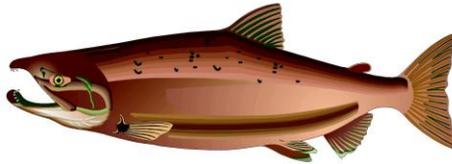


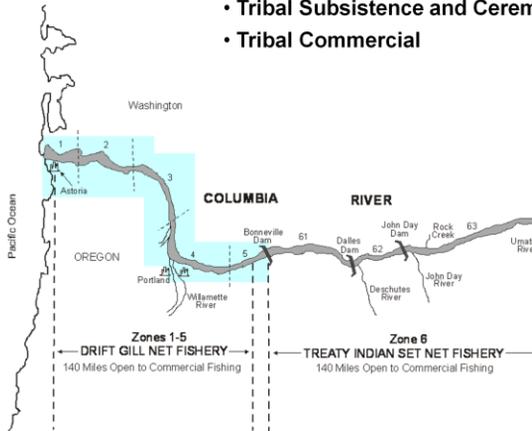
**Historic trends in size and age of
Chinook captured in Columbia River
mainstem fisheries**



Kathryn Kostow* and Kevleen Melcher
ODFW Columbia River Management

Columbia River Mainstem Fisheries:

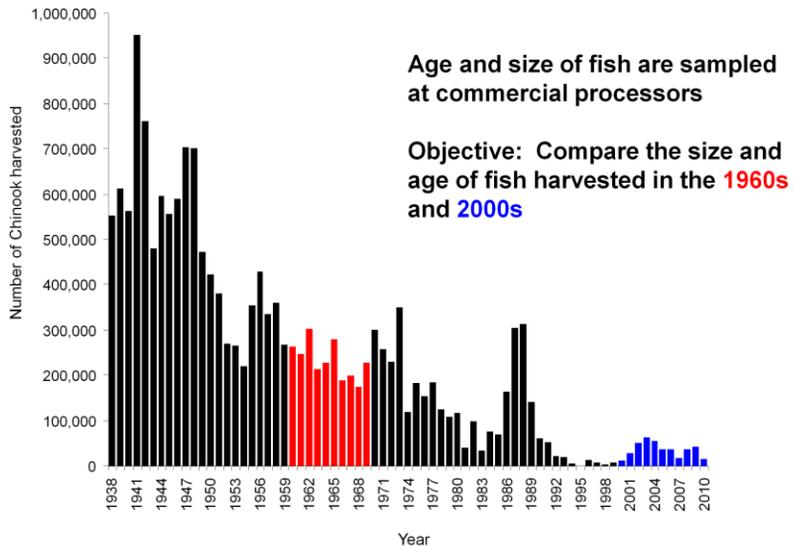
- **Non-tribal Commercial**
- Non-tribal Sport
- Tribal Subsistence and Ceremonial
- Tribal Commercial



Non-tribal fisheries in place since 1860s

Tribal fisheries in place prior to European arrival

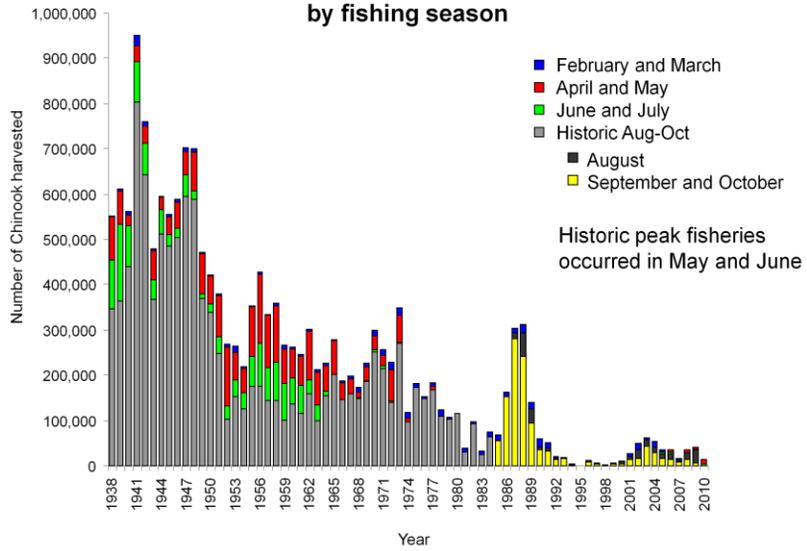
Chinook harvest in commercial fisheries below Bonneville Dam



**Chinook harvest in commercial fisheries
below Bonneville Dam**

- **This data measures the size and age of fish that were removed by the fishery**
 - **Fork Length (weight also measured, correlates with length)**
 - **Total Age**
- **Fisheries may occur from February through early October**
- **Divided into five “fishing seasons”:**
 - **“Winter” season in February and March**
 - **“Spring” season in April and May**
 - **“Summer” season in June and July**
 - **“Early Fall” season in August**
 - **(Break, first two weeks of September)**
 - **“Late Fall” season in late September and early October**
- **“Winter”, “Spring” and “Summer” seasons highly variable over the years; “Fall” seasons more consistent**

Chinook harvest in commercial fisheries below Bonneville Dam by fishing season



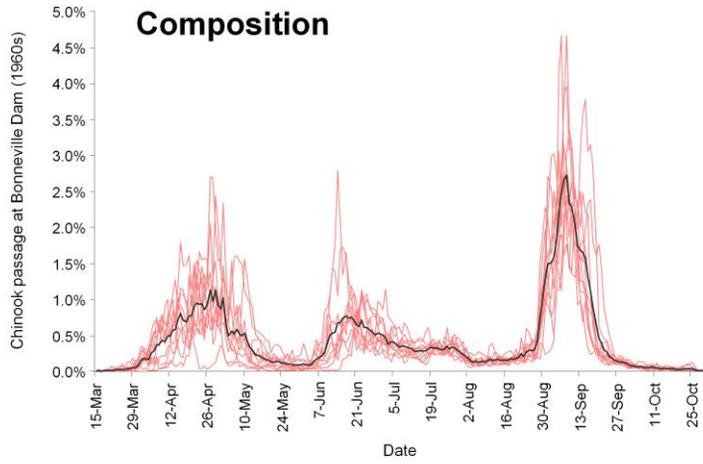
Objective:

