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FISHERIES**

**Northwest  
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Science Center**



# Ecosystem Monitoring Program 2019

## Fish Community Preliminary Results

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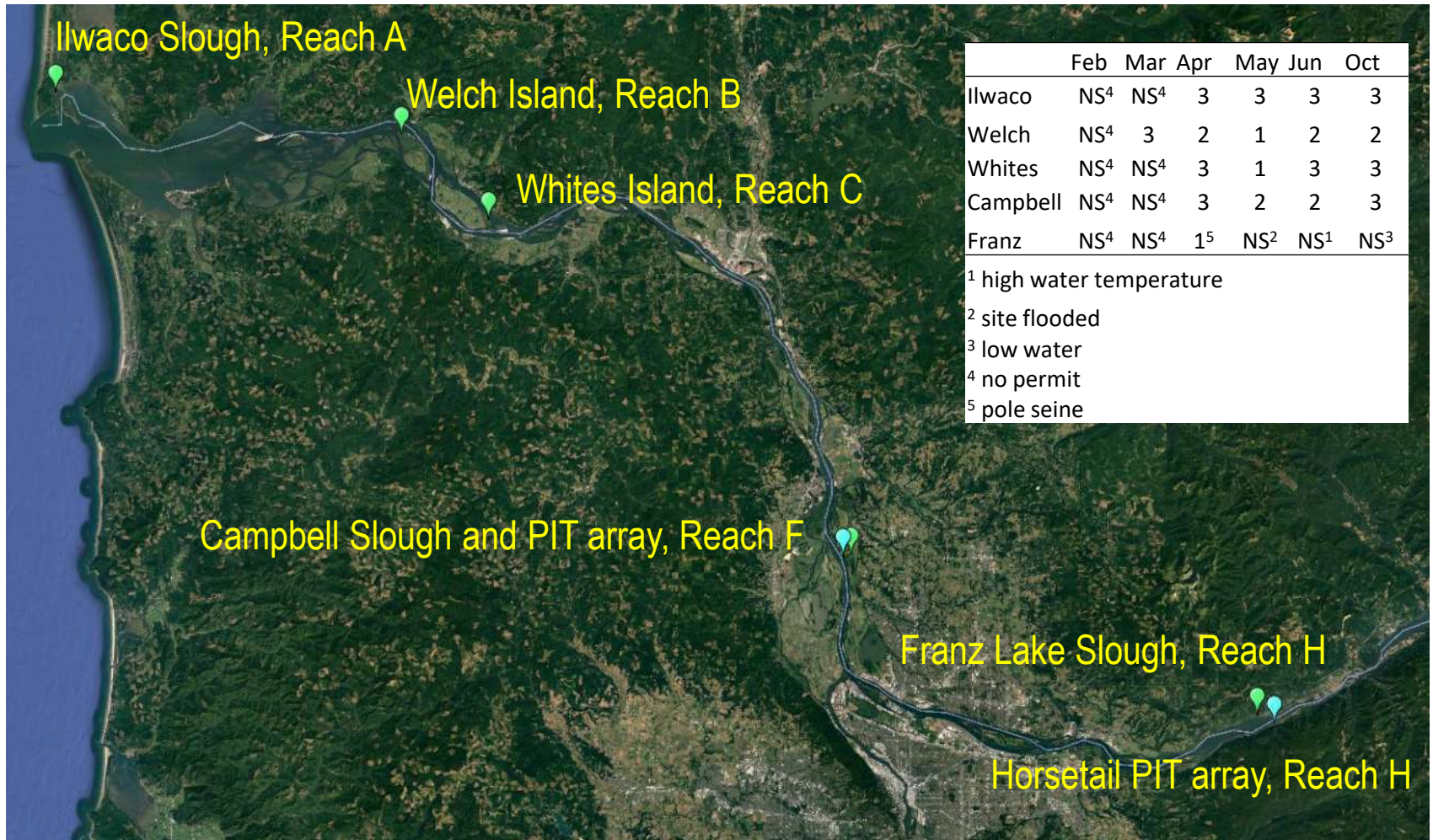
# Outline

- Sites sampled
- Physical properties
- Fish Community
- Salmonid Community
- PIT arrays

