

You've got to know when to hold 'em: Determination of appropriate transport and release timing of juvenile Chinook salmon



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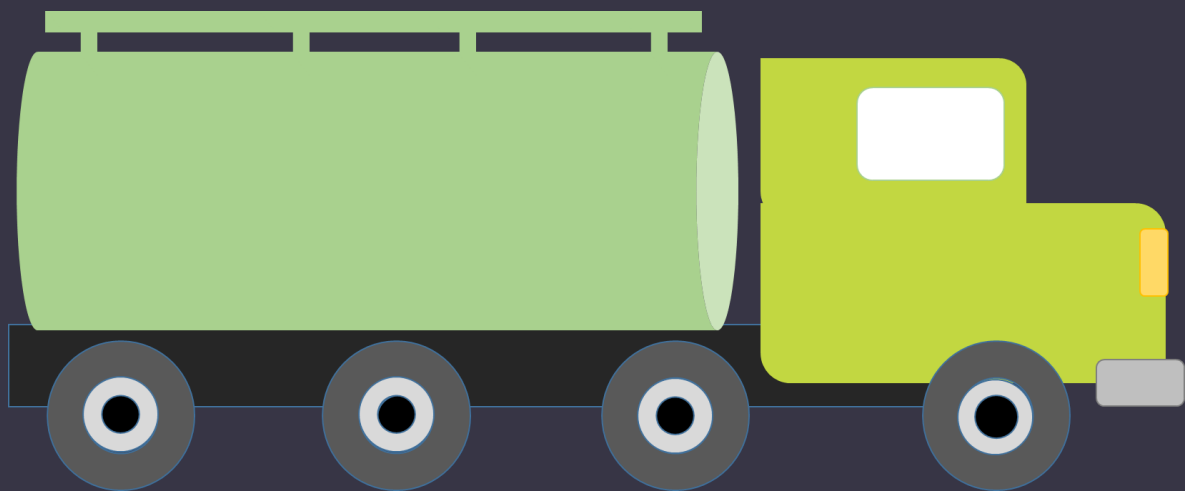
Transportation



Temperature



Timing

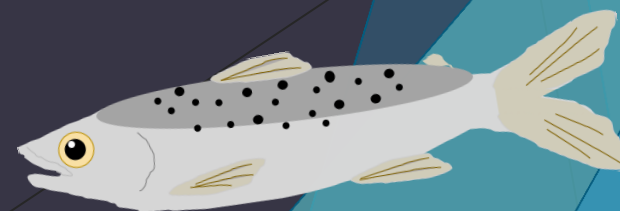
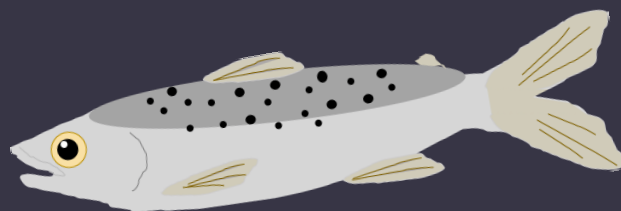
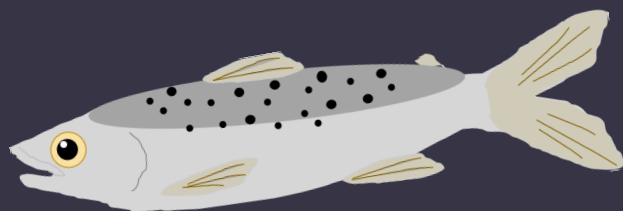


October

December

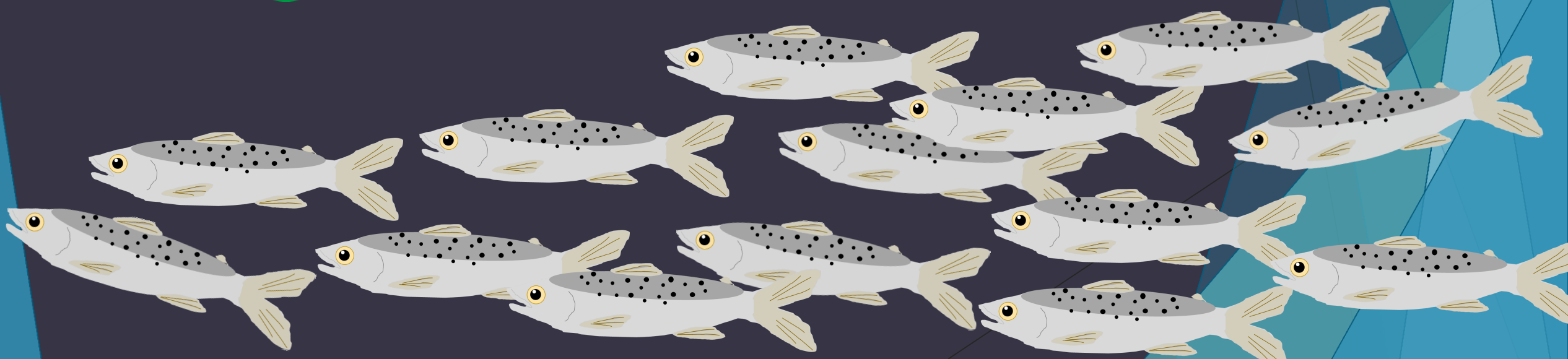
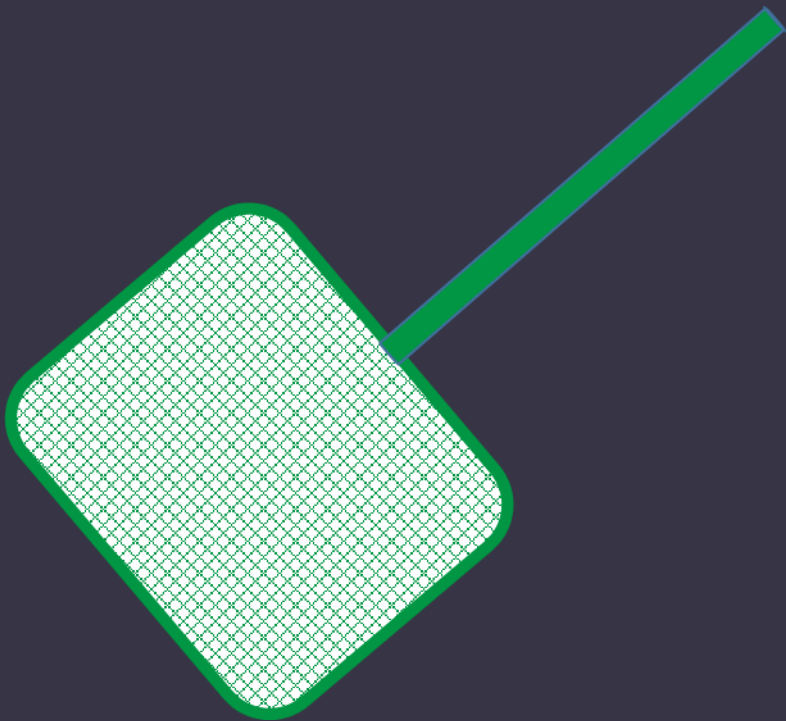
February

