Santa Cruz Countywide Partners in Restoration Permit Coordination Program

2008 Annual Report

Report prepared by
USDA – Natural Resources Conservation Service
and the RCDSCC- Resource Conservation District of Santa Cruz County

In fulfillment of terms of agreements with:

United States Army Corps of Engineers
United States Fish and Wildlife Service
United States National Marine Fisheries Service
California Department of Fish and Game
California Coastal Commission
Central Coast Regional Water Quality Control Board
County of Santa Cruz
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Acknowledgements

Many individuals and organizations have made important contributions to this report. Original funding for the Permit Coordination Program was provided by the California Coastal Conservancy and current funding for the program is being provided by the State Water Resources Control Board through Proposition 40 and 50. 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: Karen Christensen, Sharon Corkrean, Arianne Rettinger, Kelli Camara, Jennifer Stern, Angie Stuart, Zoe Carlson, Alicia Moss, Joseph Issel, Ezra Neale, Joanna Bremser, Bobbie Haver, Lea Haratani, and Karl Fieberling

RCDSCC Board of Directors: Sheryl Bailey, Howard Liebenberg, Tom Lukens, Mike Manfre, Jim McKenna, John Ricker, and Roberta Smith.

NRCS: Rich Casale, Nick Lasher, Jim Kjelgaard, Glen Wilcox, Dina Cadenazzi, and Daniel Mountjoy.

Special thanks is also extended to 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.
Permit Coordination for Resource Conservation in Santa Cruz County

Summary

Twenty projects were completed in 2008, the fourth year of the Santa Cruz County Partners in Restoration Permit Coordination Program. Eight (8) wildlife habitat improvement projects were implemented throughout the county. Three (3) of these projects were the second or third phase of projects that went through the program in 2005 through 2007. One (1) of these projects involved maintenance of native vegetation planted in 2006 and 2007. Three (3) projects improved migration potential for salmonids. Four (4) water quality improvement projects were implemented, one (1) in the Arana Gulch Watershed and three (3) in the Pajaro Watershed. Five (5) access road improvement projects were implemented, four (4) in the San Lorenzo Valley Watershed and one (1) in the Pajaro River Watershed.

More detailed information about each of these projects is summarized in this report.

The information contained in this report is provided to ensure compliance with the various approvals and agreements developed with the regulatory agencies for the Permit Coordination Program. These agencies and forms of approval are summarized in Table 1.

Table 1. Participating Agencies and Form of Agreement

<table>
<thead>
<tr>
<th>Agency</th>
<th>Regulatory Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States Army Corps of Engineers</td>
<td>Regional General Permit for the Permit Coordination Program</td>
</tr>
<tr>
<td>United States National Marine Fisheries Service</td>
<td>Programmatic Biological Opinion</td>
</tr>
<tr>
<td>United States Fish and Wildlife Service</td>
<td>Programmatic Biological Opinion</td>
</tr>
<tr>
<td>California Coastal Commission</td>
<td>Approval through the County of Santa Cruz’ Issuance of Master Permit</td>
</tr>
<tr>
<td>California Department of Fish and Game</td>
<td>Memorandum of Understanding and Template 1602 Streambed Alteration Agreement</td>
</tr>
<tr>
<td>Regional Water Quality Control Board</td>
<td>Programmatic 401 Water Quality Certification</td>
</tr>
<tr>
<td>County of Santa Cruz</td>
<td>Master Permit</td>
</tr>
</tbody>
</table>

Below is a summary of projects implemented in the 2008 construction season and updates on projects implemented in 2005, 2006, and 2007 under the Partners in Restoration Permit Coordination Program.
Projects Implemented in 2008

Project: SOQ1

Purpose/Goal of Project: The goal of this project was to restore a thirty-foot section of streambank along Soquel Creek by removing cape ivy, a non-native invasive plant, which has weakened the integrity of the streambank.

Area Affected: Cape ivy patch (30’ x 50’)

Practice/Extent: Restoration and Management of Declining Habitats (643), 30’ wide x 50’ long

Goose grass and Cape ivy were removed by hand. Soquel Creek can be seen in the background.

Goose grass and Cape ivy were removed by hand. Natives were planted in this area in November 2008.
**Conservation benefits:**
Colonization by Cape ivy results in the loss of riparian habitat, furthering the decline of special status species populations. Additionally, the presence of non-native invasive plants may destabilize the stream banks, compromising water quality through increasing turbidity and sedimentation that limit reproductive success and survival of the steelhead populations. The removal of Cape ivy improves the environmental value of Soquel Creek by addressing these environmental impacts that result from colonization by this invasive species, and increases the enjoyment and understanding by the local community of a healthy, functioning stream corridor.

**Volume of soil moved:** 0 cyd

**Wetlands/Waters:** No impact to waters of the state and no net loss of jurisdictional waters or wetlands.

**Final slope of project work (not to exceed 2:1):** Removal of Cape ivy occurred on the top of the bank. No grading or slope reshaping occurred.

**Efforts to Control Non-Native Invasive Plant Species:** During Phase 3 (2008), activities concentrated on hand removal of Cape ivy in a 30’ by 50’ area. Success criterion at this project site will be constituted by a 90% reduction in the percent of Cape ivy. The site will be monitored for 5 years to ensure no colonization of new exotic species.

**Revegetation Efforts:** After removal of Cape ivy in 2008, the site was replanted with native shrubs. Success criterion at this site will be constituted by a 90% success of native plants. Any plants that need to be replaced will be unless it is determined by an NRCS biologist that the community is regenerating itself without any need for additional inputs. Re-vegetation efforts will be monitored for a period of five years to ensure successful establishment of the native riparian vegetation.

Following work this year, barley grass seed was hand seeded, covered with straw mulch, and secured with an erosion control blanket and straw wattles in the disturbed area to prevent erosion and sedimentation into Soquel Creek. This erosion control will also deter colonization of other invasive plants.

**Special Status Species and Habitat in the Project Area and Protection Measures Implemented:** Prior to project implementation, all project workers were given information on the listed species in the project area, a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

This project is determined by NRCS to be consistent with the Letter of Concurrence issued by NMFS on April 16, 2004 which confirmed that implementation of the practice: “Restoration and Management of Declining Habitats” was an activity that may affect but was not likely to adversely affect steelhead, coho, or the critical habitat for coho in Santa Cruz County (Consultation # 151422SWR04SR9197:BLS). This project is determined by NRCS to be consistent with the Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.
Project: SOQ3

Goose grass and other invasive groundcover were removed by hand this year.

On the left, pictured is a buffer created to keep invasive plant species from spreading into the restoration area from the adjacent condo landscaping. On the right, pictured is one of the two Acacia trees cut this year.
Practice/Extent: Restoration and Management of Declining Habitats (643), 150’ wide x 1000’ long

Purpose/Goal of Project: The goal of the project is to restore a riparian community by eliminating the exotic ground cover on six (6) acres where English and Cape Ivy have infested and re-vegetating with native plants.

Area Affected: 6 acres

Conservation benefits: Removal of English and Cape ivy in this riparian corridor improves bank stability, decreases erosion and sedimentation and protects native habitat.

Volume of soil moved: 0 cyd

Wetlands/Waters: No impact to waters of the state and no net loss of jurisdictional waters or wetlands.

Final slope of project work (not to exceed 2:1): No grading or slope reshaping occurred.

Invasive Plant Control Maintenance: During Phase 4 of this project (2008), work focused on maintaining control of the invasive groundcover on the six (6) acre site. Hand removal by American Conservation Experience (ACE) crews was done to maintain control of the invasive groundcovers (English and Cape ivy and periwinkle). Removal of two acacia trees was also completed. Success criterion at this project site will be constituted by a 90% reduction in the percent of English and Cape ivy. The site will be monitored for a period of 5 years to prevent the infestation of the site by new exotic species.

Revegetation Maintenance: Revegetation with natives was done as needed for replacement of native revegetation in order to meet success criteria. The natives will provide habitat cover and forage and “shade out” unwanted species. Success criterion at this project site will be constituted by a 90% survival rate. Replanting will occur as needed to meet success criteria of the project.

All of the following native plants were replanted on-site in 2008 to meet success criterion of 90% survival rate for native plants. These plants were propagated from seed collected on-site and have

Hand removal of Tradescantia spp was removed from this area this year.
been pre-approved by an NRCS biologist or were included on the list of approved plant species for use under the Program:

<table>
<thead>
<tr>
<th>Lonicera hispidula Var. Vacillans</th>
<th>Acer negundo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hairy honeysuckle</td>
<td>Box elder</td>
</tr>
<tr>
<td>Woodwardia fimbriata</td>
<td>Populus balsamifera spp. Trichocarpa</td>
</tr>
<tr>
<td>Giant chainfern</td>
<td>Black cottonwood</td>
</tr>
<tr>
<td>Polystichum munitum</td>
<td>Umbellularia californica</td>
</tr>
<tr>
<td>Swordfern</td>
<td>California bay</td>
</tr>
<tr>
<td>Juncus patens</td>
<td>Sambucus Mexicana</td>
</tr>
<tr>
<td>Common rush</td>
<td>Blue elderberry</td>
</tr>
<tr>
<td>Artemesia douglasiana</td>
<td>Cornus sericea ssp. sericea</td>
</tr>
<tr>
<td>Douglas Sagewort</td>
<td>Creek Dogwood</td>
</tr>
<tr>
<td>Hordeum vulgare</td>
<td>Rosa californica</td>
</tr>
<tr>
<td>Common Barley</td>
<td>California Rose</td>
</tr>
<tr>
<td>Asarum caudatum</td>
<td>Ribes menzeisii</td>
</tr>
<tr>
<td>Wild ginger</td>
<td>Canyon gooseberry</td>
</tr>
<tr>
<td>Acer macrophyllum</td>
<td>Ribes sanguineum</td>
</tr>
<tr>
<td>Big leaf maple</td>
<td>Red-flowering Currant</td>
</tr>
<tr>
<td>Scrophularia californica</td>
<td>Elymus glaucus</td>
</tr>
<tr>
<td>Bee plant</td>
<td>Blue Wild Rye</td>
</tr>
</tbody>
</table>

Straw mulch was applied to some areas to deter colonization of invasive plant species. No further erosion control measures were needed.

**Special Status Species and Habitat in the Project Area and Protection Measures Implemented:**
Prior to project implementation, all project workers were given information on the listed species in the project area, a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

This project is determined by NRCS to be consistent with the Letter of Concurrence issued by NMFS on April 16, 2004 which confirmed that implementation of the practice: “Restoration and Management of Declining Habitats” was an activity that may affect but was not likely to adversely affect steelhead, coho, or the critical habitat for coho in Santa Cruz County (Consultation # 151422SWR04SR9197:BLS). This project is determined by NRCS to be consistent with the Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.
Project: SOQ5

Site in 2008 before invasive plant removal

Site in 2008 after invasive plant removal

English ivy, morning glory and goose grass were removed by hand from the area above this year.

Site in 2008 before invasive plant removal

Site in 2008 after invasive plant removal

Cape ivy and morning glory were removed by hand from the stream bank pictured above this year.

Practice/Extent: Restoration and Management of Declining Habitats (643), 20’ wide x 600’ long

Purpose/Goal of Project: The goal of this project is to restore a riparian plant community by eliminating exotic ground cover on approximately 1 acre where periwinkle, morning glory, and Cape and English Ivy have infested, and revegetating with native plants.

Area Affected: 1 acre

Conservation benefits: Removal of English and cape ivy, vinca major, and morning glory along this 600 foot riparian corridor improves bank stability, decreases erosion and sedimentation and protects native habitat.

Volume of soil moved: 0 cyd
Wetlands/Waters: No impact to waters of the state and no net loss of jurisdictional waters or wetlands.

Final slope of project work (not to exceed 2:1): No grading or slope reshaping occurred.

Efforts to Control Non-Native Invasive Plant Species: In Phase 3 (2008), hand removal by the American Conservation Experience (ACE) crews on 0.3 acres of the 1.0 acre was done to control the invasive groundcovers (English and Cape ivy, goose grass and morning glory). The remaining 0.7 acres of the site, areas previously cleared of invasive plants, was maintained. Success criterion at this project site will be constituted by a 90% reduction in the percent of English and Cape ivy, morning glory, and goose grass. The site will be monitored for a period of 5 years to ensure that no new exotic species colonize the area.

Revegetation Efforts: Native plants were planted in areas cleared of invasive groundcover (~0.3 acres). Plant sizes ranged from tube-sized to one gallon containers. The smallest sized containers available were selected in order to reduce water needs during the first year of establishment and to increase likelihood of survival. Appropriate sized holes were hand dug and the species were planted without amendments due to the fertility of the site. Material was re-compacted around the plants to ensure adequate soil contact and the plants were slightly raised to prevent water ponding and rot. An irrigation system was installed in 2007 to provide water during dry months. Nursery stock was inspected for disease and pests prior to use per nursery protocols. Re-vegetation of the site with native plants will provide habitat cover and forage and “shade out” unwanted species. Success criterion at this project site will be constituted by an increase in native plant species of 75% and a 90% survival rate of these species. Replanting will occur as needed to meet success criteria of the project. The site will be monitored for a period of 5 years in order to meet the success criteria of the project.