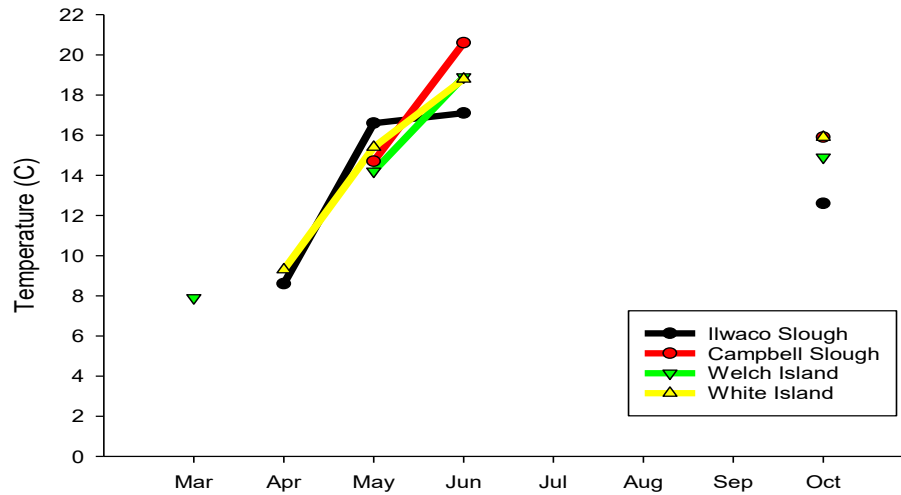




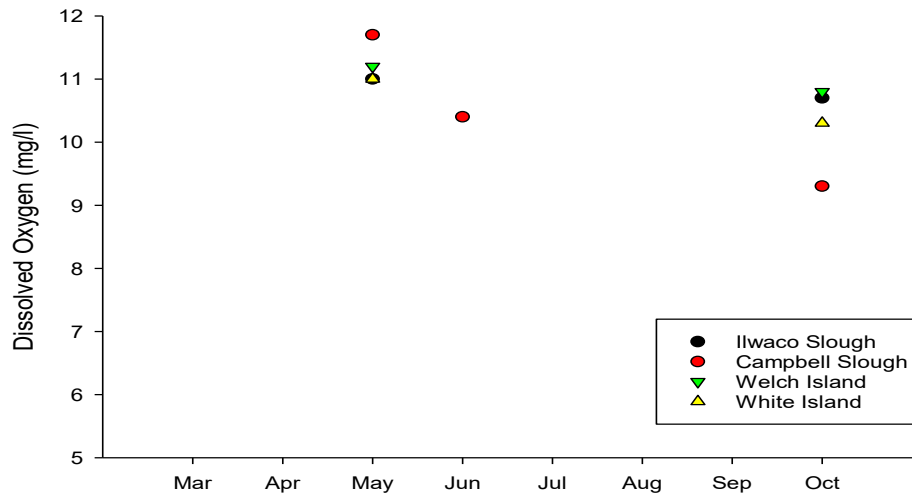
# Trend Sites and PIT Arrays



# Temperature and DO at time of sampling

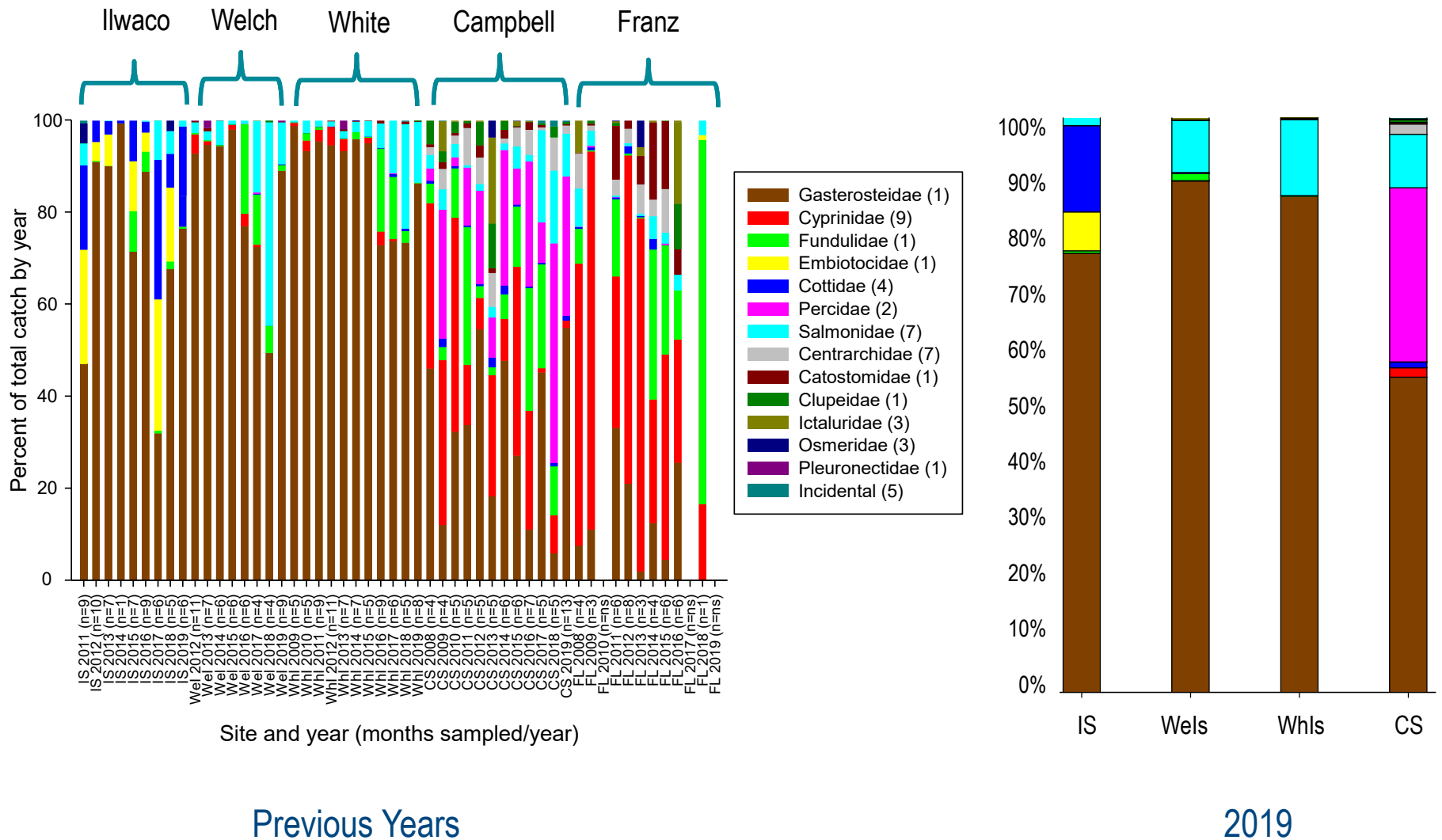


- Water temperature increasing with time
- Approaching stressful levels by June
- Drop in October

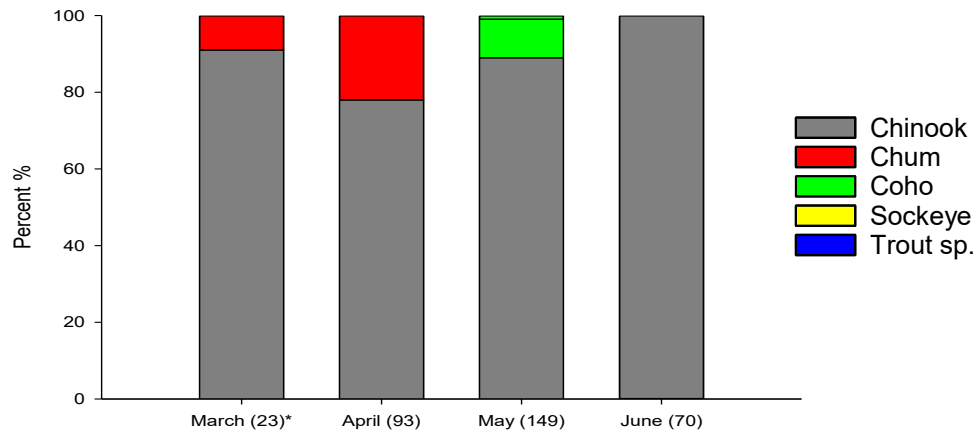


- DO readings were limited in 2019
- Levels taken at time of sampling are within parameters of adequate water quality