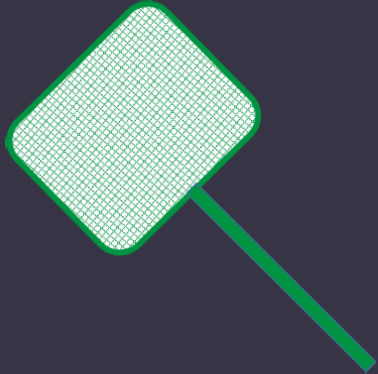
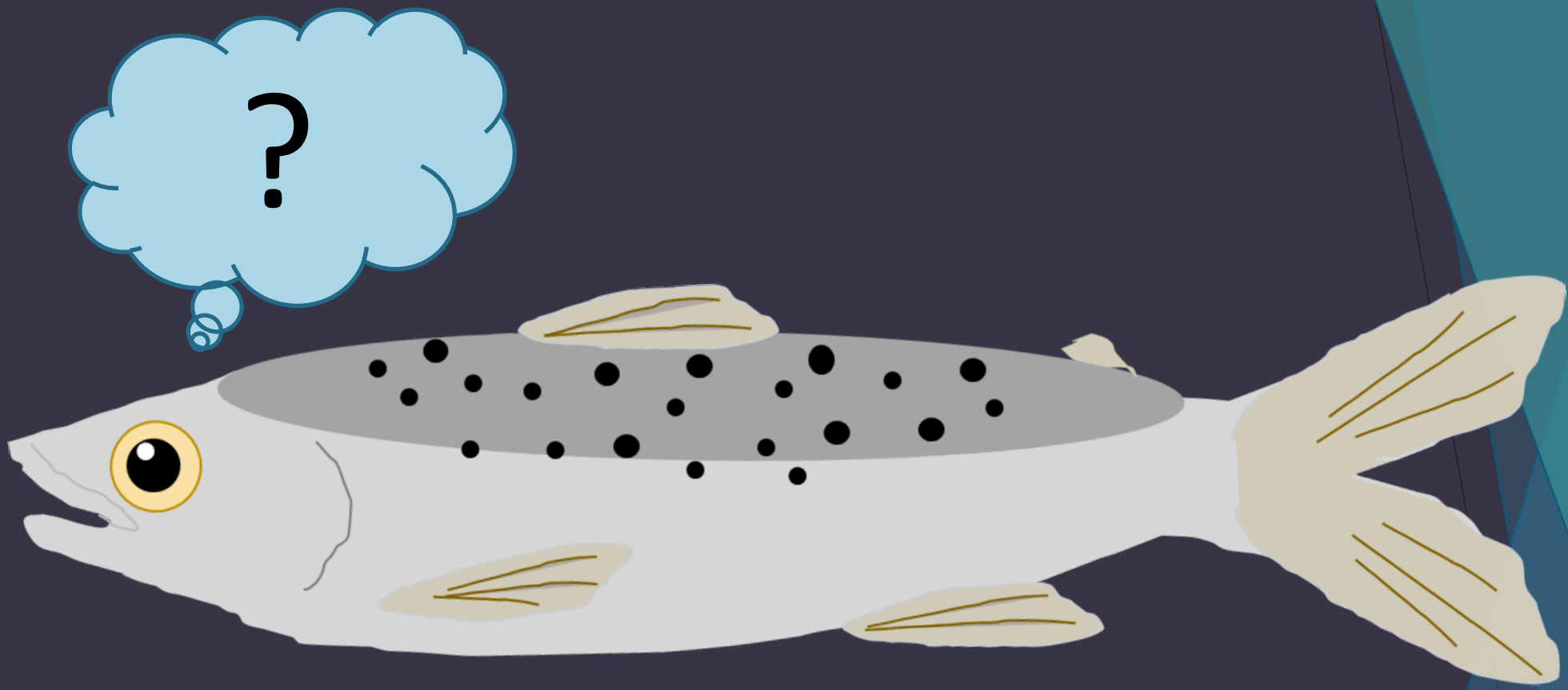
April



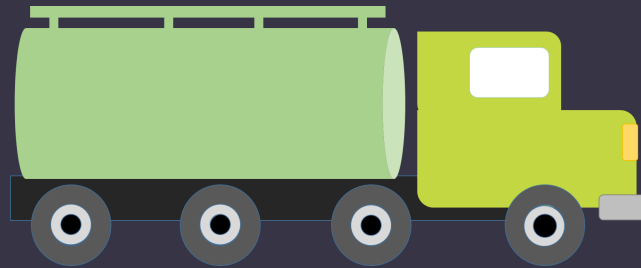
Stressors

The background of the slide is an abstract composition of overlapping triangles and polygons in various shades of blue and teal. The colors range from a dark, muted blue on the left to lighter, more vibrant blues and teals on the right. The geometric shapes create a sense of depth and movement, with some areas appearing more prominent than others due to the layering.





