



WATER INSTITUTE

OCCIDENTAL ARTS & ECOLOGY CENTER

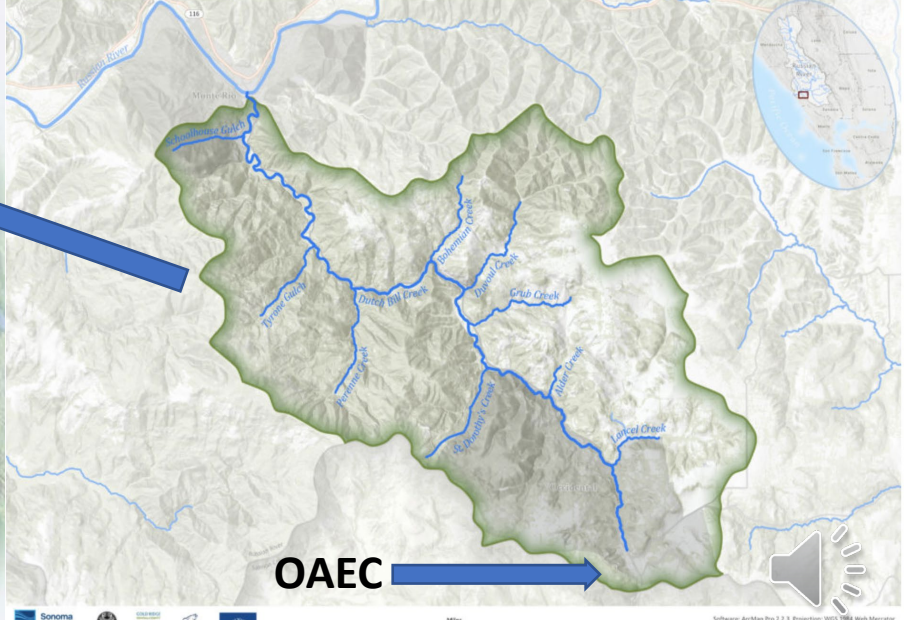




Breck Dehman

Spawning the Truth of Totem Salmon

Dutch Bill Creek Watershed
 Russian River Coho Water Resources Partnership

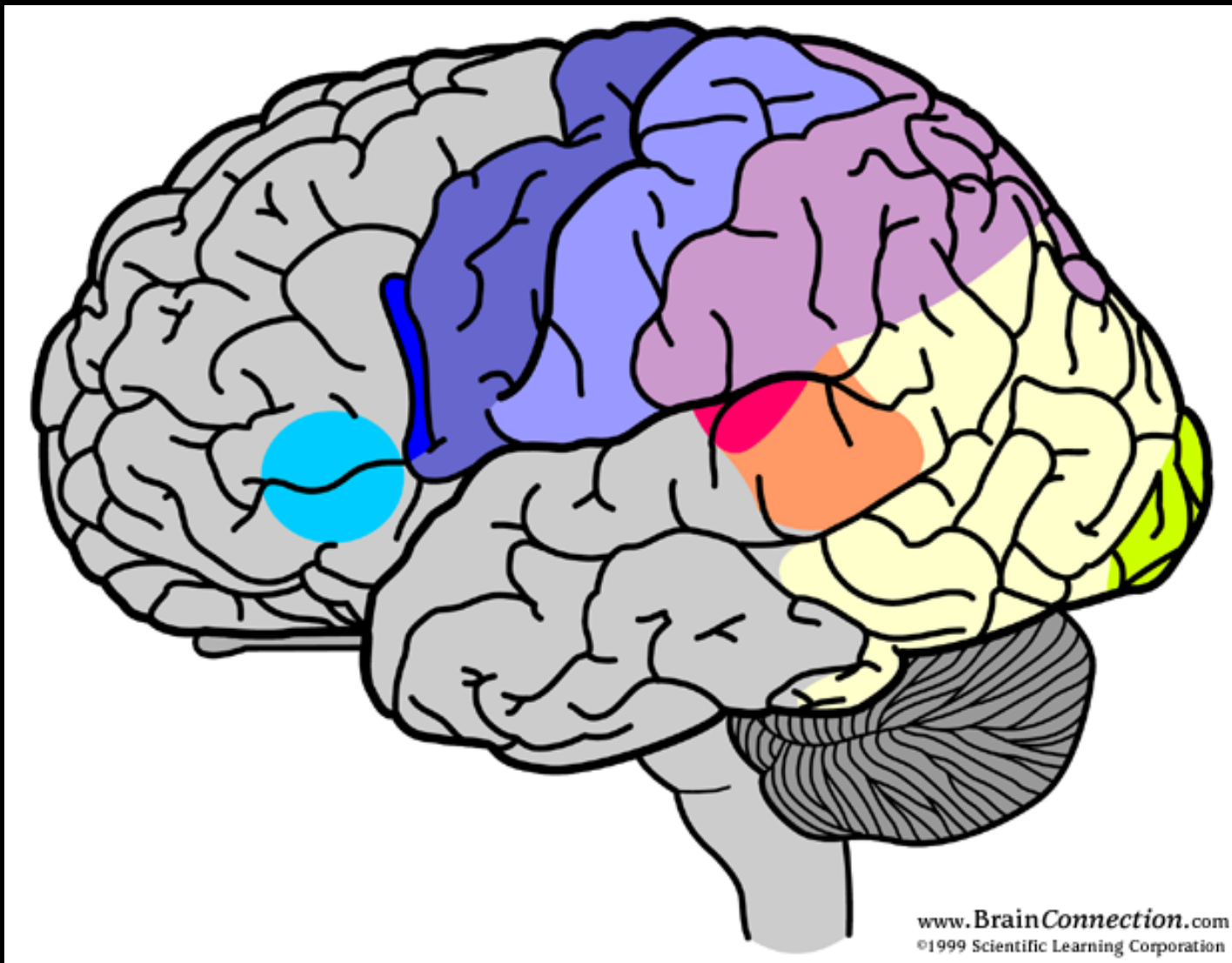


Software: ArcMap Pro 2.2.3 Projection: WGS 1984 Web Mercator
 Source: Streams, Roads, and Vegetation (Satellite Imagery), Multidimensional Hillshade (DEM)
 Map Prepared by: Andrew Brinkley, California Sea Grant, Santa Rosa, CA
<https://seagrart.ucd.edu/projects/coho-salmon-monitoring/>

**“The first thing we learned
from salmon was the
importance of the watershed
as a unit of perception”**

Freeman House in TOTEM SALMON





The critical Head-Waters in need of Ego-System Re-Storyation!



**Is your Settlement Pattern
based on regimes of:
Degenerative Disturbance?
Or
Regenerative Disturbance?**





← **Winter Dirty
&
Summer Dry**
↓

From Ridgeline to River to Reef!

**Watershed conditions
are a direct indictment
of all historic and current
land uses, & abuses.**

**Dirty & dry creeks
with nearly extinct salmonids
don't lie!**



BASINS OF RELATIONS

*A Citizen's Guide to
Protecting and Restoring Our Watersheds*



DO YOU KNOW WHERE YOUR
WATERSHED IS TONIGHT?



What watershed do you live in? What watershed supplies your water?
Are they the same? What do you use water for?
How safe do you believe your water supply to be?
Where do you get your drinking water?
How long have you been dependent on bottled water?
Would you like to restore your own local drinking water supply?

For more information and additional copies of this publication please contact:



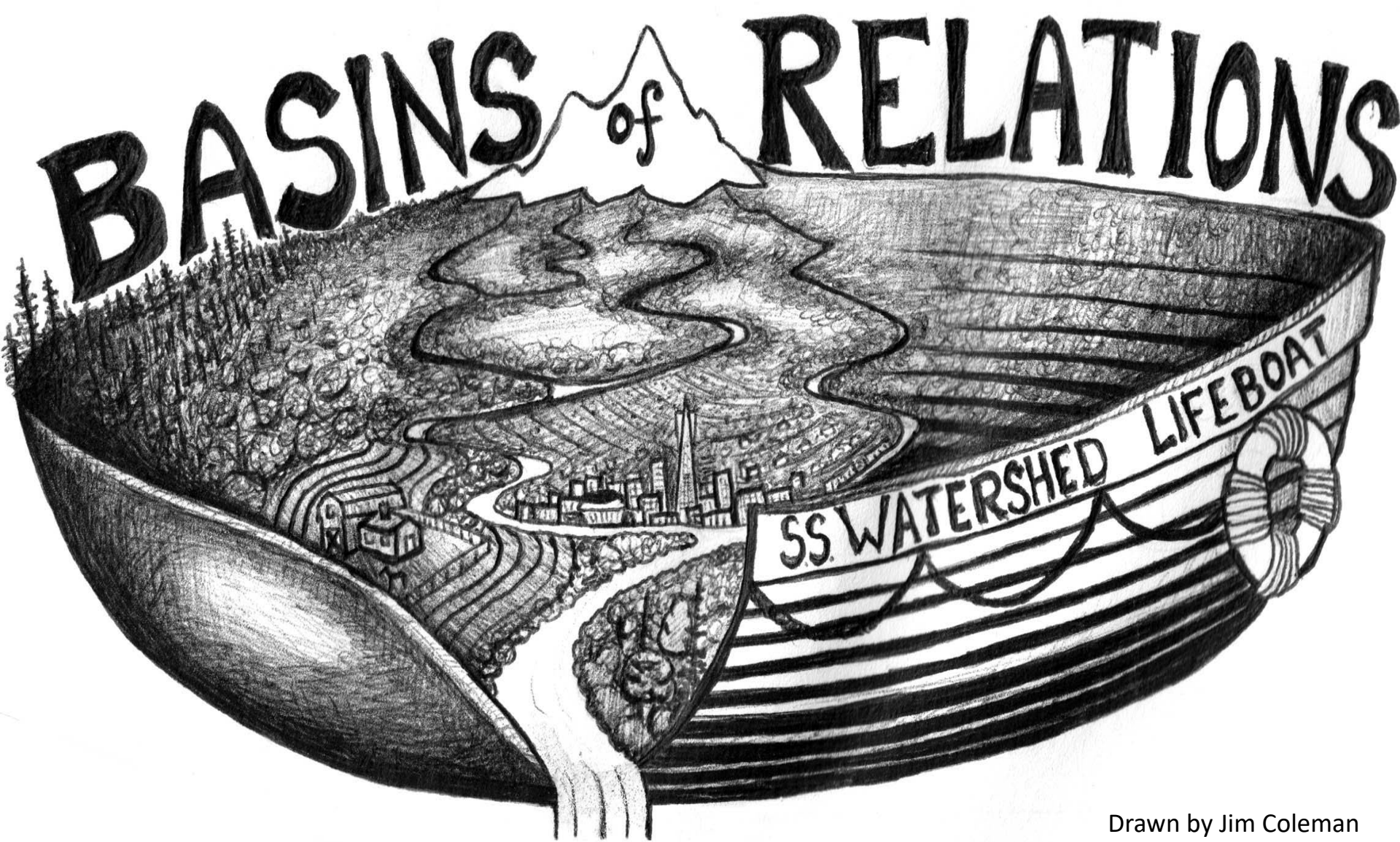
WATER INSTITUTE
WATERSHED · ADVOCACY · TRAINING
EDUCATION · RESEARCH



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OCCIDENTAL ARTS & ECOLOGY CENTER
15290 Coleman Valley Road, Occidental CA 95465
(707) 874-1557 ext. 206 • www.oaecwater.org





Drawn by Jim Coleman

“The major problems in the world are the result of the difference between how nature works and the way people think” Gregory Bateson

DO YOU WANT TO GET MORE INVOLVED IN YOUR WATERSHED?



**BASINS OF RELATIONS TRAINING PROGRAM
CREATING COMMUNITY WATERSHED COUNCILS**

HELD ANNUALLY FROM 2000 TO 2009

Ego-System Re-Storyation 



Austin Creek
11,500 sq. mi.

Mill Creek
12,230 sq. mi.

Hoafsburg

Mayacamas
14,600 sq. mi.

Franz Creek
17,800 sq. mi.

Brooks Creek
11,950 sq. mi.

Windsor Creek
12,000 sq. mi.

Mark West Creek
12,000 sq. mi.

File Creek
11,500 sq. mi.

Hubert Creek
5,000 sq. mi.

Porter Creek
7,500 sq. mi.

Rio Nido

Hobson Creek
2,500 sq. mi.

Guerneville

Pocket Canyon
5,000 sq. mi.

Forestville

Santa Rosa Creek
12,000 sq. mi.

Santa Rosa

Atascadero Green Valley
Watershed
135 sq. mi.

Graton Road
Graton

Shogholone
16,000 sq. mi.

Deater Creek

Ches Creek
1,800 sq. mi.

Monte Rio

Smith Creek
12,000 sq. mi.

Bolerman
Grave
2,000 sq. mi.

Dutch Bill
Watershed
12,500 sq. mi.

Camp
Meeker

Willow Creek
19,000 sq. mi.

Matanzas Creek
14,000 sq. mi.

Salmon Creek
Watershed
12,000 sq. mi.

Freestone

Laguna de Santa Rosa
Watershed
12,000 sq. mi.

Sebastopol

Blucher Creek
12,000 sq. mi.

Rohnert Park

Bodega Bay

Estero de Americano
Watershed
11,000 sq. mi.

Cotati



MAP BY DAVID BERMAN



Atascadero Green Valley
Watershed
135 sq. mi.