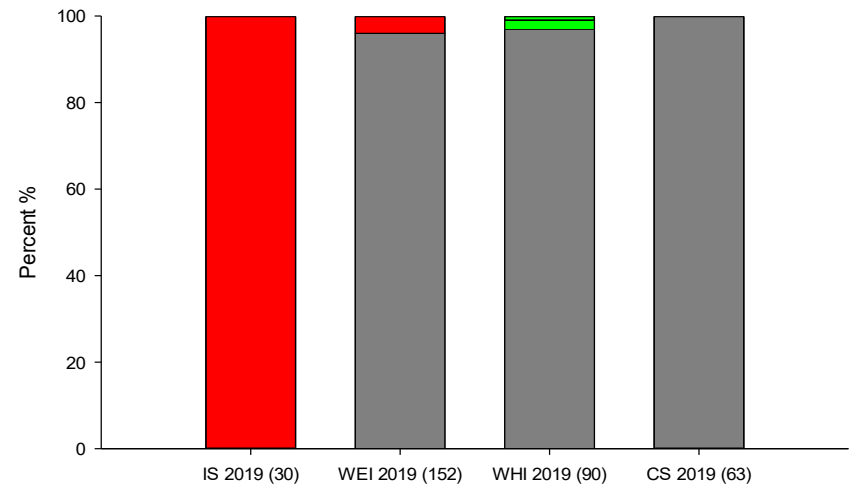
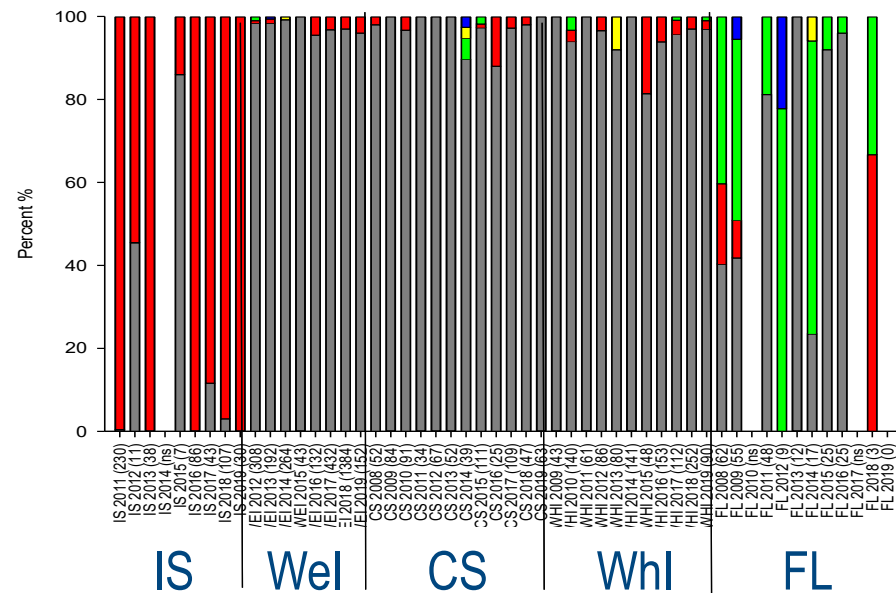
# Fish Community Composition



# Seasonal and Site Composition of Salmonids



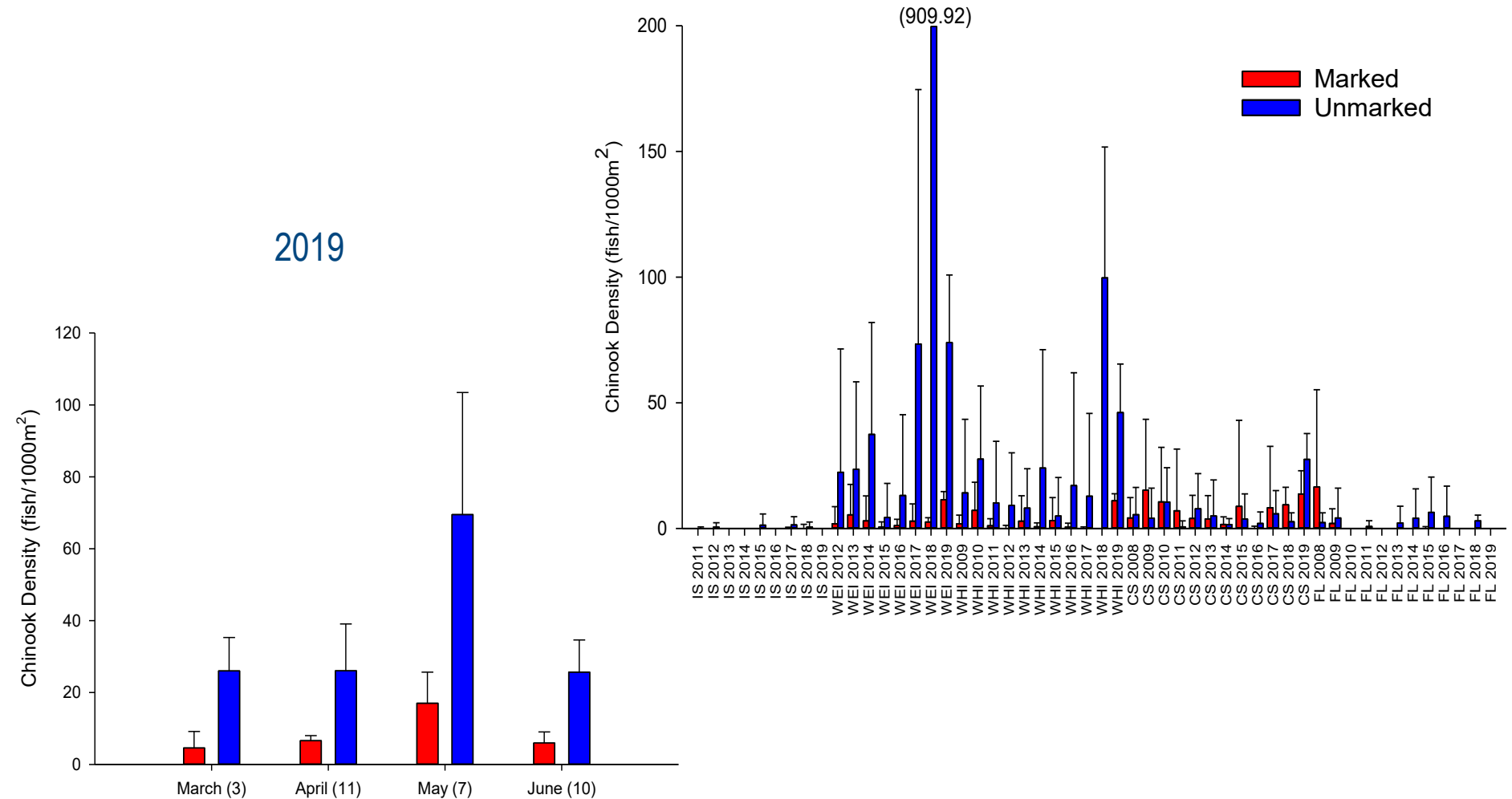
- Chinook present throughout the season
  - \* Only Welch sampled in March
- Chum presence highest in April\*
- Single subyearling coho at Whites Island
- No trout or sockeye in 2019
- Chinook present at all sites except Ilwaco
- Chum presence highest in Ilwaco
- Chinook dominated salmon catches at most sites