All of the following native plants were propagated from seed collected on-site and have been pre-approved by an NRCS biologist or were included on the list of approved plant species for use under the Program:

<table>
<thead>
<tr>
<th>Rubus parviflorus</th>
<th>Acer negundo var. californicum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thimbleberry</td>
<td>California Box Elder</td>
</tr>
<tr>
<td>Ribes sanguineum var. Glutinosum</td>
<td>Artemisia douglasiana</td>
</tr>
<tr>
<td>Red Flowering Currant</td>
<td>Mugwort</td>
</tr>
<tr>
<td>Cornus californica</td>
<td>Rhamnus californica</td>
</tr>
<tr>
<td>Dogwood</td>
<td>Coffeeberry</td>
</tr>
<tr>
<td>Ribes menzisii</td>
<td>Rosa californica</td>
</tr>
<tr>
<td>Canyon Gooseberry</td>
<td>California Rose</td>
</tr>
<tr>
<td>Symphoricarpus albus</td>
<td>Sambucus mexicana</td>
</tr>
<tr>
<td>Common Snowberry</td>
<td>Blue Elderberry</td>
</tr>
<tr>
<td>Hordeum vulgare</td>
<td>Juncus patens</td>
</tr>
<tr>
<td>Common Barley</td>
<td>Common rush</td>
</tr>
<tr>
<td>Scrophularia californica</td>
<td>Aralia californica</td>
</tr>
<tr>
<td>Bee plant</td>
<td>Elk Clover</td>
</tr>
</tbody>
</table>

Following work this year, barley grass seed was hand seeded, covered with straw mulch, and secured with an erosion control blanket and straw wattles in the disturbed area to prevent erosion and sedimentation into Soquel Creek. This erosion control will also deter colonization of other invasive plants.
Special Status Species and Habitat in the Project Area and Protection Measures Implemented:
Prior to project implementation, all project workers were given information on the listed species in
the project area, a brief overview of the species' natural history, the protection afforded the species
by the Federal and California Endangered Species Acts, and the specific protective measures to
be followed during implementation of the practices.

This project is determined by NRCS to be consistent with the Letter of Concurrence issued by
NMFS on April 16, 2004 which confirmed that implementation of the practice: “Restoration and
Management of Declining Habitats” was an activity that may affect but was not likely to adversely
affect steelhead, coho, or the critical habitat for coho in Santa Cruz County (Consultation #
151422SWR04SR9197:BLS). This project is determined by NRCS to be consistent with the
Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.

Project: SOQ6

Site in 2008 before invasive plant removal

Site in 2008 after invasive plant removal

Goose grass pictured here was removed as part of maintenance completed this year.

Site in 2008 before invasive plant removal

Site in 2008 after invasive plant removal

English and Cape ivy and goose grass were removed by hand from this area this year.
Practice/Extent: Restoration and Management of Declining Habitats (643), 30’ wide x 1500’ long

Purpose/Goal of Project: The goal of this project is to restore a riparian community by eliminating the exotic ground cover where English and Cape Ivy have infested and re-vegetating with native plants.

Area Affected: 1.25 acres

Conservation benefits: Removal of English and Cape Ivy along this 1500 foot riparian corridor improves bank stability, decreases erosion and sedimentation and protects native habitat.

Volume of soil moved: 0 cyd

Wetlands/Waters: No impact to waters of the state and no net loss of jurisdictional waters or wetlands.

Final slope of project work (not to exceed 2:1): No grading or slope reshaping occurred.
Efforts to Control Non-Native Invasive Plant Species:
In Phase 2 (2008), hand removal by the American Conservation Experience (ACE) crews on approximately one (1.0) acre was done to control the invasive groundcovers (English and Cape ivy). Success criterion at this project site will be constituted by a 90% reduction in the percent of English and Cape ivy. The site will be monitored for a period of 5 years to prevent infestation of new exotic species.

Revegetation Efforts:
Revegetation with native species was completed in 2008. Revegetation of the site with native plants will provide habitat cover and forage and help to “shade out” unwanted species.

All of the following native plants were propagated from seed collected on-site and have been pre-approved by an NRCS biologist or were included on the list of approved plant species for use under the Program:

<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lonicera hispida Var. Vacillans</td>
<td>Hairy honeysuckle</td>
</tr>
<tr>
<td>Woodwardia fimbriata</td>
<td>Giant chainfern</td>
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<tr>
<td>Polystichum munitum</td>
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<td>Asarum caudatum</td>
<td>Wild ginger</td>
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<tr>
<td>Acer macrophyllum</td>
<td>Big leaf maple</td>
</tr>
<tr>
<td>Scrophularia californica</td>
<td>Bee plant</td>
</tr>
<tr>
<td>Quercus agrifolia</td>
<td>Coast Live Oak</td>
</tr>
<tr>
<td>Stachys bulatta</td>
<td>Wood mint</td>
</tr>
<tr>
<td>Acer negundo</td>
<td>Box elder</td>
</tr>
<tr>
<td>Populus balsamifera spp. Trichocarpa</td>
<td>Black cottonwood</td>
</tr>
<tr>
<td>Umbellularia californica</td>
<td>California bay</td>
</tr>
<tr>
<td>Sambucus Mexicana</td>
<td>Blue elderberry</td>
</tr>
<tr>
<td>Cornus sericeea ssp. sericea</td>
<td>Creek Dogwood</td>
</tr>
<tr>
<td>Rosa californica</td>
<td>California Rose</td>
</tr>
<tr>
<td>Ribes menzeisii</td>
<td>Canyon gooseberry</td>
</tr>
<tr>
<td>Ribes sanguineum</td>
<td>Red-flowering Currant</td>
</tr>
<tr>
<td>Elymus glaucus</td>
<td>Blue Wild Rye</td>
</tr>
<tr>
<td>Salix lasiolepis, stichensis</td>
<td>Willow spp</td>
</tr>
</tbody>
</table>

Common barley was used in combination with straw mulch to provide adequate ground cover for temporary erosion control. Straw wattles were used in select locations on site where the slope required additional erosion control.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented:
Prior to project implementation, all project workers were given information on the listed species in the project area, a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.
This project is determined by NRCS to be consistent with the Letter of Concurrence issued by NMFS on April 16, 2004 which confirmed that implementation of the practice: “Restoration and Management of Declining Habitats” was an activity that may affect but was not likely to adversely affect steelhead, coho, or the critical habitat for coho in Santa Cruz County (Consultation #151422SWSR04SR9197:BLS). This project is determined by NRCS to be consistent with the Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.

**Project: SLO12**

- **Site in 2008 after modification**
- **Site in 2008 after modification**

On the left, the boulder has preliminary cuts with the rock saw and the middle channel boulder is still visible. On the right, a portion of each boulder has been removed to improve fish passage.

- **Site in 2008 before modification**
- **Site in 2008 after modification**

On the left, the boulder is being notched to reduce impingement on the stream. On the right, that boulder has been “shaved off”. On the left, a boulder in the middle of the main channel is obstructed fish passage. On the right, that boulder has been “shaved off” and is no longer visible.
Purpose/Goal of Project: The purpose of this project is to 1) improve salmonid migration along the San Lorenzo River through the modification of an in-stream structure to improve access to more than 75% of the steelhead and coho salmon spawning habitat upstream of the cascade, and 2) reduce salmonid mortality which results from fishing use of this area when the boulder delays passage during drought years.

Note: The original PCN indicated that this project would include modification to the side channel. Due to permitting and funding constraints, this activity was eliminated from the project scope.

Area Affected: 20 ft²

Conservation benefits: This project will improve fish passage and reduce fish mortality.

Volume of soil moved: 0 cyd

Net Waters/Wetland loss: 0.001 acres of Non-wetland Waters of the U.S. Filled with rock from the San Lorenzo River.

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

Efforts to Control Non-Native Invasive Plant Species: As the intent of the project was improved in-stream fish habitat, the project does not include any eradication of invasive species. The project area will be monitored and maintained for a period of five years following project completion. The introduction of any invasive plant species which currently do not exist on or adjacent to the project site will be prevented.

Revegetation Efforts: No vegetation was removed as part of this project.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented:
Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

The following activities occurred:
California Red-legged Frog: Qualified NRCS and RCD conducted a site assessment and determined that the site did not consist of appropriate habitat for the species.

Mount Hermon June Beetle: NRCS and RCD assessed the potential for Mount Hermon June beetle habitat by utilizing the Sandhills conservation and Management Plan GIS database. The project was neither near a known sandhills site nor mapped as Zayante soils.

Ohlone tiger beetle: The project area is not in the vicinity of a known population of the Ohlone tiger beetle.

Zayante band-winged grasshopper: NRCS and RCD assessed the potential for Zayante band-winged grasshopper habitat by utilizing the Sandhills conservation and Management Plan GIS database. The project was neither near a known sandhills site nor mapped as Zayante soils.

Coho and Steelhead: The site was not dewatered and only hand-held tools were used to construct the project. No impact to salmonids.
Project: SLO13

Site in 2008 before construction

A ditch relief culvert was installed to capture surface flow and redirect it to a safe, non-erosive location

Site in 2008 after construction

Practice/Extent:
Access Road (560), 20’ wide x 400’ long
Structure for Water Control (587), 10’ wide x 160’ long
Critical Area Planting (342), area= 900 sq. ft.

Purpose/Goal of Project: The purpose of this project was to improve water quality by reducing erosion and watercourse sediment delivery by installing properly drained road surfaces and adequate drainage infrastructure.

Area Affected: 0.25 acres

Conservation benefits: This project will improve water quality in Bear Creek by reducing the likelihood for chronic and acute sediment inputs.

Volume of soil moved: 165 cyd

Net Waters/Wetland loss: Approximately 0.003 acres of non-wetland waters of the U.S. were filled with 5 C.Y. of material placed below the ordinary high water mark.

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

Efforts to Control Non-Native Invasive Plant Species: The primary goal of the project was to reduce erosion and sediment inputs into nearby waterbodies. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

Revegetation Efforts: Common barley and straw mulch was used for erosion control. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of vegetation affected by the project activities.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented: Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species
by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

To avoid potential impacts to the Marbled Murrelet, all protective measures were implemented. This project is determined by NRCS to be consistent with the USFWS Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.

**Project: SLO14**

**Site in 2008 before construction**

![Site in 2008 before construction](image1)

**Site in 2008 after construction**

![Site in 2008 after construction](image2)

*The road bed was re-shaped to improve surface drainage and rocked to protect surface from erosion.*

**Site in 2008 before construction**

![Site in 2008 before construction](image3)

**Practice/Extent:**
Access Road (560), 20’ wide x 243’ long
Critical Area Planting (342), area = 1415 sq. ft.

**Purpose/Goal of Project:** The purpose of this project is to improve water quality of Bear Creek and the San Lorenzo River by decreasing acute and chronic sediment inputs related to poor road drainage.

**Area Affected:** 0.15 acres
Conservation benefits: This project will improve water quality and improve salmonid habitat within the San Lorenzo River watershed.

Volume of soil moved: 103 cyd

Net Waters/Wetland loss: There were no impacts to waters of the state and no net loss of jurisdictional wetlands.

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

Efforts to Control Non-Native Invasive Plant Species: The primary goal of the project was to reduce erosion and sediment inputs into nearby waterbodies. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

Revegetation Efforts: Common barley and straw mulch were used for erosion control. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of vegetation affected by the project activities.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented: Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

To avoid potential impacts to the Marbled Murrelet, all protective measures were implemented. This project is determined by NRCS to be consistent with the USFWS Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.

Project: SLO15

Site in 2008 before construction

Existing culvert outlet looking upstream.

Site in 2008 after construction

Replaced culvert outlet looking upstream.
Practice/Extent:
Structure for Water Control (587), 15’ wide x 60’ long
Critical Area Planting (342), area = 7000 sq. ft.

Purpose/Goal of Project: The purpose of this project is to protect the water quality of the San Lorenzo River by preventing excess sediment delivery due to road crossing failure.

Note: The original PCN indicated that this project length would be 35 feet and that the total grading volume would be 450 C.Y. Due to permitting constraints, the project was required to use a geotechnical engineer which increased the overall grading to approximately 850 C.Y. An 8 foot tall retaining wall was constructed on the outlet fill face under the guidance of a registered geotechnical engineer due to unanticipated project implementation constraints.

Area Affected: 0.20 acres

Conservation benefits: This project will improve water quality in the San Lorenzo River by preventing the failure of the stream crossing with subsequent acute sediment delivery to the nearby waterways.

Volume of soil moved: 850 cyd

Net Waters/Wetland loss: 0.007 acres of Waters of the U.S Filled with an estimated 150 C.Y. placed below the ordinary high water mark in the stream channel.

Final slope of project work (not to exceed 2:1): Final fill slope on outlet side of prism kept at a minimum of 1.5:1 in coordination with a registered Geotechnical Engineer’s supervision and final certification. An 8 foot tall retaining wall was constructed for the final length of the fill face in order assure a minimum road top-width was met.
Efforts to Control Non-Native Invasive Plant Species: The primary goal of the project was to reduce erosion and sediment inputs into nearby waterbodies. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

Revegetation Efforts: Road realignment will require the removal of a clump of 5, 2nd growth redwood trees that are growing from a single stump. The clump consists of 3 primary stems that are approximately 120 feet high and 36", 32", 30" DBH respectively as well as 2 secondary stems that are approximately 60 feet high and 20" and 15"DBH respectively. In order to mitigate for the loss of these trees, redwood saplings will be planted at a ratio of 3:1 on borrow sites near the project site. All redwood saplings used to replace the redwood trees removed from the project site will be maintained and monitored until established. All impacted areas were seeded with barley and mulched heavily with straw. Geotechnical engineer specified erosion control blankets were installed on the fill face for erosion control. Straw wattles and erosion control blankets were used for erosion control. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of vegetation affected by the project activities.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented: Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

To avoid potential impacts to the Marbled Murrelet, all protective measures were implemented. This project is determined by NRCS to be consistent with the USFWS Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.

Project: SLO16

Site in 2008 before construction

Site in 2008 after construction

A ditch relief culvert was installed to capture surface flow and redirect it to a safe, non-erosive location
The road bed was reshaped to improve surface drainage and a rolling dip was installed.

Practice/Extent:
Access Road (560), 20’ wide x 200’ long
Structure for Water Control (587), 10’ wide x 40’ long
Critical Area Planting (342) area = 1200 sq. ft.

Purpose/Goal of Project: The purpose of this project is to improve water quality in Deer Creek by improving drainage on adjacent access roads while decreasing chronic and acute sediment inputs.

Area Affected: 0.13 acres

Conservation benefits: This project will improve water quality in Deer Creek and the San Lorenzo River by decreasing acute and chronic sediment inputs in the short and long term.

