Spatial arrangement of habitat and sockeye salmon fry health

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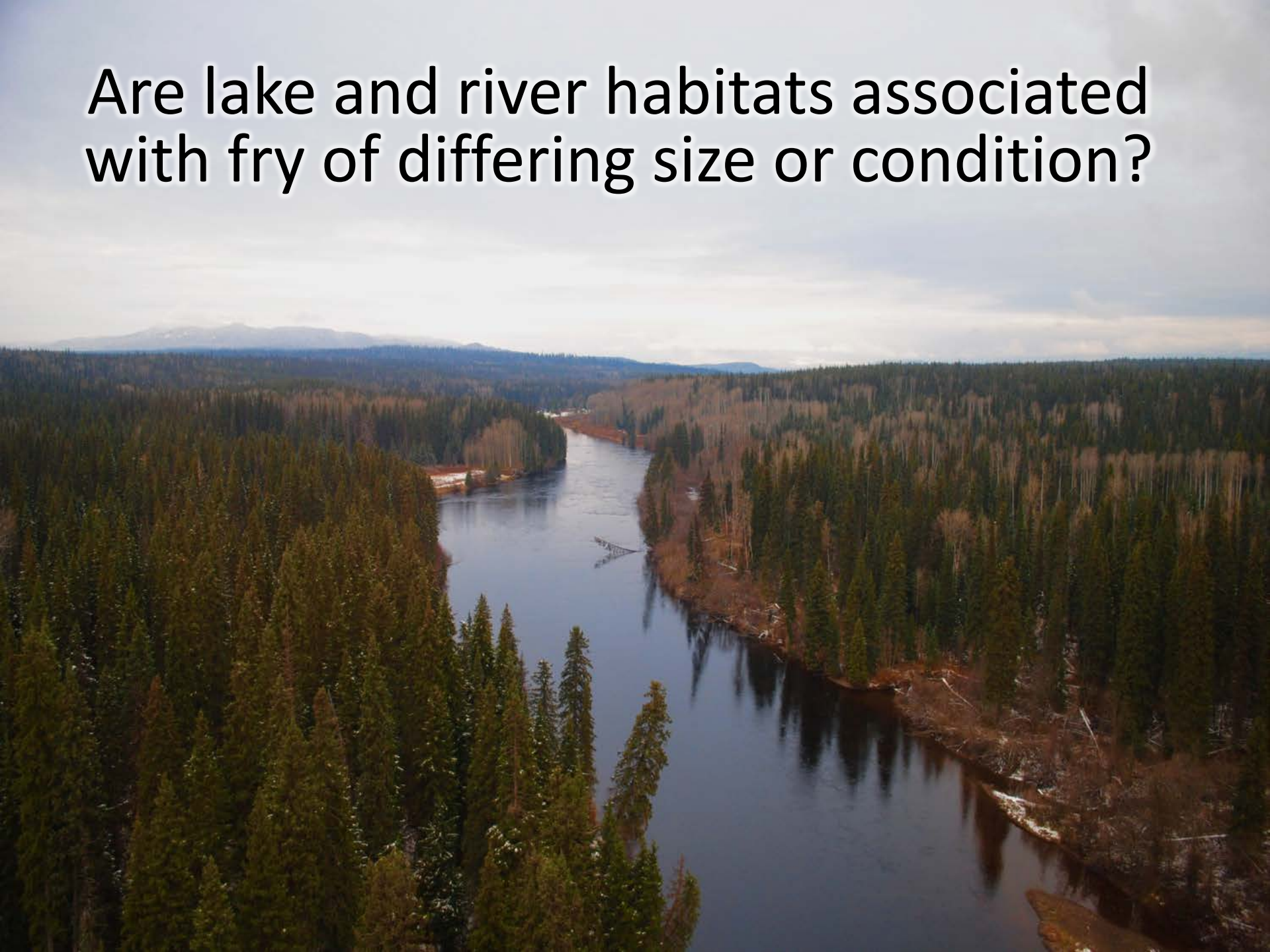
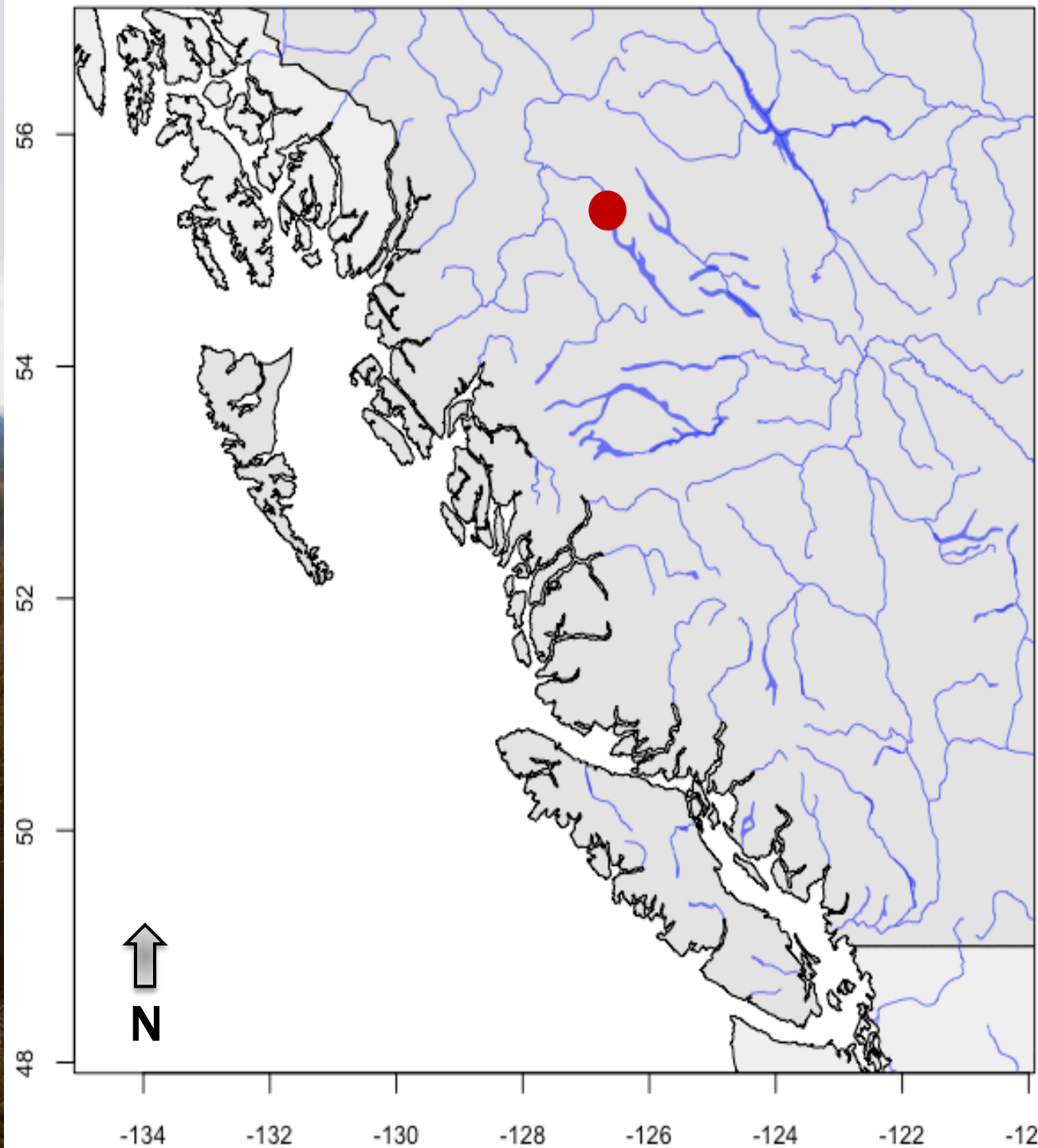
Fishbio Photo