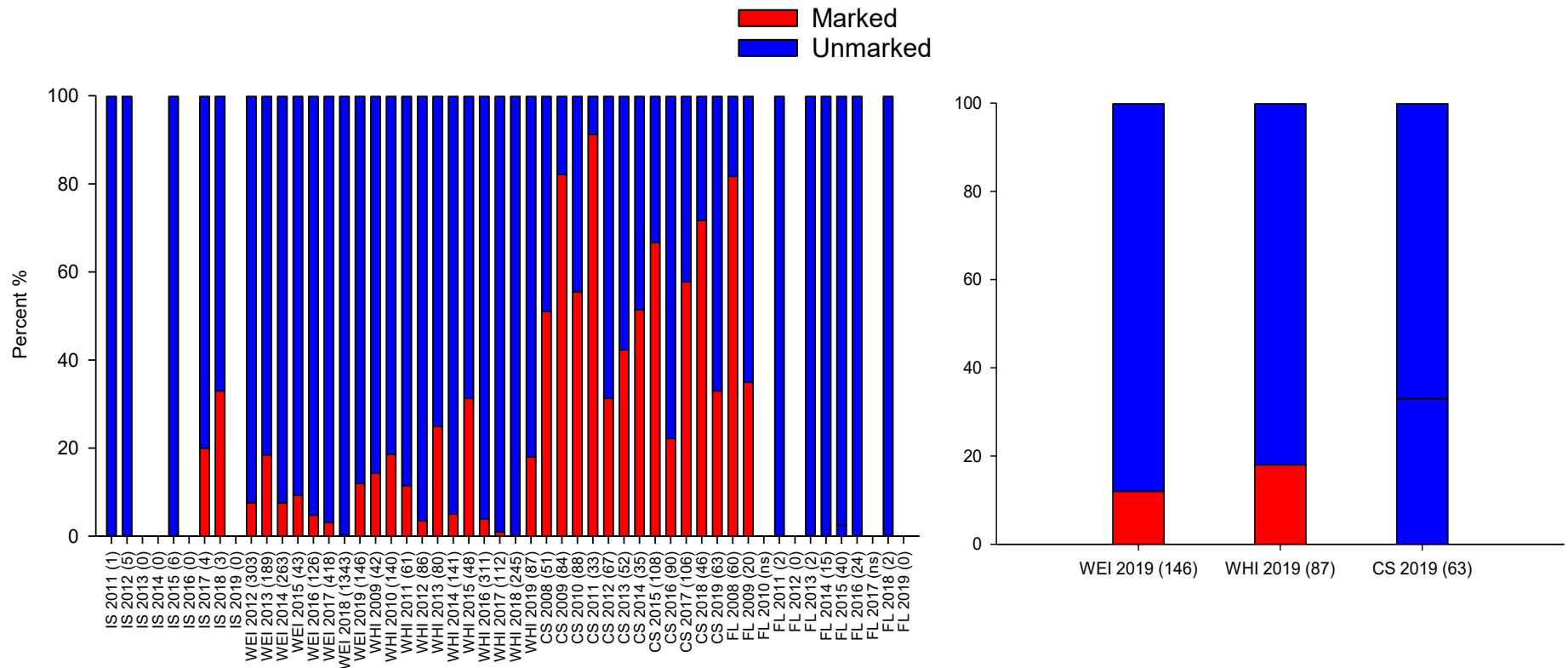
# Chinook Density

All years

2019



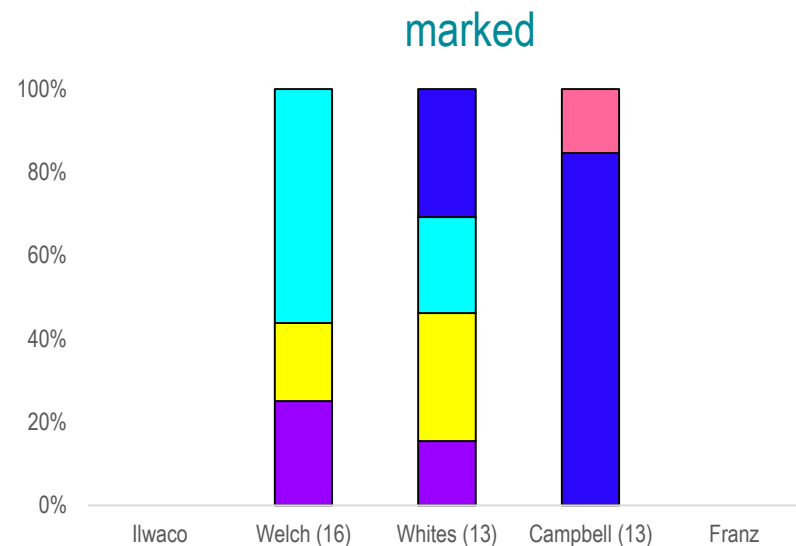
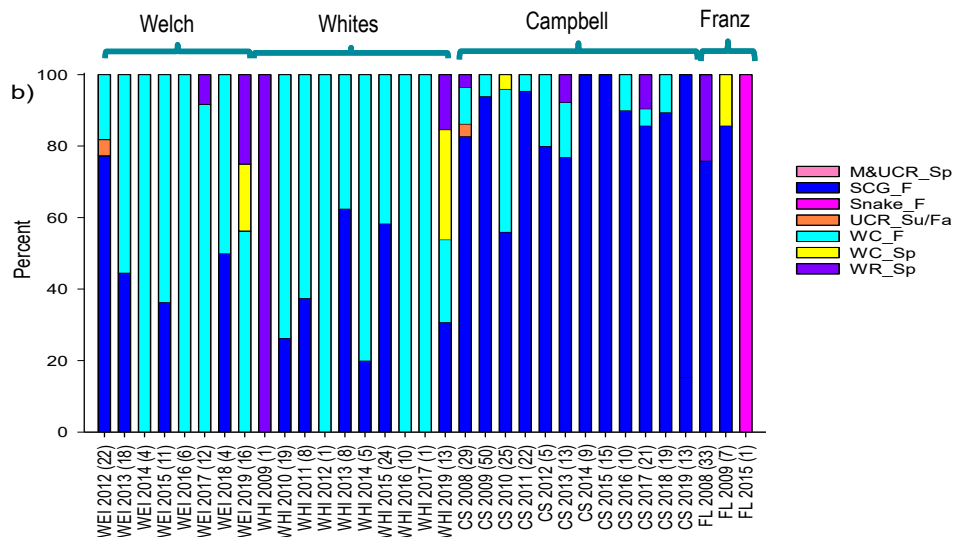
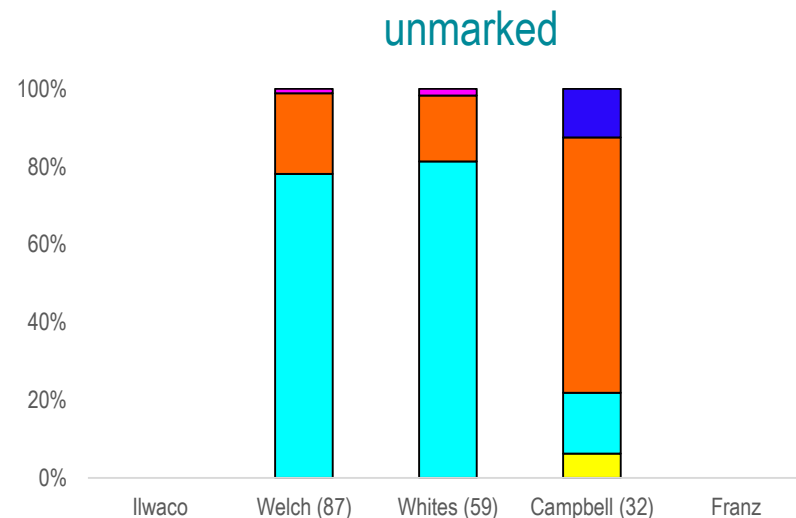
