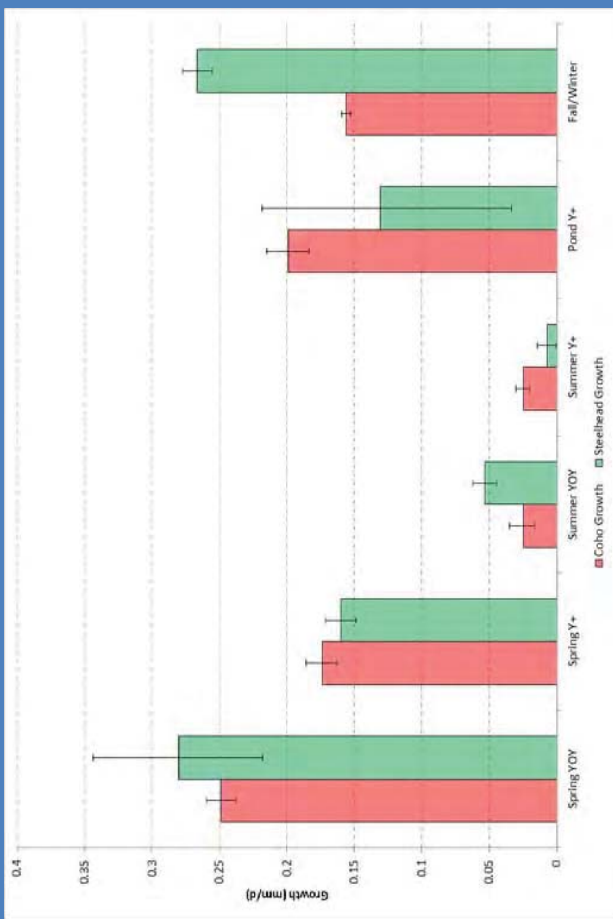
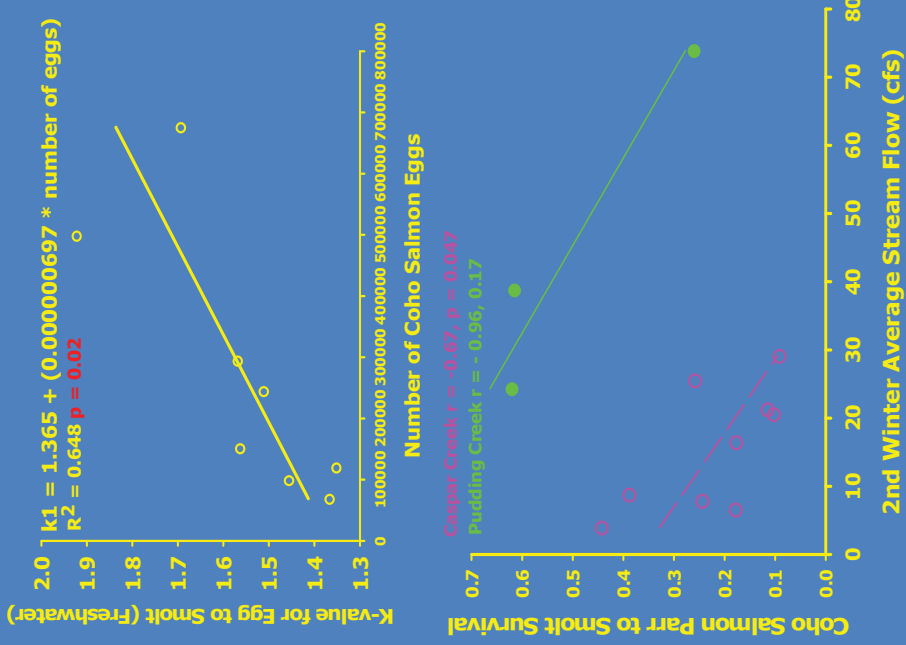


Gallagher, S. P., S. Thompson, and D. W. Wright. 2012. Identifying factors limiting Coho salmon to inform stream restoration in coastal Northern California. California Fish and Game. 98(4): 185-201.

