of red alders. In 2018-19 the log wood structure was increasing in-stream habitat complexity.

2020



Photo point 4: The log wood structure continues to increase in-stream habitat complexity.

## **SVC-3**

**Project information/Description:** The RCD has been working to improve in-stream habitat and riparian health of San Vicente Creek since 2008. In continuing our efforts, 38 redwood trees, including 1 snag, and 8 salvage pieces were felled into the stream channel at 11 identified locations to increase habitat complexity and floodplain connectivity. Increasing the wood loading will improve the quality of in-stream rearing habitat, forest health through thinning, and trapping and storing sediment. The wood was predominantly unanchored to mimic natural conditions in this undeveloped portion of the watershed.

**Practice/Extent:**

- » Stream Habitat Improvement and Management (395), LWM = 40 ft x 250 ft
- » Streambank and Shoreline Protection (580), Floodplain Connections = 200 ft<sup>2</sup>
- » Critical Area Planting (342) = 9200 ft<sup>2</sup>

**Purpose/Goal of Project:** The goal of the project is to address the lack of winter refuge and limited summer rearing habitat by increasing habitat complexity and floodplain connectivity for salmonids in San Vicente Creek.

**Area affected:** 0.45 acres

**Conservation benefits:** Enhancing instream habitat and restoring natural hydro-geomorphic function will improve the creek's capacity as a spawning and rearing ground for coho salmon, steelhead trout, and the California Red-legged Frog.

**Natural biological enhancements:** This project involves stream-channel enhancement for purposes of habitat restoration in San Vicente Creek.

**Volume of soil moved:** 23 yd<sup>3</sup>

**Net Waters/Wetland Loss:** No net loss of jurisdictional waters or wetlands occurred as a result of this project.

**Net gains in wetlands and riparian areas:**

No change

**Final slope of project work (not to exceed 2:1) NA**

**Reports submitted to County staff:** Not applicable

**Mitigation I.(B) methods to lessen "take" of protected plants, animals and habitats, including avoidance:**

On September 5, 2017, prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species in the project area, including Steelhead, Coho, and California red-legged Frog. The pre-construction meetings described the protection afforded by the Federal and California Endangered Species Acts and the specific

protective measures to be followed during implementation of practices.

The RCD coordinated with the National Marine Fisheries Service, California Department of Fish and Wildlife, and NOAA Southwest Fisheries Science Center to decrease impacts to salmonids through restoration activities. It was determined that large wood would be placed in the stream with a biologist on site, but without dewatering the reach. A qualified individual was on-site daily to monitor for California red-legged frog. No species were encountered.

**Mitigation I.(C) Efforts to control non-native plant species:** The project site is infested by a number of non-native species, including Clematis, French broom, jubata grass, forget-me-not, English ivy, Geranium, spiderwort, and Cape ivy. Eradication or control of the clematis will be occurring through separate permits from 2018-2020. However, control/eradication of the other non-native species was not within the scope of the project. The site will be monitored for three to five years to ensure no new non-native invasive species colonize the site.

**Mitigation I.(D) Revegetation efforts:** The RCD has been implementing projects in San Vicente Creek since 2008, including large scale removal of cape ivy, which blankets the ground and smothers native vegetation. After each project, the RCD has observed natural colonization of the project area and prefers this method of revegetation rather than the import of container plant materials. Redwood duff was collected near disturbed areas and spread onto these areas for protection from raindrop erosion. The 38 trees that were felled on site and used for the large woody debris structure will be mitigated for, as required, by planting 60 redwood tree seedlings. The site will be monitored to ensure that erosion does not occur and that disturbed areas are not colonized by existing non-native species.

**Mitigation I.(E) Monitoring:** The site will be monitored to document the success of large wood structures in improving salmonid habitat for a period of three to five years to ensure successful establishment of native vegetation and to ensure that no new invasive species colonize the project site. A 64% survival rate for the redwood trees will be achieved.

**Mitigation II: Floodwater conveyance:** Not applicable.

### **2020 Observations for Project (BMPs)**

The LWD structures all appear fully intact, and many have displayed positive influences in stream morphology. Numerous sites have developed sandbars and/or gravel accumulations, and many have also formed pools in the vicinity of the structure. Similarly encouraging is that most of the structures have racked up other woody debris, further amplifying their impact and creating additional habitat. The structure installed on Mill Creek has been successfully

diverting flow onto the floodplain, which has created a seasonal braided channel that runs roughly 300-400 feet downstream through the floodplain before rejoining San Vicente Creek. The channel flows during high flow events and was observed with water and small fish during the winter and spring.

### **2020 Observations for Mitigation Measures**

**Mitigation I. (B)** Not applicable.

**Mitigation I. (C)** The project site is infested by a number of non-native species, including, French broom, Jubata grass, forget-me-not, English ivy, Geranium, spiderwort, and Cape ivy. While control of the other non-native species was not originally within the scope of the project, control occurred in 2020 and will continue into 2021. Eradication of clematis occurred from 2018-2020 and will also continue into 2021. Non-native species management is authorized through individual permits. No new non-native invasive species colonized the site.

**Mitigation I. (D)** Natural colonization of the site continues to be abundant, including of redwood basal sprouting and natural seedling growth. Of the planted trees, 48 were observed alive with varying degrees of growth due to various reasons (site quality, native competition, etc.), with the remainder either observed as deceased or were unable to be located due to native growth covering the site. Roughly 3 trees were impacted by the recent CZU August Lightning Complex fires and may have died from that event. Of the 48 living planted trees, some showed growth of multiple feet since planting, while others were a similar size as when they were planted. Native, unplanted redwood seedlings onsite appear to have shown much more growth than the planted trees.

**Mitigation I. (E)** The project is meeting its intended goal and has achieved a 73% success criteria for native vegetation.

***This will be the final update for this project.***

Before



Photo point 2: Looking upstream, no large wood is in the channel.

2018



Photo point 2: After project implementation, large wood can be seen spanning the channel.

2019



Photo point 2: After project implementation, large wood can be seen spanning the channel.

