California Department of Fish and Wildlife
Fisheries Restoration Grant Program
Restoration Project Case Study

Q2010505 Somerville Creek Instream Restoration Project

Project Objective(s) – This project aimed to improve the quality and quantity of Coho Salmon spawning and rearing habitat via installation of 28 instream structures containing 131 pieces of large wood (LW), including 19 with rootwads, in 0.7 miles of Somerville Creek. The structures were designed to increase floodplain and side channel inundation, provide refugia for migrating salmonids, and promote large and small wood recruitment.

Project Location(s) – Somerville Creek; tributary to Redwood Creek; tributary to South Fork Eel River; tributary to Eel River; near the community of Briceland; in Humboldt County.

Project Description – Construction of this project started August 2, 2021, and was completed October 31, 2021. The California Conservation Corps (CCC) made final log adjustments using grip hoists following initial excavator work, then anchored LW together and secured them to live trees along the streambanks. Eighty native trees were planted on December 7, 2021, by the Eel River Watershed Improvement Group and the CCC.

Photo Credit: K. Roberts, Fishery Biologist (Pacific States Marine Fisheries Commission)

Figure 1. Looking upstream at a riffle before LW placement.
Pre-treatment photo date: 6/2/2021

Photo Credit: D. Flavin, Fisheries Technician (PSMFC)

Figure 2. Looking upstream at LW that has slowed stream flow and scoured a pool on the left bank.
Post-Treatment photo date: 5/28/2024

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Project Monitoring

Pre-Treatment	Implementation	Post-Treatment
Date(s): 6/2-6/3/2021	Date(s): 10/27 & 10/29/2021	Date(s): 5/28-5/29/2024

Post-Treatment Project Rating and Summary

In May 2024, post-treatment effectiveness monitoring on 26 of the 28 LW features found all features remained in their original position, except one that had shifted slightly. Sixty-five percent of features with a stated objective to scour and increase maximum residual water depth were successful.

The same five pools were snorkeled at pre- and post-treatment. At post-treatment one pool had poor visibility due to sediment and reduced flow and was not included in the survey results. At pre-treatment total area surveyed was 1,452.5 ft², with an average unit area of 290.5 ft² and average maximum residual depth of 1.93 ft. Fifty-three juvenile trout and four juvenile Coho Salmon were observed. At post-treatment the total area surveyed was 939.15 ft², with an average unit area of 234.79ft² and average maximum residual depth of 1.18 ft. Eleven juvenile trout and five juvenile Coho Salmon were observed. Overall trout densities were [2],

Project Funding & Cost

- California Department of Fish and Wildlife Fisheries Restoration Grant Program $172,178.19
- California Conservation Corps ..... $$17,790.80
- Edwards Excavation & Restoration $35,000
- **Total Project Cost $219,099**

Report prepared by Kori Roberts and Nate Harris, Fishery Biologists for PSMFC, 2/15/25. For permission to use with proper citation, contact CDFW Monitoring and Evaluation of Salmonid Habitat Restoration (MESHR) -1- (707) 834-4358
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California Department of Fish and Wildlife
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Q1910506 Morrison Creek Tributary Barrier Removal Project

Project Objective(s) – One undersized culvert and a nearby abandoned overflow culvert were removed and replaced with a single 30-foot span prefabricated bridge with a natural channel bottom. The project aimed to improve upstream fish passage for adult and juvenile Coho Salmon and reduce sediment delivery to Rawson Creek.

Project Location(s) – Rawson Creek; tributary to Morrison Creek; tributary to the Smith River; near the town of Crescent City; in Del Norte County.

Project Description – Construction for the Morrison Creek Tributary Barrier Removal Project started on September 19, 2022, and was completed on October 5, 2022. One undersized culvert and one non-functioning overflow culvert were removed and replaced with a single 30-foot spanning prefabricated bridge with a natural channel bottom designed to withstand a 100-year discharge. Five channel spanning logs were placed downstream of the bridge as grade control structures to prevent future incision. In addition, seven rootwads were placed along the right bank of the stream to provide habitat and erosion control.

Photo Credit: N. Harris, Fishery Biologist Pacific States Marine Fisheries Commission

Figure 1. Upstream view of inlet to undersized culvert prior to project implementation.
Pre-treatment photo date: 5/20/2021

Photo Credit: K. Roberts, Fishery Biologist (PSMFC)

Figure 2. New 30' spanning bridge that opens fish passage above crossing.
Post-treatment photo date 4/16/2024

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Project Monitoring

Pre-Treatment	Implementation	Post-Treatment
Date(s): 5/20/2021	Date(s): 10/27/2022	Date(s): 4/16/2024

Post-Treatment Project Rating and Summary

Post-treatment monitoring was conducted after two very wet winters to document site changes following high flows. There were no fish passage issues remaining. Rootwads embedded in the right bank downstream of the bridge provided bank stability and added cover. Single logs were buried in the streambed materials for grade control and scoured pools below each log.

