

Perspectives of managing, restoring, and conserving salmonids in the southern Pacific Northwest and northern California

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 - USFS-Pacific Southwest Research Station.
 - Fisheries and Fire
 - Tribal and Community forestry and restoration

Land Area Affected by Endangered Species Act Listings of Salmon & Steelhead

* 28 distinct population segments:
6 endangered, 22 threatened

* 176,000 sq. miles in Washington, Oregon, Idaho & California

* 61% of Washington's land area,
55% of Oregon's, 26% of Idaho's, &
32% of California's



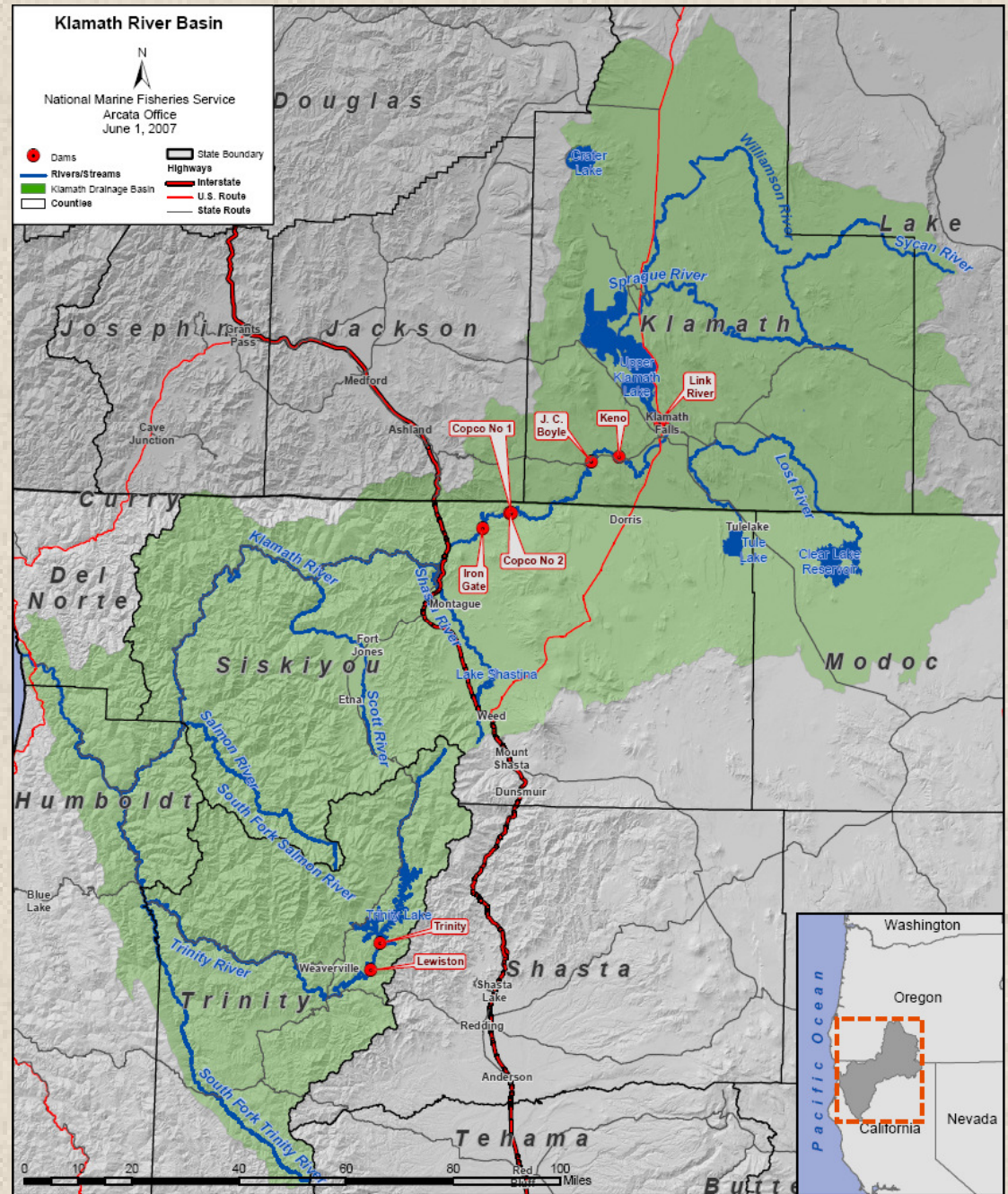
February 2008



Klamath River Basin

Topics:

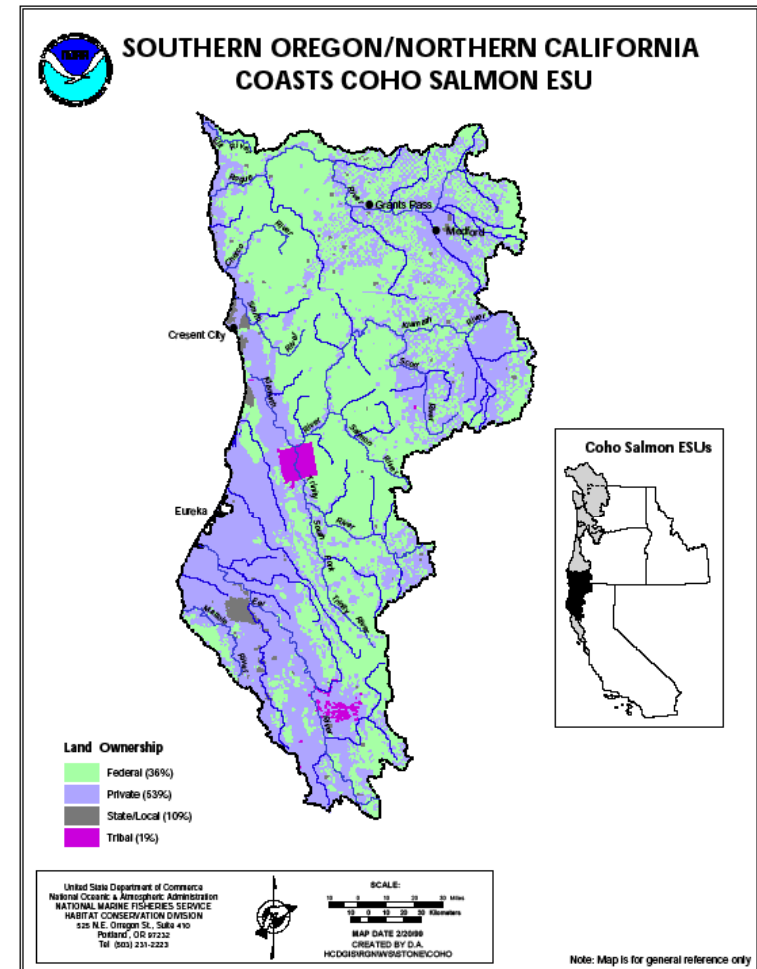
- Imperiled salmon stocks
- Dams and water allocations
- Climate and wildfires
- Agency, tribal and community efforts to restore habitat and conserve salmonids