2020



Photo point 2: After project implementation, large wood can be seen spanning the channel. While minimal additional wood accumulation has occurred here, numerous sites have developed sandbars and/or gravel accumulations, and many have also formed pools in the vicinity of the structure.

Before



Photo point 5: A remnant side channel has not been active for over a decade at the confluence of San Vicente and Mill Creeks.

2018



Photo point 5: Large wood was placed and a notch carved into the side channel to initiate floodplain re-activation.

2019



Photo point 5: The large wood and notch in the side channel has increased floodplain activation.

2020



Photo point 5: The large wood and notch in the side channel has successfully diverted flow onto the floodplain, which has created a seasonal braided channel that runs roughly 300-400 feet downstream through the floodplain before rejoining San Vicente Creek.

Before



Photo point 5D: At the confluence of Mill and San Vicente Creeks, the channel became highly incised during the 2016/2017 storm event.

2018



Photo point 5D: Large wood was placed just upstream of the confluence of San Vicente and Mill Creeks to assist in aggradation and pool development.

2019



Photo point 5D: Large wood, placed just upstream of the confluence of San Vicente and Mill Creeks, is creating deposition.

2020



Photo point 5D: Large wood, placed just upstream of the confluence of San Vicente and Mill Creeks has racked up other woody debris, further amplifying its impact and creating additional habitat.

## 2016 Project Updates

### CoC-2

**Project information/Description:** This project included the enhancement of an existing wetland through the excavation of 300 yd<sup>3</sup> of material from a 0.13 acre area to improve wetland function and habitat for amphibian species. Approximately 130 yd<sup>3</sup> of clay was imported to the site to be used for the key trench in the berm and to line the bottom of the wetland and inside of the berm. An earthen berm combined of native and imported material was constructed with a 2-inch PVC drain pipe. An emergency spillway (8 ft wide, 6 inches deep) was installed in the lower end of the embankment and an inlet ditch was installed to direct surface flows from an existing access road into the wetland. Common barley and sterile straw was used for erosion control of the access road and staging area and the wetland was Revegetated with native container plants.

**Practice/Extent:**

- » Wetland Management (657), 15 ft x 900 ft
- » Underground Outlet (620), 8 ft x 100 ft
- » Critical Area Planting (342), 0.5 acres

**Purpose/Goal of Project:** The goal of the project is to increase wetland habitat and native plant diversity to support California red-legged frogs and other wildlife

**Area affected:** 0.5 acres

**Conservation benefits:** With the majority of riparian corridors fenced off for agricultural protection, access to water particularly during the summer months is limited for endemic wildlife. This project improves a water source for amphibian breeding and wildlife use.

**Natural biological enhancements:** The project will

collect additional surface water and provide a longer hydroperiod to support amphibian and wildlife habitat.

**Volume of soil moved:** 300 yd<sup>3</sup>

**Net waters/Wetland loss:** No net loss of jurisdictional waters or wetlands occurred as a result of the project.

**Net gains in wetlands and riparian areas:** No change.

**Final slope of project work (not to exceed 2:1)** 4:1

**Reports submitted to County staff:** Not applicable

**Mitigation I.(B) Methods to lessen “take” of protected plants, animals and habitats, including avoidance:** On September 23, 2016, prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species potentially present in the project area, including the California red-legged Frog. The pre-construction meeting described the protection afforded by the Federal and California Endangered Species Acts and the specific protective measures to be followed during implementation of the project. No species were encountered during construction activities.

**Mitigation I.(C) Efforts to control non-native plant species:** While the property owner continues to implement practices to manage non-native species, the property still hosts Eucalyptus, Acacia, jubata grass, poison hemlock, English ivy, and vinca, as well as a variety of less aggressive species including narrow leaf plantain, cat’s ear, filaree, common sorrel, wild radish, field mustard, Italian thistle, nutsedge, curly dock, soft chess brome, rattlesnake grass, wild oak and riggut brome. While broad-scale removal is not feasible as part of this project, these species will be managed to allow successful native plant establishment. The project will be monitored for three to five years to ensure that no new non-native species colonize the site and that adequate native vegetation is established for wildlife use.

Wetland/Pond Edge			
<b>Total Approximate Area Pond at High Water</b>	<b>5400 square feet</b>		
<b>Total Area of Wetland /Pond Edge Available Planting</b>	<b>3000 square feet</b>		
<b>Total Planting Area by Percent</b>	<b>90%</b>		
<b>Species</b>		<b>Number</b>	<b>Size</b>
Baccharis glutinosa	Marsh baccharis	12	3x5
Eliocharis macrostachya	Spikerush	52	2"
Euthamia occidentalis	Marsh goldenrod	24	3"
Juncus effusus	Bog rush	200	2x5
Juncus xiphioides	Iris leaved rush	30	2x5
	<b>Subtotal</b>	<b>318</b>	



**Mitigation I.(D) Revegetation efforts:** Revegetation within the project area occurred with the goals of erosion control and wetland enhancement. Common barley (*Hordeum vulgare*) was broadcast seeded over the 0.5 acres and mulched with weed-free straw at a rate of two bales per 1,000 ft<sup>2</sup> to prevent colonization by non-native species that do not occur currently on the site. The wetland enhancement area was planted with native, wetland plants.

**Mitigation I.(E) Monitoring:** Revegetation of the wetland was completed with the goal of increasing native plant diversity, encourage amphibian breeding, improving pollinator habitat, and suppress existing weeds. Supplemental plantings will occur if there is insufficient plant material growing at the water's edge to enable amphibian breeding or if there is less than 25% shade surrounding the pond.

**Mitigation II: Floodwater conveyance:** Not applicable.

### 2020 Observations for Project (BMPs)

Given the low rainfall year and on-going declines in groundwater levels in the Corralitos region, it is hard to determine the correct action to address the hydroperiod of the wetland. Additional clay or other actions will be employed to ensure that project is functioning as intended.

