

Coastal Cutthroat Trout in California: Population Monitoring, Status, and Management

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ANADROMOUS FISHERIES RESOURCE AND MONITORING PROGRAM

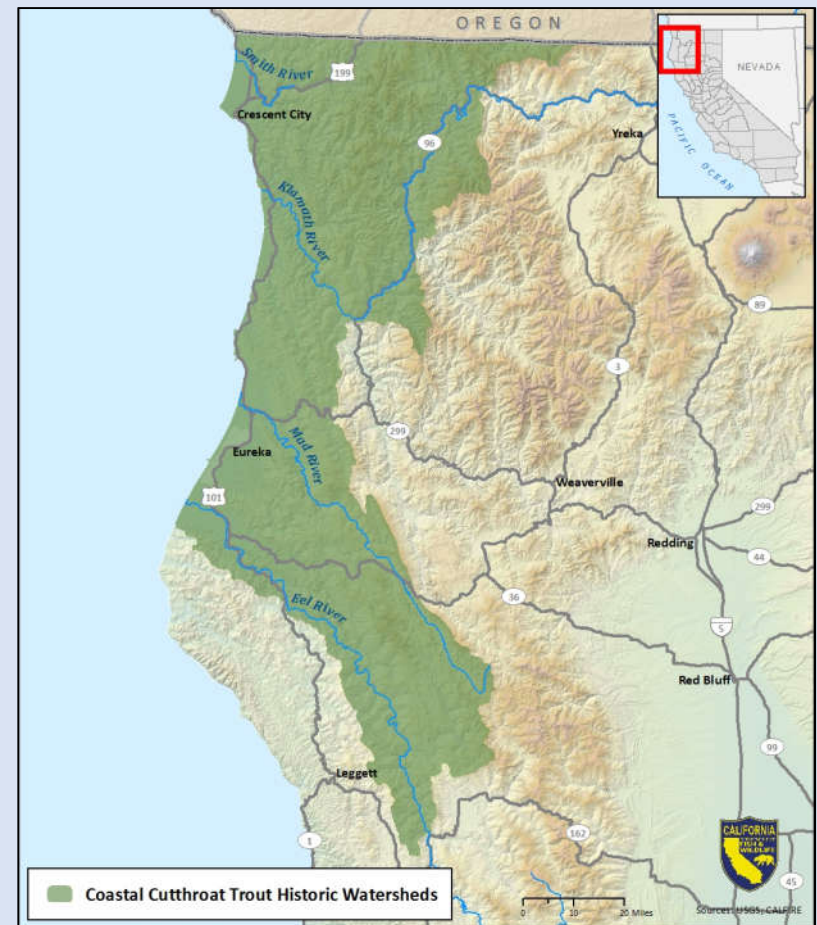
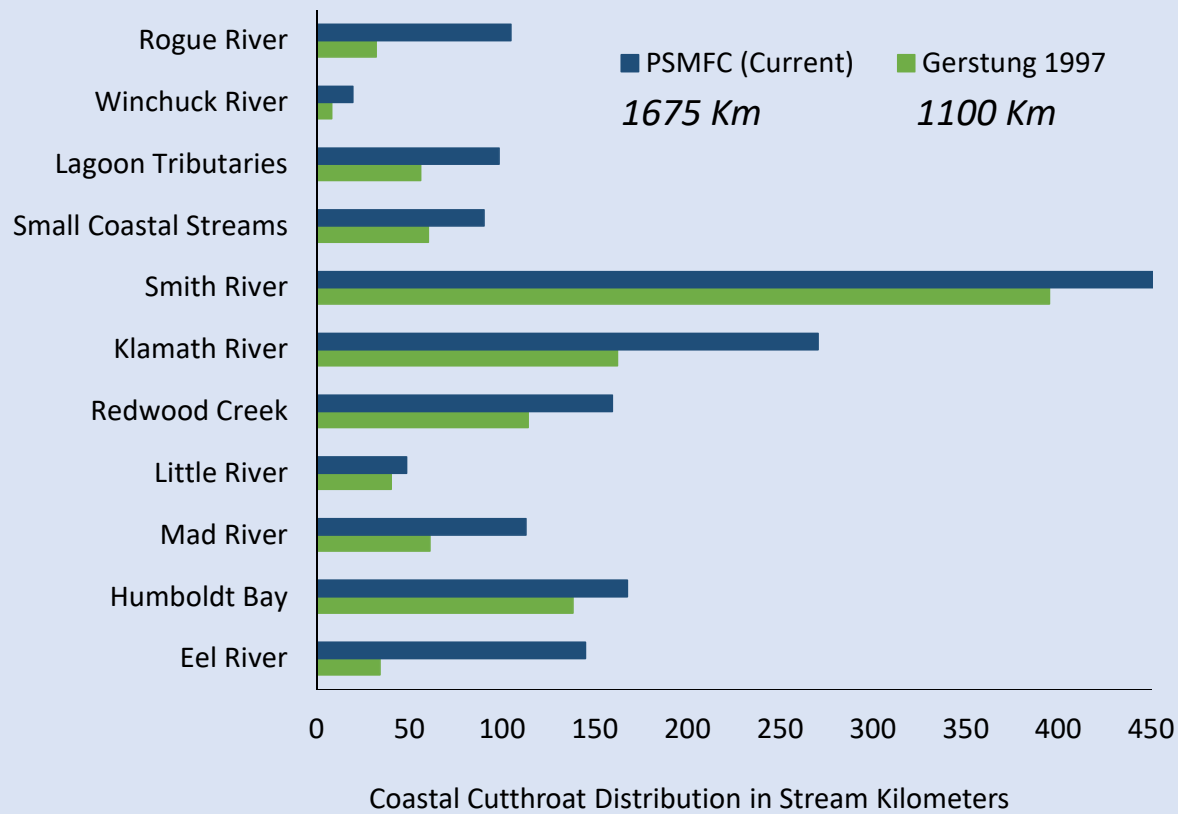
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

ARCATA, CALIFORNIA

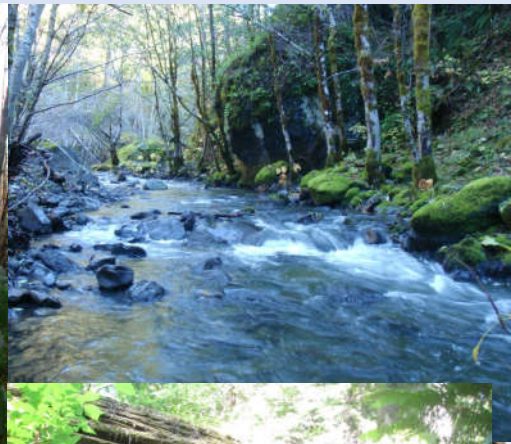
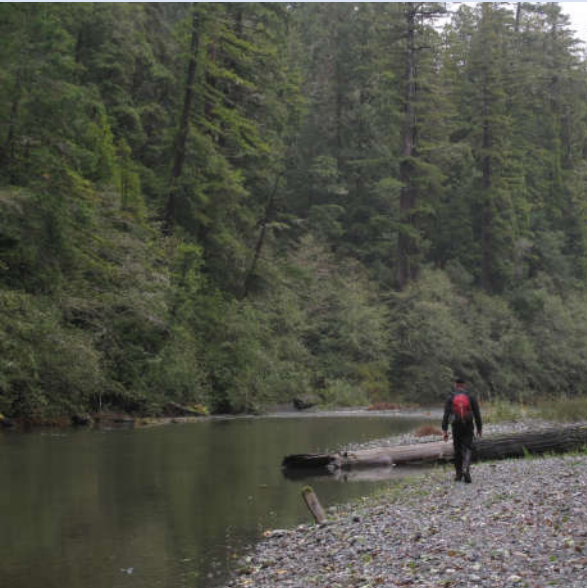