2000 to 2010

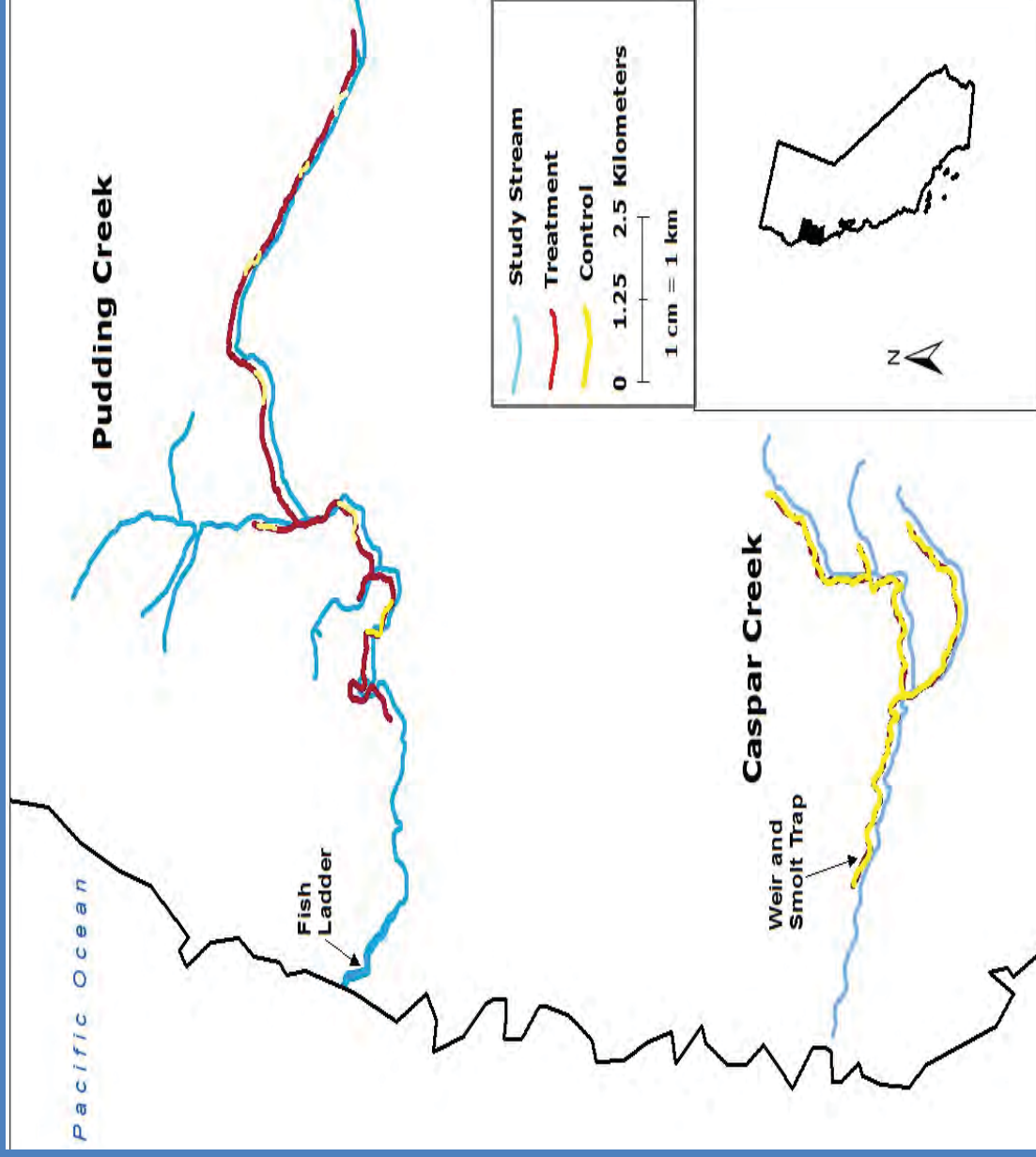
- Density Dependence
- Winter Habitat is Limiting
- Summer is Low Growth Period



Wright, D.W., S.P. Gallagher, and C.J. Hannon. 2012. Measurement of key life history metrics of coho salmon in Pudding Creek, California. Proceedings of coast redwood forests in a changing California Gen. Tech. Rep. PSW-GTR-238. Albany, CA. Forest Service, U.S. Department of Agriculture.

Will Addition of LWD Increase Habitat and Salmonid Abundance?

Before, After, Control, Impact Experiment



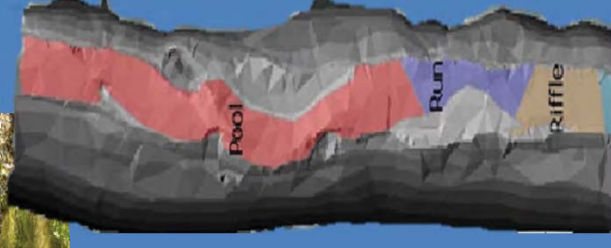
CHaMP

Columbia Habitat Monitoring Program Protocol

Topographic Data



Auxiliary Habitat Data



“The goal of CHaMP is to generate and implement a standard set of fish habitat monitoring (status and trend) methods in up to 26 watersheds across the Columbia River Basin.”

HOLLOWAY, W., A. MCCLARY, AND S. P. GALLAGHER. 2014. Summer habitat data collection protocol version 3.0. California Department of Fish and Wildlife, Fort Bragg, USA.