Map: NMFS-NOAA 2007:3

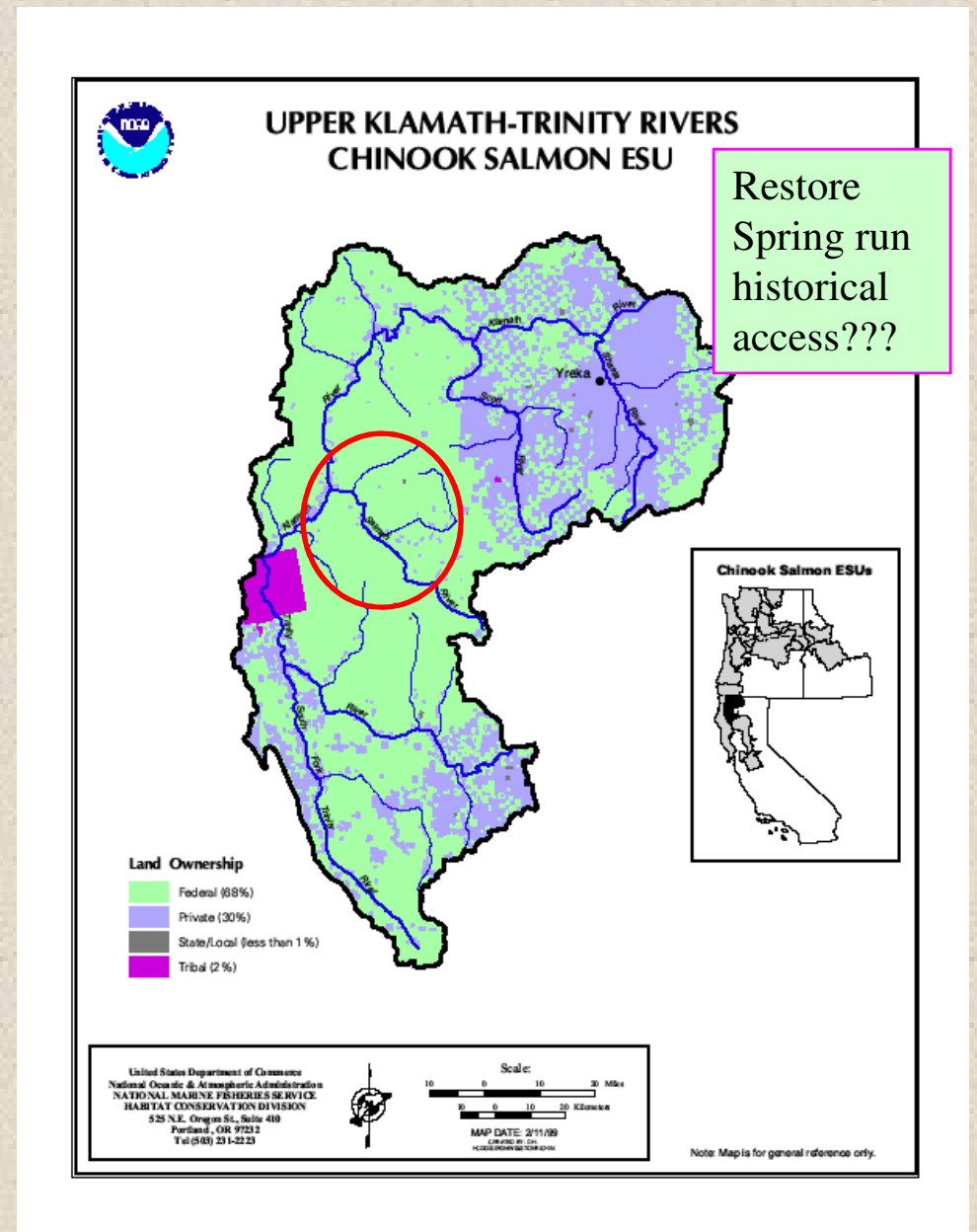
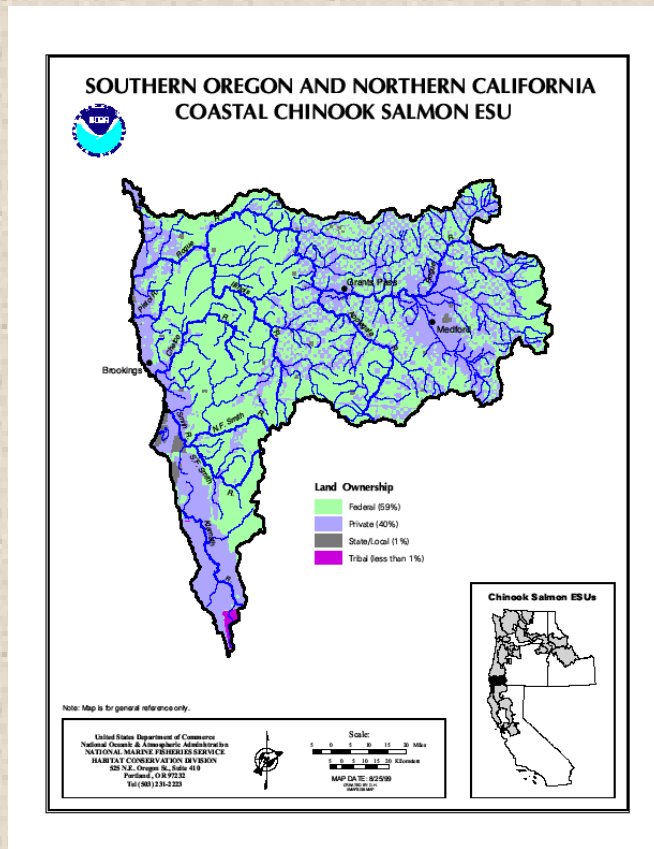
Coho –ESA Threatened