### 2020 Observations for Mitigation Measures

**Mitigation I. (B)** Not applicable.

**Mitigation I. (C)** The property hosts a number of non-native species, including Eucalyptus, Acacia, Jubata grass, poison hemlock, ivy and vinca. Eradication of these species on the property is beyond the scope of the project. However, the landowner continues

<b>Riparian</b>			
<b>Total Approximate Area Available</b>	<b>4000 square feet</b>		
<b>Total Planting Area by Percent</b>	<b>80%</b>		
<b>Shade by Percent of Riparian</b>	<b>30%</b>		
<b>Species</b>		Number	Size
Cornus cerisea ssp. occidentalis	Creekside dogwood	4	3x5
Lonicera involucrata	Twinberry	6	3x5
Jucus patens	Spreading Rush	100	2x5
Rosa californica	CA Wild Rose	20	3x5
Ribes divaricatum	Spreading gooseberry	7	#1
Rubus parviflorus	Thimbleberry	3	#1
Salix laevigata	Red willow	10	stakes
Salix lasiolepis	Arroyo willow	10	stakes
Sambucus cerealla	Elderberry	9	#1
	<b>Subtotal</b>	<b>198</b>	

<b>Embankment and Surrounding Areas</b>			
<b>Total Approximate Area of Embankment</b>	<b>1800 square feet</b>		
<b>Total Area including Surrounding</b>	<b>3500 square feet</b>		
<b>Planting Area by Percent</b>	<b>70%</b>		
<b>Species</b>		Number	Size
Arctostaphylos hookerii	Hookers manzanita	3	#1
Artemesia californica	CA sagebrush	3	#1
Carex barabarae	Santa Barbara sedge	16	3x5
Ceanothus thyrsiflorus	California lilac	2	#1
Chlorogalum pomeridianum	Soap root	2	#1
Elymus triticoides	Creeping wildrye	40	3"
Eriogonum nudum	Bare stem buckwheat	5	#1
Epilobium canum	California fuscia	3	#1
Frangula californica	Coffeeberry	4	#1
Iris douglasiana	Douglas iris	15	#1
Rosa californica	CA wild rose	20	3x5
Rubis discolor	CA blackberry	3	3x5
Satureja douglasii	Yerba buena	3	#1
Scrophularia californica	CA bee plant	20	3x5
Symphoricarpus alba	Spreading snowberry	7	#1
Symphotricum chilensis	California aster	9	3x5
Quercus agrifolia	Coast live oak	1	#1
	<b>Subtotal</b>	<b>162</b>	

efforts to control the spread of the species on the property and on the project site. No new invasive species have colonized the project area.

**Mitigation I. (D)** Revegetation occurred with the goals of erosion control and wetland enhancement. All disturbed areas have become well vegetated with existing grasses with cover established at ~ 90%. The wetland area is flourishing with native plants including willows, creeping wildrye, Santa Barbara sedge, juncus California bee plant, and spreading gooseberry.

**Mitigation I. (E)** Vegetation within the wetland has achieved a success criterion of 90%. The hydroperiod and vegetation will continue to be monitored to ensure successful establishment and function. Adaptive management measures will be employed in 2022.



Photo point 1: In the before photo, the existing wetland habitat can be seen in the foreground. The habitat to be enhanced is in the background. The after photo shows the approximately 0.15 acres that were excavated to retain water and extend the inundation period to support amphibian breeding. In 2017, the enhanced wetland was providing for tree frogs, ducks, and other wildlife. In 2018, the enhanced wetland dried in May this year. Additional clay was applied to the pond to reduce leakage and increase the hydroperiod for amphibian breeding. In 2019 more clay was added to reduce leakage and reach the intended hydroperiod.



Photo point 1: The enhanced wetland does not currently have the intended hydroperiod. The site continues to be monitored.

Before



After



2017



2018



2019



Photo point 4: The before photos shows the habitat prior to being enhanced. In the after photo, the wetland embankment, which can be seen in the right of the photo, will also double as a road to access other portions of the farm. All disturbed areas were seeding with common barley and mulch with weed-free wheat straw. In 2017-18, vegetation was becoming well established, particularly creeping wild rye, Santa Barbara, sedge, California bee plant, and spreading gooseberry. In 2019, the landowner continued irrigation throughout the summer months to increase survival. Vegetation is becoming well established, particularly creeping wildrye, mugwort, and juncus.

2020



Photo point 4: The embankment is well vegetated and native vegetation, such as mugwort and willow, is visible.

## 2015 Projects Updates

### MWS-11

**Project information/Description:** This project included the improvement of a 0.11 acre wetland by improving hydrologic function and habitat for endemic amphibian species, including the California red-legged Frog (CRLF) and Santa Cruz long-toed Salamander (SCLTS). Construction activities included the clearing vegetation from the project site, excavation, berm construction, erosion control and revegetation. Clay material for the USFWS Ellicott Slough National Wildlife Refuge was used as a clay liner in the deeper area of the wetland to extend the hydroperiod. Approximately 6 inches of topsoil and some of the native, wetland plants were set aside and replanted after construction activities. A 6-inch perforated riser pipe was installed with a 4 foot x 4 foot x 2 foot concrete pad, along with an outlet pipe, energy dissipator and 1-ft deep secondary spillway lined with non-woven geotextile fabric and rock. Excess material was disposed of in the staging area, which was seeding with a native seed mix and mulched with rice straw.

**Practice/Extent:**

- » Wetland Restoration (659), 0.11 acres
- » Structure for Water Control (587), 0 ft x 20 ft
- » Critical Area Planting (342A), 12,000 ft<sup>2</sup>
- » Critical Area Planting (342H), 12,000 ft<sup>2</sup>

**Purpose/Goal of Project:** The goal of the project is to improve wetland habitat for California Red-legged Frog (CRLF) and the Santa Cruz long-toed Salamander.

**Area affected:** 0.27 acres

**Conservation benefits:** The proposed project will directly improve breeding habitat by extending the hydroperiod of a wetland to allow amphibians to successfully breed and migrate to the existing protected upland habitat.

