

Fish Use in Franz Lake and Mirror Lake in Comparison to Other Habitats

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Flood Plain Lakes Workshop Fish Questions

- How do juvenile salmon abundance and density compare with other sites?
- Do growth rates or other measures of salmon condition differ?
- How does fish community structure compare with other sites?
- Are predation rates higher in lakes than in other habitats?
- Is there more competition with non-native species in flood-plain lakes than other habitats?
- Do juvenile salmon use fringe riparian areas of FPL or in middle? Does size and depth matter?
- Does permanently flooded versus seasonally flushed systems make a difference in fish composition (predators and non-natives)?



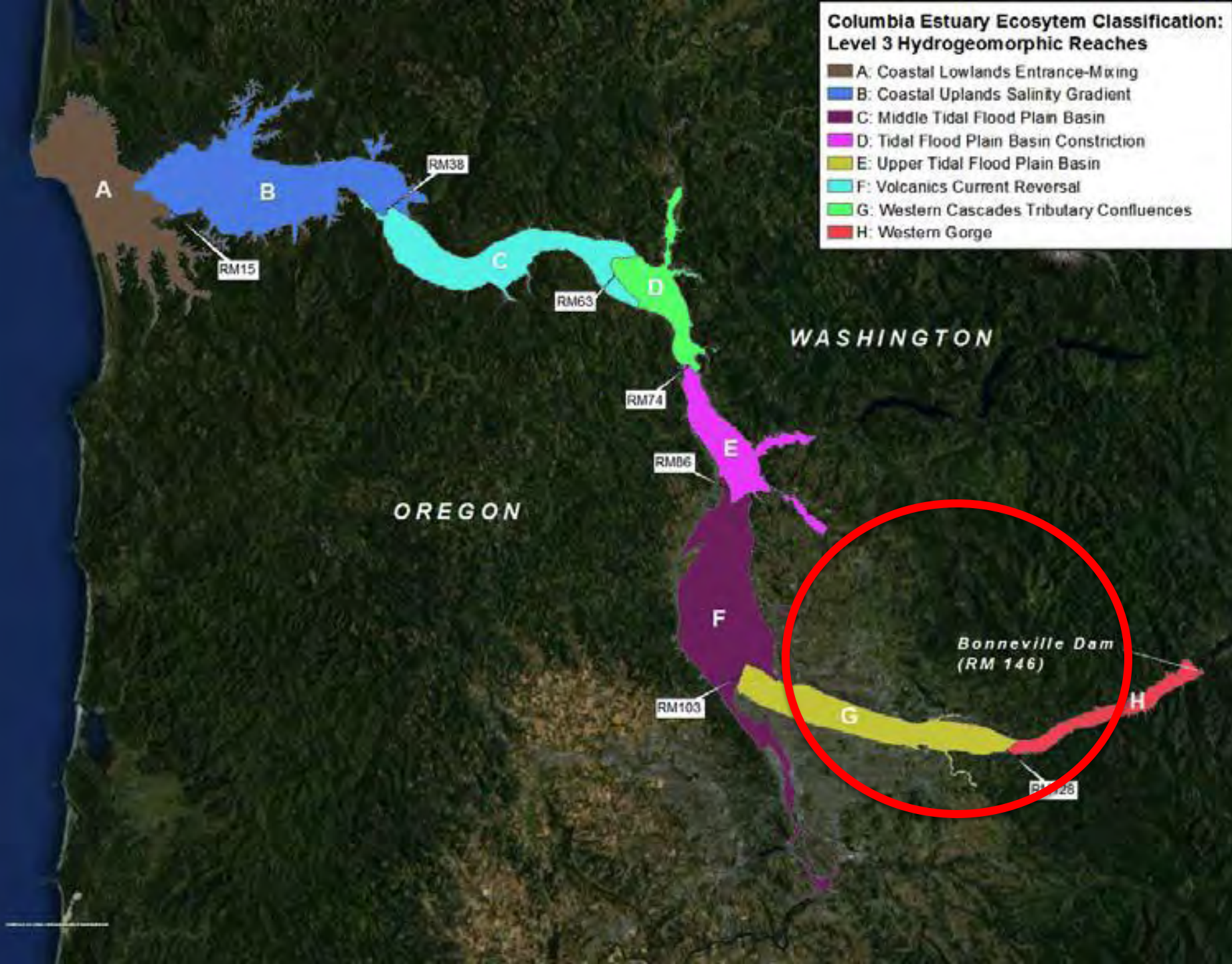
Franz Lake



Mirror Lake

Columbia Estuary Ecosystem Classification: Level 3 Hydrogeomorphic Reaches

- A: Coastal Lowlands Entrance-Mixing
- B: Coastal Uplands Salinity Gradient
- C: Middle Tidal Flood Plain Basin
- D: Tidal Flood Plain Basin Constriction
- E: Upper Tidal Flood Plain Basin
- F: Volcanics Current Reversal
- G: Western Cascades Tributary Confluences
- H: Western Gorge



LI = Lemon Island
WA = Washougal
RI = Reed Island
MLC = Mirror Lake Culvert
ML = Mirror Lake
FL = Franz Lake
PI = Pierce Island
HS = Hardy Slough