- Modification of in-land habitat
Factors:
 - Agricultural/Mining operations
 - Dams: Habitat access and quality
 - Erosion control structures
 - Road crossings
 - Forestry operations
 - No or ineffective fish screens on diversions.
 - Water quality/pollution factors
 - Diseases



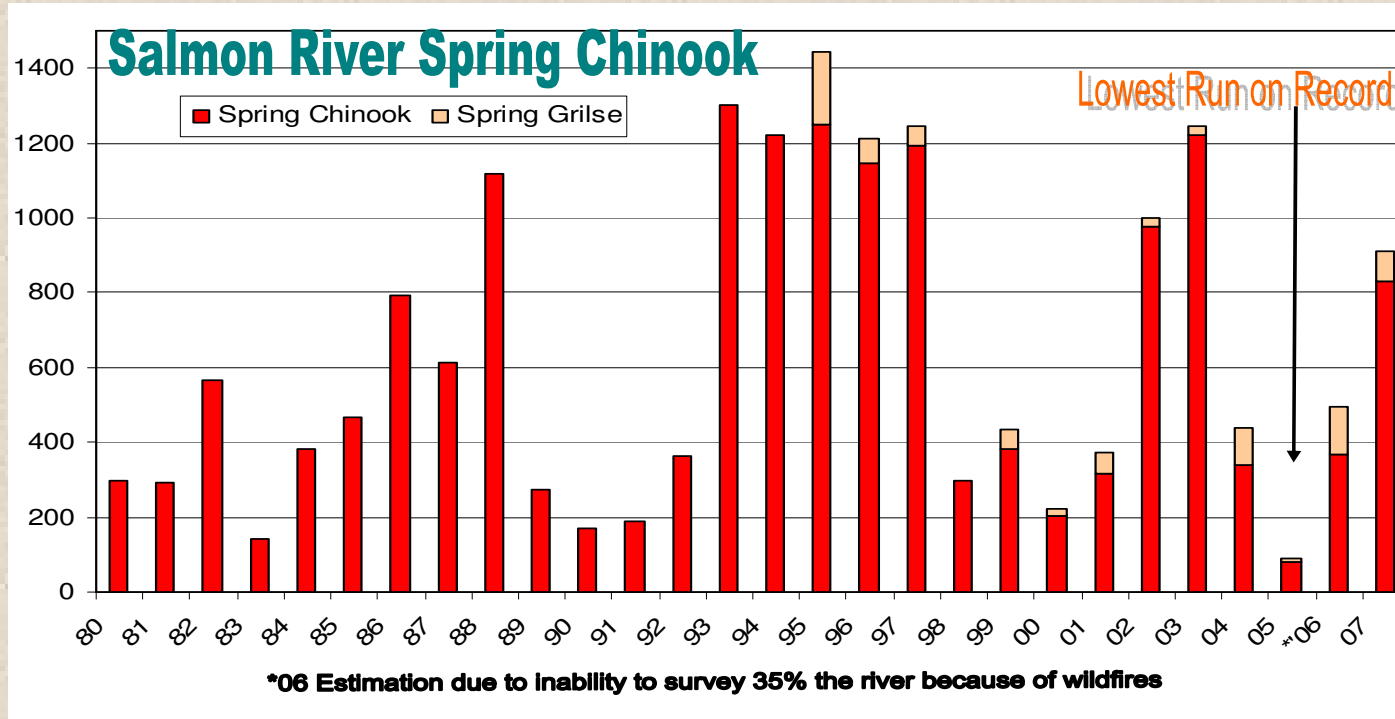
*The estimated historical abundance of the SONCC coho ESU was 150,000. The recent (2006) mean abundance is 5,170, which is the highest such abundance since 1980.

Chinook-Spring: Imperiled, species of concern



- Spring run-Threats similar to Coho
 - Hatchery and wild stocks
 - In-stream water quality:
 - Flow and temperature conditions and diseases