Photo: Thomas Dunklin

Coastal Cutthroat Trout Distribution: Streams

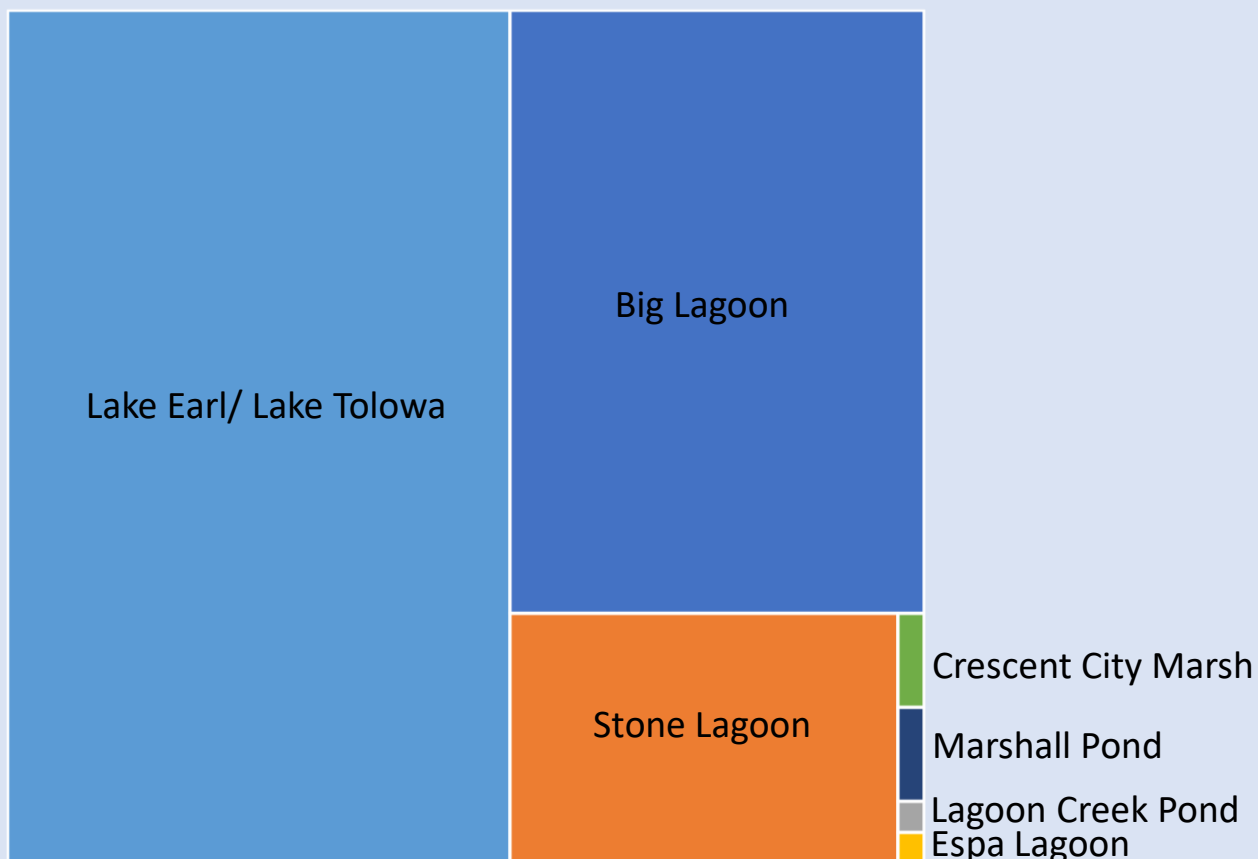


Stream Habitats

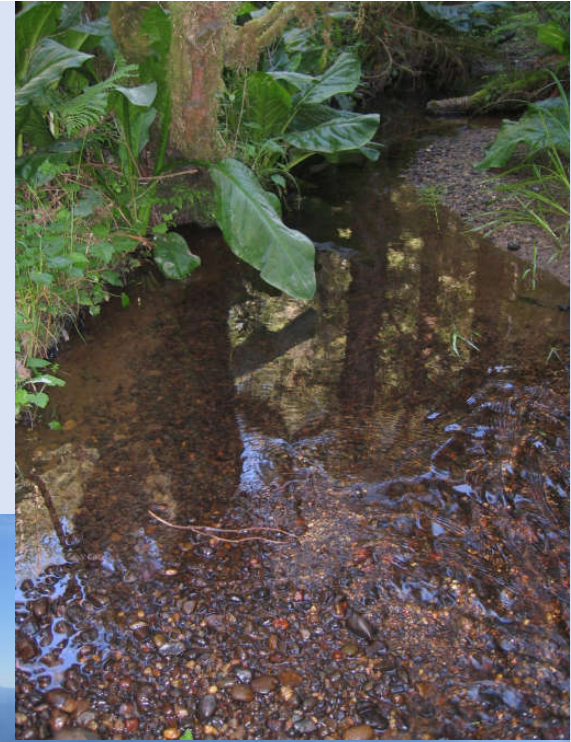


Coastal Lagoon and Wetland Distribution

	Waterbody	Area (Sq. Hectares)
Gerstung 1997	Big Lagoon	603
	Stone Lagoon	234
	Espa Lagoon	2
	Lagoon Creek Pond	2
	Lake Earl/ Tolowa	1034
2018	Marshall Pond	6
	Crescent City Marsh	6
	Total	1887



Wetland Habitats



Status

- SONCC ESU- Listing Not warranted; NOAA 1999
- California Species of Special Concern
Documents: 1995, 2015
- US Forest Service
 - Sensitive Species
 - Management Indicator Species
- Threats: Degraded habitat/ water quality, climate (sea-level rise, loss of summer fog, temperature, wildfire), invasive species



Fishery Management

Fishing Regulations

Cutthroat Trout recognized in regulations in 2000

- Last Saturday in May to August 31
- >10 inches minimum
- >14 inches minimum size (Stone Lagoon)
- 2 Fish daily bag limit

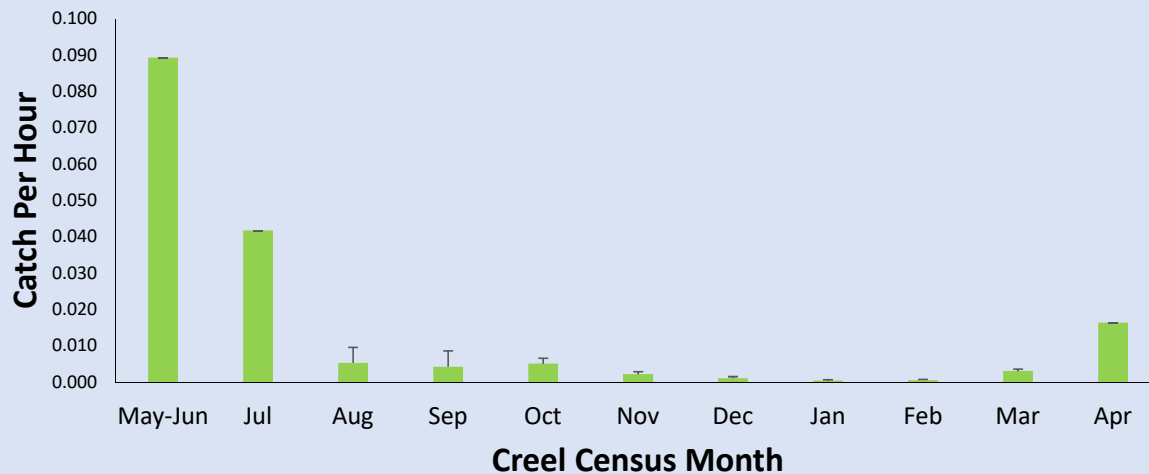
Fishery Assessments

- Smith River Fishing Creel Surveys:
1980, 1984, 1997-2007
- Angler Survey Boxes



Smith River Catch Rate and Release Statistics

**Smith River Coastal Cutthroat Trout Average Hourly Capture Rate
by Month: 1980, 1984, 1997-2007**



Data Source: CDFW; Zuspan (2018)

**Percent Catch and Release by Species
(1997-2007)**

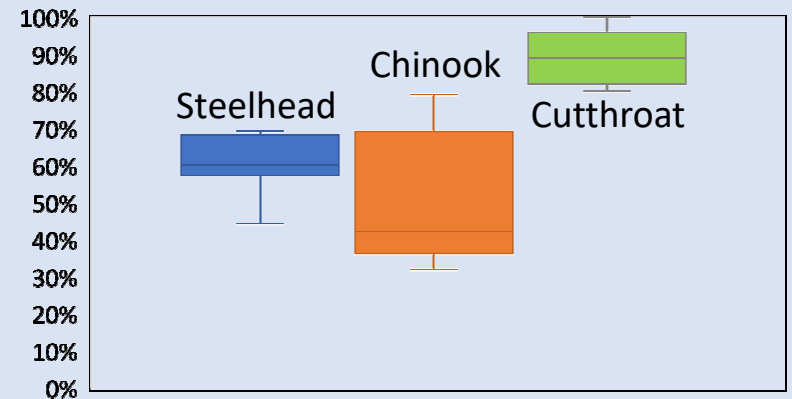


Photo: Colin Anderson

Wild and Heritage Trout Program

Waters designated by the California Fish and Game Commission

Support indigenous strains of native trout

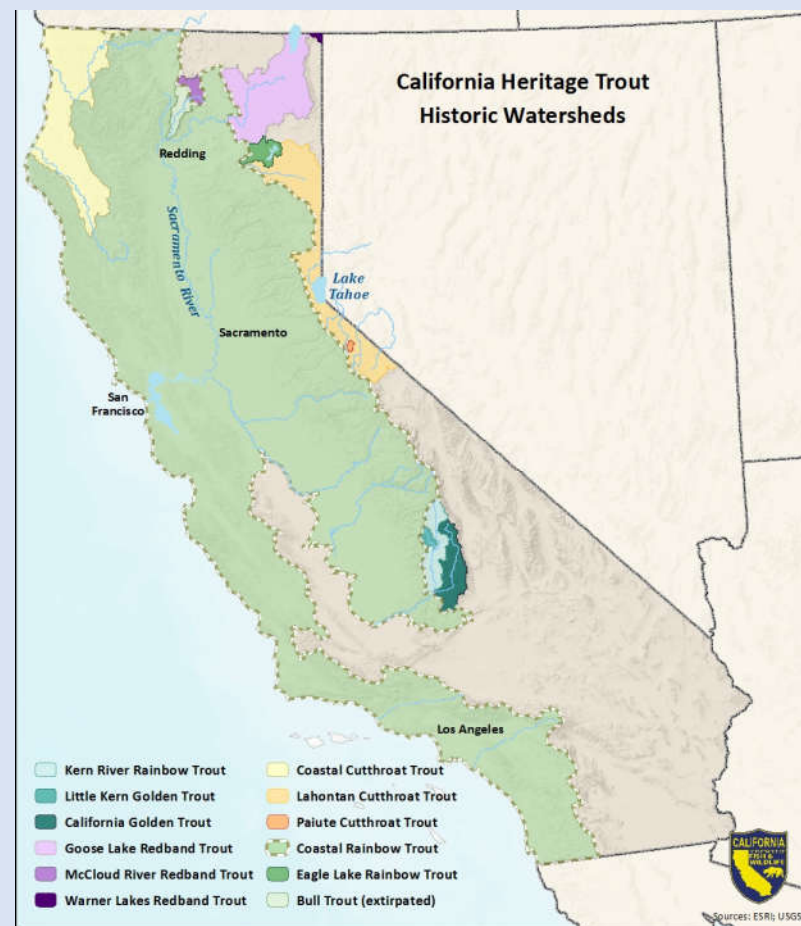
Open to public angling

Protect and restore native trout and their habitats

Conduct monitoring to inform management and angling regulations



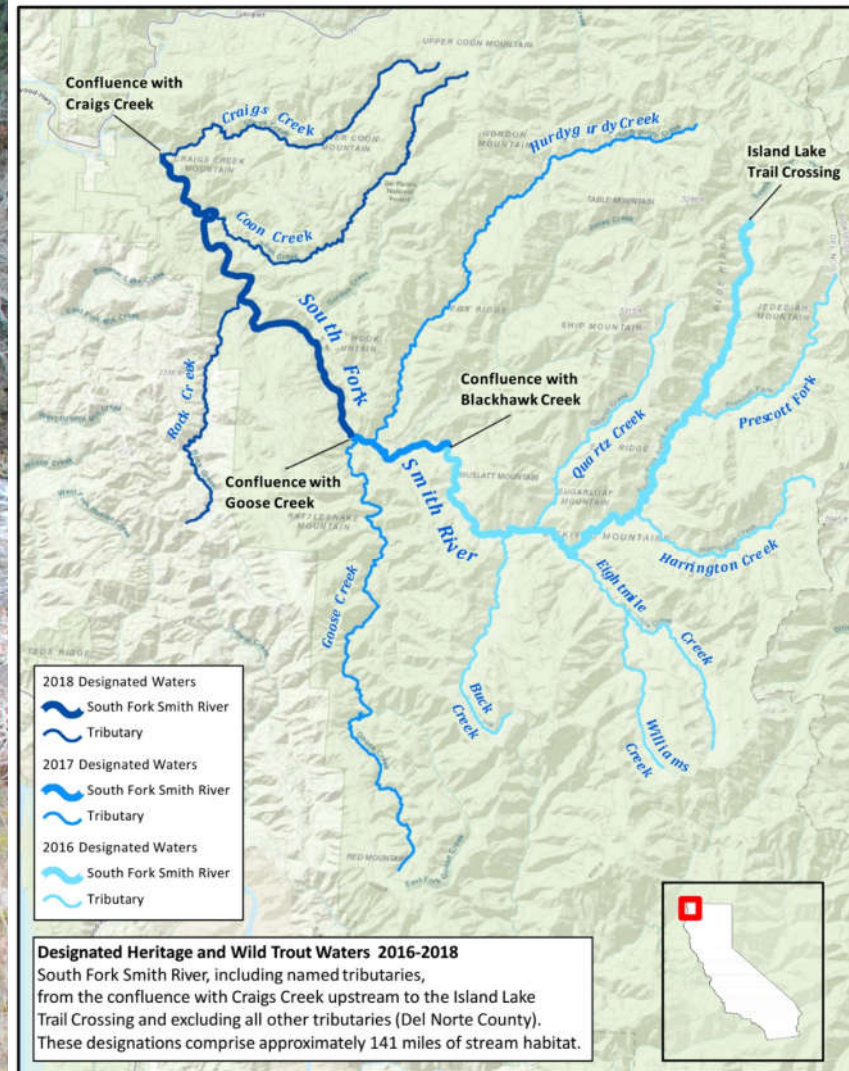
Photo: Darell Warnock



Smith River Designations

- First Coastal Cutthroat focused designation
- Three phases 2016, 2017, 2018
- 100 miles designated (2016, 2017)
+ 41 proposed (2018)