LI

WA

RI

MLC

ML

SI

FL

PI

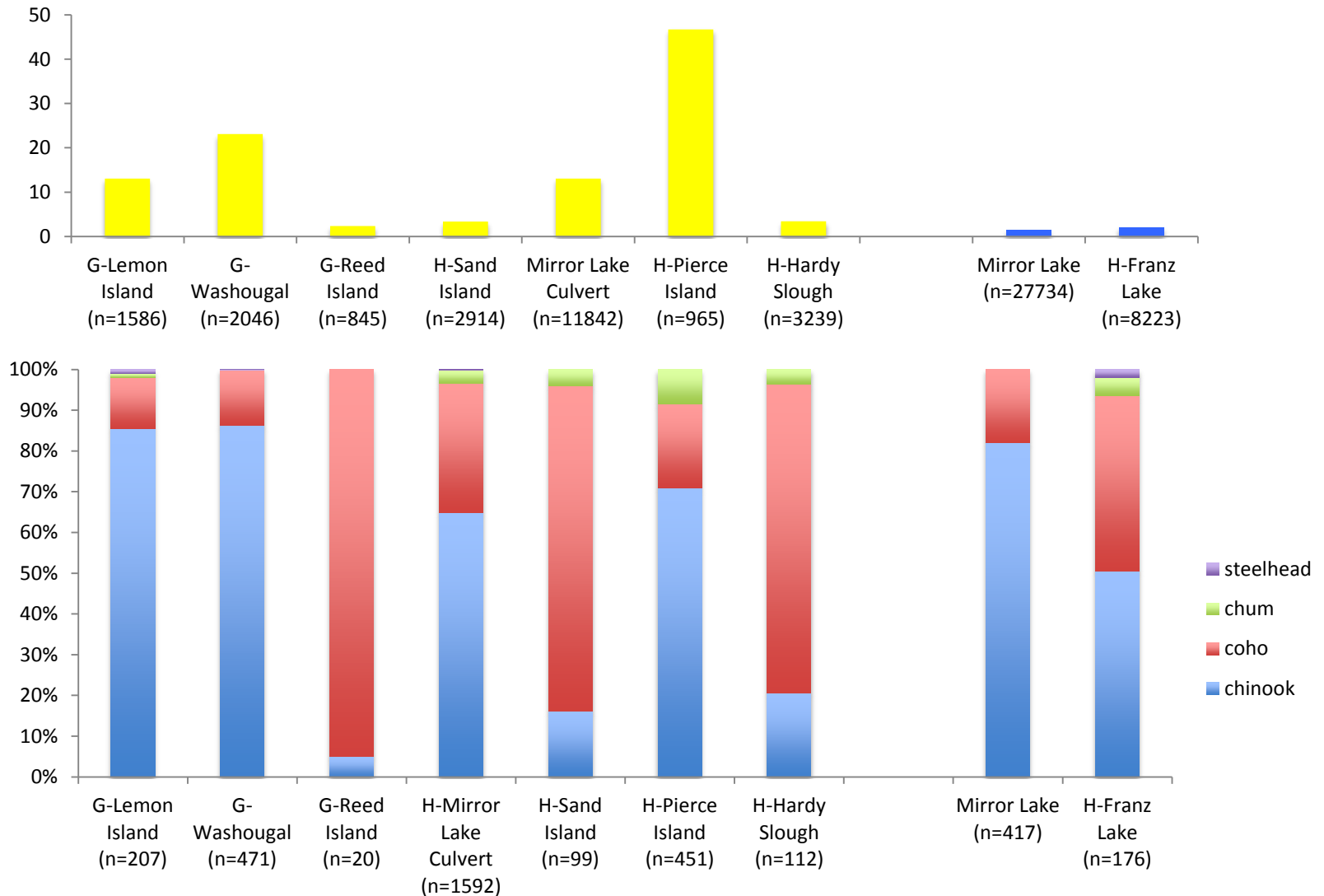
HS

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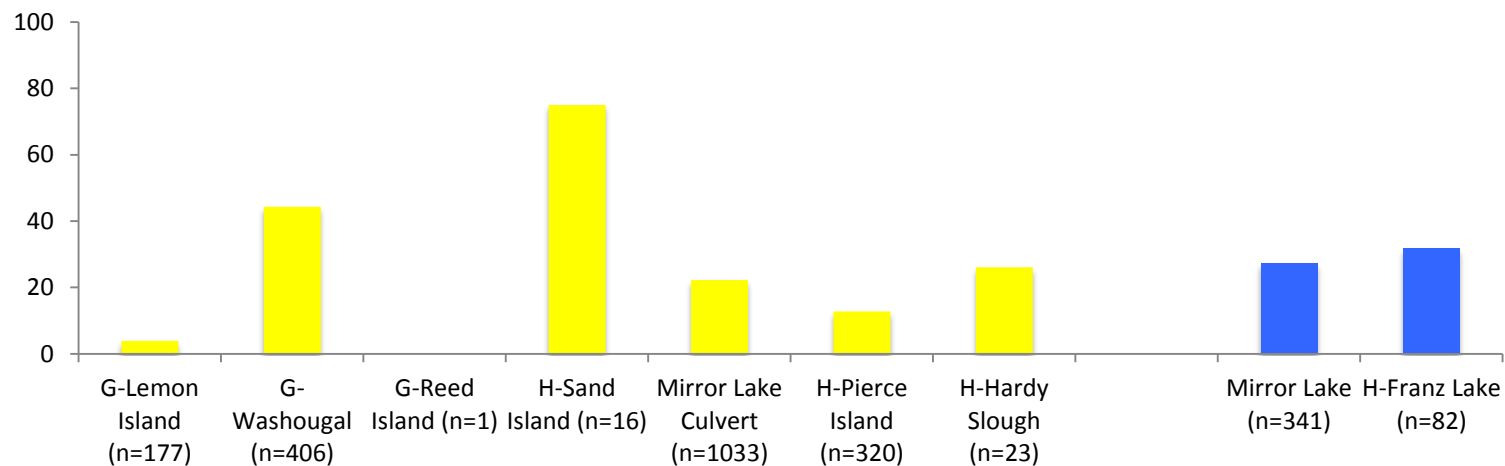
Salmonid composition