**Natural biological enhancements:** Improving breeding habitat will allow the rejuvenation of the Freedom SCLTS metapopulation and increase the likelihood for SCLTS to spread to and intermix with the adjacent metapopulations.

**Volume of soil moved:** 1,100 yd<sup>3</sup>

**Net waters/Wetland loss:** No net loss of jurisdictional waters or wetlands occurred as a result of this project.

**Net gains in wetlands and riparian areas:** No change.

**Final slope of project work (not to exceed 2:1):** Not applicable.

**Reports submitted to County staff:** Not applicable.

**Mitigation I.(B) Methods to lessen “take” of**

**protected plants, animals and habitats, including avoidance:** In preparation for project implementation, the area to be impacted by construction activities, was mowed beginning in spring of 2014 through the summer of 2015 to maintain low grass height to deter SCLTS juveniles outmigrating from the existing pond from burrowing within the project area.

On October 29 and November 20, 2015, prior to the onset of activities that resulted in disturbance of the project area, all project workers were given information on the listed species in the project area, including the California red-legged frog (CRLF) and Santa Cruz long-toed Salamander (SCLTS). The pre-construction meetings described the protection afforded by the Federal and California Endangered Species Acts and the specific protective measures to be followed during implementation of practices. A qualified individual was on-site during all activities to stop work if the species was found. No species were encountered during project activities.

**Mitigation I.(C) Efforts to control non-native**

**plant species:** The property hosts a number of invasive species, including Eucalyptus (*Eucalyptus globulus*), Acacia (*Acacia ssp.*), Italian thistle (*Carduus hynoccephalus*), Cape ivy (*Delairea odorata*), Calla lily (*Zantedeschia aethiopica*), Virginia creeper (*Parthenocissus quinquefolia*), French broom (*Genista monspessulana*), Pampas grass (*Cortaderia spp.*), as well as a plethora of non-native grass species. The focus of this project is wetland enhancement. While broad-scale invasive removal is not feasible, they will be managed to allow successful native plant establishment. The project will be monitored for three to five years to ensure no new non-native invasive species colonize the site and that adequate native vegetation is established for amphibian breeding.

**Mitigation I.(D) Revegetation efforts:** As the goal of this project was wetland enhancement, a diverse array of herbaceous vegetation were planted, including Bulrush (*Scirpus microcarpus*), Common Rush (*Juncus patens*), Horsetail (*Equisetum hyemale*) and sedges (*Carex spp.*). In addition, Western sword fern (*Polystichum munitum*), oak trees (*Quercus spp.*) and Yerba Buena (*Mentha arvensis*) were planted in the upland area. The material was harvested on-site and propagated by USFWS Refuge staff.

In addition, disturbed areas were mulched and seeded with a native seed mix, including California Brome (*Bromus carinatus*), Blue Wildrye (*Elymus glaucus*), Three Weeks Fescue (*Vulpia microstachys*), and Native clover (*Trifolium obtusiflorum*), broadcast seeded at a rate of 45 lbs/acre.

**Mitigation I.(E) Monitoring:** Revegetation of the project site was completed with the goal of increasing wetland vegetation to encourage amphibian breeding and to provide erosion control. A 60% success rate of all planted species will be measured through annual monitoring. The success

criteria will be monitored for a period of three to five years to ensure successful establishment of native vegetation.

**Mitigation II: Floodwater conveyance:**

Not applicable.

**2020 Observations for Project (BMPs)**

The pond was lined with sodium bentonite to improve the hydroperiod. Vegetation re-establishment and function will continued to be monitored.

**2020 Observations for Mitigation Measures**

**Mitigation I. (B)** Not applicable.

**Mitigation I. (C)** The property hosts a number of invasive species. As such, broad scale invasive removal was not feasible. French broom and Jubata grass continue to be actively hand pulled and sprayed, respectively, from the disturbed areas. No new non-native species have colonized the project area

**Mitigation I. (D)** Revegetation efforts were very successful with common rush and bulrush creating a lush ring around the wetland with 95% cover. With the application of bentonite, vegetation on the lower slopes was removed.

**Mitigation I. (E)** Revegetation was completed with the goal of increasing wetland vegetation for amphibian breeding and erosion control. Both of which had been achieved. However, adaptive management measures were employed in 2020 to increase the hydroperiod of the pond. Intended function and revegetation will continue to be monitored.