South Fork Smith River Designated Heritage and Wild Trout Waters 2016-2018



0 1 2 4 Miles

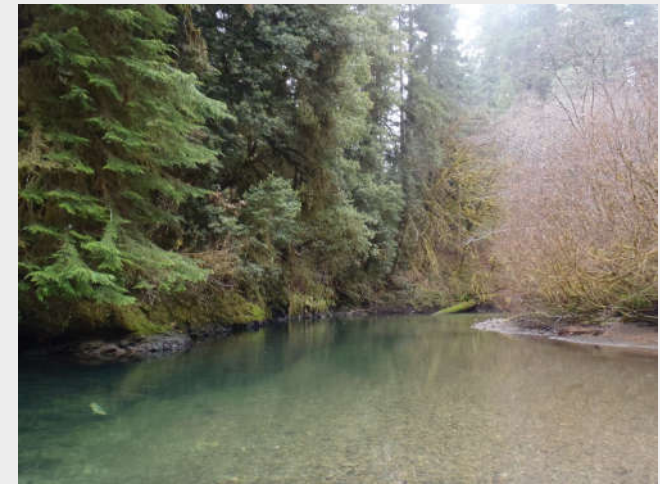
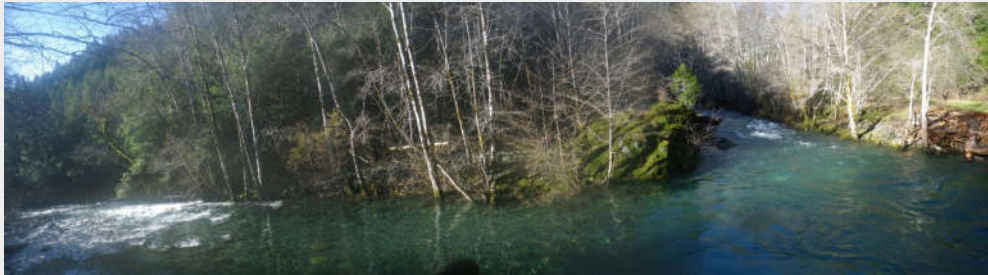


California Department of Fish and Wildlife
 Fisheries Branch GIS, 2018

Land Acquisition of Vital Coastal Cutthroat Trout Waters

Smith River National Recreation Area, Redwood National and State Parks, and the Yurok Tribal Lands

- 2002: Mill Creek (25,000 Acres) Del Norte Coast Redwoods State Park
- 2008: Goose Creek (9,400 Acres) NRA
- 2016: Hurdygurdy Creek (5,400 Acres) NRA
- 2013-2017: Prairie Creek (133 Acres) RNSP
- 2018: Blue Creek (9140 Acres) Yurok Tribe



SMITH
RIVER
ALLIANCE



WESTERN RIVERS
CONSERVANCY



WCB
State of California
Wildlife Conservation Board



Coastal
Conservancy



CALIFORNIA TROUT



FOREST SERVICE
U.S.
DEPARTMENT OF AGRICULTURE



Save The Redwoods
LEAGUE



CALIFORNIA
STATE PARKS
SINCE 1864



CALIFORNIA
DEPARTMENT OF
FISH & WILDLIFE

California Coastal Salmonid Monitoring Program

Viable Salmonid Conceptual Framework:

- Abundance
- Productivity
- Spatial Structure
- Diversity

Trend monitoring for these VSP parameters is the measure by which extinction risk and recovery status of listed salmonids are determined



Abundance: Spawner Surveys

Metrics: *Redds, Live Fish, Carcasses*



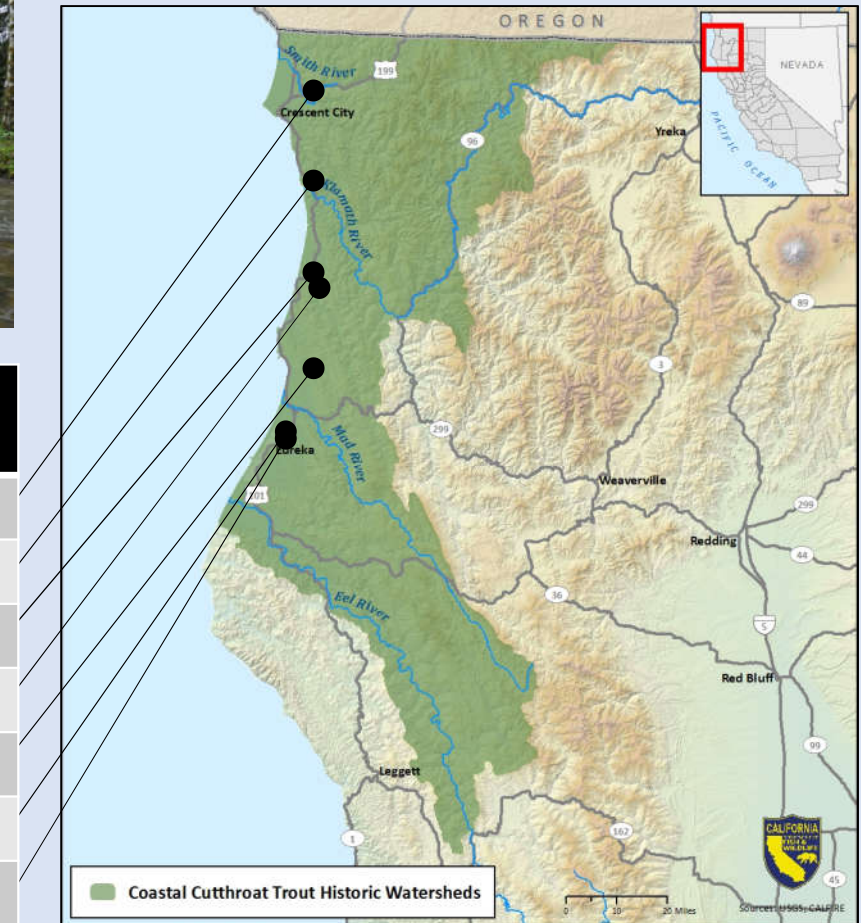
Population	Redds	Reaches	Years
Smith River	226	30	7
Lower Klamath	41	13	3
Redwood Creek	263	21	9
Humboldt Bay	158	28	9
	688	92	

