

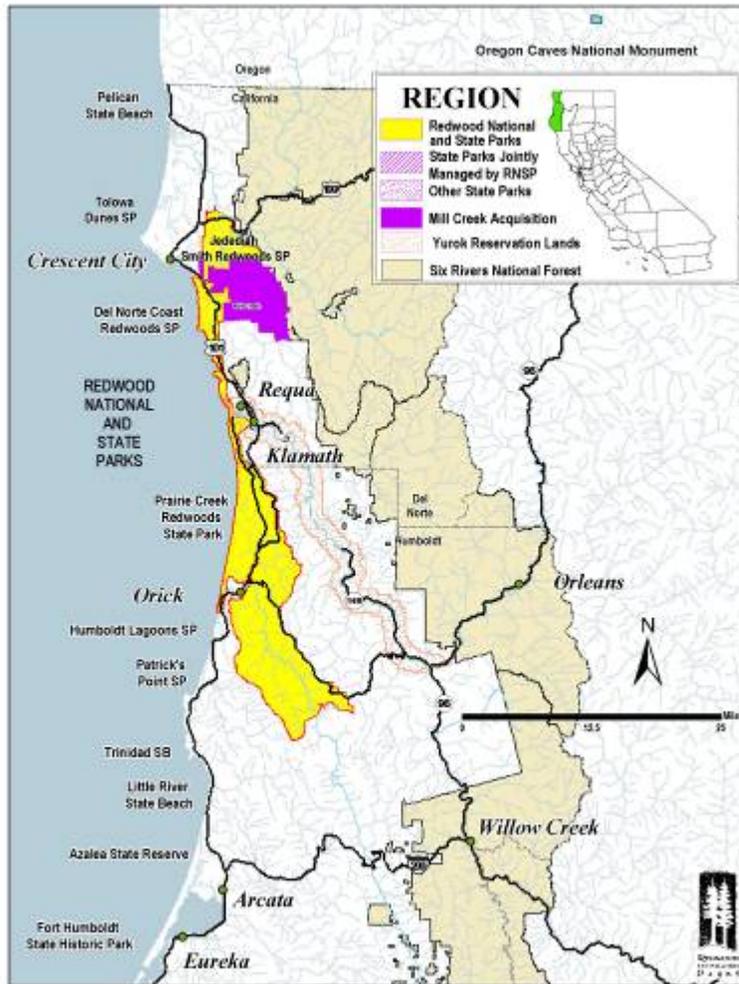
Status, Habitat Relations and Interspecific Species Associations of Coastal Cutthroat Trout in Two Managed Tributaries to the Smith River, California