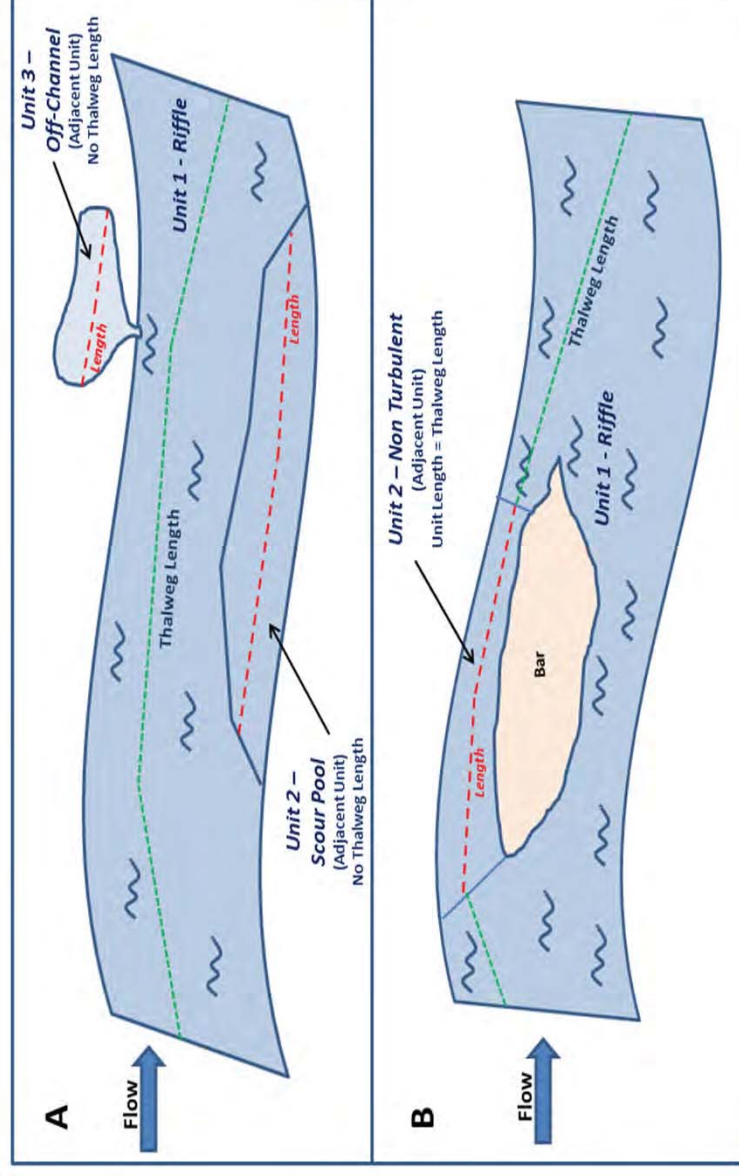
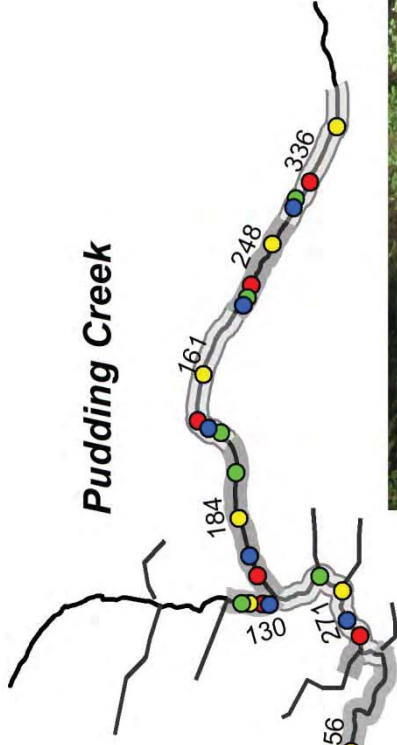


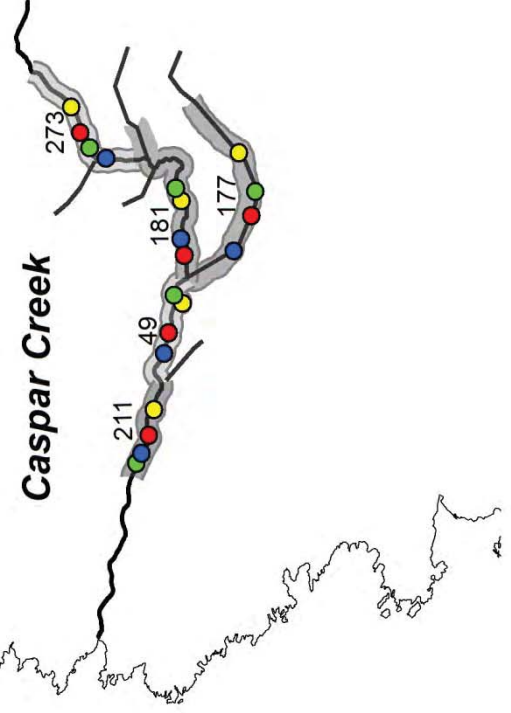
Figure 17. An example of channel unit delineations.