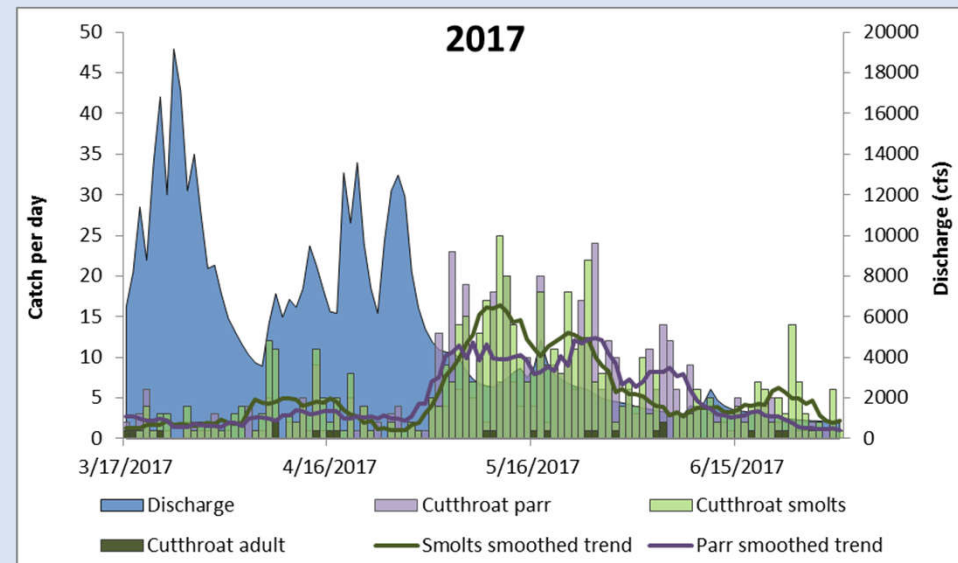
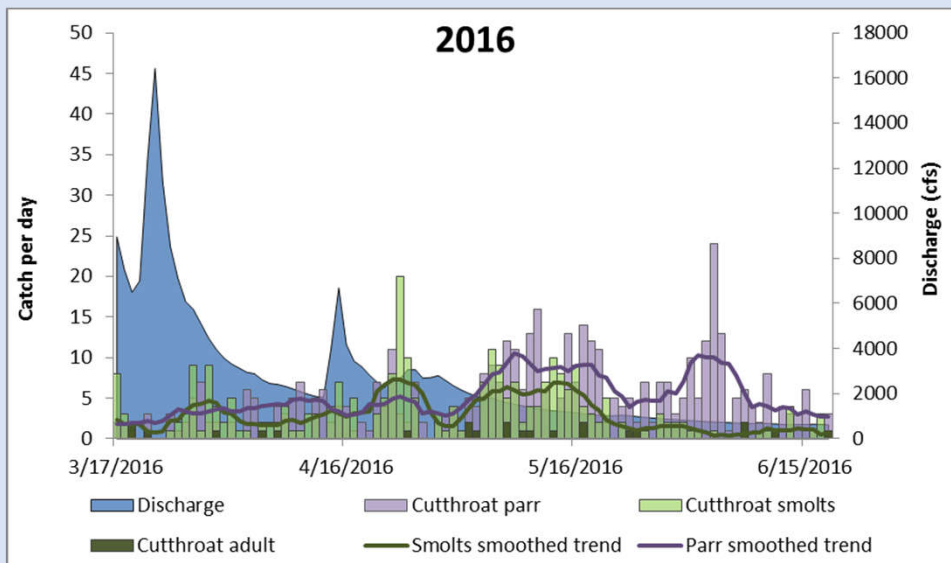
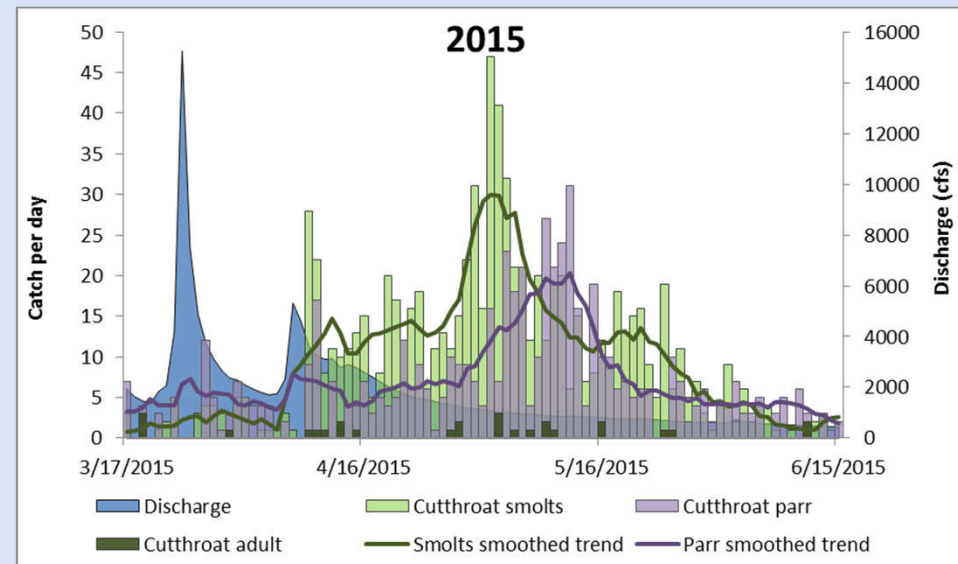
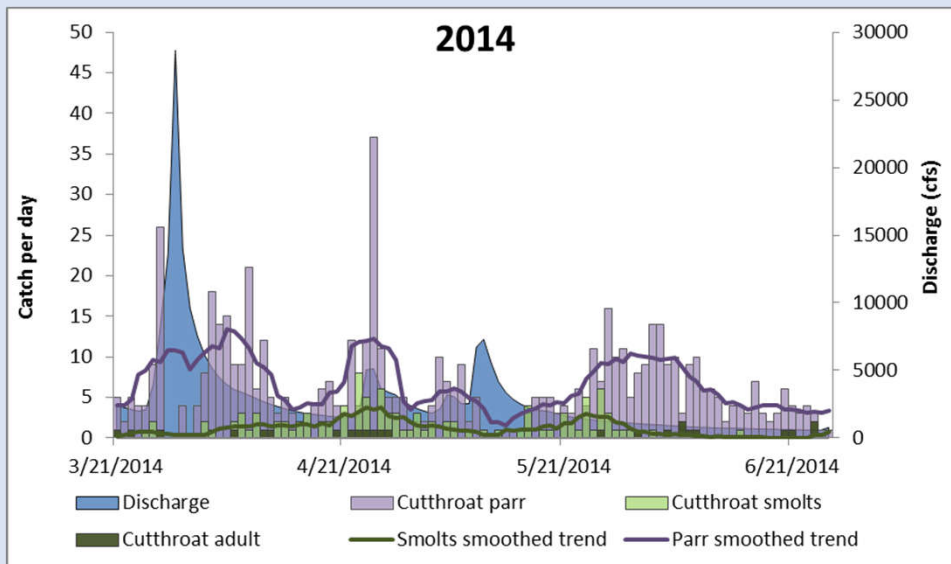
Lifecycle Monitoring Stations

Metrics: *Productivity and Diversity of Life Histories*

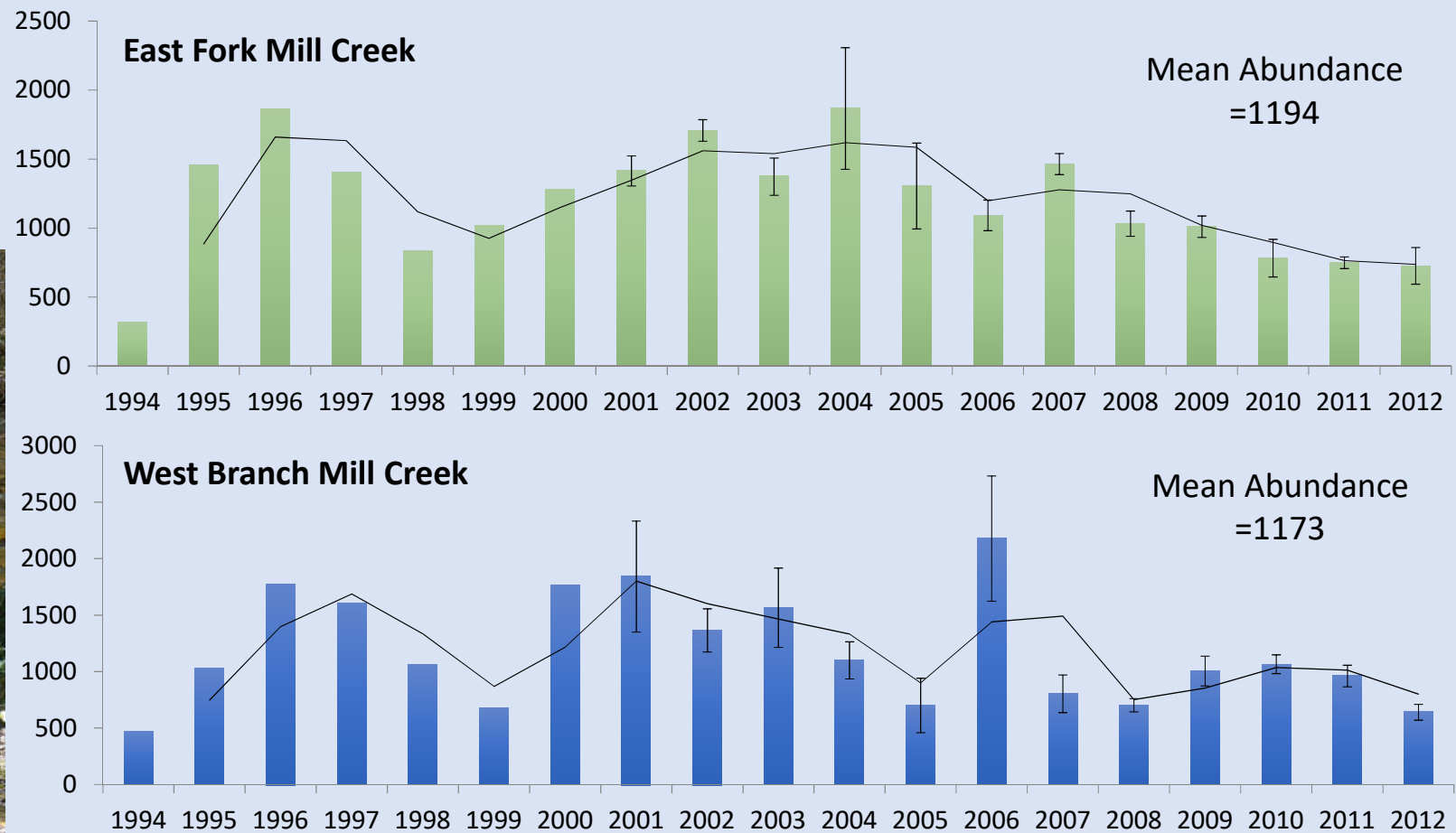


Subbasin	Years	Outmigrant Trap	Spawner Survey	RFID Antennas
Mill Creek	1994 -2018	Yes	Yes	Yes
McGarvey Creek	1997-Present	Yes	No	Yes
Prairie Creek	2011- Present	Yes	Yes	Yes
Redwood Creek	2006-2016	Yes	Yes	No
Little River	1999-Present	Yes	No	No
Freshwater Creek	2006-Present	Yes	Yes	Yes
Ryan Creek	2004-2014	Yes	Yes	Yes

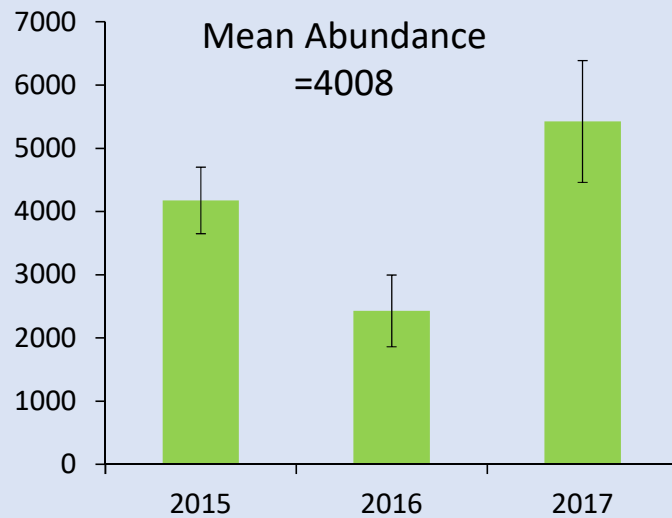




Mill Creek-Metric: Abundance (presmolt and smolt)



