

Juvenile salmon migration report: northern Strait of Georgia to Johnstone Strait 2017

— Hakai Institute Juvenile Salmon Program —

Aim

To provide regular in-season summaries of juvenile Fraser salmon migration catch statistics, health indices, and oceanographic conditions in the northern Strait of Georgia to Johnstone Strait region.

Background

The Hakai Institute Juvenile Salmon Program was launched in the spring of 2015 in a collaborative partnership with UBC, SFU, Salmon Coast, Pacific Salmon Foundation, and DFO. The program operates in the Discovery Islands and Johnstone Strait (Figure 1) and thus provides information on the health of juvenile Fraser River salmon after passage through:

- 1) Strait of Georgia – stratified high plankton biomass zone; and
- 2) Discovery Islands & Johnstone Strait – highly-mixed low-plankton-biomass zone, and area of high wild-farmed fish interactions.

Program Objectives

- 1) Determine migration timing and pathways;
- 2) Migration habitat mapping - oceanographic conditions along the migration route;
- 3) Understand the dynamics of the plankton food-webs that underpin juvenile salmon growth and health;
- 4) Understand parasite and pathogen infection dynamics and their impact on juvenile salmon growth and health.

Key Parameters Reported

- Catch Statistics
- Parasite Loads
- Sockeye Length and Weight
- Oceanographic Conditions

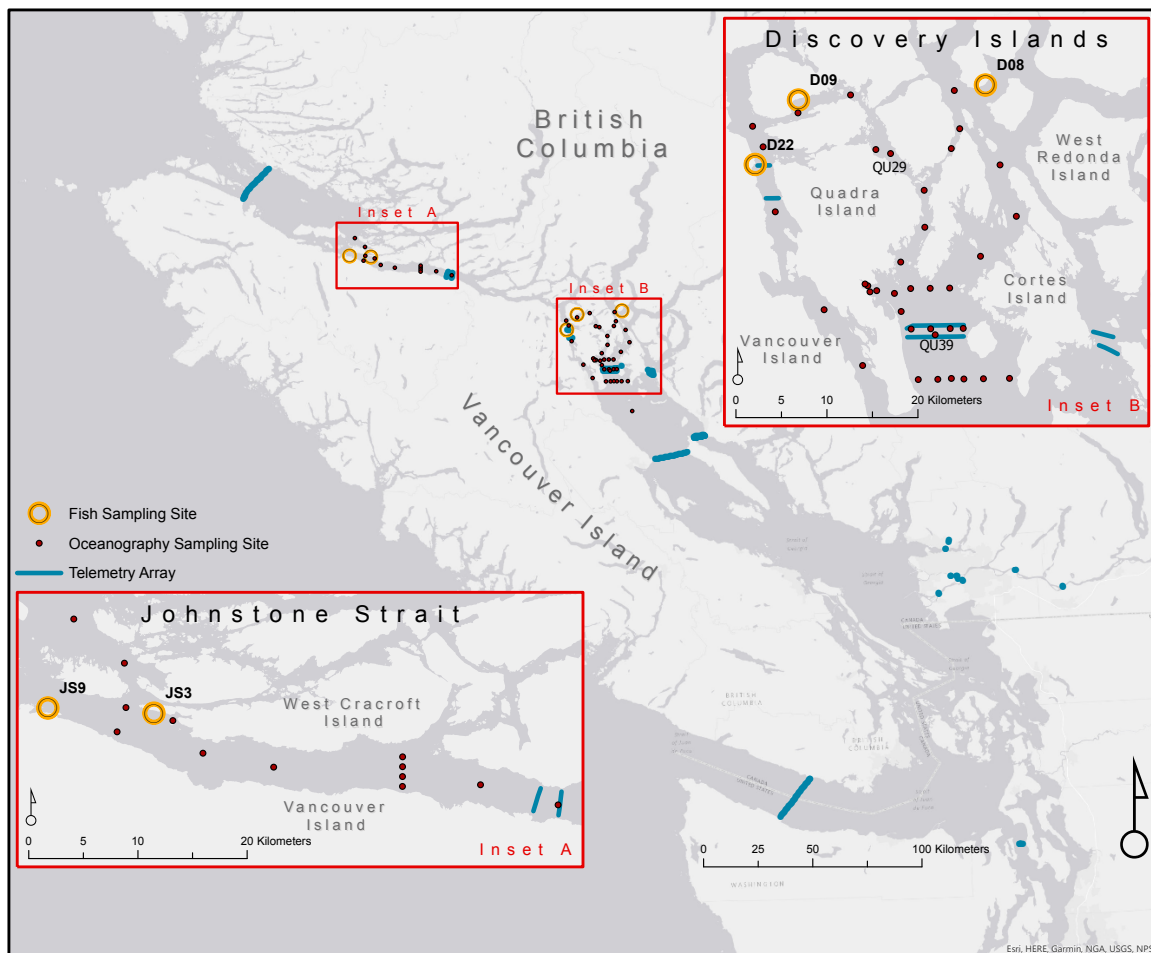


Figure 1: Salmon sampling locations in the Discovery Islands and Johnstone Strait in 2017 (yellow circles).

The following plots are subject to change as the underlying data are preliminary and subject to further quality assurance.