% salmonids in catch

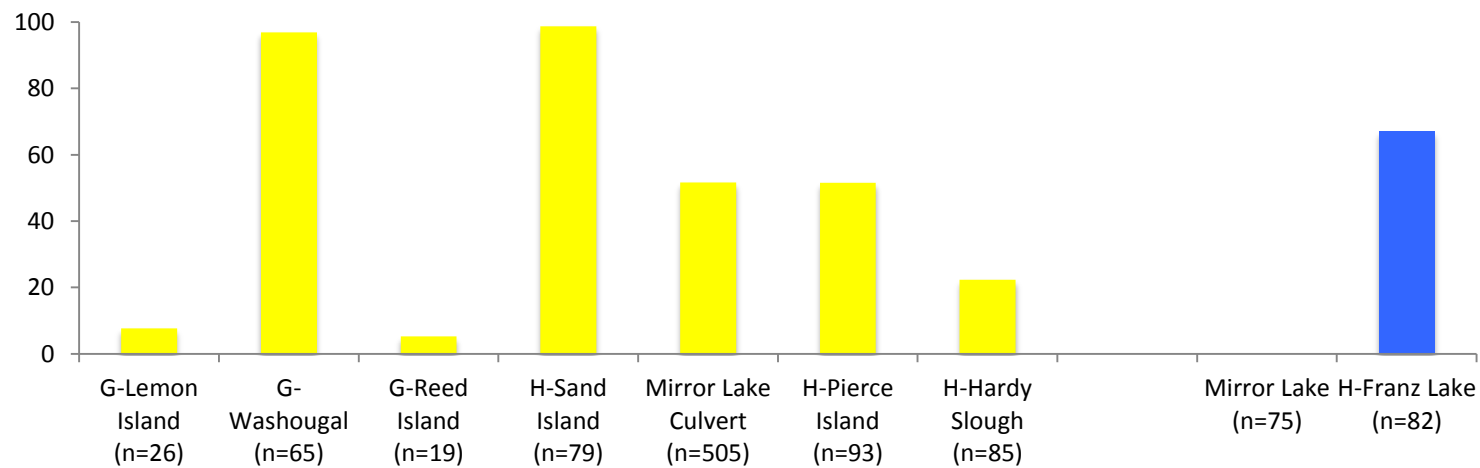


% marked salmon

Chinook salmon

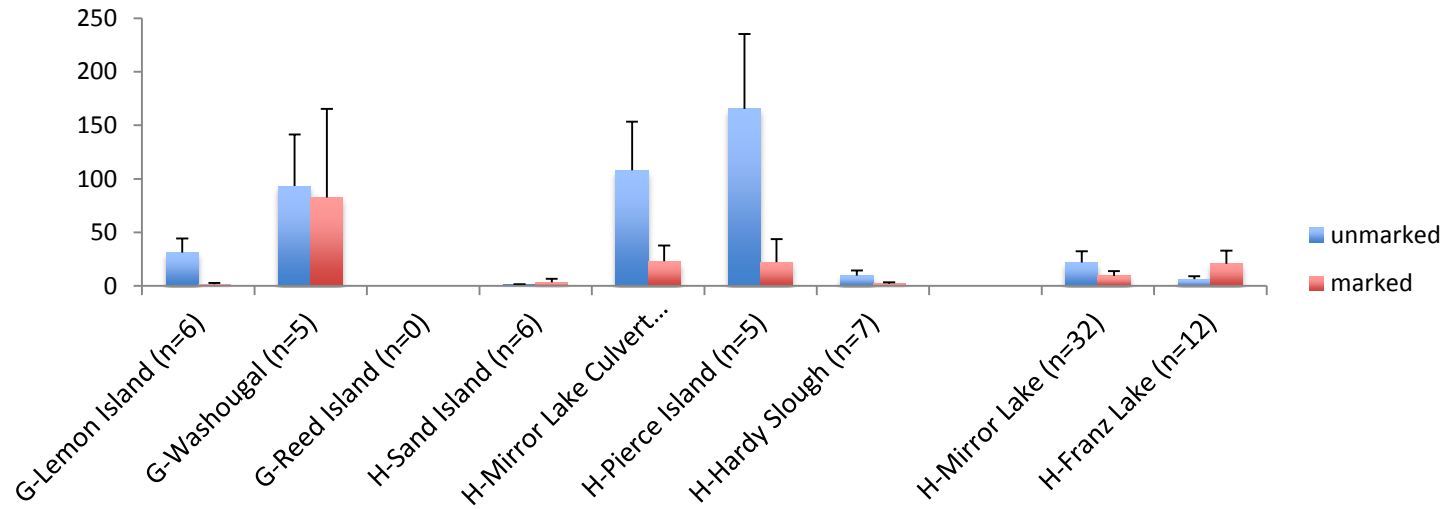


Coho salmon

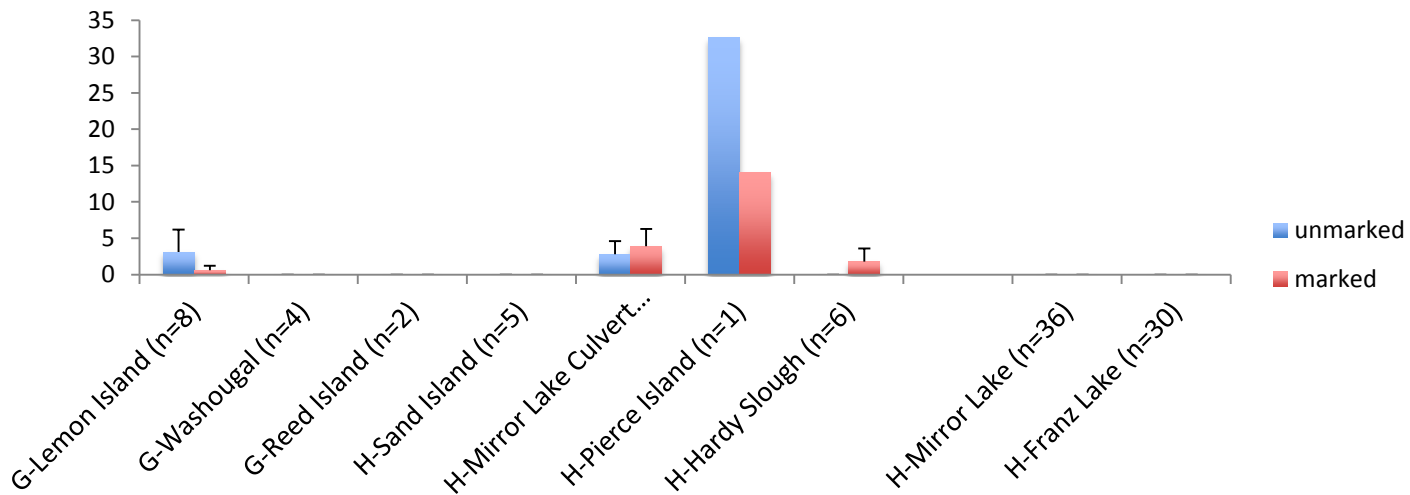


Chinook Salmon Density

Spring

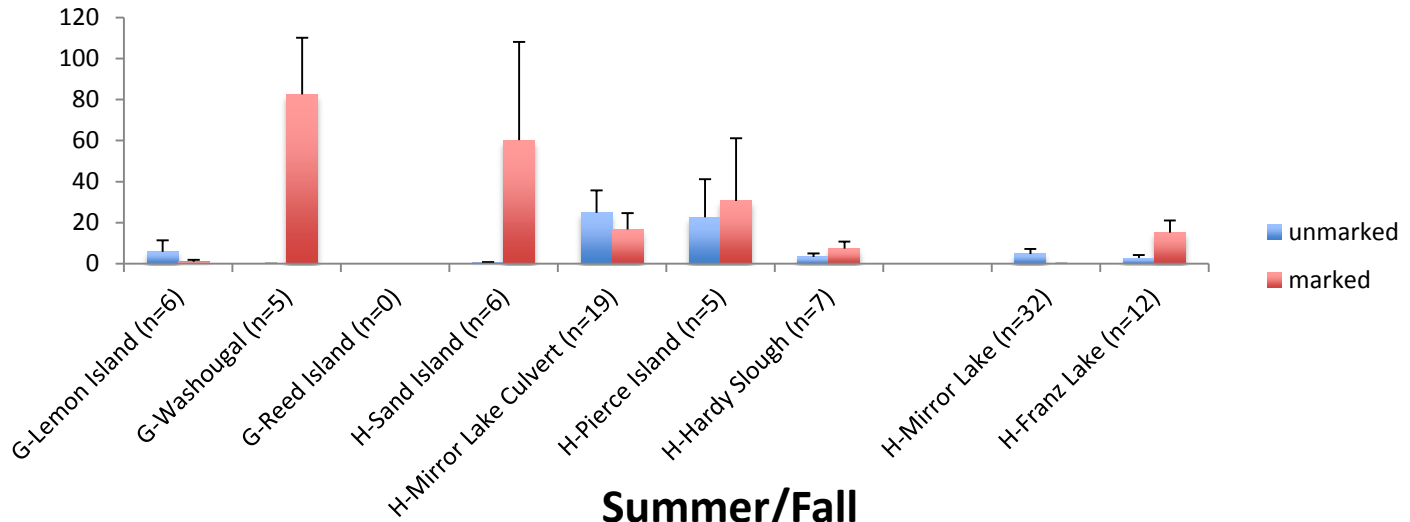


Summer/Fall