**Compare the size and age of fish harvested
in the 1960s and 2000s**

**NOT a simple question
Many factors contribute to variation**

Factors that contribute to variation in size and age:

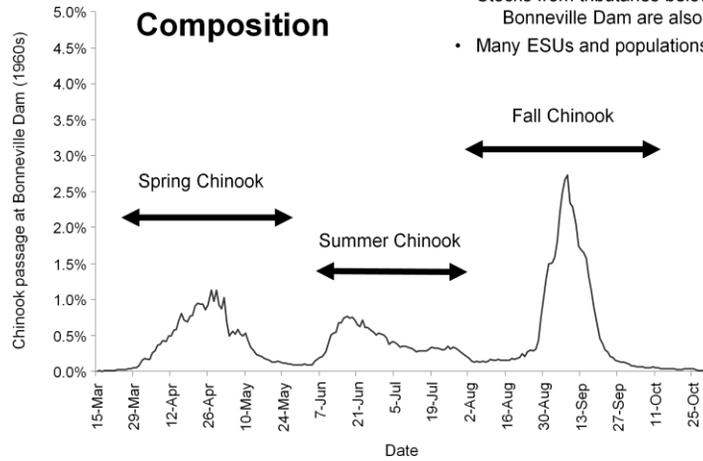
Stock Composition

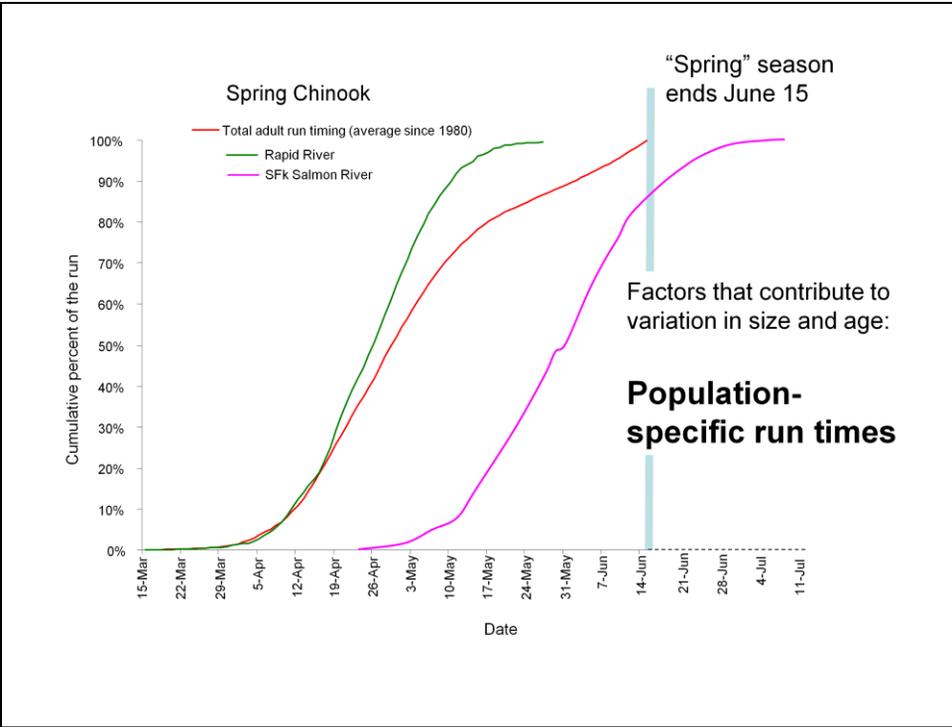


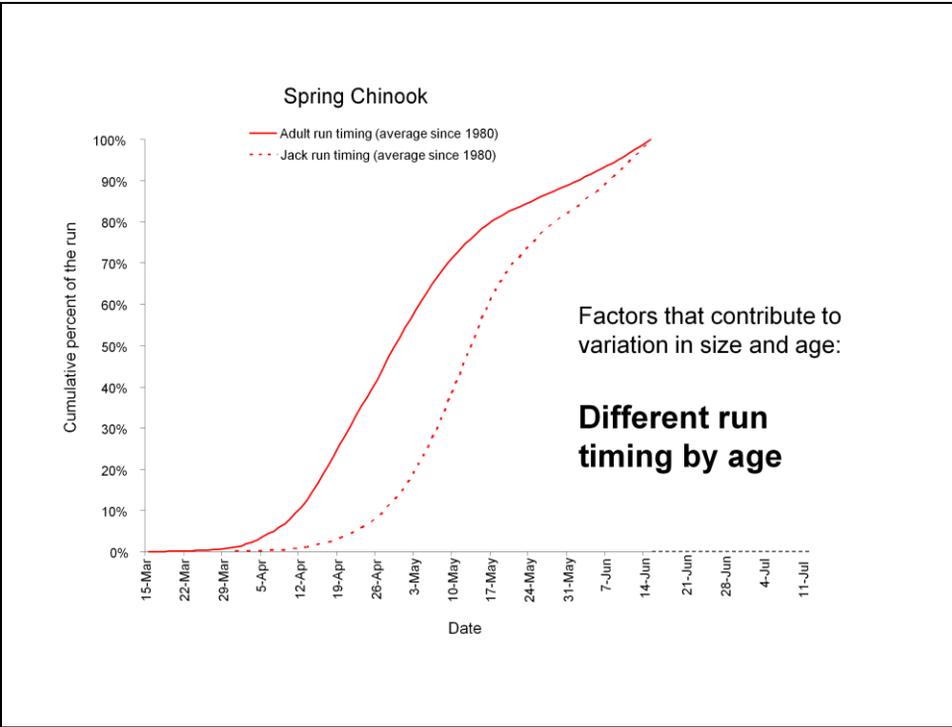
Factors that contribute to variation in size and age:

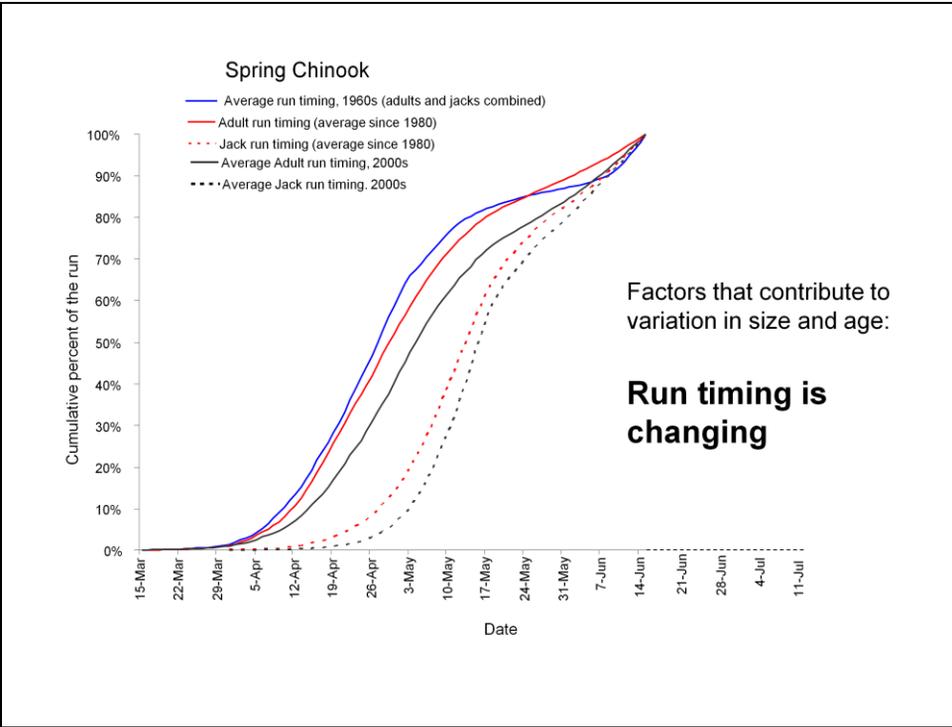
- Run timing at Bonneville Dam divided into three broad "stock" groups
- Delay between timing through the fishery and passage at Bonneville
- Stocks from tributaries below Bonneville Dam are also in the fishery
- Many ESUs and populations

Stock Composition

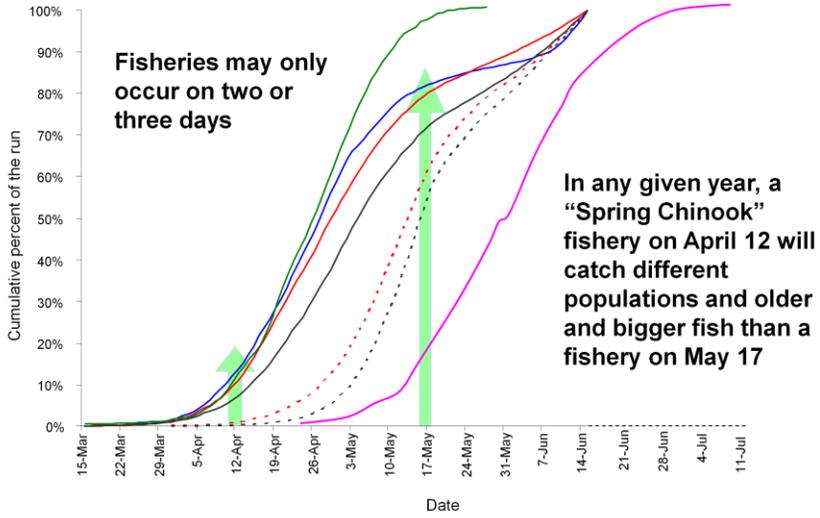






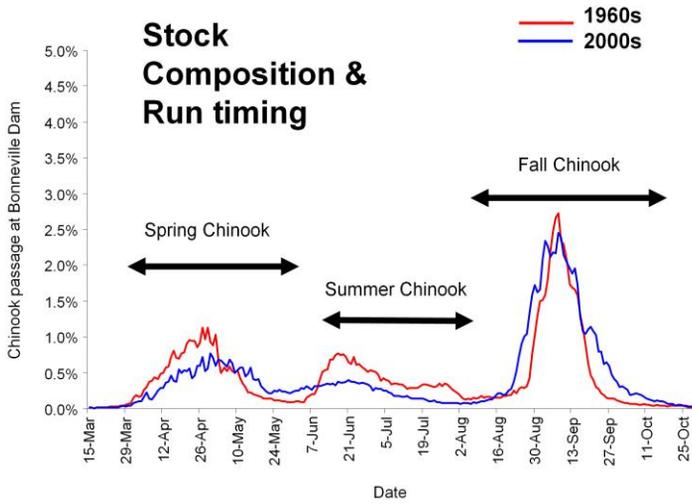


Why is run timing interesting?