Spring Chinook of the Klamath-Salmon Rivers, Ca. Wild Population

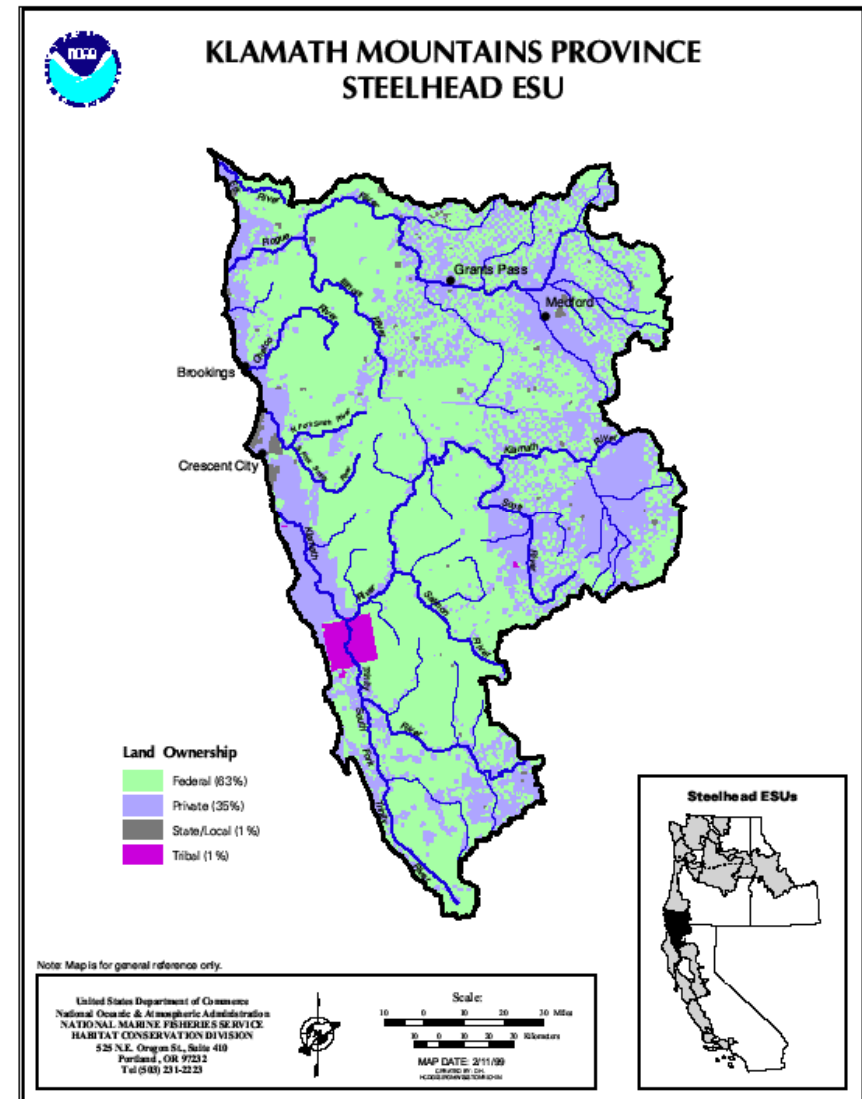
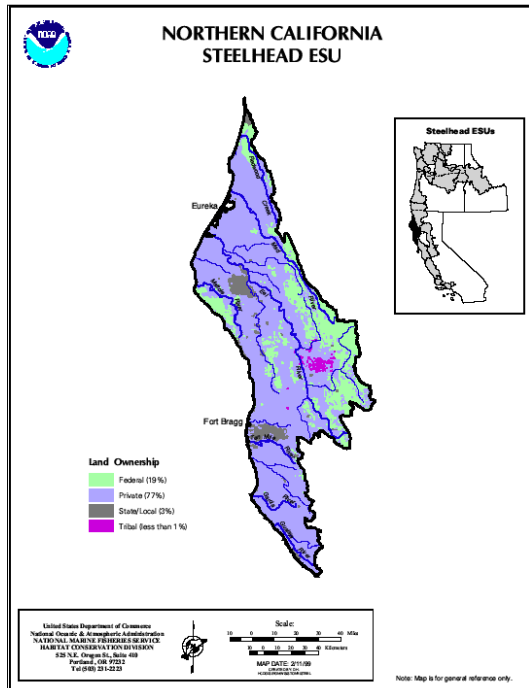


- Dive Counts: Coordinated efforts among parties.
- Declines from historical levels caused by:
 - Upper Klamath River dams block historical habitat.
 - Hatchery production supplementation
 - Threats to remnant wild populations: Klamath River migration conditions, Mining/habitat modification, Harvest/Poaching, Wildfires, Invasive weeds.