Lake Babine Nation Photo

Lake Babine Nation Photo

Are lake and river habitats associated with fry of differing size or condition?

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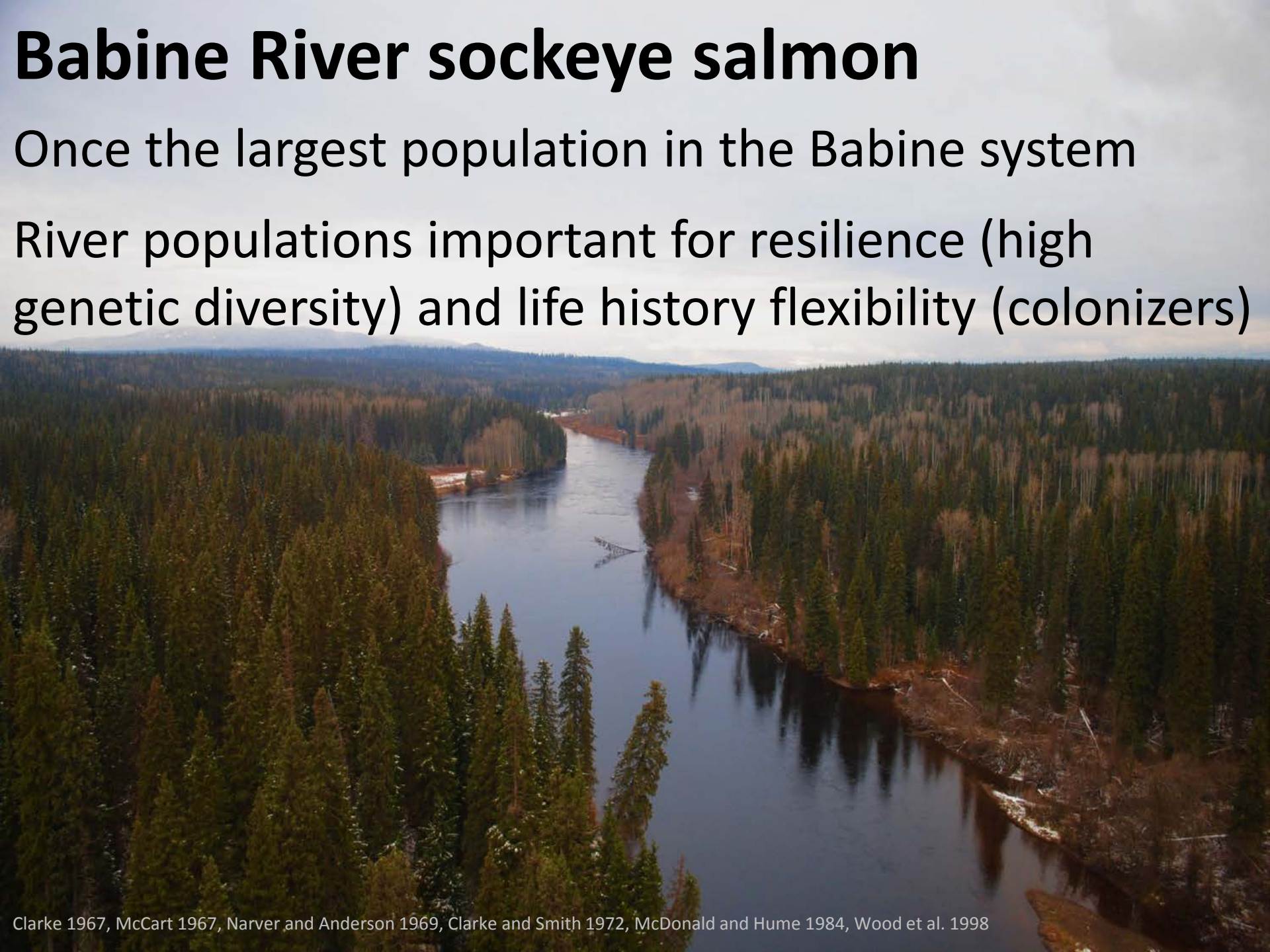
Babine River sockeye salmon