Coho spawners in DBC Dec., 2001 David Berman 



Coho juvenile in DBC 2002



RR Coho Broodstock Program 2006



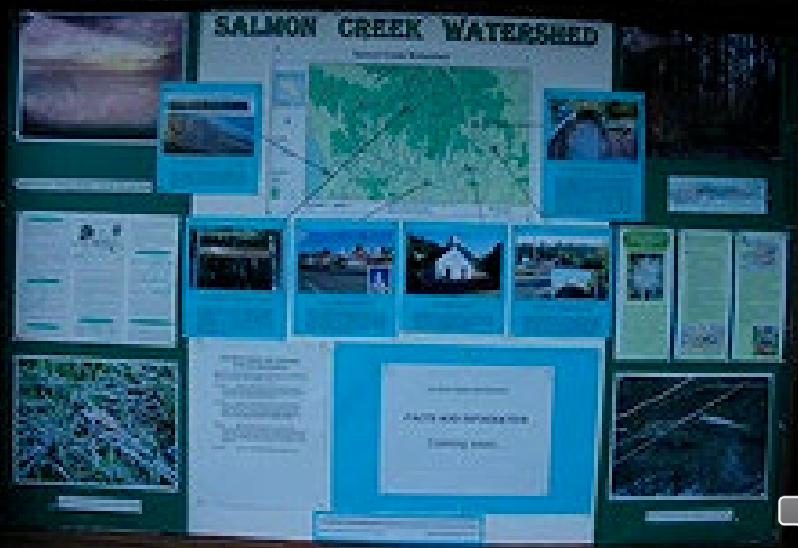


DUTCH BILL CREEK WATERSHED



2006

SALMON CREEK WATERSHED



Entering
Ebabias
Creek
Watershed

Entering
Atascadero
Green Valley
Watershed

Entering
Petaluma
River
Watershed

Entering
Salmon
Creek
Watershed

Entering
Dutch Bill
Creek
Watershed

CREEK SIGNS



Guide to Developing
a Local Watershed and
Creek Signage Program

March 2007





Doug Gore

Dragonfly Stream Restoration







Tyrone Gulch Passage Barrier Removal



Grub Creek Box Culvert





Market Street Culvert Passage 2005-2007



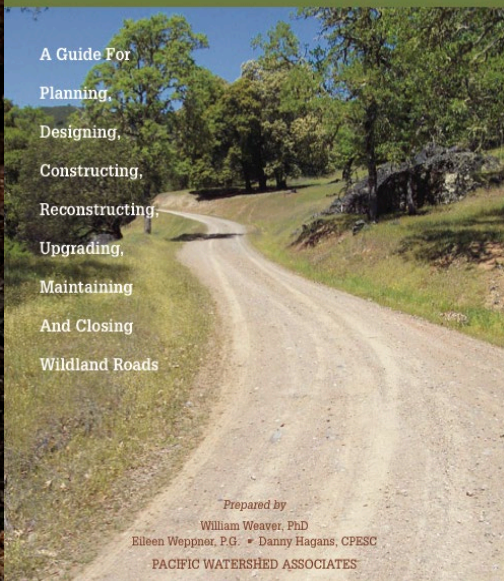






Handbook for Forest, Ranch & Rural ROADS

A Guide For
Planning,
Designing,
Constructing,
Reconstructing,
Upgrading,
Maintaining
And Closing
Wildland Roads



Prepared by
William Weaver, PhD
Eileen Weppner, P.G. • Danny Hagans, CPESC
PACIFIC WATERSHED ASSOCIATES



Danny Hagans & PWA “Nothing in Nature Mimics a Road”!



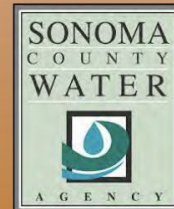
Dutch Bill Creek Streamflow Improvement Plan



Prepared by:

**The Russian River Coho
Water Resources Partnership**

With Support from:



March 2017



Article

Restoring Summer Base Flow under a Decentralized Water Management Regime: Constraints, Opportunities, and Outcomes in Mediterranean-Climate California

Matthew J. Deitch ^{1,*} and Brock Dolman ²

¹ Soil and Water Sciences Department, University of Florida, IFAS West Florida Research and Education Center, Milton, FL 32583, USA

² Occidental Arts and Ecology Center WATER Institute, Occidental, CA 95465, USA; brock@oaec.org

* Correspondence: mdeitch@ufl.edu; Tel.: +1-850-983-7131

Academic Editor: Matt Kondolf

Received: 1 November 2016; Accepted: 21 December 2016; Published: 6 January 2017





Figure 2. Image of the sediment basins and swales planted with California natives as of July 2012



Thinking like a Water-Shed and a Fire-Shed!

Roughly 10% of the surface area of most watersheds is represented by stream channels. The remainder are "uplands". **Emergent properties reality:** The **whole** of watershed is greater than **sum** of the stream channel **parts**.

Strahler Stream Order:

Classification system describing position within the drainage network

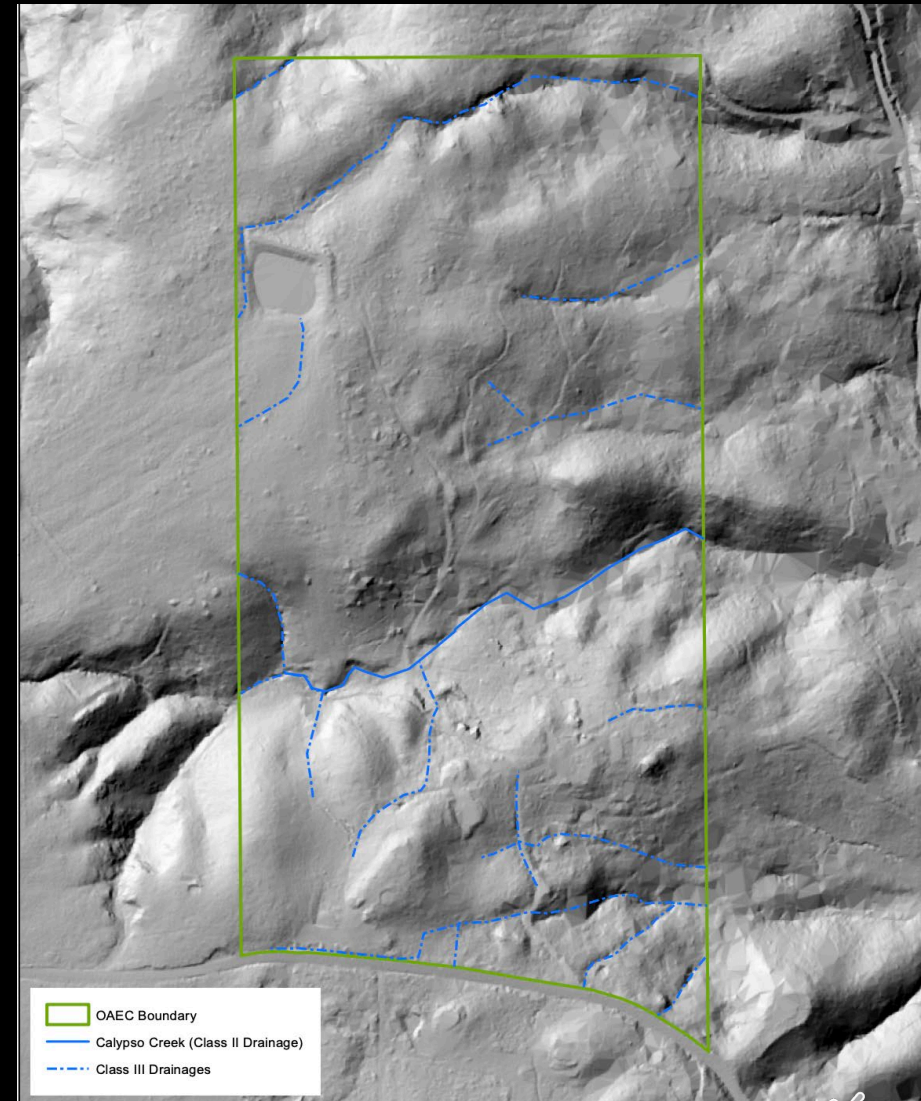
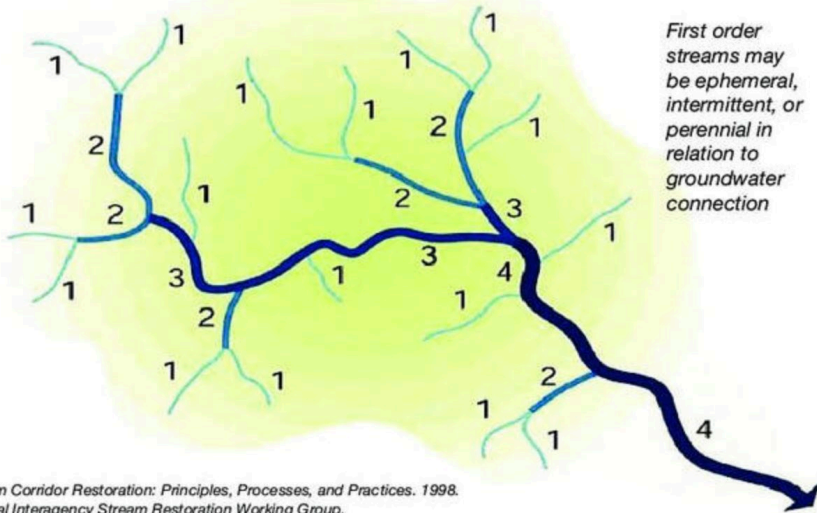


Figure 3. Subwatershed Map

0 125 250 500 feet

Sources
Hillshade: Sonoma County 2013 LiDAR

*It's time to take our fire fears
& connect those
with our water woes
by turning fuels into flows!*



Over-stocked young Douglas Fir encroaching hardwoods due to legacy logging & modern fire suppression

Bracken pocket near bottom of Sunrise, 2004



Back North end, 2003





Fewer Trees – More Forest



Slash Ain't Trash It's Beneficial Biomass!



Eroded gully to be filled with freshly cut invasive Scotch Broom (*Cytisus scoparius*)



Students filling gully

Beneficial Biomass hand placed in eroding gullies to mitigate headcut migration, arrest channel incision & reduce sediment delivery to Coho & Steelhead bearing Dutch Bill Creek downstream while reducing fuel loads & sequestering carbon as compost to enhance forest resilience by amplifying upland water holding capacity.