Lower Mainstem Mill Creek

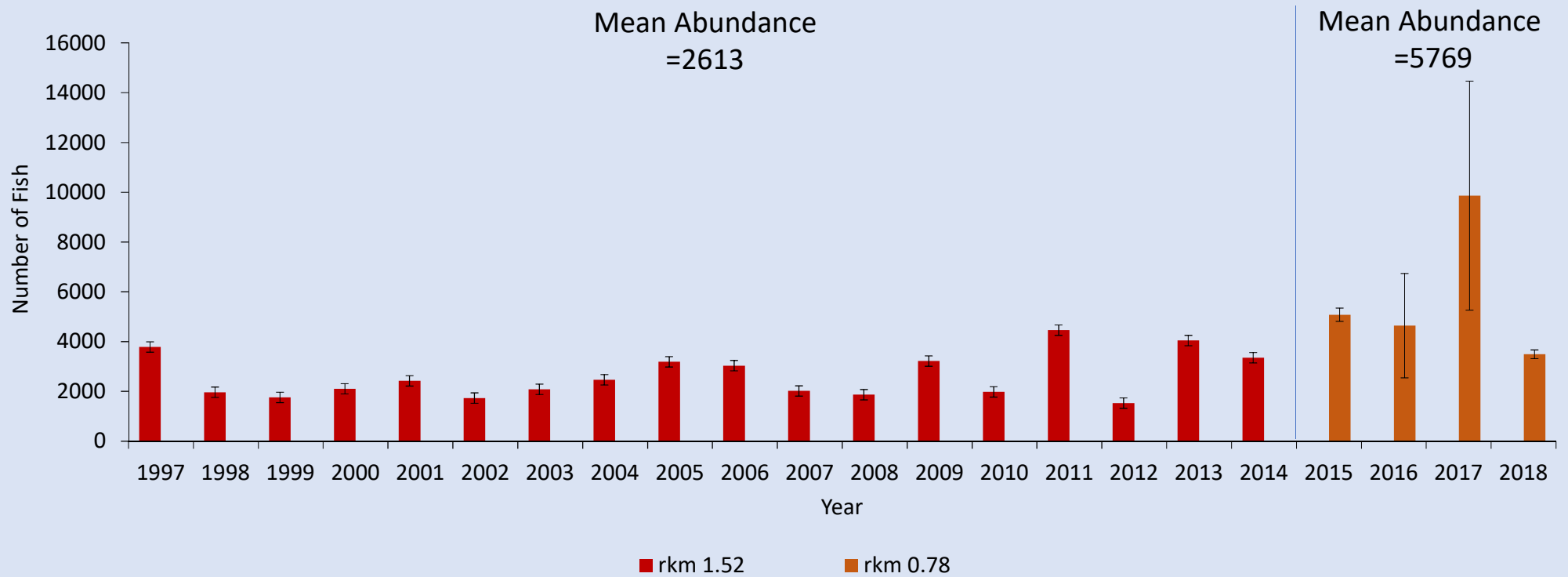


Data Source: J. Garwood (CDFW)