Once the largest population in the Babine system

River populations important for resilience (high genetic diversity) and life history flexibility (colonizers)



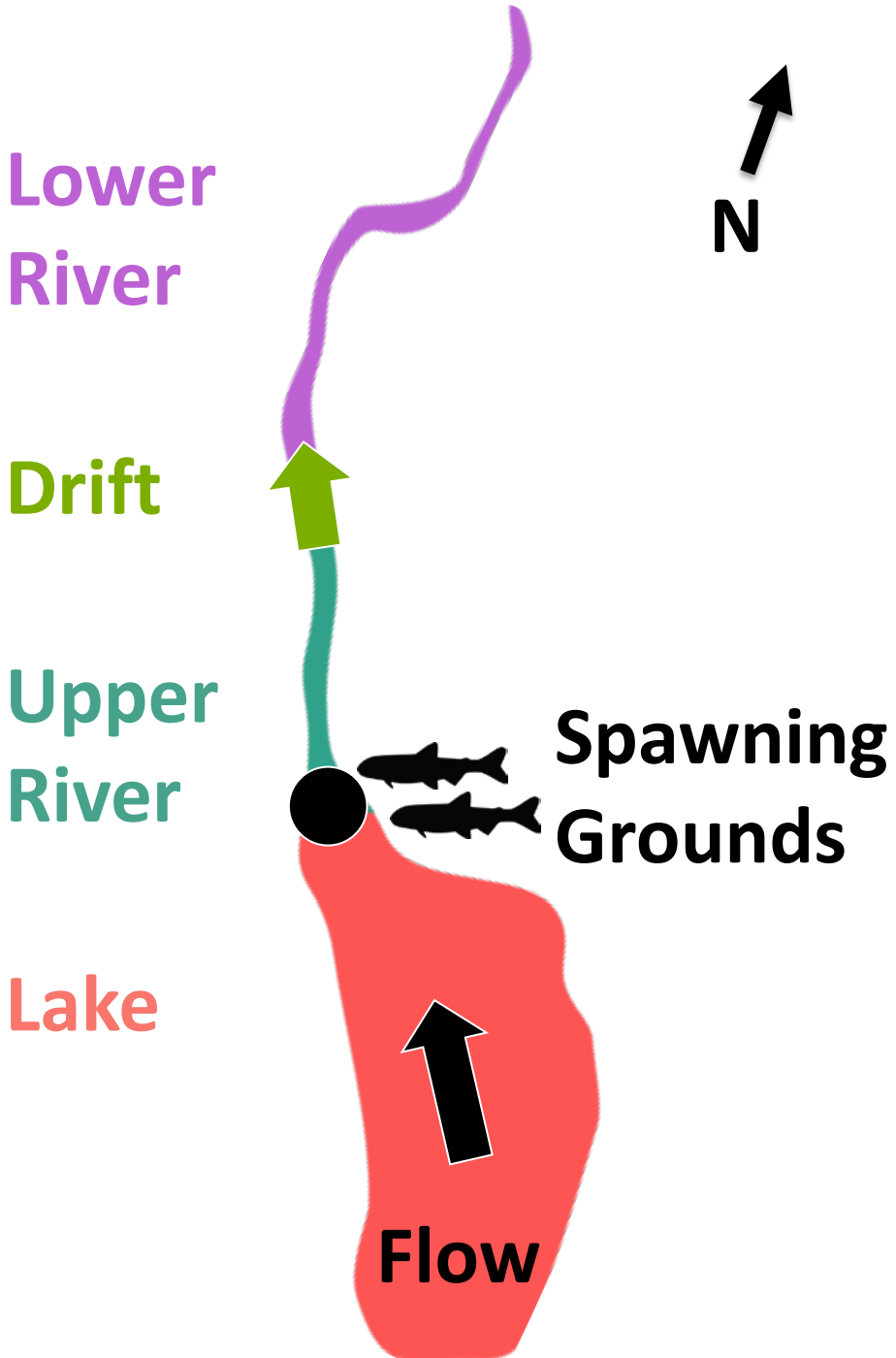
Clarke 1967, McCart 1967, Narver and Anderson 1969, Clarke and Smith 1972, McDonald and Hume 1984, Wood et al. 1998

1. **Abundance**: how are individuals distributed between the lake and river?
2. **Size**: does growth differ?
3. **Condition**: does condition differ?