We are endeavouring to provide useful information for the entire salmon research community. As such we welcome any feedback. Please direct questions or comments to Brian Hunt (B.Hunt@oceans.ubc.ca) and/or Brett Johnson (Brett.Johnson@hakai.org).

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Catch Statistics

Cumulative Abundance of all Species

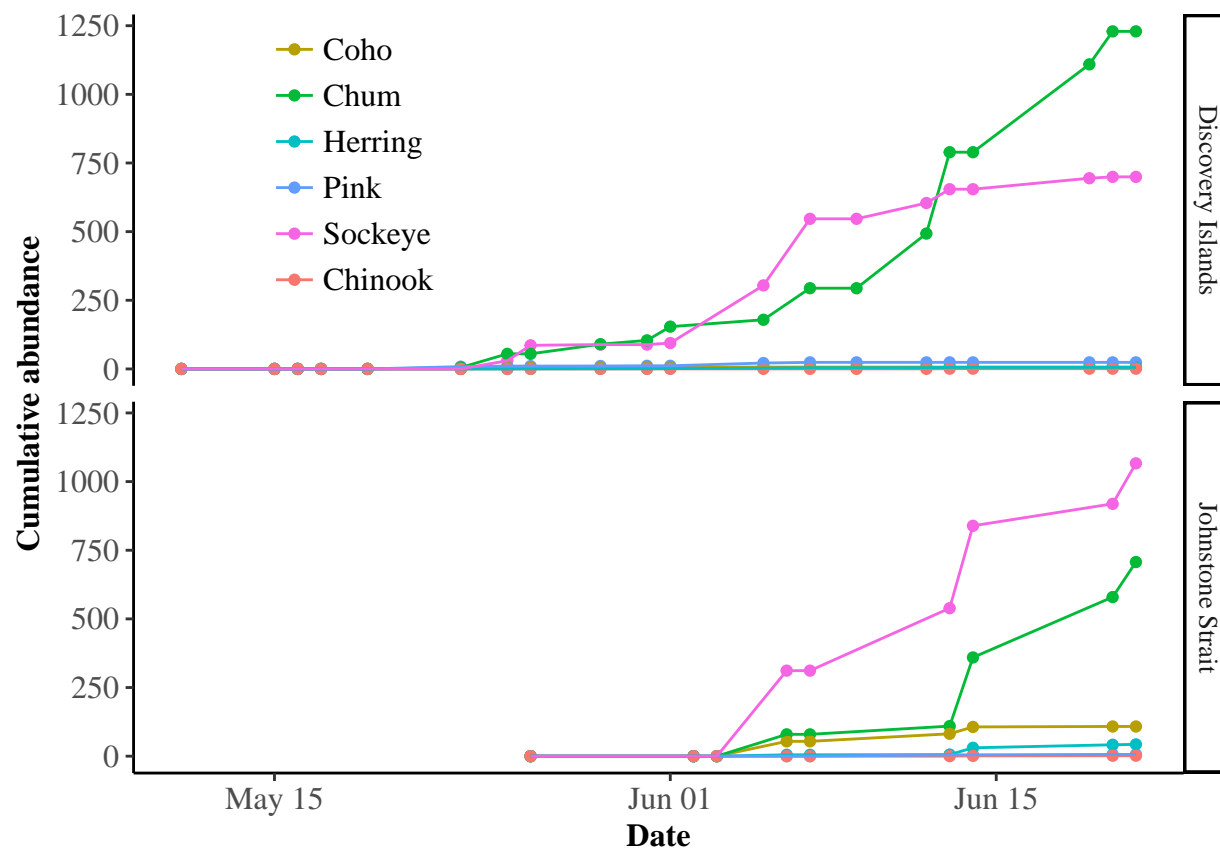


Figure 2: The cumulative abundance of fish captured in the Discovery Islands and Johnstone Strait in 2017.