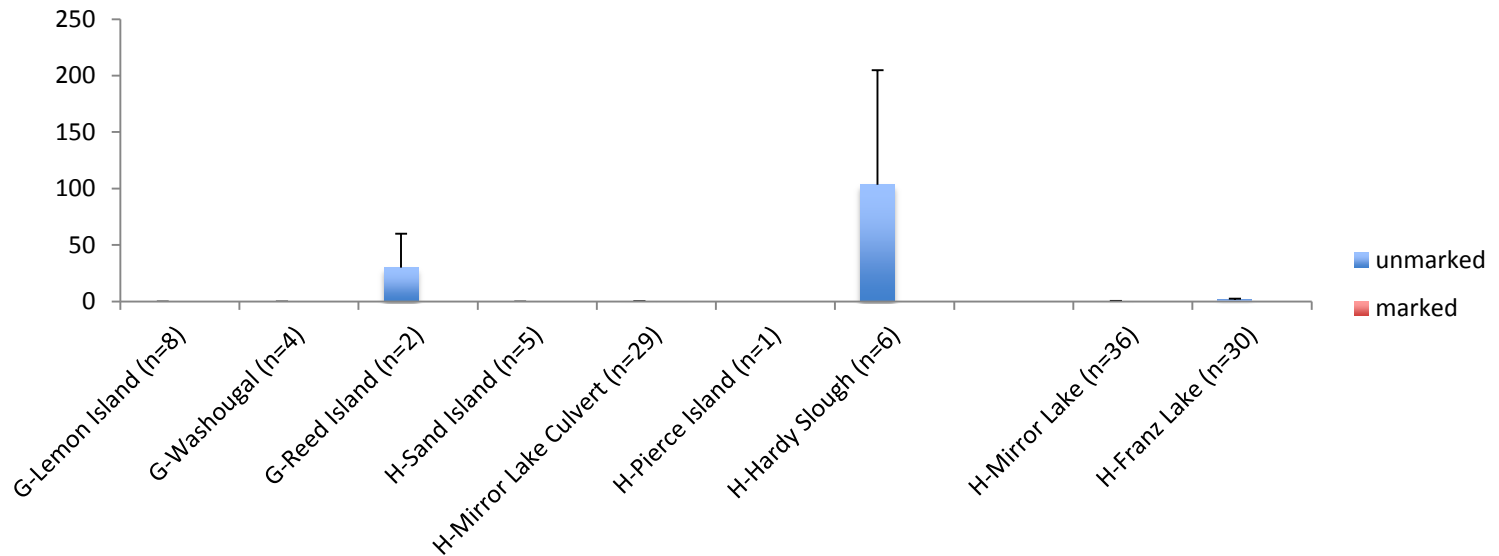


Coho Salmon Density

Spring

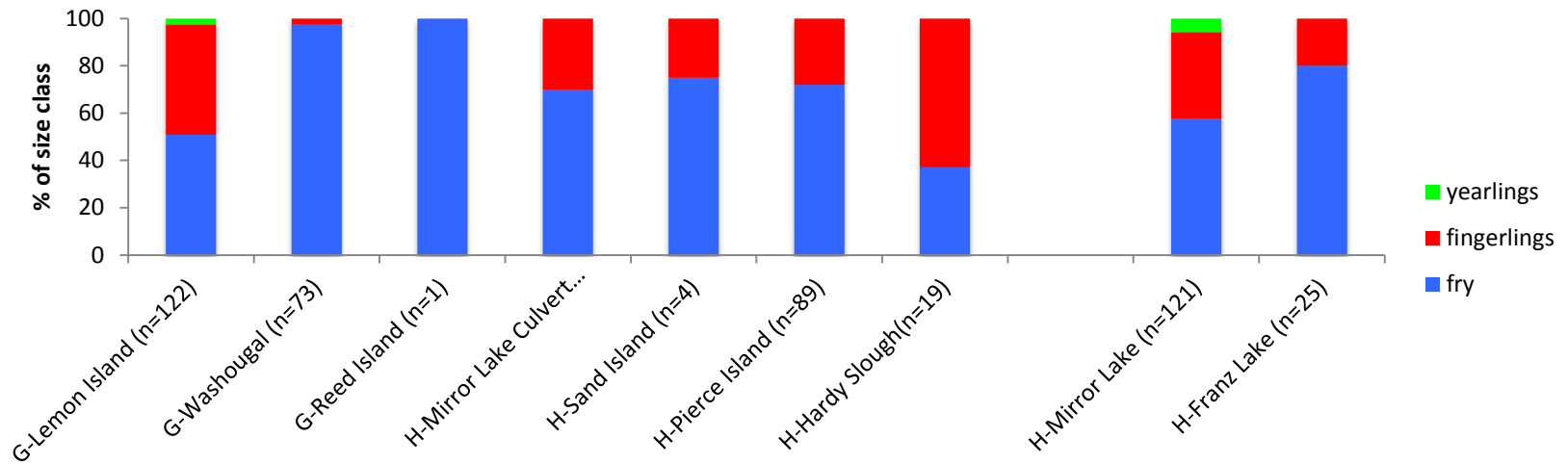


Summer/Fall

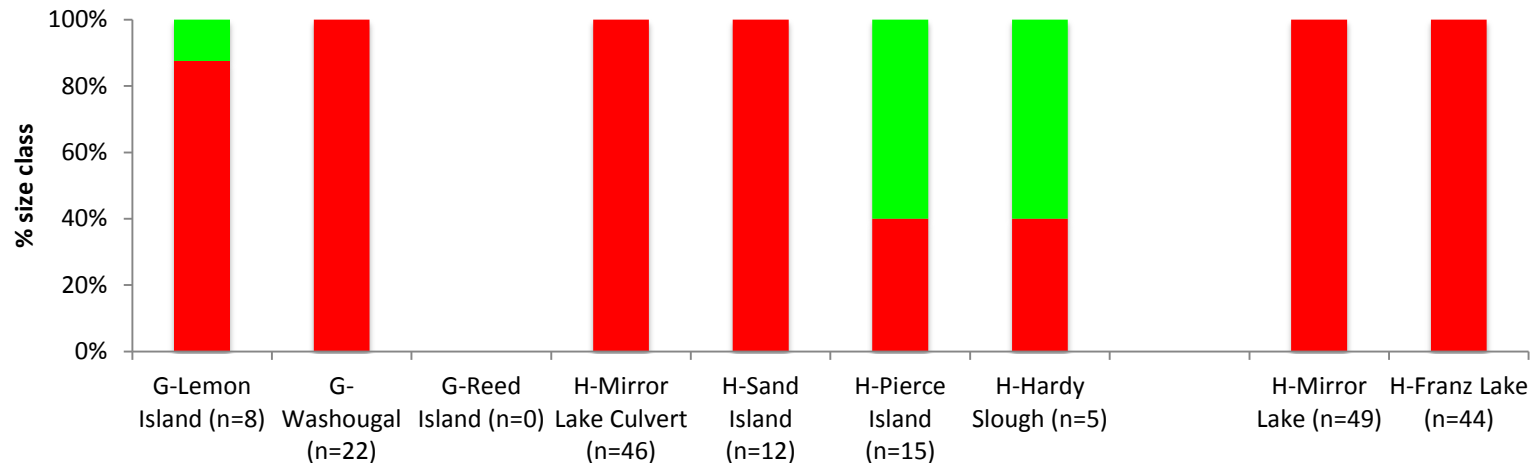


Chinook size class distribution

unmarked chinook



marked chinook

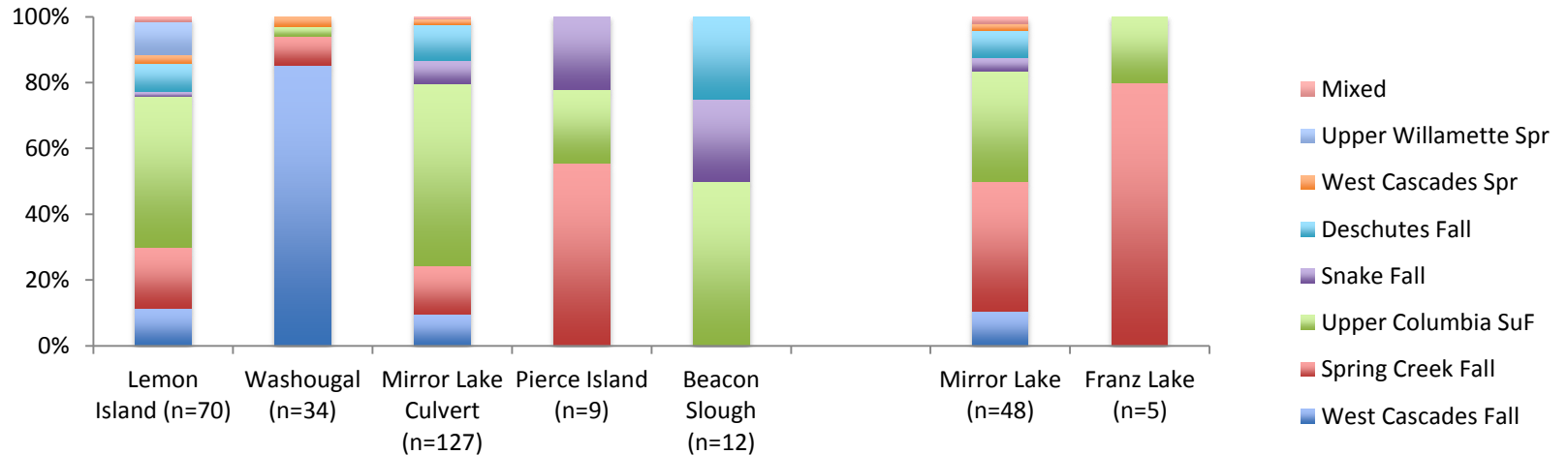