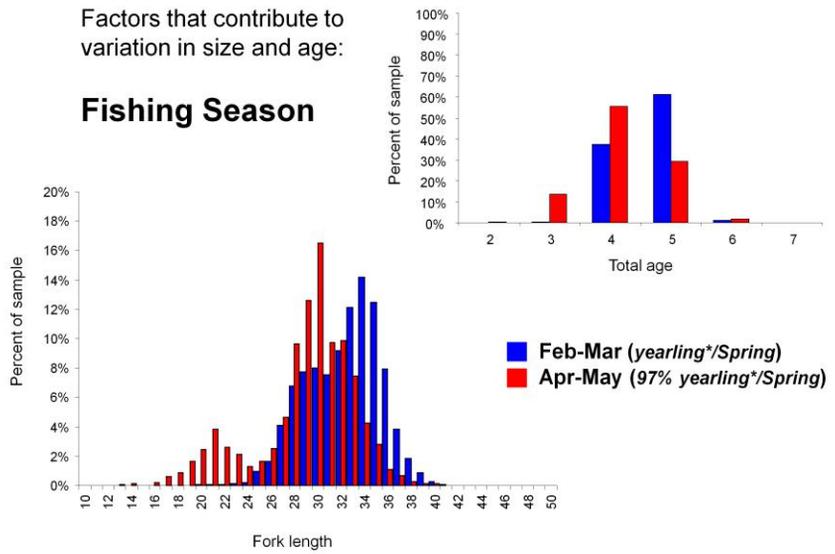
Factors that contribute to variation in size and age:

Stock Composition & Run timing



Factors that contribute to variation in size and age:

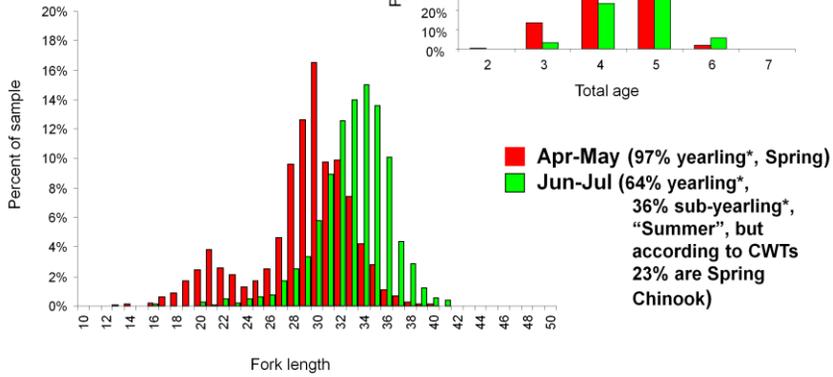
Fishing Season



2000s data
*1960s freshwater age

Factors that contribute to variation in size and age:

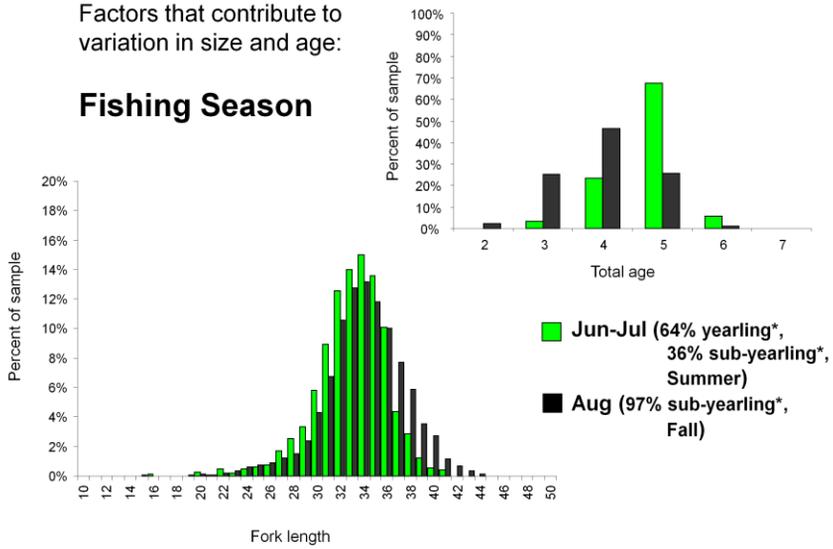
Fishing Season



2000s data
*1960s freshwater age

Factors that contribute to variation in size and age:

Fishing Season

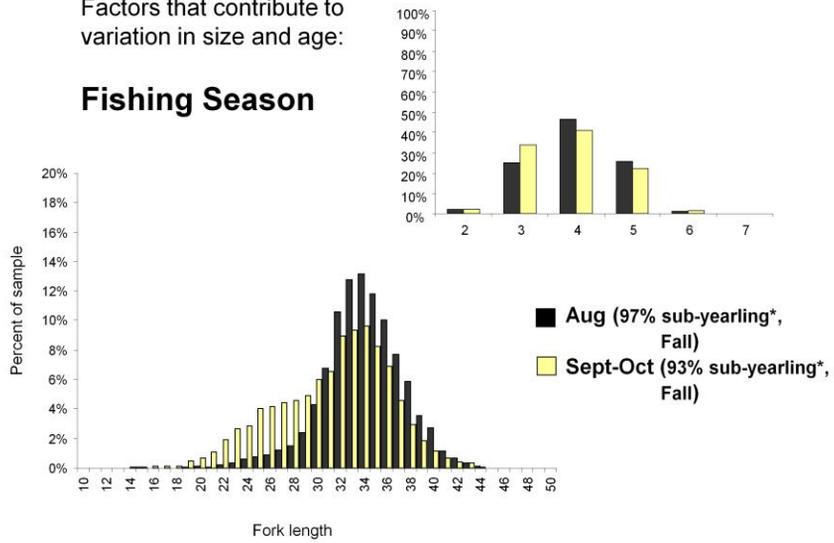


■ Jun-Jul (64% yearling*, 36% sub-yearling*, Summer)
■ Aug (97% sub-yearling*, Fall)