Klamath Basin: McGarvey Creek

Metric: Age 1+ CCT Outmigrant Population Estimate

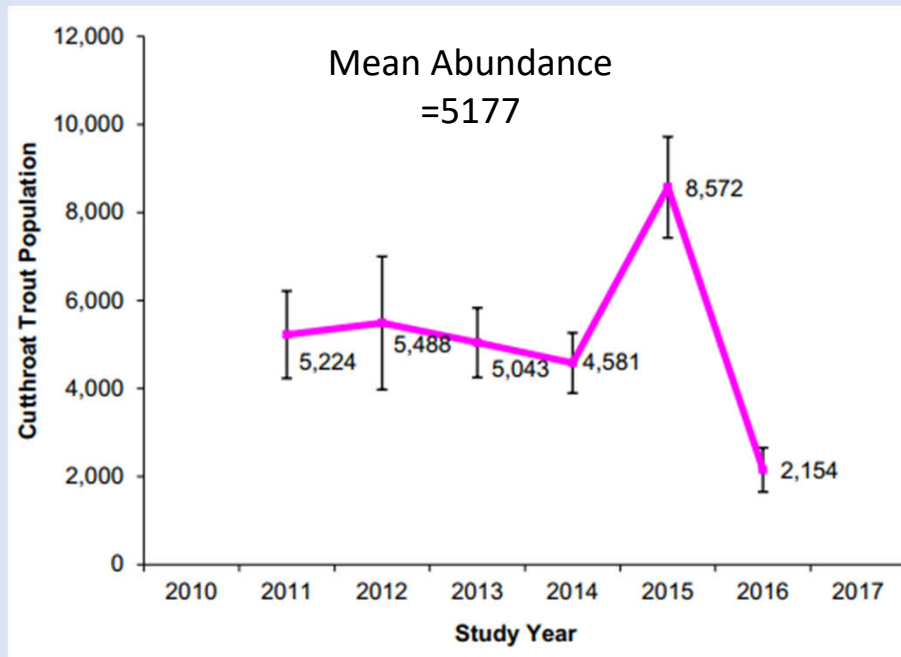


Data Source: Andrew Antonetti, Yurok Tribe, Klamath CA

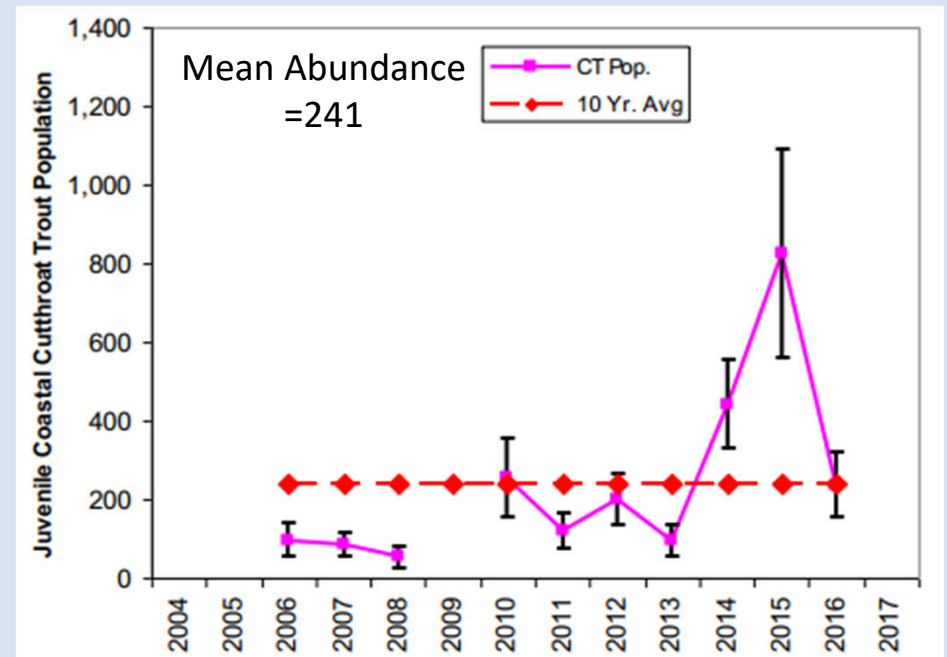
Redwood Creek Basin

Metrics: 1+ Juvenile Cutthroat Trout Abundance, Adult(>250 mm FL) Counts

Prairie Creek 2011-2016



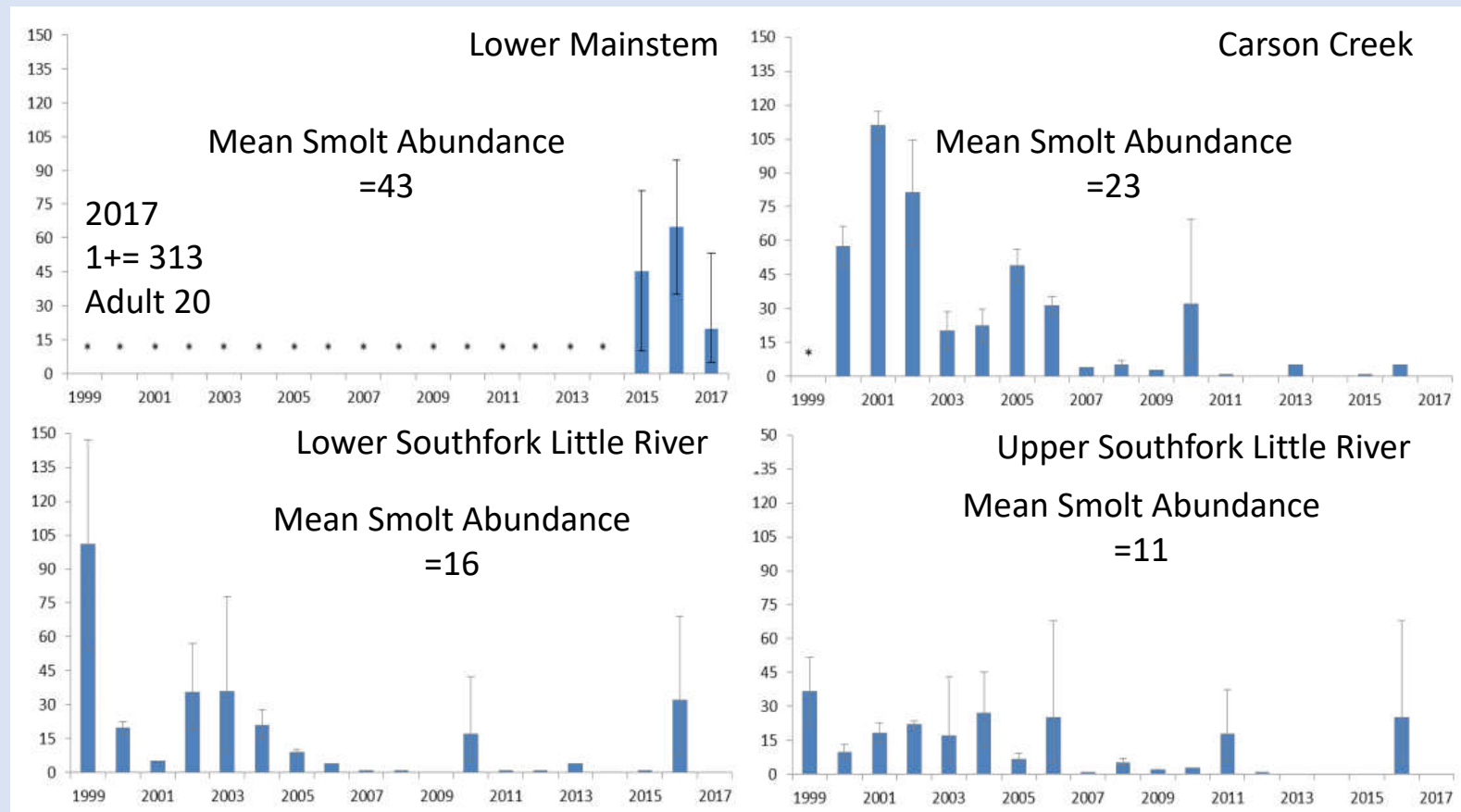
Redwood Creek 2006-2008, 2010-2016



Data Sources: (CDFW) Sparkman et al. 2017; (HSU) Wilzbach et al. 2016

Little River

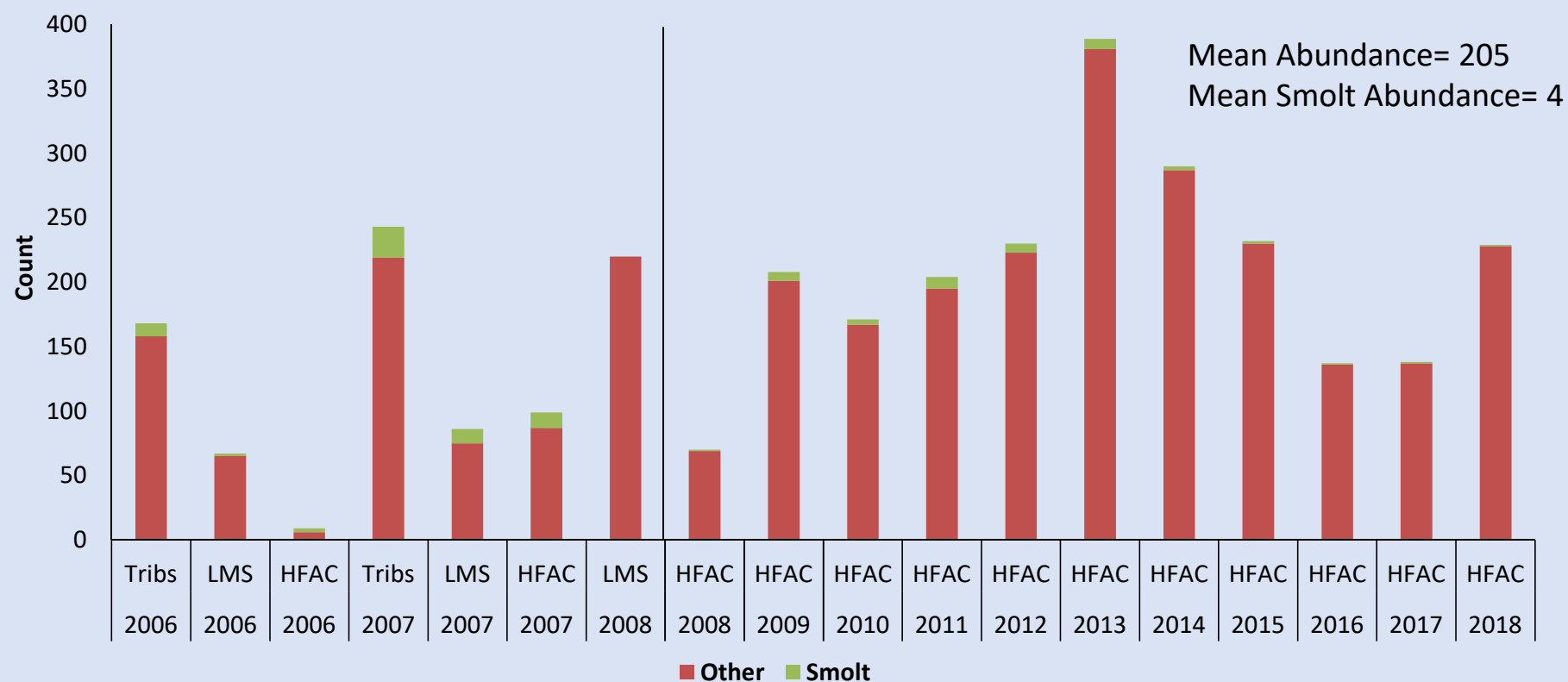
Metrics: Coastal Cutthroat Smolt Estimates, 1+ Counts, Adult Counts (>200mm FL)



Data Source: Pat Righter, Green Diamond Resource Company

Freshwater Creek Basin

Metrics: Coastal Cutthroat Counts (1+ and greater), Smolt Counts



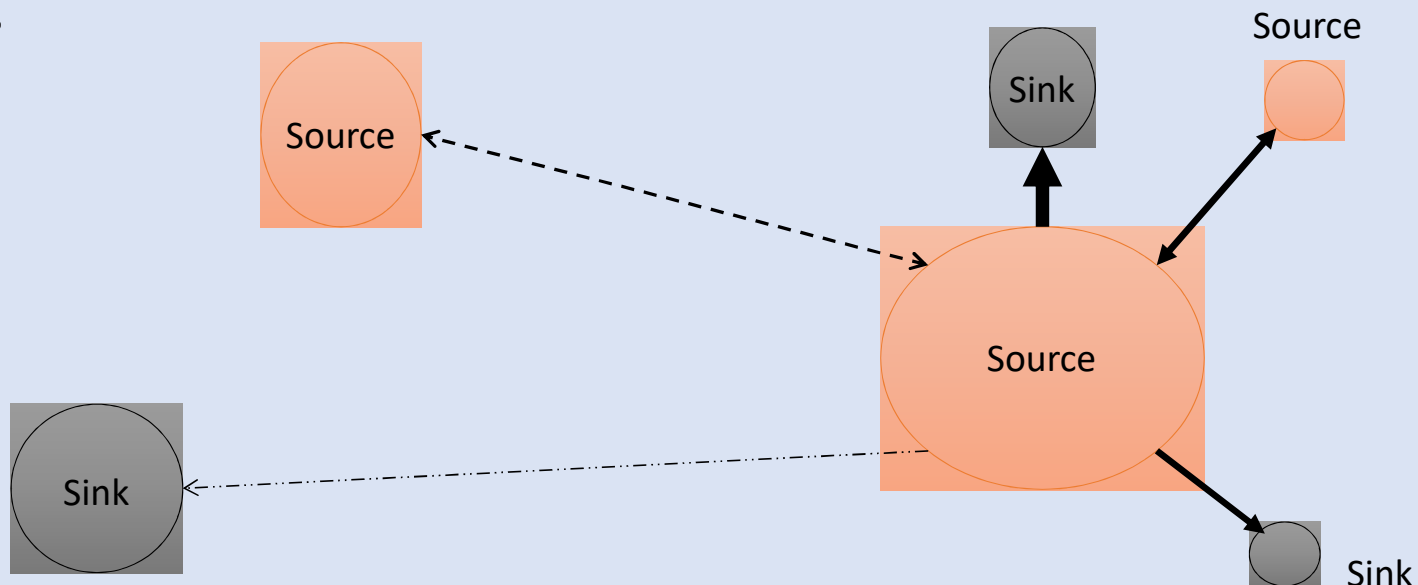
Data Source: Colin Anderson; Humboldt State University

Parr-Smolt-Adult Gradient



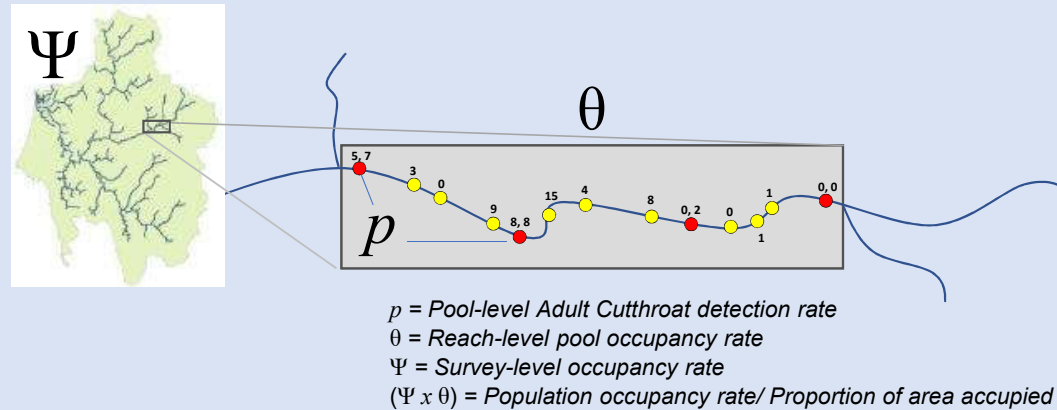
Population Spatial Structure Surveys

- Patch use
- Patch size
- Patch connectivity
- Patch colonization and extinction processes
- Density



Adult Coastal Cutthroat Population Spatial Structure

Level of Inference: Multi-scaled occupancy models

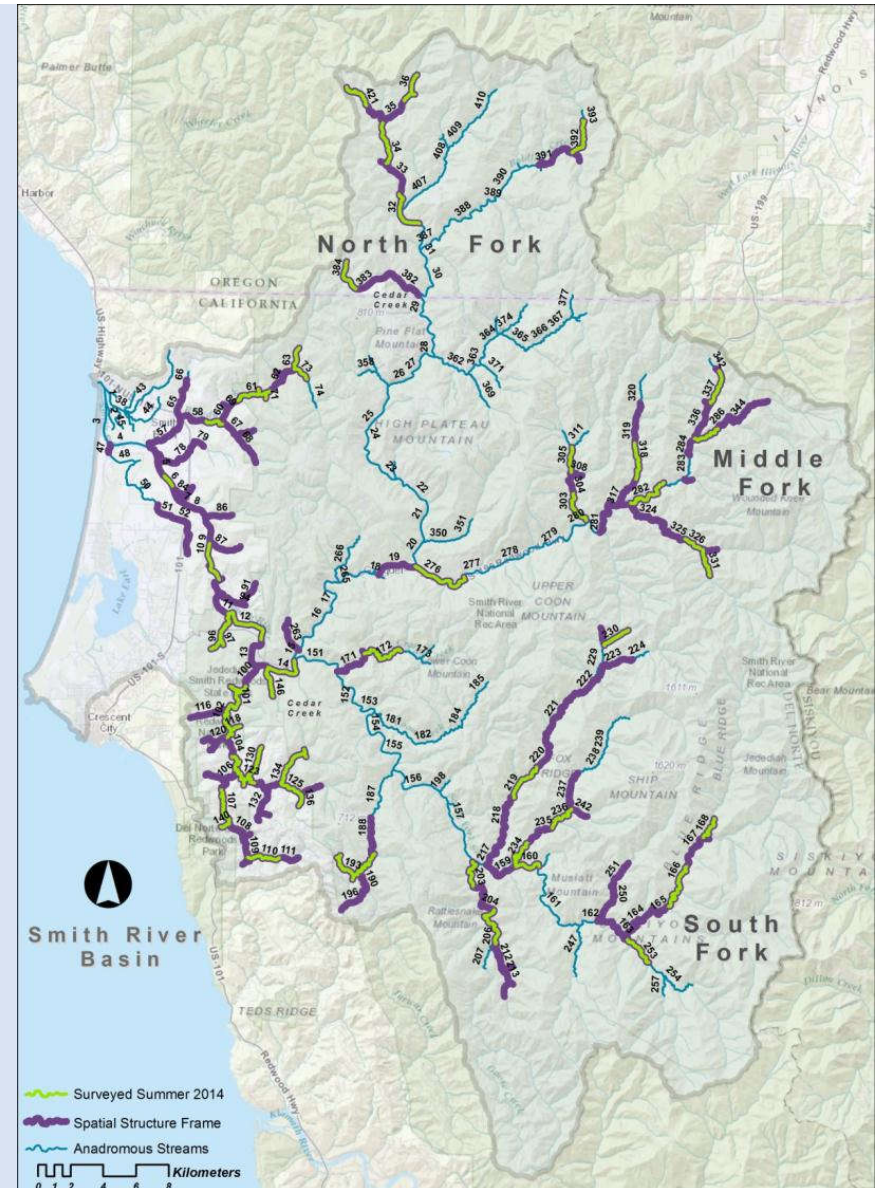


Nichols. J. , L. Bailey, A. O'Connell, Jr., N. Talancey, E. Campbell Grant, A. Gilbert, E. Annand, T. Husband, and J. Hines. 2008. **Multi-scale occupancy estimation and modeling using multiple detection methods**. Journal of applied ecology 45: 1321-1329.