Volume of soil moved: 105 cyd

Net Waters/Wetland loss: There were no impacts to waters of the state and no net loss of jurisdictional wetlands.

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

Efforts to Control Non-Native Invasive Plant Species: The primary goal of the project was to reduce erosion and sediment inputs into nearby waterbodies. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

Revegetation Efforts: Common Barley and straw mulch were used for erosion control. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of vegetation affected by the project activities.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented: Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

To avoid potential impacts to the Marbled Murrelet, all protective measures were implemented. This project is determined by NRCS to be consistent with the USFWS Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.
Project: PAJ4

Site in 2008 before removal

Facing northwest; pre-project

Site in 2008 after removal

Facing northwest; post-project (planting and irrigation system completed)

Site in 2008 before removal

Facing north; pre-project, iceplant

Site in 2008 after removal

Facing north; post-project in foreground

Site in 2008 before removal

Facing northeast; pre-project

Site in 2008 after removal

Facing northeast; post-project (planting and irrigation system completed)

Practice/Extent:
Restoration and Management of Declining Habitats (643): .49 acres
Purpose/Goal of Project: The purpose/goal of the project is to restore and enhance a previously disturbed portion of Watsonville Slough. Successful implementation of the project will increase both wetland and upland habitat values within the last mile of the slough ecosystem and improve water quality.

Area Affected: .49 acres of Carpobrotus edulis removed. The total size of the area treated was approximately 3.3 acres.

Conservation benefits: Removing invasive species from the last mile of Watsonville Slough will provide plant diversity and critical habitat for a unique ecosystem.

Volume of soil moved: 0 cyd

Wetlands/Waters: No net loss of jurisdictional waters or wetlands occurred as a result of this project.

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

Efforts to Control Non-Native Invasive Plant Species: During Phase II of this project, additional stands of invasive plants were removed as well as the regrowth from the previous year. Methods for removal included hand removal, removal using a backhoe, herbicide (Rodeo®, glyphosate) application, and the cut stump method (includes cutting the plant to within inches of the ground with a chainsaw and immediately painting herbicide Rodeo® (glyphosate) on the cut stump.

Revegetation Efforts: Planting at the site was limited to native plants from a local native plant nursery or from the Wetlands Educational Resource Center (WERC). Plants from the WERC were propagated from on site. All plants will be irrigated until successfully established. Mulching was applied to all areas that resulted in bare soil due to the removal of invasives. Seed collection from native plants and propagation will continue for the next phase of the project. Propagated plants were maintained by Watsonville Wetlands Watch staff and Pajaro Valley High School Students involved in Project Workability (a job training program). Maintenance actions occurring off-site include transplanting seedlings, applications of foliar fertilizer, weeding, and watering. Please see the project plant propagation list provided below.

<table>
<thead>
<tr>
<th>Baccharis douglasii</th>
<th>Baccharis pilularis var. consanguineum</th>
<th>Distichlis spicata</th>
<th>Ericameria ericoides</th>
<th>Eriophyllum staechadifolium</th>
<th>Frankenienia salina</th>
<th>Grindelia stricta var. angustifolia</th>
<th>Jaumea carnosa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Douglas’ Baccharis</td>
<td>Coyote Brush</td>
<td>Saltgrass</td>
<td>Mock Heather</td>
<td>Lizardtail</td>
<td>Alkali Heath</td>
<td>Marsh Grindelia</td>
<td>Fleshy Jaumea</td>
</tr>
<tr>
<td>Juncus mexicanus</td>
<td>Leymus triticoides</td>
<td>Lupinus arboreus (Yellow form)</td>
<td>Potentilla anserina ssp. pacifica</td>
<td>Rubus ursinus</td>
<td>Salicornia virginica</td>
<td>Scirpus robustus</td>
<td>Pickleweed</td>
</tr>
<tr>
<td>Mexican Rush</td>
<td>Creeping Wildrye</td>
<td>Bush Lupine - Yellow</td>
<td>Pacific Cinquefoil</td>
<td>California Blackberry</td>
<td>Pickleweed</td>
<td>Prairie Bulrush</td>
<td>Pickleweed</td>
</tr>
</tbody>
</table>
Special Status Species and Habitat in the Project Area and Protection Measures Implemented:
The special status species of concern on this property were *Monterey Spineflower* and *Coast wallflower*. A floristic survey was completed by NRCS and RCD in June 2007 and none of the above species were found. Construction activities were primarily hand removal in order to reduce impact to all native species. Sections where equipment was used for removal were dense exclusive populations of non-natives.

This project is determined by NRCS to be consistent with the Letter of Concurrence issued by NMFS on April 16, 2004 which confirmed that implementation of the practice: “Restoration and Management of Declining Habitats” was an activity that may affect but was not likely to adversely affect steelhead, coho, or the critical habitat for coho in Santa Cruz County (Consultation # 151422SWR04SR9197:BLS). This project is determined by NRCS to be consistent with the Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.

**Project: PAJ5**

![Site in 2008 before invasive plant removal](image1)
![Site in 2008 after invasive plant removal](image2)
*Cape ivy was removed from this upstream site by hand this year.*

![Site in 2008 before invasive plant removal](image3)
![Site in 2008 after invasive plant removal](image4)
*Cape ivy was removed from this upstream site by hand this year.*
Practice/Extent: Restoration and Management of Declining Habitats (643): 100’ wide x 550’ long

Purpose/Goal of Project: The goals of this project are to 1) restore a riparian community by removing the exotic ground cover (mostly Cape ivy) on about one and a half (1.5) acres, and 2) conduct research to identify the most successful and cost-effective method to use on the remaining four(4) acres. The entire site is approximately five (5) acres and is dominated by Cape ivy, a non-native invasive plant that thrives in riparian ecosystems. The long-term goal of the landowner is to eliminate all Cape ivy from her property.

Area Affected: 1.5 acres

Conservation benefits: Removal of Cape ivy in this riparian corridor improves bank stability, decreases erosion and sedimentation and protects native habitat.

Volume of soil moved: 0 cyd

Net Waters/Wetland loss: There was no impact to waters of the state and no net loss of jurisdictional wetlands.

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

Efforts to Control Non-Native Invasive Plant Species:
Component 1: Hand removal by American Conservation Experience (ACE) restoration crews was done to remove Cape ivy on 1.0 acres starting from the upper most reaches of the infestation. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.
Component 2: In order to identify the most successful and cost-effective method to use on the remaining four acres, five different control methods were applied in addition to control (non-treatment) plots. Each treatment was replicated ten times in 3m x 3m plots space at least 2 meters apart. In order to avoid edge effects, sampling plots were nested 1m x 1m plots within the 3m x 3m treatment plots. The plots were laid out using a randomized block design randomly placed within accessible areas.

Revegetation Efforts: No revegetation was done due to the high likelihood of natural recruitment from native plant species on site.

Straw wattles were installed at select locations to ensure the stability of the site.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented: Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

This project is determined by NRCS to be consistent with the Letter of Concurrence issued by NMFS on April 16, 2004 which confirmed that implementation of the practice: “Restoration and Management of Declining Habitats” was an activity that may affect but was not likely to adversely affect steelhead, coho, or the critical habitat for coho in Santa Cruz County (Consultation #151422SWR04SR9197:BLS). This project is determined by NRCS to be consistent with the Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.
Project: PAJ6

Site in 2008 before construction

Site in 2008 after construction

A ditch relief culvert and rolling dips was installed to capture surface flow and redirect it to a safe, non-erosive location.

Practice/Extent:
Access Road (560), 20' wide x 550' long
Structure for Water Control (587), 50’ wide x 120’ long
Critical Area Planting (342), area = 3450 sq. ft.

Purpose/Goal of Project: The purpose of this project is to improve drainage and decrease sediment output from a Pajaro watershed rural access road.

Area Affected: ~0.50 acres

Conservation benefits: This project will improve water quality by decreasing acute and chronic sediment inputs into adjacent waterbodies for the near and long-term future.

Volume of soil moved: 250 cyd

Net Waters/Wetland loss: There were no impacts to waters of the state and no net loss of jurisdictional wetlands.

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

Efforts to Control Non-Native Invasive Plant Species: The primary goal of the project was to reduce erosion and sediment inputs into nearby waterbodies. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

Revegetation Efforts: Common barley and straw mulch used for short-term erosion control. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of vegetation affected by the project activities.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented: Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.
To avoid potential impacts to the Marbled Murrelet, all protective measures were implemented. This project is determined by NRCS to be consistent with the USFWS Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.

**Project: PAJ8**

**Site in 2008 before construction**  
Looking upstream, eroding cutbank

**Site in 2008 after construction**  
Looking upstream, cut bank has been planted with riparian vegetation and willow cuttings. Due to low winter rains irrigation has been installed.

**Site in 2008 before construction**  
Cut bank is eroding

**Site in 2008 after construction**  
Cut bank has been planted with riparian vegetation and willow cuttings. Due to low winter rains irrigation has been installed.

**Practice/Extent:**  
Critical Area Planting (342) 30’ wide x 80’ long

**Purpose/Goal of Project:** The purpose of this project is to stabilizing the unstable, vertical streambank thereby reducing erosion and sediment deposition to the stream, improving stream and habitat quality, facilitating recruitment of native plant species within the site to prevent further degradation of the bank, stream, and landowner’s property. In addition, Green Valley Creek is
habitat for Steelhead (Oncorhynchus mykiss irideus) (according to NOAA), and by decreasing sediment loading to the creek and improving riparian vegetation this project will improve that critical habitat for this species.

**Area Affected:** .06 acres

**Conservation benefits:** This project improved the following resource benefits: sediment, habitat, and endangered species. As mentioned previously, this project seeks to reduce erosion from an unstable streambank thereby improving riparian habitat and in stream habitat for Steelhead (Oncorhynchus mykiss irideus)

**Volume of soil moved:** 0 cyd

**Net Waters/Wetland loss:** There was no impacts to waters of the state and no net loss of jurisdictional wetlands.

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

**Efforts to Control Non-Native Invasive Plant Species:** To maintain the project the landowner will keep invasive species from encroaching on the site (by hand weeding or spraying as a last resort) for the life of the project (5 years), annually or as needed. Also, the landowner will monitor the success of stakings to achieve a minimum 90% survival rate. The very small amount (1-2 plants) of Periwinkle (Vinca major) onsite was removed by hand during planting and taken offsite. The existing site conditions may prevent the complete eradication of Periwinkle, but no new invasives will be allowed to colonize. It was the opinion of the NRCS Resource Conservationist, Glenn Wilcox, that willow stakings, once established, will smother out the small amount of Periwinkle. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

**Revegetation Efforts:** The project consisted of planting willow stakes (Salix laevigata, Salix lasiandra, or Arroyo willow (salix spp.)) at the project site. Staking was done by hand, and implemented by the landowner, from cuttings on site. By stabilizing the soil, and acting as an early colonizing species, willows will facilitate increased diversity through the recruitment of other successional species, such as Alders and Cottonwoods that are found upstream. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of vegetation affected by the project activities.

**Special Status Species and Habitat in the Project Area and Protection Measures Implemented:** Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices. This project is determined by NRCS to be consistent with the Letter of Concurrence issued by NMFS on April 16, 2004 which confirmed that implementation of the practice: “Critical Area Planting” was an activity that may affect but was not likely to adversely affect steelhead, coho, or the critical habitat for coho in Santa Cruz County (Consultation # 151422SWR04SR9197:BLS). This project is determined by NRCS to be consistent with the USFWS Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.
Project: PAJ9

Site in 2008 before construction

Looking downstream. Remnant concrete can be seen in the background.

Site in 2008 after construction

Looking downstream. Remnant concrete has been removed.

Site in 2008 before construction

Looking upstream at spillway and wings. Saturation outline on concrete between earth and wood forms. 1’ undercut visible due to water flow. Remnants of grouted outlet structure also visible.

Site in 2008 after construction

Looking upstream at spillway and wings. Remnants of grouted outlet structure have been removed. Channel and undercutting have been shaped and smoothed. Spillway and wings have been stabilized with rock.
Site in 2008 before construction

Looking upstream. The vertical bank can be seen on the left hand side next to the wingwall.

Site in 2008 after construction

The wingwalls have been stabilized with rock rip and the slope has been reshaped to allow revegetation to occur.

Site in 2008 after construction

View of Woodrat nests that were voided and left intact, so as to avoid unnecessary impacts during construction.

Practice/Extent:
Streambank Stabilization (580), 30’ wide x 100’ long
Critical Area Planting (342), 0.1 acre
Grade Stabilization Structure (410), 14’ wide x 50’ long
Purpose/Goal of Project: The purpose of this project is to prevent further erosion of an unnamed channel that runs through the middle of a productive wine grape vineyard in Corralitos. Peak rainfall events in recent years have undermined a concrete drop/spillway structure originally installed by the CCC and NRCS (formerly the Soil Conservation Service) in 1935. The erosion is very serious and continues to worsen each year delivering an estimated 20 tons of sediment a year and causing damage to water quality, downstream properties, and aquatic habitat. The project will improve channel function in +/-50 foot reach of channel, reduce erosion and sedimentation, improve downstream water quality, provide enhanced habitat for wildlife species on site and for aquatic species downstream and protect a potentially valuable cultural resource concrete drop/spillway structure.

Area Affected: 0.1 acres

Conservation benefits: This project improved the following resource benefits: sediment, habitat, and endangered species.

Volume of soil moved: 258 cyd

Net Waters/Wetland loss: There were no impacts to waters of the state and no net loss of jurisdictional wetlands.

Final slope of project work (not to exceed 2:1): The bank was sloped to 1.5:1 as pre-construction condition is so steep that site conditions prohibit a 2:1 slope on the final grade.

