Fast Response to Fast-Forwarding Nature: Instream Large Wood Habitat Restoration

Coast Redwood Science Symposium
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East Branch Soquel Creek
Soquel Demonstration State Forest
Background

Soquel Creek
• Within the Central California Coast Coho Salmon Evolutionarily Significant Unit (CCC ESU)
• In the southernmost part of the range of Coho Salmon
• Identified as a focus watershed in the NOAA Fisheries 2012 Final Recovery Plan for the CCC ESU

Large Wood Habitat Enhancement
• Past wood removal occurred due to flooding
• Large wood frequency identified as poor
• Habitat complexity, including scour pool habitat, identified as poor
Sites 1 and 2c: Whole Tree Fall
Plate 1
GEOMORPHIC SKETCH MAP
SOQUEL DEMONSTRATION STATE FOREST
SITE 1 LARGE WOODY DEBRIS ENHANCEMENT PROJECT

Stephen D. Reynolds, CHG and Cheryl A. Hayhurst, PG
Sites 2a, 4a, and 5: Log Cluster

September 2013

Figure __: Typical Rootwad - Log Cluster

Not to Scale
Sites 2b and 4c:
Log Vane with Rootwad Cover

Figure 2: Typical - Log vane structure with root-wad for fish cover.

PLAN
Top of Bank
Bankfull Bank
Flow
Large Rock
2/3 Bankfull width

SECTION
Vane log and root wad buried in bank
Scour depth
Not to Scale

October 2013
Site 4b: Rootwad Anchor

October 2013

March 2015
Site 4
Site 1: Rootwad Monitoring
Site 1: Thalweg Surveys

Soquel Demonstration State Forest
Soquel Creek Large Wood Enhancement Project
Site 1 Thalweg Surveys

Annual Peak Flows Since Installation
(in cubic meters per second)
12/23/2012 - peak 35.7 (7-yr RI)
2/26/2014 - peak 1.8 (1.2-yr RI)
12/12/2014 - peak 6.3 (1.4-yr RI)
2/8/2015 - peak 9.8 (1.7-yr RI)

Explanation:
- Feb-11
- Nov-12
- Feb-13
- Dec-14
- Dec-15
- Jun-16

Elevation in meters (MSL)

Location:
- Survey Hub
- Initial upstream extent of Site 1a (approx.)
- Initial upstream extent of Site 1b (approx.)
- Upstream extent of Site 1c (approx.)
- Current upstream extent of Site 1b (approx.)

Location:
- Current upstream extent of Site 1a (approx.) after March 2016 storm event
- Upstream extent of Site 1c (approx.) after March 2016 storm event

Upstream

0  20  40  60  80  100  120
Distance in meters

Downstream

179.5
180.5
182.5
Soquel Demonstration State Forest
Soquel Creek Large Wood Enhancement Project
Site 2 Thalweg Surveys

- Site 2a Log Cluster (approx. location)
- Site 2b Intersection of Vane and RW bole (approx. location)
- Upstream extent of initial Site 2c wood placement (approx. location)

Annual Peak Flows Since Installation (in cubic meters per second)
- 2/28/2014 - peak 1.8 (1.2-yr RI)
- 12/12/2014 - peak 6.3 (1.4-yr RI)
- 2/8/2015 - peak 9.8 (1.7-yr RI)
- 3/5/2016 - peak 39.8 (10-yr RI)

*Note: During the March 2016 storm event, Site 2c moved approximately 113 meters (370 feet) downstream
Site 4c

March 2015

March 2016
Site 4c

March 2015

March 2016
Soquel Demonstration State Forest
Soquel Creek Large Wood Habitat Enhancement Program
Site 4 Thalweg Surveys

Site 4a Log Cluster (approx. location)
Site 4b Rootwad Fan (approx. initial location)
End of Vane Log (4c) (approx. location)

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3/5/2016 - peak 39.8 (10-yr RI)

Explanation:
- Feb-11
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Upstream
Distance in meters
Downstream
Site 5: Thalweg Surveys

Soquel Demonstration State Forest
Soquel Creek Large Wood Habitat Enhancement Project
Site 5 Thalweg Surveys

Approx. location of initial upstream extent of large wood placement

Approx. initial downstream extent of large wood placed in creek

Approx. location of current upstream extent of large wood placement after March 2016 storm event

Annual Peak Flows Since Installation (in cubic meters per second)
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2/8/2015 - peak 9.8 (1.7-yr RI)
3/5/2016 - peak 39.8 (10-yr RI)
Site 2b

October 2013

December 2014

Changes....
Questions?