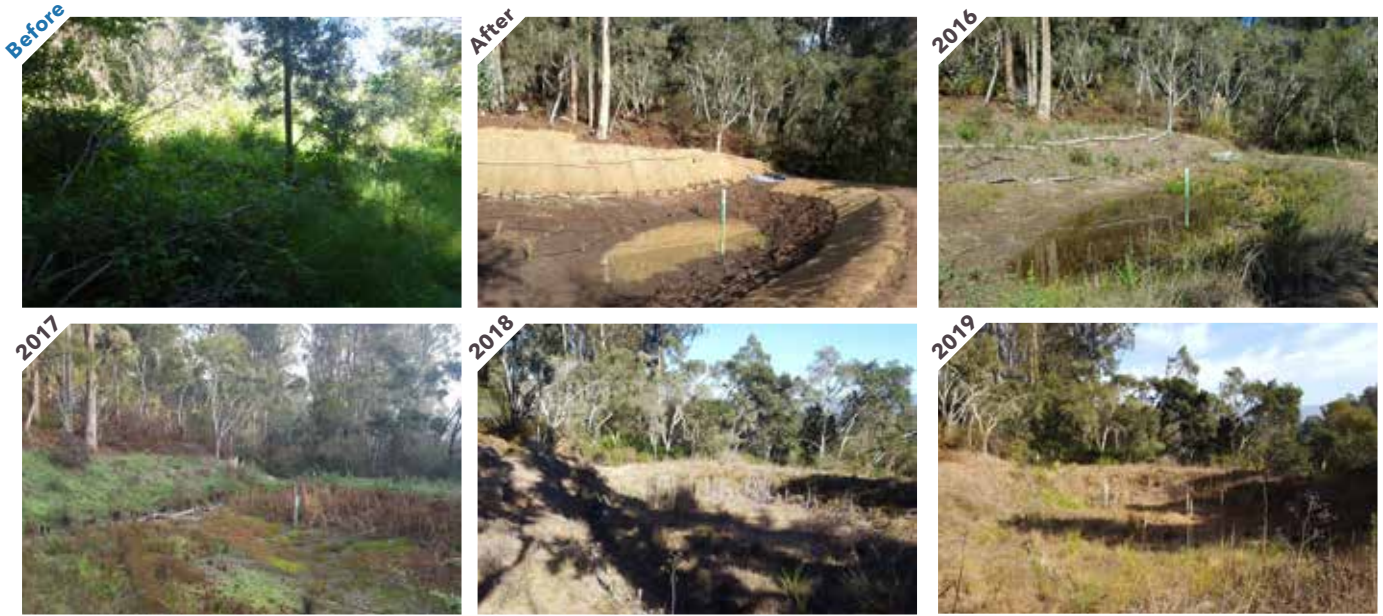


Photo point 3-2: The wetland was enhanced to increase the hydroperiod for amphibian breeding. A riser pipe to manage water levels can be seen. In 2016, the wetland did not hold water long enough to support amphibian breeding. Monitoring equipment was installed to monitor wetland hydroperiod and adaptive management measures are underway. In 2018-19 monitoring equipment was installed to monitor wetland hydroperiod and adaptive management measures were developed.



Photo point 3-2: Juncus and other wetland plants were undisturbed during pond lining. All topsoil was replaced.

Before



After



2016



2017



2018



2019



Photo point 4: The before photo is facing southwest from the pre-existing access road and breeding habitat. The wetland was enhanced to increase the hydroperiod for amphibian breeding. A riser pipe to manage water levels is visible in the center. In 2016-19, vegetation was becoming well established in the wetland/pond and was utilized by tree frogs and newts. Although french broom and jubata grass continued to present and needed to be removed.

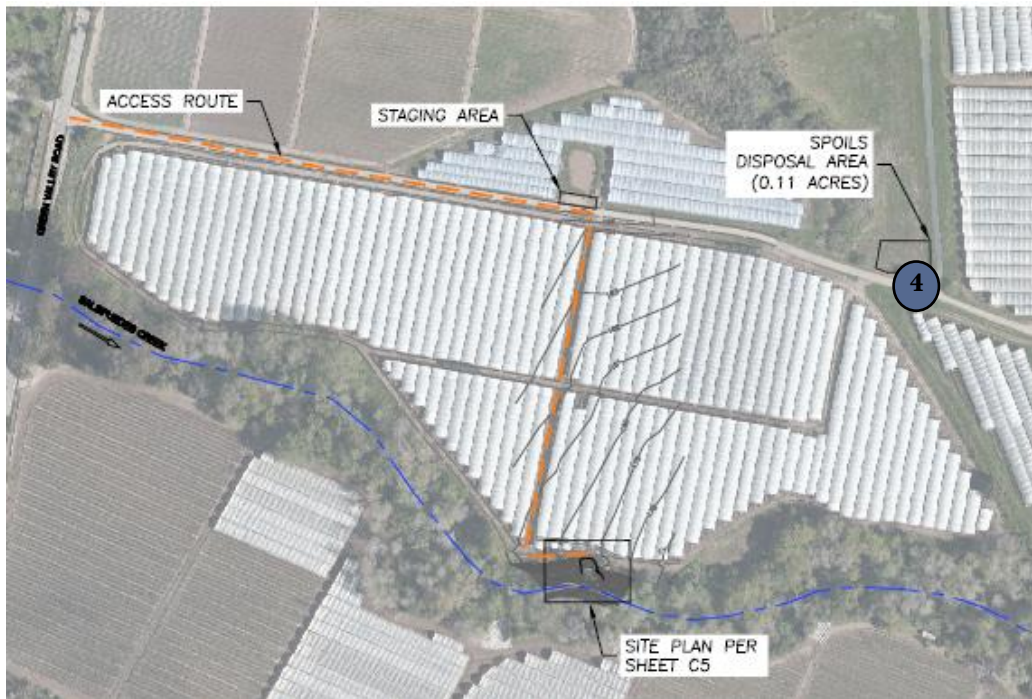
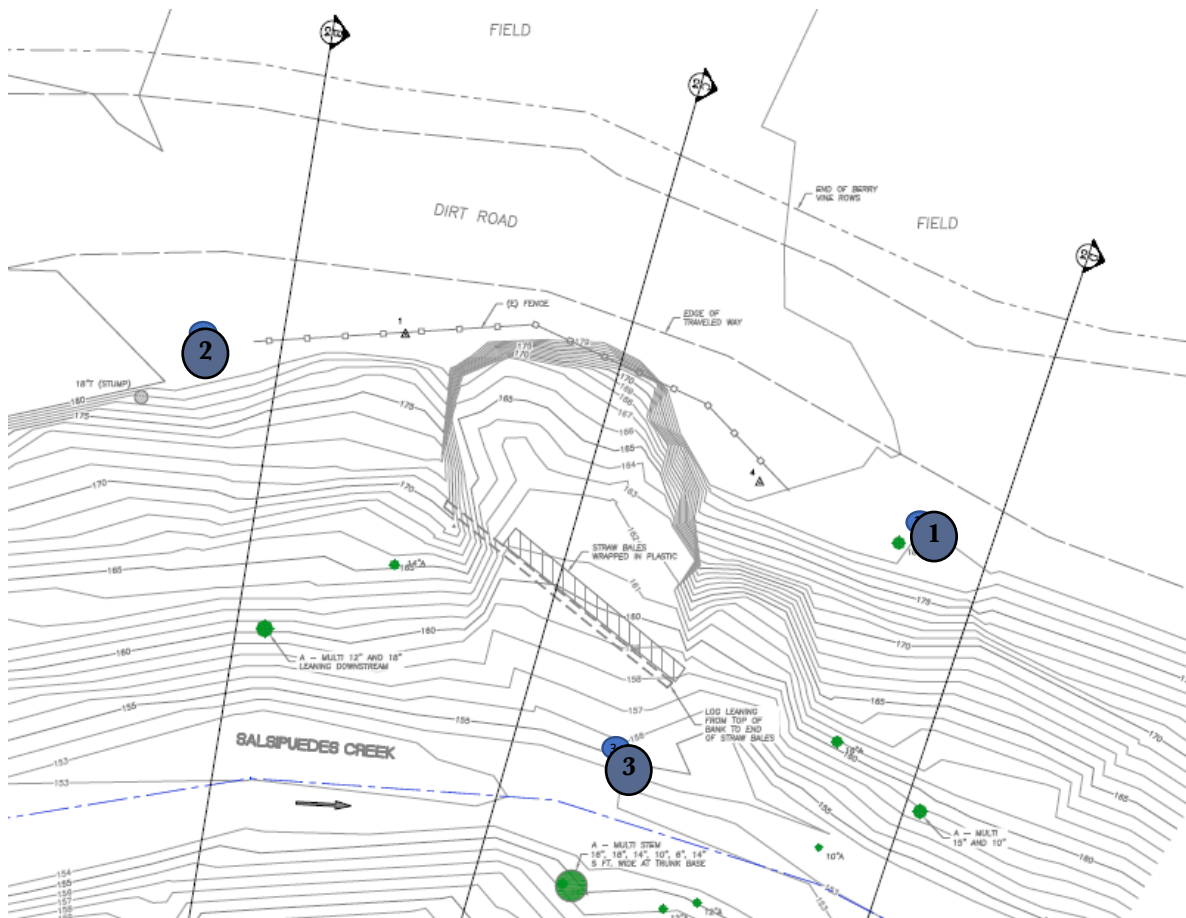
2020