Five pools were snorkeled at pre-treatment and post-treatment monitoring. At pre-treatment only trout were observed below the existing culverts, and no fish were found above the crossing. At post-treatment, trout and Coho Salmon were observed below the new bridge and Coho Salmon were documented above the former barrier for the first time.

Project Funding & Cost

- California Department of Fish and Wildlife Fisheries Restoration Grant Program $157,949.00
- **Total Project Cost $157,949.00**

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Q2010506 Sproul Creek Salmonid Habitat Restoration Project

Project Objective(s) – The project objective was to improve the quality and quantity of habitat available to salmonids in Sproul Creek by installing 72 large wood (LW) structures. The LW features aimed to increase floodplain frequency, side channel inundation, velocity refugia, pool depths and shelter, and substrate aggradation.

Project Location(s) – Sproul Creek; tributary to South Fork Eel River; tributary to Eel River; near the town of Garberville; in Humboldt County.

Project Description – Instream work was completed between June 21 and September 16, 2021, and June 15 and October 31, 2022, and all heavy machinery work was finished July 13, 2022. The Eel River Watershed Improvement Group, California Conservation Corps, and Edwards Excavation and Restoration installed 72 LW features in 2.9 miles of Sproul Creek. A total of 418 LW pieces, including 130 key pieces (49 with rootwads) were used. After completion, conifer trees and other native plants were planted along the project reach in January 2023.

Photo Credit: Nathan Harris, Fishery Biologist (Pacific States Marine Fisheries Commission)

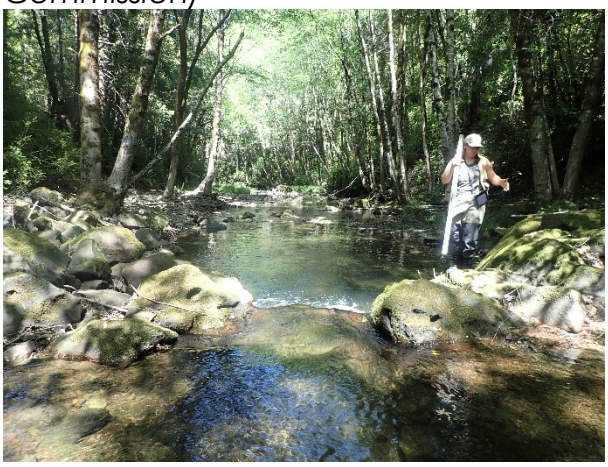

Figure 1. Boulder weir and plunge pool before LW feature was installed.
Pre-treatment photo date: 5/17/2021

Photo Credit: Dylan Flavin, Fisheries Technician (PSMFC)

Figure 2. LW features spanning pool just downstream of boulder weir.
Post-treatment photo date: 6/17/2024

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Project Monitoring

Pre-Treatment	Implementation	Post-Treatment
Date(s): 5/11-5/17/2021	Date(s): 2021 & 2022	Date(s): 4/30, 5/7-5/9, 6/17/2024

Post-Treatment Project Rating and Summary

Post-treatment monitoring was conducted on 4/30, 5/7 through 5/9, and finished on 6/17/24. Thirty-eight features had visible problems and only 35 remained in their original positions. The most common problems were shifting, materials failure, cable/rebar failure, anchoring failure, washout, and LW stranded out of water. In some cases, installed LW broke in half while anchoring held, and in others breakage occurred at the anchor point (either pulling out of anchoring live trees or breaking the bolt). Often LW had shifted downstream and out of the bankfull channel but was still present. Maintenance and repair are planned for 14 features in 2024, and new pre-treatment monitoring was conducted for those structures. Additional post-treatment monitoring for these features will be completed and reported on in 2027.

The same five pools were snorkeled for validation monitoring at both pre- and post-treatment monitoring. However, pool #2 from pre-treatment was broken up into three separate pools due to LW addition and only the largest and most upstream pool was snorkeled. Coho Salmon and steelhead/rainbow trout were observed in all pools.

Project Funding & Cost

- Department of Fish and Wildlife Fisheries Restoration Grant Program $500,415
- Geen Diamond Recourse Company $169,200
- California Conservation Corps $81,522
- **Total Project Cost $751,137**

Report prepared by Dylan Flavin, Fisheries Technician, Kori Roberts and Nate Harris, Fishery Biologists at PSMFC, 2/15/25.