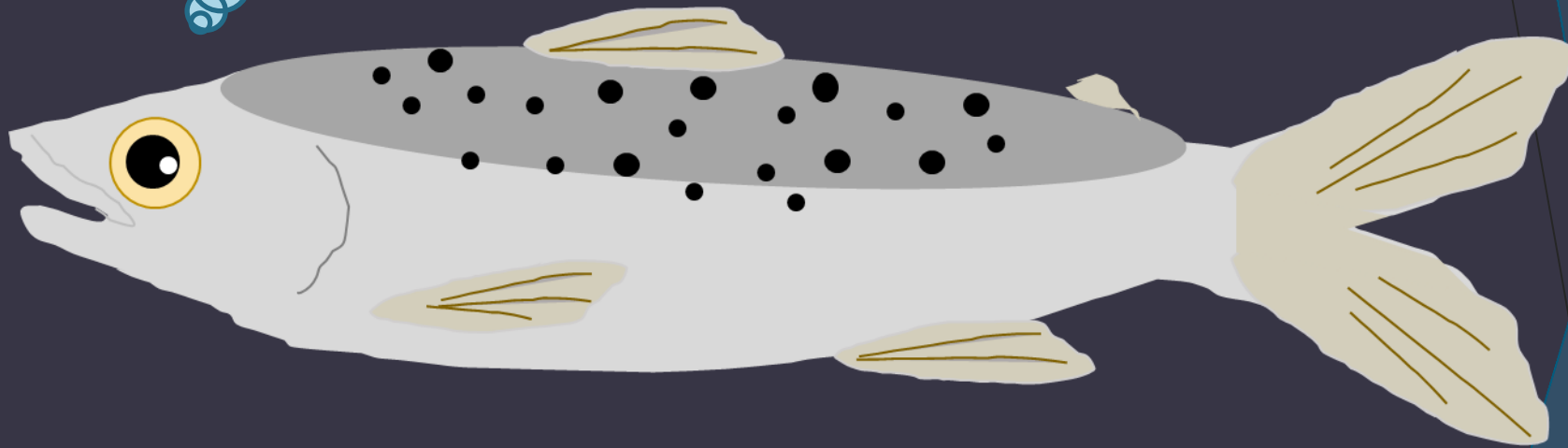
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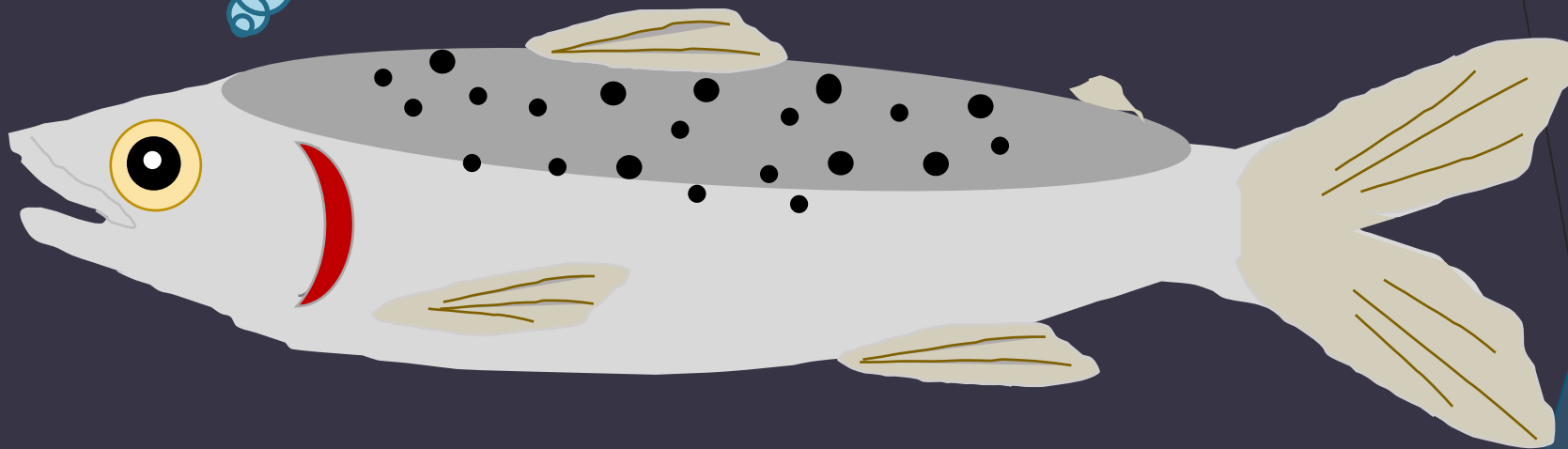
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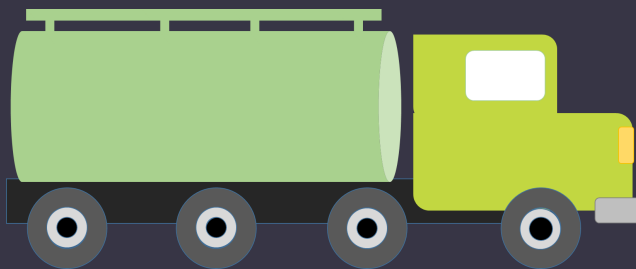
Whew



More?



+



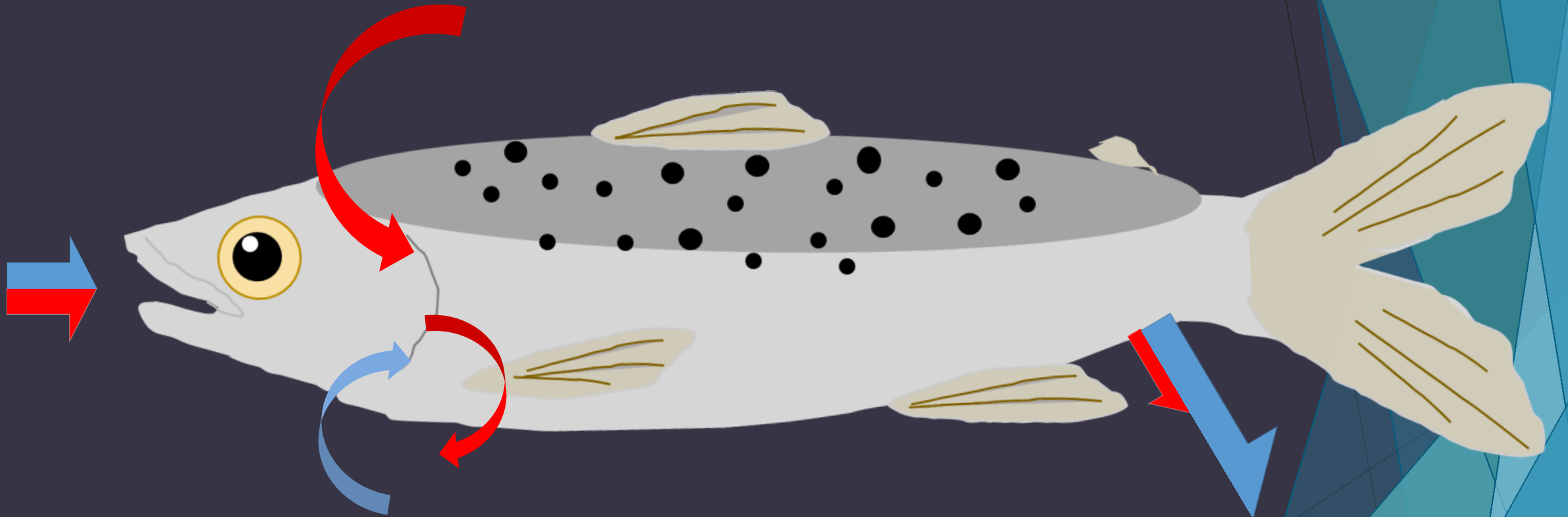
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← Water