Photo point 4: The pond was lined with sodium bentonite to increase the hydroperiod for amphibian breeding.

# 2020 Project Photo Point Maps

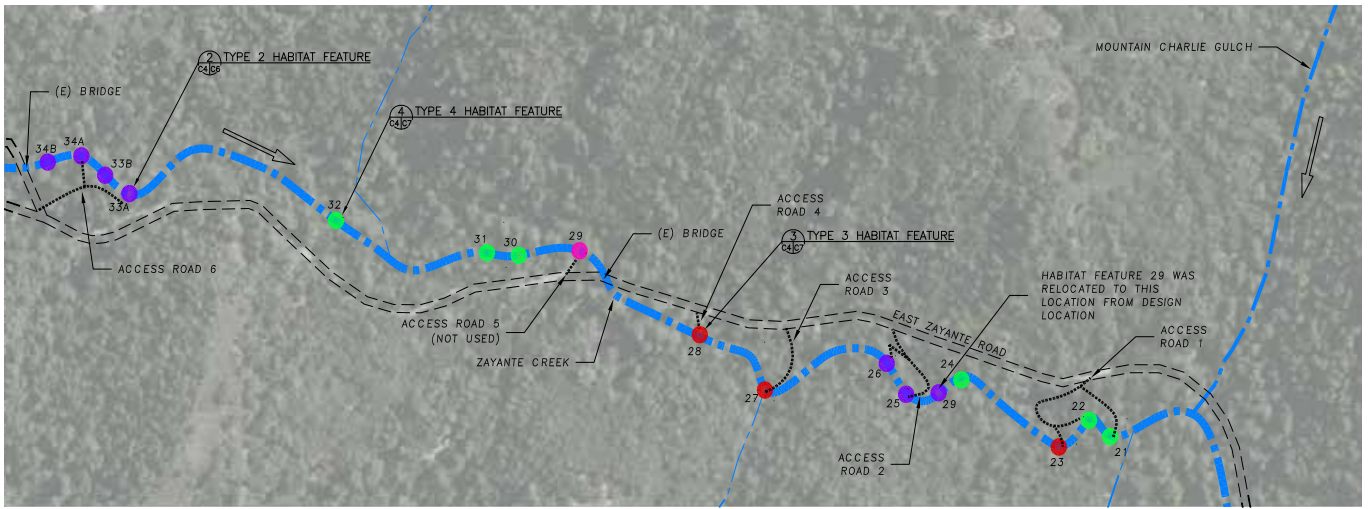
## GVC-2



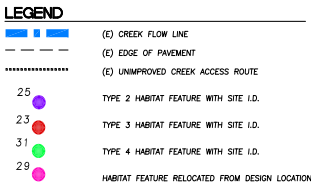


# 2019 Project Photo Point Maps

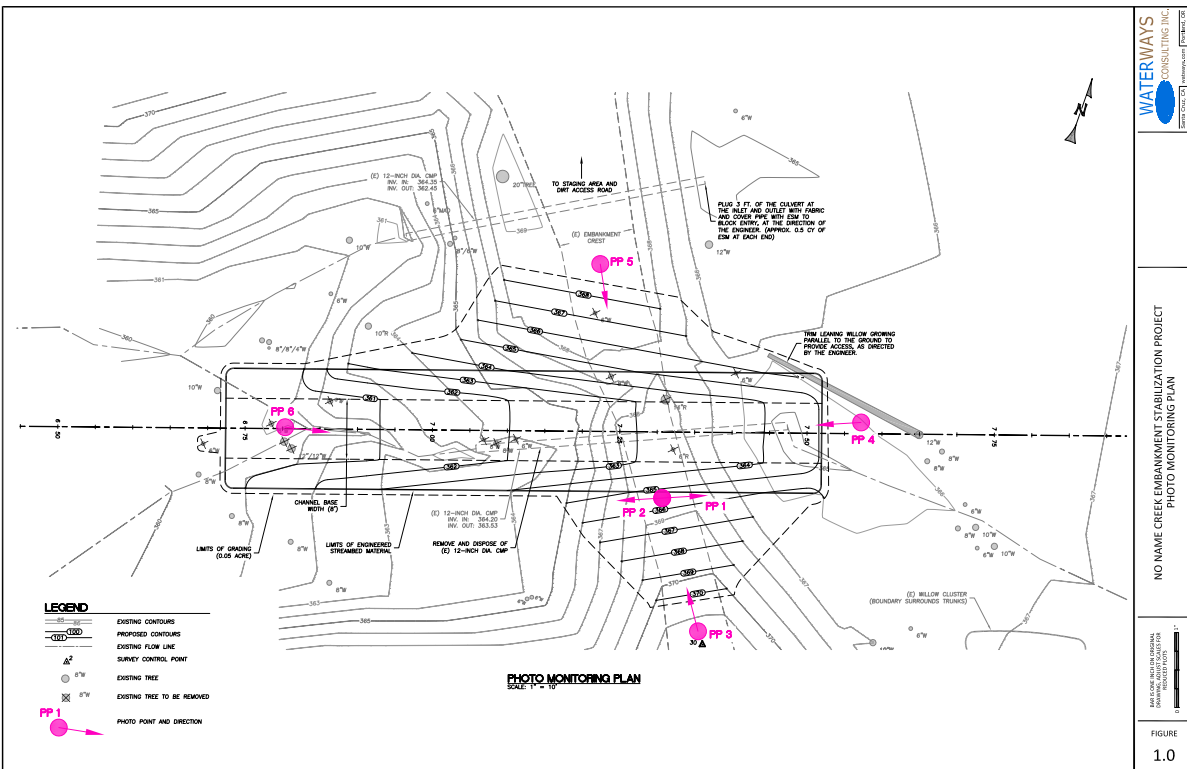
## ZaC-2



UPPER ZAYANTE ACCESS AND HABITAT FEATURE PLACEMENT AS-BUILT  
SCALE: 1" = 200'