Chris Howard

Mill Creek Fisheries Program



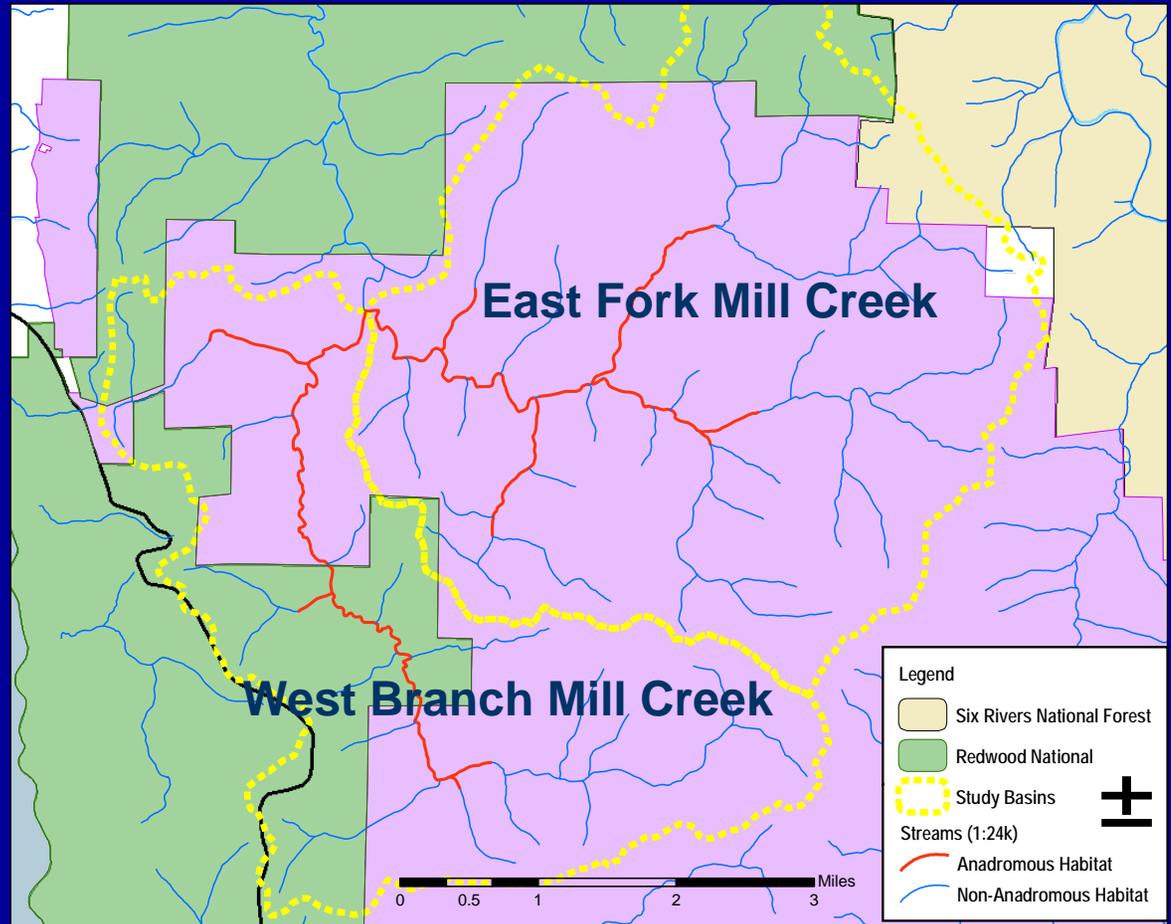
Location



Surrounding Properties

Watershed Delineation & Available Anadromous Habitat

- **Watershed Size**
 - West Branch
2,882 hectares
 - East Fork
4,263 hectares
- **Anadromous Habitat**
 - West Branch
10,532 meters
 - East Fork
11,799 meters



Program Description

- Stream Habitat Surveys (1994 and 2002)
- Adult escapement surveys – Spawning surveys for Chinook and coho salmon (1993 through 2004).
- Juvenile estimates – emphasis on coho salmon, periodic estimates for steelhead and cutthroat trout (1994 through 2005).
- Smolt outmigrant trapping – smolt production estimates (1994 through 2005).

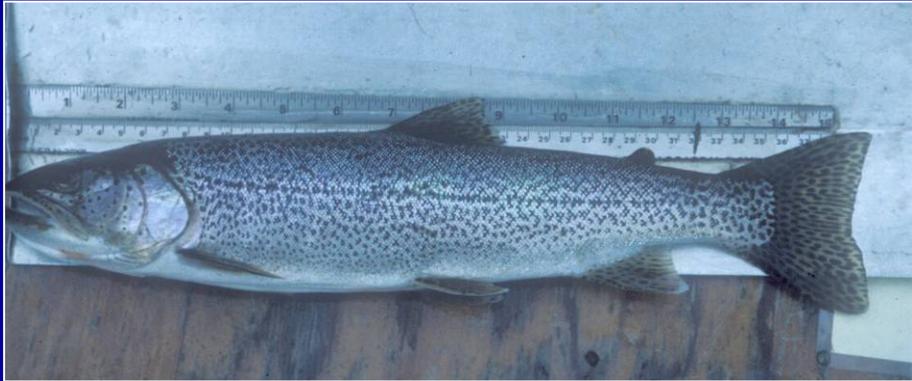


Species Composition



- Chinook Salmon
- Coho Salmon
- Steelhead
- Coastal Cutthroat Trout
- Chum Salmon
- Pacific Lamprey
- Brook Lamprey
- Klamath Small Scale Sucker
- Coast Range Sculpin
- Prickly Sculpin
- Stickleback