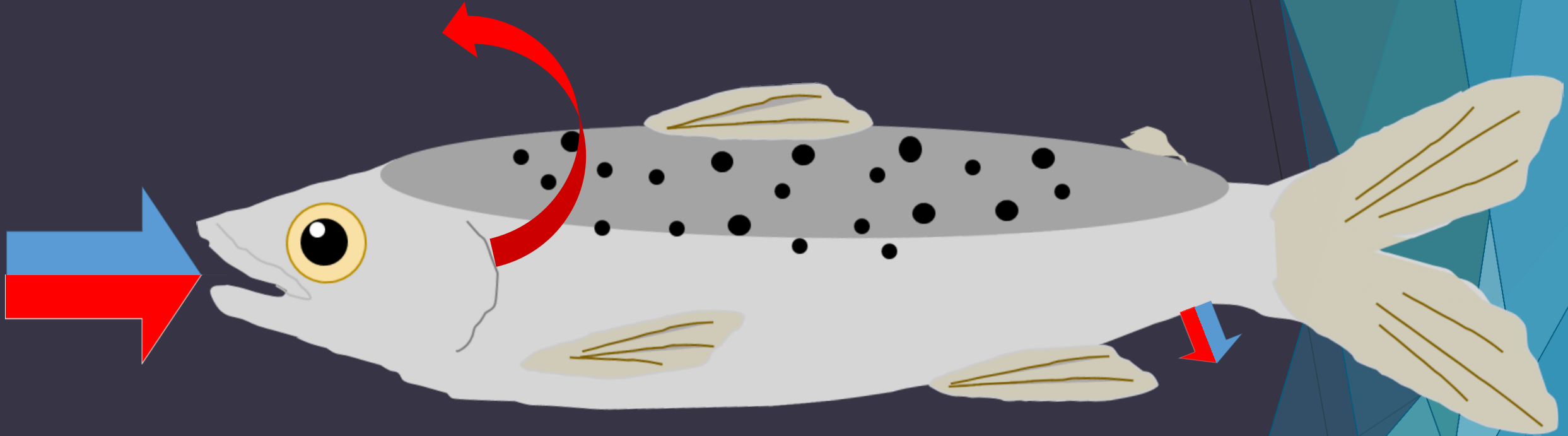
← Ions



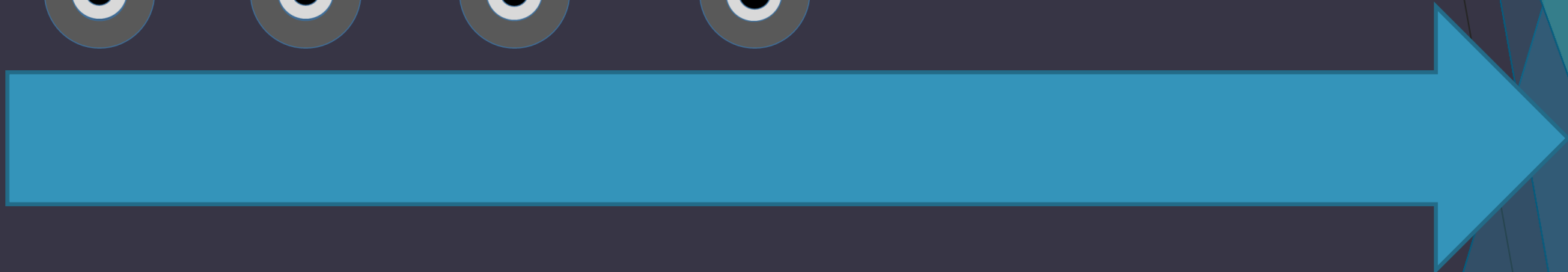
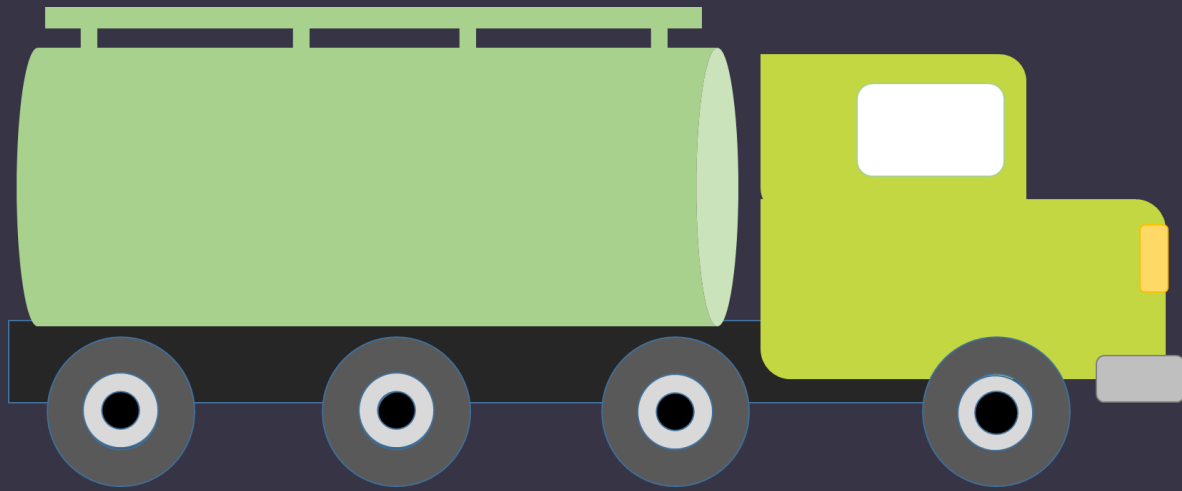
Freshwater

← Water

← Ions



Saltwater



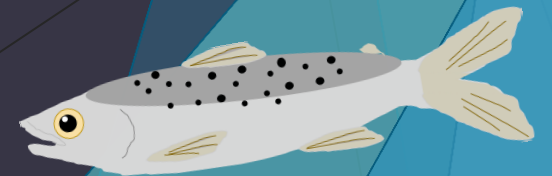
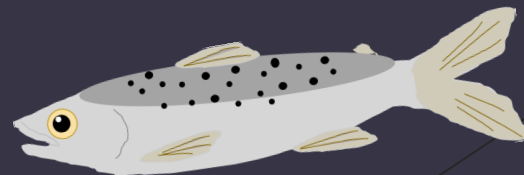
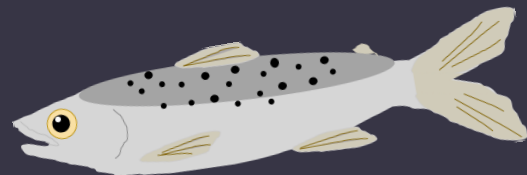
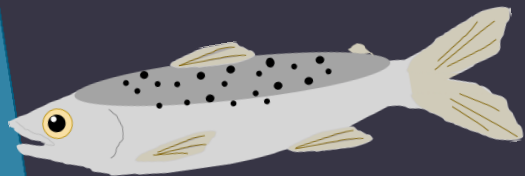
October