*Lack of recognition of Spring Run by NOAA/ESA a concern to tribes and communities

Graph/Data : SRRC

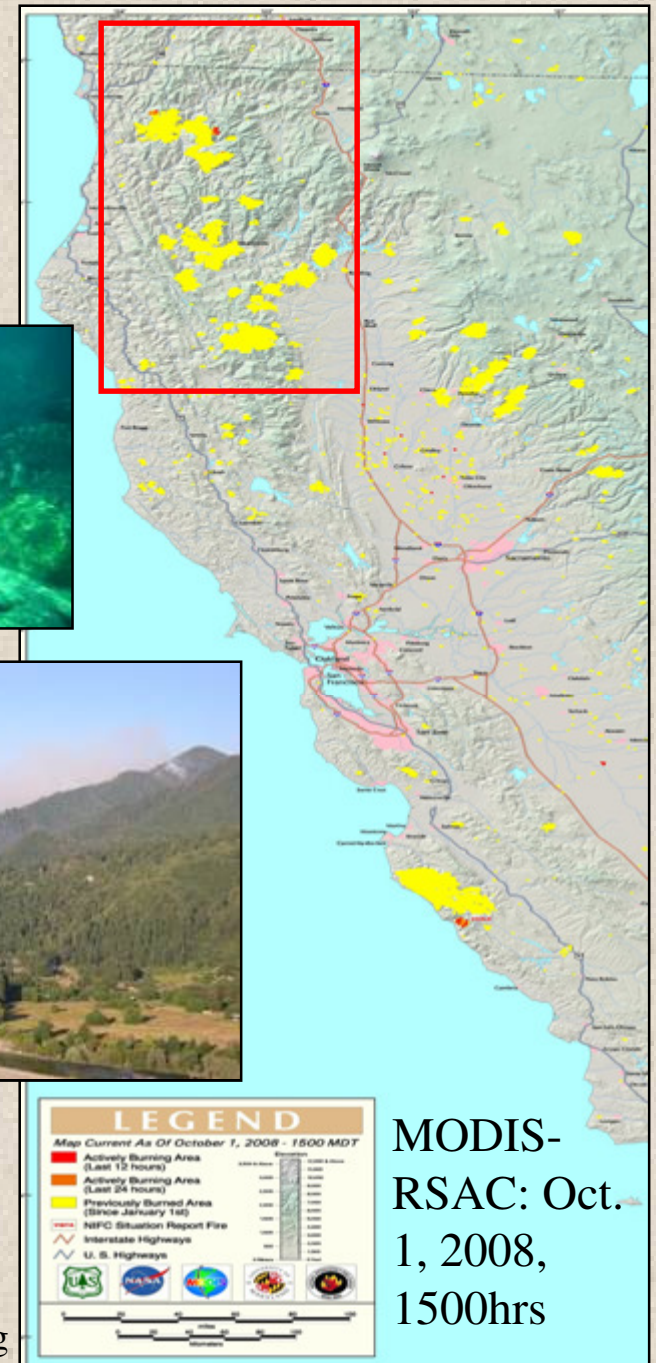
Steelhead-Summer: Proposed threatened



- Summer, Fall vs. Winter Runs:
Threats similar to Coho and Spring Chinook salmon
 - Wild and Hatchery
 - Sport and tribal harvest
- * Tribal perspectives include ecology of all fishes: Sturgeon, Lamprey eels, Candle fish, Suckers, Sculpins, etc.

Climate and Wildfires: Threats to Salmonids

- Climate change
 - Precipitation delivery: Less snow pack- hydrologic regime change
 - Winter mean temperature to increase
 - Longer wildfire season affected by fuel moisture content
- Wildfires: Short and long term affects/impacts?
 - Extent and severity to increase
 - Direct and indirect effects to salmonid habitat quality
 - Fire suppression/repair activities
 - Need for sub-basin planning
 - Research to link direct and indirect effects to habitat or species populations.