California Department of Fish and Wildlife
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Q1940404 Potrero Creek Fish Project – Carmel Valley Athletic Club, Carmel Valley

Project Objective(s) – The objective of this project was to remove an existing set of perched corrugated metal culverts and concrete aprons, which were full barriers to fish passage on Potrero Creek, and replace them with a multi-plate arched culvert to provide steelhead fish passage, improve flood conveyance and allow landowner access across the creek.

Project Location(s) – Potrero Creek, tributary to the Carmel River; near the community of Carmel; in Monterey County.

Project Description – Project construction occurred between August 16 and October 15, 2021. The perched culverts, concrete apron, and stacked rock headwalls were demolished and removed. The multi-plate pipe arch culvert was installed, embedded below the channel grade, and backfilled with engineered streambed material (ESM). Concrete collars were installed around the culvert inlet and outlet and rock slope protection were installed along the banks surrounding and upstream of the inlet.

Photo Credit: K. Roberts, Fishery Biologist (Pacific States Marine Fisheries Commission)

Figure 1. Facing downstream at the pre-treatment conditions of the site, showing the culverts slated for removal, which acted as total fish passage barriers. Pre-treatment photo date: 8/3/2021

Photo Credit: T. Redman, Fishery Biologist (PSMFC)

Figure 2. Facing downstream of the embedded arch culvert and reconstructed channel that replaced the previous culverts. No man-made fish passage barriers remain at this site. Post-treatment photo date: 6/5/2024

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Project Monitoring

Pre-Treatment	Implementation	Post-Treatment
Date(s): 8/3/2021	Date(s): 10/21/2021	Date(s): 6/5/2024

Post-Treatment Project Rating and Summary

The multi-plate pipe arch culvert and channel reconstruction with ESM treatments at the upper crossing site on Potrero Creek were monitored for post-treatment effectiveness in June of 2024, approximately three years after implementation. The project successfully removed the barrier to steelhead trout passage at the crossing. Components of the pipe arch culvert and concrete collars appeared to be in good condition and were functioning as intended. The reconstructed channel retained gradient and substrate composition matching the surrounding channel as intended, even after significant flow events following implementation.

Pre-treatment snorkeling was not conducted, due to dry conditions at the time of monitoring. Four habitat units (one downstream and three upstream of the culvert) were snorkeled during post-treatment monitoring. A total of 25 trout were observed while snorkeling, all above the culvert. Trout density was calculated as 0.095 fish/ft^2.

Project Funding & Cost

- California Department of Fish and Wildlife Fisheries Restoration Grant Program $324,434
- California Coastal Conservancy $162,841
- **Total Project Cost $487,275**

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Q1910527 Indian Creek Sediment Reduction and Salmonid Habitat Enhancement Project

Project Objective(s) – The project objective was to prevent approximately 8,859 cubic yards of sediment from entering the Indian Creek stream network by decommissioning 1.63 miles of abandoned logging roads. A total of 18 features were treated, including 12 crossings, five road fill failures, and one streambank erosion failure.

Project Location(s) – Indian Creek; tributary to South Fork Eel River; tributary to Eel River; west of the town of Piercy; in Mendocino County.

Project Description – Road work was completed between July 16, 2021, and September 30, 2021. Pacific Watershed Associates oversaw McCullough Construction, Inc., a heavy equipment operating team, during decommissioning aimed at preventing erosion and potential failures of legacy logging roads and short segments of spur roads in the inner gorge of Indian Creek. A total of 18 erosion and sediment delivery features were treated over a length of 1.63 miles.

Photo Credit: Kori Roberts, Fishery Biologist (Pacific States Marine Fisheries Commission)

Figure 1. A stream crossing feature showing erosion and improper grade. Pre-treatment photo date: 07/14/2021.

Photo Credit: Dylan Flavin, Fisheries Technician (PSMFC)

Figure 2. A restored stream bed with a 2:1 bank ratio. Placed woody material is visible along with returning vegetation. Post-treatment photo date: 09/30/24.

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Project Monitoring

Pre-Treatment	Implementation	Post-Treatment
Date(s): 7/13-7/14/2024	Date(s): 2021	Date(s): 9/30-10/1/2024

Post-Treatment Project Rating and Summary

Most treated stream crossings showed little to no evidence of sediment delivery since treatment. However, there was deep head cutting above two treated stream crossings that had scoured over 20 cubic yards of sediment. Good amounts of woody material were placed throughout each crossing and moderate vegetation regrowth was visible. Six upland features were also treated, and less than three cubic yards of scour were observed at half the sites with none at the other half.

The road surface was successfully outsloped and decompacted with woody material placed throughout. There was minimal regrowth of vegetation but also less than an estimated one cubic yard of erosion following two rainy winters.

Project Funding & Cost

- Department of Fish and Wildlife Fisheries Restoration Grant Program $439,066.22
- Lost Coast Forestlands $52,253
- **Total Project Cost $491,319.22**

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