Coastal Cutthroat Trout

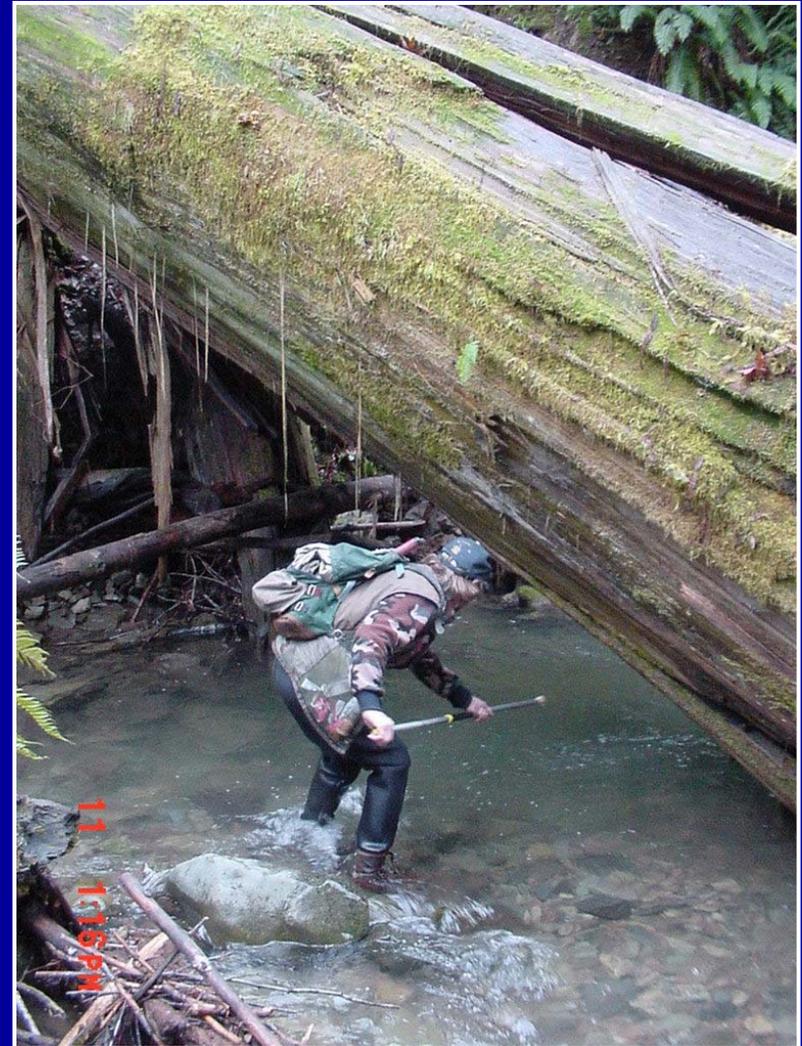


- Resident, Anadromous, Fluvial Life and Hybrids
- Many sizes and looks
- 1 to 3 year freshwater residency
- Size Ranges
 - Adults 170-420 mm
 - Pre-smolt 56-125 mm
 - Smolts 96-138 mm