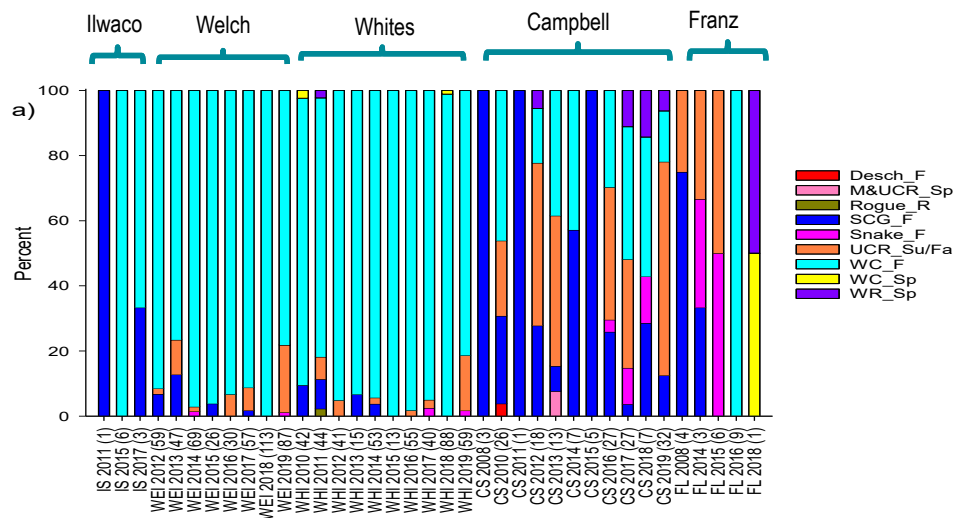
# Percentage of marked and unmarked Chinook



- Highest percentage of marked Chinook at Campbell
- Increased numbers of marked Chinook at Welch and White compared to 2018