PACIFIC OCEAN

Pudding Creek



Caspar Creek

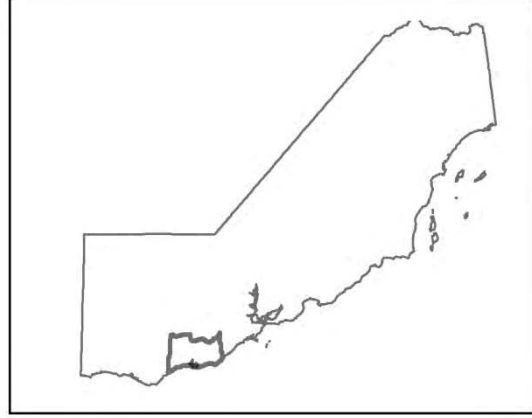
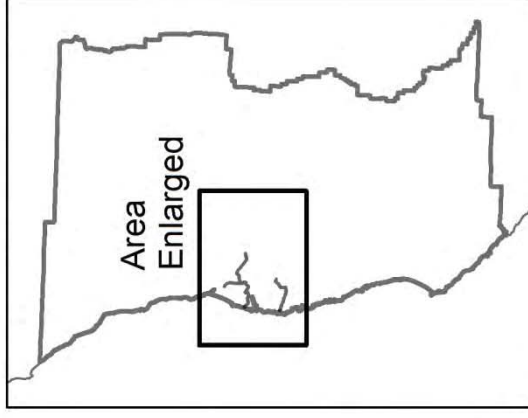


Habitat Unit Types

- Pool
- Riffle
- Non-Turbulent
- Off-Channel



Mendocino County



Gallagher, S.P., J. Ferreira, E. Lang, W. Holloway, and D.W. 2014. Wright. Investigation of the relationship between physical habitat and salmonid abundance in two coastal northern California streams. California Fish and Game. 100 (4):683-782.

Salmonid Unit Abundance:

Coho Parr, Steelhead YoY, Y+, Y++

Habitat Unit Type	Percent Fish Cover	Substrate Composition	Measured Unit Variables	Calculated Unit Variables
Cascade*	Aquatic Vegetation	Bedrock	Average Depth	Residual Pool Depth ¹
Dam Pool*	Artificial Structures*	Boulders	Bankfull Width	Residual Pool Volume ¹
Dry Units*	Dead Woody Debris	Cobbles	Length	Unit Surface Area
Falls*	Live Overhanging Vegetation	Course Gravel	Maximum Depth ¹	Unit Volume
Non-Turbulent	No Cover	Fine Gravel	Pool Tail Crest Depth ¹	Dry LWD Abundance
Off Channel	Undercut Banks	Fines	Width	Wet LWD Abundance
Plunge Pool		Sand		Dry LWD Density
Rapid*		Pool Tail Fines < 2mm ¹		Wet LWD Density
Riffle		Pool Tail Fines 2-6mm ¹		
Scour Pool				