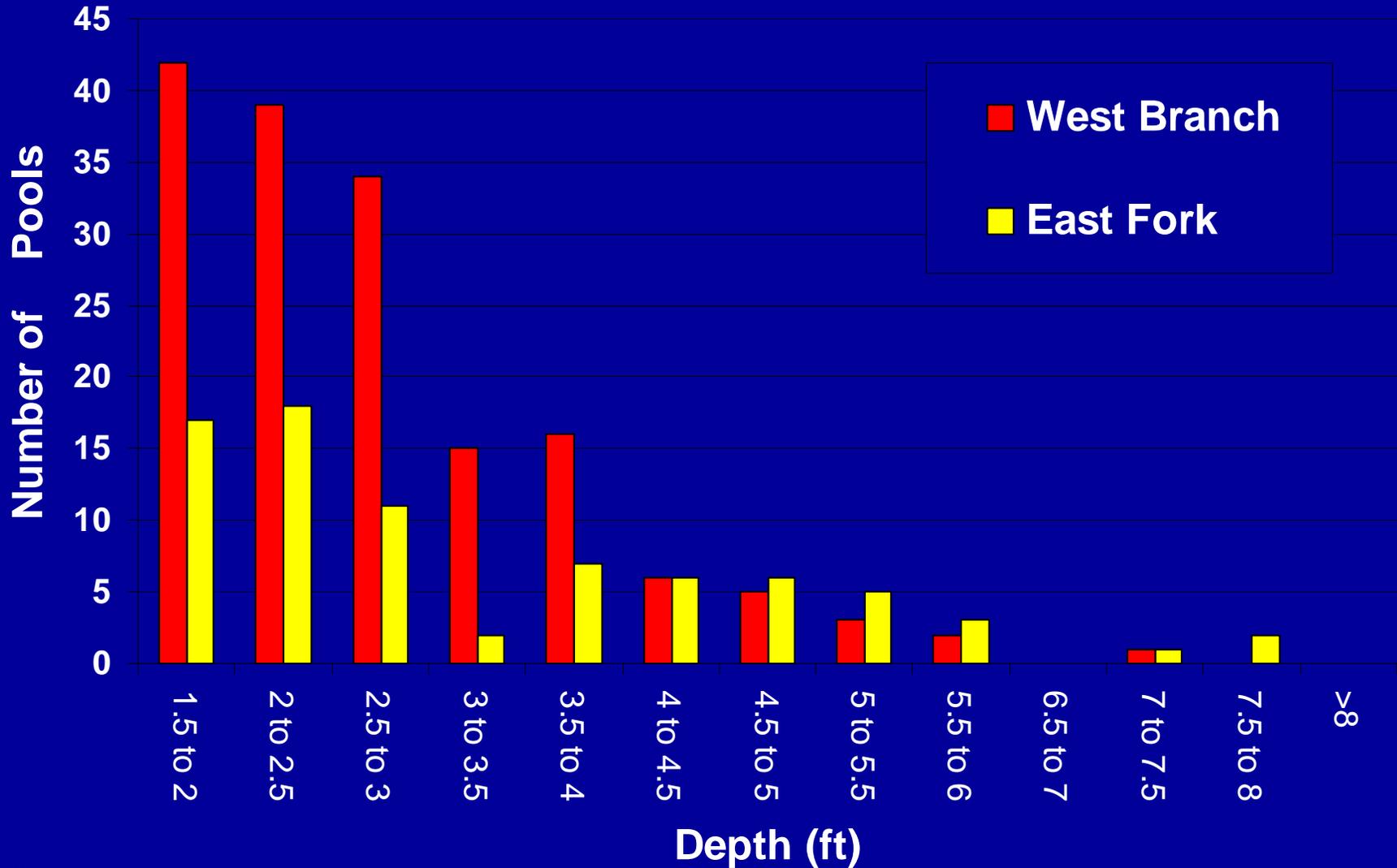


Stream Gradient, Canopy Cover, & Percent Pools

- **Stream Gradient (Anadromy)**
 - West Branch – $<1\%$
 - East Fork – $<1\%$
- **Mean Canopy Cover**
 - West Branch 62%
 - East Fork 81%
- **Percent Pools by Length**
 - West Branch 48%
 - East Fork 28%



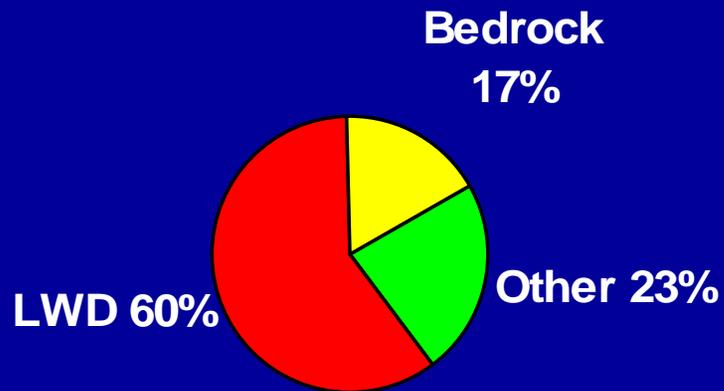
Pool Frequency and Depth



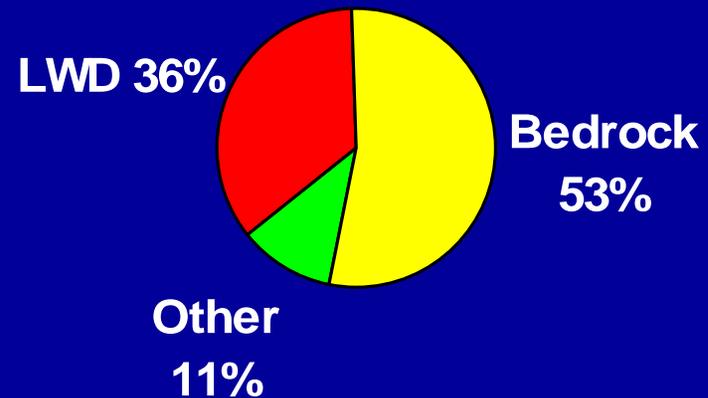
Ozaki et al. 2002

Pool Formation

West Branch Mill Creek



East Fork Mill Creek



Land Use History

- **1908** – Timber harvest began in West Branch Mill Creek.
- **1908-1922** – Logs transported from West Branch Mill Creek to Crescent City.
- **1920's** – Harvest ceased in West Branch Mill Creek.
- **1941** – Stimson Lumber Co. purchased West Branch and East Fork of Mill Creek.
- **1954** – Stimson Lumber Co. resumed timber harvest in West Branch and East Fork Mill Creek.