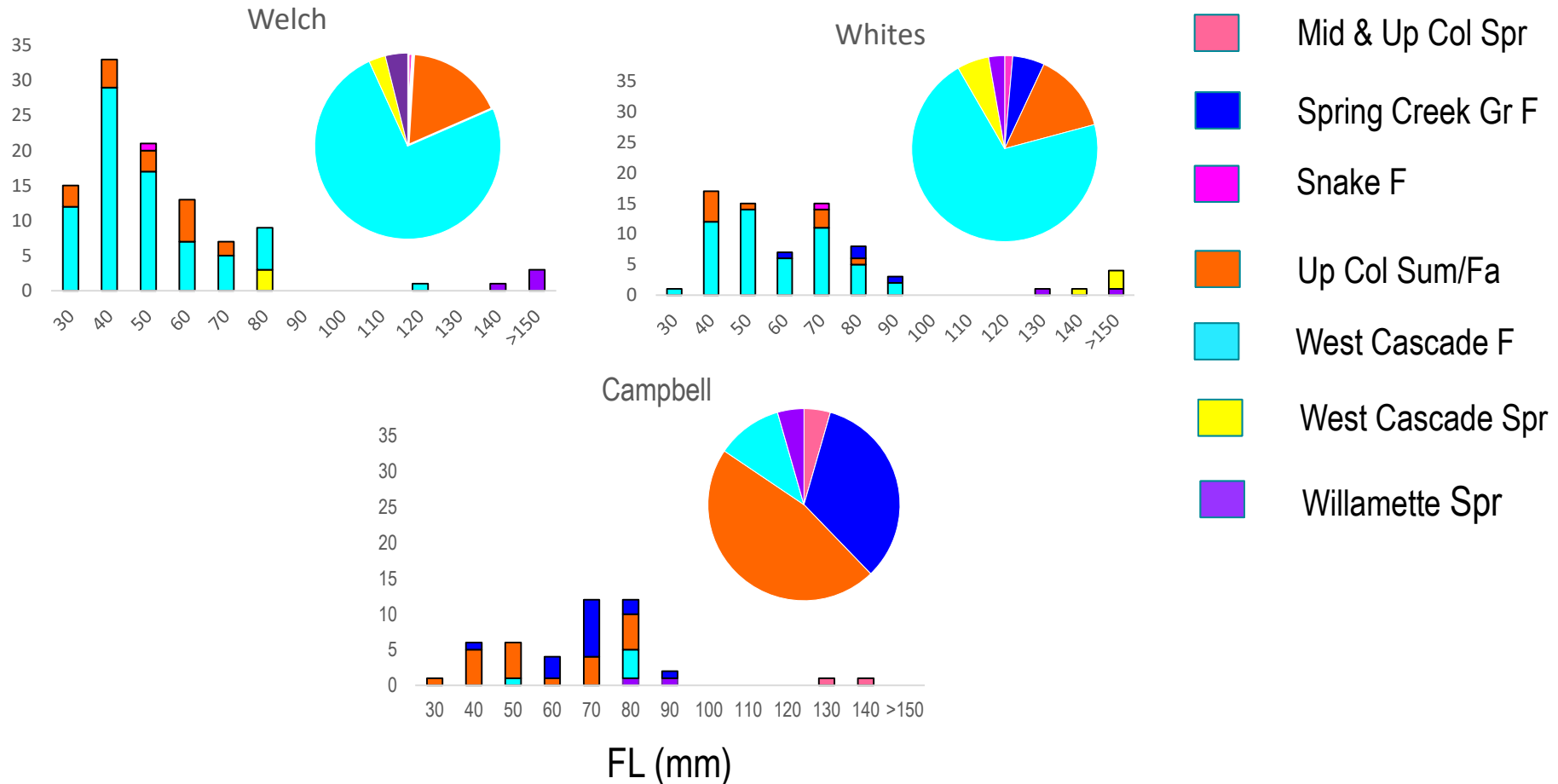


# Genetic Composition of Chinook 2019



# Length Frequency of Stocks 2018

(marked & unmarked)



- Welch and Whites dominated by fry of West Cascade fall stock, but to a lesser extent than 2018
- Similar diversity and size range at all sites, typically just Campbell has high stock and size diversity