Cumulative Abundance of Sockeye by Region

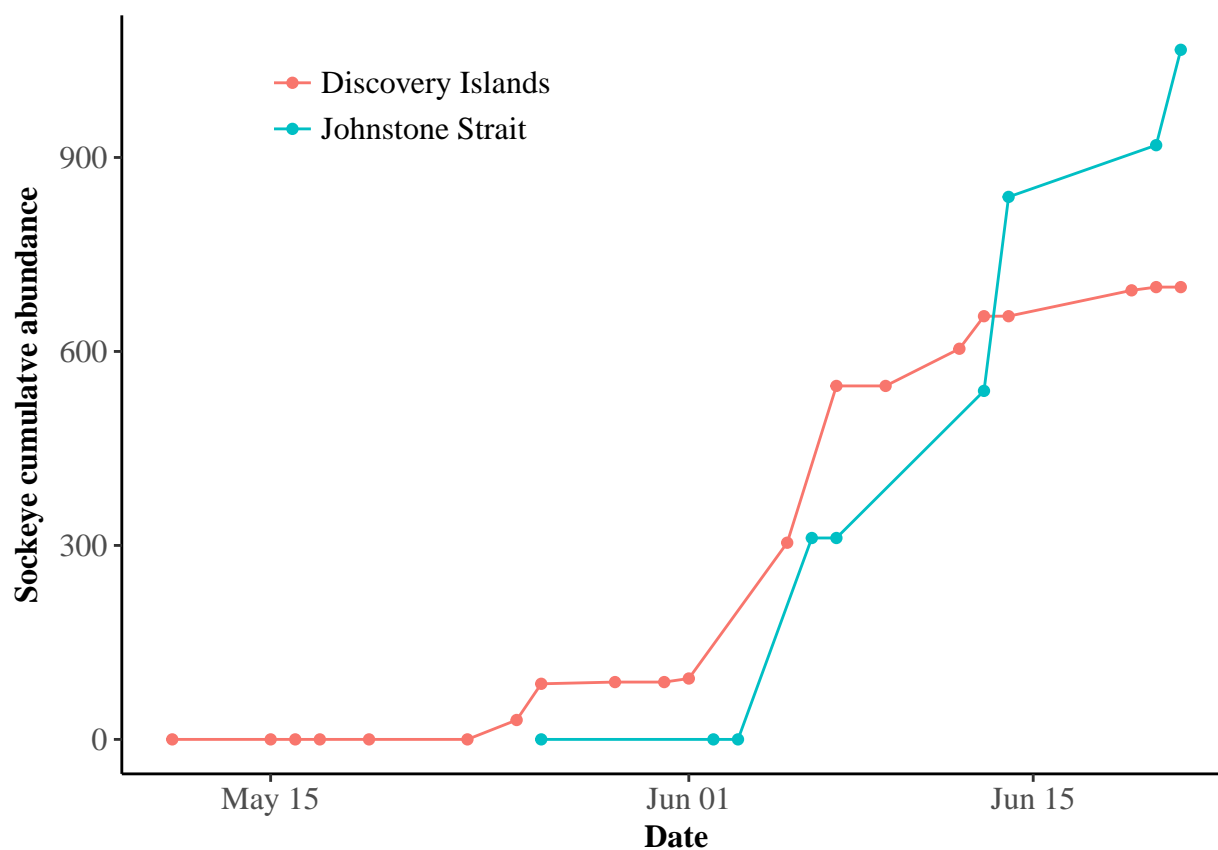


Figure 3: The cumulative abundance of sockeye captured in the Discovery Islands and Johnstone Strait in 2017.

Sockeye Catch Per Unit Effort

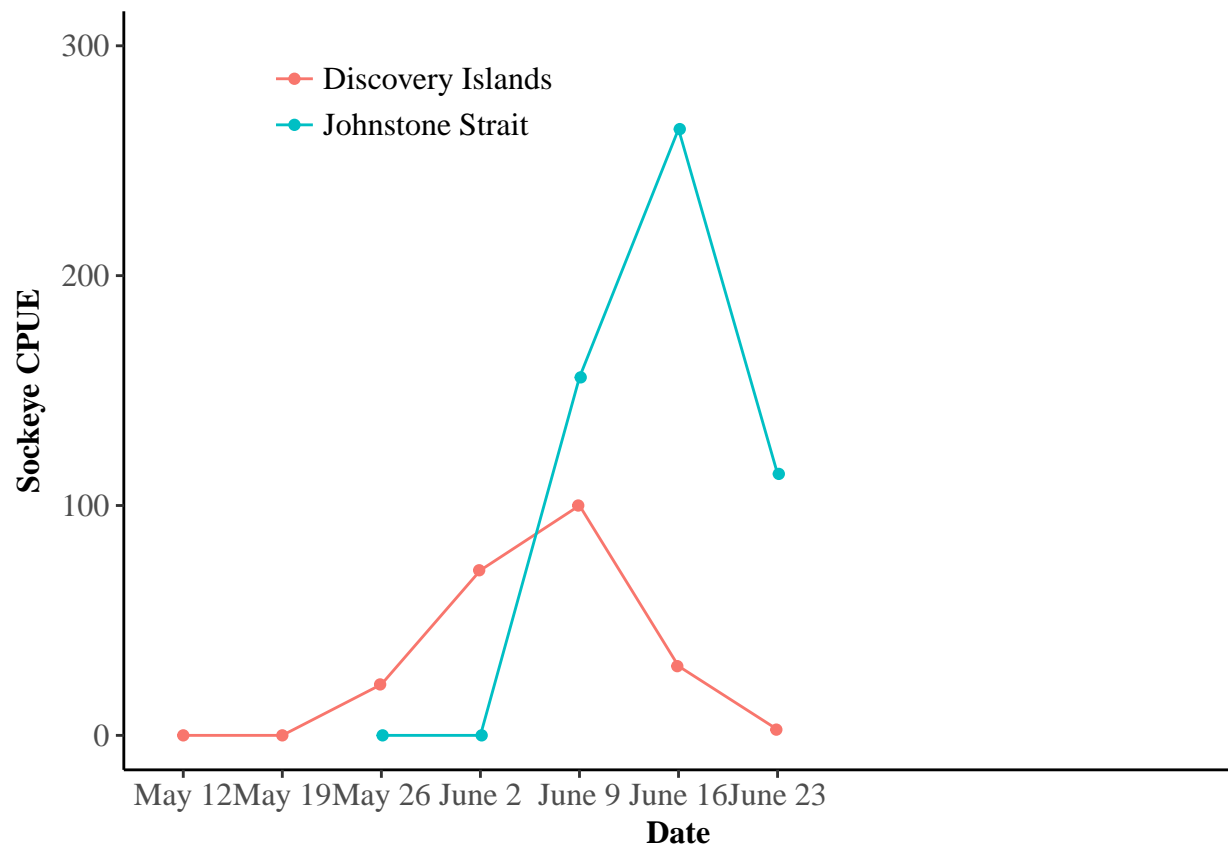


Figure 4: Catch per unit effort of juvenile sockeye salmon in 2017 averaged over one week periods for each region.