Genetic stock composition

marked Chinook



unmarked Chinook

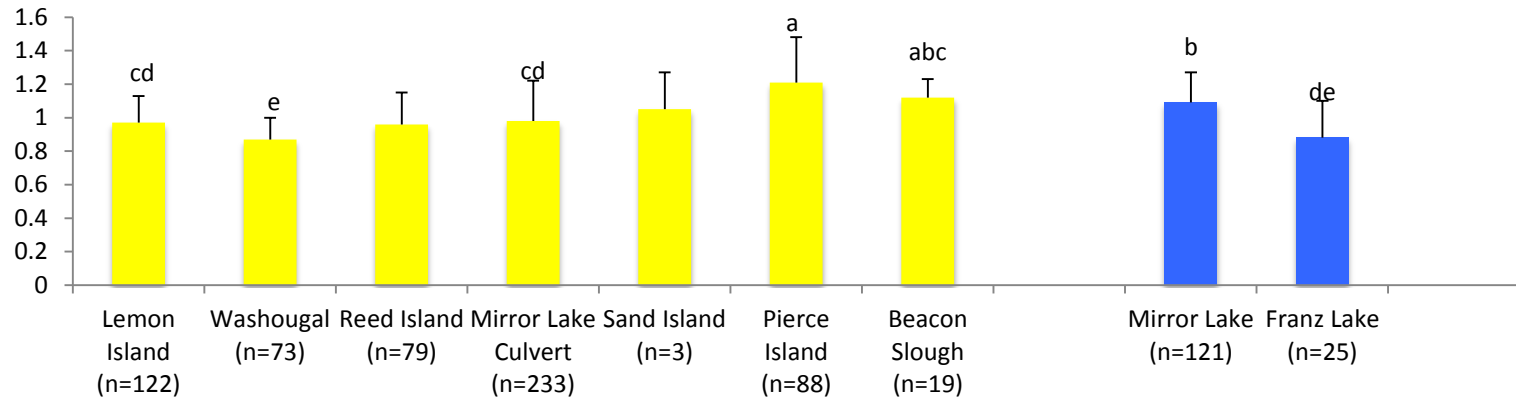


Flood Plain Lakes Workshop Fish Questions

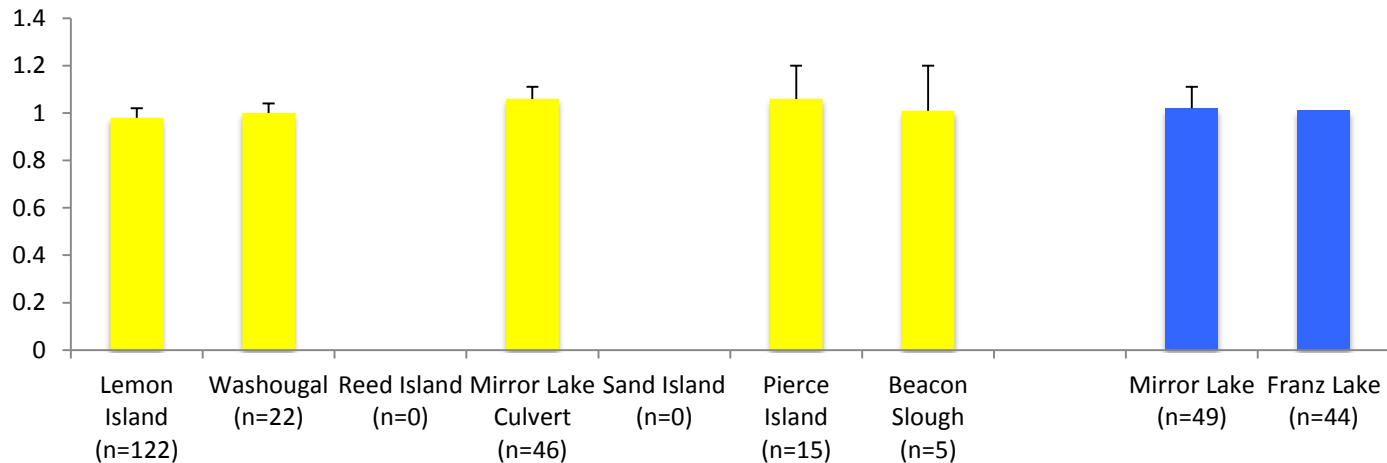
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Salmon Condition Indicators