Land Use History

- **1964** – Stimson Lumber Co. opened old-growth processing facilities.
- **1968** – Redwood National and State Parks established
- **1970 - 1980's** – California Department of Fish and Game mandated a wood removal program.
- **1974** – California Forest Practice Act implemented
- **1993** – Stimson Lumber Co. closed mill.
- **2001** – Mill Creek property acquired by Save the Redwoods League.



*1964 Photo first year of mill operation

Rate of Harvest

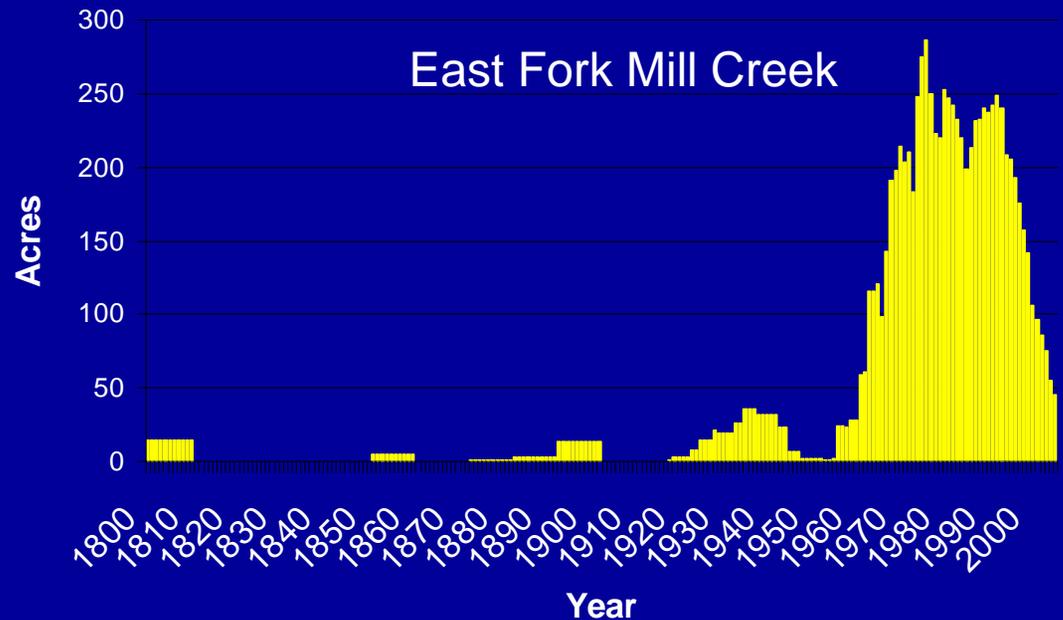
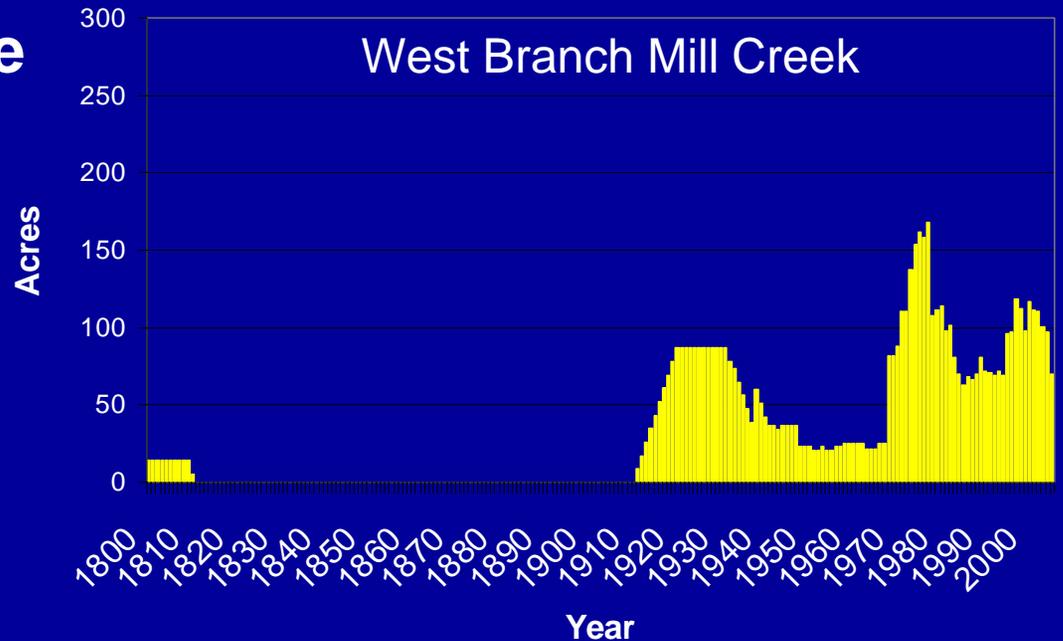
Ten Year Moving Average

1910 -1930 harvest rate was determined through aerial photos, dividing total acreages cut by 20 years of harvest.