2000s data
*1960s freshwater age

Factors that contribute to variation in size and age:

Fishing Season

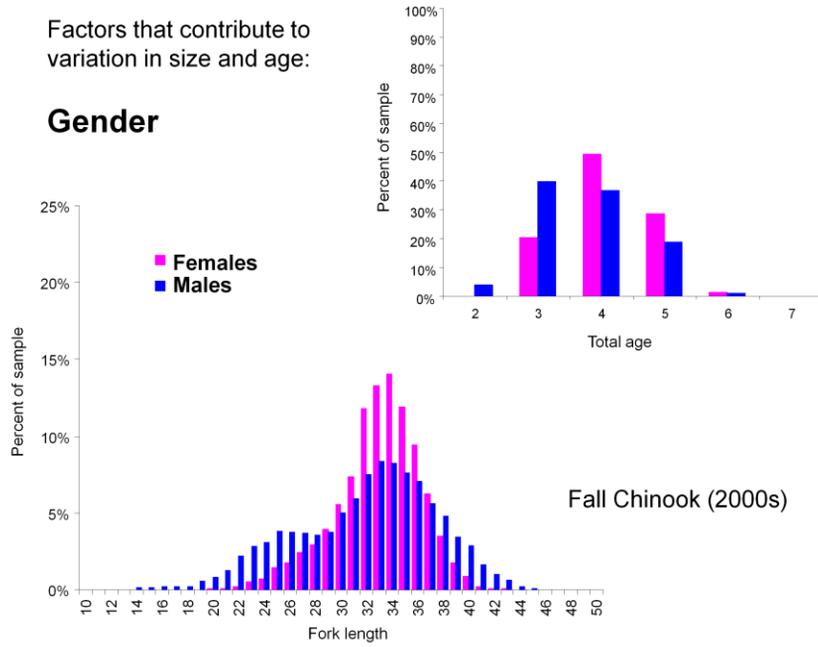


■ Aug (97% sub-yearling*, Fall)
■ Sept-Oct (93% sub-yearling*, Fall)

2000s data
*1960s freshwater age

Factors that contribute to variation in size and age:

Gender



Factors that contribute to variation in size and age:

Fishing Gear (Gill nets)

Smaller fish escape through larger mesh nets

1960s:

- No mesh restrictions
- Mesh size unknown

2000s:

Feb-Mar: 8 or 9 inch

Apr-May: variable mesh
8 or 9 inch
4.25 inch

Jun-Jul: variable mesh
8 or 9 inch
4.5 inch

Aug: 8 or 9 inch

Sept-Oct: variable mesh
8 or 9 inch
6 inch

Factors that contribute to variation in size and age:

Hatchery vs Wild?

Potential differences in size, age and run timing

1960s:

- Mix of hatchery & wild fish
- Higher percent of the catch was wild fish

2000s:

Feb-Mar: Only hatchery fish

Apr-May: Only hatchery fish

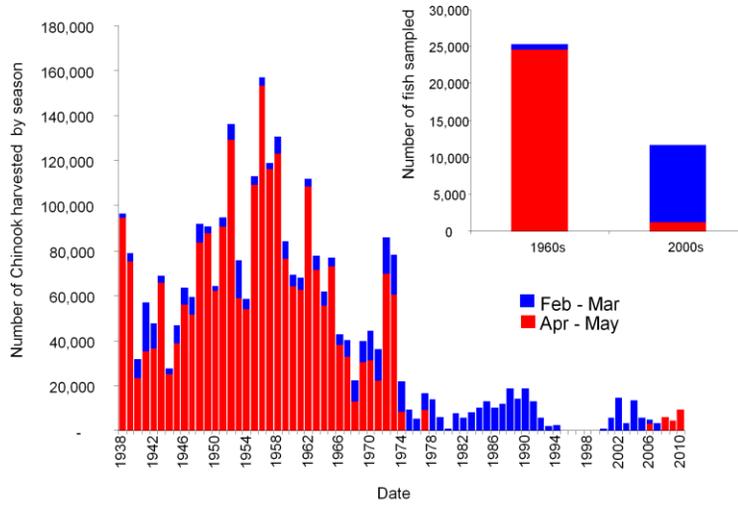
Jun-Jul: Mix of hatchery and wild

Aug: Mix of hatchery and wild

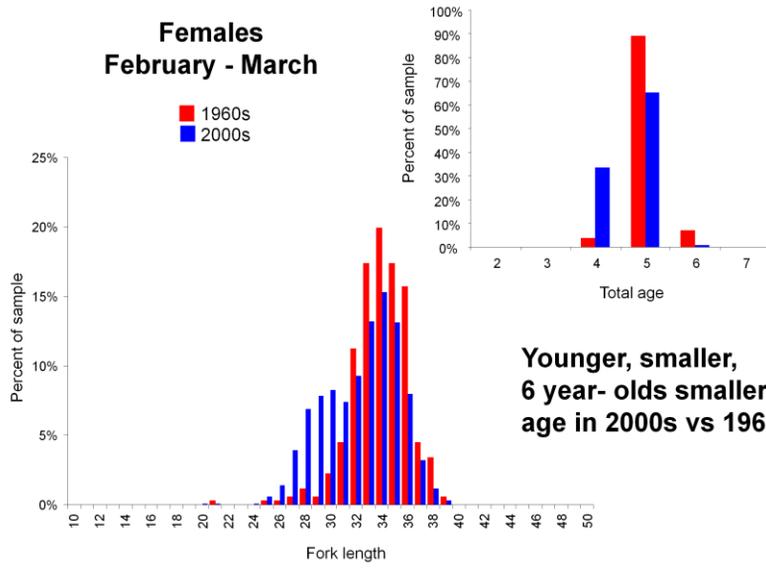
Sept-Oct: Mix of hatchery and wild

Objective:
Compare the size and age of fish harvested
in the 1960s and 2000s

Winter and Spring seasons = "Spring Chinook"