K - Unmarked Chinook

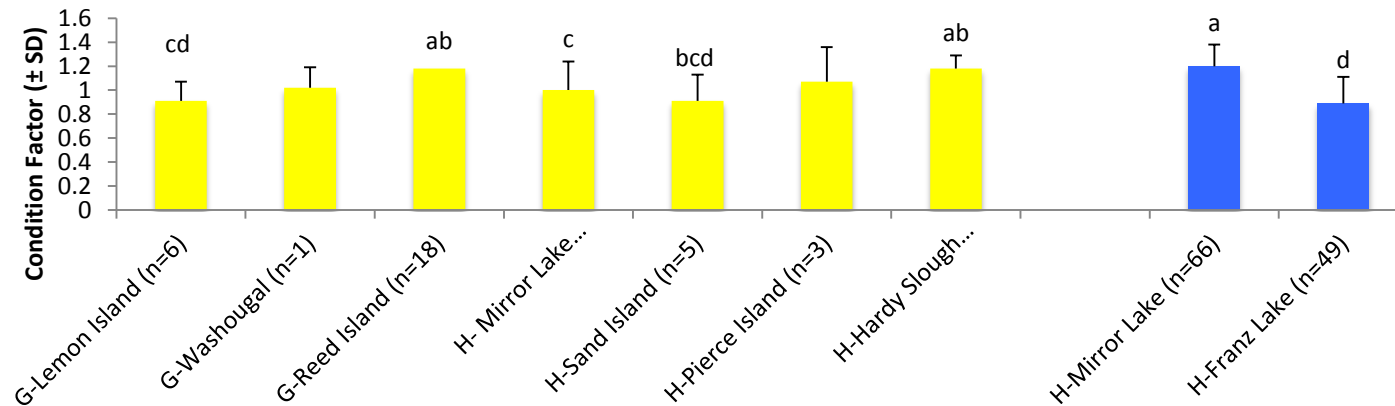


K -marked Chinook

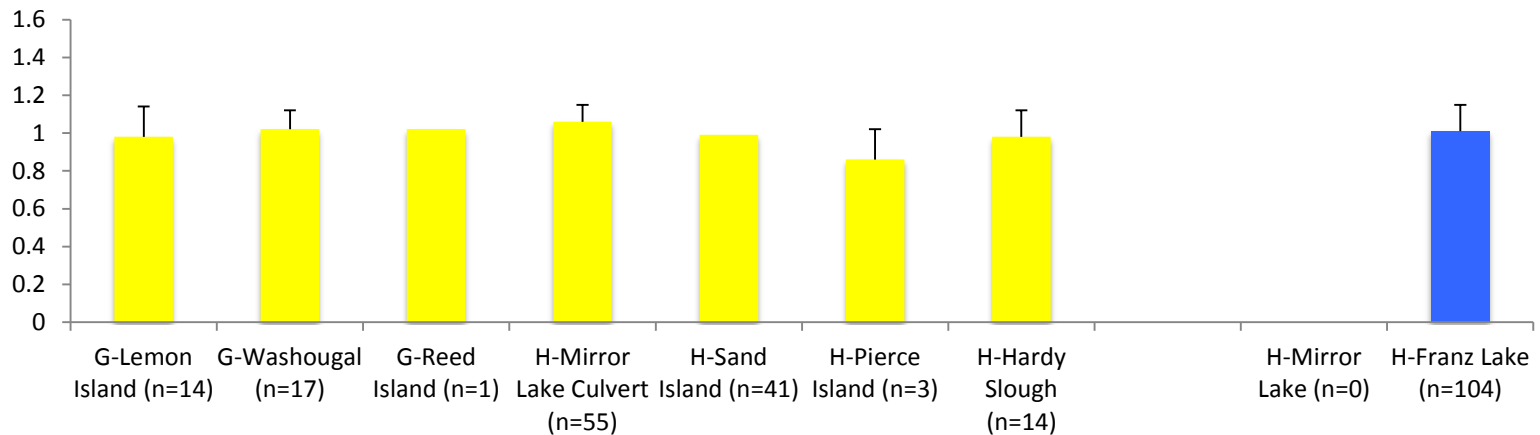


Salmon Condition Indicators

K- unmarked coho salmon

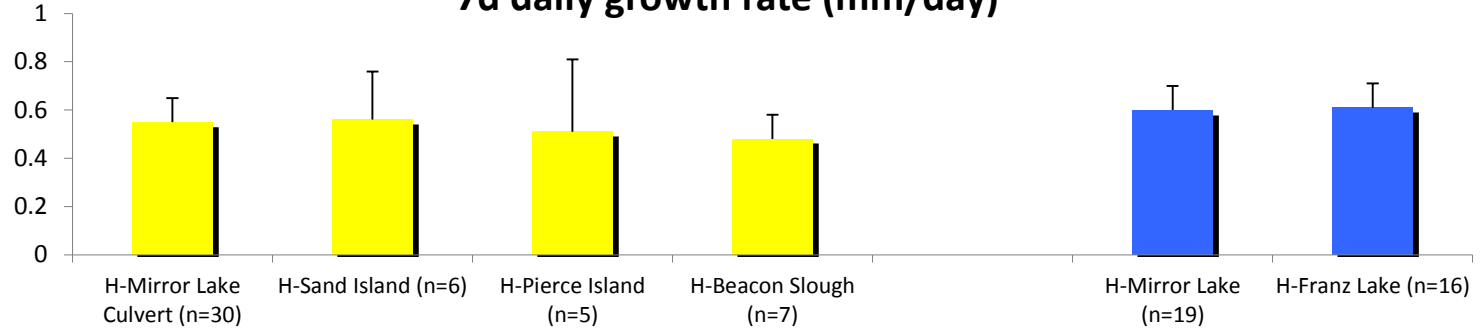


K- marked coho salmon

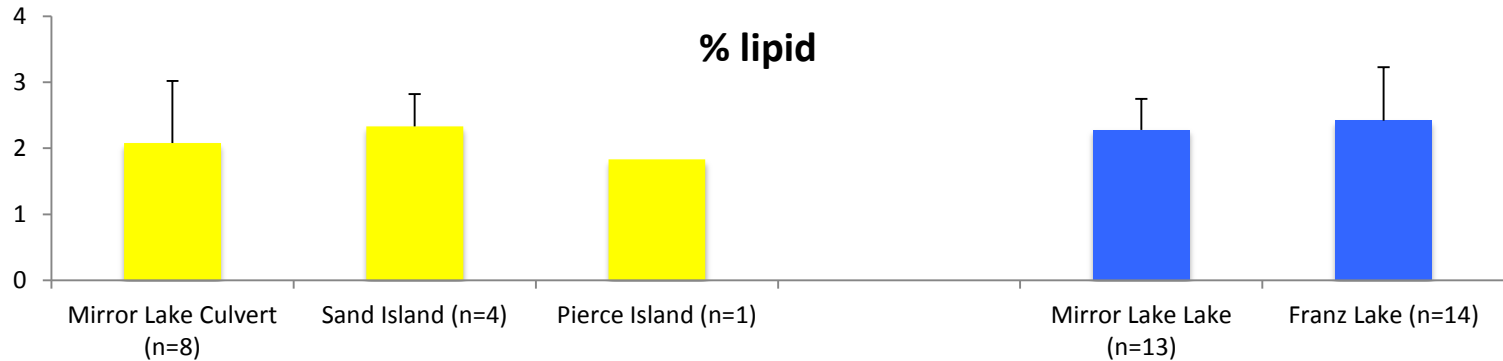


Salmon Condition Indicators

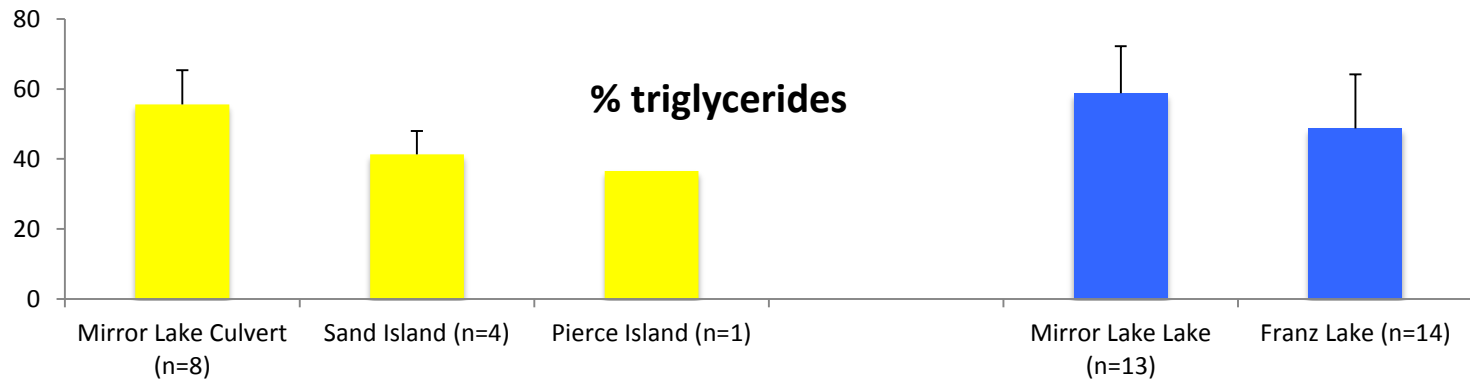
7d daily growth rate (mm/day)