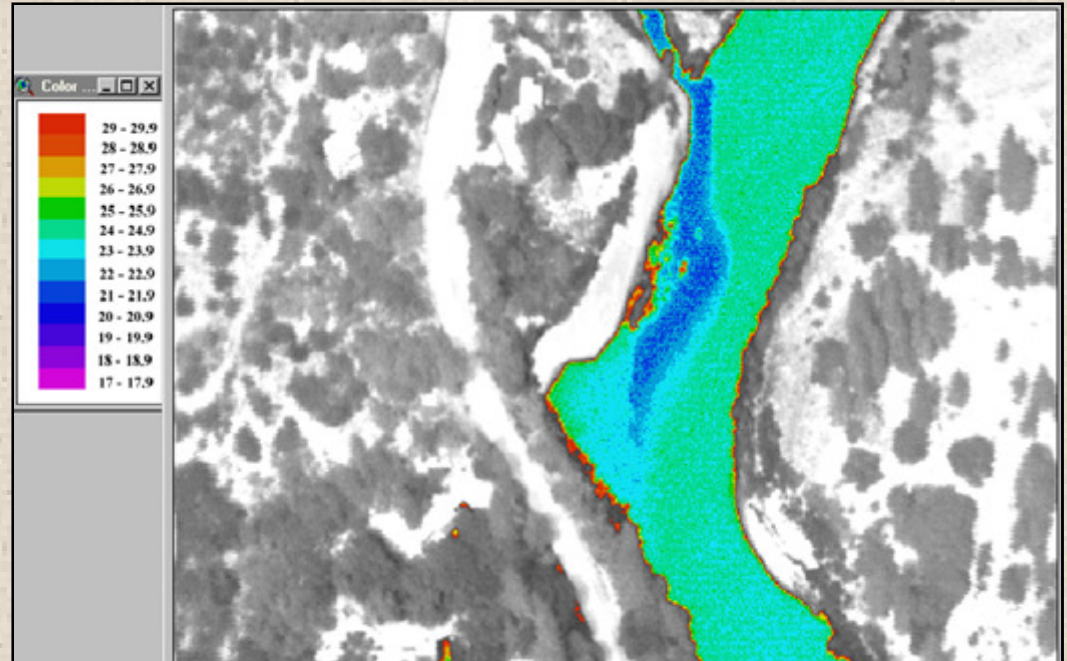


MODIS Image: http://activefiremaps.fs.fed.us/fireplots/cgb2008275_1500.jpg

Monitoring and Research to Guide Restoration and Conservation Efforts



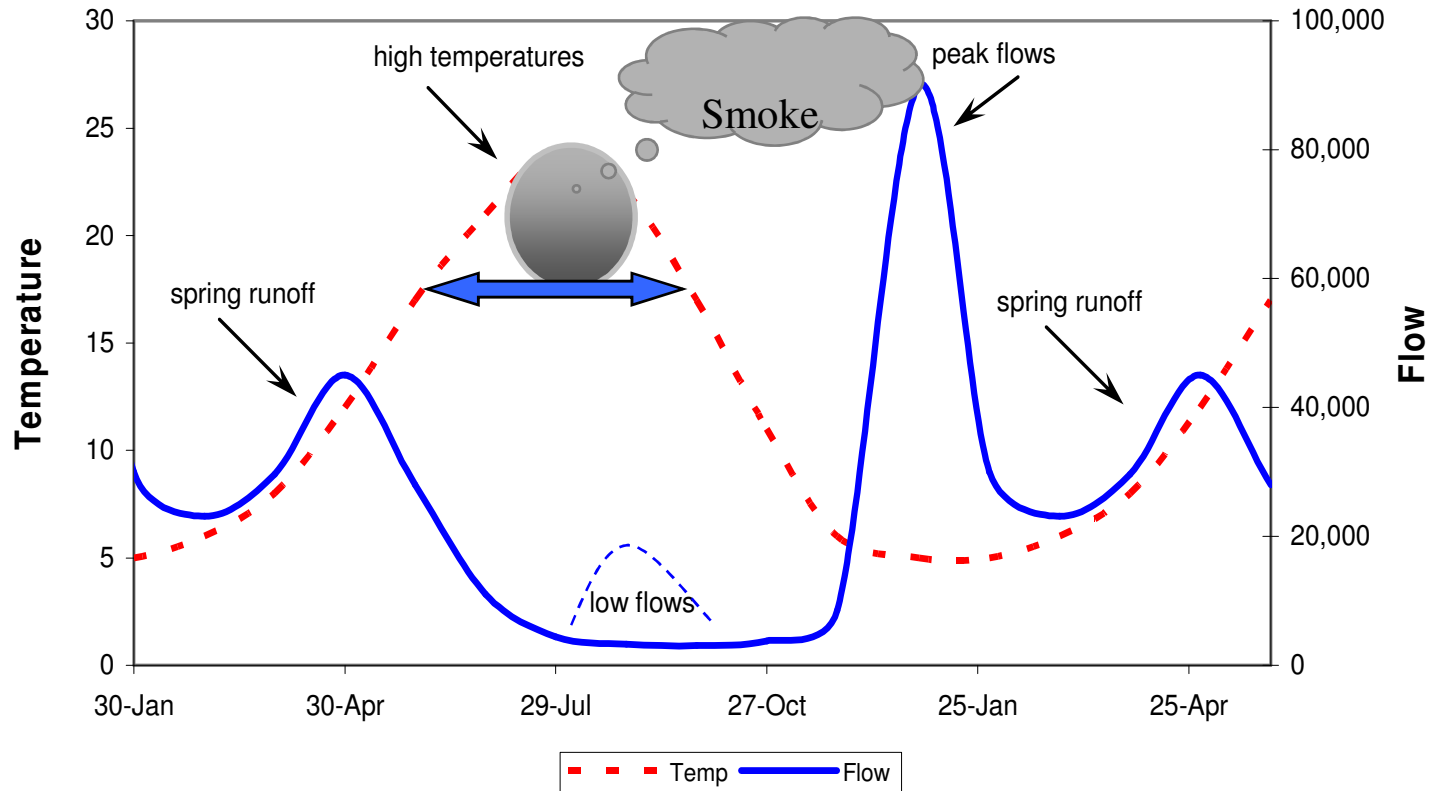
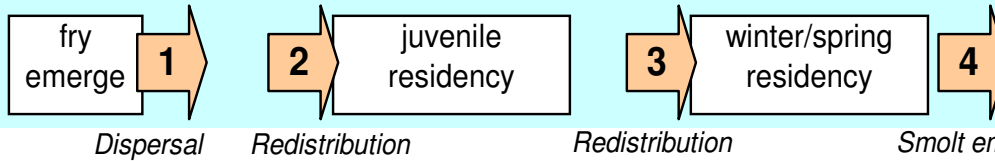
- Harvest management, adult escapement, spawning distribution and success
- Out-migrant monitoring
- Thermal refugia study
- Disease and density studies