Efforts to Control Non-Native Invasive Plant Species: The table below shows a list of non-native plant species that were identified during the field assessment of the project site.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Percent Cover</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees</td>
<td>Black Locust</td>
<td>Robinia psueduacacia</td>
<td>15%</td>
</tr>
<tr>
<td>Shrubs</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Vines</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Forbs</td>
<td>Poison Hemlock Thistle</td>
<td>Conium maculatum Carduus pycnocephalus</td>
<td>10% 5%</td>
</tr>
</tbody>
</table>

Prior to implementation, non-native Black Locust trees were mixed with native riparian vegetation, including willows, cottonwood, etc. at the project site. All non-native vegetation was removed within the project site, and willow cuttings and erosion control blankets were spread to inhibit the recolonization of non-native species. Routine maintenance of vegetation will occur over the life of the project, and will include the removal of non-native plant species, especially non-native invasive species, hazardous trees and branches that threaten safety, erosion control structures. The landowner will also maintain vigorous growth of desirable vegetative coverings.
to inhibit recolonization of non-native species. This includes reseeding, and controlling weeds. Periodic mowing or whacking may also be needed to control height of grasses. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

Revegetation Efforts: Native willow trees were taken from resident native trees growing in the project area and were installed in a bioengineering fashion on streambank to prevent future soil erosion and bank failure according to NRCS Specifications and Construction Requirements: Critical Area Planting-Woody Cuttings (342). All bare soil disturbed from construction activities, other than where the willow and blackberry plantings were installed, was seeded with native erosion control grasses such as Molate Red Fescue, Creeping Wildrye, Blue Wildrye, Meadow Barley or other approved native grasses. Grass seed was broadcast according to NRCS Specification: Critical Area Planting (342). Blackberry vine sprigs were planted 12 inches apart on mid to upper bank areas in 2 rows 2 feet apart above willow plantings for erosion control and to restore the natural pre-construction appearance of the area. Approximately 200 total blackberry plants in the form of sprigs were used to protect/restore areas on a total of 100 linear feet of upper streambank (50ft on either side of the channel). Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of vegetation affected by the project activities.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented: Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

A qualified biologist identified six San Francisco Dusky Footed Woodrat houses within the construction area and three additional houses nearby which would be avoided. Vegetation was removed by hand to access the houses. Not all of the six SFDW houses appeared active and two of the houses were very small. Live-trapping was conducted from 26-29 August 2008. In late afternoon, 20 live-traps (Sherman, 12-inch, folding) were baited (rolled oats, mixed bird seed, peanut butter) and placed around the houses: four at each large house and two at each small house. Traps were placed in runways or close to runways leading into houses, checked and closed the following morning, and opened each evening. All species were identified and all nocturnal rodents were sexed, aged, and temporarily marked with ink. If an SFDW was captured, it was held in the trap while its house was dismantled and an artificial house constructed according to the methods below. The SFDW was then released at the new house and observed for approximately 10 minutes. Locations of the old and new houses were recorded using a hand-held global positioning device (UTM WGS84).

The existing stick house was dismantled and the grassy nest material within was salvaged. The artificial house consisted of ½ a wine barrel placed on its side and set approximately 4 inches below grade in a shady area usually under tree canopy at least 20 feet from existing SFDW houses. Rebar was also used to further stabilize the structure. Soil was placed within the open box, brought to grade and lightly compacted. Nest material salvaged from the existing house and food (rolled oats, mixed bird seed, peanut butter) was placed inside the chamber. A framework of large sticks was used to create a chamber with only one entrance approximately 3-4 inches in diameter. The remaining space within the wine barrel was filled with the woody debris salvaged from the existing house. Excess woody debris from the nest and surrounding area was piled around the structure as necessary. The SFDW was carefully released at the
entrance by keeping the trap still and slowly opening the door and waiting until the animal enters the artificial house on its own accord.

**Results.** Five individual SFDW were captured at four existing houses (4 adults and 1 subadult). A total of 5 artificial houses were built. One adult female and subadult were captured at WR-1 and both released at WR-A1 (Table 1) on the first morning. Two other individuals were released the first morning, one at WR-A2 and one at WR-A3. No SFDW were captured on the second morning. On the third morning, one new SFDW was captured and released at WR-A4, and one was recaptured and returned to WR-A2, after it was rebuilt. WR-A2 had to be rebuilt because it had been dismantled by a predator. One of the small houses monitored was inactive. Although no SFDW were captured at one of the big houses, it was dismantled and rebuilt anyway (WR-A5). WR-A1, A2 and A3 were placed within ~50 feet downstream of their original location and WR-A4 and A5 were placed ~150 feet downstream due to several existing SFDW houses. New house locations were constrained due to a narrow drainage corridor that was deeply incised. Other species captured were Merriam's chipmunk (*Tamias merriami*), deer mouse (*Peromyscus maniculatus*), California mouse (*Peromyscus californicus*), and pinyon mouse (*Peromyscus truei*).

The primary purpose of SFDW relocation is to salvage woody debris to provide a temporary shelter for the captured individual, and to provide the physical structure for other SFDW to colonize the location in the future. The intent is to provide refuge at the release site, ideally until nighttime, to reduce the possibility of predation. Whether the artificial house is subsequently used by the relocated individual or another is unknown. Over time, the likelihood that the location is colonized is reasonable, assuming a relatively undisturbed SFDW population persists in the area.

It is recommended that rebuilt houses use any available heavy logs, even if they are not part of the original house, to pin down the woody debris to reduce disturbance by a mammalian predator. Many SFDW houses are built around fallen logs or within heavy brush, which likely deters certain predators.

**Project: SCK1**

![Site in 2008 before modification](image1.jpg)  ![Site in 2008 after modification](image2.jpg)

*Looking upstream at bridge site*
Practice Extent:
Fish Stream Improvement (395), Rock vane, 3’ wide x 5’ long
Fish Stream Improvement (395), Bridge, 20’ wide x 50’ long

Purpose/Goal of Project: The goal of this project is to improve habitat on Queseria Creek for anadromous fish during high winter flows, as well as during low flows in late spring and early summer through the installation of cross vane structures and continued revegetation.

Area Affected: 400 ft²

Conservation benefits: The cross vane will create pool and riffle features to dissipate energy and offer temporary bedload. The bridge replaces a culvert which inhibited fish passage and allows for ranch and fire access.

Volume of soil moved: 56 cyd for bridge abutments and 2 cyd for rock vane.

Net Waters/Wetland loss: Permanent fill of 0.0001 acres of waters occurred during the construction of this project, consistent with the PCN.

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

Efforts to Control Non-Native Invasive Plant Species: The primary intent of the project was to provide habitat for aquatic species and improve stream dynamics. The site will be monitored for a period of 5 years to ensure no infestation of new exotic species and to maintain the <10% invasive cover which currently exist at the site. Establishment of native species will promote a healthy riparian corridor, shading out non-natives.

Revegetation efforts: In-stream native vegetation consisted primarily of Carex and Juncus ssp at less than 20% cover. The following plants were used as they are present in the watershed: Carex amplifolia, Carex obnupta, Juncus effuses. An NRCS biologist has approved use of these species.
Larger populations or Carex and Juncas were harvested and divided from on on-site and planted to revegetate disturbed areas. Appropriate sized holes were hand dug and the species were planted without amendments due to the fertility of the site. Material was recompacted around the plants to ensure adequate soil contact and the plants were slightly raised to prevent water ponding and rot. An irrigation system was established to provide water during dry months.

Because the project site is located on a section of the streambank where little riparian vegetation currently exists due to stream channel instability, revegetation with native species approved for the project will ensure that disturbed areas are restored to preconstruction condition or better. Our success criteria for revegetation to this site is that 90% of the plantings will survive, and if any plants are lost they will be replaced unless an NRCS biologist determines that natural recruitment will occur. To further ensure this objective the site will be maintained until project success criteria have been met and plants have become fully established.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented:
Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species' natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

The special status species of concern on this property was California red-legged frog (Rana aurora draytonii). Since suitable habitat for California red-legged frog was present, construction activities began after July 1 to avoid impacts to breeding adults or egg masses. In addition to appropriate timing of the construction season, a qualified individual approved by USFWS conducted reconnaissance surveys of the surrounding habitat. The site was dry during construction and no red legged frogs were seen.

**Project: SCK2 (MC-4 and MC-2)**

![Site in 2008 before modification](MC-4 site, Large Wood Feature) ![Site in 2008 after modification](MC-4 site, Large Wood Feature)
Practice/Extent:

<table>
<thead>
<tr>
<th>Fish Stream Improvement (395) J-Hook Vanes</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC-2: 1 (rock, 2’x2’x1.5’)</td>
<td>20 ft²</td>
</tr>
<tr>
<td>MC-2: 2 (rock, 2’x2’x1.5’)</td>
<td>20 ft²</td>
</tr>
<tr>
<td>MC-2: 3 (rock, 2’x2’x1.5’)</td>
<td>20 ft²</td>
</tr>
<tr>
<td>MC-2: 1 (earthwork, 20’x8’x1.5’)</td>
<td>450 ft²</td>
</tr>
<tr>
<td>MC-2: 2 (earthwork, 20’x8’x1.5’)</td>
<td>450 ft²</td>
</tr>
<tr>
<td>MC-2: 3 (earthwork, 20’x8’x1.5’)</td>
<td>450 ft²</td>
</tr>
<tr>
<td>MC-2: 1 (log, 20’x16”)</td>
<td>27 ft²</td>
</tr>
<tr>
<td>MC-2: 2 (log, 20’x16”)</td>
<td>27 ft²</td>
</tr>
<tr>
<td>MC-2: 3 (log, 20’x16”)</td>
<td>17 ft²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fish Stream Improvement (395) Large Wood Feature</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC-4 (rock anchor, 4’x4’x6’)</td>
<td>N/A</td>
</tr>
<tr>
<td>MC-4 (log, 12’x16”)</td>
<td>16 ft²</td>
</tr>
<tr>
<td>MC-4 (rootwad, 5’x16”)</td>
<td>6 ft²</td>
</tr>
<tr>
<td>MC-4 (earthwork, rock revetment, 1’x3’x15”)</td>
<td>15 ft²</td>
</tr>
<tr>
<td>MC-4 (earthwork, log and rootwad, 2’x12”)</td>
<td>NA</td>
</tr>
<tr>
<td>MC-4 (earthwork, anchor rock, 4’x4’x6”)</td>
<td>16 ft²</td>
</tr>
</tbody>
</table>

Purpose/Goal of Project: The purpose of this project is to reduce erosion and undercutting to the adjacent road, improving water quality and habitat for Coho salmon, the Central California Coast ESU of steelhead, and the California red legged frog.
Note: The original PCN indicated that this project would 3 in-stream features at MC-2. With input from NMFS, two (2) in-stream features were installed along with 13 rootwads in the road/streambank.

**Area Affected:** .3 acres

**Conservation benefits:** This project will improve water quality and habitat for listed salmonids.

**Volume of soil moved:** 150 cyd

**Net Waters/Wetland loss:** 0.08 acres

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

**Efforts to Control Non-Native Invasive Plant Species:** As the intent of the project is improved stream habitat and the stream system is invested with *Vinca major*, feasible removal of non-natives will be done at the MC-2 and MC-4 sites, to lessen the extent and allow for successful establishment of native plantings.

Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

**Revegetation Efforts:** The success of revegetation will be based upon a desired increase of 50% coverage attained over a three year period. In year 1, bare ground will be planted with native grasses and aquatic plants species collected and grown from local stock to replace cover to no less than 25% of the exposed.

At MC-2, a two-by-two-foot grid will be used due to the dense tree and shrub canopy. Tree and shrubs will be planted at a ratio of 3:1. Those areas adjacent to the in-stream structures will be planted on a 1-foot grid spacing with bunch grasses. Selection of species should attempt to replicate the current vegetation patterns in each location. The total plant count at MC-2 will be approximately 300.

At MC-4 site, replacement vegetation will not be installed in a geometric grid spacing to avoid an unnatural appearance. Floodplain areas will be planted to replicate the surrounding landscape, dominated by meadow-like vegetation and intermittent shrubs and trees. The channel banks will be heavily planted with bunch grasses and additional shrubs. Areas adjacent to the in-stream structures will be heavily planted with bunch grasses. The total plant count at MC-4 will be approximately 300.

Irrigation will not be necessary due to natural shade and moist conditions during autumn and winter months. Plants will be thoroughly “watered in” when planted. Seasonal precipitation and climate conditions will allow for immediate root establishment and promote future foliar growth. Inspections will occur regularly during the summer months to ensure soil moisture levels are adequate. These inspections will also occur throughout the first year following revegetation to visually assess plant health and survival. Those individual plants which have not survived will be replaced with one of the same species or the equivalent. Successful revegetation will be attained when the health and abundance of native vegetation within the project sites is functionally equivalent or superior to pre-construction conditions.
At the conclusion of the three year monitoring phase, NRCS biologist will have the option of visiting the site to assess vegetation establishment. Findings at that time will determine if an additional two years of monitoring are necessary.

**Special Status Species and Habitat in the Project Area and Protection Measures Implemented:**
Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

The special status species of concern on this property were Coho and Steelhead.

**Coho and Steelhead:**
A qualified individual approved by NOAA Fisheries acted as a biological monitor during construction. The biological monitor monitored construction activities and instream habitat and performance of sediment control devices. The biological monitor did not have to exercise his authority to halt work activity and recommend measures for avoiding adverse effects.

A qualified fishery biologist and the biological monitor monitored placement and removal of the streamflow diversion structure. The fishery biologist captured and relocated listed salmonids prior to construction of the water diversion structures (e.g., cofferdams). The qualified fisheries biologist noted the number of salmonids observed in the affected area, the number and species of salmonids relocated, and the date and time of collection and relocation as follows:

- On August 26th, 2008, thirteen (13) juvenile steelhead were relocated from the MC-4 site. Steelhead were the only fish species found at the site and there were no mortalities.
- On August 26th, 2008, twenty-one (21) juvenile steelhead were relocated from the MC-2 site. Steelhead were the only fish species found at the site and there were no mortalities.
- On September 2nd, twenty-one (21) juvenile steelhead were relocated from the MC-2 site. Steelhead were the only fish species found at the site and there were no mortalities.
- On September 18th, two (2) one juvenile steelhead was relocated from the MC-2 site. Steelhead were the only fish species found at the site and there were no mortalities.