## ZaC-2



## 2018 Project Photo Point Maps

BrC-2

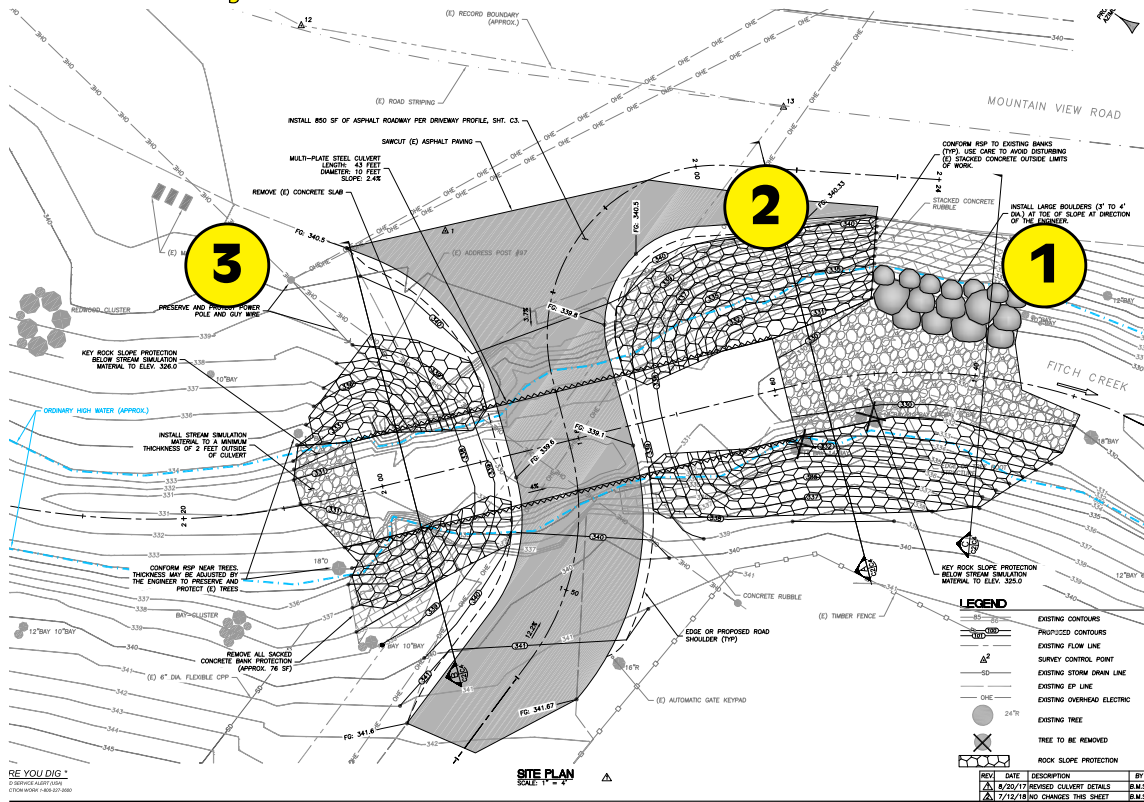


KC-1

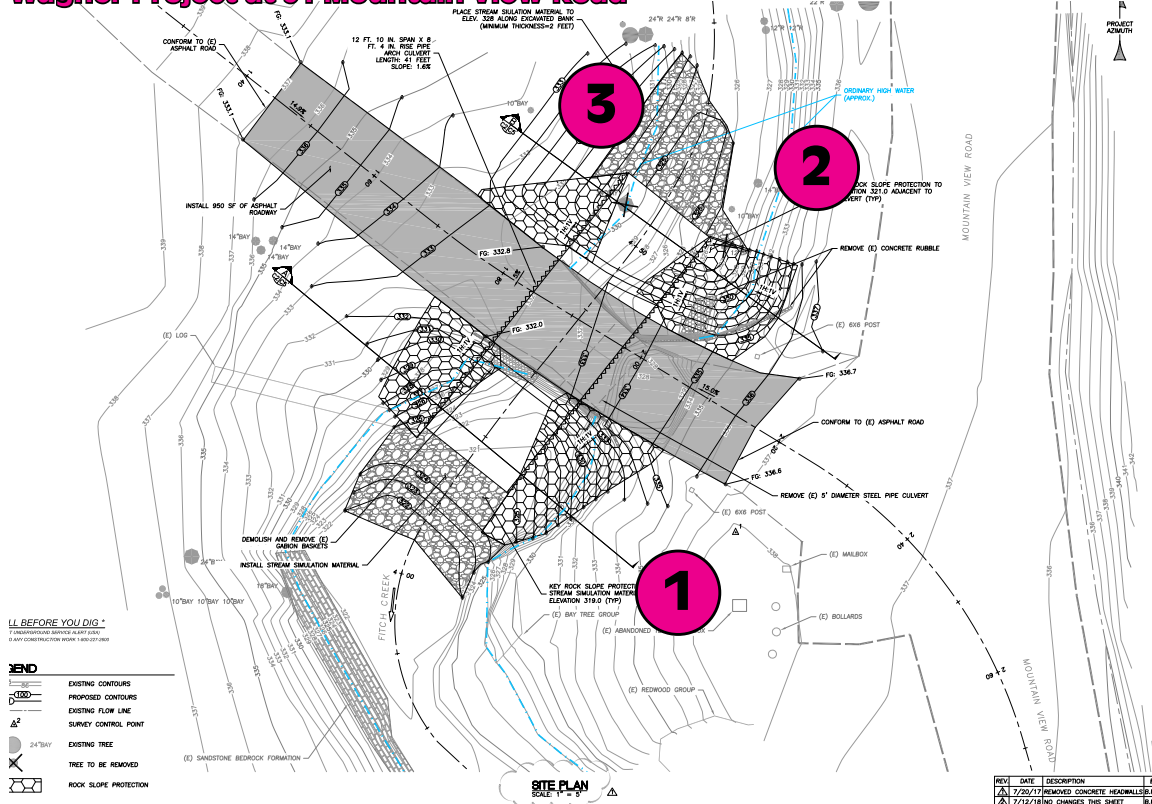


FTC-1 (sites 1 & 2)

Fitch Creek Project at 95 Mountain View Road



Wagner Project at 91 Mountain View Road