Parasite Loads

Sea Lice Abundance

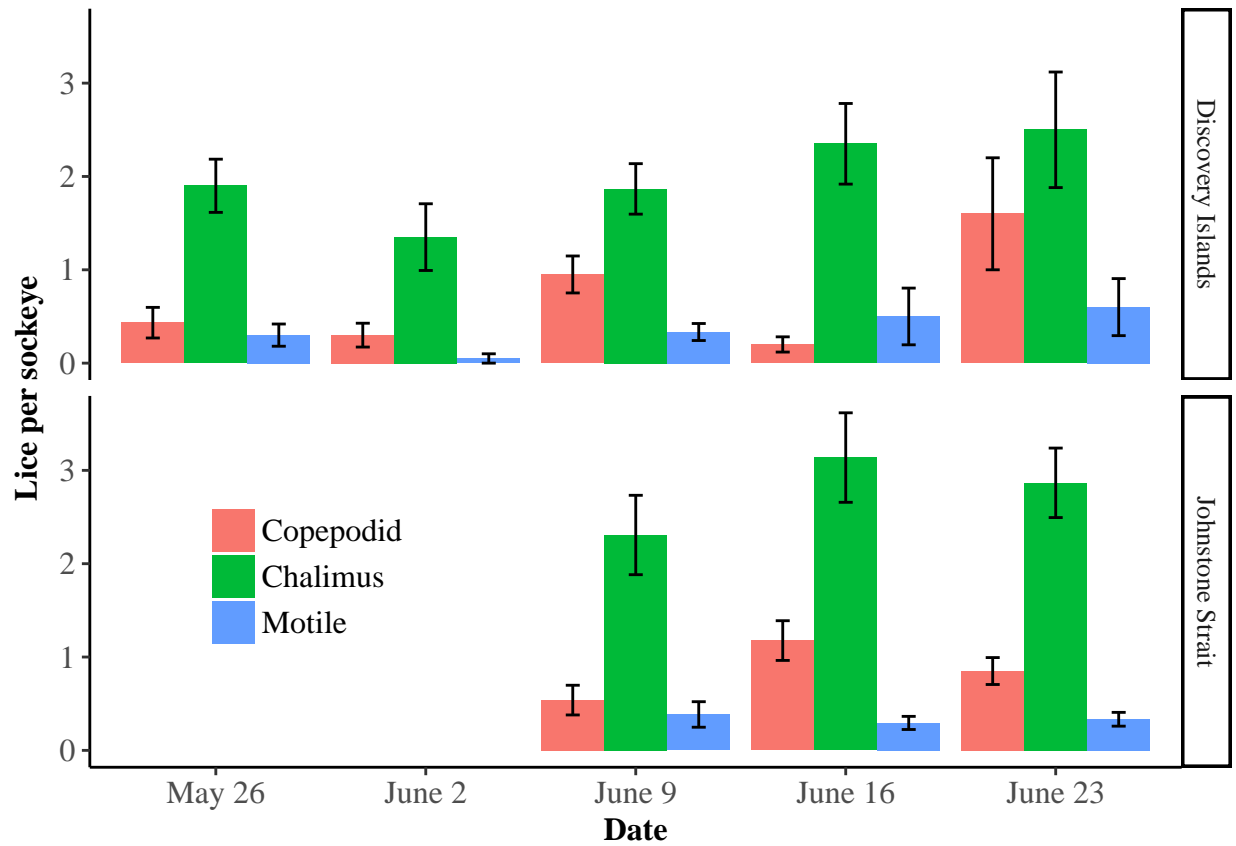


Figure 5: The average abundance \pm SE of three developmental stages of both *Leptheoptheirus salmonis* and *Caligus clemensi* sea lice per juvenile sockeye salmon.