The number and type of Practices implemented within the stream channel:

- Fish stream improvement (395) MC-2
- Fish stream improvement (395) MC-4

The length of streambank (feet) protected and stabilized:

- 820 feet

The number of culverts replaced or repaired, including the number of miles of restored access to unoccupied salmonid habitat:

- N/A

The distance (feet) of aquatic and riparian habitat disturbed at project site:

- Approximately 2000 sq feet
All NMFS protocols were adhered to.

Implementation procedures of this project is determined by NRCS to be consistent with the Biological Opinion issued by NMFS on May 31, 2005 (Consultation #151422SWR04SR9195:JMA). This project is determined by NRCS to be consistent with USFWS Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006 with regards to Red-legged frog.

**Project: SCK3**

**Site in 2008 before construction**

**Site in 2008 after construction**

Site in 2008 before modification (looking west).

Site in 2008 after modification (looking west).

The fencing was installed AFTER the initial photo. Note water tower for reference

**Site in 2008 before construction**

**Site in 2008 after construction**

Site in 2008 before modification (looking south).

Site in 2008 after modification (looking south).

**Practice/Extent:**
Grassed waterway (412) 14’ wide X 552’ long
Structure for Water Control Plastic pipe culverts (587 B) 14.5' wide X 20’ long

Purpose/Goal of Project: The purpose of the project is to reduce the potential entry of sediments, nutrients, and pathogens into Queseria Creek from adjacent rangeland. Rangeland activity during peak storm events can increase erosion and decrease soil quality due to saturated soils. The project seeks to capture and treat runoff water that currently escapes into the confined rangeland area. The rangeland is used for various livestock including goats, alpacas, cattle and horses.

Area Affected: 0.2 acres

Conservation benefits: This project will improve water quality at the site by reducing the potential for sediment, nutrient, and pathogen transport to the creek.

Volume of soil moved: 258 cyd

Net Waters/Wetland loss: There was no impact to waters of the state and no net loss of jurisdictional wetlands.

Final slope of project work (not to exceed 2:1): The grassed waterway channel was shaped to a bottom width of 10 feet with 2:1 side-slopes and a bottom depth of 1 foot with an overall top width of 14 feet.

Efforts to Control Non-Native Invasive Plant Species: Due to the current percent cover of non-natives in the rangeland, eradication of existing non-natives is not within the scope of the project or feasible, and thus will not be eradicated from the site. The site will be returned to preconstruction condition or better and overall native plant cover will be increased. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

Revegetation Efforts: Festuca rubra was hand broadcast at a rate of 176 lbs/ac. Irrigation will be applied 3 times per week at a rate of 16,000 lbs/ac until rains. Visual monitoring of the site will be performed and removal of species as necessary. Seed will be obtained from a source that is a minimum 99% pure and weed free. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of vegetation affected by the project activities.

Special Status Species and Habitat in the Project Area and Protection Measures Implemented: Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species' natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

The special status species of concern on this property was California red-legged frog (Rana aurora draytonii). Since suitable habitat for California red-legged frog was present, construction activities began after July 1 to avoid impacts to breeding adults or egg masses. In addition to appropriate timing of the construction season, a qualified individual approved by USFWS conducted reconnaissance surveys of the surrounding habitat. The site was dry during construction and no red legged frogs were seen.
Project: ARA2

Site in 2008 before construction

Facing downstream. A headcut has begun at the inlet.

Site in 2008 after construction

Facing downstream. Repaired.

Site in 2008 before construction

Facing upstream. The willow branch prevented adequate compaction in 2007.

Site in 2008 after construction

Facing upstream. The willow branch was removed and an additional rock vane was installed.

Site in 2008 after construction

Post-Phase II; erosion control and location of removed willow downstream side of culvert from road.
Practice/Extent:
Fish Stream Improvement (395), Habitat Improvement Structure: 7’ wide x 4’ long
Fish Stream Improvement (395), Rock inlet, 2’ wide x 4’ long
Fish Stream Improvement (395), Rock Cross Vanes 7’ wide x 4’ long
Obstruction Removal (500), willow branch, 3-inch dbh
Critical Area Planting (342), 300 ft²

Purpose/Goal of Project: The intent of this project was to improve fish passage and increase flood capacity in the channel.

Area Affected: Approximately 300 square feet was affected by the implementation of the additional in-stream rock vanes, including all staging areas.

Conservation benefits: Completion of this treatment will enhance wildlife habitat, reduce erosion, and improve water quality. Passage to half a mile of stream habitat for steelhead has been improved. A Fish Stream Improvement Structure was installed to create additional habitat for steelhead moving through the area including the creation of resting spots. The structure will also reduce the grade and enhance soil stabilization within the culvert. Existing vane structures were reinforced and modified according to the designs and as deemed necessary in the field. A pre-existing willow located on the stream bank was approximately 13”in diameter and was leaning into the channel thereby destabilizing the bank. The willow was successfully removed and will result in the improvement of habitat for steelhead by reducing erosion.

Volume of soil moved: Approximately 25cyds

Wetlands/Waters: Fill consisted of: imported angular rock =10 cyd, soil backfill=15 cyd, and 5cyd for the temporary diversion.

Vegetation was removed from the banks of the channel, however, the large pre-existing willow removed was a significant obstruction and will reduce sediment over time as it was contributing to bank destabilization. Several willows from Phase I have taken, and additional vegetation was planted during this phase.

Final slope of project work (not to exceed 2:1): The final slope of the project conformed with the natural bank slope.

Efforts to Control Non-Native Invasive Plant Species: As the project area is adjacent to established, existing infestations by invasive plant species, such as vinca and hemlock, that cannot reasonably be prevented from spreading onto the site without constant removal effort, the success criteria for invasive species control are as follows: a) to prevent the introduction of any invasive species which currently do not exist on or adjacent to the project site; b) to prevent an increase in the quantity of non-native vegetation above pre-construction conditions. These criteria will be accomplished by revegetation of native vegetation and maintenance of invasive and non-native plants with hand tools, weed whacking, and hand pulling by the landowner.

Revegetation efforts: The primary objective of re-vegetating the site was to restore those native plants disturbed during construction and provide temporary ground cover until the more mature riparian vegetation can be re-established. All soil disturbed in the staging area and the area of fill disposal was reseeded with common barley.
Erosion control seed will be re-broadcast if the first seeding fails to provide adequate erosion control protection. Willow stakes will be replanted the following year if success is limited. Invasive and non-native vegetation species after project implementation will be controlled with hand tools, weed whacking, and hand pulling. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of the riparian vegetation affected by the project activities.

**Special Status Species and Habitat in the Project Area and Protection Measures Implemented:**
Prior to project implementation, all project workers were given information on the listed species in the project area, a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

The special status species of concern on this property were California red-legged frog (Rana aurora draytonii) and Steelhead.

Previous surveys have shown that no California red-legged frog were present. However, construction activities began after July 1st to avoid potential impacts to breeding adults or egg masses. In addition to appropriate timing of the construction season, Additional actions to avoid negative impact to California red-legged frog due to the project being within a stream channel include, execution of all construction activities during daylight hours, before winter rains, dewatering of the channel in order for all construction activities to occur in a dry channel whenever possible, and minimal disturbance of vegetation throughout the project area.

**Coho and Steelhead:**
A qualified individual approved by NOAA Fisheries acted as a biological monitor during construction. The biological monitor monitored construction activities and instream habitat and performance of sediment control devices. The biological monitor did not have to exercise his authority to halt work activity and recommend measures for avoiding adverse effects. The following fish relocation information was provided by the Aquatic Ecologist contracted to complete fish relocation and project monitoring.

All fish relocation activities were conducted in accordance with permit conditions outlined in the Permit Coordination Program Biological Opinion (BO) issued by the National Marine Fisheries Service (NMFS). Block nets with a ¼” mesh size were installed upstream and downstream of the construction area on September 30, 2008. Subsequent to net installation, fish present within the exclusion area were captured using standard electrofishing techniques. A total of three passes were made in an upstream direction, starting with an electrofisher setting of 100 V, 1 ms, 40 Hz and ending with a setting of 200 V, 2 ms, 50 Hz. Captured fish were allowed ample time to recover, carried in a bucket, and released in mainstem Arana Gulch approximately 200 ft downstream of the construction site. Although relocating fish to reaches within the same channel and upstream of the construction site is generally preferable, very low flow conditions in late September 2008 resulted in poor habitat conditions in Central Branch Arana Gulch Creek both upstream and downstream of the construction site. The mainstem of Arana Gulch, however, contained slightly greater streamflows and several pools immediately upstream of the Central Branch confluence and thus provided the most suitable habitat in the vicinity of the construction site.
The fish relocation effort was conducted on September 30, 2008 in anticipation of an October 1, 2008 construction start date. However, after fish had been relocated, the contractor informed the RCDSCC that work would not begin until October 9, 2008. Thus, the block nets were left in place and an additional electrofishing pass was conducted on the morning of October 9, immediately prior to construction start.

The exclusion area between the block nets was approximately 130 ft long with a 1-4 ft wide channel. Stream substrate was dominated by fine silt/clay materials. The majority of the reach contained run-type habitat with the exception of minor scour pool immediately downstream of the rock veins and immediately upstream of the culvert. Riparian vegetation, dominated by willows (Salix spp.) was dense except in the immediate vicinity of the culvert. Water temperature on September 30, 2008 (9:15 am) was 12.4ºC and electrical conductivity was 507 µS/cm. Thus, electrical conductivity exceeded the maximum level stipulated by the NMFS BO, but authorization to electrofish under these conditions was previously obtained from Jon Ambrose (NMFS Santa Rosa) on September 24, 2008.

Central California coast steelhead (Oncorhynchus mykiss) were the only fish species present within the exclusion area. A total of eight young-of-the-year (YOY) and one yearling (age 1+) steelhead were captured during the first pass; five YOY and no age 1+ steelhead were captured on the second pass; and no steelhead were captured during the third pass on September 30, 2008. The subsequent pass conducted on October 9, 2008 yielded no steelhead. Thus, a total of 14 steelhead (13 YOY and one age 1+) were relocated. All fish appeared in good condition upon release and no mortalities were observed.

Dewatering of the construction site was achieved thorough the use of a cofferdam and a gravity-fed bypass pipe. Isolated pools of standing water were pumped. No stranded fish were observed during dewatering.

In-channel construction activities were completed on October 15, 2008 and the cofferdam was removed on the same day. The downstream block net was removed prior to cofferdam removal, but the upstream net was left in place to avoid washing fish into the dewatered channel reach. Due to the low flow conditions in Central Branch Arana Gulch, water reached only the upstream-most rock vein before seeping into the ground. It became evident after about one hour that it would take several days for the low flows to re-water the substrate and channel throughout the entire reach. It was therefore decided to leave the upstream block net in place to prevent steelhead potentially present above the construction zone to enter until the entire reach was re-watered. The upstream net was ultimately removed on until October 23, 2008 when the entire reach contained water.

The number and type of Practices implemented within the stream channel:

- Fish Stream Improvement (395) Habitat Improvement Structure Rock Inlet
- Rock Cross Vanes
- Dewatering Structure
- Obstruction Removal (500)
- Critical Area Planting (342)
The length of streambank (feet) protected and stabilized:

- Approximately 300 feet was effected by implementation of one new rock vane and the repair of the existing two rock vanes.

The number of culverts replaced or repaired, including the number of miles of restored access to unoccupied salmonid habitat:

- Culvert replacement occurred in 2007.

The distance (feet) of aquatic and riparian habitat disturbed at project site:

- Revegetation efforts encompassed approximately 300 square feet of the riparian habitat.

All protocols were adhered to. Implementation procedures of this project is determined by NRCS to be consistent with the Biological Opinion issued by NMFS on May 31, 2005 (Consultation # 151422SWR04SR9195:JMA). This project is determined by NRCS to be consistent with USFWS Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006 with regards to Red-legged frog.

Project: ARA3

Site in 2008 before invasive plant removal

Site in 2008 after invasive plant removal

English and Cape ivy was removed from this area by hand. The area was then seeded, planted and erosion control was installed. English and Cape ivy can be seen in foreground on the left.

Site in 2008 before invasive plant removal

Site in 2008 after invasive plant removal

English ivy was removed in this area by hand.

Some barley grass can be seen sprouting in the picture on the right.
Practice/Extent: Restoration and Management of Declining Habitats (643): 50’ wide x 60’ long; 4’ wide x 200’ long.

Purpose/Goal of Project: The purpose of this project is to restore a riparian community by eliminating the exotic plants on a portion of a 5.5-acre site along Leona Creek and revegetating with native plants to improve wildlife habitat and riparian ecosystem functioning.

Area Affected: 0.25 acres

Conservation benefits: Removal of English and Cape ivy along Leona Creek in this riparian corridor improves bank stability, decreases erosion and sedimentation and protects native habitat.

Volume of soil moved: 0 cyd

Net Waters/Wetland loss: There was no impact to waters of the state and no net loss of jurisdictional wetlands.