## 2017 Project Photo Point Maps

### CoC-3



### ScC-3



SVC-3



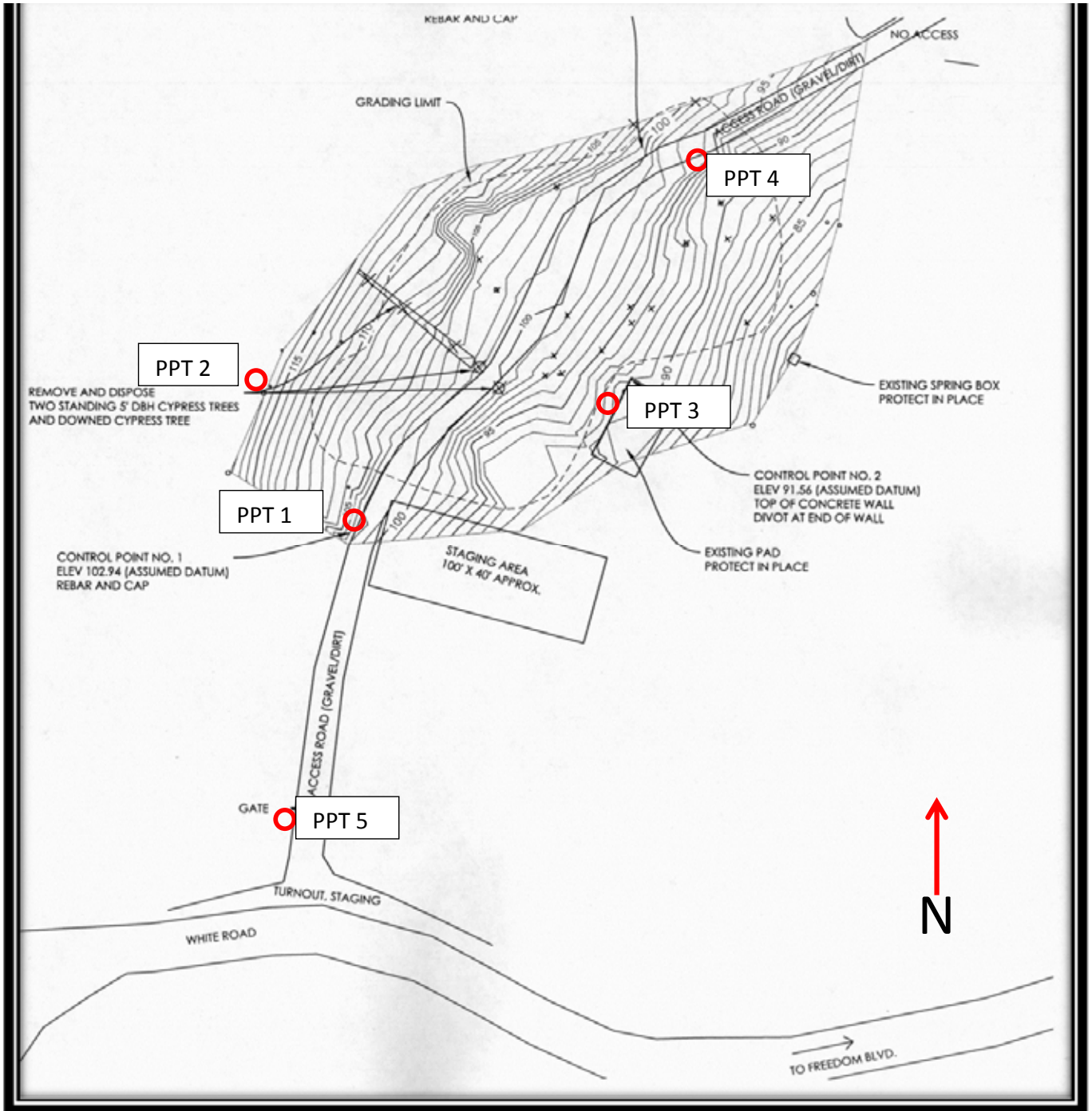
## 2016 Project Photo Point Maps

CoC-2



# 2015 Project Photo Point Maps

## MWS-11



**Local Solutions.**



**Real Results.**