Motile Sea Lice Abundance by Species

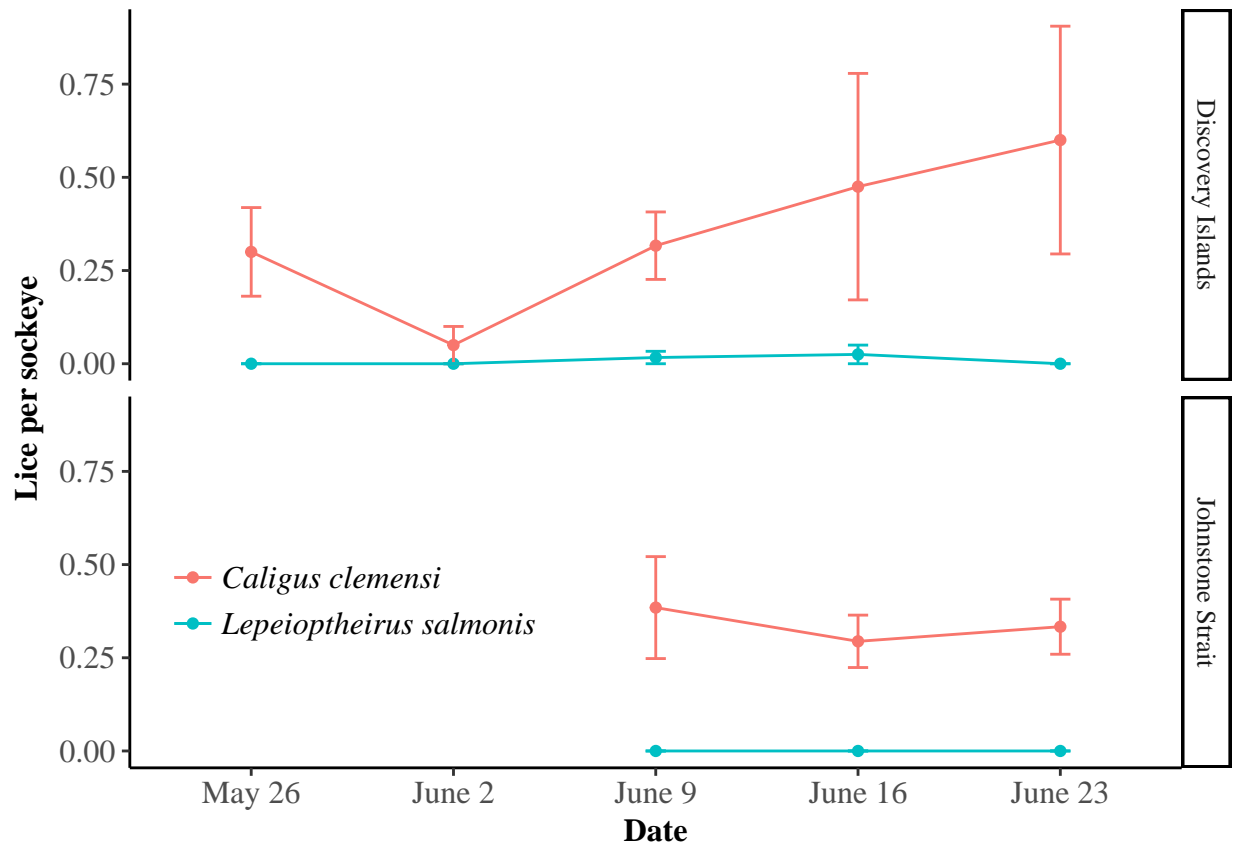


Figure 6: The mean number \pm SE of motile *Lepeiotheirus salmonis* and *Caligus clemensi* sea lice in the Discovery Islands and Johnstone Strait in 2017.