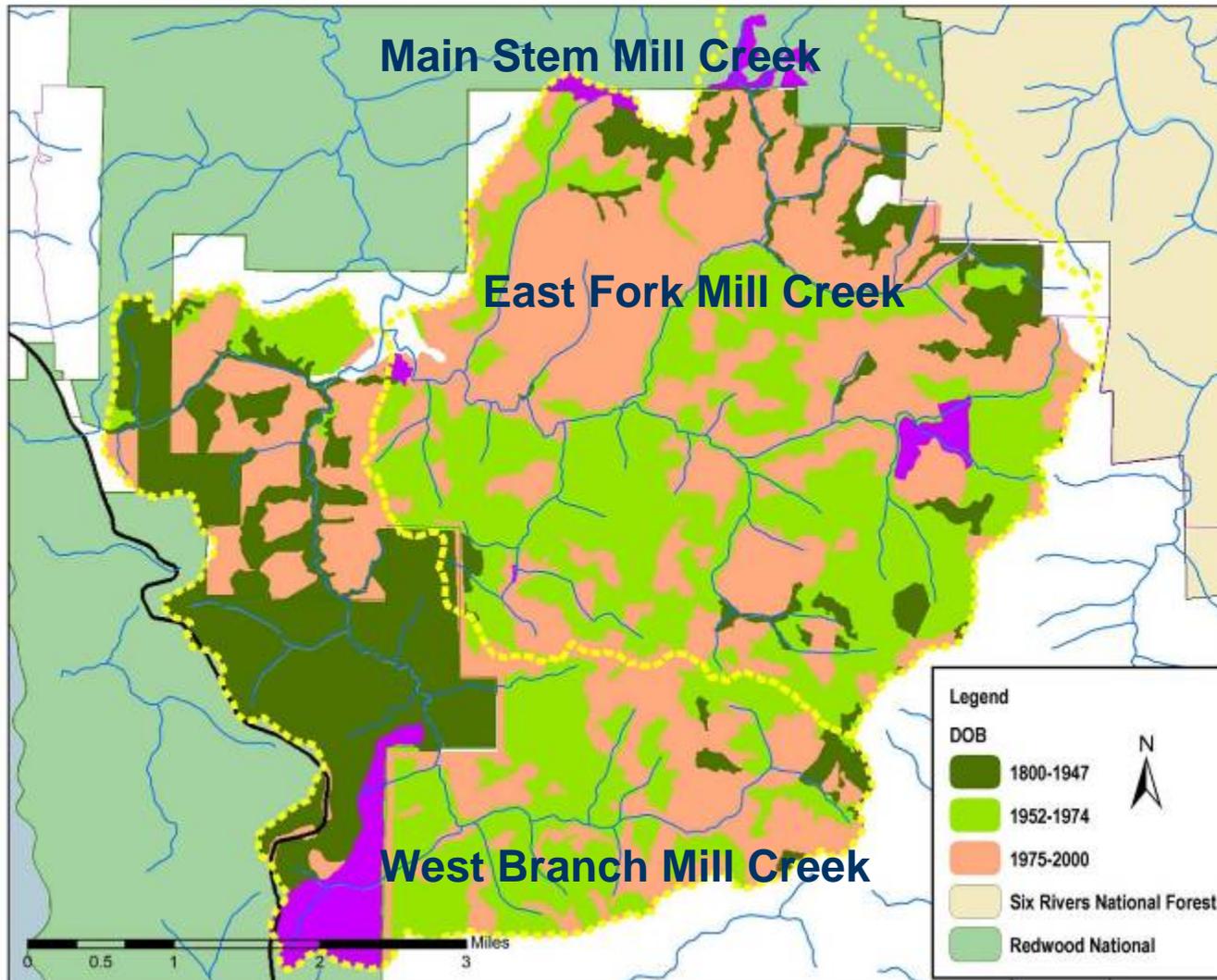
Operations in the East Fork Mill Creek where ramped up to feed the mills demand for 60-65 million board feet a year.

Areas harvested around the East Fork Mill Creek between the 1970's and 1980's were located adjacent to anadromous reaches.