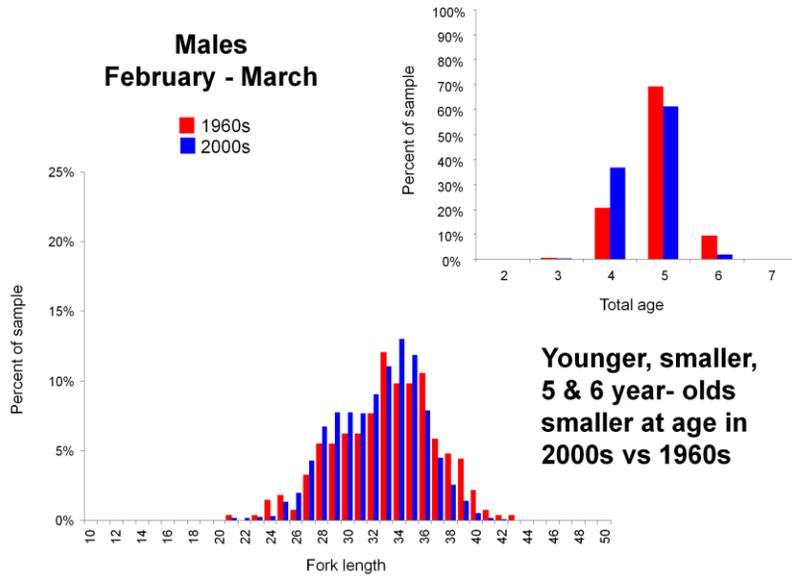


Females February - March



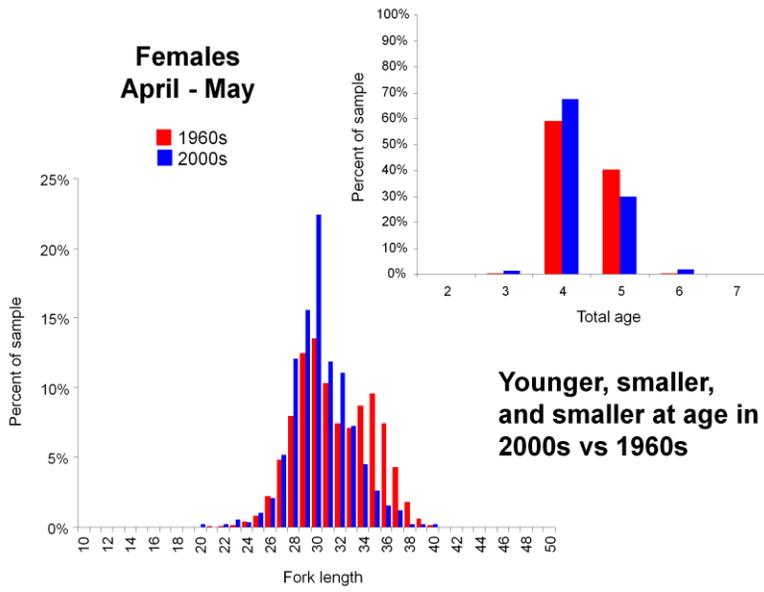
**Younger, smaller,
6 year- olds smaller at
age in 2000s vs 1960s**

Males February - March



**Younger, smaller,
5 & 6 year- olds
smaller at age in
2000s vs 1960s**

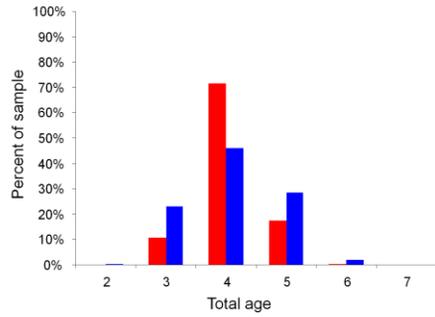
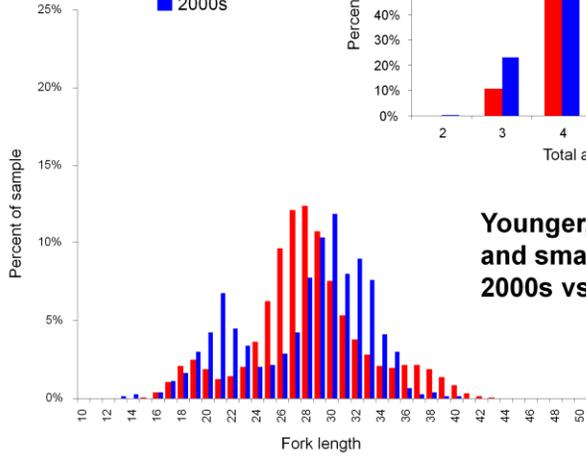
Females April - May



**Younger, smaller,
and smaller at age in
2000s vs 1960s**

**Males
April - May**

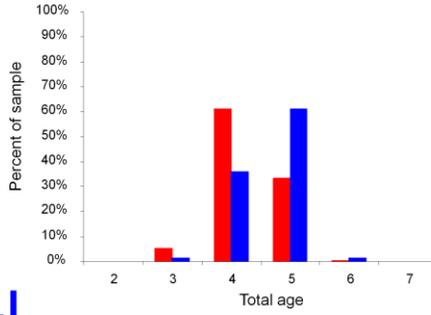
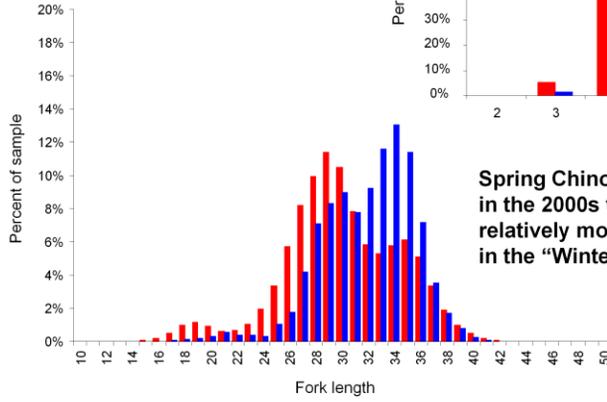
■ 1960s
■ 2000s