Methods

Lake and river sites (n=11) monitored over 10 weeks

Sampling was carried out using seine and drift net methods



Velocity environment

Velocity environment

Flow

Bridge

Drift

Weir

2017 Max: peak discharge 188 m^3/s (June 10, 2017)

Map: early July discharge 130 m^3/s 70% of annual max

Downstream drift: approximately 55% of emerged river fry

2016 Max: peak discharge 98 m^3/s (about 50% of 2017)

< sustained

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Spawning Grounds

Velocity environment

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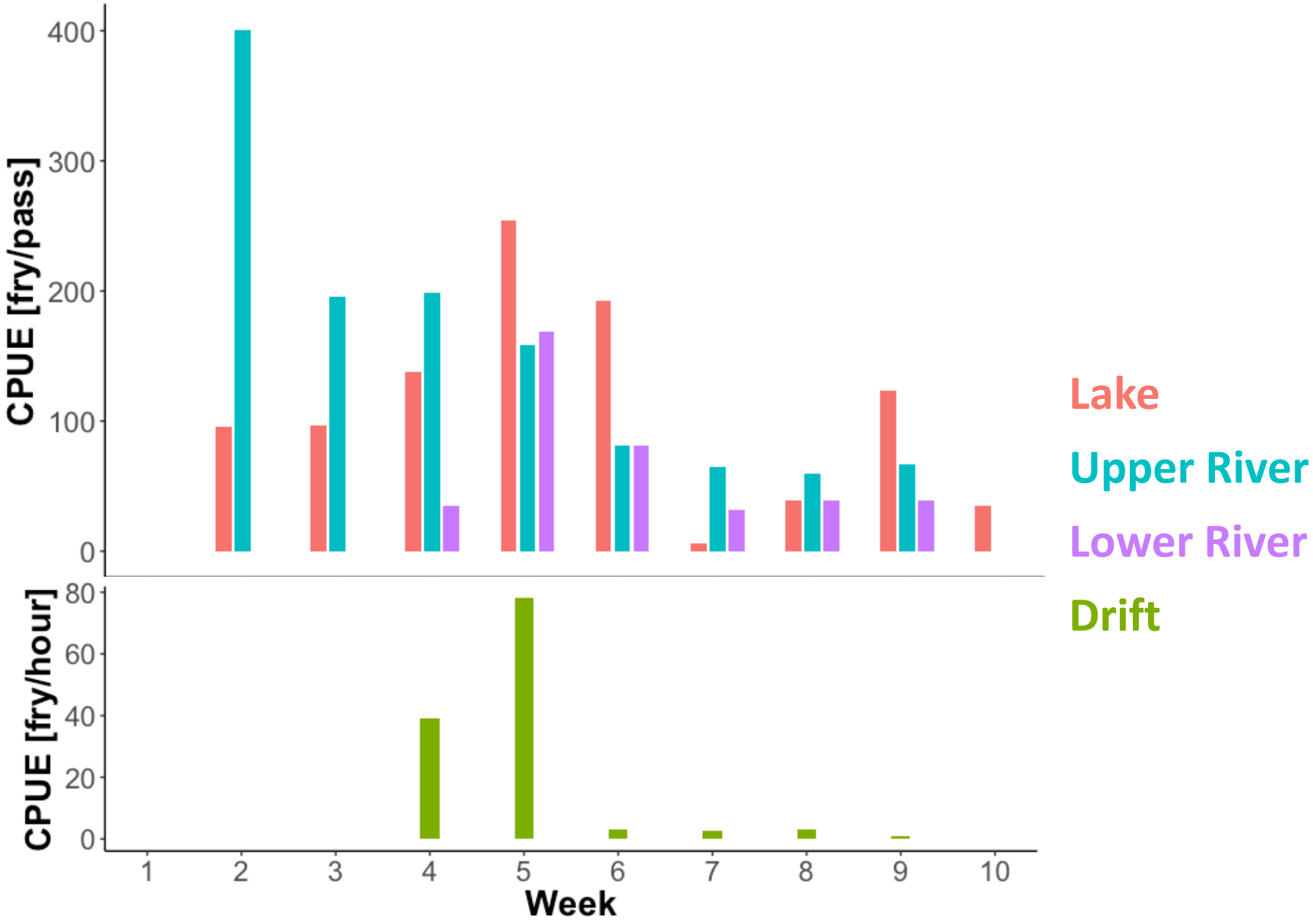
2016 Max: peak discharge 98 m^3/s (about 50% of 2017)