Sea Lice Prevalence

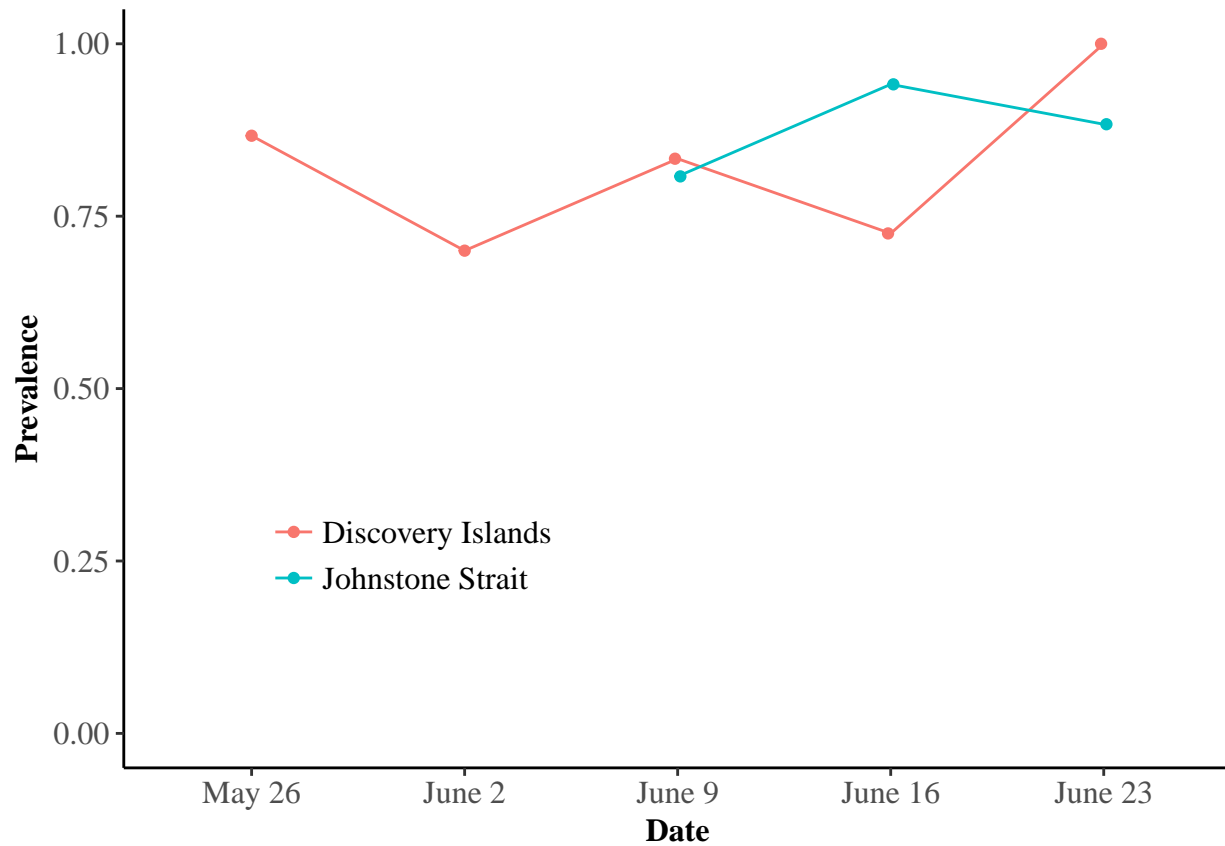


Figure 7: The proportion of juvenile sockeye that had at least one sea louse of any developmental stage of both *Leptheoptheirus salmonis* and *Caligus clemensi* in the Discovery Islands and Johnstone Strait in 2017.

Fish Length and Weight

Sockeye Length

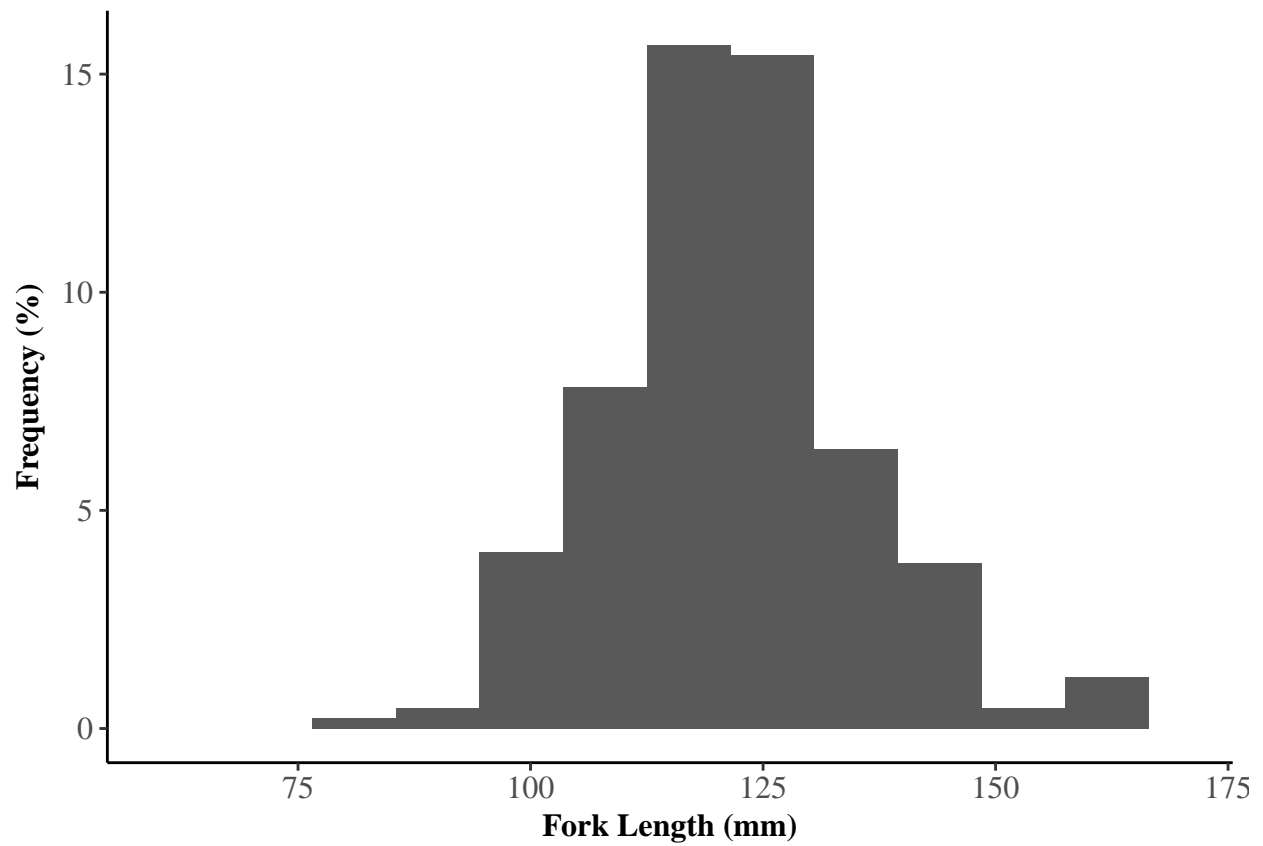


Figure 8: Length frequency histogram of juvenile sockeye in the Discovery Islands and Johnstone Strait in 2017.