**Younger, smaller,
and smaller at age in
2000s vs 1960s**

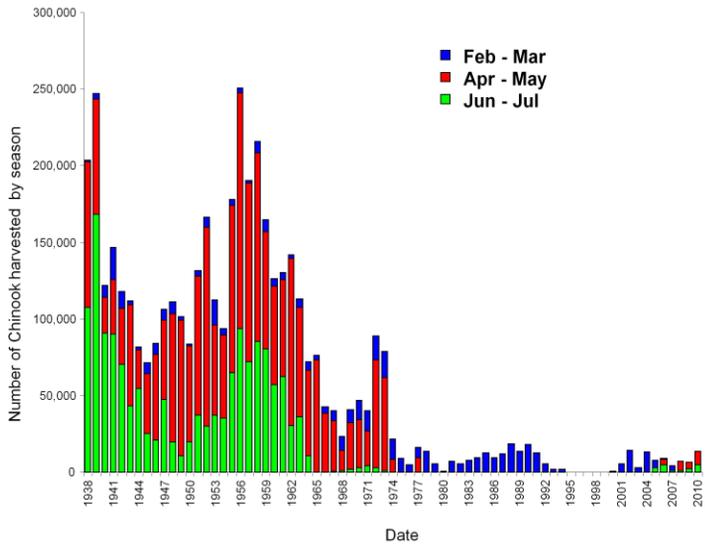
Spring Chinook overall

■ 1960
■ 2000

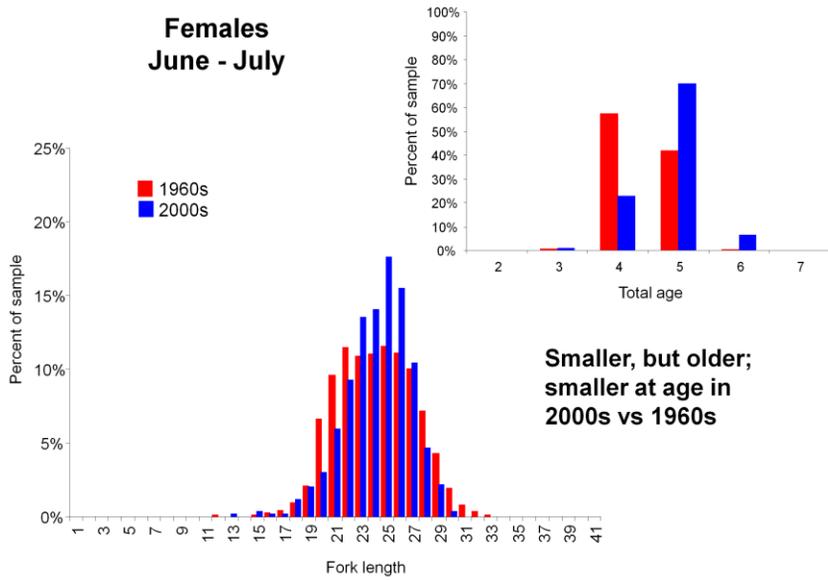


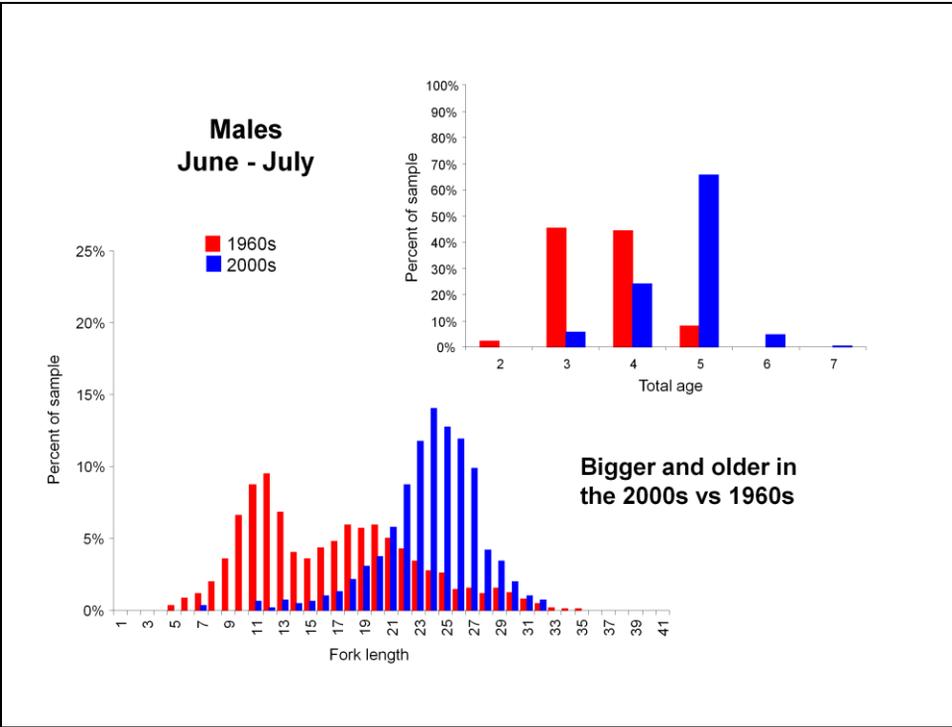
Spring Chinook were larger and older in the 2000s than in the 1960s because relatively more of the fishery occurred in the "Winter" season