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

Efforts to Control Non-Native Invasive Plant Species: This project focused on removal of the invasive plants on the site. Hand removal by American Conservation Experience (ACE) crews was done to control Cape and English ivy. Success criterion at this project site will be constituted by a 90% reduction in English and Cape ivy. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

Revegetation Efforts: Revegetation with native plants was done this year by ACE crews. Plant sizes ranged from tube-sized to one gallon containers. The smallest sized containers available were selected in order to reduce water needs during the first year of establishment and to increase likelihood of survival. Appropriate sized holes were hand dug and the species were planted without amendments due to the fertility of the site. Material was re-compacted around the plants to ensure adequate soil contact and the plants were slightly raised to prevent water ponding and rot. Nursery stock was inspected for disease and pests prior to use per nursery protocols. Re-vegetation of the site with native plants will provide habitat cover and forage and “shade out” unwanted species. Success criterion at this project site will be constituted by a 90% survival rate of natives planted. Replanting will occur as needed to meet success criteria of the project. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of vegetation affected by the project activities. All of the following native plants were purchased at a local native plant nursery as container plants and have been pre-approved by an NRCS biologist or were included on the list of approved plant species for use under the Program:

<table>
<thead>
<tr>
<th>Rubus ursinus</th>
<th>Rosa californica</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Blackberry</td>
<td>California Rose</td>
</tr>
<tr>
<td>Hordeum vulgare</td>
<td>Ribes sanguineum</td>
</tr>
<tr>
<td>Common Barley</td>
<td>Red-flowering Currant</td>
</tr>
<tr>
<td>Salix spp</td>
<td>Willow spp</td>
</tr>
</tbody>
</table>

Following work this year, barley grass seed was hand seeded, covered with straw mulch, and secured with an erosion control blanket and straw wattles in the disturbed area to prevent
erosion and sedimentation into Leona Creek. This erosion control will also deter colonization of other invasive plants.

**Special Status Species and Habitat in the Project Area and Protection Measures Implemented:**
Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species' natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

This project is determined by NRCS to be consistent with the Letter of Concurrence issued by NMFS on April 16, 2004 which confirmed that implementation of the practice: “Restoration and Management of Declining Habitats” was an activity that may affect but was not likely to adversely affect steelhead, coho, or the critical habitat for coho in Santa Cruz County (Consultation # 151422SWR04SR9197:BLS). This project is determined by NRCS to be consistent with the Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.

**Project: ARA4**

**Site in 2008 before invasive plant removal**  
**Site in 2008 after invasive plant removal**

*Pampas grass on the cliff was treated with herbicide using the cut stump method. A backpack sprayer was used along with a rope and harness to access the Pampas grass.*

**Site in 2008 before invasive plant removal**  
**Site in 2008 after invasive plant removal**

*Periwinkle, English ivy and Himalayan blackberry were removed in this area by hand.*
Practice/Extent: Restoration and Management of Declining Habitats (643): 100’ wide x 269’ long

Purpose/Goal of Project: The purpose of this project is to restore a riparian community by eliminating the invasive exotic plants on a 2.6-acre site along Rodeo Creek and revegetating with native plants to improve wildlife habitat and riparian ecosystem functioning.

Area Affected: 0.25 acres

Conservation benefits: Removal of English ivy, Himalayan blackberry, periwinkle and Pampas grass along Leona Creek in this riparian corridor improves bank stability, decreases erosion and sedimentation and protects native habitat.

Volume of soil moved: 0 cyd

Net Waters/Wetland loss: There was no impact to waters of the state and no net loss of jurisdictional wetlands.

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

Efforts to Control Non-Native Invasive Plant Species: This project focused on removal of several invasive plants on the site. English ivy, Himalayan blackberry, and periwinkle were removed by hand, and Pampas grass was cut at the base and sprayed with an approved herbicide. Success criterion at this project site will be constituted by a 100% reduction in cover of pampas grass, and an 85% reduction in cover of all other above listed invasive plants. Follow up monitoring will be conducted for a period of 5 years to ensure that there is not an infestation of new exotic species.

Revegetation Efforts: Revegetation with native plants was done this year by ACE crews. Plant sizes ranged from tube-sized to one gallon containers. The smallest sized containers available were selected in order to reduce water needs during the first year of establishment and to increase likelihood of survival. Appropriate sized holes were hand dug and the species were planted without amendments due to the fertility of the site. Material was re-compacted around the plants to ensure adequate soil contact and the plants were slightly raised to prevent water ponding and rot. Nursery stock was inspected for disease and pests prior to use per nursery protocols. Re-vegetation of the site with native plants will provide habitat cover and forage and “shade out” unwanted species. Success criterion at this project site will be constituted by a 80% survival rate of natives planted. Replanting will occur as needed to meet success criteria of the project. The site will be monitored for a period of 5 years in order to meet the success criteria of the project. All of the following native plants were purchased at a local native plant nursery as container plants and have been pre-approved by an NRCS biologist or were included on the list of approved plant species for use under the Program:

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</tr>
<tr>
<td>Carex spp</td>
<td>Scrophularia californica</td>
</tr>
<tr>
<td>Sedge spp</td>
<td>Bee plant</td>
</tr>
<tr>
<td>Rubus parviflorus</td>
<td></td>
</tr>
<tr>
<td>Thimbleberry</td>
<td></td>
</tr>
</tbody>
</table>
Following work this year, barley grass seed was hand seeded, covered with straw mulch, and secured with an erosion control blanket and straw wattles in the disturbed area to prevent erosion and sedimentation into Rodeo Creek. This erosion control will also deter colonization of other invasive plants.

**Special Status Species and Habitat in the Project Area and Protection Measures Implemented:**
Prior to project implementation, all project workers were given information on the listed species in the project area; a brief overview of the species’ natural history, the protection afforded the species by the Federal and California Endangered Species Acts, and the specific protective measures to be followed during implementation of the practices.

This project is determined by NRCS to be consistent with the Letter of Concurrence issued by NMFS on April 16, 2004 which confirmed that implementation of the practice: “Restoration and Management of Declining Habitats” was an activity that may affect but was not likely to adversely affect steelhead, coho, or the critical habitat for coho in Santa Cruz County (Consultation # 151422SWR04SR9197:BLS). This project is determined by NRCS to be consistent with the Biologic Opinion #1-8-0-4-F-01 issued on July 25th 2006.

**Projects Implemented in 2007**

**Project: SOQ1**

**Site in 2008**

![Image](image)

*No re-growth of Arundo has occurred since the follow up treatment in 2007*

**Annual Monitoring of Project Site:**
**Practice/Extent:** Restoration and Management of Declining Habitat

The primary intent of the project was the eradication of a 10 x 30 square foot stand of Arundo donax and control of cape ivy to allow successful revegetation. Eradication of cape ivy is not possible on due to its infestation on the project site and within this reach of the stream. Revegetation will occur in 2008.
The site has been monitored for two (2) out of the five (5) years scheduled. There has been no infestation of new exotic species.

**Original Revegetation Success Criterion:** Success criterion at this project site will be constituted by a 100% reduction in the percent of Arundo. The site will be monitored for 5 years to ensure no colonization of new exotic species.

During phase II (2007), an additional treatment of Arundo was completed to achieve the success criterion.

Common barley was used in combination with straw mulch to provide adequate ground cover for temporary erosion control. Straw wattles and erosion control blankets were used in select locations on site where the slope required additional erosion control.

**Revegetation Success in 2008:** A 100% eradication of Arundo was maintained throughout 2008. Native shrubs were not planted until 2008 due to the excessive amount of Cape ivy and the need for an additional treatment of Arundo donax.

Revegetation began in 2008. Further information is provided in the “Projects Implemented in 2008” section.

**Project: SOQ3**

**Site in 2008**

2-acre area: English and Cape ivy, and periwinkle were removed by hand from this area in 2007 and natives were planted in 2007 and 2008. This area was maintained in 2008.

2-acre area: English ivy was removed and natives planted in 2007.
**Annual Monitoring of Project Site:**

**Practice/Extent:** Restoration and Management of Declining Habitat

Phase III of this project involved subsequent hand removal of invasive groundcovers (English and Cape ivy and vinca) by the Community Action Board's NREP crews on the two (2) acre area. Revegetation with native plants was also completed as part of Phase III.

The site has been monitored for two (2) out of the five (5) years scheduled. There has been no infestation of new exotic species.

**Original Revegetation Success Criterion:**

= Success criterion at this project site will be constituted by a 90% reduction in the percent of English and Cape ivy and an increase in native plant species of 75%. Success criterion at this project site will be constituted by a 90-95% survival rate. The site will be monitored for a period of 5 years to prevent the infestation of the site by new exotic species. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of the riparian vegetation affected by the project activities.

Acacia removal did not occur in 2007 as planned due to lack of available qualified consultants.

Common barley was used in combination with straw mulch to provide adequate ground cover for temporary erosion control. Straw wattles and erosion control blankets were used in select locations on site where the slope required additional erosion control.

**Revegetation Success 2008:** A 90% reduction of English and Cape ivy was maintained throughout 2008. A 80% survival rate and an 75% increase of native vegetation were maintained throughout 2008.

**Project: SOQ5**

**Site in 2008**

*English ivy, Cape ivy, and morning glory were removed from this area in 2007 and 2008. Revegetation with natives began in 2006.*
Site in 2008

English ivy, Cape ivy, morning glory and periwinkle were removed from this area in 2007 and 2008.

Annual Monitoring of Project Site:
Practice/Extent: Restoration and Management of Declining Habitat

Phase II of this project involved the removal and control of remaining invasive groundcover (English and Cape ivy, vinca, and morning glory, and additional re-vegetation of the site with native plants.

The site has been monitored for two (2) out of the five (5) years scheduled. There has been no infestation of new exotic species.

Original Revegetation Success Criterion: Success criterion at this project site will be constituted by a 90% reduction in the percent of English and Cape ivy, vinca, morning glory, and poison hemlock. The site will be monitored for a period of 5 years to ensure that no new exotic species colonize the area.

Re-vegetation of the site with native plants will provide habitat cover and forage and “shade out” unwanted species. Success criterion at this project site will be constituted by an increase in native plant species of 75% and a 90-95% survival rate of these species. Replanting will occur as needed to meet success criteria of the project. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of the riparian vegetation affected by the project activities.

Common barley was used in combination with straw mulch to provide adequate ground cover for temporary erosion control. Straw wattles and erosion control blankets were used in select locations on site where the slope required additional erosion control.

Revegetation Success 2008: A 90% reduction of English ivy, Cape ivy, vinca, morning glory, and poison hemlock was maintained throughout 2008. A 90% survival rate and an 75% increase of native vegetation were maintained throughout 2008.
English ivy was removed from this area in 2007 and follow-up maintenance was done in 2008.

English and Cape ivy were removed from this area in 2007 and follow-up maintenance was done in 2008.
Annual Monitoring of Project Site:
Practice/Extent: Restoration and Management of Declining Habitat

Phase I of this project involved the removal of invasive groundcover (English and Cape ivy) in the flat areas on the site. Arundo donax, French broom, pampas grass, and poison hemlock were also removed using hand removal methods. Native trees and shrubs that currently stabilize steep, highly erosive banks were protected by cutting the ivy around the base of the tree trunk with either a chain saw or hand clippers, treating the lower portion of ivy with pre-approved herbicide (Rodeo glyphosate), and leaving the upper portion to die and fall off the trees. Revegetation will occur in 2008.

The site has been monitored for two (2) out of the five (5) years scheduled. There has been no infestation of new exotic species.

Original Revegetation Success Criterion: Because the goal of this project is to restore a riparian community, the success criteria will be constituted by a 90% reduction in the percent of Arundo donax, French broom, pampas grass, poison hemlock and English and Cape ivy. The site will be monitored for a period of 5 years to prevent infestation of new exotic species.

Common barley was used in combination with straw mulch to provide adequate ground cover for temporary erosion control. Straw wattles were used in select locations on site where the slope required additional erosion control.

Revegetation Success 2008: A 90% reduction of English ivy, Cape ivy, vinca, morning glory, and poison hemlock was maintained throughout 2008. Revegetation began in 2008. Further information is provided in the “Projects Implemented in 2008” section.

Project: SLO4

Site in 2008

In 2007, the pictured bridge replaced a failing culvert crossing
Annual Monitoring of Project Site: The goal of this project is to improve debris passage; upstream fish passage and improve access to homes and property. As the project area is adjacent to established, existing infestations by invasive plant species, such as French broom, which cannot reasonably be prevented from spreading onto the site without constant removal effort, the site will be preconstruction condition or better.

The site has been monitored for two (2) out of the five (5) years scheduled. There has been no infestation of new exotic species.
Original Revegetation Success Criterion:
The primary objective of revegetating the site was to provide temporary ground cover until the more mature riparian vegetation (thru natural recruitment) could be re-established. The temporary erosion control seeding (common barley, *Hordeum vulgare*) will provide temporary stabilization (1 year) while riparian vegetation becomes established. Rock rip rap was extended up the bank and was underlain with geotextile fabric and interplanted with willow stakes.

The success criteria for this project will be:
To ensure proper establishment of temporary grass seed during the first winter for erosion control until the riparian vegetation can re-establish, erosion control seed will be re-broadcast. This will ensure adequate erosion control protection.

To ensure proper establishment of willows onsite, planting techniques for willow sprigs will be consistent with CDFG’s California Salmonid Stream Habitat Restoration Manual, VII-76. Willow stakes will be replanted the following year if success is limited.

To prevent an increase in the quantity of non-native vegetation above pre-construction condition, the site will be monitored for a period of five (5) years to ensure no infestation of new exotic species. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of the riparian vegetation affected by the project activities.

**Revegetation Success 2008:** Proper establishment of temporary grass seed for erosion control was maintained during the first winter 2008 at this site. Proper establishment of willows onsite was maintained throughout 2008 at this site. An increase in the quantity of non-native vegetation above pre-construction condition was prevented throughout 2008 at this site.

**Project: SLO5**

**Site in 2008**

Annual Monitoring of Project Site
Practice/Extent: Restoration and Management of Declining Habitats

The goal of this project is to restore 3000 feet along the San Lorenzo River levee by removing the following non-native invasive plants from the levee: fennel, English ivy, pampas grass and French Broom (*Black wood acacia and green wattle acacia were identified in the Riparian Restoration Plan for the Urban San Lorenzo River as occurring on-site. This was erroneous information).

The site has been monitored for two (2) out of the five (5) years scheduled. There has been no infestation of new exotic species.

Original Revegetation Success Criterion: Phase I of this project consisted of selective removal of highly aggressive invasive species to allow establishment of native trees, shrubs and herbaceous cover. The following species were removed from the project area: French broom, pampas grass, English ivy, and fennel. All Non-native vegetation will be controlled as needed to ensure at least a 90% success of native vegetation establishment. The site will be monitored for a period of five (5) years to ensure no infestation of new exotic species.