North Coast Regional Water Quality Control Board

September 13, 2021

Brock Dolman
Occidental Arts & Ecology Center
15290 Coleman Valley Road
Occidental, CA 95465
brock@oaec.org

Dear Brock Dolman:

Subject: Notice of Applicability (NOA) for Coverage under the Conditional Waiver of Waste Discharge Requirements for Specific Categories of Low Threat Discharge in the North Coast Region R1-2017-0039

File: Occidental Arts & Ecology Center Restoration Project,
WDID No. 1B21166WNSO, ECM PIN CW-875439

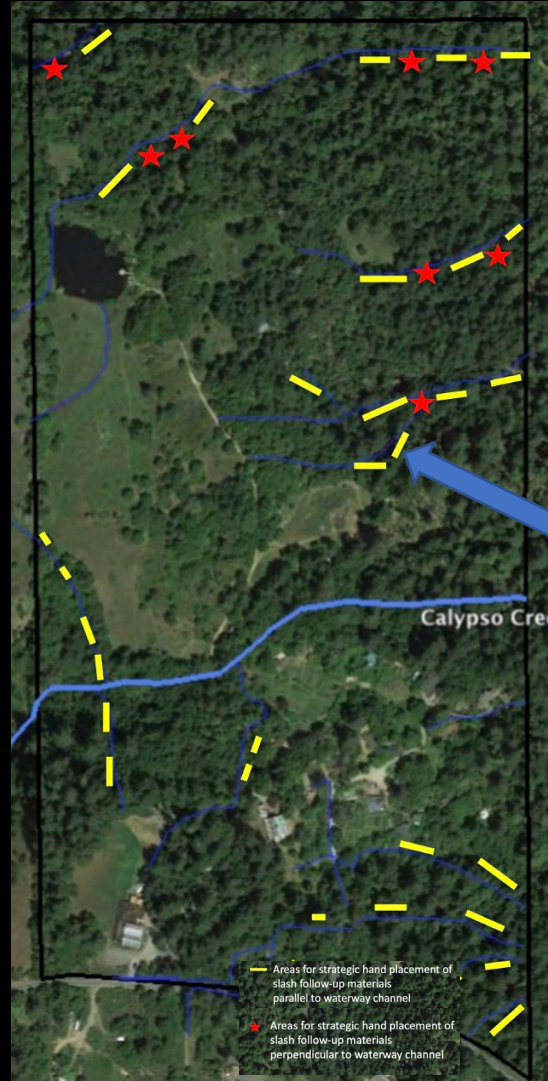
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
BAY DELTA REGION
2825 CORDELIA ROAD, SUITE 100
FAIRFIELD, CA 94534



STREAMBED ALTERATION AGREEMENT
EPIMS-SON-22045-R3
UNNAMED TRIBUTARIES TO DUTCH BILL CREEK

OCCIDENTAL ARTS & ECOLOGY CENTER
UPLAND WATERCOURSE RESTORATION AND ENHANCEMENT

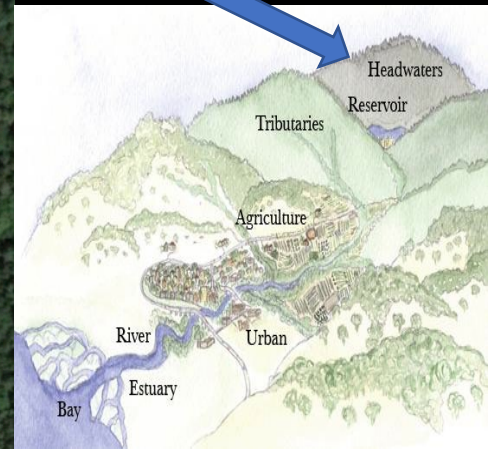
This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (CDFW) and Occidental Arts & Ecology Center (Permittee) as represented by Brock Dolman.



Order 1 streams are headwater streams where no other streams flows into it.

Forest Practices Act Class 3 upland ephemeral waterways that do not support aquatic life

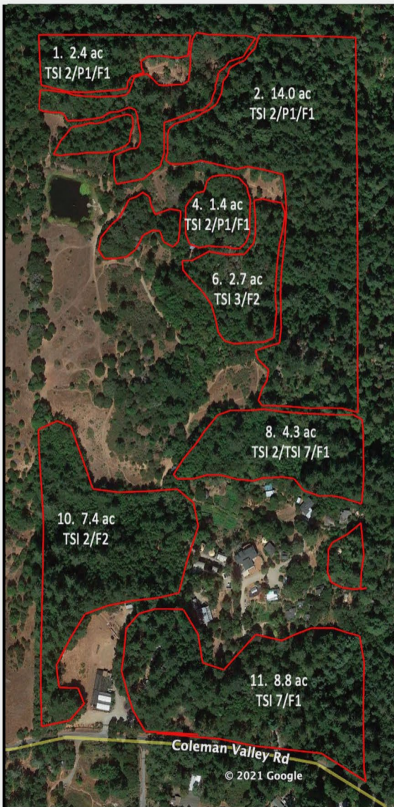
Headwaters drainages at OAEC selected for Fuels to Flows Treatments





Welcome to the North Bay Forest Improvement Program

North Bay Forest Improvement Program
Landowner Implementation & Incentive Payment Agreement



Unit 1: TSI#2, Pruning #1, Followup #1	\$4,896
Unit 2: TSI#2, Pruning #1, Followup #1	\$28,560
Unit 4: TSI#2, Pruning #1, Followup #1	\$2,856
Unit 6: TSI#3, Followup #2	\$6,156
Unit 8: TSI#2, TSI #7 Followup #1	\$7,056
Unit 10: TSI#2, Followup #2	\$15,540
Unit 11: TSI#7, Followup #1	\$11,616
Out Units 3, 5, & 7	

