Stressors Influencing the Viability of Shasta, Scott, and Upper Klamath SONCC Coho Salmon Populations
Presentation Purpose

• Characterize the historical ecological conditions Interior Klamath coho salmon populations experienced (e.g., flow, temperature, habitat conditions)

• Describe the stressors that have limited Interior Klamath coho population production, and viability

• Provide context for supplementation discussions by describing a “Baseline Description.”
Frederick A. Butman (1821-1871), Mount Shasta. (San Francisco Artist). Courtesy Bancroft Library, University of California, Berkeley, California (http://www.siskiyous.edu/shasta/map/pd/index.htm).
Characteristics of the Interior Klamath Basin

- Warm dry summers, cool/cold winters
- Snowmelt or Volcanic spring hydrology
- Valley floors are often historic wetlands

Image courtesy of Erich Yokel, Siskiyou RCD
Estimate of Unimpaired Monthly Flows in the Shasta River
(Presented by B. Bennet, DWR, Lower Klamath Basin Science Conference, June 2004)

![Graph showing monthly flows in the Shasta River.]

Estimated Unimpaired Flow at the mouth of the Shasta River (Deas, et. al. 2004)

![Graph showing unimpaired flow at the mouth of the Shasta River.]

- Mean Monthly Flow (CFS)
- Month
Habitat Complexity Courtesy of Beavers

Image courtesy of Erich Yokel, Siskiyou RCD
Stressor

“The physical or biological response to anthropogenic or natural events that adversely affect individuals”
Altered Hydrology

USGS 11517500 SHASTA R NR YREKA CA

USGS 11519500 SCOTT R NR FORT JONES CA

Daily Discharge, cubic feet per second

- Daily mean discharge
- Period of approved data
- Estimated daily mean discharge
- Period of provisional data
Average daily Klamath River discharge at Keno, Oregon, during three different time periods. The 1905-1913 dataset represents historic, relatively unimpaired river flow. From NMFS 2010.
Impaired Water Quality
EPA TMDLs

• Upper Klamath Population- The mainstem Klamath River was listed as impaired due to high water temperatures, low dissolved oxygen, nutrient, and microcystin water quality impairments for the Klamath River Hydrologic Unit.

• Shasta River Population- The Shasta River watershed was listed as impaired due to both high water temperatures and low dissolved oxygen.

• Scott River Population- The Scott River watershed was listed as impaired due to elevated sediment and temperatures.
Impaired Water Quality from NRC 2004
Reduced Complex Riparian Habitat
Reduced Habitat Complexity

Status of Beavers, Tappe 1941, Division of Fish and Game. Reports of a large party capturing 1800 beavers, annually, in the 1850s in Scott Valley near Fort Jones. Population extirpated in 1920s.
Altered Sediment Supply

Percent Fines (< 6.4 mm) by Reach in the Scott River 1990

Loss of Floodplain and Channel Characteristics
Disease

- *Ceratomyxa shasta* myxospore
- *Manayunkia speciosa*
- *Parvicapsula minibicornis* acinospora
- *Ceratomyxa shasta* acinospora
- Myxozoan life cycles
- Salmon
Adverse Hatchery-Related Impacts

- Genetic impacts
  - Reducing the productivity of populations
- Competition for limited resources
- Predation
Reasons for Optimism

- Effective Restoration
- Recovery Guidance
- Habitat Conservation Plans
- Potential for large-scale, long-term restoration
- Hatchery Reform
- Community Support