December

February

April

Hatchery



Survival following Saltwater Challenge

Delivery Group	Mortalities
October	0%
December	0%
February	0%
April	43%
Hatchery	0%

Survival following Saltwater Challenge

Delivery Group	Mortalities
October	0%
December	0%
February	0%
April	43%
Hatchery	0%

Fish exceeding smolt criterion

(n = 59)

Delivery Group	Na ⁺ > 170 mM
October	8
December	10
February	17
April	23
Hatchery	3

Fish exceeding smolt criterion

(n = 59)

Delivery Group	Na ⁺ > 170 mM
October	8
December	10
February	17
April	23
Hatchery	3

Fish exceeding smolt criterion

(n = 59)

Delivery Group	Na ⁺ > 170 mM	Mg ²⁺ > 2 mM
October	8	10
December	10	10
February	17	17
April	23	21
Hatchery	3	4

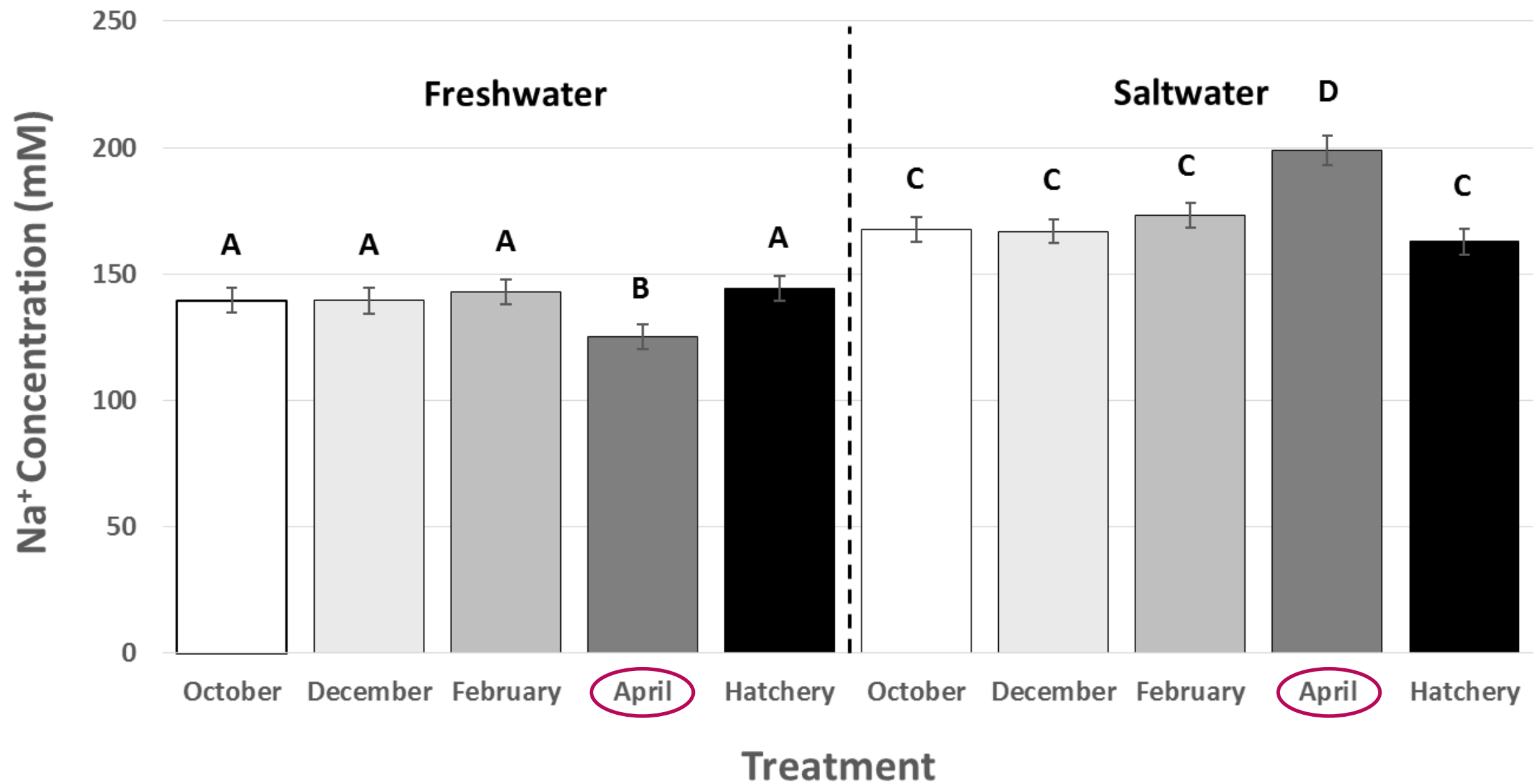