Photos: Karuk Tribe

Linking coho life history migration, thermal refugia, and wildfire research

Movement of juvenile coho within the mainstem river corridor



Graph: Karuk Tribe,
 Top Photo: MODIS,
 Collaborative ideas and data sharing

Monitoring and Research to Guide Restoration and Conservation Efforts

- Flow and temperature scenario modeling
 - With and without dams
 - Species life history requirements
 - With reduced agricultural use
- Collaborative Dives-
Adult and juvenile surveys
- River geomorphology, bedload transport, and flow conditions.



Photos: Karuk
Tribe &
Google Earth



Multiparty Restoration and Monitoring: *Is it working?*

- Road decommissioning
 - Geologically unstable watersheds
- Fish passage enhancement
 - Roads and irrigation diversions
- Stream flow management and conservation. Fish centric
- Entrapment prevention
 - Fish screens and flow management
- Riparian Improvements
 - Creek mouth modification, plantings, and thinning.
- Post-fire repair work
 - Soil stabilization and fuel treatments



Photos: USFS,
MKWC, Yurok Tribe

Klamath Basin Dam Removal: Political, Social and Ecological Tradeoffs

- Started with Framework Agreement
 - Klamath River Basin Restoration Agreement
 - A multiparty agreement involving federal, state, county, tribal, agricultural-industry, and community organizations
 - Anticipated-Major funding basin wide:
 - Dam removal
 - Better flows
 - Improve water quality and wetlands,
 - Fish restoration and re-introduction in to upper basin.
- *Agreement in Principle-** To remove four dams and restoration efforts: Pacific Corps., Federal, and States

Conclusions:

- Coho, chinook and steelhead continue to decline, though difficult to quantify because abundance has not been systematically monitored at the basin scale over time
- Other species important for tribal culture and subsistence are declining or extirpated from historic habitats that are linked to salmon.
- Climate change is supported by fire frequency and intensity data, but the effects on salmonids are not well understood.
- Klamath River Basin Agreement and all of the collaborative research leading up to it hopefully represents a turning point in fate of this salmon ecosystem

Thanks to Karuk and Yurok Tribes, USFS, MKWC, SRRC, and River Keeper input, photos, and data.

Wild Salmon Center and Eco-Trust for the invitation to present