State policies regarding fish habitat demanded "stream cleaning" to allow for increased fish passage between 1970's and 1980's.

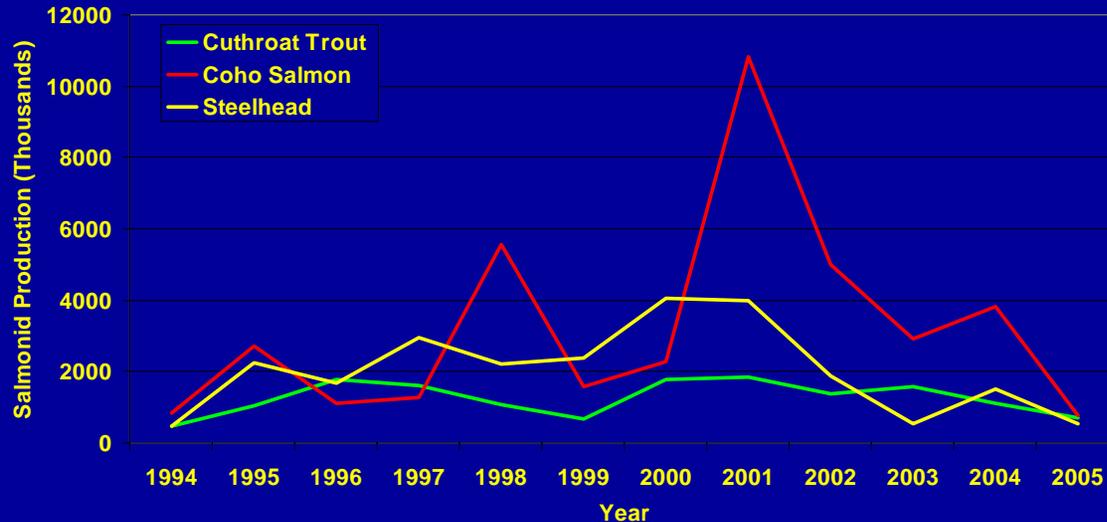


Harvest History



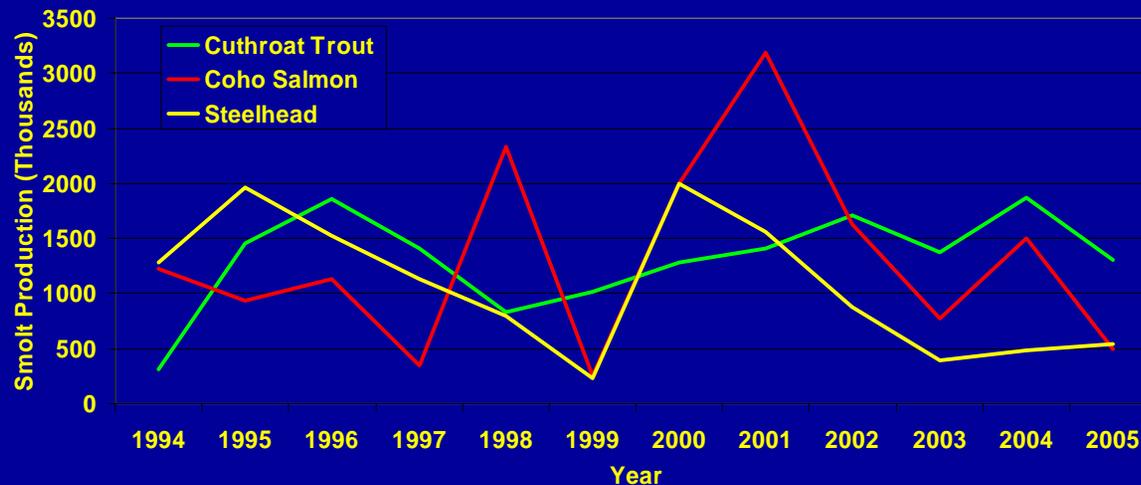
Yearly Smolt Production

West Branch Mill Creek



- West Branch steelhead and cutthroat smolt production steady trend, while coho production is slowly taking a lead.
- East Fork cutthroat, steelhead and coho production a generally rolling back and forth with most up and down shifts in production being felt by all species.