% lipid



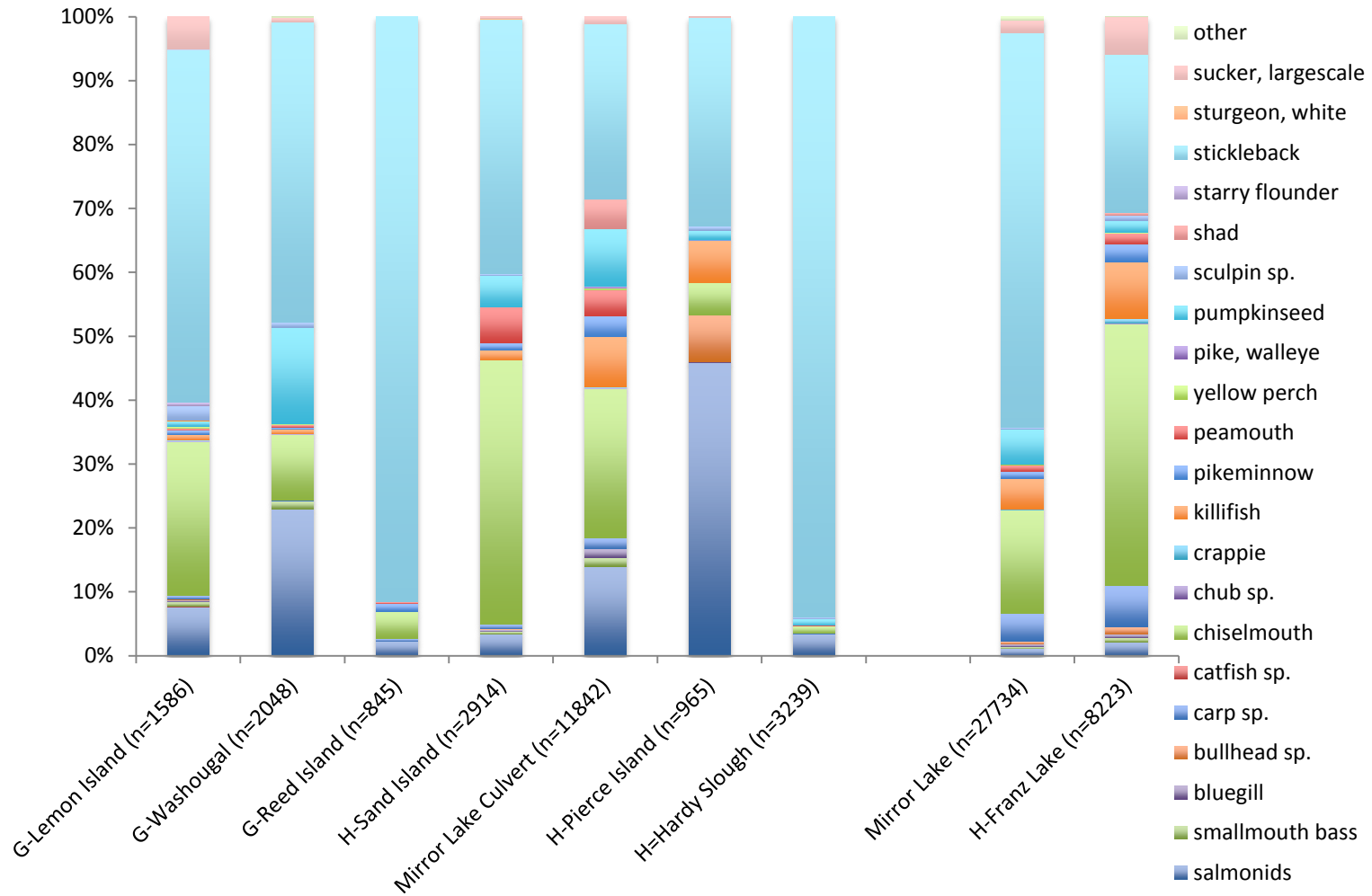
% triglycerides



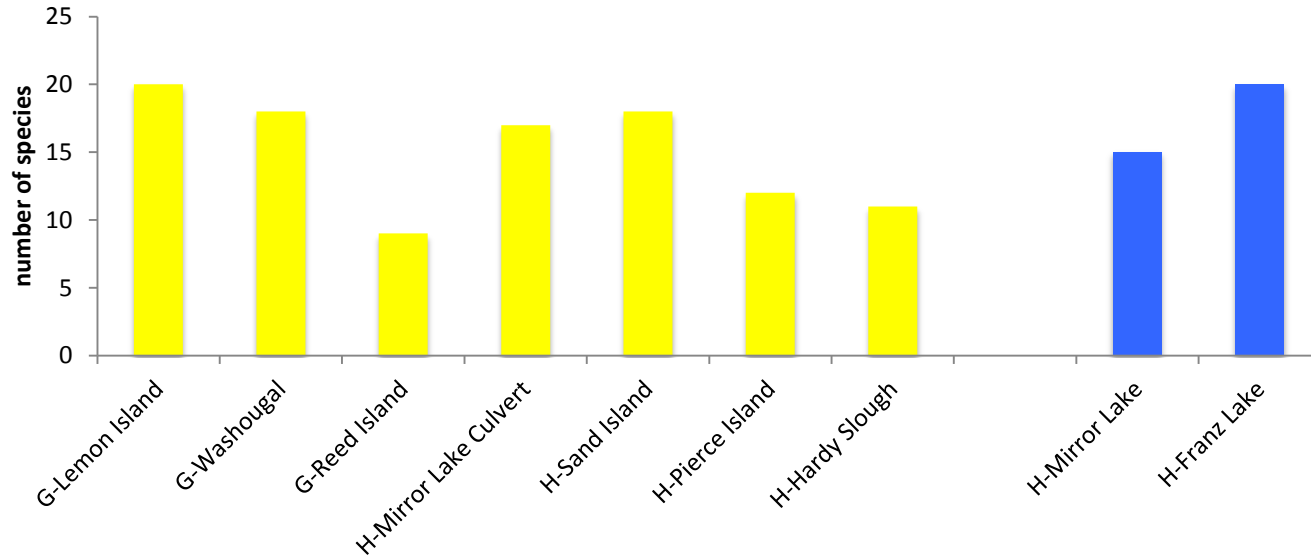
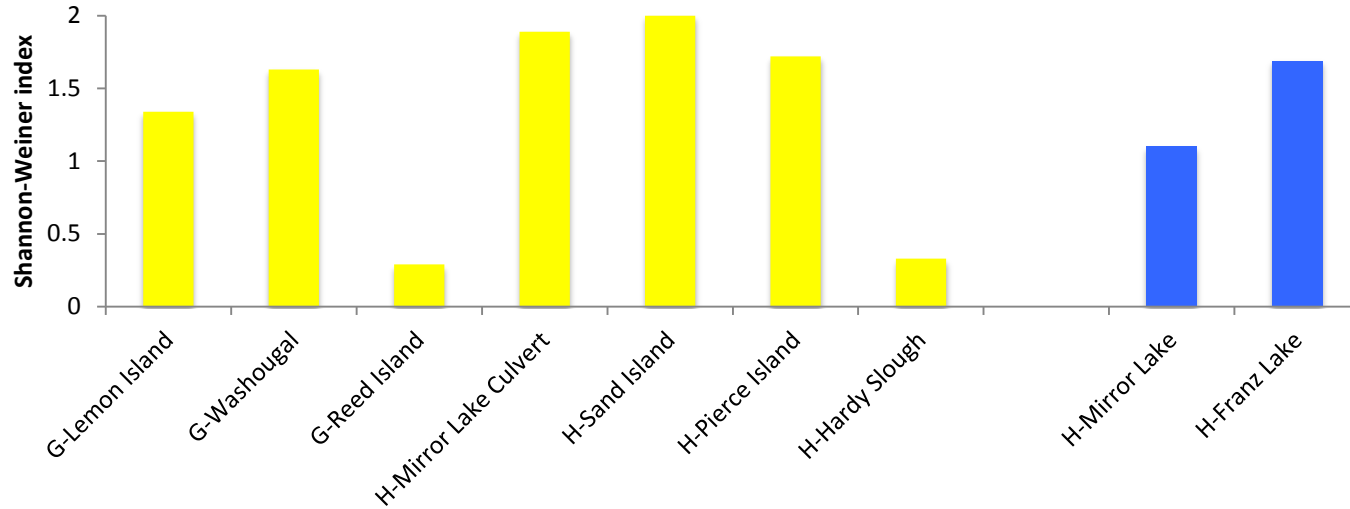
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Fish community composition