Fish exceeding smolt criterion

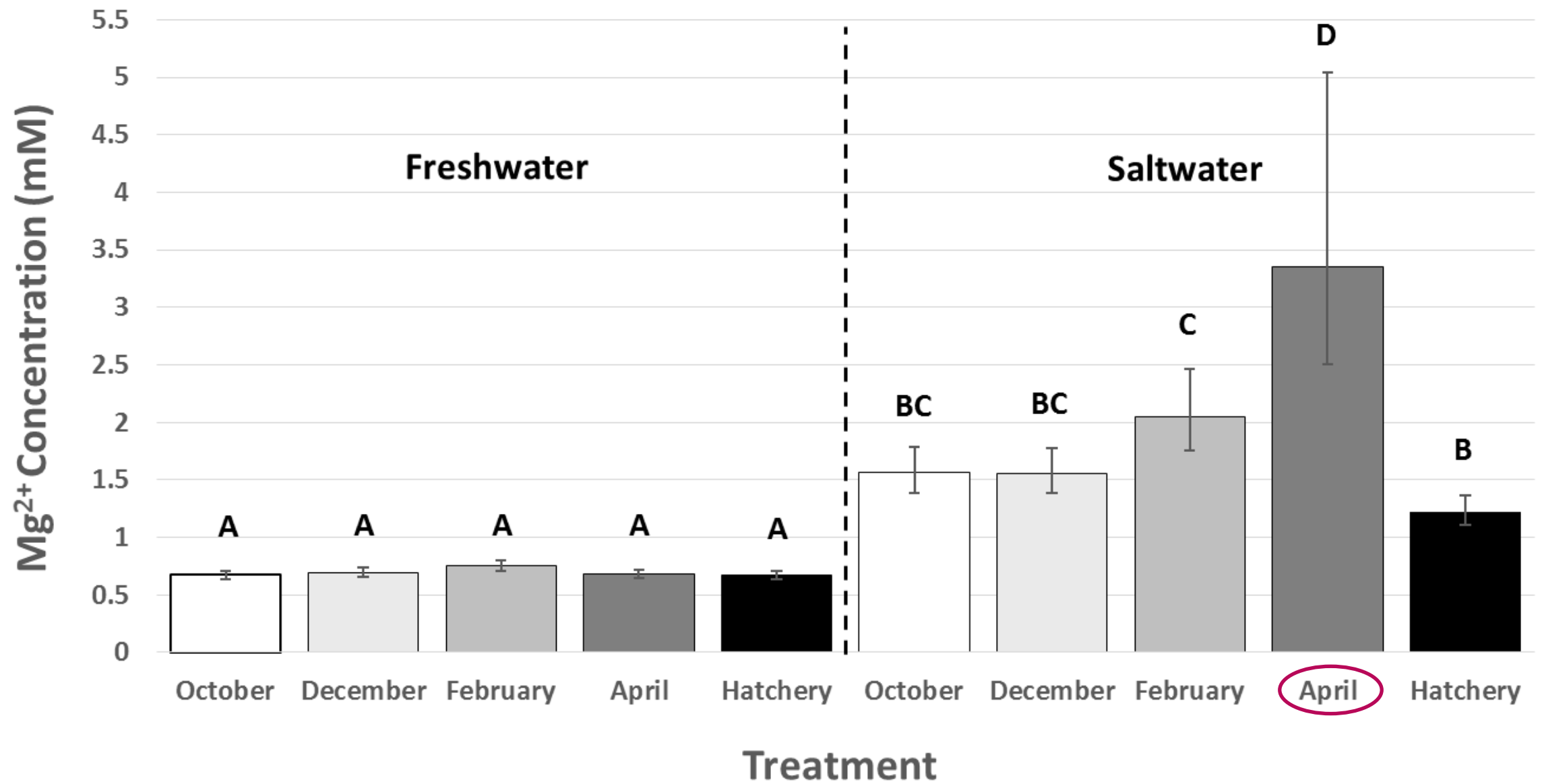
(n = 59)

Delivery Group	Na ⁺ > 170 mM	Mg ²⁺ > 2 mM
October	8	10
December	10	10
February	17	17
April	23	21
Hatchery	3	4

~~Stop?~~

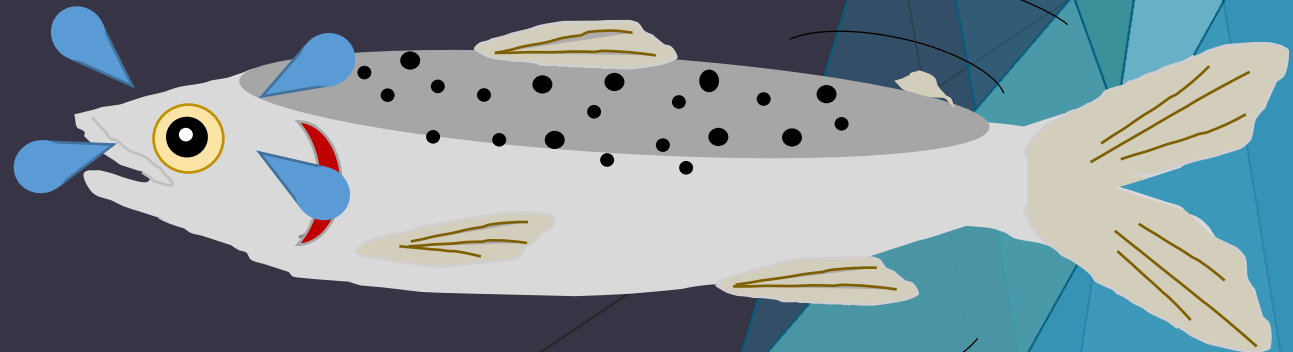
~~Stop?~~





Why April?

- ▶ April corresponds with smolting of these spring Chinook salmon
- ▶ Smolting fish are wusses

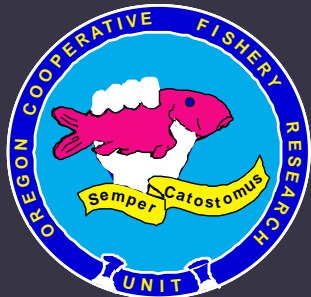


Take Home Message

- ▶ Acclimatization during smoltification requires additional time.
- ▶ Allowing two months should ensure greatest survival and avoid stunted growth.

Acknowledgments

- ▶ Marion Forks Fish Hatchery Staff
- ▶ Rob Chitwood
- ▶ Courtney Danley
- ▶ Kate Self
- ▶ Steve Whitlock