*Few or none encountered

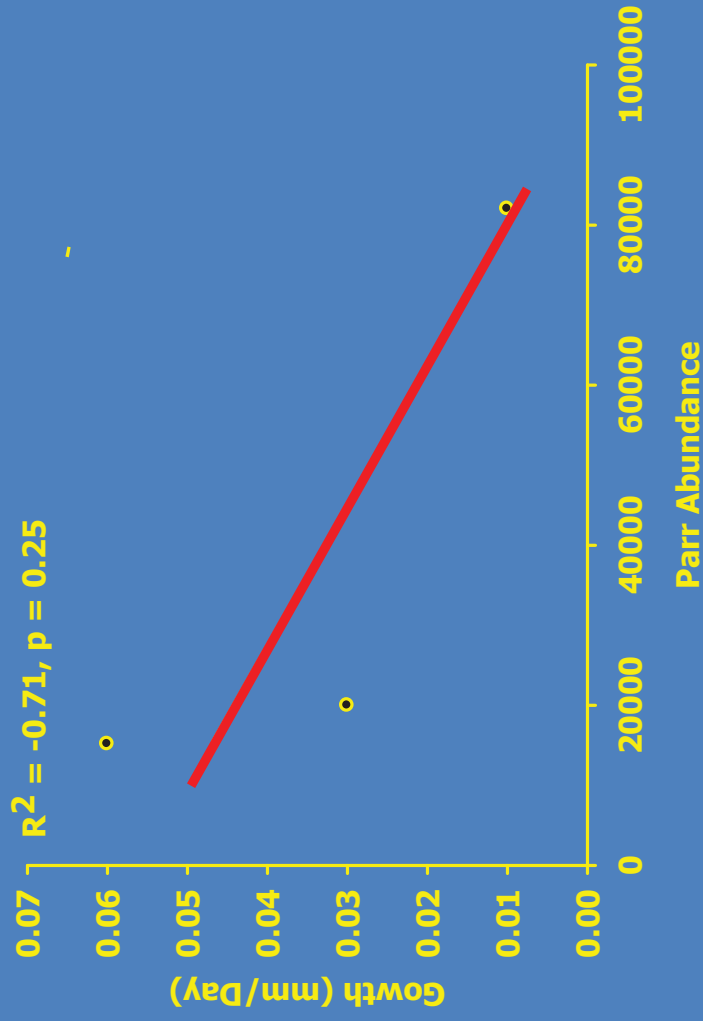
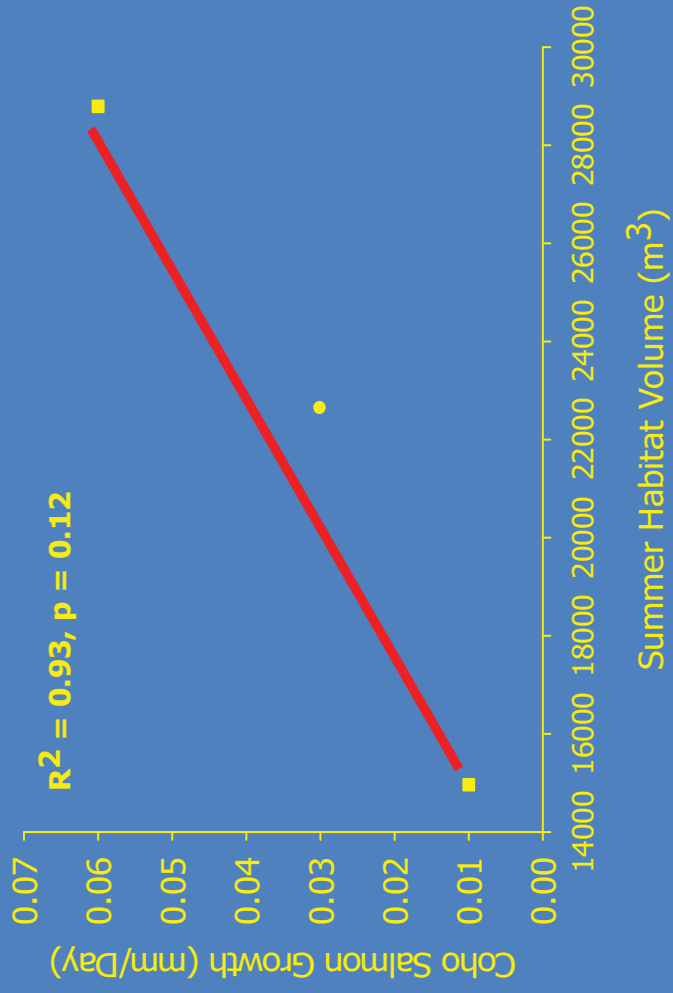
¹ Pools only