# PIT Arrays 2019





# Horsetail Restoration Site



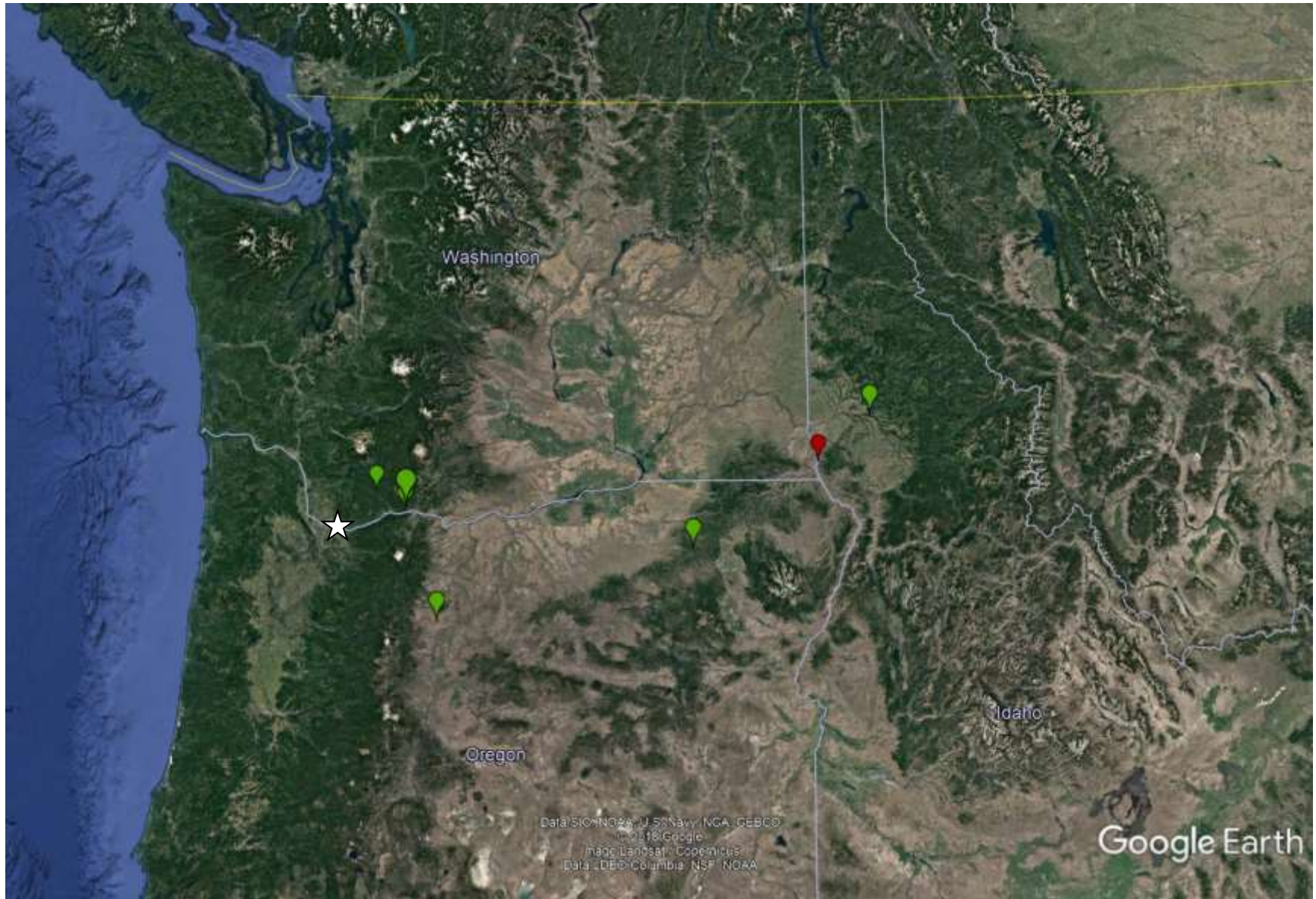
- Culvert underneath I-84 in Columbia River Gorge
- Installed in May 2013, intermittent operation from 2014-2016
- 2017 three upstream (Horsetail/Oneonta Creek) and two downstream (Columbia) antennas
- 2018 two antennas on upstream side and three antennas on the downstream side of culvert
- 2019 four antennas each on upstream and downstream sides

# Horsetail 2019 Detections

- 15 unique detections from  
Apr 26 – Aug 14
  - 7 Fall Chinook (hatchery)
    - Max residence time = 5.4 d,  
median 37 s
  - 4 Spring Chinook (hatchery)
    - Max residence time = 1 d,  
median 11.75 h
  - 1 Hatchery coho (unknown  
run type)
    - Residence time = 1.7 d
  - 2 Northern Pikeminnow
    - Max residence time = 2.2 d,  
median 1.1 d
  - 1 “Orphan”
    - Residence time = 1.75 h
- 
- Number of detections down in 2019, despite having more antennas working
  - >1 million reduction of PIT tags in the system in 2019
  - No steelhead
  - No natural origin



# Origins of salmonids detected at Horsetail





# Campbell Slough Site - Refurbished

- Old antennas were broken, did not span the channel well at various water levels, and cables were frequently damaged by rodents
- Revamped site in February 2018
- Operational March 20 – Sept 1, 2019