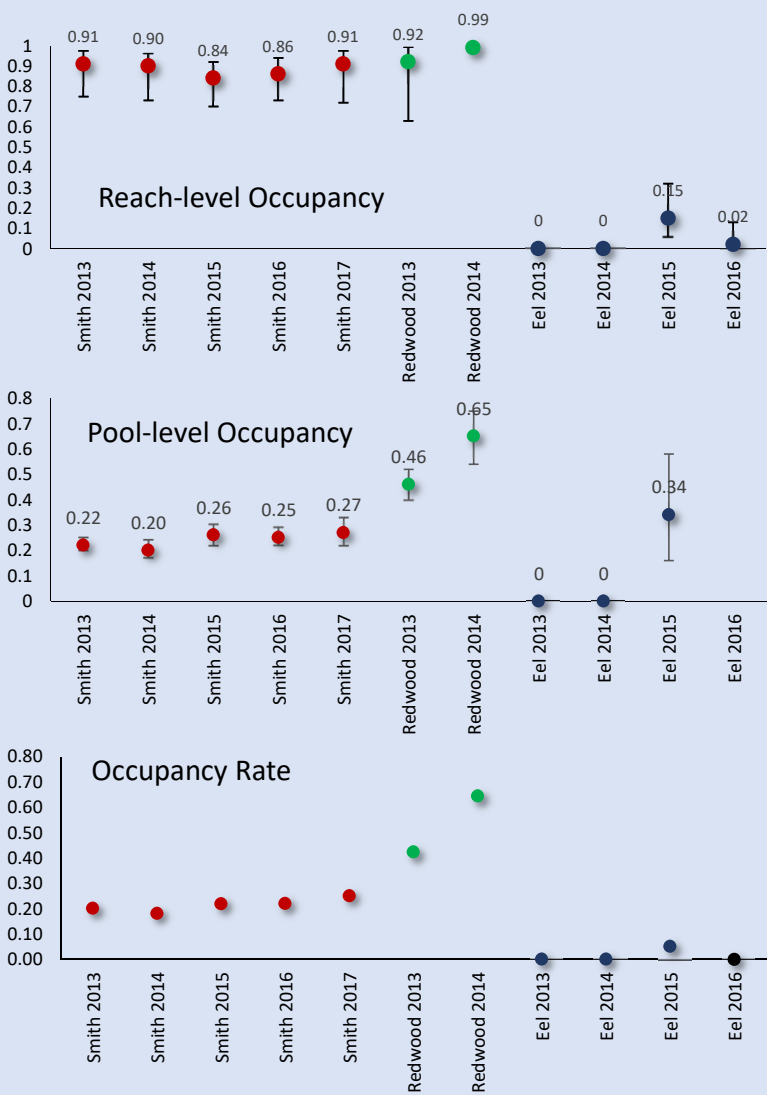
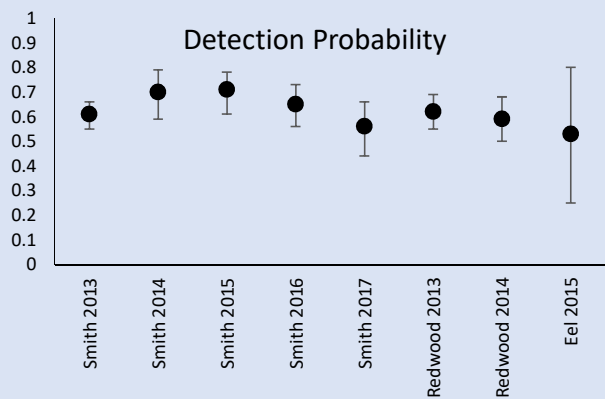


Spatial Structure Effort

Population	Years	Frame Size	Survey Reaches
Smith River	2012-2018	298 km	166
Redwood Creek	2013-2014	149 km	69
Eel/ Van Duzen	2013-2016	397 km	204
Totals		844 km	439

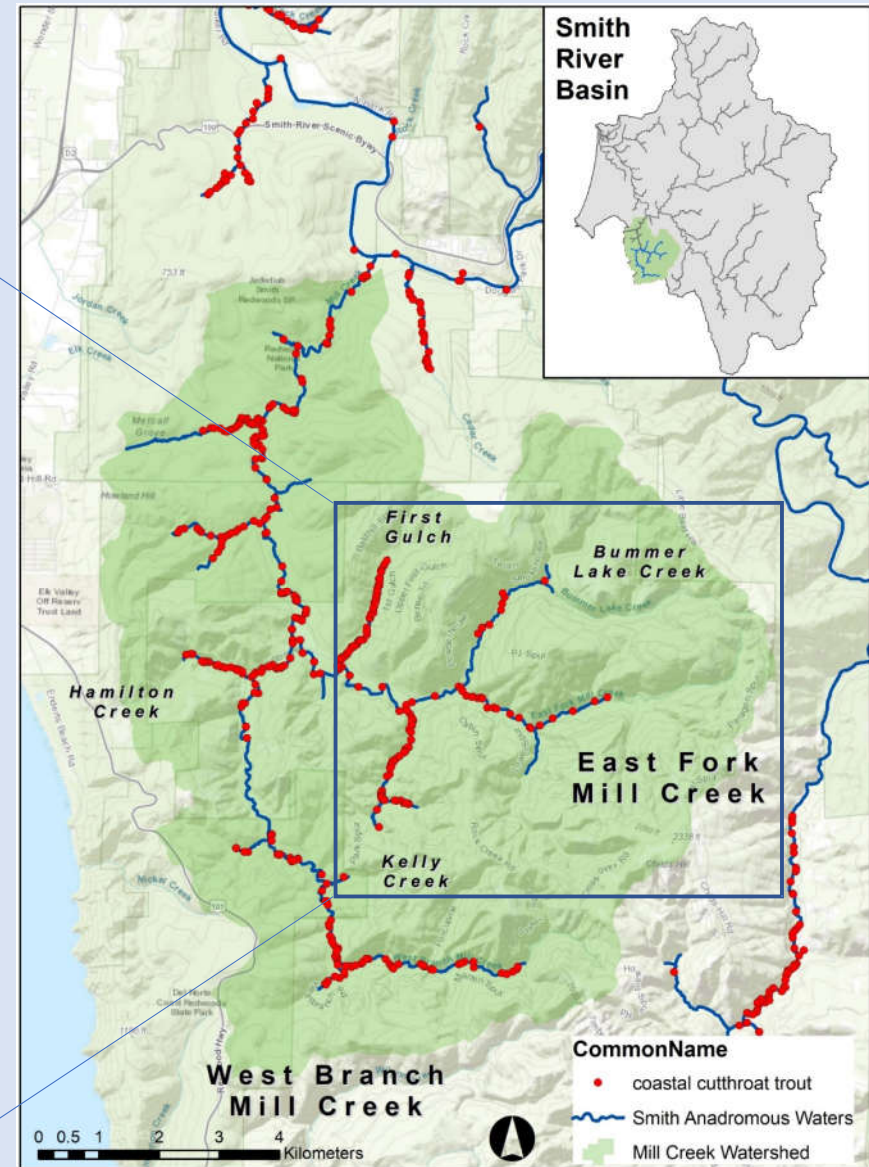
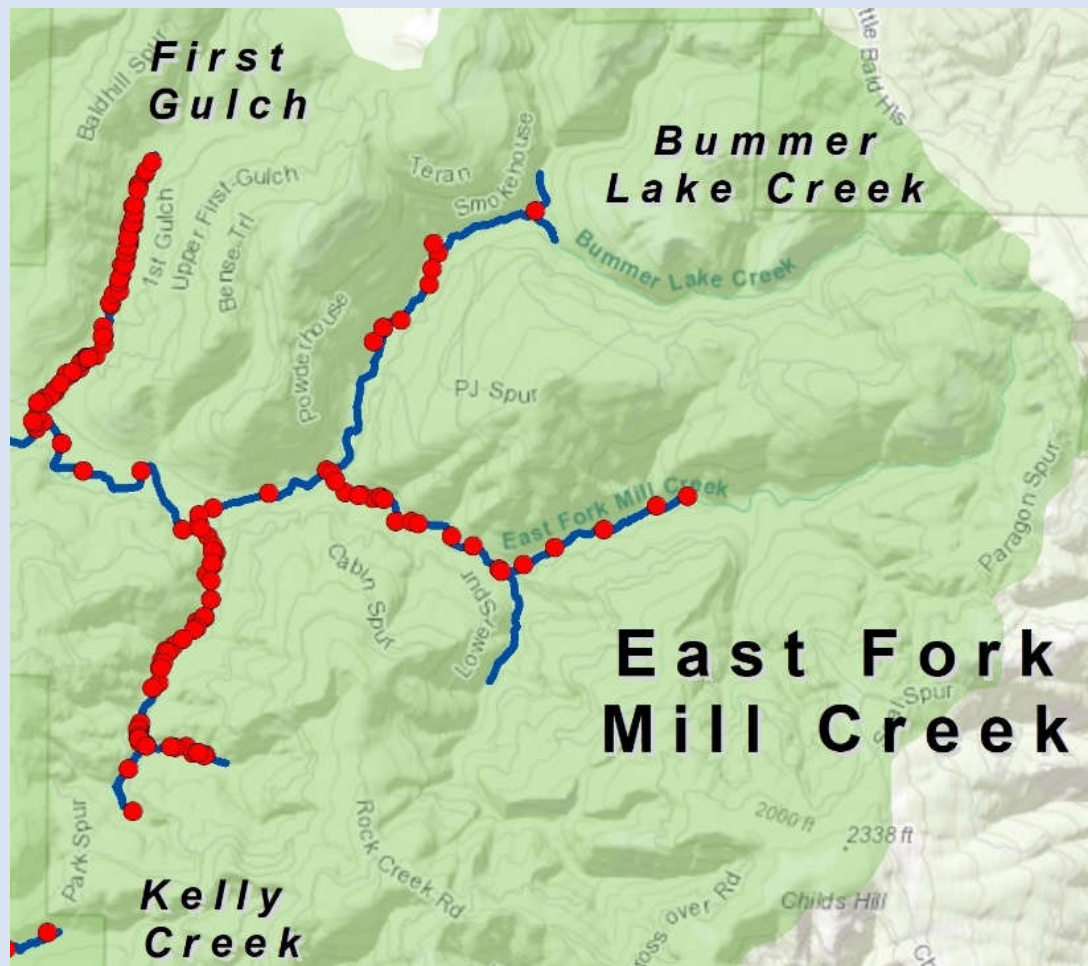