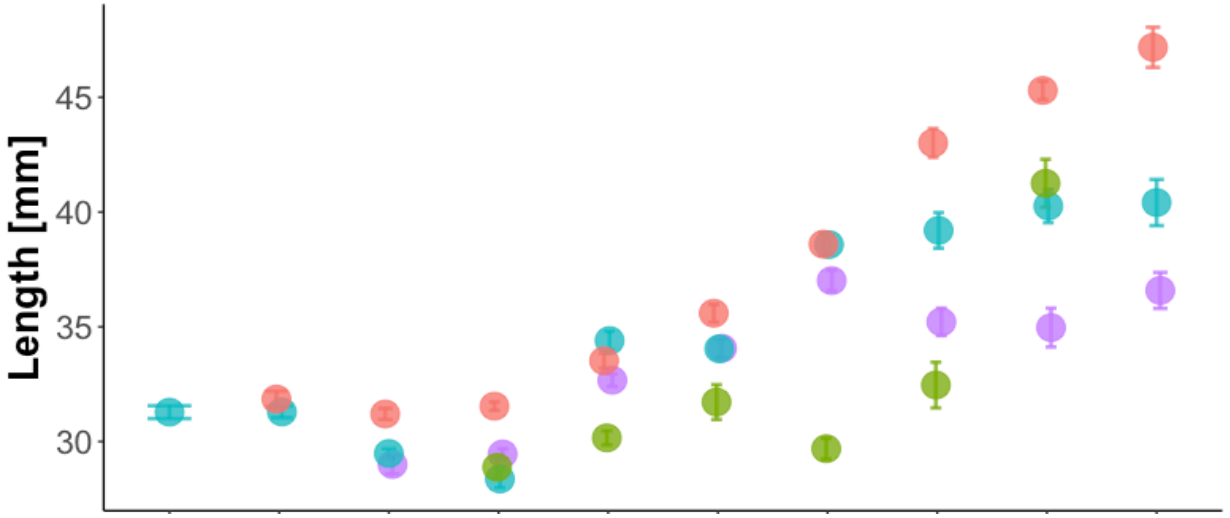
Confirmed: velocity barrier

Spawning Grounds

Peak drift transport at max discharge



Smallest fish transported and found downstream



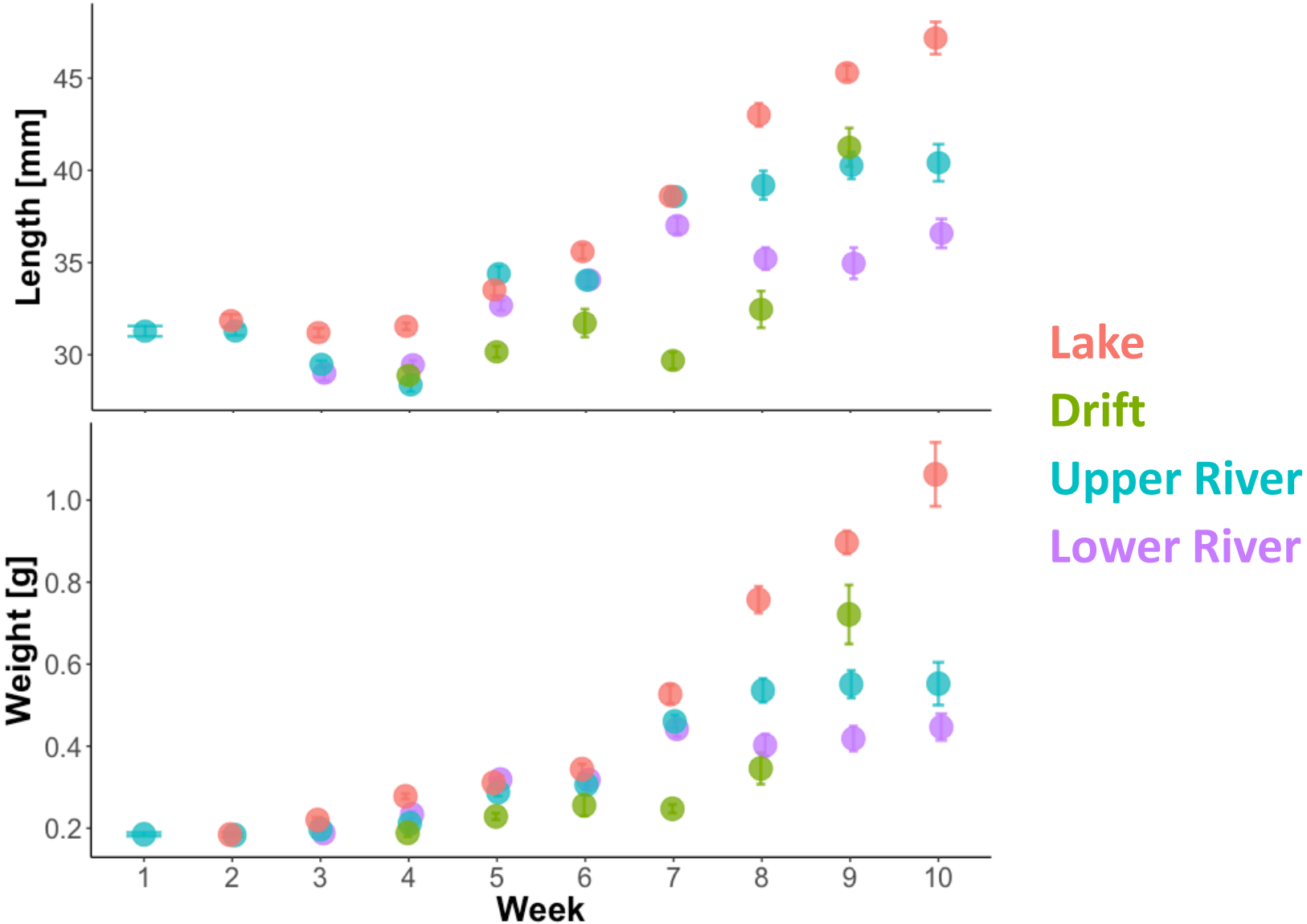
Lake

Drift