Revegetation Success 2008: Phase II, revegetation with native plants, did not occur in 2008 due to Army Corps of Engineers pending legislation. It is unclear when this legislation will be resolved.
Project: SLO6

Site in 2008

Rolling dips were installed to shed surface flow from the roadbed and reduce ditch incising and gully erosion.

Site in 2008

Replaced 18” culvert to convey flow

Annual Monitoring of Project Site:
Practice/Extent: Access Road Improvement

The goal of the project is to reduce delivery of road-derived sediment to Deer Creek in the San Lorenzo River Watershed as a means of protecting and enhancing downstream salmonid habitat.

Project success was evaluated using photo monitoring. Two (2) years of the five (5) years scheduled for monitoring have been completed. There has been no infestation of new exotic species, but there has been infestation of exotic broom that looks to be from the existing seed bank or from nearby populations on the road segment.
Current Status/Success of the Project: Annual photo monitoring was completed at all photo points established during pre and post project photo monitoring. The results of the annual monitoring indicate that all the erosion control treatments installed were operating as planned. Access Road Improvements (560) including outsloping, rolling dips, critical dips, and road surfacing armoring were properly conveying water from the road’s surface eliminating excessive roadbed erosion. In several locations, very small rills were present on the road during storm events.

Project: SLO7

Site in 2008

A total of 962 feet of road was outsloped and 5 rolling dips were installed to shed water from the road surface.

Annual Monitoring of Project Site:
Practice/Extent: Access Road Improvement

The goal of the project is to reduce delivery of road-derived sediment to Deer Creek in the San Lorenzo River Watershed as a means of protecting and enhancing downstream salmonid habitat.

Project success was evaluated using photo monitoring. Two (2) years of the five (5) years scheduled for monitoring have been completed. There has been no infestation of new exotic species, but there has been infestation of exotic broom that looks to be from the existing seed bank or from nearby populations on the road segment.

Current Status/Success of the Project: Annual photo monitoring was completed at all photo points established during pre and post project photo monitoring. The results of the annual monitoring indicate that all the erosion control treatments installed were operating as planned. Access Road Improvements (560) including outsloping, rolling dips, critical dips, and road surfacing armoring were properly conveying water from the road’s surface eliminating excessive roadbed erosion. In several locations, very small rills were present on the road during storm events.
Project: SLO8

Site in 2008

A 36-inch corrugated plastic culvert was installed to convey 100 year flows.

Annual Monitoring of Project Site:
Practice/Extent: Structure for Water Control

The goal of the project is to reduce delivery of road-derived sediment to Newell Creek in the San Lorenzo River Watershed as a means of protecting and enhancing downstream salmonid habitat.

Project success was evaluated using photo monitoring. Two (2) years of the five (5) years scheduled for monitoring have been completed. There has been no infestation of new exotic species, but there has been infestation of exotic broom that looks to be from the existing seed bank or from nearby populations on the road segment.

Current Status/Success of the Project: Annual photo monitoring was completed at all photo points established during pre and post project photo monitoring. The results of the annual monitoring indicate that all of the Structures for Water Control (587) were properly conveying stream flows through the road fill eliminating problems related to culvert plugging and road washouts. As apparent in the photo several small potholes have formed indicating that the road section requires outsloping.

Original Revegetation Success Criterion: The primary objective of the site re-vegetation efforts was to provide temporary ground cover until native riparian vegetation can re-establish through natural recruitment processes. The revegetation efforts consisted of spreading and crimping straw at a rate of 3 bales/1000 square feet and broadcasting common barley (Hordeum vulgare) at a rate of 150 lbs/acre across the entire .024 acres site. The site will be monitored for 5 years to ensure no colonization of new exotic species.

Revegetation Success in 2008: Annual grasses and small herbaceous plants are beginning to re-colonize approximately 75% of the road edges.
Project: SLO9

Site in 2008

Drainage upgrades have successfully controlled erosion.

Site in 2008

In order to treat erosion issues, the road was outsloped to a 4-6% grade. The outboard road edge was removed, and any existing inboard ditch was filled.

Annual Monitoring of Project Site:
Practice/Extent: Access Road Improvement

The goal of the project is to reduce delivery of road-derived sediment to Deer Creek in the San Lorenzo River Watershed as a means of protecting and enhancing downstream salmonid habitat.
Project success was evaluated using photo monitoring. Two (2) years of the five (5) years scheduled for monitoring have been completed. There has been no infestation of new exotic species, but there has been infestation of exotic broom that looks to be from the existing seed bank or from nearby populations on the road segment.

**Current Status/Success of the Project:** Annual photo monitoring was completed at all photo points established during pre and post project photo monitoring. The results of the annual monitoring indicate that all the erosion control treatments installed were operating as planned. Access Road Improvements (560) including outsloping, rolling dips, critical dips, and road surfacing armoring were properly conveying water from the road’s surface eliminating excessive roadbed erosion. In several locations very small rills were present on the road during a storm event.

**Project: SLO10**

**Site in 2008**

The road fill prism was removed and the sloped treated with straw and barley to prevent short term erosion. The newly re-established stream channels (#1 and #2) are shown above.

**Annual Monitoring of Project Site:**
**Practice/Extent:** Access Road Improvement

The goal of the project is to reduce delivery of road-derived sediment to Newell Creek in the San Lorenzo River Watershed as a means of protecting and enhancing downstream salmonid habitat.

Project success was evaluated using photo monitoring. Two (2) years of the five (5) years scheduled for monitoring have been completed. There has been no infestation of new exotic species.
**Current Status/Success of the Project:** Annual photo monitoring was completed at all photo points established during pre and post project photo monitoring. The results of the annual monitoring indicate that all the erosion control treatments installed were operating as planned. Access Road Improvements (560) including outsloping, rolling dips, critical dips, and road surfacing armoring were properly conveying water from the road’s surface eliminating excessive roadbed erosion.

**Original Revegetation Success Criterion:** The primary objective of the site re-vegetation efforts was to provide temporary ground cover until native riparian vegetation can re-establish through natural recruitment processes. The revegetation efforts consisted of spreading and crimping straw at a rate of 3 bales/1000 square feet and broadcasting common barley (*Hordeum vulgare*) at a rate of 150 lbs/acre across the entire .248 acres site. This will provide immediate erosion protection (1 year) while native vegetation becomes established. If the first seeding fails to provide adequate erosion control protection, barley seed and straw will be re-broadcast. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of native vegetation across the entire site. If after the first year it is determined that native vegetation density is not sufficient to protect the site, willow stakes and other native woody plant materials will be installed. The site will be monitored for 5 years to ensure no colonization of new exotic species.

**Revegetation Success in 2008** The annual barley spread as erosion control was present on approximately 5% of the project site. No other significant sources of native vegetation was present at the time, but duff has accumulate to provide protection from surface erosion.

**Project:** SLO11

**Site in 2008**

*The failing culvert and road fill prism was removed in the fall of 2007 and the sloped treated with straw and barley to prevent short term erosion. Similar to SLO 10, approximately one yard of sediment appears to have slid off from the end of the channel.*
Annual Monitoring of Project Site:
Practice/Extent: Access Road Improvement

The goal of the project is to reduce delivery of road-derived sediment to Newell Creek in the San Lorenzo River Watershed as a means of protecting and enhancing downstream salmonid habitat.

Annual Monitoring of Project Site: Project success was evaluated using photo monitoring. Two (2) years of the five (5) years scheduled for monitoring have been completed. There has been no infestation of new exotic species.

Current Status/Success of the Project: Annual photo monitoring was completed at all photo points established during pre and post project photo monitoring. The results of the annual monitoring indicate that all the erosion control treatments installed were operating as planned. Access Road Improvements (560) including outsloping, rolling dips, critical dips, and road surfacing armoring were properly conveying water from the road’s surface eliminating excessive roadbed erosion.

Original Revegetation Success Criterion: The primary objective of the site re-vegetation efforts was to provide temporary ground cover until native riparian vegetation can re-establish through natural recruitment processes. The revegetation efforts consisted of spreading and crimping straw at a rate of 3 bales/1000 square feet and broadcasting common barley (Hordeum vulgare) at a rate of 150 lbs/acre across the entire .248 acres site. This will provide immediate erosion protection (1 year) while native vegetation becomes established. If the first seeding fails to provide adequate erosion control protection, barley seed and straw will be re-broadcast. Revegetation efforts will be monitored for a period of 5 years following construction to ensure successful re-establishment of native vegetation across the entire site. If after the first year it is determined that native vegetation density is not sufficient to protect the site, willow stakes and other native woody plant materials will be installed.

Revegetation Success in 2008: Duff has successfully accumulated at the site and small redwood saplings are present.

Project: PAJ2

Site in 2008

Site where grassed waterway inlets into the water and sediment control basin.
Site in 2008

Northwest corner of property; site of first sediment basin, and start of grassed waterway.

Annual Monitoring of Project Site:
Practice/Extent: Sediment Basin, Grassed Waterway, and Water and Sediment Control Basin

The goal of this project is to treat the sediment and contaminant laden water which enters from neighboring agricultural operations and release it as better quality as it exits at the southeast corner of the property and travels downstream towards Pinto Lake.

The site has been monitored for two (2) out of the five (5) years scheduled. While there has been no infestation of new exotic species, we did observe an increase in the extent of nutsedge on disturbed areas. The landowners have been utilizing sheep to control the weed and it appears to be controlling the population on non-natives.

Original Revegetation Success Criterion: Seeding of all disturbed areas including basins, grassed waterway, staging area, access road, and spread/fill will occur. The intention of seeding was erosion control, bank stability, filtration and retention of nutrients and pesticides. All areas were hydro-seeded with red fescue. All disturbed areas will be monitored for a period of five years to ensure that cover is maintained within the preconstruction conditions or better. Because cover is critical at this site, a success criteria of 90% cover will be maintained. The site will be monitored for a period of five (5) years to ensure no infestation of new exotic species.

The first hydro-seeding of the project did not take due to lack of rain, so an additional application occurred.

Revegetation Success 2008: The second hydro-seeding was successful and the success criteria of 90% cover has been obtained.
Project: PAJ3

Site in January 2008

The redwood stumps and willow stakes have sprouted.

Site in January 2008

Vegetation has recolonized the site and the slope has been stabilized.

Site in July 2008

With flowers blooming

Annual Monitoring of Project Site:
Practice/Extent: Streambank Stabilization

The goal of this project is to implement a streambank stabilization structure that works in concert with the environmental setting to protect and enhance the sites valuable resources and water quality of the creek.

The site has been monitored for two (2) out of the five (5) years scheduled. While, there has been no infestation of new exotic species, the existing hemlock population has been mowed two times before seed set and remains a prolific weed and competitor for the natives which were planted. Control of seedlings from the existing eucalyptus tree will be continue to be a challenge.
**Original Revegetation Success Criterion:** Because the project site is located on a section of the streambank where little riparian vegetation currently exists due to the severe slope and instability of the soil in this area, revegetation with native species will ensure that disturbed areas are restored to preconstruction condition or better. Our success criteria for revegetation to this site is that 90% of the plantings will survive, and if any plants are lost they will be replaced unless an NRCS biologist determines that natural recruitment will occur. To further ensure this objective the site will be maintained until project success criteria have been met (a minimum of 5 years) and plants have become fully established.

Revegetation of all disturbed areas including access roads, staging areas, and construction zones will occur for erosion control, bank stability, and habitat creation. Additional Coast Redwoods will be planted at a 3:1 ratio in order to mitigate for Coastal Redwoods harvested on site and used in the structure. The site will be monitored for a period of five (5) years to ensure no infestation of new exotic species.

**Revegetation Success 2008:** An increase in native plant species of 75% and a 90-95% survival rate of these species was maintained throughout 2008 at this site.

**Project: PAJ4**

**Site in 2008**

*Looking upstream from southern end of Watsonville Slough. Natives have filled most of the area where Carboprotus edulis was removed.*
New areas have been cleared, the area beyond the backhoe that was cleared previously shows substantial native plant recruitment.

The cleared area is being colonized by Lupinus arboreus and other native plants.

**Annual Monitoring of Project Site:**
*Practice/Extent:* Restoration and Management of Declining Habitats

The goal of this project is to restore and enhance a previously disturbed portion of Watsonville Slough to improve both wetland and upland habitat values of the ecosystem and to improve water quality.
The site has been monitored for two (2) out of the five (5) years scheduled. There has been no infestation of new exotic species.

**Original Revegetation Success Criterion:** Because the primary goal of the project is to improve habitat, the success criteria will be a 90% reduction in non-native invasives. This criterion will be achieved through continued treatment (phase II in 2008 and phase III in 2009). The site will be monitored for a period of five (5) years to ensure no infestation of new exotic species.

**Revegetation Success 2008:** Revegetation began in 2008. Further information is provided in the “Projects Implemented in 2008” section.

**Project: ARA2**

*Site in 2008*

*The inlet of the culvert has down cut between the fill material and native ground and the rock riprap has rolled into the channel.*

*Site in 2008*

*Scour has occurred around the existing rock vanes.*
Annual Monitoring of Project Site:
Practice/Extent: Fish Stream Improvement

The goal of this project is to improve fish passage and increase flood capacity in the channel.

The site has been monitored for two (2) out of the five (5) years scheduled. There has been no infestation of new exotic species.

Original Revegetation Success Criterion: As the project area is adjacent to established, existing infestations by invasive plant species, such as vinca, ivy and French broom, that cannot reasonably be prevented from spreading onto the site without constant removal effort, the success criteria for this project will be thus:

1) To ensure proper establishment of temporary grass seed for 1-3 years of erosion control until the riparian vegetation can re-establish.
2) To replace the 1-2 willow trees which will be removed as part of the project with the successful establishment of 2-4 or more willow trees for long term bank stabilization and riparian cover. Planting techniques for willow sprigs will be consistent with CDFG’s California Salmonid Stream Habitat Restoration Manual, VII-76.
3) To prevent the introduction of any invasive species which currently do not exist on or adjacent to the project site
4) To prevent an increase in the quantity of non-native vegetation above pre-construction condition.