Adult Coastal Cutthroat Trout Spatial Structure



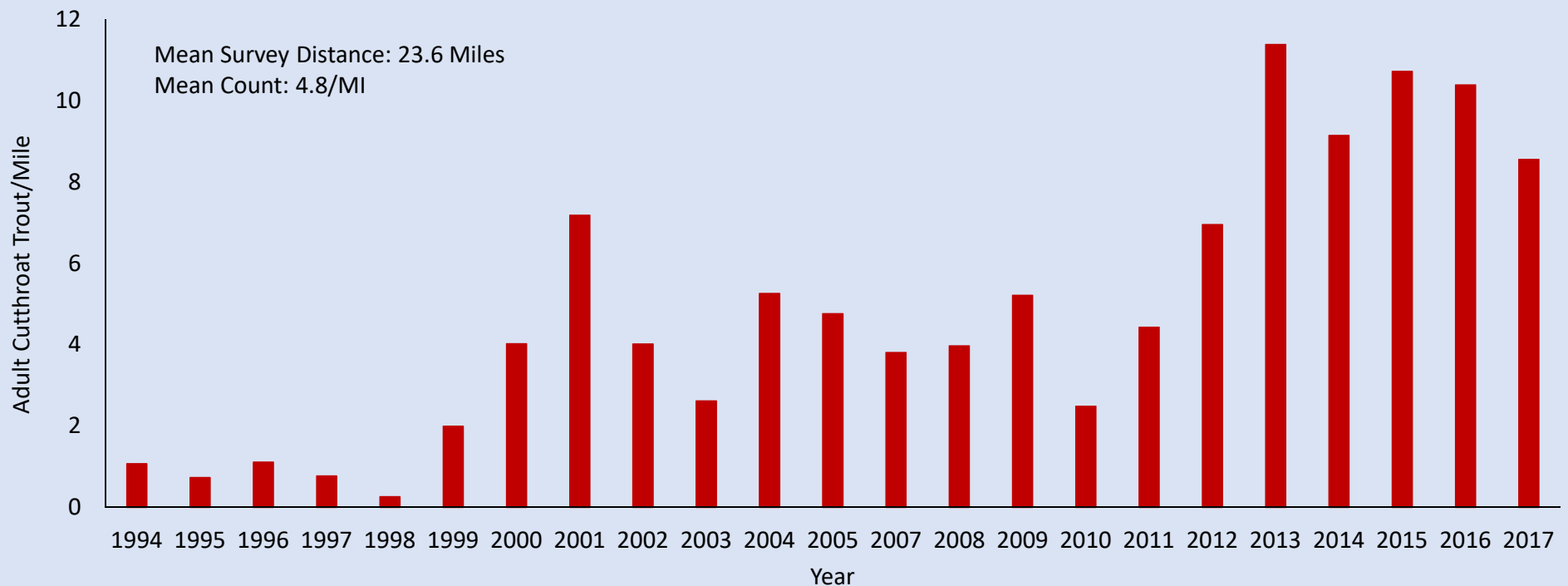
Spatial Structure

Refined Spatial Distributions



Redwood Creek Redwood National Park Snorkel Surveys

Metric: Adult Coastal Cutthroat Trout Counts (Length >10")

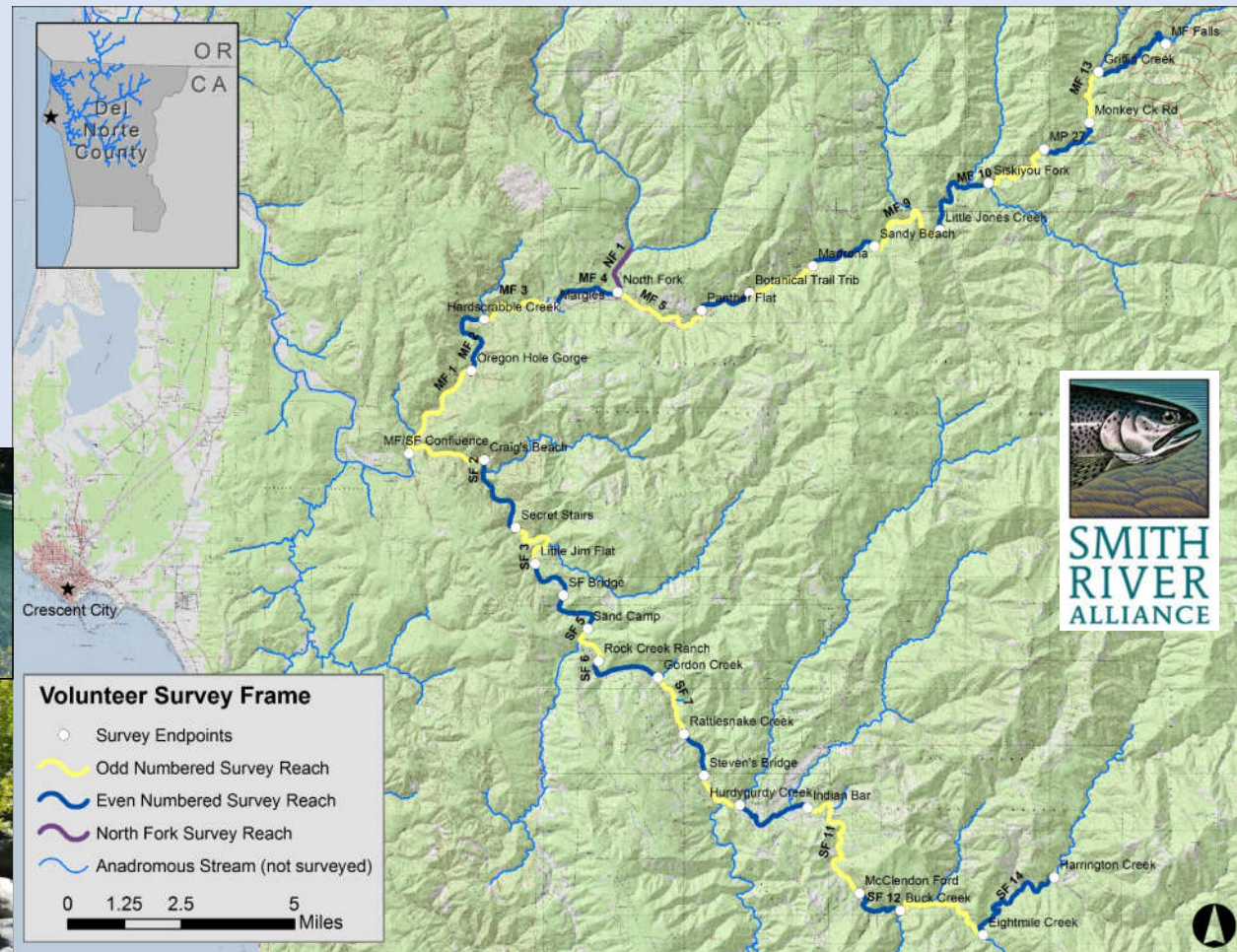


Data Source: David Anderson-National Park Service

Summer Volunteer Adult Coastal Cutthroat Survey- 28 years and counting

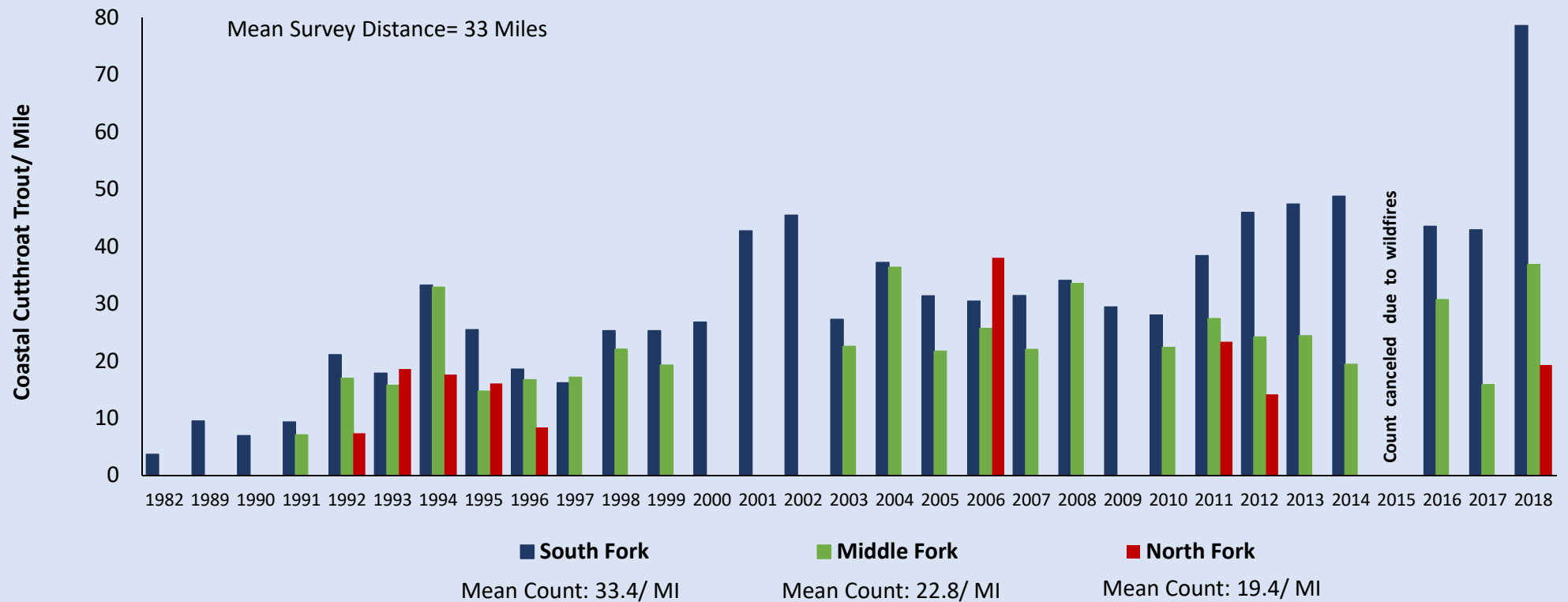
2018 Effort

- 75 snorkelers
- 42 stream miles
- 2418 Adult Cutthroat Counted



Smith River

Metric: Adult Coastal Cutthroat Trout Counts



Data Source: Smith River Alliance