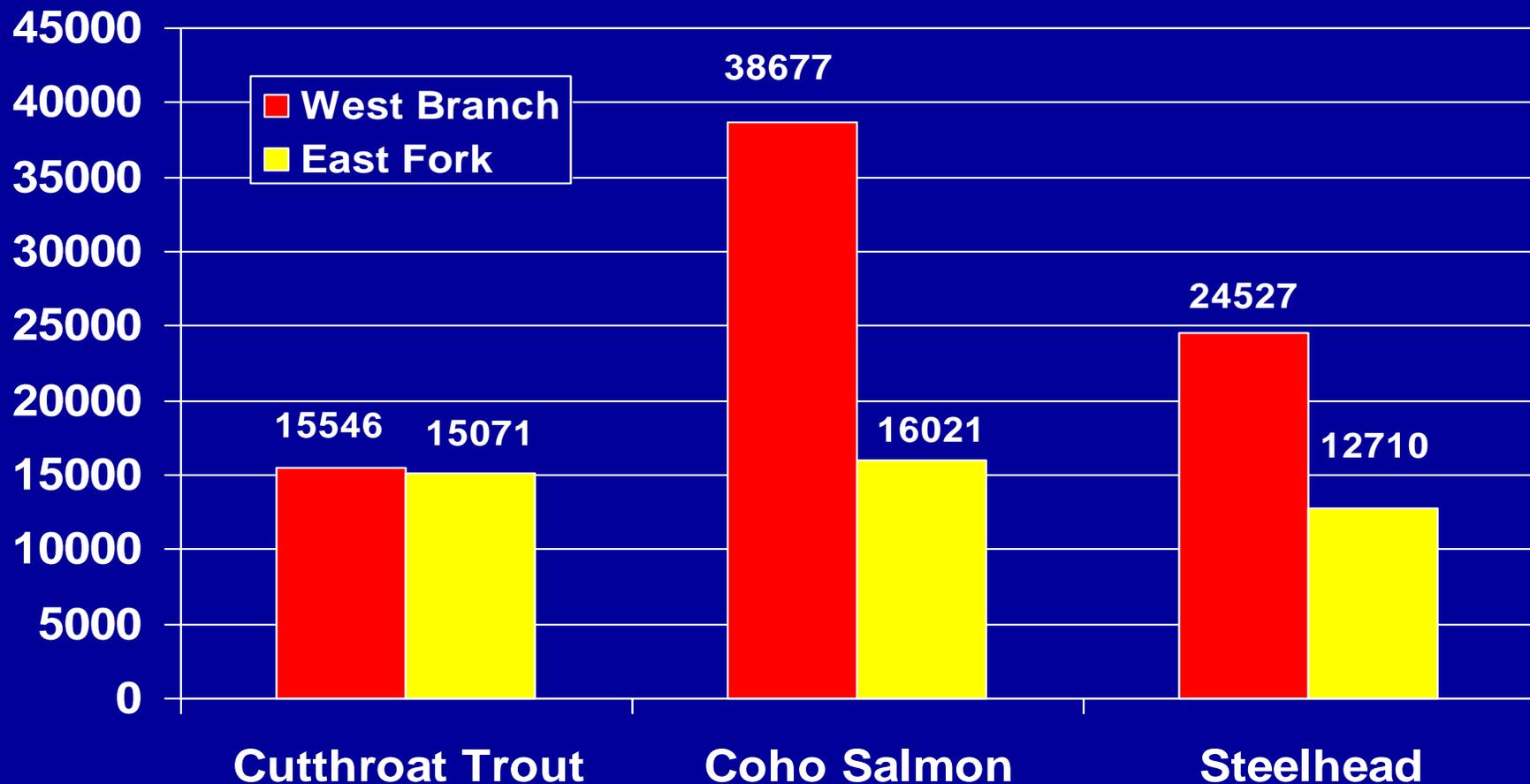
East Fork Mill Creek



Interspecific competition may be more of a factor affecting smolt production within the West Branch, where habitat availability may place all species on more of an even playing field in the East Fork.

Salmonid Smolt Production

Eleven Year Cumulative Salmonid Smolt Production (1994-2005)
in the West Branch and East Fork of Mill Creek



Conclusion

- Differences in harvest history, harvest method and time entry within the two tributaries reflect the observed variation in pool frequency and type.
- Early entry into the West Branch, coupled with its variable harvest history has allowed for a longer recovery period, potentially resulting in observed increases in smolt production.
- Late entry into the East Fork, coupled with increase demands for wood fiber, limited riparian protections and stream cleaning policy, may have slowed habitat recovery and subsequent smolt production.
- Cutthroat trout utilizing the two tributaries for reproduction and rearing are able to take advantage of various ranges and qualities of habitat, and maintain relatively stable populations that are capable of replacing themselves.



Paul Albro 2002

Thank you to the California Department of Fish and Game and California State Parks



Paul Albro