In order to ensure the success of native plants, the introduction of any invasive plant species which currently do not exist on or adjacent to the project site will be prevented. The site will be monitored for a period of five (5) years to ensure no infestation of new exotic species.

Revegetation Success in 2008: Since construction of this project, excess flows throughout the area have created scouring that threatens to undermine the structure. In order to protect the investment of the structure, additional work in needed. Further information is provided in the “Projects Implemented in 2008” section.

Project: SV1

Site in 2008

PCV1
Annual Monitoring of Project Site:
Practice/Extent: Fish Stream Improvement

The goal of this project is to improve habitat on Queseria Creek for anadromous fish during high winter flows, as well as during low flows in late spring and early summer through the installation of cross vane structures and continued revegetation.

The site has been monitored for two (2) out of the five (5) years scheduled. There has been no infestation of new exotic species.

Original Revegetation Success Criterion: Because the goal of this project is to improve habitat for salmonids, the success criteria will be 90% success of native plants. Any plants that need to be replaced will be unless it is determined by an NRCS biologist that the community is regenerating itself without any need for additional inputs.
In order to ensure the success of native plants, the introduction of any invasive plant species which currently do not exist on or adjacent to the project site will be prevented. The site will be monitored for a period of five (5) years to ensure no infestation of new exotic species and to maintain the <10% invasive cover which currently exists at the site.

Revegetation Success in 2008: An increase in native plant species of 75% and a 90-95% survival rate of these species was maintained throughout 2008 at this site, with the exception of PCV3 which was reconstructed in 2008 to improve the jump height and pool formation for over-wintering salmonids. Further information on PCV3 is provided in the “Projects Implemented in 2008” section.

Projects Implemented in 2006

Project: SOQ1

Site in 2008

Area where Arundo donax was removed from along Soquel

Annual Monitoring of Project Site:
Practice/Extent: Restoration and Management of Declining Habitat

Phase I of this project (2006) involved the initial treatment of Arundo utilizing the cut-stump method.

The site has been monitored for three (3) out of five (5) years. There has been no infestation of new exotic species.

Original Revegetation Success Criterion: The primary intent of the project is the 100% eradication of Arundo. The other goal of the project is the establishment of native species, the success criteria will be a 95% success of native plants. Any plants that will need to be replaced will be replaced unless it is determined by an NRCS biologist that the community is regenerating
itself without any need for additional inputs. The site will be monitored for a period of five (5) years to prevent infestation of the site by new exotic species.

In 2007, there was some Arundo re-growth and therefore a repeat cutting and herbicide application was done to address remaining Arundo present in the treatment area.

**Revegetation Success 2008:** A 100% eradication of the Arundo donax was maintained in 2008. No planting occurred in 2007 due to the extensive Cape ivy and nasturtium on site. Planting occurred in 2008. See Projects Implemented in 2008 section for more information.

**Project: SOQ3**

**Site in 2008**

2-acre area: English ivy was removed and natives planted in 2007.

**Annual Monitoring of Project Site:**

**Practice/Extent:** Restoration and Management of Declining Habitat

Phase II of this project (2006) involved subsequent hand removal of the invasive groundcovers (English and Cape ivy) on the four acres treated in 2005. Additional hand removal of the Arundo was also done. Other species, including pampas, vinca, lilies, and hemlock were also removed from the site by hand. Revegetation with native plants on the four acre area was also completed as part of Phase II.

Phase II of this project also included an initial hand removal on the remaining two (2) acres of the six (6) acre site to control invasive groundcovers (English and Cape ivy). Other species, including, pampas, vinca, lilies, and hemlock were also removed from the two (2) acre area by hand. Four (4) Acacia trees were removed. These trees were replaced at 3:1 ratio with native trees. Twelve (12) native trees were planted in place of the four (4) Acacia trees removed. Native trees and shrubs that currently stabilize steep, highly erosive banks on the two acre area were protected by ivy removal. Ivy was removed from the ground utilizing hand removal methods and from the trees by cutting and applying herbicide.
The site has been monitored for three (3) out of five (5) years. There has been no infestation of new exotic species.

**Original Revegetation Success Criterion:** Because the goal of this project is to restore a riparian community, the success criteria will be 90% success of native plants. Any plants that need to be replaced will be unless it is determined by an NRCS biologist that the community is regenerating itself without any need for additional inputs.

In order to ensure the success of native plants, the introduction of any invasive plant species which currently do not exist on or adjacent to the project site will be prevented. The site will be monitored for a period of five (5) years. Success criterion will be constituted by a 90% reduction in the percent of non-native invasive cover.

**Revegetation Success 2008:**
Four-acre area:
An increase in native plant species of 75% and a 90-95% survival rate of these species was maintained throughout 2008 at this site. The site will be monitored for a period of five (5) years to prevent infestation of the site by new exotic species.

A 100% eradication of the Arundo donax, and a 90% reduction in the percent of pampas, vinca, hemlock, and acacia was maintained throughout 2008. A 90% reduction of English and Cape ivy was also maintained throughout 2008.

Two-acre area:
A 90% survival rate of native plant species was maintained throughout 2008 at this site. A 90% reduction of English and Cape ivy was maintained throughout 2008.

**Project: SOQ5**

**Site in 2008**

*English ivy, Cape ivy, and morning glory was removed by hand from this area in 2006. Revegetation with native plants was also completed here in 2006.*
Site in 2008

English ivy, Cape ivy, and morning glory was removed by hand from this area in 2006. Revegetation with native plants was also completed here in 2006.

Annual Monitoring of Project Site:
Practice/Extent: Restoration and Management of Declining Habitat

Phase I of this project (2006) focused on eliminating invasive vegetation (English and Cape ivy) around five (5) areas where Arundo donax had previously been eradicated to create a defensible space for re-vegetation with native plants. Other invasives such as vinca, morning glory, and poison hemlock were also removed to create defensible space. Native trees and shrubs that currently stabilize steep, highly erosive banks were protected by removal of ivy and morning glory. Ivy and morning glory were removed from the ground utilizing hand removal methods. Ivy was removed from the trees by cutting ivy and applying pre-approved herbicide (Rodeo glyphosate) while morning glory was removed from trees by hand pulling. Revegetation with native plants was also completed as part of Phase I in areas cleared of invasive groundcover. The site has been monitored for three (3) out of five (5) years. There has been no infestation of new exotic species.

Original Revegetation Success Criterion: Because the goal of this project is to restore a riparian community, the success criterion is 90% success of native plants. Any plants that need to be replaced will be unless it is determined by an NRCS biologist that the community is regenerating itself without any need for additional inputs.

In order to ensure the success of native plants, the introduction of any invasive plant species which currently do not exist on or adjacent to the project site will be prevented. The site will be monitored for a period of five (5) years. Success criterion will be constituted by a 90% reduction in the percent of non-native invasive cover.

Revegetation Success 2008: An increase in native plant species of 75% and a 90% survival rate of these species was maintained throughout 2008 at this site. A 90% reduction of English and Cape ivy was maintained throughout 2008.
**Project: PAJ1**

**Site in 2008**

*Looking northeast from outlet of sediment basin to top of sediment basin.*

**Site in 2008**

*Looking southwest from location of the inlet to the outlet of the sediment basin.*

**Annual Monitoring of Project Site:**

*Practice/Extent: Sediment Basin and Structure for Water Control*

The goal of this project is to capture sediment and associated pollutants from an adjacent berry operation. Over the past three (3) years the sediment basin has controlled flows related to irrigation and storm events, and has successfully filtered and allowed settlement of sediment in the water. The landowners have cleared the downstream drain of debris to assist in the functioning of the system.
In an effort to control non-native invasive plant species the site has been monitored for three (3) out of the five (5) years scheduled. There has been no infestation of new exotic species.

**Original Revegetation Success Criterion:**

*Temporary Erosion Control Revegetation Criterion:* A percentage of the revegetation took place to provide temporary erosion control in an area that is to be maintained and reseeded annually. For this purpose non-reseeding annual barley was used on the sediment basin for winter erosion control. Success criterion for the temporary erosion control was based on its ability to provide adequate winter erosion control (60% cover).

*Perennial Erosion Control Revegetation Criterion:* At the entrance to the basin, where disturbance is not reoccurring, native red fescue ‘molate’ (Festuca rubra molate) was planted for long term stability. Success criterion for the native red fescue was constituted by 90% cover.

*Staging Area Revegetation Criterion:* For revegetation of the existing access road and staging area the landowners used existing range seeding mix, as these areas are forage sites. Success criterion for the range seeding mix was constituted by 90% cover.

**Revegetation Success 2008:** Both the Temporary and Perennial Revegetation areas of concern are experiencing more than 90% cover by barley and native red fescue ‘molate’ (Festuca rubra molate). The red fescue ‘molate’ has done better than expected, and has actually been recruited into all three revegetation areas of concern (including the staging/forage area). The staging area has been successfully returned to forage land, and is experiencing greater than 90% cover by the range seeding mix.

**Project: SLO1**

*Site in 2008*

42” culvert at stream crossing #1 properly conveying stream flow following a storm event.

Trash rack in place to help block large woody debris.

42” culvert at stream crossing #1 conveys water from large storm event.
Annual Monitoring of Project Site:
Practice/Extent: Access Road and Structure for Water Control

The goal of the project is Reduce road erosion and sediment inputs into the Deer Creek watershed.

Project success was evaluated using photo monitoring. Three (3) years of the five (5) years scheduled for monitoring have been completed. There has been no infestation of new exotic species, but there has been infestation of exotic broom that looks to be from the existing seed bank or from nearby populations on the road segment.

Current Status/Success of the Project: Annual photo monitoring was completed at all photo points established during pre and post project photo monitoring. The results of the annual monitoring indicate that all the erosion control treatments installed were operating as planned. Access Road Improvements (560) including outsloping, rolling dips, critical dips, and road surfacing armoring were properly conveying water from the road’s surface eliminating excessive roadbed erosion. All of the Structures for Water Control (587) were properly conveying stream flows through the road fill eliminating problems related to culvert plugging and road washouts.
Project: SLO2

Site in 2008

Road outsloping and rolling dip properly draining road surface in 2008.

Annual Monitoring of Project Site:
Practice/Extent: Access Road and Structure for Water Control

The goal of the project is to reduce road erosion and sediment inputs into the Deer Creek watershed.

Project success was evaluated using photo monitoring. Three (3) years of the five (5) years scheduled for monitoring have been completed. There has been no infestation of new exotic species.

Current Status/Success of the Project: Annual photo monitoring was completed at all photo points established during pre and post project photo monitoring. The results of the annual monitoring indicate that all the erosion control treatments installed were operating as planned. Access Road Improvements (560) including outsloping, rolling dips, critical dips, and road surfacing armorining were properly conveying water from the road’s surface eliminating excessive roadbed erosion. The ditch relief culverts are properly conveying water from inboard ditches eliminating problems related to ditch incising and gully formation at culvert outlets.
Project: SLO3

Site in 2008

Road outsloping and rolling dip properly draining road surface in 2008.

Annual Monitoring of Project Site:
Practice/Extent: Access Road Improvements

The goal of the project is to reduce road erosion and sediment inputs into the Deer Creek watershed.

Project success was evaluated using photo monitoring. Three (3) years of the five (5) years scheduled for monitoring have been completed. There has been no infestation of new exotic species.

Current Status/Success of the Project: Annual photo monitoring was completed at all photo points established during pre and post project photo monitoring. The results of the annual monitoring indicate that all the erosion control treatments installed were operating as planned. Access Road Improvements (560) including outsloping, rolling dips, and road surfacing armoring were properly conveying water from the road’s surface eliminating excessive roadbed erosion noted in pre project photo monitoring.
Projects Implemented in 2005

Project: SOQ2

Site in 2008

*Arundo donax was removed from this location and a culvert extension was installed in 2005. The white rebar piece denotes the top of the culvert extension.*

**Annual Monitoring of Project Site:**
**Practice/Extent:** Restoration and Management of Declining Habitat

The goal of the project is to eradicate the 20' x 40' stand of Arundo which has weakened the integrity of the streambank and continues to break off and spread downstream. The project resources do not allow for broader eradication of other invasive species present in the area (specifically, ivy and nasturtium).

The site has been monitored for four (4) years of the five (5) years scheduled for monitoring have been completed.

**Original Revegetation Success Criterion:**
Revegetation success is defined as the site being restored to pre-construction condition or better. Because the site is currently dominated by Arundo donax and nasturtium, success criterion at this project site will be constituted by a reduction in the percent of non-native invasive cover at the site (specifically Arundo), which is currently predominantly Arundo with some nasturtium=100% invasive cover) and an increase in native plant species (currently 0% at this site).
Revegetation Success in 2008:
A 100% reduction of Arundo donax, 50% reduction of nasturtium, and a 70% reduction of Cape ivy were maintained throughout 2008. Revegetation occurred in 2008. Further information is provided in the “Projects Implemented in 2008” section.

Project: SOQ3

Site in 2008

View of site of 4-acre area of site from condominiums.
English ivy was initially removed from this location in 2005.

Annual Monitoring of Project Site:
Practice/Extent: Restoration and Management of Declining Habitat

The goal of phase I of this project is the elimination of the exotic ground cover on the approximately 4 acres where Cape ivy has infested and eradication of Arundo.

The site has been monitored for four (4) years of the five (5) years scheduled for monitoring have been completed. There has been no infestation of new exotic species.

Original Revegetation Success Criterion:
Success criterion at this project site will be constituted by a 99% eradication of Arundo donax and a 90% reduction of English ivy.

Revegetation Success in 2008:
A 100% reduction of Arundo donax and a 90% reduction of English and Cape ivy were maintained throughout 2008. Revegetation began in 2006. Further information is provided in the “Projects Implemented in 2008” section.