“Summer” Season = mix of “spring” and “summer/fall” Chinook

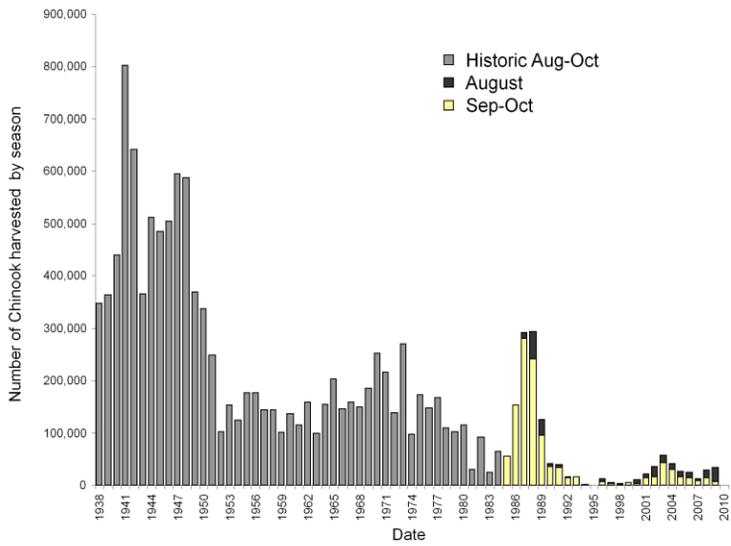


Females June - July

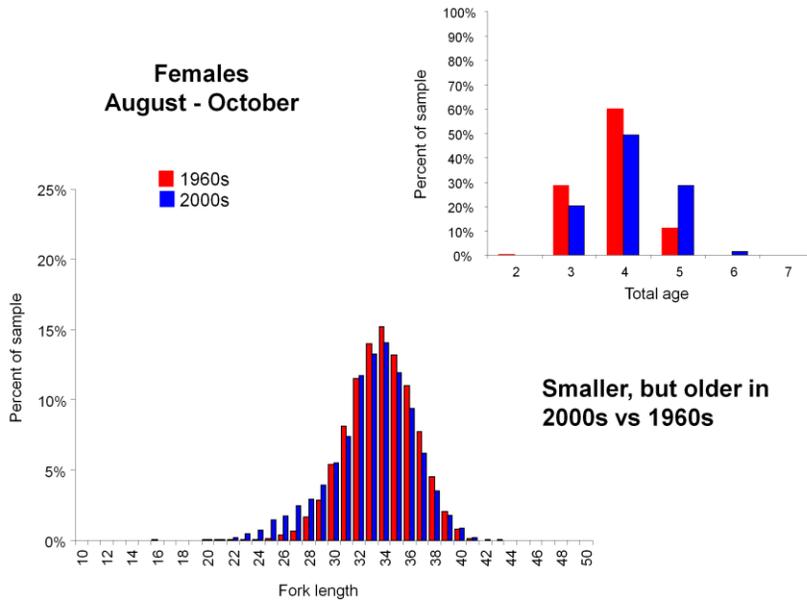


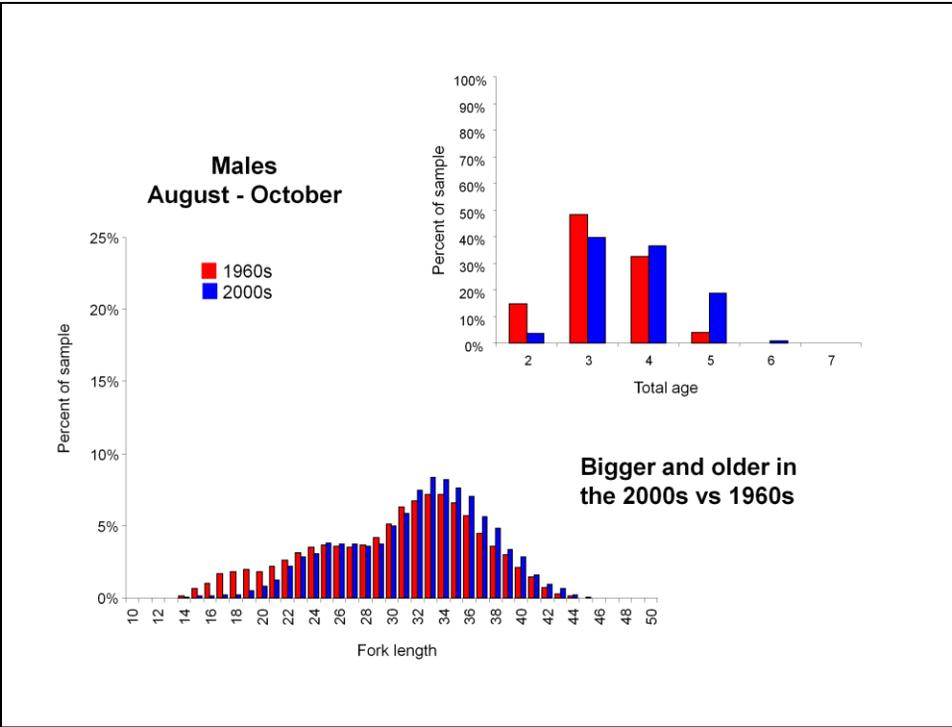


August – early October = “Fall” Chinook



Females August - October





Summary and Conclusions 1960s vs 2000s

- **The number of fish harvested has declined**
- **Run timing through the river has changed**
 - Run timing differences between populations
 - Run timing differences between ages
- **The age and size of fish caught in the fisheries has changed, but the changes are complex**
 - Spring Chinook are larger and older because of differences in run timing and the timing of the fishery
 - But after taking run time into account fish are smaller and younger
 - In the summer and fall fisheries, females are smaller but older while males are larger and older