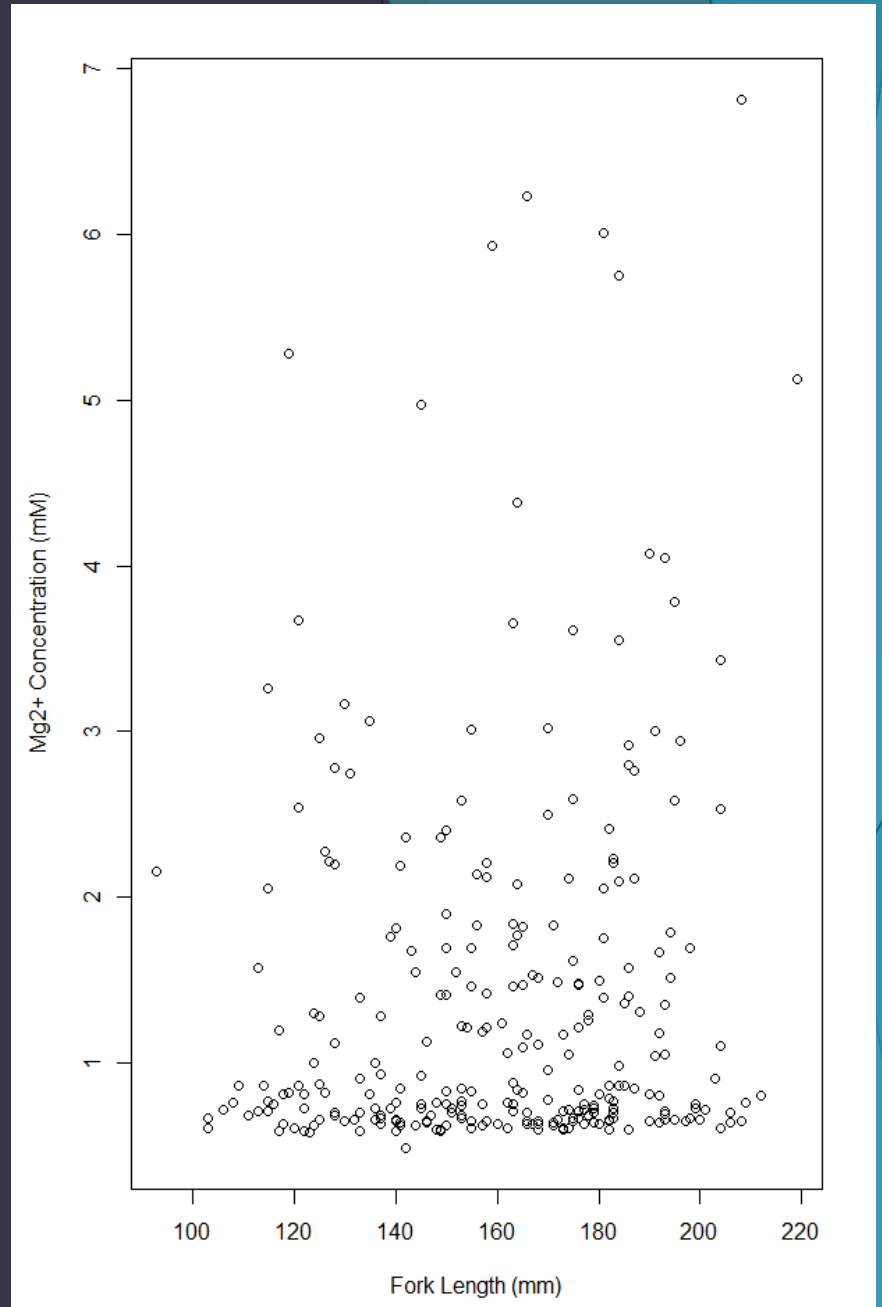
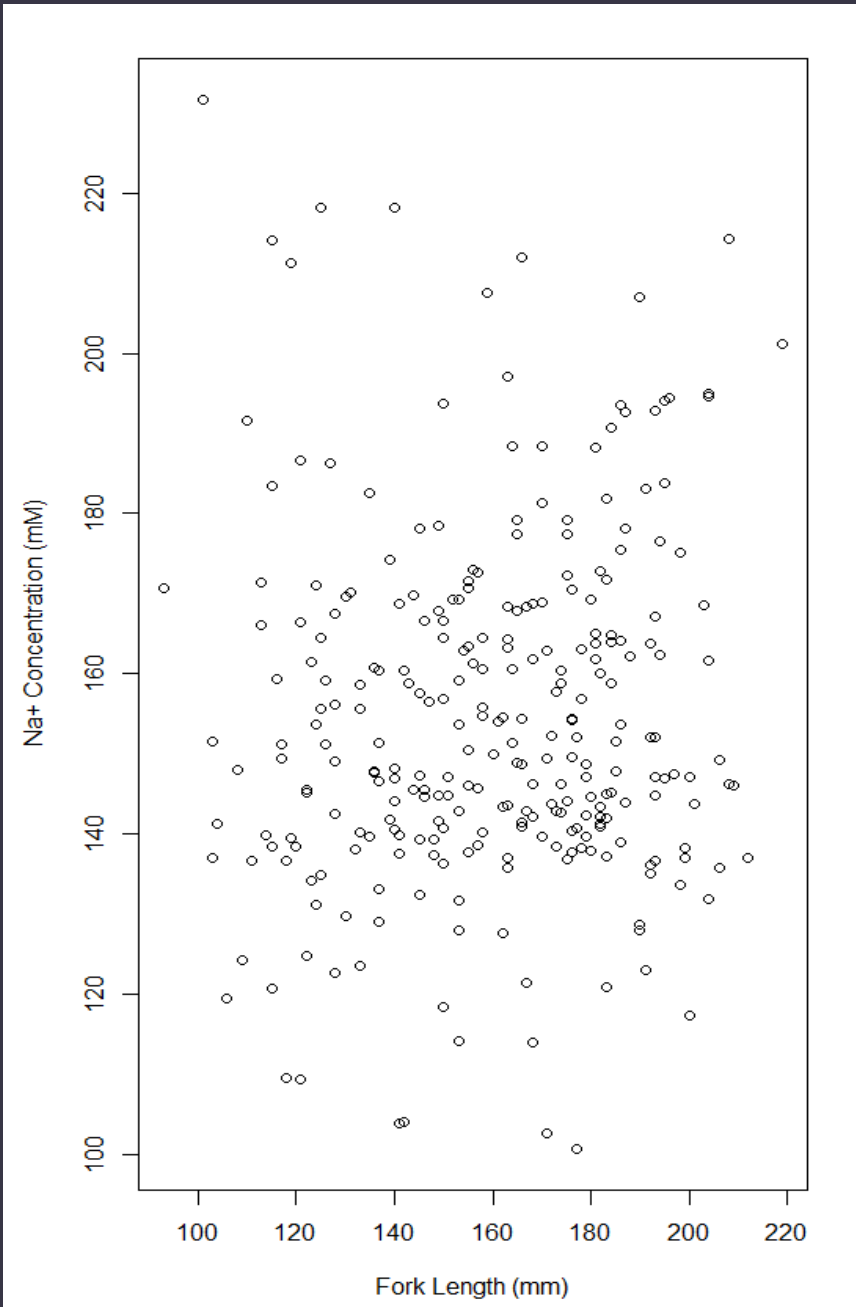