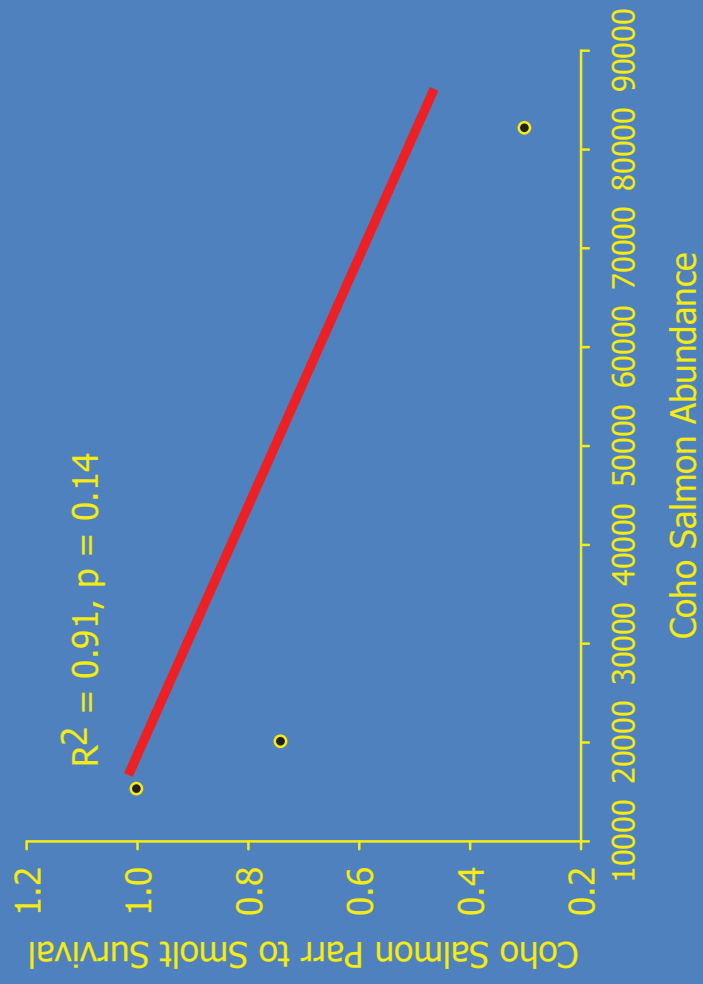
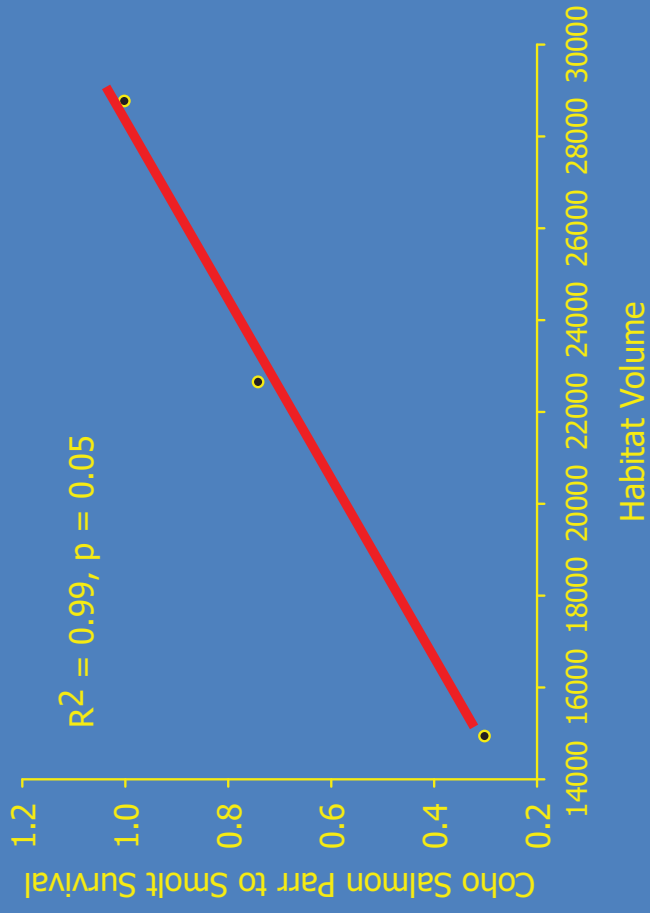
Coho Salmon Abundance and Habitat Variables

Variable	Factor Names				
	Volume and Dry Large Wood	Wood	Overhead Vegetation	Turbulent Water Stream And Dry Large Wood	Slow Water Volume
Bedrock					
Boulders				0.59	
Cobbles				0.89	
Coarse Gravels					-0.38
Fine Gravels					-0.74
Sand					-0.46
Fines					0.96
Large Wood Wet		0.75			0.64
Large Wood Dry	0.31	0.47		0.34	
Overhead Vegetation Cover			0.76		
Overhead Wood Cover		0.72			
Aquatic Vegetation Cover					
Undercut Banks		-0.43	-0.86		0.98
No Cover					
Unit Type					
Unit Volume	0.79				0.32
Stream				0.33	