Sockeye Weight

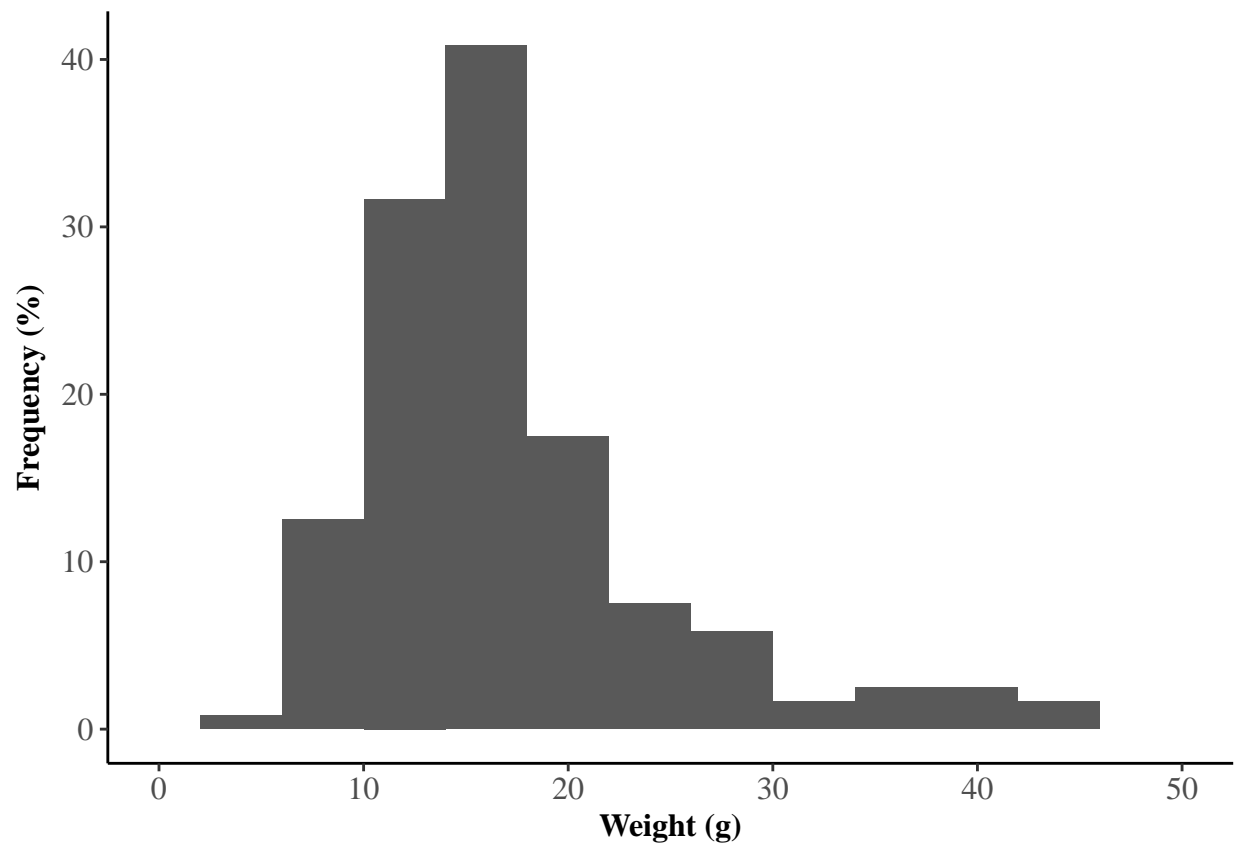


Figure 9: Weight frequency histogram of juvenile sockeye salmon in the Discovery Islands and Johnstone Strait in 2017.