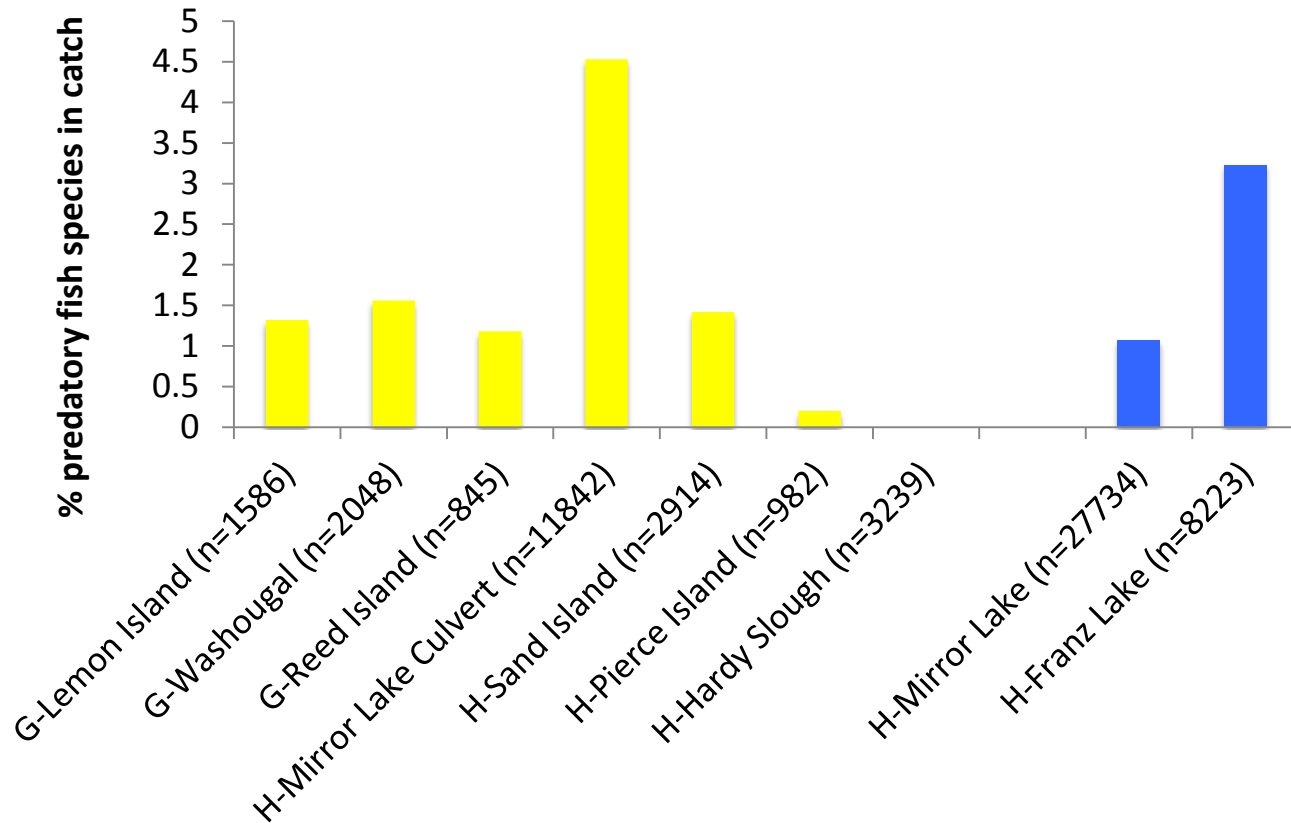
Fish species richness and diversity



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Predatory Fish*

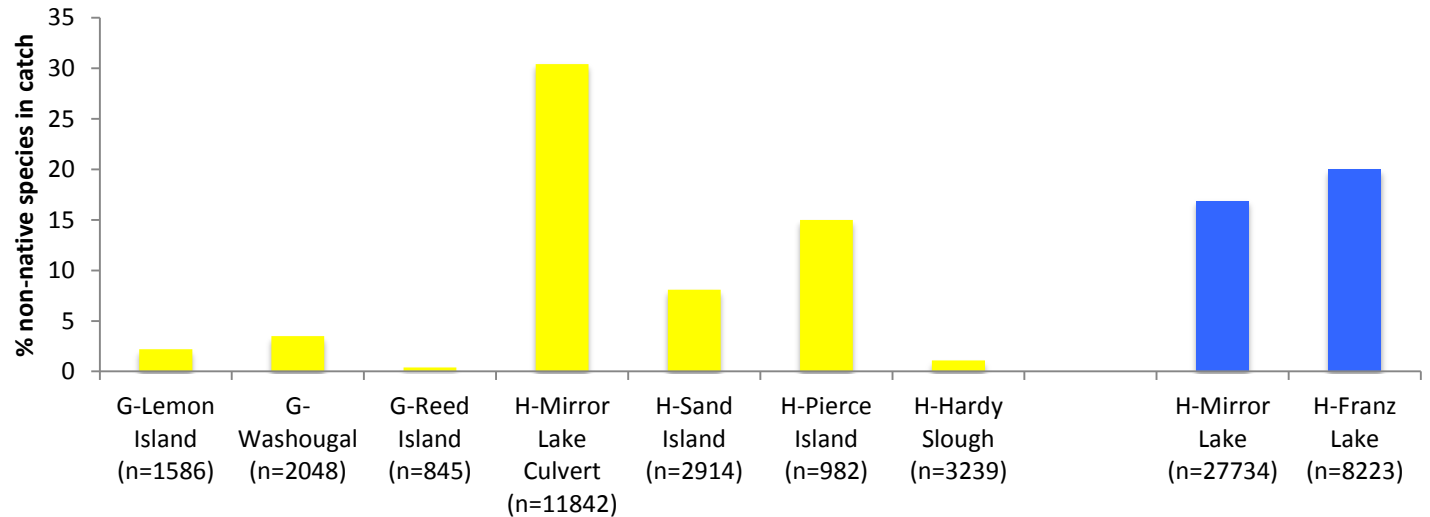
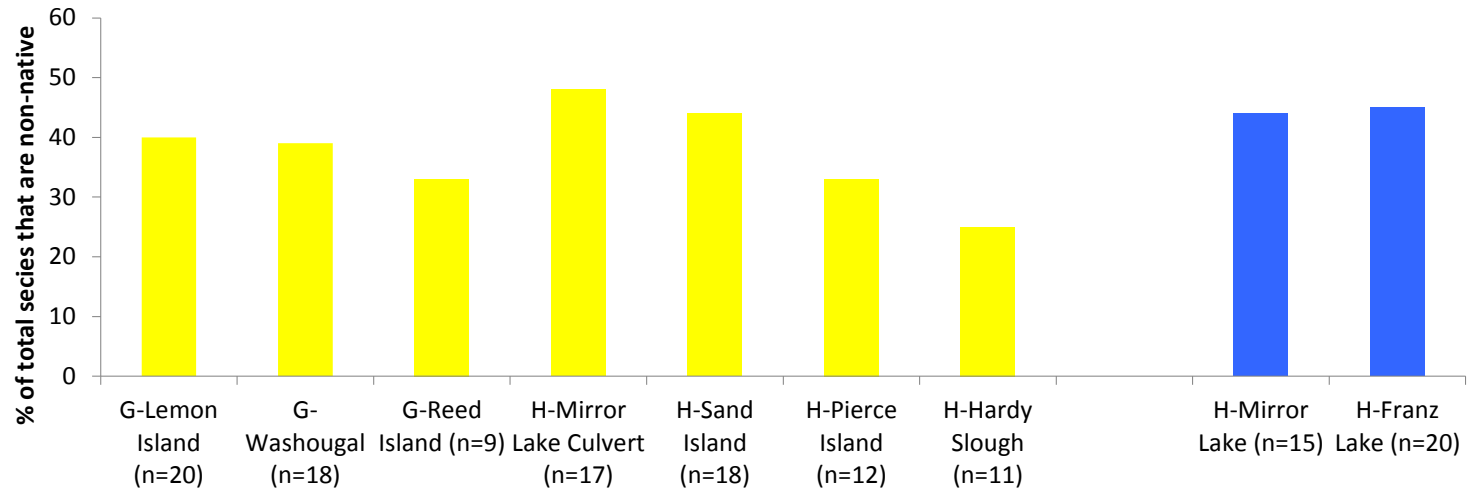


*smallmouth bass, walleye, northern pikeminnow

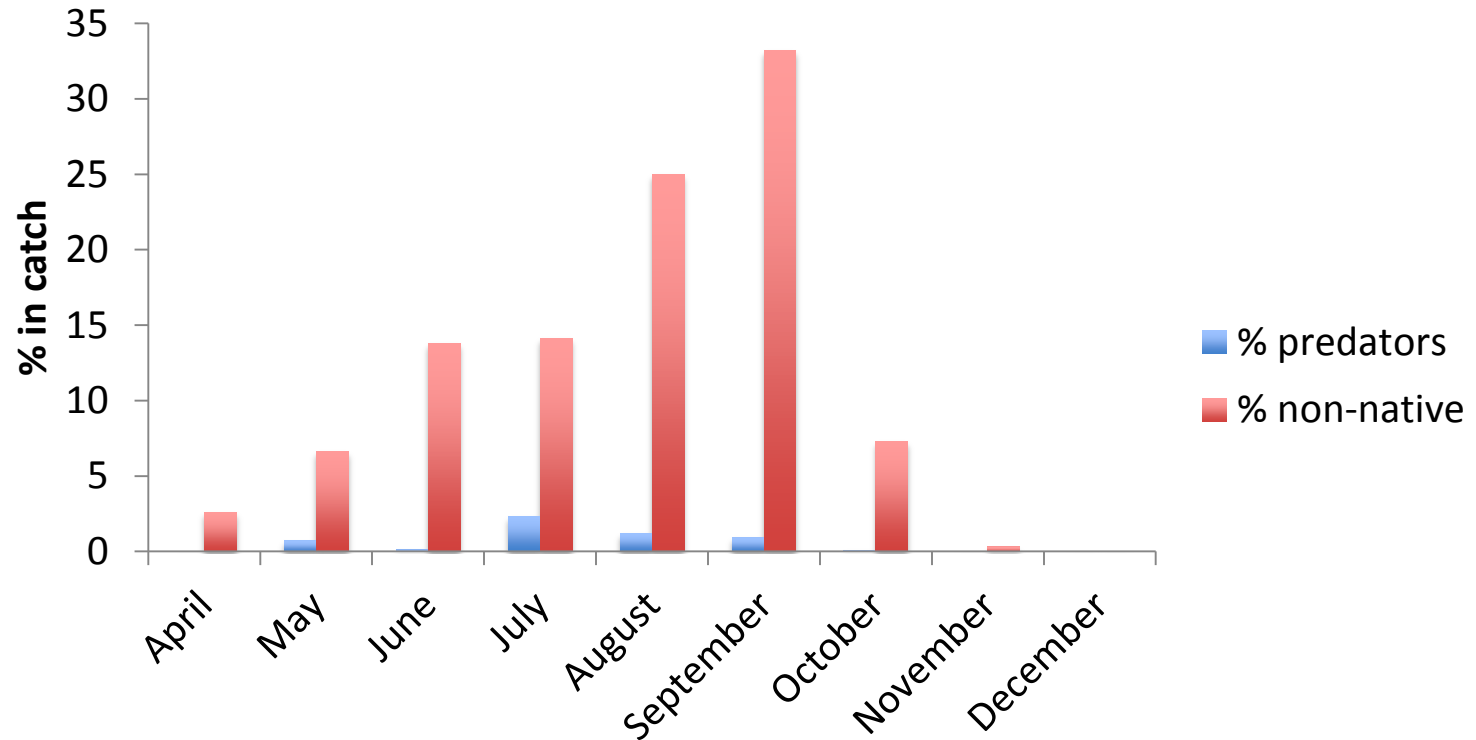
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Non-native species



Non-native and predatory species by month – Mirror Lake



Summary of Findings

Salmon abundance:

- Salmon densities are not high at either Mirror or Franz Lake, but are within the range observed at sites within Reaches G and H.

Salmon diversity and genetic stock composition

- Salmon species composition at Mirror Lake and Franz Lake was similar to most Reach G and H sites, except that no chum salmon were found at Mirror Lake
- The range of size classes at the lake sites was similar to other Reach G and H sites
- Mirror Lake and Franz Lake had a somewhat higher proportion of Spring Creek fall Chinook than most of the other Reach G and H sites
- At both Franz Lake and Mirror Lake, percentages of marked chinook salmon were similar to Reach G and H sites; the same for coho at Franz Lake, but no marked coho at Mirror Lake.

Salmon health and condition

- Growth rate, lipid content, and condition factor at Mirror Lake and Franz Lake are comparable to other Reach G and H sites

Summary of Findings

Fish community composition

- Fish community composition, species richness and species diversity at Mirror Lake and Franz Lake are comparable to other sites in Reach G and H.

Predators and Invasive Species

- Non-native fish species made up a slightly higher percentage of the catch at Mirror Lake and Franz Lake at than at most Reach G and H sites
- Predatory fish make up a somewhat higher percentage of the catch at Franz Lake than at most other Reach G and H sites.
- Interactions with salmon uncertain as these species are most common in summer months when few salmon are present