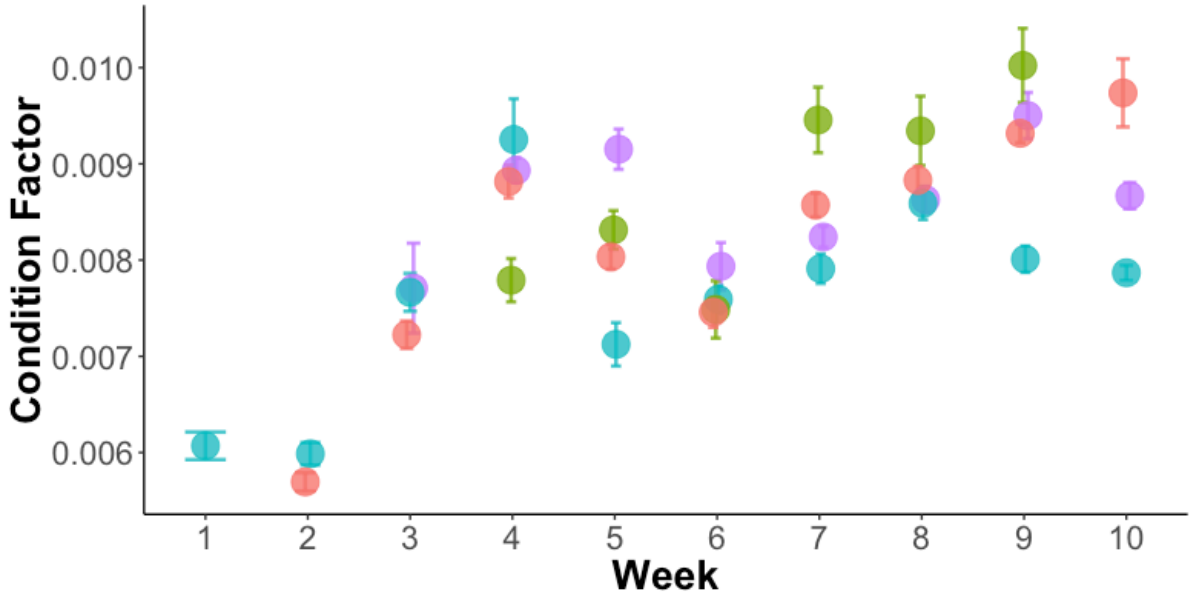
Upper River

Lower River

Smallest fish transported and found downstream



Fry condition across all sites is similar



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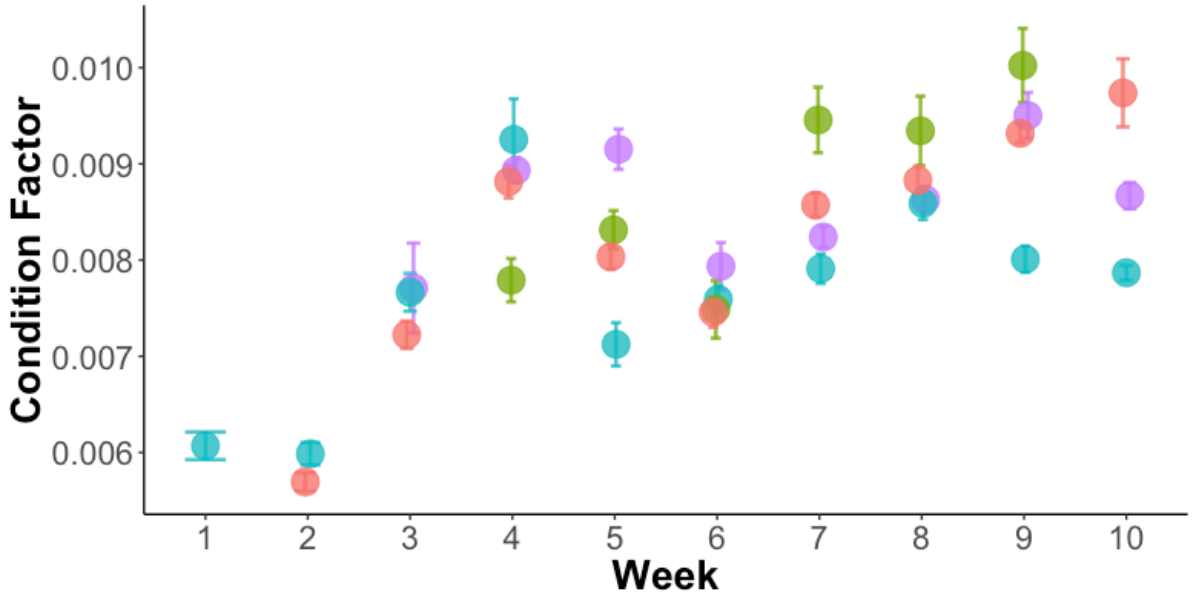