Oceanographic Conditions

Chlorophyll a

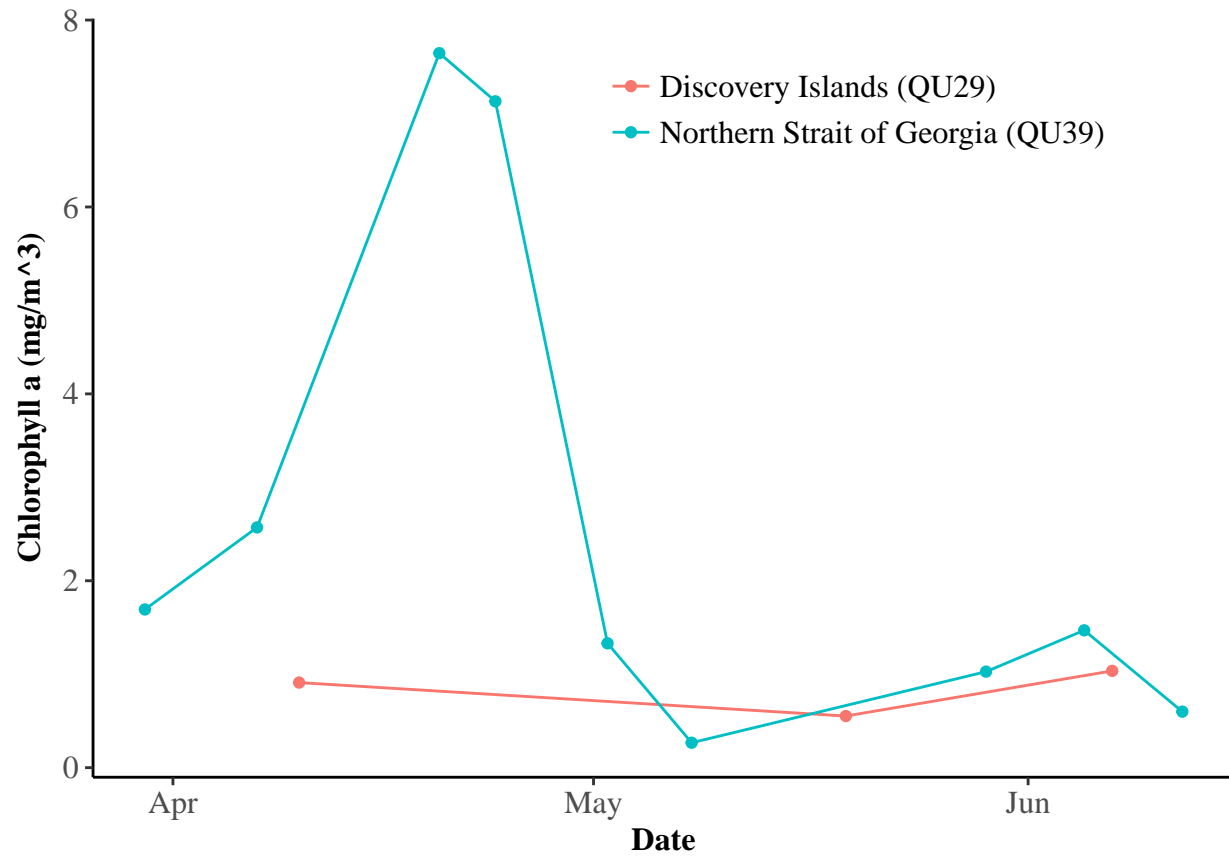


Figure 10: Surface chlorophyll a concentrations in the Discovery Islands and the northern Strait of Georgia in 2017. See Figure 1 for station locations.

Temperature

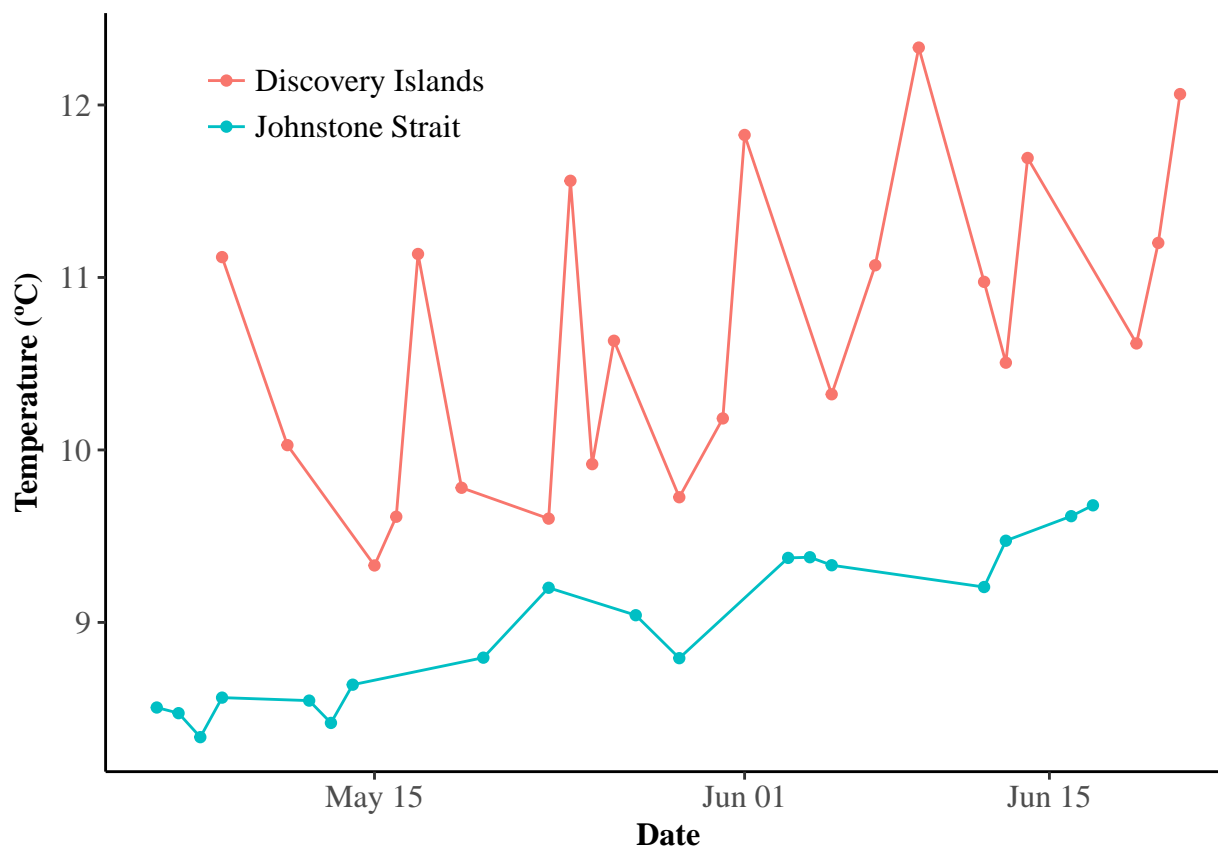


Figure 11: Average temperature of the top 30 m of the water column in the Discovery Islands and Johnstone Strait in 2017.

Highlights

- Sockeye arrived approximately two weeks later in 2017 than in 2015 and 2016.
- The first sockeye to be captured in the Discovery Islands were large (30 g) sockeye — likely two year olds.
- Catch per unit effort of sockeye appears low in 2017 compared to 2015 and 2016