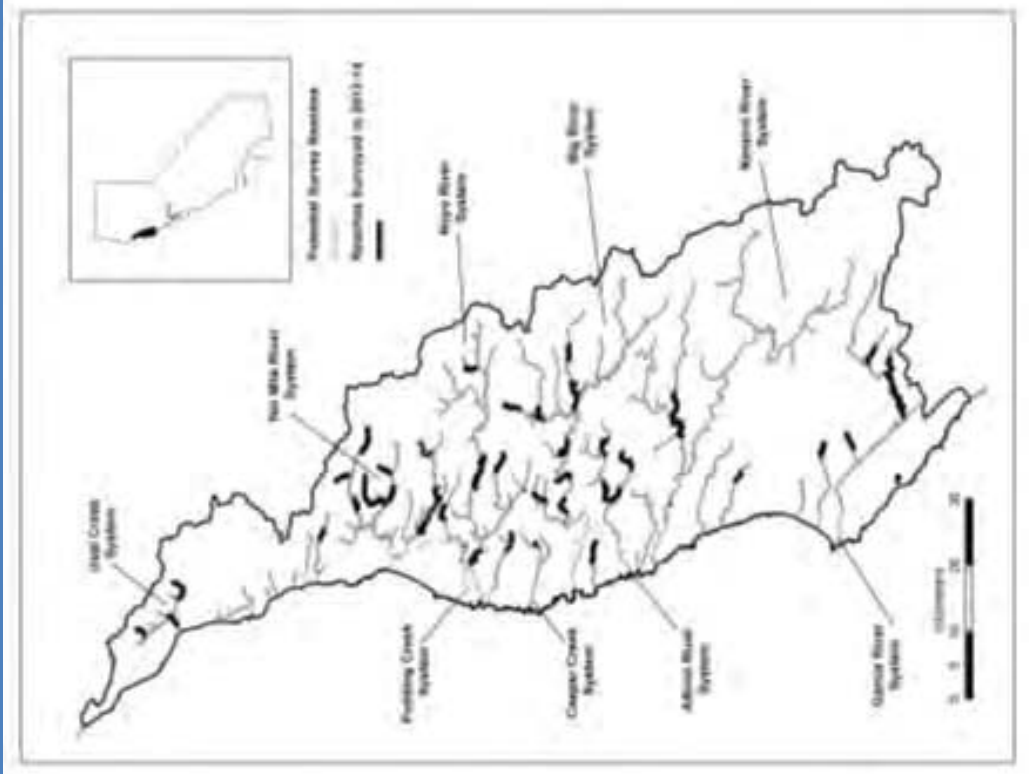
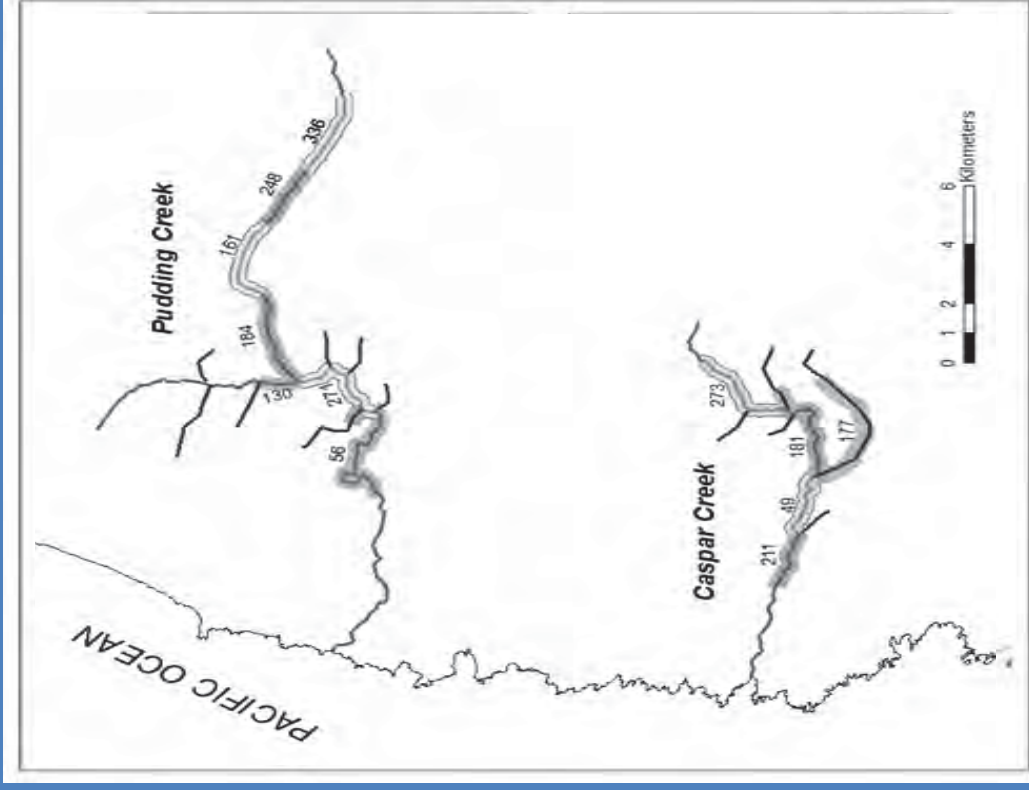