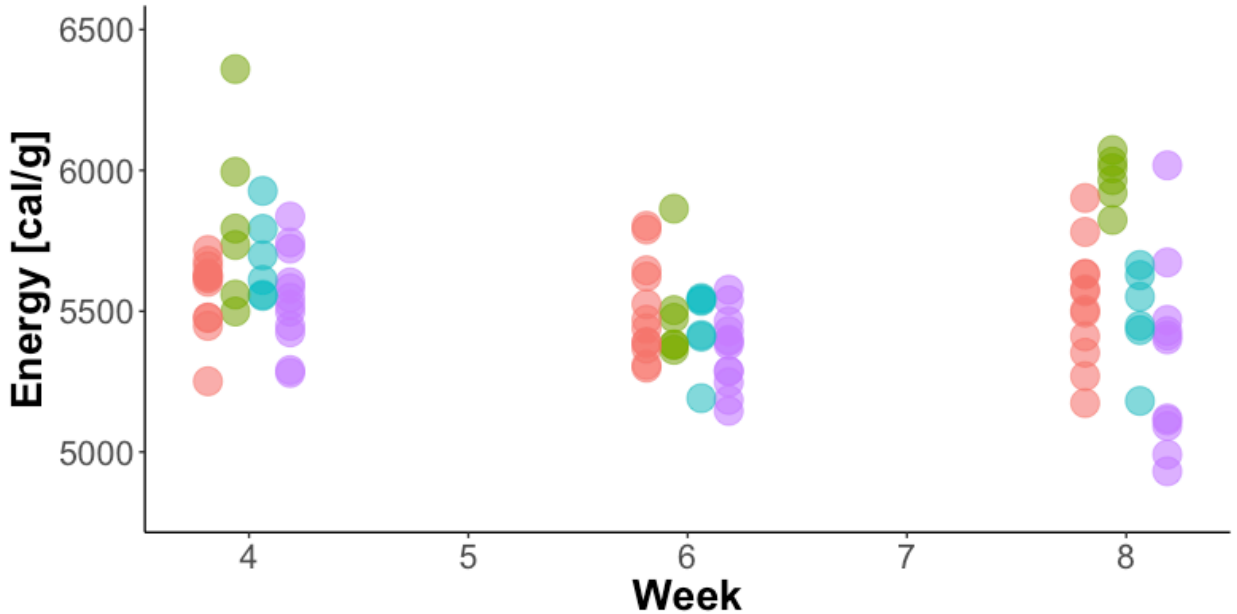

Lake

Drift

Upper River

Lower River

1. **Downstream transport associated with discharge; downstream fish do not hold position**

2. **Small fry were being displaced downstream; fry downstream were growing more slowly than lake fry**

3. **Condition and energy relationship is weaker**

Spatial arrangement and accessibility of habitats can exert strong control on the condition of juvenile sockeye

Poorer condition of river fry could affect health parameters such as competitive ability and pathogen resistance

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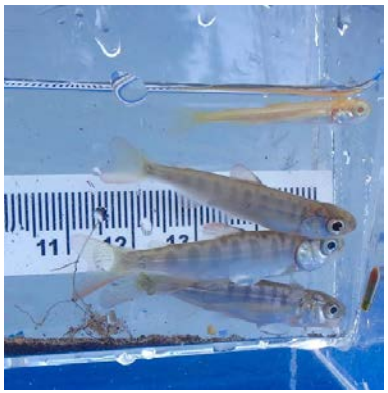
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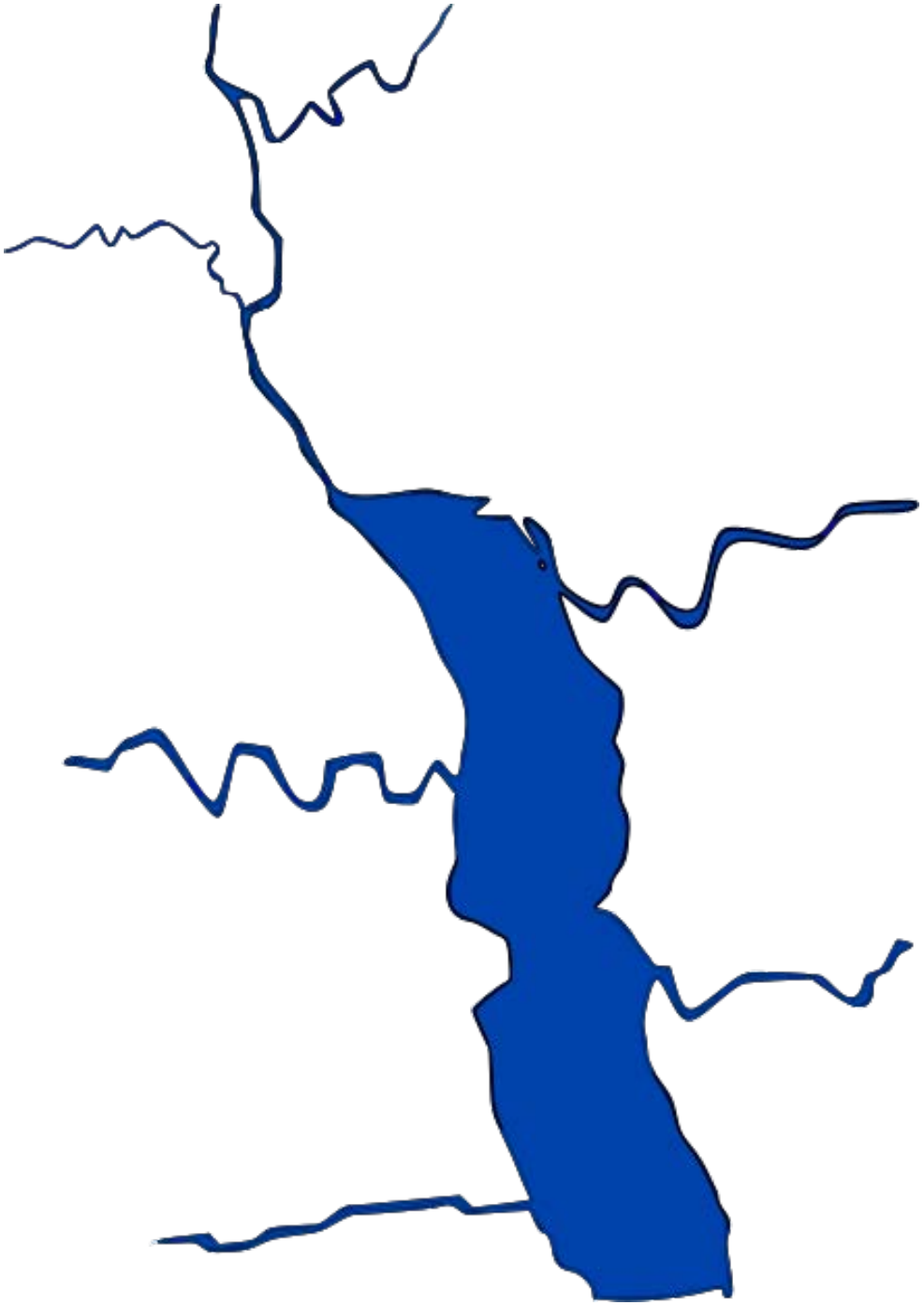