Questions



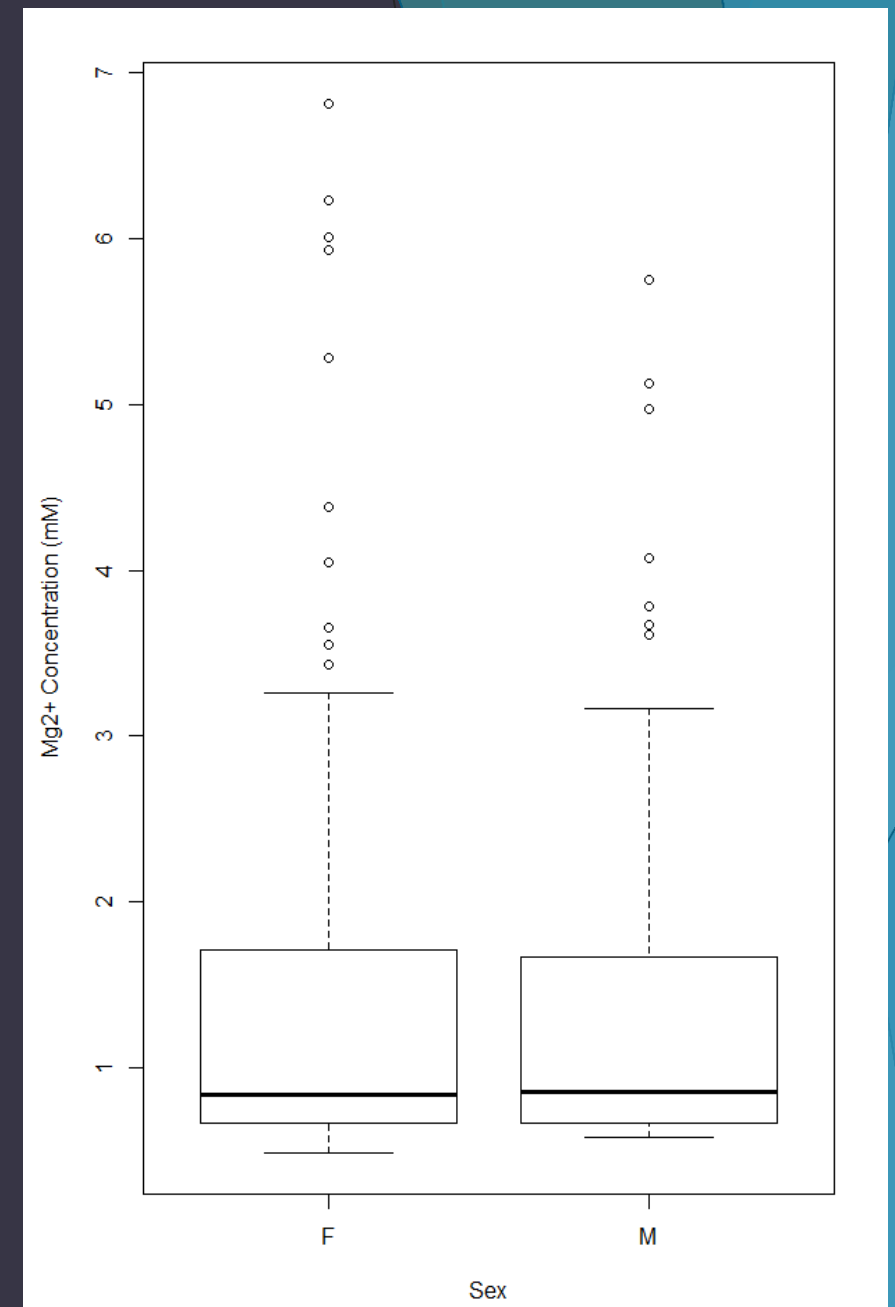
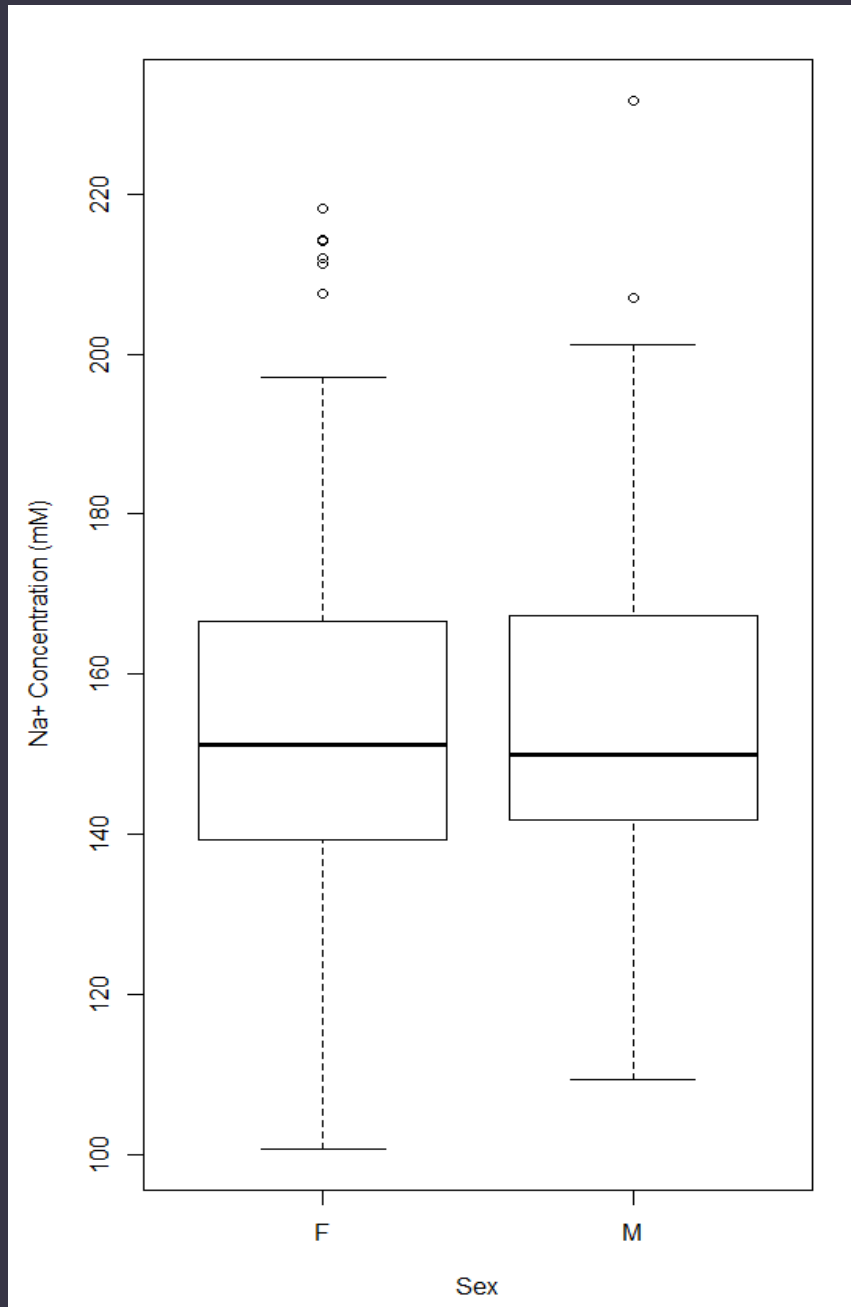
Results

► Size of fish



Results

► Sex of fish



Results

► Salinity of water