NBFIP Total = \$76,680



INITIAL TREATMENTS (TIMBER STAND IMPROVEMENT)

Scenario	Rx Description
TSI 2	Timber Stand Improvement: Large Stem (4-8" DBH) Treatment
TSI 3	Historic Oak Woodland Enhancement/Restoration
TSI 7	Light Understory Removal & Ladder Fuel Reduction

FOLLOW-UP SLASH TREATMENTS

Scenario	Rx Description
Follow-up Slash #1	Pile and Burn - Light
Follow-up Slash #2	Pile and Burn - Heavy

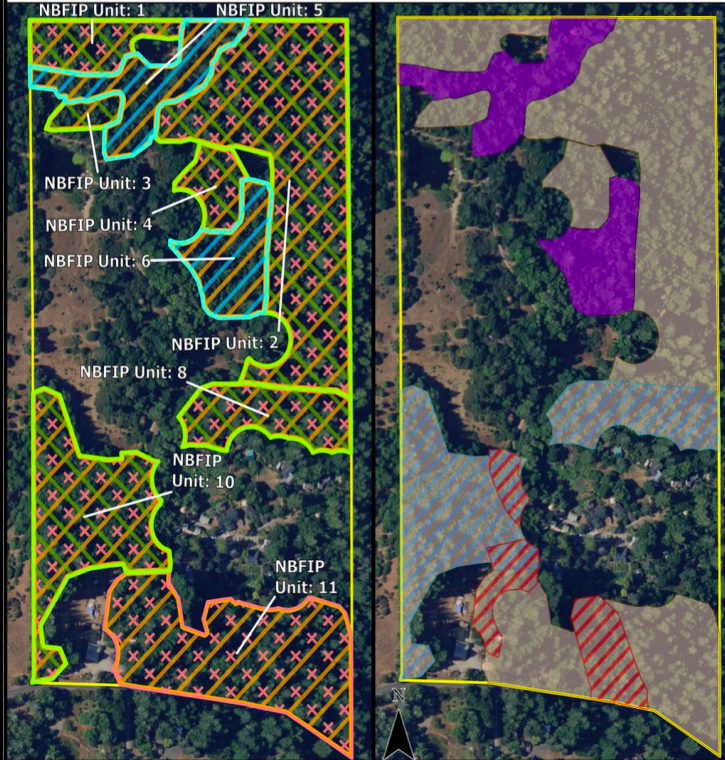
Scenario	Rx Description
Pruning #1	Pruning: 50 – 100 TPA



Conservation Plan Map

Planner: Drew Loganbill
Assistant: Sam Ericksen
Client: Occidental Arts and Ecology Center
Farm/Tract Number: F3714/T13759

Date: 8/3/2021



Scenario	Rx Description
Property Boundary	
Practices	
384 - Woody Residue Treatment #5	42.9ac
660 - Tree/Shrub Pruning #2	35.0ac
666 - Forest Stand Improvement #2	25.7ac
666 - Forest Stand Improvement #10	6.0ac
Enhancements	
E666E - Reduce Forest Height	8.9ac
E666G - Reduce Density Along Roads	3.9ac
E666J - Facilitate Oak Regen	6.0ac
E666O - Create Snags	36.9ac

Cartographer: Samuel.Ericksen@USDA.gov







We can't build a water, fire & life resilient future without worker justice

OCCIDENTAL ARTS & ECOLOGY CENTER





Disconnecting
Ground Fuel from Crown Fuel
by Limbing & Thinning
and Lopping & Scattering

Created Snag

Fire Ladders Limbed

Cavity Nesting Birds

Douglas Fir Thinned

Lop & Scatter of Limbs



A photograph of a forest with many trees and a blue semi-transparent text box in the center. The text is white and reads: "While there are Limits To Growth We can Limb It For Growth!".

**While there are
Limits To Growth
We can
Limb It For Growth!**



Marin Conservation Corps at OAEC in 2001



Live
Oaks

Douglas Fir fuel loads



Fuels to Flows 2001

Live Oaks

Channel Spanning bio-dam

Deeply incised gully



Fuels to Flows 2023

Live Oaks

Channel Spanning bio-dam

Fuel Load Slash in Gully Stuffed with Biomass



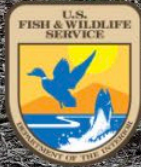
Fuels to Flows Ego-System Agency Permitting & \$\$ Intersectionality



Forest health
Defensible space



Coho & Steelhead
Recovery & LSAA's



Partners with Wildlife



Coho & Steelhead
Recovery



Conservation practices



GHG reductions via
carbon sequestration



Water quality benefits from
erosion control & sediment reduction
Peak flow attenuation. Recharge.
Upland water holding.