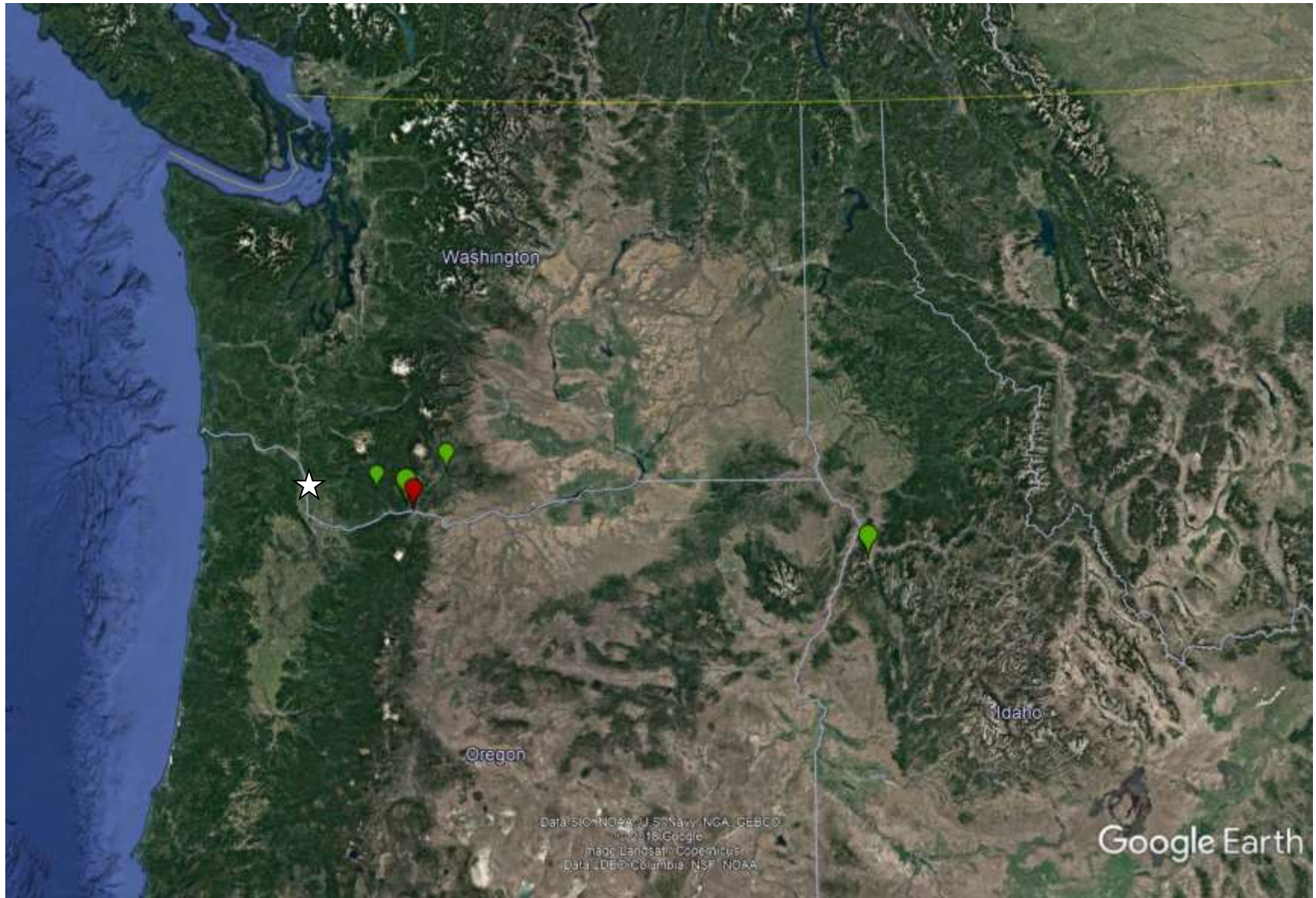


# Campbell Slough 2019 Detections

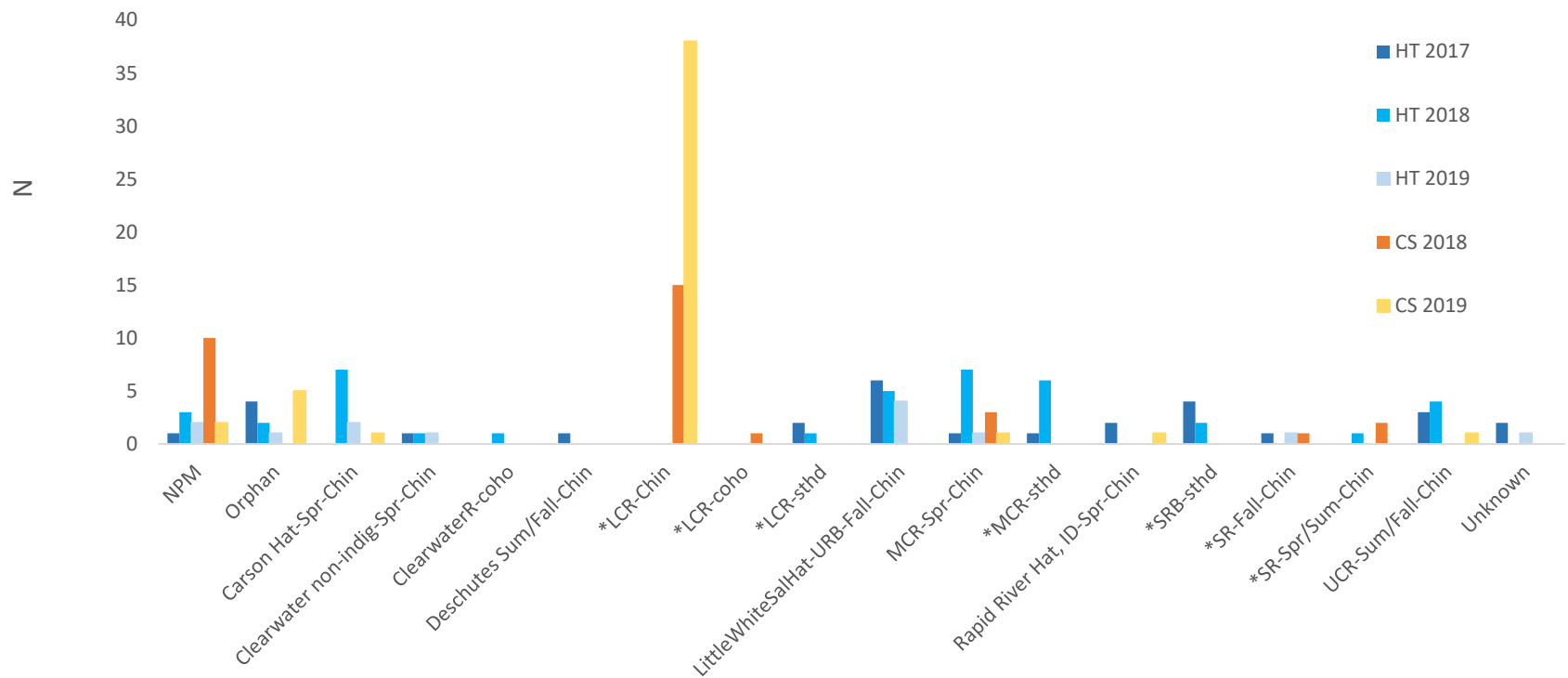
- 49 unique detections from Apr 10 – Aug 4
  - 39 fall Chinook (hatchery)
    - Max residence time = 20.4 d, median 2 s (avg 1.4 d)
  - 3 Spring Chinook (hatchery)
    - Max residence time = 25 s, median 2 s
  - 2 Northern Pikeminnow
    - Max residence time = 90.8 d, median 46.4 d
  - 5 “Orphans”
    - Max residence time = 41.3 d, median 16.6 d
- 
- Number of detections up in 2019, despite less tags in the system
  - Spring Creek fall Chinook driving the trend
  - No steelhead
  - No natural origin



# Origins of salmonids detected at Campbell



# ESU/DPSs at Horsetail and Campbell



\* Denotes ESA listing



# Highlights

- Relatively “normal” hydrologic year
- Fish community patterns are holding, greatest diversity at Campbell followed by Ilwaco, least diversity at Welch and Whites
- Typical seasonal and geographic trends of Chinook and chum, highest densities of Chinook in May, overall densities down from 2018 except at Campbell
- Most sites dominated by unmarked Chinook, greater proportion of marked Chinook at Welch and Whites than 2018
- Greater stock diversity than 2018, higher proportion of UCR su/fa
- Less diversity of stocks detected at Horsetail and Campbell, LCR Chinook at Campbell
- Overlapping use of Northern pikeminnow and salmon



# Acknowledgements/Questions

Thanks to all that helped with the field work and cutting fish, especially:

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