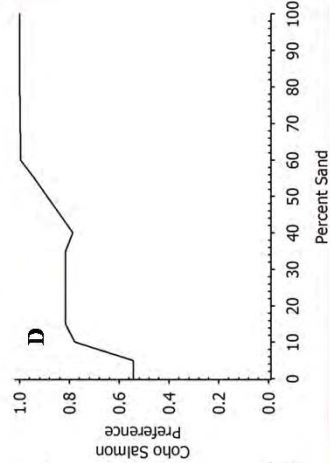
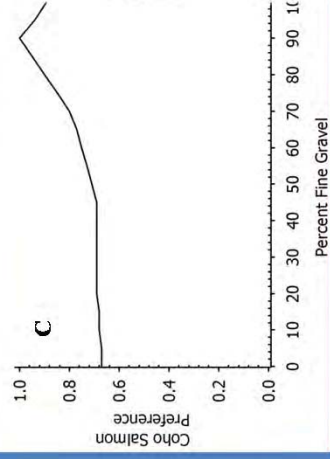
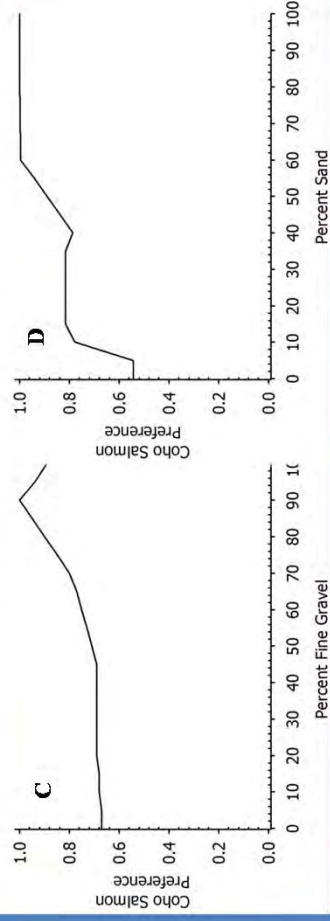
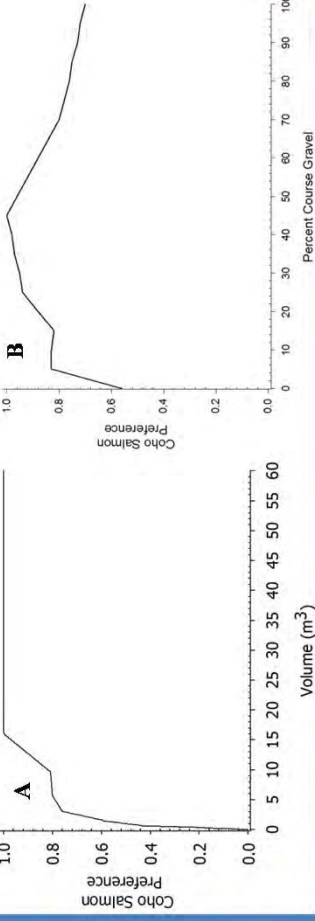




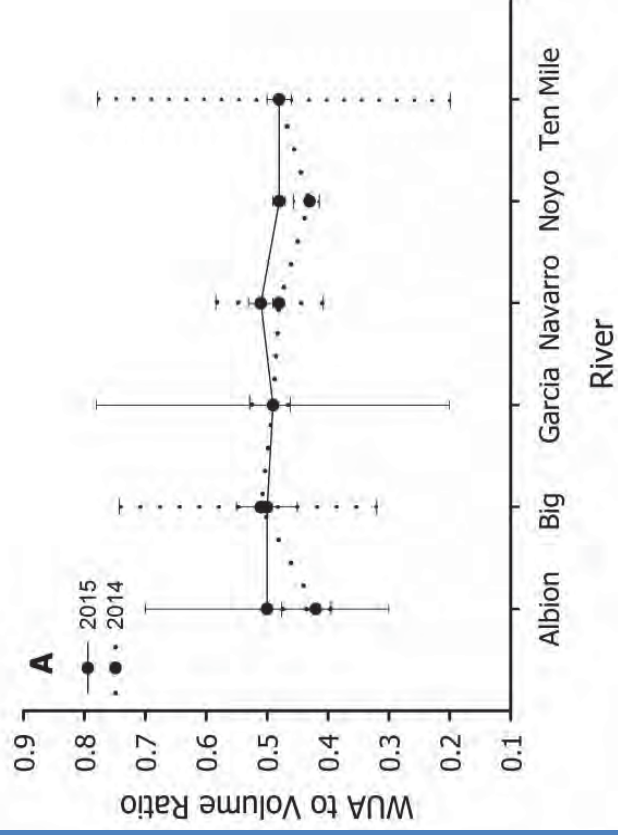
Applying mesoscale habitat suitability criteria and spatial balanced random sampling to quantify preferred salmonid habitat in coastal streams: implications for recovery monitoring and management. In Prep.



Estimated weighted usable volume



River	Coho Salmon			
	2014		2015	
	Estimate	Precision	Estimate	Precision
Albion	10,524	0.76	55,107	0.77
Big	256,804	0.69	103,869	0.62
Garcia	106,145	0.67	77,050	1.70
Navarro	68,038	1.31	264,717	0.79
Noyo	126,646	0.97	309,462	0.59
Ten	64,750	0.80	136,360	0.84



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Matt Colmen

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Lyme Redwood Forest Company