Upland Process-based Fuels to Flows
Slow it Spread it Sink it Store it Share it Structures
Leak it Later & Longer so it is: Clear Cold & Copious for Coho!



Leak Later Longer

Headcut Gully Stuffing

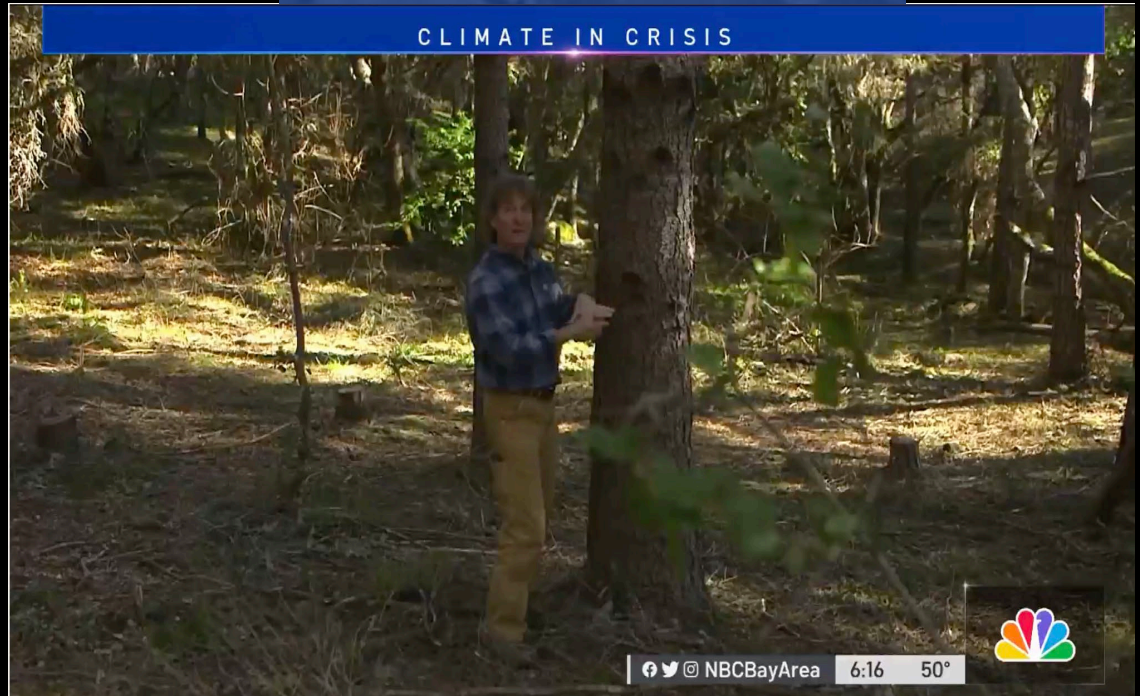
Rough-skinned Newt Breeding
Pool Retained



*It's time to take our fire fears
& connect those with our water woes
by turning our fuels into flows!*

NBC  BAY AREA

CLIMATE IN CRISIS



<https://oaec.org/nbc-news-intersection-of-fire-water-at-oaec/>



Leaf Litter Life!



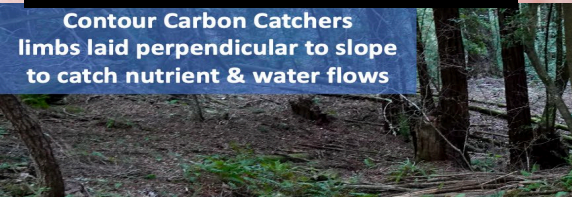
Ensatina *Ensatina eschscholtzii orgeonensis*



Arboreal Salamander *Aneides lugubris*



Black Salamander *Aneides flavipunctatus*



Contour Carbon Catchers
limbs laid perpendicular to slope
to catch nutrient & water flows



Perpendicular Plethodontid Palaces

“The authors calculate that woodland salamanders at the density in their study would send 179 pounds of carbon per acre of forest down into the soil, rather than up into the atmosphere.”

Woodland salamanders as metrics of forest ecosystem recovery:
a case study from California's redwoods
Hartwell H. Welsh, Garth R. Hodgson 2013



California Slender Salamander *Batrachoseps attenuatus*



OAEC's accounting for 10 acres of Beneficial Biomass carbon sequestered into healthy soils & clean water rather than emitted as an atmospheric GHG

Total Length of Parallels + Perpendiculars (ft)	Total Volume of Biomass Reutilized (ft cubed)		Aprox. Carbon Sequestered (lbs)*	Aprox. Carbon Sequestered (tons)
1859	10109		151635	75.82

Futurism One Space Trip Emits a Lifetime's Worth of Carbon Footprint

Yer welcome, Jeff!



"Perhaps the most conspicuous illustration of extreme pollution associated with wealth inequality in recent years is the development of space travel," the report states. "An 11-minute flight emits no fewer than 75 tonnes of carbon per passenger... About one billion individuals emit less than one tonne per person per year. Over their lifetime, this group of one billion individuals does not emit more than 75 tonnes of carbon per person."