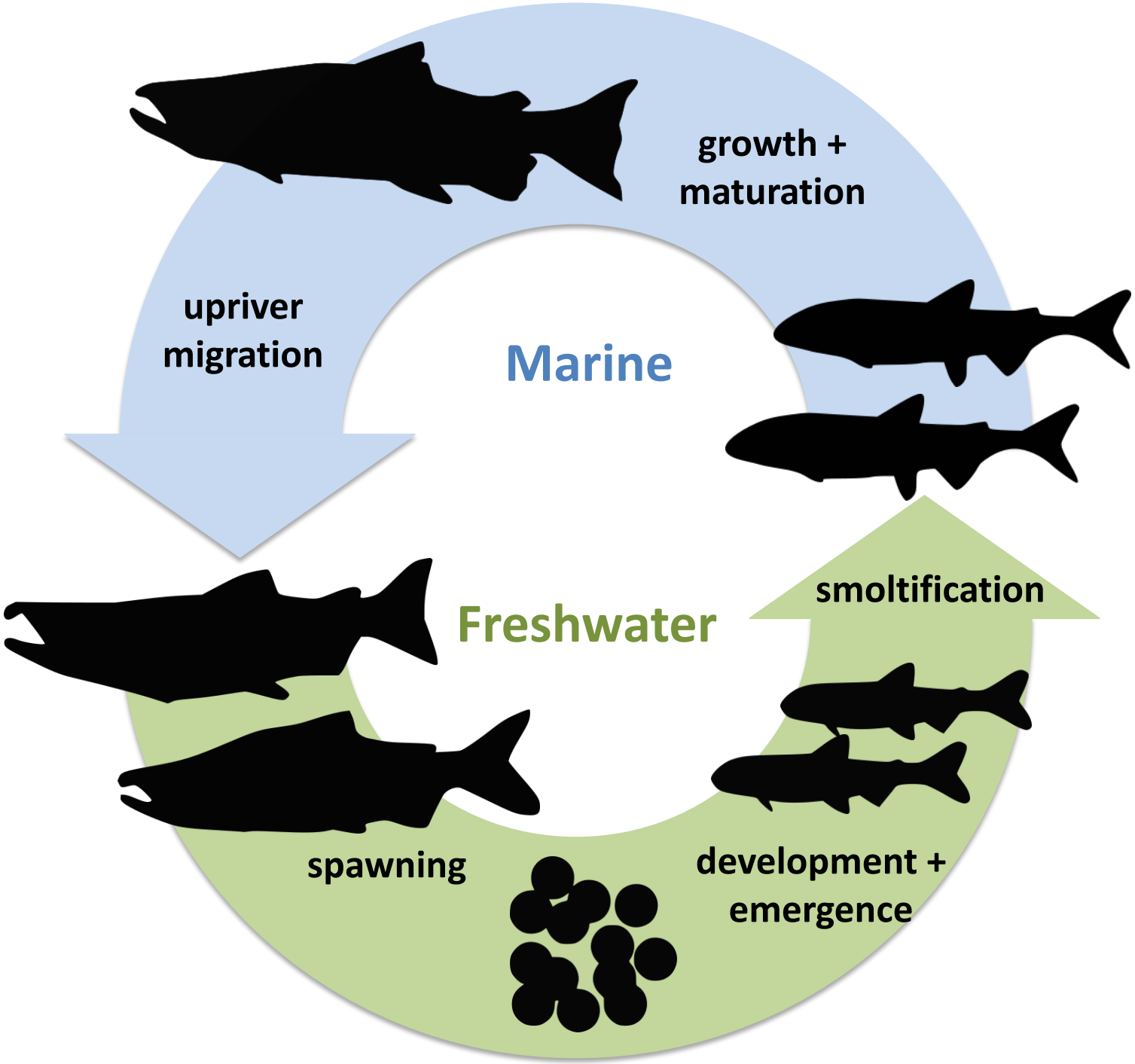
growth +
maturation
upriver
migration
Marine
smoltification
Freshwater
spawning
development +
emergence